North American Response Centers

HP 3000 APPLICATION NOTE #26

HP 2680A, 2688A Error Trailer: Line-by-Line Explanation

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Error Trailers

This application note explains the HP 2680A and HP 2688A Laser Printer error trailer. The article originally appeared in the *Communicator*, Volume 2, Issue 1 (Part No. 5955-1770). We have revised it and added a discussion and quick reference guide on the various functions of FDEVICECONTROL.

If you select an undefined character set, move the pen off the page, or cause similar formatting errors, the printer reports an error to the host, along with the number of the record in error. The host system prints the errors in an error trailer at the end of the output.

The system will abort a job after more than 100 programming errors are reported by the printer. The first 100 errors will be listed with the message "***EXCEEDED 100 ERRORS FOR THIS JOB, SPOOLFILE DEFERRED". The output of aborted jobs is deferred, allowing the programmer to read the error trailer and examine the bad records with the SPOOK utility.

```
:RUN  SPOOK.PUB.SYS
>TEXT  devicefileid
>MODE  CONTROLS=ON
>LIST  firstrecnum/lastrecnum
>EXIT
```

Here is an annotated HP 2680/2688A Laser Printer error trailer:

```
**************************************************************************

          *** 1ERROR LOG FOR LDEV = 14  2DFID = #0667 ***
 3REC = 1667,  PHYS PAGE = 1,  MOVED LOGICAL PEN OFF THE LOGICAL PAGE
          ***                              ***
          ***  ENVIRONMENTAL STATISTICS    ***
          ***                              ***
 4BUFFER = 16 BLOCKS  5BUCKETS AVAILABLE = 32051   6BUCKETS USED = 1772
 7MEMORY = 1024K WORDS
 8 3 VFCs;  9 1 FORMS;  10 7 CHARACTER SETS;  11 1 ACTIVE LOGICAL PAGES;
12 0 PICTURES
13CHARACTER SETS = 43568 WORDS;  14FORMS = 6256 WORDS;  15VFCs = 192 WORDS;
16PICTURES = 0 WORDS
17PAGE LENGTH = 8.50 INCHES   ( 21.59 CM)
18PAGE WIDTH  = 11.0 INCHES   (27.94 CM)
19FORMS CLIPPED = NO;  20DATA TRUNC = NO;  21CHARS CLIPPED = 77;
22PICTURES CLIPPED = NO
23TOTAL USER MEMORY = 50016 WORDS  24DATE CODE = 2214
25TOTAL PHYSICAL PAGES PRINTED = 1


**************************************************************************
```

1. ERROR LOG FOR LDEV = *xx* : the logical device number of the Laser Printer that produced the error trailer.

2. DFID = #O*nnn* : the device file identification number of the output spool file that contained the error. If the output spool file is deferred, this number is used in SPOOK to identify the spool file (see above).

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3. Certain errors will cause an error message to appear. The number of the record that caused the error and the physical page where the error occurred are listed, along with an error message. If the output is deferred, you can use SPOOK to view the record(s) which have errors. The specific error messages are listed below, along with a brief explanation of corrective action:

- NOT ENOUGH MEMORY FOR CHARACTER SET LOAD : There is not enough memory available to load the character set which is being sent to the laser printer.
- NOT ENOUGH MEMORY FOR FORMS LOAD : There is insufficient memory available to load the form which is being sent to the laser printer.
- NOT ENOUGH MEMORY FOR VFC LOAD : There is insufficient memory available to load the VFC which is being sent to the laser printer.
- OUT OF MEMORY - JOB ABORTED, SPOOLFILE DEFERRED : The main memory is completely occupied with character sets, VFCs, forms, and data so that the current input data is lost.
- NOT ENOUGH MEMORY FOR PICTURE DOWNLOAD : The main memory is completely occupied with character sets, VFCs, forms, and data so that the current picture cannot be downloaded.

To correct any of the above five errors, add additional memory to the Laser Printer, and/or reduce the amount of total user memory used (item 23). Look at the memory used for character sets (item 13), forms (item 14), VFCs (item 15), and pictures (item 16). Eliminate any of these that are not essential. If possible, limit the range of character sets in the environment (at the character font menu in IFS) by specifying the lowest and highest character codes actually used. Consider changing permanent (addressable) pictures to temporary (item 12).

