

**Field
Developed
Program**

MVS/TSO/VTAM Data Set Print

Program Number: 5798-CPF

Program Description/
Operations Manual

This manual describes the capabilities of the system and the programs. Discussion of design assumptions and potential modification areas are included. Record and file layouts are described and primary processing procedures specified. This manual is both a system description and an installation and operations reference document.

This is a major revision of SB21-2070-0 and incorporates the following Technical Newsletters: SN20-6554 and SN20-6557.

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PROGRAM SERVICES

Central Service is normally provided for a period of twelve (12) months from the date the FDP is initially available from PID. If the Central Service Period is modified, all users will be advised via an Error Correction Letter. Further details are included in each FDP Availability Notice (sales brochure GB21-XXXX) under the heading Program Services.

PSP for the base product has expired. Documentation concerning errors for the SNA extension may be submitted to:

IBM Corporation
Atlanta Midtown Branch Office
Life of Georgia Tower
600 West Peachtree St., N.W.
Atlanta, GA 30308
Attn: Hal Martin

Information concerning Program Services for this FDP can be found in the Availability Notice (GB21-2069).

During this period only, IBM through the program sponsor(s) will, without additional charge, send corrections to the customer reporting the problem and/or through PID issue corrected code or notice of availability of corrected code. However, IBM does not guarantee service results or represent or warrant that all errors will be corrected. Any on-site program service service or assistance will be provided at a charge.

The program documentation updates are distributed in the form of Technical Newsletters, which are to be inserted into the existing manuals. TNLs for the Program Description/Operations Manual are prefixed SN20; TNLs for the Systems Guide are prefixed LN20.

Machine Readable Material updates, distributed as Error Correction Letters, include:

1. A Cover Letter, numbered in ascending sequence, beginning with letter number 001.
2. Problem description materials.
3. Key punch coding sheets or cards that identify changed, added or deleted records.

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INTRODUCTION

The manual presents information required to understand, install, and make use of the MVS/TSO/VTAM Data Set Print (DSPRINT) facility in a TSO environment.

The DSPRINT command is described conceptually. There is a description of the command from the user's standpoint, suitable for extraction from this manual and inclusion in a TSO User's Manual.

Instructions are given, in a cookbook fashion, for installing the product. It is assumed that the installer will understand VTAM concepts to the extent required to create the installation's VTAM environment.

Finally, a section is included on how to operate the printers, and system operator considerations.

For details on the internal design of the product, refer to the DSPRINT Systems Guide, Form No. LB21-2071.

SNA Extension Feature

An optional feature is available for DSPRINT to provide enhanced support for the 3287 and 3289 printers when connected to a 3274 or 3276 controller operating in SNA/SDLC mode. The SNA Extension Feature supports these printers as secondary logical units type 1 (SLU1) as defined in IBM 3270 Information Display System Component Description, GA27-2749. The data stream used in SLU1 operation is the SNA Character String (SCS).

Operation in this mode greatly enhances the throughput and usability of these printers. Printing is overlapped with line transmission time for the next message segments, resulting in virtually continuous printing if line speed and traffic are appropriate. A high degree of terminal operator control of the output is also provided through the CANCEL PRINT, PA1, PA2, and BUFFER REPRINT switches when operating with this feature.

Operational details of these extensions are presented throughout this manual. Operations unique to this optional feature are identified by the terms SNA, SLU1 and/or SCS. If you do not have the SNA Extension Feature of DSPRINT (Feature code | 6025 or 6026) these operations may be ignored.

SYSTEM OVERVIEW

Description

The DSPRINT facility consists mainly of two asynchronously running programs:

- (1) Foreground Command Processor (DSPRINT), and
- (2) Background Print Processor (CPF5798#).

The Foreground Command Processor, invoked when the TSO user enters the DSPRINT command, will validate the request, copy and edit (as requested) the user-specified data set to a dynamically created print data set, and queue the print data set for subsequent retrieval and printing by the Background Print Processor.

The Background Print Processor manages the printers (via VTAM) and the retrieval of print data sets queued by the DSPRINT command Processor. Figures 1.1 through 1.5 are an example of a sequence of events which might occur in this standard use of DSPRINT.

The queue of print requests will reside on a direct access device (vs. memory queuing) so that system failures should not result in the loss of print requests.

Optionally, the TSO user may request DSPRINT to queue a data set directly for printing, thus bypassing the dynamic creation of a print data set.

The DSPRINT Command Processor may be used in either a TSO/TCAM or TSO/VTAM environment. However, the Background Print Processor requires VTAM in order to communicate with the supported devices.

The data sets will be printed with descriptive headers. A person observing the printing will have the option of stopping the printer to change paper, or of flushing the entire data set. Flushing is done by manipulating the printer switch (non-SNA 328x only) or by an operator command, or by deleting the interim print data set prior to the start of printing. For 3287 or 3289 printers operating in Systems Network Architecture Secondary Logical Unit Type 1 (SNA SLU1) mode, flushing is accomplished by using the "CANCEL PRINT" switch on the printer. The header may be printed at the top of the first page or on a page by itself.

The printers may also be left unattended if the "DIRECT" option is not used and there are not special forms requirements. DSPRINT knows the length of the page in each printer, and the command processor will follow each data set listing with sufficient new-line characters to position the paper for the next data set. Occasional checking is advisable to prevent running out of paper.

A TSO user on any type of display or hard-copy terminal may request a printed copy of a data set by entering the DSPRINT command. Thus he can take advantage of parallel operation -- he continues with other commands while the data set is printing -- as well as benefitting from the speed of having a locally available printer.

Any cataloged sequential data set or member of a partitioned data set may be printed (except spanned-record data sets), provided only that it consists of printable characters. Input data records may be blocked or unblocked of fixed, undefined, or variable length.

Printer formatting capabilities are provided which allow the user to optionally specify:

- o Number of lines to be printed per page.
- o Size of both top and bottom margins.
- o Width of the printed line.
- o A selected group of records to be included from the data set.
- o Selected groups of columns to be printed from each record.
- o Printing or suppression of line numbers.
- o Printer spacing control:
 - o Single.
 - o Double.
 - o Honor some ANSI forms control characters.
 - o Honor some machine forms control characters.

Output may be directed to any specific 3790 line printer or 3270-attached 3284, 3286, 3287, 3288, or 3289 printer supported by the installation via VTAM.

The vertical forms control feature of the 3288 is supported.

For 3287 and 3289 printers operating in SNA SLU1 mode, all front panel switches provided on the hardware for operator communications are supported. These include the CANCEL PRINT switch for flushing a request, BUFFER REPRINT to request reprinting the current page (3287 only), PA2 to request reprint starting one page back, and PA1 to request restart at the beginning of the request. In addition, vertical forms control and blank compression are supported using standard SNA Character String (SCS) commands in the SLU1 mode of operation. Operational details of these facilities are given in the Operations Instructions section of this manual.

