File No. S370-37
Order No. GC20-1823-3

Systems

IBM Virtual Machine Facility/370: Interactive Problem Control System (IPCS) User's Guide

Release 5 PLC 1

This publication, is a reference publication for users of the Interactive Problem Control System (IPCS) component of VM/370. It is specifically directed to the system programmer or the IBM program support representative. IPCS standardizes the problem reporting process and provides:

- Online problem management
- Interactive problem diagnosis
- An online debugging facility for disk-resident CP abend dumps
- A problem-tracking facility that can be updated either by the user or, automatically, by the system

This publication contains IPCS command formats and instructions for their use. IPCS programs, subroutines, and files are listed, as well as the messages associated with IPCS.

PREREQUISITE PUBLICATIONS

IBM Virtual Machine Facility/370:

CP Command Reference for General Users, Order No. GC20-1820

Operator's Guide, Order No. GC20-1806

CMS Command and Macro Reference, Order No. GC20-1818

IBM

| Fourth Edition (December 1977)

| This is a major revision of GC20-1823-2 and makes it obsolete. This
| edition applies to Release 5 PLC 1 (Program Level Change) of the IBM
Virtual Machine Facility/370 and to all subsequent releases until
otherwise indicated in new editions or Technical Newsletters.

Extensive changes have been made to the organization and content of this manual; therefore, the user should read it in its entirety.

Changes are periodically made to the specifications herein; before using this publication in connection with the operation of IBM systems, consult the latest IBM System/370 Bibliography, Order No. GC20-0001, for the editions that are applicable and current.

Technical changes and additions to text and illustrations are indicated by a vertical bar to the left of the change.

Requests for copies of IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form for readers' comments is provided at the back of this publication. If the form has been removed, comments may be addressed to IBM Corporation, VM/370 Publications, Dept. D58, Bldg. 706-2, P. O. Box 390, Poughkeepsie, New York 12602. Comments become the property of IBM.

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Preface

This publication is a reference manual for all users of the Interactive Problem Control System (IPCS) component of VM/370. It is addressed to the system programmer and the IBM program support representative (PSR) whose job it is to diagnose and track system problems, and to debug disk-resident abend dumps. For information on planning and installing IPCS, consult the VM/370 Planning and System Generation Guide. For information regarding operator action when IPCS error messages are encountered, see VM/370 System Messages.

It is assumed that the reader has a thorough knowledge of the listed prerequisite publications and a working knowledge of the corequisite publications. The supplementary publications cited will also prove helpful to the user.

This publication is organized as follows:

"Section 1. Introduction and General Information" gives insight to the facilities provided by the IPCS program.

"Section 2. Using IPCS" describes the procedures and operation of the program.

"Section 3. IPCS Commands" provides detailed descriptions of IPCS command usage. Only those commands unique to IPCS are included.

"Section 4. Other Requirements for IPCS" directs the user to system needs and the requirements for installing as well as the procedures for updating IPCS.

PREREQUISITE PUBLICATIONS

IBM Virtual Machine Facility/370:

CP Command Reference for General Users, Order No. GC20-1820

Operator's Guide, Order No. GC20-1806

CMS Command and Macro Reference, Order No. GC20-1818

COREQUISITE PUBLICATIONS

IBM Virtual Machine Facility/370:

Planning and System Generation Guide, Order No. GC20-1801

System Messages, Order No. GC20-1808

SUPPLEMENTARY PUBLICATIONS

IBM Virtual Machine Facility/370:

Service Routines Program Logic, Order No. SY20-0882

System Logic and Problem Determination Guide,

-- Volume 1, Order No. SY20-0886 (CP)

-- Volume 2, Order No. SY20-0887 (CMS)

-- Volume 3, Order No. SY20-0888 (RSCS)

If all three volumes are needed, use Order No. SBOF3802.

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VMFDUMP SUPPORT REVISED

Changed: Program Support

VM/370 support for the use of the more extensive IPCS version of the VMFDUMP command has been implemented and the modifications will provide CP abend dumps that print all available information pertinent to either the main or attached processor. The DMKEDM module for the CP version of VMFDUMP is no longer available or supported.

MESSAGES SECTION DELETED

New: Documentation Only

All messages pertaining to the IPCS component of VM/370 have been incorporated into the VM/370 System Messages, GC20-1808, for user convenience.

IPCS INSTALLATION

New: Documentation Only

All text referring to the installation procedures for IPCS incorporation into the system has been moved to the publication VM/370 Planning and System Generation Guide, GC20-1801.

APPENDIXES TRANSFERRED

New: Documentation Only

The following appendixes are now found in the VM/370 System Messages publication --

Appendix A. Command-to-Message Cross-Reference
Appendix B. Message Summary Listed Alphamerically by Message Identifier
Appendix C. Message-to-Module Cross-Reference

The content of "Appendix D. IPCS Programs and Subroutines" has been incorporated into VM/370 Service Routines Program Logic, SY20-0882

IBM VM/370 ATTACHED PROCESSOR SUPPORT

New: Hardware Support

VM/370 support for the IBM System/370 Attached Processor is available for the System/370 Model 158 and 168 processors. Modifications to the VMFDUMP (CP abend dump) program documented in this publication are:

- Address of the processor that took the abend
- Printing of all pertinent information for the abending processor plus the PSAs of the main processor and the attached processor.

REORGANIZATION OF TEXT FOR EASE OF REFERENCE

New: Documentation only

Text throughout this publication has been reorganized in order to enhance ease of reference to each of the various phases of the IPCS program. The commands and their usage have been consolidated.

All cross-reference and summary items have been placed in the appendixes for quicker access.

Portions of text have been rewritten for clarification.

Illustrations have been added to supplement the contents.

Section 1. Introduction and General Information

The Interactive Problem Control System (IPCS) enhances the serviceability of VM/370 by standardizing the problem report process. The VMFDUMP command together with the PROB command are the methods used in this process. Both of these generate a disk-resident problem report which, when used in conjunction with the Early Warning System (EWS) microfiche, allows faster identification of previously reported problems. A status capability allows both the system programmer and the PSR to utilize an online data base to manage problems from point of occurrence through final resolution.

The IPCS component:

- Facilitates online problem management and interactive problem diagnosis.
- Provides an analysis function for CP abend dumps; the resultant extracted data resides on disk as a unique problem report.
- Has a prompting program for user-detected failures (for example, documentation, message, etc.); the resultant data resides on disk as a unique problem report.
- Searches for duplicates and informs the user when a problem with similar symptoms was previously experienced at the installation.
- Has a problem-tracking facility that updates and displays problem status.
- Has an interactive debugging facility that aids in the analysis of disk-resident CP abend dumps.

Preliminary Considerations

Problem determination and resolution often require analysis of other data in addition to CP abend dumps. This data is termed "supplementary data" in the IPCS system. Procedures must be established to collect this data before problems occur. For many problems, it is important that the console log be available.

The text that follows summarizes console logs, virtual machine dumps, and trace output. In addition, you can learn of possible collecting procedures and viewing techniques.

CONSOLE LOGS

Spool the system operator's console to the IPCS virtual machine. This will provide a copy of the system console log in the IPCS virtual machine reader in the event of a VM/370 CP abend. At regular intervals during the day, the operator should close the system console thus creating files in the IPCS userid reader. Those files not associated with a CP abend may be reclaimed and printed (using the CP TRANSFER command), or purged. When a problem occurs, type the summary record to

see the next problem number. Read the console log file that corresponds to the time of the failure onto the A-disk naming it PRBnnnnn CONSLOG, where nnnnn is the next problem number. As detailed in "Section 3. IPCS Commands," when the VMFDUMP or PROB commands create the problem report for this problem, you are prompted for the names of Supplementary Data files.

Other users who experience problems in virtual machines (CMS in particular) should spool their console to the IPCS virtual machine and re-create the problem. After using the above procedures to read in and name the console file, use the PROB command to create the problem report.

VIRTUAL MACHINE DUMPS

When an abend occurs in a virtual machine (CMS for example), the CP DUMP command can be used to create a dump for analysis. Spool the virtual printer to the IPCS virtual machine. Type the Summary Record to see the next problem number. Read the dump onto the IPCS A-disk and name it PRBnnnnn VIRTDUMP, where nnnnn is the next problem number. For analysis of the dump, use the CMS TYPE or EDIT commands.

TRACE OUTPUT

Some types of problems (loops in particular) are best analyzed using the CP TRACE command. The virtual printer or console (depending upon the TRACE command options used) should be spooled to the IPCS virtual machine. Type the summary record to see the next problem number. Read the file onto the IPCS A-disk and name it PREnnnnn TRACE, where nnnnn is the next problem number. The CMS EDIT or TYPE commands can be used to analyze this file.