- ATTEMPT TO SELECT AN UNDEFINED CHARACTER SET : The character set number specified is not in the environment file. The record is ignored and the currently selected character set remains active. Either add the character set to the environment (at the logical page menu in IFS) or change the character set reference to a valid one.
- AN UNDEFINED FORM WAS SELECTED : The form name referenced by the environment or an IFS/3000 procedure, or the form number referenced by an intrinsic, does not exist. Either correct the reference, download the form with an intrinsic, or remove a previous intrinsic call which deleted the form.
- ATTEMPT TO PRINT WITH NO VFC SELECTED : An attempt was made to print data and there is no currently selected VFC. VFCs were turned off, but an attempt was made to issue a channel call. The channel call is ignored and single spacing is performed. Either specify a VFC file for the environment (at the VFC selection menu in IFS) or specify a VFC file with an intrinsic, or eliminate the channel call.
- ATTEMPT TO PRINT WITH NO LOGICAL PAGE TABLE : An attempt was made to print data and there is no currently active logical page. Be sure to have a logical page active when printing data. Either select a logical page or make a logical page initially active in the environment (at the logical page menu in IFS).
- MOVED LOGICAL PEN OFF THE LOGICAL PAGE : An attempt was made to move the logical pen off the currently defined limits of the logical page. Either modify the "move

pen" command or change the size of the logical page.

- DATA SATURATION - DATA WAS LOST : The HP2680/26688A could not process all of the data fast enough to transfer it to the drum. The number of characters which may appear on any scan line is a function of the horizontal width and vertical height of each character. Wider and higher characters require greater processing than smaller ones, consequently fewer can be placed on a scan line. However, the maximum number of characters (excluding blanks) and form elements that can appear on any scan line is 255. Forms (including shading, boxes, and lines) and pictures will also reduce the number of characters which can be placed on one scan line. Blank scan lines between two adjacent rows of print may help solve this problem. This error can also occur if two logical pages are superimposed on each other so that the total items per scan line exceed the limits of the machine. The 255 limit may be exceeded if you underline characters or use overriding line spacing to overlay print lines.

- SPOOLER BLOCK CONTAINS FORMAT ERROR : The information in the spoolfile was not in the correct format for the HP2680/2688A to interpret it. This could be an invalid function code or an incorrect record or block size. Use SPOOK to analyze the record in error (explained at the beginning of this article).

- A MULTI-COPY FORMS ERROR HAS OCCURRED : An attempt was made to use the multi-copy forms table but the table has not been loaded for this job. Ensure that the multi-copy forms box is set to 'Y' on the IFS physical page menu or ensure that the multi-copy form overlay table is downloaded by an intrinsic.

- EXCEEDED MAXIMUM COPIES PER PAGE : The maximum number of copies per physical page has been exceeded. The physical page menu of the environment file allows you to specify how many times you want a physical page printed before the next physical page is printed. This error indicates that you specified a number greater than the maximum number of 32,767. However, the maximum value can be changed with the FDEVICECONTROL intrinsic. If this error occurs, only the maximum allowed will be printed. Note that this error is unrelated to the number of copies generated by the spooler.

- EXPECTED JOB OPEN FROM SPOOLER : A command or function code was received when no job was in progress. The printer expects that the first record received is a JOB OPEN.

- SPACING PARAMETER IS <=0 IN LPT FOR VFC : The VFC linespacing is less than or equal to zero. The base height of the character set was non-positive. Check that word 10 (height of base character set) of the logical page table downloaded by the FDEVICECONTROL intrinsic is correct.

- ATTEMPT TO SKIP TO A NON-EXISTENT VFC CHANNEL : A non-existent VFC channel was selected. Change your VFC call to point to a valid channel, modify your VFC file to include that channel, or reference a VFC file which has that VFC channel.

- LOGICAL PAGE WAS TRUNCATED TO FIT ON PAPER : Modify the environment (using IFS) to change the logical page, physical page, or scaling on the logical page forms menu.

- OPERATOR MOUNTED WRONG SIZE PAPER : The page size requested by the user did not match the paper length set by the operator. The page length set by the operator will be used. Rerun using correct size paper, have the proper page length entered on the HP2680/2688A operator's panel, or change the physical page of the environment at the physical page menu in IFS. You will get this message if you print on the HP 2688A with an HP 2680A environment, or vice versa.

- ATTEMPT TO PRINT WITH NO CHARSET SELECTED : No character set was selected when a print record was processed. The record was skipped. Specify a valid character set in the environment (using IFS), or select a valid character set with a procedure or intrinsic.

- ATTEMPT TO PRINT WITH TOO MANY PICTURES ON A PHYSICAL PAGE : An attempt was made to print more than 64 pictures on a physical page. This is a system constraint. Modify your program.

- ATTEMPT TO PRINT A PICTURE WHICH IS NOT PRESENT : An attempt was made to print a picture which was not present in memory. Modify your program to reference a valid picture or make the picture available.

4. BUFFER = xx BLOCKS : The size of the incoming data buffer is 512 word blocks. Rather than receiving one data record at a time, the HP2680/2688A expects large multi-block transfers. Each transfer is composed of between one and eight 512-word blocks which were created by the host system spooler. This increases throughput and relieves the burden of deblocking from the host.