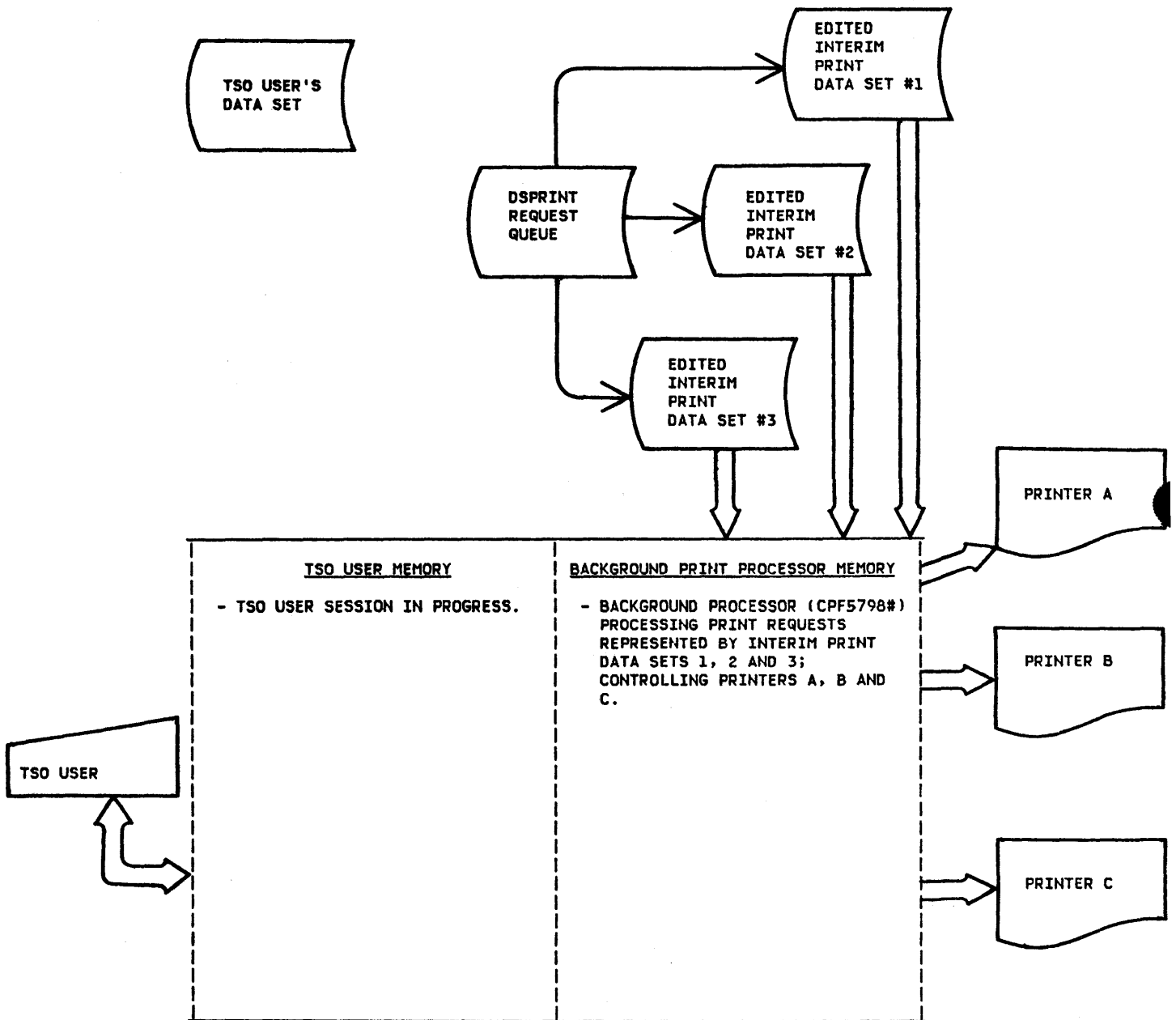


FIGURE 1.1

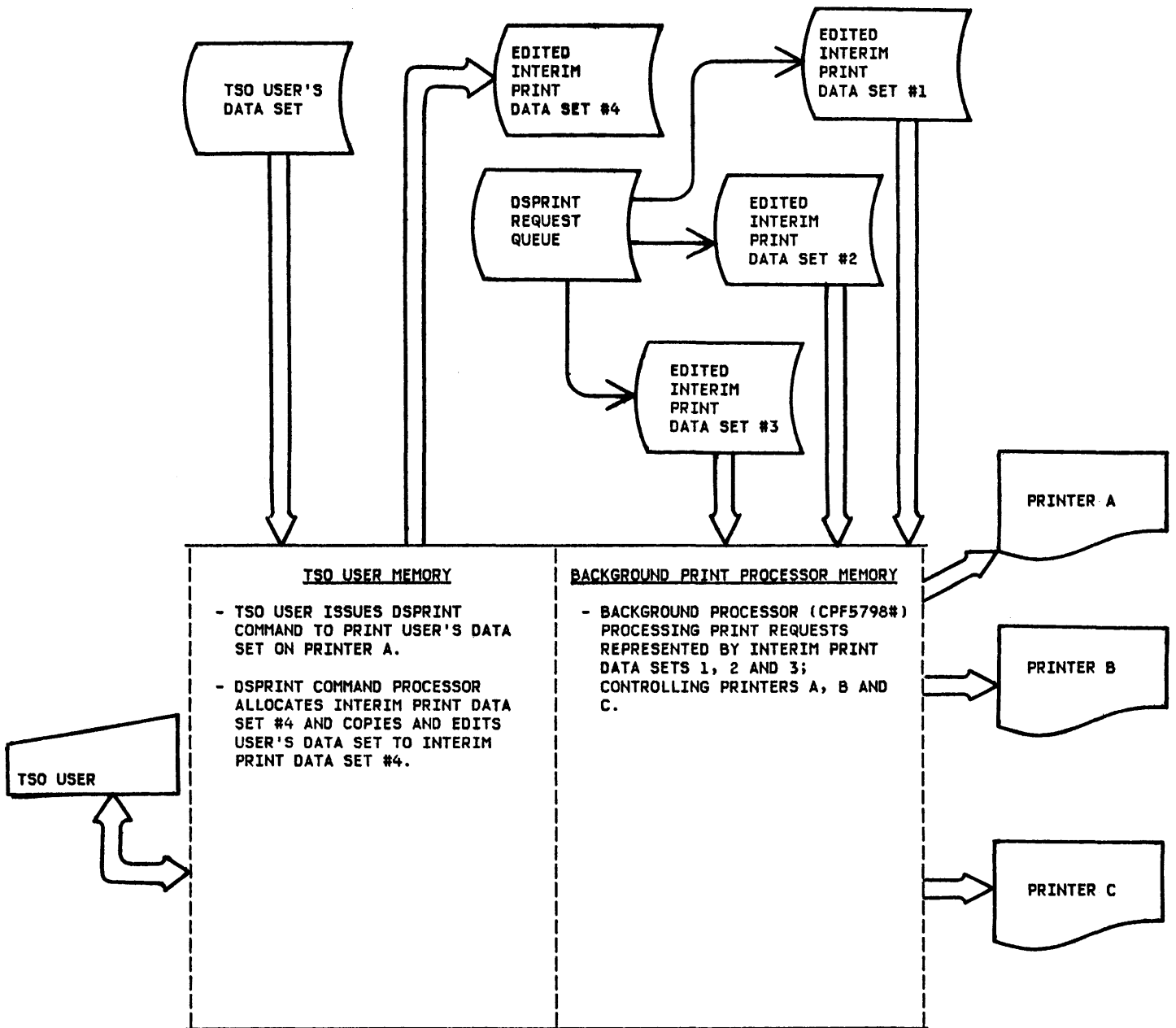


FIGURE 1.2

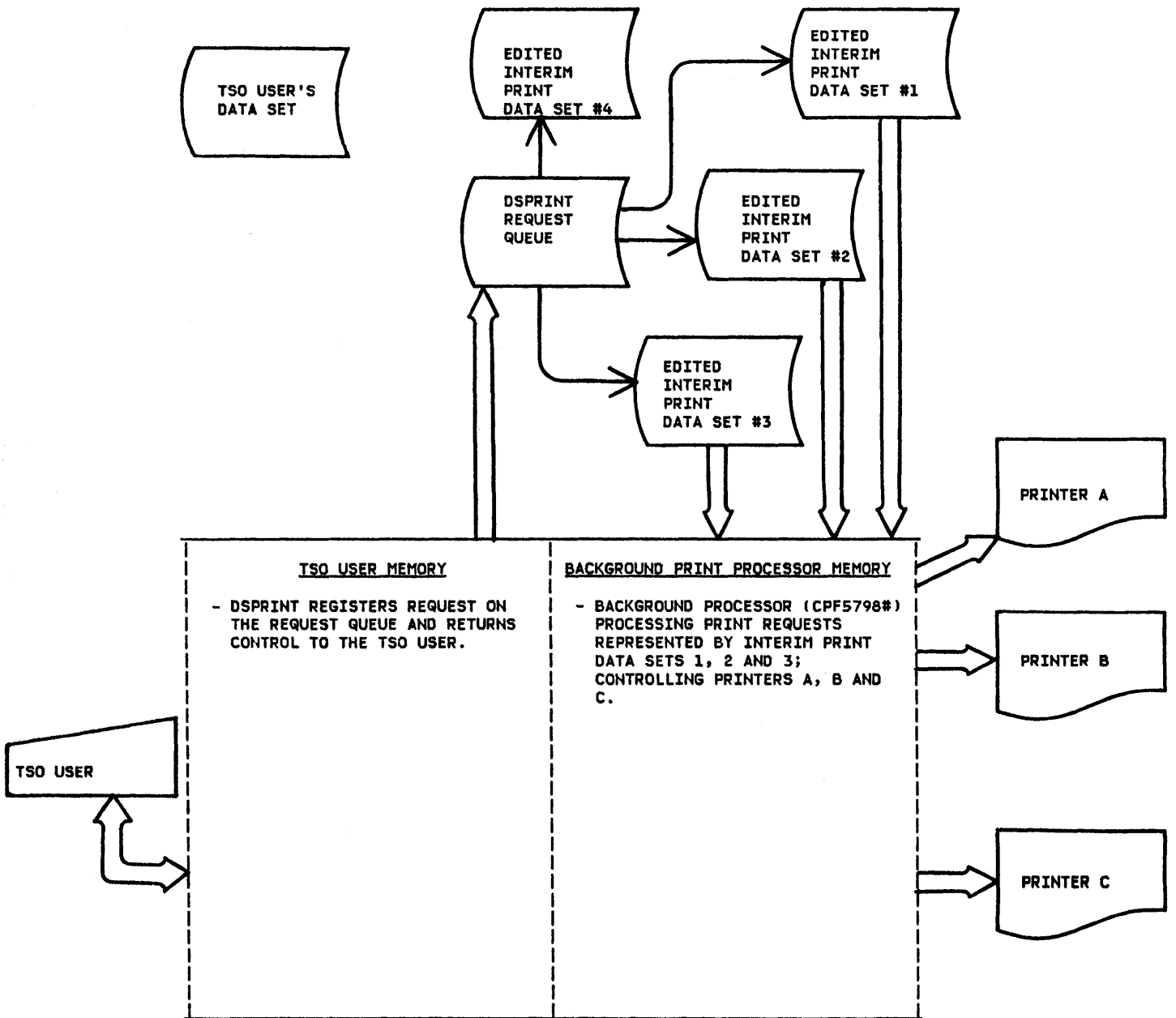


FIGURE 1.3

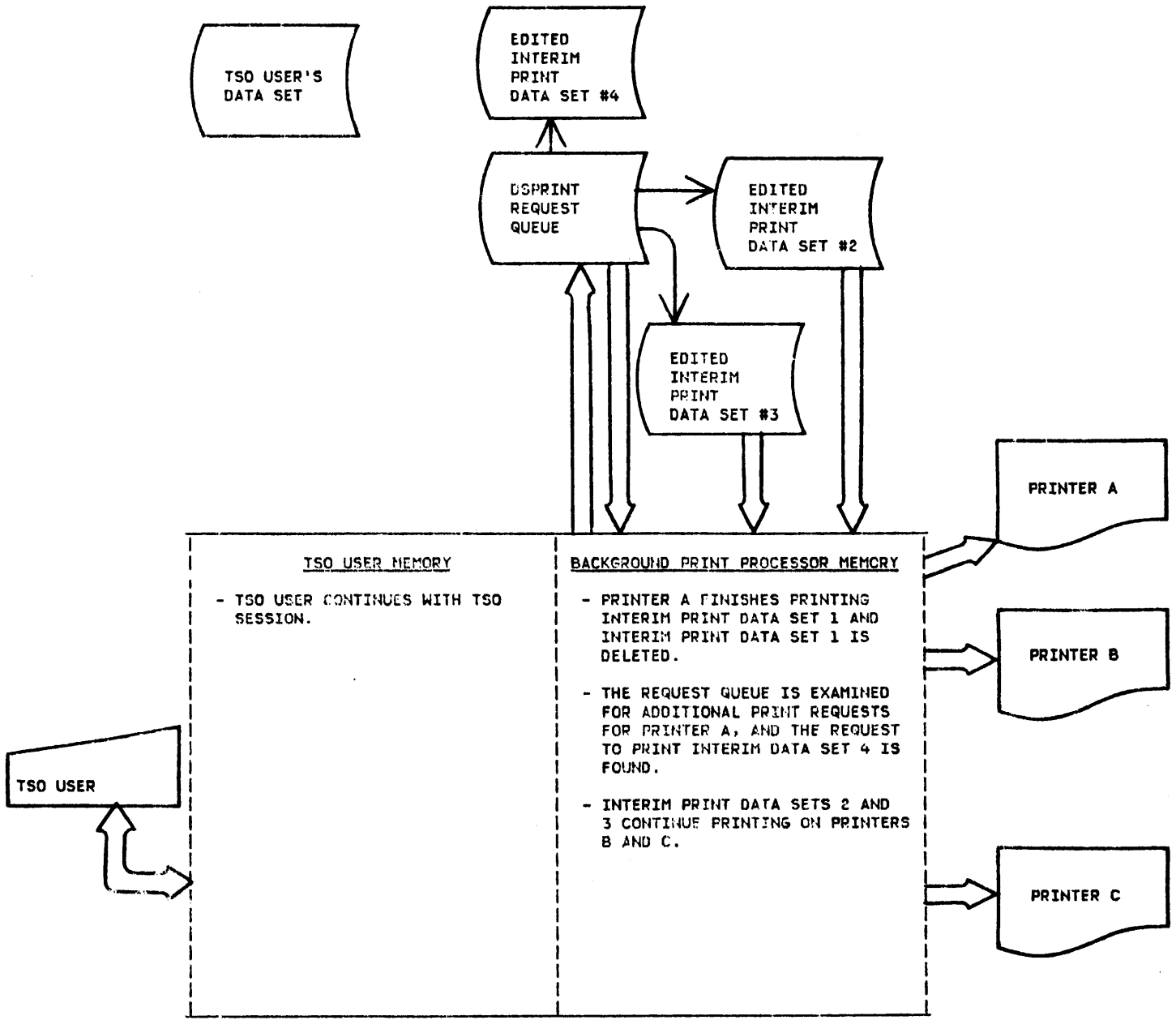


FIGURE 1.4

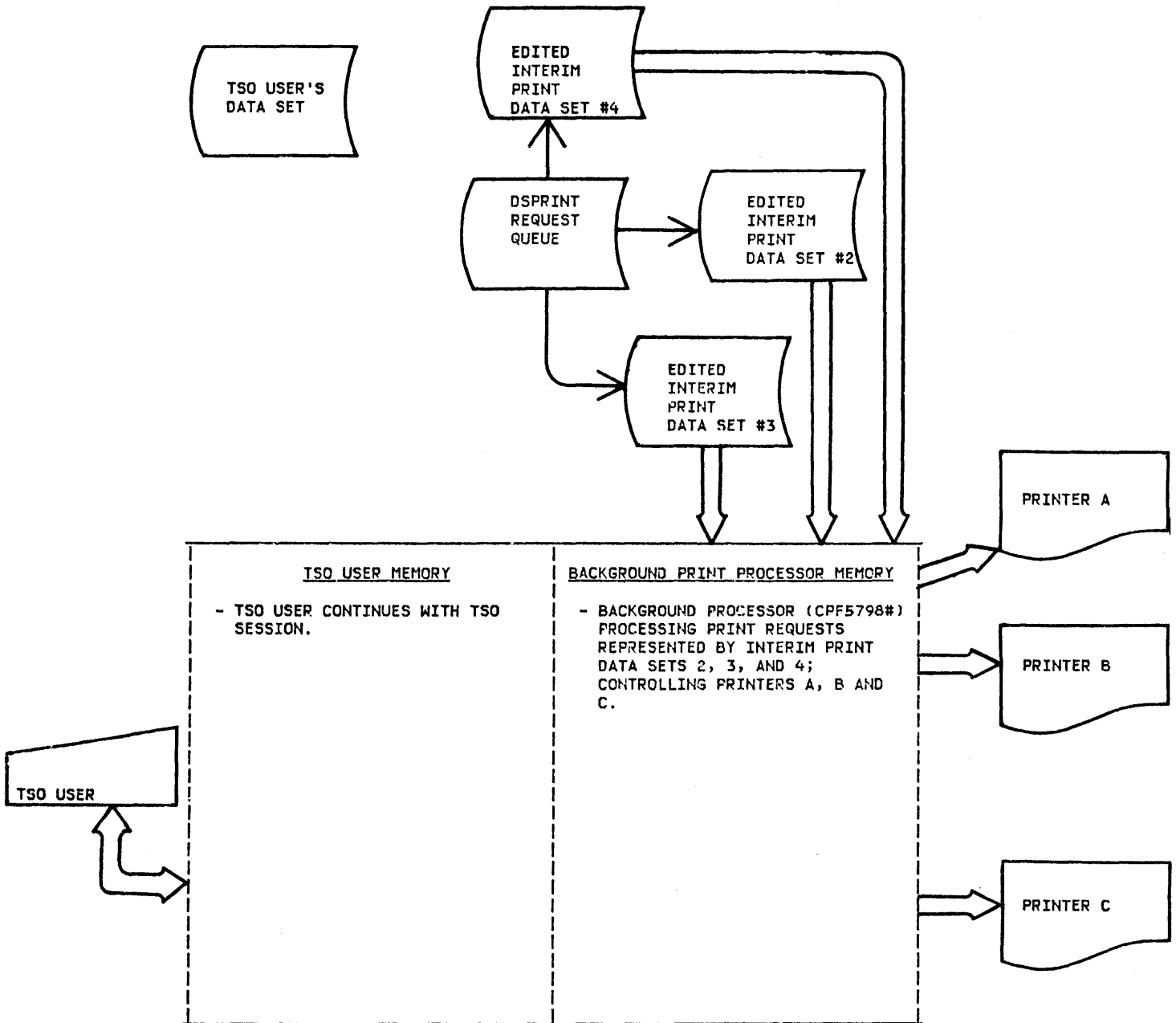


FIGURE 1.5

System Configuration

The DSPRINT Command Processor and associated Background Print Processor operate on System/370s with MVS, VTAM, and either TSO/TCAM or TSO/VTAM.

The storage requirements for the product load modules are as follows:

DSPRINT Command Processor module:	14K
Background Print Processor module (CPF5798#):	12K
CPF5798# 328x subtask module (CPF5798A):	14K
CPF5798# 3790 subtask module (CPF5798B):	16K
CPF5798# 3287-3289 SLU1 subtask module (CPF5798C):	20K
CPF5798# Timer subtask module (CPF5798\$):	200 bytes

All modules are re-enterable and may be placed in the Link Pack Area except CPF5798#.

Any TSO-supported terminals may be used to enter the DSPRINT command. Any 3284, 3286, 3287, 3288, or 3289 printer defined to VTAM as a local or remote bisync device is supported. Vertical Forms Control for the 3288 is supported if defined at product installation (defined in the DSPRINT Request Queue). VTAM defined 3790 Batch Function Line Printers are supported.

Version 2 of this program also works with 3287 and 3289 printers, both local and remote SNA connections, but in Data Stream Compatibility (DSC) mode only. A separate feature, #6075 or #6026, is available to support SNA Character String (SCS) mode.

Programming Systems

All portions of the base product were written using PL/S II. PL/S listings of the base product are provided along with Assembler Language source. (These PL/S listings are at the Version-1 level, even on Version 2 of the program.) The SNA SLU1 extension was written in Assembler Language based upon the Assembler Language source of module CPF5798A.

Programs and components required to maintain and execute this product include VTAM (or ACF/VTAM) and TSO running under OS/VS2 Release 3.7 or 3.8.

PROGRAM DESCRIPTION

The following pages may be reproduced for inclusion in TSO terminal user's manuals and System Console Documentation.

The DSPRINT Command

Use the DSPRINT command to cause selected lines and columns of a data set or member of a partitioned data set (PDS) to be printed on a 3284, 3286, 3287, 3288, 3289, or 3790 line printer. You may select the printer, by name, from among those made available to you by your installation. You may direct your listing to a printer even though that printer is currently busy printing another data set.

You may print your data set with or without line numbers. You may specify single or double spacing or allow spacing to be handled by embedded forms control characters. A header will always be printed for you, containing your userid, the date, the time of day, and the data set (and member) name. However, you may request that the header be printed on a separate page, if you do not want it with your listing.

Each printer at your installation has been assigned default values for certain of its characteristics: page length, printing width, top margin, and bottom margin. You may change any of these values for your own data set if you wish. To allow for special forms requirements, the printer will pause for ten seconds after printing your header. Read the "Printer Operational Characteristics" section, if you wish to take advantage of this feature. However, it will be your responsibility to be in attendance at the printer when your data set begins printing, because printing will resume automatically after the ten second pause. (There are no pauses for 3790 printers.)

If you wish to cancel a previously entered DSPRINT request which has not started printing, it may be done by deleting the print data set created by the DSPRINT command. DSPRINT sends a message to you, identifying the Request Number associated with the DSPRINT request. Since DSPRINT interim print data sets have data set names (DSNs) of the form 'userid.DSPRINT.REQUEST.#nnnnn', where nnnnn is the Request Number, you enter the command

```
'DELETE DSPRINT.REQUEST.#request-number'
```

If you cannot recall the Request Number, the LISTCAT command can show all your extant DSPRINT print data sets:

```
'LISTCAT LEVEL (userid.DSPRINT.REQUEST)'
```