Section 2. Using IPCS

The user who is going to implement IPCS must follow the necessary VM/370 system generation procedures. For system generation information, see the IBM Virtual Machine Facility/370: Planning and System Generation Guide, Order No. GC20-1801.

Operating Procedures

Before you use IPCS, certain steps should be taken. You should:

- Spool the system console log to the IPCS userid so that that you can use the system log file as supplementary data when necessary.
- Use the CP privilege class B SET command as follows:

  ```
  SET DUMP AUTO
  ```

  This command causes the CP abend dump to be placed on disk where it can be processed by the VMFDUMP command.
- Spool the virtual machine log to the IPCS userid so that you can use the virtual machine console log file as supplementary data when necessary.
- Make available as supplementary data any other information that the VM/370 System Logic and Problem Determination Guide -- Volumes 1, 2, and 3 suggest for a given type of problem.

Operating Conditions

The amount of available IPCS virtual machine A-disk space can affect the operation of IPCS.

- Where adequate disk space is available, all problem reports, dumps, supplementary data files, and the Symptom Summary file are stored on disk. As a problem is resolved, the supplementary and dump data files for that problem can be erased. If the number of dumps resident on disk at a given time creates disk space problems, dumps can be temporarily stored on tape.
- Where disk space is at a premium, only the problem reports and Symptom Summary file are required to be kept on disk. All dumps created by VMFDUMP and all supplementary data files associated with a problem should be temporarily stored on tape or spooled to the printer, printed, and retained for future reference to the problem.

IPCS Files

The following are the filename, filetype, and description of the data files residing on the IPCS A-disk. All files associated with a given problem (for example, PTF files or supplementary files) are of the form PREnnnnn filetype, where nnnnn is the problem number. For details of IPCS operations, see Figure 1.

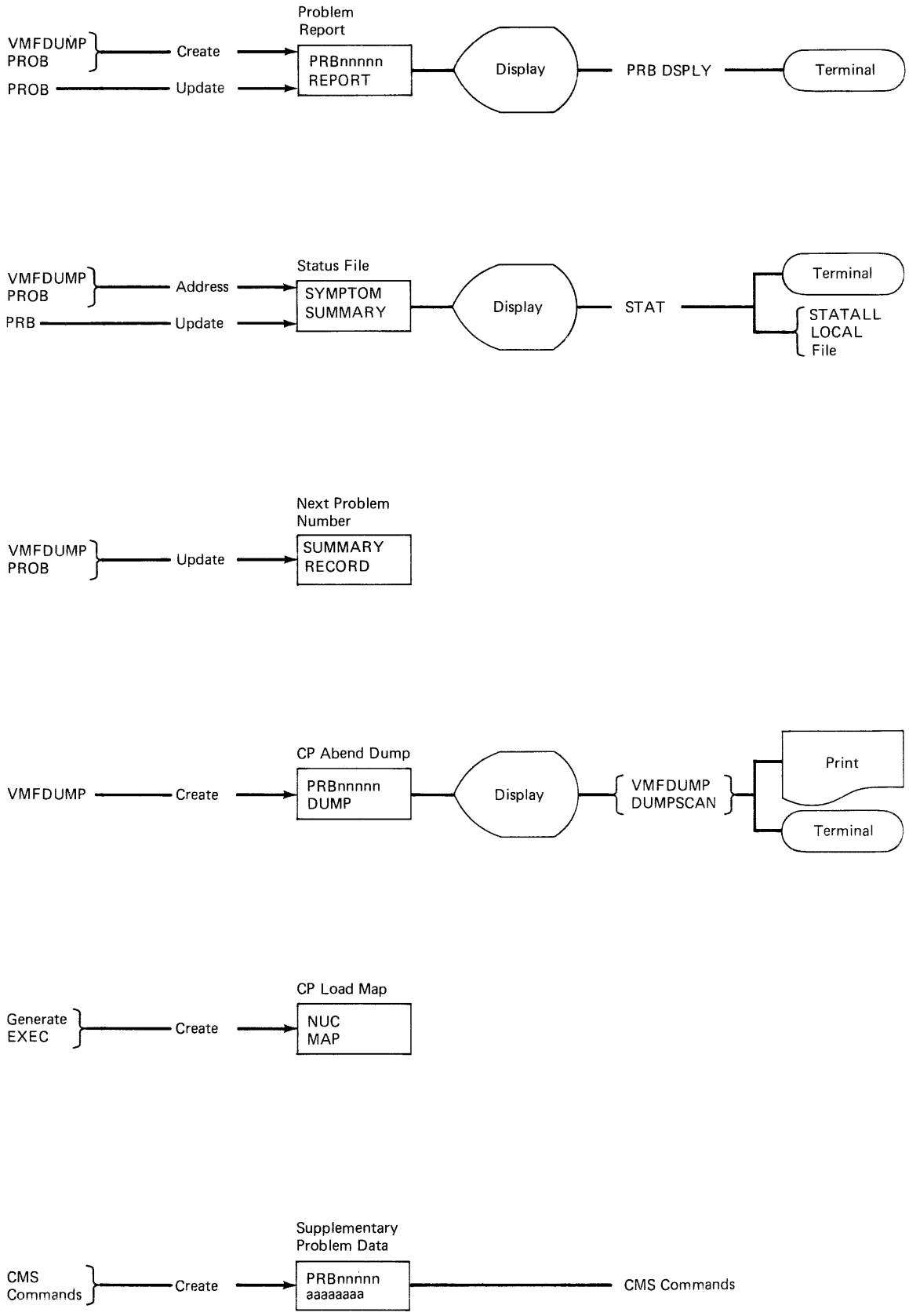


Figure 1. Operations on Data Files Residing on the IPCS A-Disk

PRBnnnnn REPORT
is generated by the PROB command or the VMFDUMP command (see "Section 3. IPCS Commands"). One file exists for each problem known to the system. Use the CMS TYPE or the PRB command to display these files.

SYMPTOM SUMMARY
serves two functions:

1. It provides information about all the problems known to the system and can, therefore, be used for problem control. Use the STAT command to display any status information. Use the PRB command to update the status of specific problems.

2. The symptoms of each problem are kept with their summary control record. These symptoms are used to screen out possible duplicate problems as they are entered into the system via the PROB command or the VMFDUMP command.

Caution: Do not edit the Symptom Summary file.

SUMMARY RECORD
consists of one 80-character record that contains the next available problem number. Should it become necessary, you can use the CMS Editor to create or change this file. You can display this file (using the TYPE command) to find the next problem number. This allows you to name the files associated with a problem (PRBnnnnn). All data associated with a given problem can be controlled in this manner.

STATALL LOCAL
contains the status of all problems known to the system. It is created by the STAT ALL command. You may print this file for a summary of all known problems. For additional information, see the STAT command and Figure 8.

PRBnnnnn DUMP
contains the output of VMFDUMP, where nnnnn is the problem number assigned when VMFDUMP was run.

NUC MAP
contains the current load map for the VM/370 system. This file is required for successful failure analysis by the VMFDUMP program.

Note: The Symptom Summary file contains a control record for each problem. Use the STAT command to display the fields within this record. In order to update the system summary file, use the PRB command. These fields are explained in Figure 2.

Field	Contents
PROB	The problem number.
CREATED	The date the problem was entered into the IPCS system.
LAST	The date of the last update to the control record.
LASTFNCT	The last update function. Possibilities are: CREATED REPORTED APAREL NEEDINFO PTFRCVD PTFON USER CLOSE
STATUS	The status of the problem. Possibilities are: OPENUSER OPENIBM CLOSEL
PTF DUP APAR	One of the following: • The PTF filename and filetype of a PTF for this problem. • The number of a problem of which this problem is a duplicate. • The APAR number that was assigned by IBM.
PLC	The program level change of the VM/370 system on which this problem was detected.
SEV	The severity assigned to this problem.
FAILURE	A one-word description of the type of failure.
ENVIR	The environment in which this problem was detected.

Figure 2. Control Record Fields

Problem Report Generations

IPCS can be used for reporting two types of problem situations. These are:

- CP system-detected failures
- All user-detected failures

To generate a problem report for these problems, see "Section 3. IPCS Commands" for details on the use of the VMFDUMP command and the PRCB command, respectively.

The VMFDUMP command automatically gathers the failure analysis information from the abend dump. It then prompts you for additional problem description information. The PROB command prompts you for specific failure information as well as problem description. In both cases, you are prompted for additional files or diagnostic data associated with the problem (console logs, trace output, etc.), so that these filenames and filetypes can be retained in the problem report file (PRBnnnnn REPORT). These files are referred to as supplementary data

files (see "Preliminary Considerations" in "Section 1. Introduction and General Information").