5. BUCKETS AVAILABLE = xx : The number of buckets (i.e. 32-word blocks of memory) available. These buckets are used in data linking and command processing. The number of buckets will control how many pages the printer can process (link up) ahead of the actual printing.

6. BUCKETS USED = *xx*: The maximum number of buckets used since the beginning of the job. The number of buckets required to print a job is data dependent.

7. MEMORY = *xxxx* WORDS : The number of memory words in the HP 2680A/2688A Laser Printer, a minimum of 128K 16-bit words. Up to one megaword memory configurations are optionally available. The mainframe and power supply are capable of supporting up to one megaword.

   Approximately 23,000 words of the printer's memory are allocated to exclusive use by the printer for system tables and cannot be accessed by the user. These system tables are invariant in size regardless of the amount of memory installed. The remainder of memory is available to the user and is called the user area. This memory space contains all character sets, forms, VFCs and pictures which are downloaded into the user area. It also contains buckets (32-word blocks) which are used in data linking and command processing.

8. *xx* VFCs : The number of VFCs which are loaded in the printer. The printer will support up to 32 VFCs simultaneously, one for each defined logical page. A VFC consists of a two-word descriptor block and a table of N words. Each bit in a word corresponds to one of the 16 VFC channels. Each word in the table corresponds to one line of the logical page. When a VFC command is received, the printer calculates the line on the page where the pen is currently located. It then accesses the VFC table at this particular address PLUS one, and starts searching the VFC table looking for a word with the bit set corresponding to the VFC channel being skipped to. When the bit is found, the pen is moved down the page to the new line position and the pen is left justified on the logical print line.

   If a VFC bit is not found before the end of the table or the end of the page, then a logical page eject occurs and the VFC table of the next logical page is scanned from the beginning, looking for the bit. If no bit is found on that VFC table then the pen is placed on the first line of that VFC table.

9. FORMS = *xx* : The number of electronic forms loaded in the printer. The HP2680 can print electronic forms on plain paper thus eliminating costly, pre-printed forms. The printer allows a physical page to be divided into a maximum of 32 logical pages. In addition each logical page may have up to two forms overlayed on it. A check is made to see if the form overflows the physical

page, but no check is made to see if the form overflows the logical page. A single form, stored only once in the HP2680 memory, can be used by several different logical pages. The printer will properly place each copy of the form on the corresponding logical page. The orientation of a form is dependent on the rotation of the logical page. The number of logical page form overlays on any physical page cannot exceed 30 forms.

In addition, the user can specify two forms to be overlaid on the physical page, (multi-copy forms). For each copy of the same sheet of paper, the printer can be instructed to overlay two different forms on each of the first eight copies. This feature is controlled by the multi-copy forms overlay table. This means that a total of 32 forms may be placed on one sheet of paper.

10. CHARACTER SETS = *xx* WORDS : The number of character sets loaded in the printer. The maximum is 32.

11. *xx* ACTIVE LOGICAL PAGES : The number of active logical pages. The term logical page refers to any rectangular area on the physical page to which text or graphics may be written. The HP2680 allows up to 32 logical pages per physical page.

12. *xx* PICTURES : The number of permanent (addressable) pictures currently loaded. The maximum is 32. A user wishing to output graphics to the HP2680 will do so by using a construct called a picture. A picture is a dot/bit image of a print area which has been partitioned into a set of picture cells, (i.e. small subsections of the complete picture).

    Two types of pictures are provided, temporary and permanent (addressable). A temporary picture is downloaded, then printed as data, and then deleted from memory. A permanent picture is downloaded, stored in memory, and is then available to the user for printing on demand. These two picture types give the HP2680 the flexibility to efficiently address conflicting requirements:

    - A job which prints multiple copies of the same picture on the same or different pages may use permanent pictures, as directed by the programmer or creator of the job. The job downloads the picture, assigns it an index, and references the picture by index whenever desired. Permanent pictures minimize data communication overhead when the same picture must be printed many times. However, memory limitations may become a problem.

    - Jobs which print many pictures, but rarely repeat them, use temporary pictures. Whenever the job requires a picture to be printed, it issues a print picture command which downloads the picture, prints it, and deletes it from memory.

    The HP2680/2688A supports up to 32 permanent pictures and 64 total pictures depending on memory limitations. Both types of pictures may be used simultaneously within the same job in any manner the creator chooses. The only absolute restrictions are memory availability and the performance limitations of the HP2680.

13. CHARACTER SETS = *xx* words : The number of HP2680A/2688A memory words used for character set definition.

14. FORMS = *xx* WORDS : The number of HP2680A/2688A memory words used for form definition.

15. VFCs = *xx* WORDS : The number of HP2680A/2688A memory words used for VFCs.

16. PICTURES = *xx* WORDS : The number of HP2680A/2688A memory words used for pictures.

17. PAGE LENGTH = *xx* INCHES (*yy* cm) : The length of the page in the direction of motion, in .25-inch increments (or corresponding 1 centimeters). The page length handled by the HP

2680A/2688A may vary from 3 to 17 inches (76.20 to 431.8 mm) in .5 in increments. The page length of the HP 2688A is 11.8 inches (297 mm).