If there are multiple print data sets and the desired Request Number cannot be recalled, you can browse the print data sets in order to determine which should be deleted.

The syntax for the DSPRINT command is as follows:

Command Syntax

DSPRINT dsname[/password] printer-name

```
[ [DDNAME(ddname)]  
  [LINES(linenum1[:linenum2])]  
  [NUM [(location[,length])]  
  [SNUM [(location[,length])]  
  [NONUM]  
  
  [COL([integer1][:integer2][,...])]  
  
  [PAGELEN(integer)]  
  
  [TMARGIN(integer)]  
  
  [BMARGIN(integer)]  
  
  [SINGLE]  
  [DOUBLE]  
  [CCHAR ]  
  
  [FOLD [(width)]]  
  [TRUNCATE[(width)]]  
  
  [EJECT ]  
  [NOEJECT]  
  
  [DIRECT [ (KEEP ) ]  
            (DELETE) ] ] ]
```


dsname

This is the name of the data set or PDS member to be printed. It may be expressed as a fully qualified name by enclosing it in a pair of single quotes, or it may be expressed as an unqualified name by not using quotes. If an unqualified name is used, the true data set name will be assumed to be the specified name prefixed by your TSO prefix. If the data set is partitioned, a member name must be specified in parentheses immediately following the data set name (and within the quotes, if the fully qualified name is given). If the data set is password protected, suffix the dsname with / and the password.

The record format may be fixed, variable, or undefined. It may be blocked or unblocked. The records may contain ANSI or machine-code forms control characters or no forms control characters. Spanned records are not supported.

printer-name

This is the name of the printer to which the data set will be sent. Your installation must supply you with the valid names of your printers.

DDNAME

This specifies a file name (DDNAME) with which the data set is currently allocated. DSPRINT will bypass its dynamic allocation routines for the data set. However, the ddname is not crosschecked against the dsname.

LINES

Linenum1 and linenum2 define the range of lines within the data set or member that are to be printed. Linenum2 must not be less than linenum1. If linenum2 is omitted, printing will end with the last line. If the data set contains no lines in the specified range, the request will be rejected.

Unless NONUM is specified, a field within each record will be taken to be the line number field (see NUM). Linenum1 and linenum2 will be compared with the numbers contained within the records of the data set. The first record to be printed will be the first one found having a line number equal to or greater than linenum1. After that, the first record having a line number greater than linenum2 will cause printing to cease.

If NONUM is specified, then linenum1 and linenum2 will be taken to represent record positions within the data set or member. All lines, beginning with linenum1 and

ending with `linenum2`, will be printed. If 0 is specified for `linenum1`, printing will begin with the first line (record).

NUM

This operand implies that the data set contains a line number field within each record. Location and length are integers that define the position of this field within each record. Length is one digit and may not be greater than 8. If length is not given, it will default to 8 characters. The default for location will depend on the record format: the beginning of the record for variable or undefined formats, and the end of the record for fixed formats.

The contents of the line number field will print in the first positions of the printed form, followed by 1 blank, followed by the rest of the record or requested columns. If the width specified with `FOLD` or `TRUNCATE` is not large enough to contain the sequence field, the blank, and one character of text, `NUM` will not be allowed. Instead, `NONUM` will be forced.

SNUM

This operand implies that the line number field exists within each record exactly as though `NUM` had been specified. However, the printing of the line number fields will be suppressed. The designated text of each record will be printed starting in column 1 of the output form.

NONUM

This operand implies that there is no line number field in the records of the data set. If in fact there is one, the line numbers will be treated as data. The designated text will be printed starting in column 1. `NONUM` is the default if and only if `DIRECT` is specified.