VMFDUMP or PROB assigns a problem number, nnnnn, when the problem report file is first generated. This number is unique for each problem and is used to refer to the problem for all future update information. This number is also appended to the prefix PRB to create the filename for the problem report file (for example, PRB00001 REPORT). The filename, PRBnnnnn, is used for all supplementary files associated with the problem so that all data for a given problem may be readily recognized and managed.

After the problem report is generated, the system checks the Symptom Summary file (see "IPCS Files" in "Section 2. Using IPCS") for possible duplicate problems already reported. Up to ten possible duplicate problems are displayed with associated status information [for example, any PTFs (Program Temporary Fix) associated with the problem are listed, closed or open status is noted, and the date the problem was detected is recorded]. The current problem report is then filed, whether or not a duplicate problem was found.

Recognizing Problems that Are Duplicates

When a new problem is reported (during PROB or VMFDUMP command processing), its keyworded information is compared with keyworded information for all previously recorded problems, looking for possible duplicates. The keyworded data of the new problem may be a subset of that of an old problem, thus resulting in a "duplicate" status.

It may happen that information about a problem entered via the PRCB command or gathered by the VMFDUMP command is minimal, for example, SCP (System Control Program) level, PLC, and abend type. If this is the case, possible duplicate status might be reflected against a problem that is not, in fact, a duplicate. Your analysis of the problem reports will reveal whether or not the problems are likely to be duplicates.

Since the PLC level and SCP level of the system is keyworded data, duplicates will not be recognized across PLC level or SCP level changes.

Problem Report Updating

After you create a problem report, you can change or display its status.

Updating the Status of a Problem

Issue the PRB command to update the current status of a problem. This command allows you to update the STATUS, LASTFNCT, SEV, or PTF fields in a given problem's Symptom Summary record. For a description of these fields, see "IPCS Command Formats and Their Usage" in "Section 3. IPCS Commands," especially the text of the STAT command.

Retrieving Status of a Problem

Use the STAT command to inquire about the current status of one or more problems.

Adding Information to the Problem Report File

When the PROB command is used, additional information concerning a previously reported problem is put into the problem report file generated for that problem. When you issue the PROB command, the system prompts you for additional information, and then appends it to the existing problem report.

Using DUMPSCAN as a Debugging Tool for CP Abend Dumps

DUMPSCAN allows you to interactively inspect the CP dump created by VMFDUMP. DUMPSCAN is a problem determination tool to aid you in analyzing the dump caused by the CP abend.

You can use the DUMPSCAN subcommands (Figure 3 in "Section 3. IPCS Commands") to view the code preceding and following the error, and the various control blocks, registers, trace table entries, and data areas as they appeared at the time the error was recorded.

Section 3. IPCS Commands

This section contains reference information for the IPCS commmands. For proper usage, see "Notational Conventions" below. Each command description includes the format, keywords, operands, and options if any. In addition, any error messages and return codes issued by the command are listed. Where applicable, usage notes are provided.

IPCS commands are invoked from a CMS virtual machine. There are five IPCS commands as follows:

- DUMPSCAN, which when invoked enables the user to interactively examine a CP abend dump which exists as a CMS file created by VMFDUMP.
- PRB, which updates the status of problems in the Symptom Summary file.
- PROB, which creates problem reports and adds information to existing problem reports.
- STAT, which lists the current status of a given problem report or group of problem reports.
- VMFDUMP, which reads the CP abend dump from the virtual reader, creates a CMS file containing the dump, and creates a problem report by extracting pertinent data from a VM/370 CP abend dump.

Notational Conventions

The notation used to define the command syntax in this publication is:

Commands and subcommands are shown in uppercase and lowercase; the uppercase letters represent the absolute minimum truncation or abbreviation of the command or keyword operand that the system accepts. An all lowercase operand indicates a variable value supplied by the user -- for example, raddr (real address) or fn (filename).

Where operands are shown between braces ({ }), only one must be selected. Where operands are shown between brackets ([ ]), either one or none can be the choice. When an operand is enclosed in brackets and is also underscored, it is the system-selected default value used when no other operand was chosen.

For additional information on syntactical representation of each command, see IBM Virtual Machine Facility/370: CP Command Reference for General Users, Order No. GC20-1820.

IPCS Command Formats and Their Usage

The following text pages give detailed descriptions of the various IPCS commands and their use. For information on error messages and return codes, see VM/370 System Messages.

DUMPSCAN creates an environment that permits interactive inspection of CP dumps formatted by VMFDUMP as CMS files. DUMPSCAN then prompts for the dump filename and filemode. Once the dump is located, subcommands can be entered.

DUMPSCAN is most effective on a 3270 display terminal and the unit of display is approximately one screen of data or X'130' bytes of the dump. If the terminal is a typewriter-like terminal, the unit of display is changed to one line.

Use DUMPSCAN to look at the CP abend dump produced by the VMFDUMP command.

- You can display:

  -- Any chosen area of the dump specified directly by address
  -- The trace table entries, by number of entries
  -- Real and virtual device control blocks by device address
  -- Registers, PSWs, and clocks
  -- A list of all logged-on users with their VMBLOK addresses and status
  -- Any CP module or entry point in the dump by entry name

- You can locate:

  -- A string of hexadecimal data between two addresses
  -- The module containing a given address

- You can print:

  -- The displayed data resulting from the subcommands

The format of the DUMPSCAN command is:

```
┌──────────────────────────────────────────────────────────────────────┐
│                │                                                     │
│   DUMPSCAN     │                                                     │
│                │                                                     │
└──────────────────────────────────────────────────────────────────────┘
```

Note: When you invoke DUMPSCAN, you are prompted for the dump file identification (dump number and filemode). When the dump is found, you can use one or more of the subcommands shown in Figure 3.

Usage Notes:

These usage notes refer to the DUMPSCAN subcommands that are summarized in Figure 3.

1. A string of eight question marks (????????) is displayed when any subcommand is not recognized.

2. If a requested address happens to be for a page that was not dumped, you are so informed.

3. All input, except the string in the LOCATE subcommand, is tokenized to eight bytes. Hexloc-type addresses (1) do not need leading zeros and (2) may have up to six significant digits plus two leading zeros.

4. Use of the DISPLAY (without the nnnn operand) and DMKmmmeee subcommands causes a full-screen display on a graphics terminal. If a 2741 type terminal is in use, this output is limited to one line. In all cases, however, the minimum DISPLAY subcommand output is one 16-byte line with translation.

5. The LOCATE, SCROLL, and SCROLL UP subcommands may be reissued by pressing the enter key (or its equivalent). The last-used address is updated and the subcommand is then reissued.

6. The cuu-type address needs no leading zeros and may be up to three significant digits in length.

7. A minimum one-letter trucation is acceptable for the following subcommands:

AREGS	PRINT	TRACE
DISPLAY	REGS	VIOBLOK
LOCATE	RIOBLOK	VMBLOK
MREGS	SCROLL	

| Note that use of the one-letter truncation R without an operand indicates the subcommand REGS. The truncation R followed by an operand is interpreted to be the RIOBLOK subcommand.

| Also note that use of the one-letter truncation V without an operand indicates the subcommand VMBLOK. The truncation V followed by an operand is interpreted to be the VIOBLOK subcommand.

8. Use of the increment operand in the LOCATE subcommand can reduce search time by eliminating unwanted matches. For example, to search a TRACE table for activity on device 0191, starting at location 70000, enter:

```
LOCATE 0191 70002 80000 10
```

This will check only the four half-bytes at 70002, 70012, etc., until the upper limit is reached.

9. When entering data into the &NAME table, you may not enter any PRINT subcommand nor another &NAME subcommand. For example,

```
&NAME1 &NAME2
```

is not allowed.

If you try to recall an &NAME that is not in the table, the
| response (see Usage Note 1 above) is:

```
???????? &NAME
```

The subcommand in the table is not validity checked until it is
| called from the table and only then are any errors in it indicated.

10. The PRINT subcommand is not allowed into the &NAME table. When the PRINT subcommand is executing, all data displayed on the terminal is also written to the virtual printer. PRINT CLOSE causes this output to be sent to the real printer. PRINT OFF stops output to the virtual printer. CLOSE, by itself, does not turn off the PRINT subcommand nor does OFF close the printer. CLOSE is issued at the end of the session for you. If PRINT is off and the command is issued again, with or without a subcommand, PRINT is turned on for that operation, then turned off. If PRINT was on, it is left on and the CLOSE subcommand is not issued. PRINT with no subcommand reissues the previous command and prints the data. The PRINT ? subcommand displays the status of PRINT.