18. PAGE WIDTH = *xx* INCHES (*yy* cm) : The width of the page in .1-inch increments (and corresponding width in centimeters). The page width from tractor to tractor may vary from 6.5 inches (165mm) to 12.7 inches (322mm). The maximum print width is 11.38 inches. The page width on the HP 2688A is 8.5 inches (210 mm).

19. FORMS CLIPPED = (YES/NO) : If yes, one or more forms were not printed on a physical page because the form started in the non-printable area of the physical page (i.e. within 1/4 inch of the perforation between pages). Either a programming error occurred or the operator used the registration buttons to locate the form off the page.

20. DATA TRUNC =(YES/NO) : If yes, data was truncated from the top or bottom of the physical page. Either a programming error occurred or the operator moved the print off the page with the registration buttons.

21. CHARS CLIPPED = *xx* : The number of non-blank characters clipped (i.e. not printed). As characters are processed, the bounds of each character cell are computed to insure that the entire character cell is within the limits of the active logical page. If a character cell fails this check, it is skipped and no attempt is made to print it. If a character cell is not completely within a logical page, the character is truncated and the number of characters clipped for this job is incremented. The actual pen position remains unchanged.

    Note: There is an exception to this rule. If a character cell is oriented in the same direction as the logical page, and the character cell is off the bottom of the logical page, a logical page eject is performed and the character is placed in the first cell position of the next logical page.

22. PICTURES CLIPPED = (YES/NO) : If yes, one or more pictures were not printed because they started in the non-printable area of the page (i.e. within 1/4 inch of the perforation between pages). Either a programming error occurred or the operator used the registration buttons to locate the picture off the page.

23. TOTAL USER MEMORY = *xx* WORDS : The number of user area words actually loaded.

24. DATE CODE = *yyww* : The date code of the DCS firmware ROMS installed, in the form *yy/ww*. The *yy* show the year since 1960, and *ww* shows the week of the year in the range 1 to 52. Date code 1905 translates: to the fifth week of 1979 (1960+19=1979).

25. TOTAL PHYSICAL PAGES PRINTED = *xx* : Total number of physical pages printed since the beginning of the job.

FDEVICECONTROL Functions

The following discussion reviews how to find errors in a spool file that is producing an error trailer. The use of the ;ENV= parameter in a file statement causes calls to be made to the system intrinsic FDEVICECONTROL. The spooler places these calls within the body of the spool file. When looking at the spool file with the SPOOK utility, the first part of the file may look like this:

```
:RUN SPOOK5.PUB.SYS
>TEXT  devicefileid
>LIST firstline/lastline

0
1 ...B..... .. .0.(.0. .8. .0.(.1. .8. .0.*.0. .8. .1.(.0.
.....(.0. .8. ..... ....d.........
2 . .0...2._...d..... .p.4.........................
.....................
3 .........................................
```

To change these lines into understandable commands issue the following:

```
>MODE CONTROLS=ON
```

Now if you use the >LIST command the file should look like this:

```
0  FOPEN
1  FDEVICECONTROL FUNC= 138 P1=% 000000 P2=% 000000 LEN=144
2  FDEVICECONTROL FUNC= 134 P1=% 000000 P2=% 000007 LEN=166
3  FDEVICECONTROL FUNC= 134 P1=% 000000 P2=% 100007 LEN=166
```

The following table is a quick reference guide to the various functions of FDEVICECONTROL. A more complete description of each of the control codes can be found in the MPE V Intrinsics Manual (Part No. 32033-90007).

FDEVICECONTROL Functions

Control Code	Function
128	Select Primary/Secondary Character Font.
129	Activate/Deactivate Logical Page.
130	Move Pen Relative to Current Position.
131	Move Pen to Absolute Position.
132	Define Job Characteristics.
133	Define Physical Page.

FDEVICECONTROL Functions (continued)

Control Code	Function
134	Download/Delete Character Set.
135	Download/Delete Form.
136	Download Logical Page Table.
137	Download Multicopy Form Table.
138	Download/Delete Vertical Format Control.
139	Download/Delete Picture.
140	Page Control.
141	Clear Environment.
142	Job Open.
143	Load Default Environment.
144	Print Picture.
145	End of Job.
146	Device Extended Capability Mode.

READER COMMENT SHEET

North American Response Centers
HP 3000 Application Note #26: HP 2680A, 2688A Error Trailer
RC Questions & Answers (April 15, 1987)

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