COL

This operand says that only selected columns from each of the records are to be printed. A maximum of 32 pairs of integers give the ranges of columns. These may be specified in any order. Each range must be specified from left to right. Duplication or overlap of the column ranges is allowed. Forms control characters, if present, will not be counted. The specified columns will be printed even if they include the line-number field. If any range given has no second value specified, end-of-record will be assumed. If no first value is specified for a range, beginning-of-record will be assumed. Blanks will be "printed" for any part of a range that lies outside of the actual record. However, if a starting column is given that

is beyond the end of a record, and no second value is given for that range, the range will be considered empty.

PAGELN

This integer is the length of a page in terms of the number of lines it could hold with no top or bottom margins. If this operand is not given, it will default to a value specified by the installation for the designated printer.

If you specify a value other than the default, you must be present at the designated printer when your data set begins to print. You will have to insert the proper paper for your own data set and restore the standard-length paper and align it properly when you are done.

TMARGIN

This is the number of blank lines to be left at the top of each page. If this operand is not given, it will default to a value specified by the installation for the designated printer. Unless EJECT is specified, the top margin (minus one line) on the first page of the listing will occur after the header.

BMARGIN

This is the minimum number of blank lines to be left at the bottom of each page. If double or triple spacing is in effect, there may actually be one or two more blank lines left than specified here. If this operand is not given, it will default to a value specified by the installation for the designated printer.

SINGLE

DOUBLE

CCHAR

These key words indicate the vertical line spacing to be used. If either SINGLE or DOUBLE is requested and forms control characters are present in the data set, the forms control characters will be ignored. If CCHAR is specified and the data set contains either ANSI or machine-code forms control characters, the control characters will be examined and requests for single, double, and triple spacing and skipping to a new page will be honored. If CCHAR is specified but the data set contains no control characters (RECFM neither xxA nor xxM), spacing will default to SINGLE. If none of these key words is given, SINGLE will be assumed. In no case will forms control characters be printed.

FOLD
TRUNCATE

These key words indicate the action to take if the length of the formatted output record exceeds a single print line according to the width given. If the width is not given, the default width for the designated printer will be used. If a value is given that is greater than the default width, a message will be issued and the default width will be used. If neither FOLD nor TRUNCATE is specified, and any record size (or total size of selected columns) exceeds the default width, FOLD will be assumed.

The formatted output record includes the line-number field and the space that follows it, along with the selected columns. Thus the fold or truncate width does not represent a column position within the input data set, but rather a position on the physical printer. The width specified must be large enough to include the line number field, if it is to be printed, the space that follows it, and one character from the record or selected columns.

A header block may be up to 78 characters wide, depending on DSN length. If a width less than the header block length is specified, the header block will nevertheless be printed in one full line.

EJECT

This operand specifies that a page eject should take place after the header block is printed. In this case, the top margin will occur on the second page of the listing. If CCHAR is also specified and the control character in the first record indicates page eject before printing, a second eject will take place.

NOEJECT

This operand specifies that a page eject will not be forced after the printing of the header block. Instead, the top margin (minus one line) will occur between the header block and the first line of print. If CCHAR is specified and the first record contains an eject character, then a page eject will occur and a top margin will be inserted on the second page before printing the first line.

DIRECT

This operand specifies that DSPRINT should not copy the specified data set to an interim print data set, but rather should simply queue the specified data set for access by the background print processor. The suboperands of DELETE and KEEP specify data set (not member) disposition to be performed by the background print processor upon print completion. Specification of DIRECT is mutually exclusive with the specification of any other

optional operands, and implies NONUM AND CCHAR.

It is the user's responsibility to assure that the data records are formatted so as to be compatible with the installation defined printer characteristics and the DSPRINT background request processor program (CPF5798#). The System Guide, LB21-2071, describes on page 14 what the background program expects to find.

Most datasets with the correct DCB attributes will print with some degree of satisfaction. Note, however, that page ejection will not perform properly without the special two-byte record that specifies the number of new-line characters required.

Care should be exercised when using the DIRECT option not to have the dataset that is to be printed also allocated to your foreground session. If it is, the background program will enqueue on it, and the designated printer will be unable to print that or any subsequent request.

DSPRINT Terminal Messages

Following is a list of the messages that may be presented at your terminal by the DSPRINT Command Processor. The list is in order by message identification number (msgid). Most of the messages and the required user action are obvious. In some cases additional explanations are given.

- CPF579801 REQUEST TERMINATED.
The request has been rejected. A previous message explains the cause.
- CPF579802 UNABLE TO ALLOCATE DSPRINT REQUEST QUEUE.
Messages produced by the TSO DAIRFAIL routine accompany this message, explaining the allocation failure.
- CPF579805 UNABLE TO OPEN DSPRINT REQUEST QUEUE.
Notify your TSO coordinator.
- CPF579806 DSPRINT REQUEST QUEUE I/O ERROR.
You may retry the request. If this message occurs frequently, notify your TSO coordinator.
- CPF579807 PAGE WIDTH TOO LARGE FOR PRINTER; DEFAULT USED.
- CPF579808 "DIRECT" MUTUALLY EXCLUSIVE WITH ALL OTHER OPTIONS.
- CPF579809 PAGELLEN-TMARGIN-BMARGIN IS LESS THAN ONE.
The arithmetic relationship of the specified values yields no lines for printing.
- CPF579810 "NONUM" FORCED BECAUSE OF LINE-WIDTH SPECIFIED.
When printing sequence number fields, the page width (see FOLD/TRUNCATE options) must be at least large enough to contain the sequence field, one blank and one character of data.
- CPF579811 "LINES" VALUE(S) WILL STILL BE USED AS SEQUENCE-FIELD VALUE(S).
- CPF579812 REQUEST QUEUED (#nnnnn).
The edited data for your request is contained in the data set whose DSN is:
 userid.DSPRINT.REQUEST.#nnnnn
If you subsequently wish to cancel this request, prior to printing actually starting, you may do so by deleting this data set.

CPF579813 REQUEST QUEUE IS FULL.
You may try later, but ask your TSO coordinator to
create a larger request queue.

CPF579814 BACKGROUND DSPRINT REQUEST PROCESSOR (CPF5798#) IS
NOT ACTIVE.
Your request has been queued, but no printing can
occur until the DSPRINT background request processor
job is started.

CPF579815 UNABLE TO ALLOCATE SPECIFIED DATA SET.
Messages produced by the TSO DAIRFAIL routine
accompany this message, explaining the allocation
failure.

CPF579816 UNABLE TO OPEN SPECIFIED DATA SET.

CPF579817 UNABLE TO ALLOCATE INTERIM PRINT DATA SET.
Messages produced by the TSO DAIRFAIL routine
accompany this message, explaining the allocation
failure.

CPF579818 UNABLE TO OPEN INTERIM PRINT DATA SET.
Notify your TSO coordinator.

CPF579819 I/O ERROR READING SPECIFIED DATA SET.

CPF579820 END-OF-FILE REACHED ON SPECIFIED DATA SET BEFORE
SPECIFIED RANGE OF RECORDS FOUND.

CPF579821 I/O ERROR WRITING INTERIM PRINT DATA SET.
You may retry the request. If this message persists,
notify your TSO coordinator.

CPF579822 UNABLE TO DELETE INTERIM PRINT DATA SET.
Messages produced by the TSO DAIRFAIL routine
accompany this message, explaining the unallocation
failure.

CPF579823 SEQUENCE FIELD NOT LOCATED WITHIN RECORD.
The specified (or defaulted) sequence field location
was not within the scope of a record read from the
specified data set.

CPF579824 NO RECORDS FOUND IN RANGE SPECIFIED.
Correct the "LINES" operand and retry.

CPF579825 SPANNED RECORDS NOT SUPPORTED.

CPF5798 System Console Messages

CPF579850 SIMULTANEOUS EXECUTION OF CPF5798# WITH ITSELF IS NOT PERMITTED.

Explanation: An attempt was made to execute the DSPRINT request processor program, CPF5798#, and the program found that it was already executing elsewhere in the system.

System Action: The redundant CPF5798# execution terminates.

Operator Response: None.

CPF579851 UNABLE TO ALLOCATE DSPRINT.REQUEST.QUEUE.

Explanation: An attempt was made to execute the DSPRINT request processor program, CPF5798#, and the program was unable to allocate the request queue data set (DSN=DSPRINT.REQUEST.QUEUE).

System Action: An IKJxxxxxx message is issued indicating the reason for allocation failure and the execution of CPF5798# is terminated.

Operator Response: Inform System Programmer.

CPF579852 UNABLE TO OPEN DSPRINT.REQUEST.QUEUE.

Explanation: An attempt was made to execute the DSPRINT request processor program, CPF5798#, and after successfully allocating the request queue data set (DSN=DSPRINT.REQUEST.QUEUE), it could not be opened.

System Action: Abnormal termination with a user code of 52 (decimal).

Operator Response: Inform System Programmer.

CPF579853 DSPRINT.REQUEST.QUEUE I/O ERROR.

Explanation: An I/O error occurred on the DSPRINT request queue data set.

System Action: Immediate program termination.

Operator Response: Re-run the job or, if the error persists, notify System Programmer.

Programmer Response: All unprocessed requests and requests in process will be processed in their entirety upon re-running the job if the error can be corrected. Otherwise, delete the current request queue data set and generate a new one as was done in product installation (all unprocessed requests are lost and any interim data sets created by the DSPRINT Command Processor should be deleted and uncataloged).

CPF579854 CPF5798\$ ATTACH FAILED.

Explanation: An ATTACH request was issued for the program CPF5798\$ (timer sub-task) and ATTACH returned a non-zero return code.

System Action: Immediate program termination.

Operator Response: Inform System Programmer.

CPF579855 TO SHUTDOWN, REPLY "STOP".

Explanation: The DSPRINT request processor program (CPF5798#) has begun to process requests created by the DSPRINT Command Processor. Also, this message will be reissued after an invalid reply (see message CPF579857).

System Action: Request processing will continue until a STOP is replied.

Operator Response: Reply STOP when it is time to terminate the DSPRINT request processor (program CPF5798#) normally. Requests in process will be completed. Unprocessed requests will await a subsequent execution of this program.

CPF579856 STOPPING.

Explanation: The DSPRINT request processor program (CPF5798#) is beginning termination processing as a result of either (1) a valid reply to message CPF579855, or (2) a VTAM HALT command.

System Action: Requests in process will be completed (except in the case of a VTAM HALT QUICK command) and then the program will end.

Operator Response: None.

CPF579857 INVALID REPLY.

Explanation: An invalid reply to message CPF579855 was received.

System Action: Message CPF579855 will be reissued and processing will continue, starting with an immediate examination of the request queue.

Operator Response: Ignore or reply to the next CPF579855 message.

CPF579858 SYSTEM CLOCKS INOPERATIVE. STOPPING.

Explanation: The sub-task CPF5798\$ abnormally terminated, probably because of a failure attempting to use the system clocks.

System Action: Requests in process will be completed and then the DSPRINT request processor (CPF5798#) will end.

Operator Response: Inform System Programmer or Installation Manager.