Subcommand Format	Function
&name subcommand	Enters the cited subcommand into a table. The name portion of this subcommand can be from one to seven characters in length and must be preceded by the ampersand. &name recalls the subcommand. The & alone lists the table entries. See also Usage Note 9.
?	Displays the last subcommand entered.
Aregs	Displays the registers, clocks, PSWs, CSW, and CAW for the attached processor (AP). See also Usage Note 7.
C	Displays the control registers for the failing processor.
Display {hexloc / hexloc%} [nnnn] -- or -- Display {Thexloc / Thexloc%} [nnnn]	Displays areas in the dump. Hexloc is the address you wish to see. nnnn is the hexadecimal number of bytes. If not entered, nnnn defaults to X'130' on a graphics terminal and X'10' on a non-graphics terminal. % gives indirect addressing. If a % is put on the end of hexloc, that address is rounded down to a word boundary. The low order three bytes are then used as the display address. The letter T preceding hexloc is acceptable because it provides compatibility with the CP DISPLAY command. No other leading letter is acceptable. Hexloc followed by a period (.) rather than a space before the nnnn operand is also acceptable. Note: Use of this subcommand with the nnnn operand can cause the display of information crossing a page boundary. If the nnnn operand is not used, data display will be within page boundaries. See also Usage Notes 4 and 7.
DMK? hexloc	Locates the CP module that includes the address hexloc, and displays its current loaded address and the displacement of hexloc from its start.

Figure 3. Summary of DUMPSCAN Subcommands (Part 1 of 3)

Subcommand Format	Function
DMKmmmee	Searches the load map for that entry point where mmm is the module name and ee is the entry name. If it is not found, it truncates to a six-digit module name DMKmmm and tries tc locate that. The address in the load map is converted to a real address at the time of the dump. If the terminal is a display type, the area is displayed. If it is not, the load map address and the real address are listed. Note: This subcommand will not display data crossing a page boundary. See also Usage Note 4.
END	Ends and returns tc CMS.
G	Displays the General Registers for the failing processor.
HELP	Displays a summary of these subcommands.
HX	Ends and returns to CMS.
Locate string fromhexloc tohexloc [increment]	Searches between the fromhexloc and tohexloc for the given string. The string may be from 1 to 32 hexadecimal characters unless the subcommand is in the &NAME table when the maximum is 8 characters. Increment is an optional hexadecimal number from 1 through 1000. It indicates by how many bytes the fromhexloc is to be increased on each match attempt. The default is one-half byte. Note: This subcommand will not display data crossing a page boundary. See also Usage Notes 3, 5, 7, and 8.
MAP	Adds the file NUC MAP A to the dump being processed. If NUC MAP is not found or if it does not match the dump, you are prompted to enter the correct fileid. The dump must be on the A-disk accessed in write mode.
Mregs	Displays the registers, clocks, PSWs, CSW, and CAW for the main processor. See also Usage Note 7.
Print PRT — or — Print { subcommand / ON / OFF / CLOSE / ? } PRT	Reissues the previous subcommand and prints the data. Issues subcommand and prints the data. Turns PRINT on Turns PRINT off Sends printed data to the real printer Displays PRINT status See also Usage Notes 7 and 10.

Figure 3. Summary of DUMPSCAN Subcommands (Part 2 of 3)

Subcommand Format	Function
QUIT	Ends and returns to CMS.
Regs	Displays registers, clocks, PSWs, CSW, and CAW. In AP mode, these are those of the failing processor. See also Usage Note 7.
Rioblok cuu	Displays the RCHBLOK, RCUBLOK, and RDEVBLOK for cuu. See also Usage Note 7.
Scroll [U] ScrollU	Displays the area X'130' bytes ahead (SCROLL) or behind (Scroll U or ScrollU) the current area, except at the end of a storage page, where as much of the page as is possible is shown before crossing the page boundary. This subcommand is intended for use on a display terminal. Note: This subcommand will not display data crossing a page boundary. See also Usage Notes 5 and 7.
Trace [nnn / 19]	Displays nnn trace table entries up to the latest entry. Maximum number is 100 (the default is 19). The display will only go back to the closest page boundary. Note: This subcommand will not display data crossing a page boundary. See also Usage Note 7.
Vioblok cuu [userid]	Displays the VCHBLOK, VCUBLOK, and VDEVBLOK for cuu and userid. Once userid has been entered, it need not be re-entered until a different userid is needed. If no userid has been entered, the default is OPERATOR. See also Usage Note 7.
Vmblok	Scans the VMBLOK chain and lists userids, the VMBLOK address, and status (VMRSTAT, VMDSTAT, VMOSTAT, VMQSTAT) for all logged-on users. See also Usage Note 7.

Figure 3. Summary of DUMPSCAN Subcommands (Part 3 of 3)

Responses:

DMMDSC700I TYPE 'HELP' OR ENTER

is issued when DUMPSCAN is invoked. If you need assistance type 'HELP', otherwise press the enter key.

DMMDSC701R ENTER DUMP NUMBER AND MODE

is issued after the enter key is pressed following the previous message. Enter the significant digits of the dump number -- for PRB00014 enter 14 -- followed by the letter indicating the disk on which the dump is located.

*** READY ***

-- or --

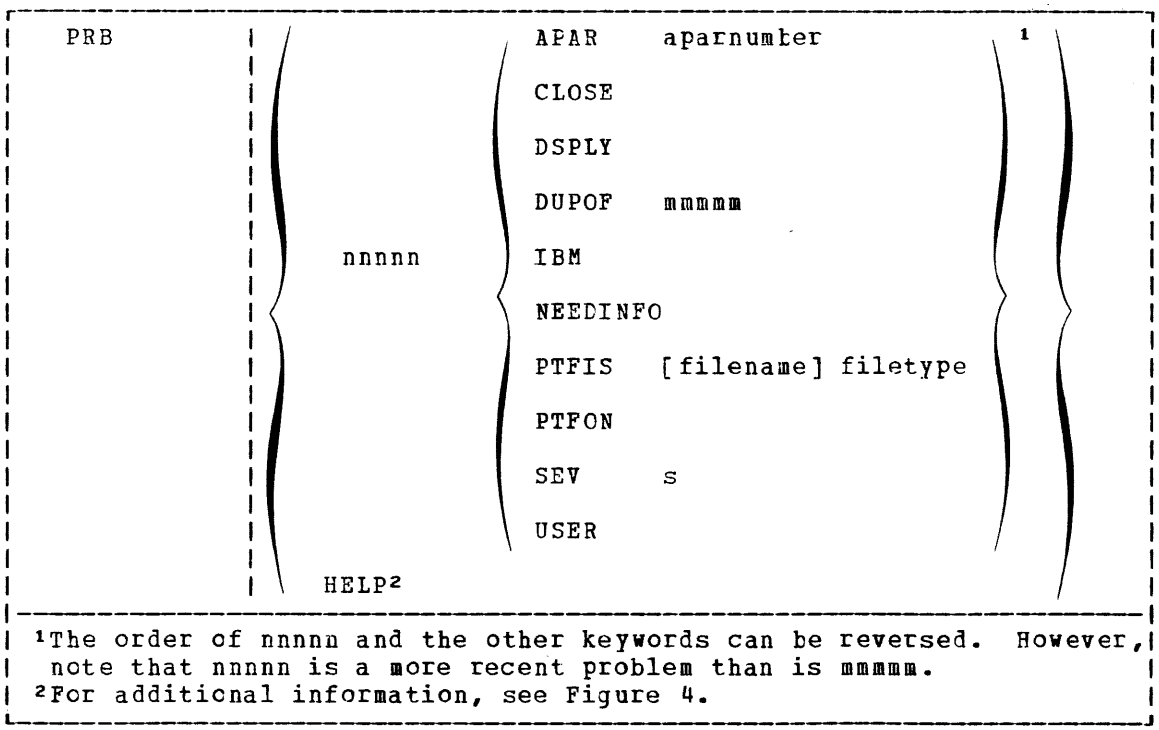
R*

is issued when DUMPSCAN is ready to accept subcommands.

The PRB command updates the STATUS, LASTFNCT, SEV, or PTF fields in a Symptom Summary record (the record associated with a given problem number). This command is an EXEC procedure that invokes the IPCS program SUMMARY after the input data is checked for validity. Changes to the Symptom Summary record are also reflected in the problem report.

Use the PRB command to update the STATUS, LASTFNCT, SEV, or PTF information for a specific problem number.

The format of the PRB command is:



where:

nnnnn identifies which problem report and Symptom Summary record to change; leading zeros may be omitted.

APAR aparnumber
is the number assigned to the APAR (authorized program analysis report). Along with the problem number, it identifies the problem to be resolved.

CLOSE indicates that the problem has been resolved.

DSPLY generates and shows the requested PRBnnnnn REPORT at the terminal.

DUPOF mmmmm
indicates that problem nnnnn is a duplicate of problem mmmmm.

| HELP produces information that tells you how to use the PRB command (see Figure 4).

IBM indicates that a report has been submitted to IBM about problem nnnnn.

NEEDINFO indicates that more information is needed about problem nnnnn before a resolution can be made.

PTFIS [filename] filetype
indicates that there is a filename and filetype of a PTF (Program Temporary Fix) file available for use in resolving problem nnnnn.

PTFON indicates that the PTF has been applied to problem nnnnn.

SEV s indicates that a severity number has been assigned to problem nnnnn, where s is a number from 1 through 4; the lower the number, the greater the severity.

USER indicates that problem nnnnn is a user responsibility.

Note: All status update transactions entered with the PRB command are appended to the PRBnnnnn REPORT data file for the given problem (see Figure 5).

```
prb help
THE FORMAT IS:
PRB NNNNN|HELP OPERAND (DATA)
         OPERAND MAY BE:IBM    APAR   PTFIS  PFTON  DUPOF
                        USER   CLOSE  DSPLY  SEV    NEEDINFO
          DATA MAY BE:
                   A. IF OPERAND IS APAR THE APAR NUMBER
                      E.G. PRB 1 APAR A000123

                   B. IF OPERAND IS PTFIS (FILENAME) FILETYPE OF PTF
                      FILEMANE DEFAULTS TO PRENNNNN IF NOT SPECIFIED
                      E.G. PRB 1 PTFIS PRBC0001 PTFC0001

                   C. IF OPERAND IS DUPOF THE PROBLEM OF WHICH THIS
                      PROBLEM IS A DUPLICATE.
                      E.G. PRB 2 DUPOF 1

                   D. IF OPERAND IS SEV THE NEW SEVERITY
                      E.G. PRB 1 SEV 3
R; T=0.10/0.42 09:46:15
```

Figure 4. Appearance of Screen Following the Invoking of the HELP Operand

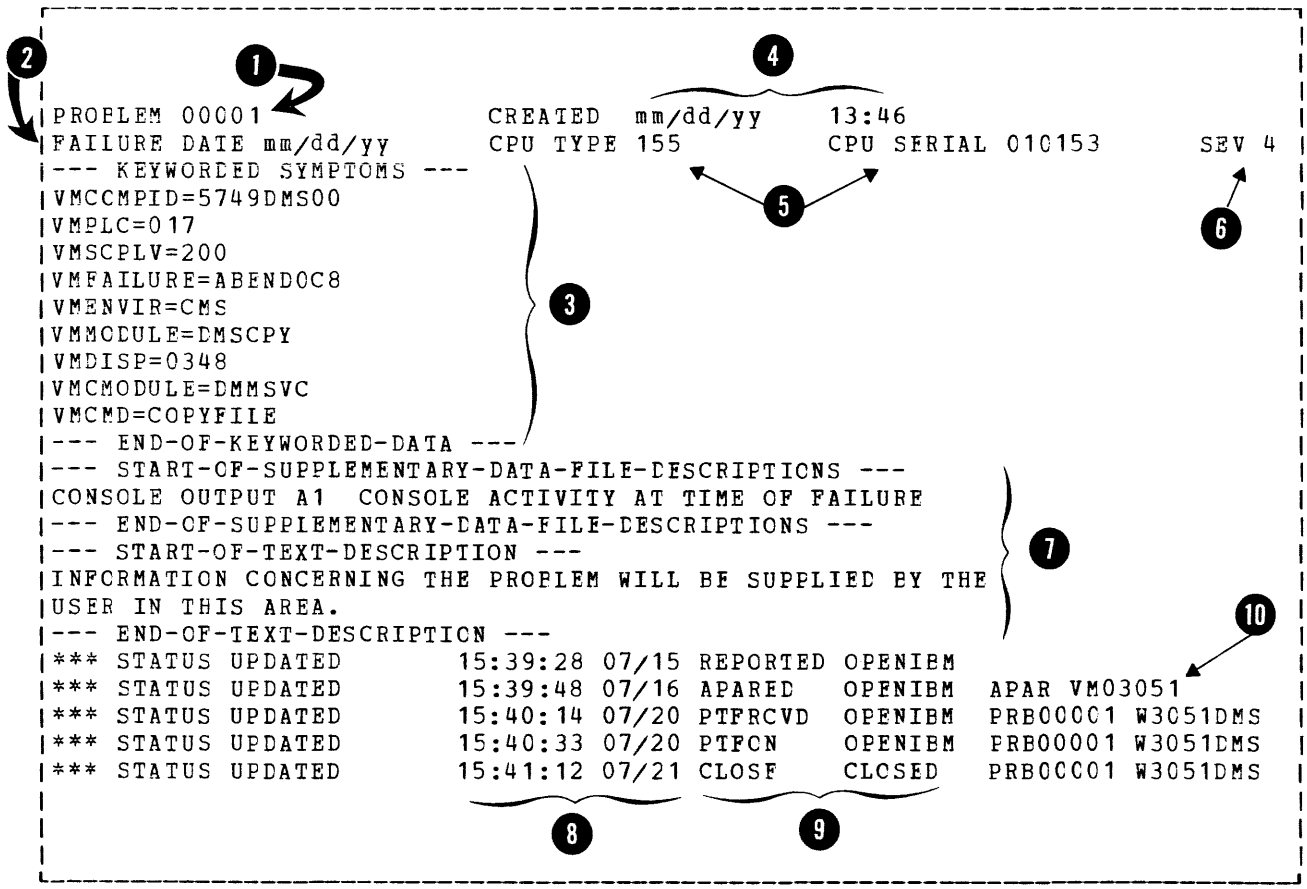


Figure 5. Sample PRB00001 Report File with Status Updates Appended

1. Number assigned to the problem
2. Data in which problem was initially detected
3. Data recorded with keywords
4. Date and time the Problem Report file was generated
5. Machine on which the problem occurred
6. The severity level of the problem
7. Other pertinent data files that can be used to assist in the resolution of the problem
8. Time and date when user updated the problem status via the PRB command
9. New status after completion of the execution of the PRB command

⑩ Additional data and/or information dependent on status update

where:

APAR		is the APAR number
PTF		is the filename, filetype
CLOSE	{ NONPTF { NONPLC	is the reason for closing
DUP		is the duplicate problem's number

Responses:

The following self-explanatory responses are displayed after you have manually posted the status of a problem thus updating it to a new state.

*** APAR aaaa POSTED ***

*** PROBLEM CLOSED ***

*** PROBLEM POSTED AS DUPLICATE ***

*** PROBLEM POSTED AS REPORTED TO IBM ***

*** PROBLEM IS POSTED AS WAITING FOR INFORMATION ***

*** PTF AVAILABLE POSTED ***

*** PROBLEM POSTED AS PTF APPLIED ***

*** SEVERITY UPDATED ***

*** PROBLEM POSTED AS AN OPEN USER PROBLEM ***

The PROB command provides a means for entry of a non-CP abend problem into the IPCS system or for adding information to an existing problem report. Through a prompting technique, PROB systematically collects information from you about the problem.

If this is a new problem, PROB produces a problem report and adds the problem to the Symptom Summary file (see "IPCS Files" in "Section 2. Using IPCS"). It then searches the Symptom Summary file for previously entered problems of the same description and informs you of any matches.

If you are adding information to an existing problem report, PROB prompts you for the additional information and appends it to the existing problem report. For a sample session using the PROB command, see Figure 6.

The PROB command has no operands and is used to enter a non-CP abend problem into the system or to add information to an existing problem report (see Figure 7). The format of the PROB command is:

```
PROB
```

Usage Notes:

1. When you use this command, it creates a problem report by prompting you for information concerning a new problem that has not resulted in a CP system dump. Use of the PROB command can also result in a series of prompts for additional information to be added to an already existing problem report file.

2. In cases where the system expects specific lengths or kinds of data, checking is done and, if discrepancies are encountered, you are prompted again for the desired information.

3. Prompts for information are usually prefixed by a line number (:Lnnnn). If, after a line number is displayed, you wish to change the information you entered in response to the prompt, simply enter the line number exactly as it appeared at your terminal and you will be reprompted for the information. If the reprompt requested was a "decision" prompt (when subsequent prompting depends on the information entered), the prompting continues from that point in the prompting logic and all information entered subsequent to the original prompt will not be recorded. If the reprompt request was not a "decision" prompt, you are returned to the point where you left off.