CPF579859 VTAM ACB OPEN FAILED. ACB ERROR FIELD RETURNED IN
CONDITION CODE.

Explanation: The DSPRINT request processor could not open the ACB it uses for VTAM services.
System Action: The program terminates, placing the ACB ERROR field value in the user condition code (ref. VTAM Macro Language Reference, GC27-6995, for meanings).
Operator Response: Correct the problem, if possible, and rerun (e.g., VTAM is inactive). Otherwise, notify System Programmer.

CPF579860 "SETLOGON FAILURE"; UNABLE TO START LOGONS.

Explanation: A SETLOGON request failed, thus preventing logon processing and program operation.
System Action: Abnormal termination with a user code of 60 (decimal).
Operator Response: Notify System Programmer.

CPF579870 UNABLE TO ALLOCATE DATA SET dsn

Explanation: The DSPRINT request processor in attempting to process a queued request was unable to allocate the specified data set (dsn).
System Action: If allocation failed because (1) the data set was allocated to another job (or TSO user), or (2) the limit for concurrent dynamic allocations has been reached, then allocation attempts for the specified data set will continue every twenty seconds. Otherwise the request processor will cancel the request from its queue and proceed with the next request. In any case, an IKJxxxxxx message is issued indicating the reason for allocation failure.
Operator Response: For System Action reason (1), tolerate the message repetition and/or try and have the TSO user, who has the data set allocated, release (FREE) the data set. Otherwise inform TSO Coordinator or System Programmer.

CPF579871 UNABLE TO OPEN DATA SET dsn

Explanation: The DSPRINT request processor in attempting to process a queued request was unable to open the specified data set (dsn).
System Action: The request processor has canceled the request from its queue and proceeded with the next request.
Operator Response: None.

CPF579872 ERROR READING DATA SET dsn

Explanation: OS reported an error in attempting to read the specified data set (dsn).

System Action: The request processor has canceled the request from its queue and proceeded with the next request.

Operator Response: None.

CPF579873 INVALID RECFM FOR DATA SET dsn

Explanation: A DIRECT request was issued for the specified data set (dsn) and the data set RECFM was not xxA or xxM, or the data set contains spanned records (not supported).

System Action: The request processor has canceled the request from its queue and proceeded with the next request.

Operator Response: None.

CPF579874 TOO LARGE LRECL IN DATA SET dsn

Explanation: A "DIRECT" request was issued for the specified data set (dsn) and one of the records read was too large to be handled. (For 328x, LRECL must be at least four bytes smaller than target printer device buffer. For 3790, the number of data bytes must be less than or equal to the number of hardware print positions.)

System Action: The request processor has canceled the request from its queue and proceeded with the next request.

Operator Response: None.

CPF579875 GENCB/MODCB/SHOWCB/TESTCB MACRO FAILURE,id,
R15=hex,R0=hex

Explanation: One of the specified macros failed in the subtask which was in session with or was establishing a session with the VTAM device (id). The general purpose register values shown were set by the failing macro.

System Action: The subtask is abnormally terminated with a user code indicating the failing macro (see CPF5798 Abend Codes). The request processor has not canceled the request from its queue, but there will be no further attempts to communicate with the device during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).

Operator Response: Notify System Programmer.

CPF579876 INACTIVE DEVICE:id

Explanation: The request processor was attempting to establish a session with the specified VTAM device (id) and found it inactive.

System Action: The request processor will continue to attempt session establishment.

Operator Response: If it is permissible to use the device, issue the VTAM command V NET,ACT,ID=id

CPF579877 OPNDST FAILED FOR id,RTNCD=10,FDBK2=01,SSENSEI=x,
SSENSMI=y

Explanation: OPNDST acquisition failed for the specified VTAM device (id) and the RPL contained the specified values.

System Action: The request processor will continue to attempt session establishment.

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579878 CHANNEL OR LINK FAILURE,id

Explanation: Either a permanent channel failure occurred in the channel that connects VTAM to the communications controller or to the control unit of a locally attached 3270 Information Display System or 3790 Data Communication System or a permanent link failure occurred on the link that connects VTAM to the remotely-attached communications controller, for the specified VTAM device (id).

System Action: There will be no further attempts to communicate with the device during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).

Operator Response: Notify System Programmer.

CPF579879 NCP HAS SHUTDOWN,id

Explanation: The communications controller's network control program has shutdown.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579880 VTAM ERROR,id

Explanation: An error has occurred in VTAM itself.
System Action: There will be no further attempts to communicate with the specified VTAM device (id) during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).
Operator Response: Notify System Programmer.

CPF579881 UNKNOWN NAME,id

Explanation: The entry for the specified VTAM device (id) was not found in either the resource definition table or the logon mode table.
System Action: There will be no further attempts to communicate with the specified VTAM device (id) during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).
Operator Response: Notify System Programmer.

CPF579882 INVALID NAME,id

Explanation: The entry for the specified VTAM device (id) corresponds to an entry in the resource definition table, but the entry is for a node with which connection cannot be established.
System Action: There will be no further attempts to communicate with the specified VTAM device (id) during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).
Operator Response: Notify System Programmer.

CPF579883 ACQUIRE NOT AUTHORIZED FOR THIS PROGRAM

Explanation: Authorization has been denied to acquire (SIMLOGON and OPNDST) the specified VTAM device (id).
System Action: There will be no further attempts to communicate with the specified VTAM device (id) during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).
Operator Response: Notify System Programmer.

CPF579884 CONTROLLER ERROR (RPL:RTNCD=ØC, FDBK2=Ø1),id

Explanation: For the specified VTAM device (id), the communications controller detected a hardware check for the device, or a modem check for the device's modem, or a dial-line disconnection for a dial-in device, or the device's 3271 controller was powered-off.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579885 CONNECTION RECOVERY (RPL:RTNDC=ØC,FDBK2=Ø7),id

Explanation: Contact with the specified VTAM device (id) has been lost and a request was issued after connection recovery has been initiated. No further communication with this device is possible until the device has been reconnected.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579886 INTERVENTION REQUIRED, id[,SSENSEI=y,SSENSMI=hex]

Explanation: Intervention is required at the specified VTAM device (id). If the device is a 3287 or 3289 in SCS mode, SSENSEI and SSENSMI are provided to indicate the cause of the condition, such as loss of power, TEST key depressed, etc. Refer to GA27-2749, IBM 3270 Information Display System Component Description, for information on the specific sense codes.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id). If the device is an SCS printer, the request processor waits to receive a Logical Unit Status (LUS) message from the device indicating the error is cleared before proceeding.

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579887 REQUEST CANCELED AT DEVICE,id,FOR DATA SET dsn

Explanation: Action has been taken at the specified VTAM device (id) to cancel the current request being processed (dsn). This message may have been preceded several times by message CPF579886.

System Action: The request processor has canceled the request from its queue and proceeded with the next request.

Operator Response: None.

CPF579888 BROKEN SESSION,RTNCD=04,FDBK2=04,SSENSEI=y,
USENSEI=hex,id,DATA SET dsn

Explanation: An exception condition response has been received as a result of an attempted communication with the specified VTAM device (id) while processing a request for the specified data set (dsn).

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579889 REQUEST CANCELED (BY V INACT,I),id,DATA SET dsn

Explanation: The specified VTAM device (id) has been made inactive during a session with the device while processing the specified data set (dsn).

System Action: The request processor has interpreted this as a cancel request, has canceled the request from its queue, and proceeded with the next request.

Operator Response: Activate the device if subsequent requests are to be processed for the device; otherwise take no action.

CPF579890 DEVICE FAILURE (RPL:RTNCD=0C,FDBK2=08),id

Explanation: The specified VTAM device (id) has experienced a failure.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579891 VTAM BUFFERS FILLED (RPL:RTNCD=10,FDBK2=0F),id

Explanation: An attempt was made to send data to the specified VTAM device (id), but VTAM's buffers were already filled.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579892 SESSION ACQUISITION ABANDONED,id

Explanation: The network operator has issued a HALT command, initiating a quick closedown, while the request processor was attempting to acquire a session with the specified VTAM device (id).

System Action: The request processor has abandoned its attempt to establish a session with the specified VTAM device (id) and will end all processing.

Operator Response: None.

CPF579893 SESSION TERMINATED BY DEVICE id

Explanation: The specified VTAM device (id) has sent an unconditional Terminate Self command or character-coded logoff and the session is terminated.

System Action: The request processor will continue to attempt session establishment with the specified VTAM device (id).

Operator Response: If the message continues to repeat and the remedy is not apparent, notify System Programmer.

CPF579894 RECEIVE MACRO FAILURE,id, R15=hex,R0=hex

Explanation: Applies only to 3287 and 3289 printers operating in SCS mode. The VTAM RECEIVE macro failed in subtask CPF5798C, which was in session with the logical unit (id). The general purpose register values shown were set by the failing macro.

System Action: The subtask is abnormally terminated with a user code 61 (see CPF5798 Abend Codes). The request processor has not canceled the request from its queue, but there will be no further attempts to communicate with the logical unit during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).

Operator Response: Notify System Programmer.

CPF579895 LOGICAL SHOULD-NOT-OCCUR CONDITION AT RECEIVE COMPLETION,id

Explanation: Applies only to 3287 and 3289 printers operating in SCS mode. The VTAM RECEIVE macro in subtask CPF5798C has completed in an unexpected manner for logical unit (id).

System Action: The subtask is abnormally terminated with user completion code 63 (see CPF5798 Abend Codes). The request processor has not canceled the request from its queue, but there will be no further attempts to communicate with the logical unit during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).

Operator Response: Notify System Programmer.

CPF579896 SEND ERROR IN ERROR RECOVERY - SESSION TERMINATED,
id, RTNCD=hex,FDBK2=hex,SENSE=hex

Explanation: Applies only to 3287 and 3289 printers operating in SCS mode. The VTAM SEND macro used to send error recovery sequences to (id) itself completed abnormally, creating an "error in EREP" condition. The abnormal condition is indicated in the RTNCD, FDBK2, and SENSE (combination of SSENSEI & SSENSMI) Fields.

System Action: The current session between the request processor and the logical unit is terminated. The request has not been removed from the queue. An attempt will be made to establish a new session and begin printing the request again.

Operator Response: If the message continues to repeat, notify System Programmer.

CPF579899 INEXPLICABLE RPL COMPLETION,RTNCD=hex,FDBK2=hex,
SSENSEI=y, {USENSEI} =hex,id,DATA SET dsn
{SENSMI}

Explanation: While attempting to establish a session with (OPNDST/SIMLOGON) or SEND data to (or RECEIVE data from) the specified VTAM device (id), an RPL completed in an unaccountable manner. The specified fields are provided from the RPL, and the data set (dsn) for the request being processed is also provided.

System Action: The subtask is abnormally terminated with a user code of 98 or 99 (see CPF5798 Abend Codes). The request processor has not canceled the request from its queue, but there will be no further attempts to communicate with the device during this execution. The request in process will be the first one processed in the next execution of the request processor program (CPF5798#).

Operator Response: Notify System Programmer.