4. Information entered by you is used to search for already reported problems with the same symptoms. Therefore, accuracy and consistency in entering information is important.

5. Entering :HX or HX at any time during prompting causes immediate termination of the prompting program. No data will be saved.

Responses:

There is a prompting sequence that must be followed to gather problem descriptions and problem-related data. You must supply the name given to the supplementary data file at this time. You can examine this file during problem analysis by using the CMS TYPE or EDIT commands.

```
prob
****** DOES THIS PERTAIN TO AN EXISTING PROBLEM REPORT? (Y OR N)
n
:L0022 DOES PROBLEM PERTAIN TO THIS CPU? (Y OR N)
y
:L0025 ENTER LOCATION OF SUPPORTING DATA.
:L0026 ENTER FN FT FM  PLUS DESCRIPTION OR NULL WHEN DONE
prb00005 conslog  console activity at time of failure
:L0026 ENTER FN FT FM  PLUS DESCRIPTION OR NULL WHEN DONE

:L0027 ENTER SEVERITY. 1-4 (n)
2
:L0028 IS BYPASS FOR PROBLEM REQUESTED? (Y OR N)
n
:L0029 ENTER COMPONENT ID IF KNOWN, EG 5749DMK00 (MAX 10 CHAR)
5749dms00
:L0030 ENTER PLC LEVEL. (1-3 CHAR -- omit leading zeros)
17
:L0031 ENTER SCP LEVEL. (1-3 CHAR -- omit leading zeros)
2
:L0032 ENTER DATE OF FAILURE. (mm/dd/yy)
07/07/75
:L0033 SELECT ONE OF THE FOLLOWING KEYWORDS
****** MSG    ABEND
****** DOC    PERFORMANCE (PER)
****** LOOP   INCORROUT (INC)
****** WAIT   INFORMATION (INF)
abend
:L0038 ENTER OPERATING ENVIRONMENT. CP,CMS,RSCS,VS1,VS2,DOS,ETC. (20 CHAR MAX)
cms
:L0039 ENTER ABEND CODE. EG 0CX
0c8
:L0040 ENTER FAILING MODULE IF KNOWN. EG DMKPAG (8 CHAR MAX)
dmscpy
:L0041 ENTER DISPLACEMENT WITHIN FAILING MODULE. (4 CHAR EXACTLY)
004c
:L0042 ENTER CALLING MODULE IF KNOWN (8 CHAR MAX)
:l0041
:L0041 ENTER DISPLACEMENT WITHIN FAILING MODULE. (4 CHAR EXACTLY)
0348
:L0042 ENTER CALLING MODULE IF KNOWN (8 CHAR MAX)
dmssvc
:L0043 ENTER COMMAND WHICH CAUSED FAILURE IF APPLICABLE
copyfile
:L0061 ENTER TEXT DESCRIPTION OF PROBLEM OR NULL LINE
:L0062 ENTER TEXT (MAX 80 CHAR/LINE)
information concerning the problem will be supplied by the
:L0062 ENTER TEXT (MAX 80 CHAR/LINE)
user in this area.
:L0062 ENTER TEXT (MAX 80 CHAR/LINE)

THIS PROBLEM HAS BEEN ASSIGNED NUMBER 00005
R; T=0.06/0.13 16:58:20
```

Figure 6. Sample Session Using the PROB Command

```
|PROBLEM 00005                CREATED  mm/dd/yy   13:46
|FAILURE DATE mm/dd/yy        CPU TYPE 155        CPU SERIAL 010153    SEV 2
|--- KEYWORDED SYMPTOMS ---
|VMCOMPID=5749DMS00
|VMPLC=017
|VMSCPLV=200
|VMFAILURE=ABEND0C8
|VMENVIR=CMS
|VMMODULE=DMSCPY
|VMDISP=0348
|VMCMODULE=DMSSVC
|VMCMD=COPYFILE
|--- END-OF-KEYWORDED-DATA ---
|--- START-OF-SUPPLEMENTARY-DATA-FILE-DESCRIPTIONS ---
|PRB00005 CONSLOG A1  CONSOLE ACTIVITY AT TIME OF FAILURE
|--- END-OF-SUPPLEMENTARY-DATA-FILE-DESCRIPTIONS ---
|--- START-OF-TEXT-DESCRIPTION ---
|INFORMATION CONCERNING THE PROBLEM WILL BE SUPPLIED BY THE
|USER IN THIS AREA.
|--- END-OF-TEXT-DESCRIPTION ---
```

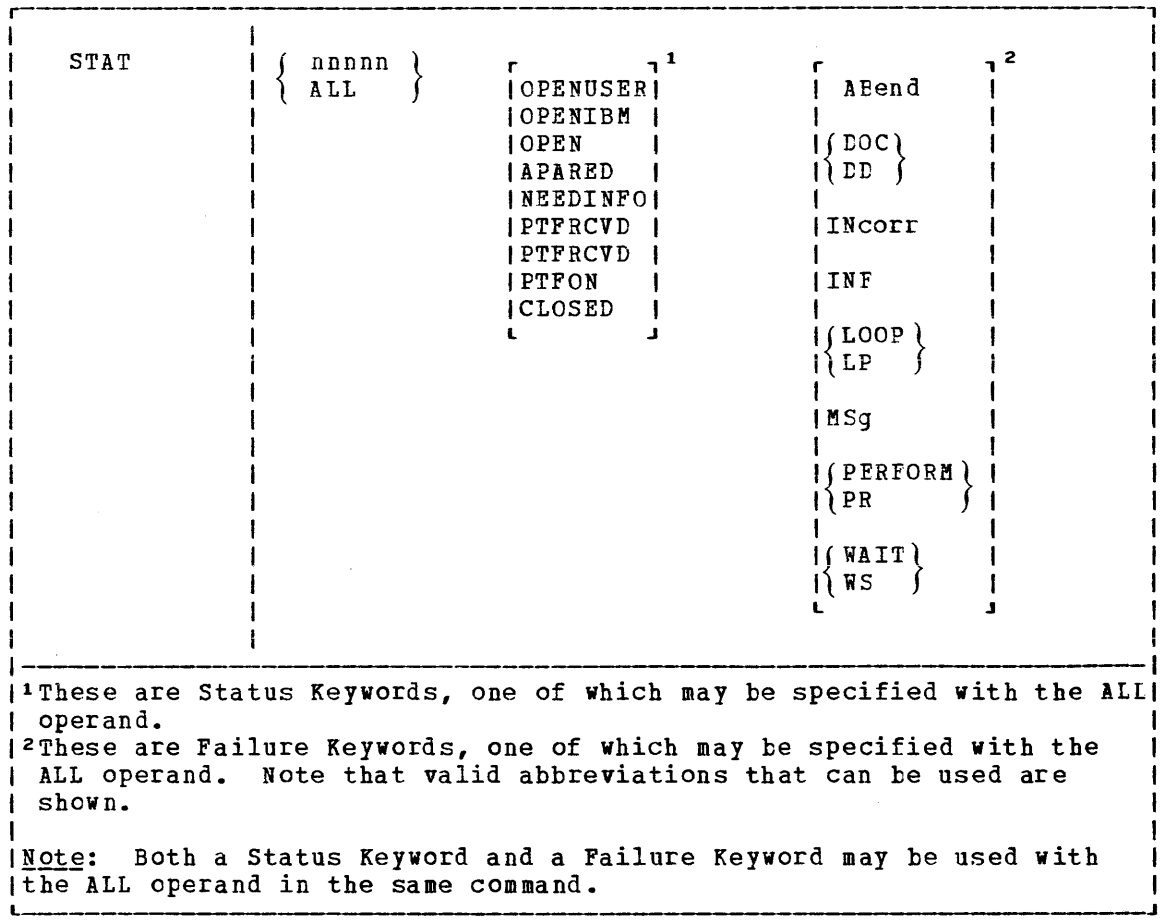
Figure 7. Problem Report File Generated by the PROB Command

The STAT command lists the current status as maintained in the Symptom Summary file for a given problem, a specific subset of problems, or all problems. A request for the status of all problems produces a file named STATALL LOCAL that you can have printed or typed. The results of all other requests are displayed on the terminal for immediate viewing.

When making requests for a subset of problems, you can specify a valid status and/or failure type and the system searches the Symptom Summary file for it.

Use the STAT command to get the current status of a given problem, a specific subset of problems, or all problems.

The format of the STAT command is:



[1] These are Status Keywords, one of which may be specified with the ALL operand.

[2] These are Failure Keywords, one of which may be specified with the ALL operand. Note that valid abbreviations that can be used are shown.

Note: Both a Status Keyword and a Failure Keyword may be used with the ALL operand in the same command.

where:

nnnnn is the problem number of a problem whose status is to be displayed

ALL used alone creates a file containing all known problems. When used with keywords, creates a file containing the following subsets:

Status Keywords:

OPENUSER
indicates all unresolved problems that have not yet been reported.

OPENIBM
indicates all unresolved problems that have been reported to IBM.

OPEN
indicates all problems not yet resolved nor marked closed.

APARED
indicates those problems for which an APAR has been submitted.

NEEDINFO
indicates those problems for which additional information has been requested.

PTFRCVD
indicates those problems for which a PTF has been received.

PTFON
indicates those problems for which a PTF has been applied.

CLOSED
indicates all problems that have been resolved and are marked as completed.

Failure Keywords:

ABEND
AB
indicates problems where an abnormal termination has been detected.

DOC
DD
indicates problems where a document is wrong or unclear.

INCORR
IN
indicates problems giving incorrect output or invalid results.

INF
indicates these problems that contain a request for information.

LOOP
LP
indicates those problems that go into a loop either in CP or in a virtual machine.

MSG
MS
indicates those problems in which an error message was generated.

PERFORM
PR
indicates problems causing poor performance.

WAIT
WS
indicates problems causing a CP or virtual machine wait.

Usage Notes:

1. Use operand nnnnn to display the status of a given problem.

2. If the operand ALL is used alone, a CMS file containing the status of all problems known to the system is created. This file has a fn ft of STATALL LOCAL. This file can be displayed using the CMS TYPE command or printed using the CMS PRINT command. Note that if nnnnn is 00000, STATALL is assumed, status keywords will be ignored, and the STATALL LOCAL file will be created.

3. The status and/or failure keywords are used to request a list of a category of problems. For example:

   STAT ALL OPEN ABEND
   retrieves all open problems with an abend failure type.

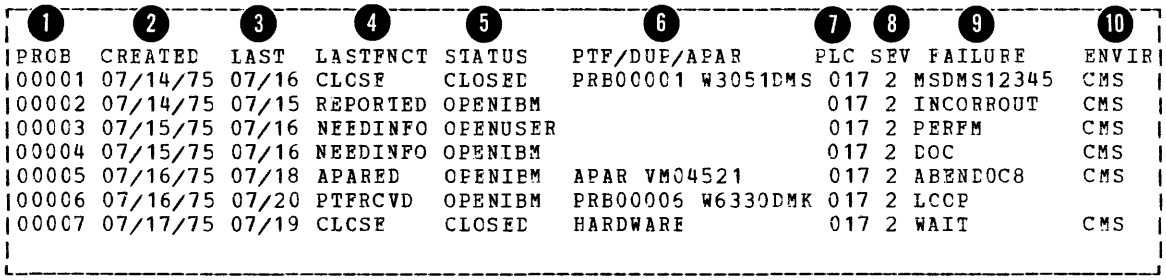
   STAT ALL OPENIBM
   retrieves all open problems that have been reported to IBM.

4. If both status and failure keywords are specified, any valid entry for either will cause a search to be executed. No notification is given of an invalid search argument unless both arguments are incorrect. If both search arguments are selected from the same list (both from status or both from failure), the first one is ignored and the second argument is used.

Responses:

None.

The status of the requested problem(s), preceded by a header line is shown in Figure 8.



❶ PROB	❷ CREATED	❸ LAST	❹ LASTFNCT	❺ STATUS	❻ PTF/DUP/APAR	❼ PLC	❽ SEV	❾ FAILURE	❿ ENVIR
00001	07/14/75	07/16	CLOSE	CLOSED	PRB00001 W3051DMS	017	2	MSDMS12345	CMS
00002	07/14/75	07/15	REPORTED	OPENIBM		017	2	INCORROUT	CMS
00003	07/15/75	07/16	NEEDINFO	OPENUSER		017	2	PERFM	CMS
00004	07/15/75	07/16	NEEDINFO	OPENIBM		017	2	DOC	CMS
00005	07/16/75	07/18	APARED	OPENIBM	APAR VM04521	017	2	ABEND0C8	CMS
00006	07/16/75	07/20	PTFRCVD	OPENIBM	PRB00006 W6330DMK	017	2	LOOP	
00007	07/17/75	07/19	CLOSE	CLOSED	HARDWARE	017	2	WAIT	CMS

Figure 8. STATALL LOCAL File Generated by the STAT Command with the ALL Operand

Output Fields of the STAT Command:

❶ PROB — The system assigned problem number of this problem (nnnnn).

❷ CREATED — The date this problem was entered into the IPCS system using PROB or VMFDUMP.

❸ LAST — Date of last control record status change of this problem.

❹ LASTFNCT — The last significant update function performed relating to this problem. Possibilities are: CREATED, REPORTED, APARED, NEEDINFO, PTFRCVD, PTFON, USER, and CLOSE.

❺ STATUS — The current status of this problem. Possibilities are: OPENUSER, OPENIBM, and CLOSED.

❻ PTF / DUP / APAR — The filename and filetype of a PTF that is intended to fix this problem. This field may alternatively indicate another problem of which this is a duplicate (DUP or APAR). If this is the case, the APAR number assigned by IBM or any PTF activity is reflected in the first recorded problem.

❼ PLC — PLC level of the VM/370 system at time problem was detected.

❽ SEV — Severity assigned to this problem.

❾ FAILURE — One-word description of the general type of failure.

❿ ENVIR — Environment--the general area in which the problem was detected.

VMFDUMP

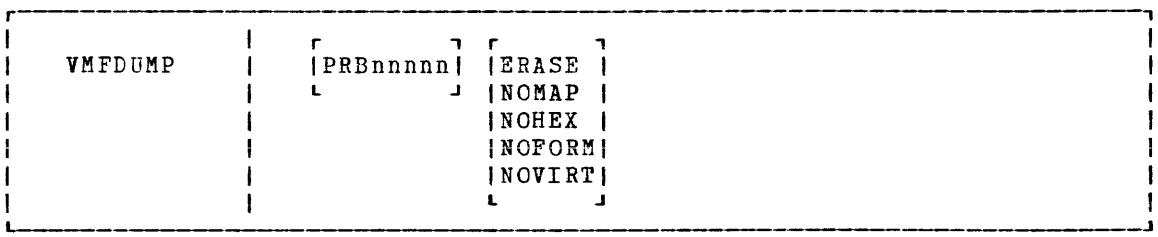
The VMFDUMP command extracts data pertinent to the type of abend and creates a problem report. If you are processing in attached processor (AP) mode, this data will be extracted from the failing processor. In addition to the automatic dump data extraction function, VMFDUMP prompts you for information further describing the problem.

Upon completion of the problem report generation, the system searches the Symptom Summary file. If this search results in a match, you are informed of a possible duplicate. An entry is made in the Symptom Summary file for this problem whether or not the problem is a duplicate.

Use VMFDUMP to format and print, or erase an existing dump. The VMFDUMP command also provides the following IPCS functions:

- Identify the processor
- Read the dump
- Assign it a number
- Extract abend information; if in AP mode, for failing processor only
- Collect additional information
- Create a problem report

The format of the command is:



where:

PRBnnnnnn specifies the dump number previously assigned. Since VMFDUMP has already processed this dump and created a CMS file PRBnnnnnn DUMP, no new problem report is produced. If this number is specified, the dump proceeds dependent upon the second operand specified. If PRBnnnnnn is not specified, the dump is read from the spool file and assigned the next sequential problem number (PRBnnnnnn) as the dump number and a Problem Report file is produced.

ERASE specifies that the dump being processed be erased

NOMAP specifies that no load map be printed

NOHEX specifies that no hexadecimal portion of the dump be printed

NOFORM specifies that no formatted control blocks be printed

NOVIRT specifies that only the real machine control blocks be formatted. This option is ignored if NOFORM is also specified.

Usage Notes:

1. The current CP load map (NUC MAP) is required for the VMFDUMP function to execute correctly. This file must reside on the A-disk of the IPCS virtual machine. For information on obtaining a load map, see the "Generating a CP Load Map (NUC MAP) for IPCS" portion of "Section 4." If VMFDUMP does not find NUC MAP or finds that it is invalid, you are asked to enter the name of the current load map. Note that you may use the MAP subcommand of DUMPSCAN in order to add NUC MAP to the dumping process.