INSTALLATION INSTRUCTIONS

This section describes the procedure for installing the programs involved with the DSPRINT facility. The steps and their suggested order of performance are:

1. Understanding the contents of the distribution tape.
2. Loading the desired DSPRINT libraries.
3. Creating the DSPRINT Request Queue.
4. Preparation of the Operating System.
5. Validating the Installation.

Contents of the Distribution Tape

The machine-readable material for this product consists of six files on one 9-track tape reel. Each file when loaded will create a partitioned data set.

File 1 - JCL you will need:

- Member BMODEL -sample JCL for the execution of the Background Request Processor.
- Member CPFLOAD -in-stream procedure for loading the desired product libraries.
- Member INITQUE -sample JCL for creating a Request Queue.

File 2 - Product load modules:

- CPF5798\$ - Required; background timer subtask (of CPF5798#)
- CPF5798A - 328x processor subtask (of CPF5798#)
- CPF5798B - 3790 processor subtask (of CPF5798#)
- DSPRINT - Required, TSO Command Processor

File 3 - DSPRINT member for SYS1.HELP

File 4 - Object modules (one for each load module).

File 5 - Assembler language source modules (one for each object module). Note that assembly of the DSPRINT module requires the CVT macro definition, found in SYS1.AMODGEN.

File 6 - PL/S Compiler listing modules (one for each File 5 module). These listings are of the Version-1 level of the program.

Version 2 assembler source modules all contain a prologue commentary describing changes (both problem fixes and altered functions) that were put in after Version 1. Each change is clearly marked with an identifier in positions 64-71 of each statement. Some changes are considered optional. These were included as comment lines and may be activated by following instructions in the prologue.

Contents of the SNA Extension Feature Tape

The machine-readable material for the SNA Extension Feature consists of 2 Files on one 9-track tape reel. The contents of the files are as follows:

- File 1 - SYSIN jobstream for the IBM utility IEBUPDTE. The SYSIN statements will update members DSPRINT and CPF5798# in the existing partitioned data set containing the Assembler language source modules for the base product, and add the new source module CPF5798C.

- File 2 - Unloaded load modules that are new or changed in the SNA Extension:
 - DSPRINT - TSO Command Processor
 - CPF5798# - Main background task
 - CPF5798C - 328x SCS processor subtask (of CPF5798#)
 - SCANGTF - diagnostic aid

Loading the Desired Libraries

Step 1. Using the sample JCL provided below, load File 1 from the distribution tape.

```

***** JOB CARD ***** 00010000
/**                               00020000
//JCLLOAD EXEC PGM=IEBCOPY,REGION=256K 00030000
/**                               00040000
//SYSPRINT DD SYSOUT=A 00050000
/**                               00060000
//JCL DD DSN=CPF5798.MASTER.JCL, 00070000
// VOL=SER=?????, <===== DASD VOLUME SERIAL ? 00080000
// UNIT=?????, <===== DASD UNIT TYPE ? 00090000
// DISP=(NEW,CATLG,DELETE), 00100000
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,OPTCD=W), 00110000
// SPACE=(3120,(16,4,1)) 00120001
/**                               00130000
//TAPJCL DD LABEL=(1,NL), 00140000
// VOL=SER=CPFTAP, 00150000
// UNIT=?????, <===== TAPE UNIT TYPE ? 00160000
// DISP=OLD, 00170000
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120) 00180000
/**                               00190000
//SYSUT3 DD UNIT=?????, <===== DASD UNIT TYPE ? 00200000
// SPACE=(80,(1000,100)) 00210000
/**                               00220000
//SYSIN DD * 00230000
COPY OUTDD=JCL,INDD=TAPJCL 00240000
/**                               00250000
/**                               00260000
//                               00270000

```

Step 2. The only other files you need are files 2 and 3 (load modules and HELP) unless you intend to re-link edit or modify the product. Update the JCL member CPFLOAD and submit it.

Step 3. You may now optionally copy, if desired, load modules into system libraries, e.g., SYS1.LINKLIB, SYS1.LPALIB, or SYS1.CMDLIB (remember, CPF5798# is not re-entrant), and copy the HELP member, DSPRINT, from CPF5798.MASTER.HELP into SYS1.HELP. ←

If you copy the product load modules into the appropriate system libraries, then you may omit the STEPLIB DD statement from the JCL member BMODEL.

Installing the SNA Extension Feature

Installation of the optional SNA Extension Feature requires that the base product libraries be previously created, including the Assembler language source from File 5 of the base product distribution tape.

Step 1. Using the sample JCL provided below as a guide, update the base product Assembler language source file to include the SNA Extension changes and additions.

```
//***** JOB CARD****
//UPDATE EXEC PGM=IEBUPDTE
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=CPF5798.MASTER.ASM,DISP=OLD
//SYSUT2 DD DSN=CPF5798.MASTER.ASM,DISP=OLD
//SYSIN DD DSN=UPDTE,UNIT=TAPE,VOL=SER=SCSTAP,
// LABEL=(1,NL),DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120)
```

Step 2. Using the sample JCL provided below as a guide, update the base product load library from File 2 of the feature tape. If your installation has installed modifications to modules CPF5798# and DSPRINT, you may wish to reassemble and linkedit these modules from the updated source of Step 1 rather than reloading them in this step. In that case, SELECT only members CPF5798C and SCANGTF.

```
//**** JOB CARD ****
//RELOAD EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=A
//TAPE DD DSN=UNLOADED,VOL=SER=SCSTAP,
// UNIT=TAPE,DISP=OLD,LABEL=(2,NL)
//LOADLIB DD DSN=CPF5798.MASTER.LOAD,DISP=OLD
//SYSUT4 DD DSN=%%TEMP,UNIT=SYSDA,SPACE=(256,(1,1)),
// DISP=(NEW,DELETE),DCB=(KEYLEN=8)
//SYSIN DD *
COPY INDD=TAPE,OUTDD=LOADLIB
SELECT MEMBER=((CPF5798#, ,R),(CPF5798C, ,R),(DSPRINT, ,R))
SELECT MEMBER=((SCANGTF, ,R))
/*
```

Step 3. You may optionally copy, if desired, load modules into appropriate system libraries, e.g., SYS1.CMDLIB for DSPRINT, SYS1.LINKLIB, SYS1.LPALIB; again, CPF5798# is not reentrant (nor is SCANGTF).

- Step 4. Create (or re-create) the DSPRINT Request Queue File, changing QABPnBFS and QABPnTYP to reflect SCS values as documented in the following section.
- Step 5. Make appropriate modifications to your VTAM and NCP definitions, as documented in "Preparation of the Operating System."
- Step 6. Run.

Creating the DSPRINT Request Queue

The JCL member INITQUE contains sample JCL for the creation of the DSPRINT request queue. Peruse the following description of the data set (DSN, RECFM, and BLKSIZE values must not be changed).

DSPRINT REQUEST QUEUE DATA SET DESIGN

```
DDNAME=DSPRQSTQ
DSN=DSPRINT.REQUEST.QUEUE
RECFM=F, BLKSIZE=2480
```

QUEUE ANCHOR BLOCK (QAB):

THERE IS ALWAYS AT LEAST ONE QAB. EACH QAB ANCHORS REQUEST QUEUES FOR UP TO 103 PRINTERS PER QAB. QABS ARE CONSECUTIVE STARTING WITH RELATIVE BLOCK 0. OFFSET BYTES 1-6 ARE MEANINGFUL ONLY IN RELATIVE BLOCK 0 AND ARE RESERVED IN ALL OTHER QABS.

ITEM NUMBER AND NAME	OFFSET	LENGTH	REPRESENTATION	POSSIBLE CONTENTS	DESCRIPTION
1.0 QABFLAGS QABLAST QABFRSVD	0 (0)	1	BIT	1... .. .XXX XXXX	QUEUE CONTROL FLAGS: INDICATES LAST QAB-BLOCK. RESERVED.
2.0 QABTIME	1 (1)	1	BINARY	1-255	BACKGROUND PROBE TIME INTERVAL IN DECASECONDS (MAXIMUM FREQUENCY AT WHICH QUEUE WILL BE EXAMINED FOR QUEUED REQUESTS). E.G., QABTIME OF 1 = 10 SECONDS.
3.0 QABFFEAD	2 (2)	4	BINARY		QUEUE-ADDRESS OF FIRST FREE ELEMENT (0 IF NO FREE ELEMENT AVAILABLE).
3.1 QABFFERB	2 (2)	2	BINARY	0-32767	FIRST FREE ELEMENT RELATIVE BLOCK ADDRESS.
3.2 QABFFEDF	4 (4)	2	BINARY	0-2400	FIRST FREE ELEMENT OFFSET WITHIN RELATIVE BLOCK.
4.0 QABNREQ#	6 (6)	2	BINARY	0-32767	NEXT REQUEST NUMBER
5.0 QABPTRQL	8 (8)	2472			LIST OF 1 TO 103 PRINTER REQUEST QUEUE ANCHORS (QABPTRQA) --- ONE PER DEFINED PRINTER; IF LESS THAN 103 ANCHORS IN A QAB, THEN HEX ZERUS OCCUR AFTER ANCHOR FOR LAST PRINTER DEFINED. ANCHOR FORMAT (QABPTRQA) FOLLOWS:

ITEM NUMBER AND NAME	OFFSET	LENGTH	REPRESENTATION	POSSIBLE CONTENTS	DESCRIPTION
1.0 QABPTRQA	0 (0)	24			PRINTER REQUEST QUEUE ANCHOR (HEX ZEROS IF END OF QABPTRQL).
2.0 QABPTRNM	0 (0)	8	CHARACTER		PRINTER NAME AS DEFINED IN THE VTAM RESOURCE DEFINITION TABLE, LEFT ADJUSTED, PADDED WITH BLANKS.
3.0 QABORQEA	8 (8)	4	BINARY		QUEUE-ADDRESS OF OLDEST REQUEST ELEMENT FOR THIS PRINTER (0 IF NO REQUESTS QUEUED).
3.1 QABORQEB	8 (8)	2	BINARY	0-32767	RELATIVE BLOCK ADDRESS OF REQUEST ELEMENT.
3.2 QABORQEO	10 (A)	2	BINARY	0-2400	REQUEST ELEMENT OFFSET WITHIN THE BLOCK REFERENCED BY QABORQEB.
4.0 QABLRQEA	12 (C)	4	BINARY		QUEUE-ADDRESS OF LATEST REQUEST ELEMENT FOR THIS PRINTER (0 IF NO REQUESTS QUEUED).
4.1 QABLRQEB	12 (C)	2	BINARY	0-32767	RELATIVE BLOCK ADDRESS OF REQUEST ELEMENT.
4.2 QABLRQEO	14 (E)	2	BINARY	0-2400	REQUEST ELEMENT OFFSET WITHIN THE BLOCK REFERENCED BY QABLRQEB.
5.0 QABPBFSZ	16(10)	2	BINARY		328X PRINTER HARDWARE BUFFER SIZE. --OR-- FOR 3287 OR 3289 PRINTERS IN SLUI MODE - MAXIMUM REQUEST UNIT SIZE (MUST AGREE WITH "RUSIZES" IN MODE TABLE ENTRY). --OR--
5.1 QABPRSD	16(10)	1		0	RESERVED.
5.2 QABPGRP#	17(11)	1	BINARY	1-32	3790 "PRINT GROUP NUMBER".
6.0 QABPWIDE	18(12)	1	BINARY	<= QABHPP	MAXIMUM (AND DEFAULT) PAGE WIDTH SPECIFICATION.
7.0 QABPLEN	19(13)	1	BINARY	< 256	DEFAULT NUMBER OF LINES THAT WILL FIT ON A PRINTER PAGE (PERFORATION TO PERFORATION).
8.0 QABTMARG	20(14)	1	BINARY	< QABPLEN	DEFAULT NUMBER OF LINES THAT SPECIFY THE TOP OF PAGE MARGIN.
9.0 QABB MARG	21(15)	1	BINARY	< (QABPLEN - QABTMARG)	DEFAULT NUMBER OF LINES THAT SPECIFY THE BOTTOM OF PAGE MARGIN.
10.0 QABHPP	22(16)	1	BINARY	80, 120, 126, 132	NUMBER OF HARDWARE PRINT POSITIONS IN A LINE, E.G., PLATEN WIDTH.
11.0 QABTYPE	23(17)	1	BINARY	1 2 3 4 6	PRINTER TYPE: -3284 PRINTER, 3286 PRINTER, OR 3288 PRINTER, BUT VERTICAL FORMS CONTROL NOT TO BE USED FOR PAGE EJECTION. -3288 PRINTER AND VERTICAL FORMS CONTROL TO BE USED FOR PAGE EJECTION. -3790 BATCH FUNCTION LINE PRINTER. -3287 PRINTER OR 3289 PRINTER IN SLUI MODE, BUT VERTICAL FORMS CONTROL NOT TO BE USED FOR PAGE EJECTION. -3287 PRINTER OR 3289 PRINTER IN SLUI MODE AND VERTICAL FORMS CONTROL TO BE USED FOR PAGE EJECTION (RECOMMENDED VALUE).

QUEUE ELEMENT BLOCK (QEB):

EACH QEB CONTAINS 31 PRINTER QUEUE ELEMENTS (PQE). EACH PQE IS 80 BYTES IN LENGTH. A PQE IS ALWAYS EITHER IN A PRINTER REQUEST QUEUE (REPRESENTING A PRINT REQUEST) AND ANCHORED IN A QABPTRQA, OR IN THE FREE ELEMENT QUEUE AND ANCHORED IN QABFFEAD.

THE FOLLOWING IS A DESCRIPTION OF A PQE:

ITEM NUMBER AND NAME	OFFSET	LENGTH	REPRESENTATION	POSSIBLE CONTENTS	DESCRIPTION
1.0 PQENEXTA	0 (0)	4	BINARY		QUEUE-ADDRESS OF NEXT PQE IN THIS QUEUE (0 IF END OF QUEUE).
1.1 PQENEXTB	0 (0)	2	BINARY	0-32767	RELATIVE BLOCK ADDRESS OF NEXT PQE IN THIS QUEUE.
1.2 PQENEXTO	2 (2)	2	BINARY	0-2400	OFFSET OF NEXT PQE WITHIN RELATIVE BLOCK SPECIFIED IN PQENEXTB.
2.0 PQEID	4 (4)	60	CHARACTER/ HEX ZEROS		(A) IF THIS PQE IS IN A PRINTER REQUEST QUEUE (REPRESENTS A PRINT REQUEST), THEN THIS FIELD CONTAINS THE PRINT DATA SET NAME (DSN), MEMBER NAME (IF ANY), AND PASSWORD (IF ANY), AND PQENEXTA POINTS TO THE NEXT PQE FOR THE SAME PRINTER. (B) IF THIS PQE IS IN THE FREE ELEMENT QUEUE, THEN THIS FIELD CONTAINS HEX ZEROS, AND PQENEXTA POINTS TO THE NEXT PQE IN THE FREE ELEMENT QUEUE.
2.1 PQEDSN	4 (4)	44	CHARACTER/ HEX ZEROS		PRINT DSN.
2.2 PQEMEMBR	48(30)	8	CHARACTER/ HEX ZEROS		PDS MEMBER NAME, IF ANY (HEX ZEROS IF NOT PDS).
2.3 PQEPASSW	56(38)	8	CHARACTER/ HEX ZEROS		PASSWORD, IF ANY (HEX ZEROS IF NOT PASSWORD PROTECTED). ---OR--- IF DSPRINT REQUEST DID NOT SPECIFY "DIRECT" (I.E., PQEDSTYP = 0):
2.3.1 PQEREQ#	56(38)	2	BINARY		CONTAINS REQUEST NUMBER.
2.3.2 PQEPLN	58(3A)	2	BINARY		CONTAINS PAGE LENGTH FROM REQUEST (USED ONLY BY 3287-3289 SLUI SUPPORT).
2.3.3 RESERVED	60(3C)	4			
3.0 PQEDTTIM	64(40)	8	DECIMAL		DATE AND TIME OF REQUEST AS RETURNED BY THE "TIME" MACRO.
3.1 PQEDATE	64(40)	4	DECIMAL		JULIAN DATE OF REQUEST.
3.2 PQETIME	68(44)	4	DECIMAL		TIME OF REQUEST.
4.0 PQETSUID	72(48)	7	CHARACTER		TSO USER'S ID, LEFT ADJUSTED, PADDED WITH BLANKS.
5.0 PQEFLAGS PQEFRSVD PQEDSTYP PQEDSDSP	79(4F)	1	BIT	XXXX XX..0.1. 01	PQE FLAGS: RESERVED. DATA SET TYPE: INTERIM. USER. DATA SET DISPOSITION UPON SUCCESSFUL PRINT COMPLETION: DELETE. KEEP.

Peruse the description of the IBM utility program IEBDG.

The JCL member INITQUE has been arbitrarily set up for 9 printers and 2 QEBs. Modify this member for printers at your installation. Printer names should match those names specified in your VTAM definition statements (e.g., LOCAL and LU statements) -- see Preparation of the Operating System section. Remember:

1. Printer names must be left justified and padded with blanks (field QABPTRNM in data set description, fields QABPnNAM in the INITQUE control statements).
2. In the data set description, fields QABPBFSZ and QABPGRP# are really the same location but are used differently for 328x and 3790 printers.
 - a. For non-SCS 328x printers, QABPBFSZ=hardware buffer size.
 - b. For SCS 3287 and 3289 printers, QABPBFSZ= maximum request unit size as specified in the MODETAB table (768 bytes in the example shown).
 - c. For 3790, QABPGRP#=3790 Print Group#.

Note that QABPBFSZ and QABPGRP# have the same name in the INITQUE control statements (QABPnBFS).

3. The INITQUE control statement for QABPnTYP must be set for the proper printer type as detailed in the QABTYPE field of the data set description. Note the 3287 printer requires the SCS hardware special feature to be used in SCS mode.

Submit the JCL to create the request queue. Once the data set is created, the DSPRINT programs will maintain it from then on.

3274 Controller Customization

3274 controllers must be customized to user configuration requirements before use. Certain customization parameters are necessary for proper DSPRINT operation to printers on these controllers.

1. If 3287 or 3289 printers are to be used in SNA SCS mode, the SCS option must be selected at 3274 customization time.
2. 3274 controllers utilize a Print Authorization Matrix (PAM) to control local copy authorization and routing. The PAM may be down-loaded from the host by a VTAM application program such as CICS or IMS, and/or a default customization matrix may be used. If a PAM is

used, printers to be used by DSPRINT must have either SYSTEM or SHARED mode set in the PAM in use at that time; otherwise, the 3274 will reject any DSPRINT requests to these printers.

Preparation of the Operating System

1. Update the appropriate APPCONnn member in SYS1.VTAMLST to include the following:

```
APPDSPRT
  name      APPL      AUTH=(ACQ)
```

where "name" is the label you select for the EXEC statement shown in the JCL member BMODEL. This will be the "name" by which CPF5798# will open its ACB for VTAM.

3790: If 3790 printers are to be included for DSPRINT use, this "name" must also be entered into the 3790 Batch ID Table by the 3790 control operator, using the 3790 SYSHOST function.

2. Ensure that the appropriate labels for VTAM device definition statements (e.g., LOCAL, LU) match the names specified in the DSPRINT Request Queue definition for those printers you want DSPRINT to support. The printer name for 3790 line printers is the label on the VTAM LU definition statement describing the 3790 Batch Function LU (begins with the characters "IN").

Data lengths of records sent to a 3790 will be less than 241 bytes. Data lengths of records sent to a non-SNA 328x will generally be of a length approaching the 328x hardware buffer size; however, use of the "DIRECT" option could result in a data length equal to the 328x hardware buffer size.

Data transmitted to a 3790 Batch Function LU is in the 3790 compressed line-image format. 3790 Batch Session Initiation/Termination, Protocols and Transmission Sequences for Print Records are as described in the IBM publication, IBM 3790 Communication System Host System Programmer's Guide, GC27-0026.

Data lengths transmitted to a 3287 or 3289 operating in SNA SLU1 mode will generally approach the RUSIZES length as specified in the VTAM MODETAB entry as detailed in Item 4 below and in the QABPBFSZ entry in the DSPRINT Request Queue entry for the printer. The RUSIZES and QABPBFSZ values must agree, although they are in different formats.

3. An appropriate VTAM mode table entry must be provided for 3287 and 3289 printers to be operated in SNA SLU1 mode (and for all other DSPRINT printers if operating under ACF/VTAM). A suggested MODEENT which is appropriate for both 3287 and 3289 SLU1 operation is provided later in this section. This was obtained from SNA 3274/3276 Installation Guide, G320-6023, which is highly recommended as a source of 3270 installation information, with a particularly good discussion on pacing and RUSIZES.

For ACF/VTAM installations, the mode table entry may be a part of a larger overall system mode table, since the individual entry to be used by DSPRINT can be specified via the DLOGMOD parameter on the LU statement in the appropriate NCP, LOCAL, or SWITCHED definition. For non-ACF systems, the table used for a given DSPRINT-eligible printer should probably consist of a single entry with the table name provided on the MODETAB parameter of the LU statement for the printer.

PACING must be used for SLU1 operation. For systems utilizing both ACF/VTAM and ACF/NCP, this may be provided via PSNDPAC and SRCVPAC parameters of the MODEENT macro, or the VPACING and PACING parameters of the LU statement. The values shown below are appropriate for overlapped printing and transmission through an ACF/VTAM/NCP combination. See G320-6023 (mentioned above), and GA27-2749, IBM 3270 Information Display System Component Description for possible variances for tuning purposes.