2. The dump specified by PRBnnnnnn will be handled according to the options used. When a dump number is specified in the VMFDUMP command, no data extraction occurs. The following example is the suggested command for processing a new dump:

   ```
   VMFDUMP  NOFORM NOHEX
   ```

   where:

   NOFORM specifies that no formatted control blocks be printed

   NOHEX specifies that no hexadecimal portion of the dump be printed

   Since a dump number was not specified, VMFDUMP will:

   - Read the dump from the spool file.
   - Assign the next sequential problem number as the dump number.
   - Perform the data extraction.
   - Create a problem report.

   The filenames of dumps created by VMFDUMP are of the form PRBnnnnnn DUMP.

   Upon completion of the problem report generation function of VMFDUMP (see Figure 9), a search is made of the Symptom Summary file for a possible duplicate problem. Up to ten possible duplicate problems are displayed with their associated status. Whether or not the problem was a duplicate, an entry is made in the Symptom Summary file for this problem. Figure 10 lists keywords and explanations of their use.

```
PROBLEM 00001                CREATED  mm/dd/yy   12:52
FAILURE DATE mm/dd/yy        CPU TYPE 155        CPU SERIAL 010153    SEV 4
--- KEYWORDED SYMPTOMS ---
VMCOMPID=5749DMK00
VMENVIR=CP
VMPLC=017
VMSCPLV=200
VMFAILURE=ABENDPRG001
VMMODULE=DMKLOG
VMDISP=0024
--- END-OF-KEYWORDED-DATA ---
--- START-OF-SUPPLEMENTARY-DATA-FILE-DESCRIPTIONS ---
PRB00001 DUMP A1
--- END-OF-SUPPLEMENTARY-DATA-FILE-DESCRIPTIONS ---
--- START-OF-TEXT-DESCRIPTION ---
RUNUSER ADDRESS AND NAME-0001C258 SYSTEM
GR 0-15                      00000001  0001CDC8  00000000  0001D204
                             00000010  0001D664  00000000  00010C28
                             000105E8  00079048  0001FC10  0007F290
                             00074000  0007F9A0  4000076C  00000000
PRECEDING CODE    1B22 5020 D00C 5810 03A8 4100 0001 5500 1024  VMINSIR=0000
--- END-OF-TEXT-DESCRIPTION ---
```

Figure 9. Problem Report File Generated by the VMFDUMP Command

Keyword	Explanation	Example
VMCALLER	Module name that called the module in error.	VMCALLER=DMKVSP
VMCMD	Command which was issued causing the failure.	VMCMD=COPYFILE
VMCOMPID	Component ID of failing component.	CP=5749DMK00 CMS=5749DMS00 VMCOMPID=5749DMK00
VMDATA	Type of incorrect output.	VMDATA=MISSING
VMDEGRADE	Type of performance degradation.	VMDEGRADE=VIRTMACH
VMDEVTYPE	Device type that produced incorrect output or on which incorrect output was detected.	VMDEVTYPE=3211
VMDISP	Displacement into the failing module at which the error occurred or was detected.	VMDISP=003C
VMDOC	Type of documentation error which was discovered.	VMDOC=PUB
VMDOCNO	Document (manual) number in which error exists.	VMDOCNO=GC/1234/3
VMENTRY	Entry point of failing or calling module.	VMENTRY=DMKVSPWA
VMENVIR	Environment in which problem was detected (VS1, CMS, CP, etc.).	VMENVIR=CMS

Figure 10. Keywords Used in Identifying Status of Problems Encountered as Shown on a PRBnnnnn REPORT (Part 1 of 2)

Keyword	Explanation	Example
VMFAILURE	General type of failure reported: Code / Meaning MSmmmmmmmm — Where mmmmmmmm is the message identifier ABENDaaaaaa — Where aaaaa is the abend type INCORROUT — Incorrect output and/or results WAIT — Wait state LOOP — System in loop DOC — Documentation PERF — Performance INF — An information report	VMFAILURE=MSDMS222S
VMMODULE	Module where the error appears to be located.	VMMODULE=DMSCPV
VMPAGE	Page number where error exists.	VMPAGE=37
VMPLC	PLC level of the VM/370 system.	VMPLC=-16
VMPREVMSG	Pertinent message preceding error message.	VMPREVMSG=DMSCPY300S
VMRC	Return code.	VMRC=8
VMSCPLV	SCP level. Release number of VM/370.	Rel 2 = 2 VMSCPLV=200
VMSTATE	Type of wait state detected	VMSTATE=ENA

Figure 10. Keywords Used in Identifying Status of Problems Encountered as Shown on a PRBnnnnn REPORT (Part 2 of 2)

SAMPLE INITIATION OF A VMFDUMP OPERATION

Following typical logon procedures, the user can take the following steps to initiate a VMFDUMP operation.

```
query rdr
ORIGINID FILE CLASS RECDS  CPY HOLD
SYSTEM   0126 D DMP 000065 00  NONE
SYSTEM   0088 D DMP 000061 00  NONE
```

Entering QUERY READER discloses that these files are system generated Class D files. This alerts you to the fact that the files are CP Dumps. These dump, although not usable in their present state, are translated by subsequent VMFDUMP processing.

```
ipl CMS
CMS mm/dd/yy WED hh.mm.ss
vmfdump noform nchex
VM/370 DUMP, EXTRACT, EDIT, AND PRINT
```

```
VM/370 SYSTEM ABEND CODE PRG005 DATE 08/26/75  TIME 13:42
DO YOU WANT THIS DUMP?  (YES OR NO)
yes
CREATING FILE PRB00013 DUMP A1
```

(Data extraction process)

```
ASSIGNED PROBLEM NUMBER PRB00013
ENTER SEVERITY OF THE PROBLEM (1,2,3 or 4)
3
ENTER FN FT FM OF SUPPORTING DATA AND DESCRIPTION
E.G.  PRB00013 CONSOLE A1
```

(User enters pertinent data)

```
ENTER ADDITIONAL TEXT 80 CHARS. PER LINE
ENTER TEXT OR NULL
```

(user enters needed text or presses return key or its equivalent)

```
THE FOLLOWING PROBLEM(S) ARE POSSIBLE DUPLICATES,
00012 OPENUSER 08/19/75
R;
```

CMS is loaded into the user's virtual machine and IPCS VMFDUMP is invoked. In this example, he elects to create a CMS dump file. The processing messages related to creating the file follow. If the file is processed and saved using the VMFDUMP program, the CP spool file is erased, and the newly created CMS file becomes PRBnnnnn DUMP, where nnnnn is a number from 00001 through 99999.

Note: If VMFDUMP terminates or enters a loop condition because of an unrecoverable or invalid situation encountered while attempting to format a dump, VMFDUMP should be invoked again with the NOFORM operand.

HOW TO PRINT A CMS DUMP FILE

Use the VMFDUMP command to print a previously created dump file under CMS by entering:

```
VMFDUMP  PRBnnnnn [options]
```

at the terminal. The message:

```
PRINTING FILE 'PRBnnnnn DUMP'
```

is then displayed at the terminal. When the specified file has been formatted and printed, one of two completion messages is displayed:

```
DUMP FILE 'PRBnnnnn DUMP' PRINTED AND KEPT

-- or --

DUMP FILE 'PRBnnnnn DUMP' PRINTED AND ERASED
```

Responses:

None.

Section 4. Other IPCS Requirements

Installation Procedures

| The system requirements and installation procedures for IPCS are
| documented in VM/370 Planning and System Generation Guide.

Generating a CP Load Map (NUC MAP) for IPCS

The following procedure will provide you with a copy of the CP load map on the IPCS virtual machine A-disk. It will not be necessary to use this procedure if you spool your virtual printer to the IPCS virtual machine while loading the VM/370 nucleus during system generation. To execute this procedure you will need the CP nucleus tape created during system generation.

1. Log on to the IPCS virtual machine and attach the tape drive on which you have mounted the tape containing the CP nucleus.

2. Be sure you do not have a virtual disk defined in your virtual machine with the same address as that specified during VM/370 system generation in the SYSVOL operand of the SYSRES macro in your DMKSYS deck. If such an address exists, detach that device from your virtual machine.

3. Spool your virtual printer to yourself. This causes virtual printer output to be routed to your virtual reader.

4. IPL the virtual tape drive. This loads the VM/370 nucleus into your virtual machine and prints the load map in your virtual printer.

5. When the load completes the VM/370 nucleus would normally be written on the system disk. Since that disk does not exist in your virtual machine, an error message appears. The CP load map has already been printed on your virtual printer.

6. Close your virtual printer. The CP load map will now be in your virtual machine reader.

7. IPL CMS and read the CP load map onto the IPCS virtual machine A-disk naming it NUC MAP.

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