4. Sample VTAM mode table MODEENT for SLU1 operation.

```
SCS328X MODEENT LOGMODE=SCS328X, X
                FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
                SECPROT=X'90',COMPROT=X'3080', X
                RUSIZES=X'87C6', ==>See Note 1 X
                PSERVIC=X'01000000E100000000000000', X
                PSNDPAC=X'02',SRCVPAC=X'01' ==>See Note 2
```

Note 1: The RUSIZES parameter represents inbound and outbound request unit sizes, respectively, as a hexadecimal mantissa (8 through F) and an exponent value of 2 by which the mantissa is multiplied. In the example above, the outbound value X'C6' represents a maximum request unit size of $12 \times 2^6 = 12 \times 64 = 768$ bytes. The value of QABPBFSZ should therefore be set to 768 for a printer using the above mode table.

Note 2: This shows PACING as may be used with ACF/VTAM-ACF/NCP. For non-ACF systems, pacing must be specified as VPACING=(n,m) and PACING=(n,m) on the LU statement. Values of VPACING=(2,1) and PACING=(1,1) would be equivalent.

Validating the Installation

1. Issue the TSO DSPRINT command:

```
DSPRINT 'SYS1.MACLIB(READ)' printer-name
```

where "printer-name" is the symbolic name of one of the printers you defined to VTAM and in the DSPRINT Request Queue.

2. Ensure the printer is ready with paper aligned on the first physical print line.
3. Start your installation's VTAM procedure.
4. Start the Background Print Processor (CPF5798#) by submitting the updated version of the BMODEL member in the JCL library. Printing should start in seconds.

You might ultimately decide to put a version of BMODEL into SYS1.PROCLIB so that the Background Print Processor could be started from a system console.

OPERATIONS INSTRUCTIONS

328x Printer Operational Characteristics

The first step in preparing a printer for use is to insert paper and align it properly. The DSPRINT command processor assumes that the paper is in position to be printed on the very first line, i.e., within the top on-sixth-inch of the page. Alignment should be done with the switch on the front of the printer in the OFF position to prevent the possibility that printing might begin while the paper is being moved. However, consideration must be given to the fact that for 3284, 3286, and 3288 printers the paper will roll up one or more spaces when the switch is turned on.

When a data set is ready to be printed, the following will take place:

1. The header block will print on the top line.
2. If EJECT was specified for this data set, spacing will be performed to align the paper at the top of the next page. If NOEJECT was requested, this spacing will not take place.
3. Spacing will be performed to achieve the required top margin.
4. There will be at least a ten-second pause before printing resumes.
5. The contents of the data set will be printed.
6. Subsequent pages of the data set will not have the header or the pause. Each page will begin with the top margin.
7. Spacing will be performed to align the paper at the top of the next page.

The purpose of the pause following the header is to allow time for the switch on the printer to be turned off so that a new paper form can be inserted or the previous listing can be torn off. For non-SLU1 printers, the form should be aligned to the first physical line before the perforation before the switch is turned back on, as the header will be printed again.

There will be a delay after the switch is turned on. Normally, this delay will be no more than ten seconds in duration.

Canceling a Request

After a request starts printing on a 328x, you may cancel it as follows:

- A. For 3287 or 3289 printers operating in SNA SLU1 (SCS) mode:
 1. Depress the HOLD PRINT switch and wait for printing to cease.
 2. Depress the CANCEL PRINT switch.
 3. Depress the ENABLE PRINT switch.
 4. The message '<<DSPRINT REQUEST CANCELED>>' will be printed and the paper ejected to the top of the next form.

- B. For remote printers operating in binary synchronous mode, or on a local SNA SLU3 (DSC) 3287 or 3289:
 1. Turn the printer switch off.
 2. Turn the printer switch on and allow a full buffer-load plus one line to print. (A pause in printing can usually be noticed when the printer buffer is being reloaded.)
 3. Repeat steps 1 and 2 until you see the message
<<DSPRINT REQUEST CANCELED>>
 4. Turn the printer switch off, position the paper for the header line of the next request (if there is one) and turn the printer switch on. If the next header prints before the switch is turned off, you should still perform this action, and be sure the switch is left off for at least ten seconds.

- C. Another method of canceling a request in process that is applicable to all 328x printer modes is to have the system operator enter the command:

```
V NET,INACT,I,ID=printer-name
```

Any request in process at the time will be canceled. To resume processing for the printer with the next request, if any, the system operator must enter the command:

```
V NET,ACT,ID=printer-name
```

- D. Prior to printing having started for a request, the request may be canceled simply by deleting the interim print data set created by DSPRINT at the time of the original request. The data set name is

'userid.DSPRINT.REQUEST.#nnnnn'

where "userid" is the userid of the issuer of the DSPRINT command and 'nnnnn' is the number DSPRINT returned in terminal message CPF579812 when the request was queued.

- E. For 3790s, the 3790 control operator can, via the SYSPRINT function, initiate printing or deleting of selected print records from the print data set (where they were placed by the 3790 Batch Function LU when in session with the Background Print Processor program, CPF5798#).

Enhanced Operator Control of Output (SCS 3287 and 3289 printers only)

DSPRINT installations that include the optional SNA Extension Feature provide additional operator control functions for 3287 and 3289 printers operating in SCS mode. These functions are provided via the front panel switches CANCEL PRINT, PA1, and PA2 (3287 and 3289) and BUFFER REPRINT (3287 only). You can tell if your printer has this support if the following indicators are on while printing a DSPRINT request:

1. For a 3287, the "READY" light flashes on and off while the printer is in "HOLD PRINT" if SCS support is available.
2. For a 3289, the "SCS" light is on continuously if the SCS support is available.

If your printer does not have the appropriate SCS indicator on, please ignore the instructions in this section.

CANCEL PRINT - The operation of this switch is documented in the previous section, "Canceling a Request."

PA1 - This switch is used to request DSPRINT to restart the printing of your request from the beginning, including the header. This would be appropriate when forms alignment was not properly set before printing began. To use, perform the following steps:

1. Depress the HOLD PRINT switch and wait for printing to cease.
2. Depress the PA1 switch.
3. Depress the ENABLE PRINT switch.

Printing will resume where it was interrupted, and may continue for some time. Eventually, however, DSPRINT will perform a form feed, reprint the header line, and pause at least 10 seconds for you to perform forms alignment. Then printing will resume with the first line of your request.

PA2 - This switch is used to request DSPRINT to back up approximately two pages from the page it is currently printing. Due to the chained transmission techniques used by the SCS support to increase print output, it is sometimes not possible to tell exactly how far along your job is when you depress the PA2 key, so the number of pages backspaced is not always exactly two. If PA2 does not reset your job far enough back, you may use PA1 to restart from the beginning. Please note that it is not possible to go back more than two pages by repeatedly depressing PA2 - after the first reset, additional PA2 uses result in reprinting the same page.

The operation sequences for the PA2 switch are the same as for the PA1 (i.e., HOLD PRINT, PA2, ENABLE PRINT), except that the header is not reprinted and there is no pause for forms alignment.

BUFFER REPRINT (3287 only) - This switch is used to request DSPRINT to restart the printing of your request from the top of the current page. This would be appropriate for recovering from a forms jam, where a few lines of output have been garbled. To use, perform the following steps:

1. Depress the HOLD PRINT switch and wait for printing to cease.
2. Realign forms, if necessary. Use of the SETUP switch may be appropriate to check alignment.
3. Depress the BUFFER REPRINT switch.
4. Depress the ENABLE PRINT switch.

DSPRINT will perform a Forms-Feed to the top of a new page, and attempt to reprint the entire page. However, DSPRINT may not be able to tell the exact page your error occurred on, as previously explained for the PA2 switch. If DSPRINT restarts on the wrong page, you may use PA1 to restart the entire job.

Automatic Recovery Actions of SNA Extension Feature

DSPRINT will attempt automatic page recovery if certain error conditions occur. If the printer loses power, either accidentally or purposefully, DSPRINT will automatically perform the same page restart as described earlier for BUFFER REPRINT as soon as power is restored. The same action will be taken if the TEST switch is depressed during the printing of a request, as soon as the TEST printout ends.

If a paper jam occurs and you depress the HOLD PRINT switch within 1 minute of the jam, then correct the jam and depress ENABLE PRINT within 10 minutes DSPRINT will never know anything wrong occurred. However, if either the 1 minute or 10 minute interval expires, DSPRINT will attempt page restart when the error condition is cleared.

APPENDIX A

CPF5798 User Abend Codes

When the background request processor (CPF5798#) or one of its subtasks detects an inexplicable failure of an OS macro, abnormal termination of the task occurs with a specific user code. Except for abend codes 52 and 60, request processing will continue for all VTAM devices other than the one for which the abnormal termination occurred. The abnormal termination is preceded by a diagnostic console message containing information which may be sufficient for problem resolution. If more information is needed, rerun the job with a SYSUDUMP or SYSABEND DD statement. The following is a list of the user abend codes (decimal) and the OS service being requested.

<u>Abend Code</u>	<u>Message Number</u>	<u>OS Service</u>
52	CPF579852	OPEN failure for DSPRINT.REQUEST.QUEUE.
60	CPF579860	SETLOGON failure.
61	CPF579894	(SNA Extension Feature) - RECEIVE macro failure in module CPF5798C
62	CPF579875	(SNA Extension Feature) - MODCB/SHOWCB/TESTCB macro failure in module CPF5798C. The word labeled CAMEFROM and located X'6F0' bytes off register 11 in the dump contains the address of the instruction following the failing macro.
63	CPF579895	(SNA Extension Feature) - RECEIVE macro posted with logically incorrect completion in module CPF5798C.
81	CPF579875	MODCB failure resetting SEND/RECEIVE RPL after a "message" to the printer.
82	CPF579875	MODCB failure resetting SEND/RECEIVE RPLs after a completed print request.
83	CPF579875	MODCB failure converting SEND RPL to CHAIN=ONLY.
84	CPF579875	MODCB failure converting SEND RPL to CHAIN=LAST.
85	CPF579875	MODCB failure converting SEND RPL to CHAIN=MIDDLE.

- 86 CPF579875 MODCB failure converting SEND RPL to CHAIN=FIRST.
- 87 CPF579875 TESTCB or MODCB failure converting SEND RPL to send response.
- 88 CPF579875 MODCB failure converting SEND RPL to send a CANCEL command.
- 89 CPF579875 MODCB failure converting RECEIVE RPL to receive data (vs. response).
- 90 CPF579875 SHOWCB failure in analyzing SIMLOGON completion.
- 91 CPF579875 SHOWCB failure in analyzing OPNDST completion.
- 92 CPF579875 SHOWCB or TESTCB failed in the SEND/RECEIVE failure-analysis routine.
- 93 CPF579875 MODCB failure setting SEND RPL RECLLEN value.
- 94 CPF579875 MODCB failure changing OPNDST RPL to a send RPL.
- 95 CPF579875 MODCB failure changing SEND RPL to the in-bracket state.
- 96 CPF579875 GENCB failure generating an RPL or NIB.
- 97 CPF579875 SHOWCB or TESTCB failed in the OPNDST/SIMLOGON failure analysis routine.
- 98 CPF579899 OPNDST or SIMLOGON failure; inexplicable values in the RPL.
- 99 CPF579899 SEND or RECEIVE failure; inexplicable values in the RPL.

Diagnostic Aids

In addition to message and dump analysis, examination of VTAM trace information can greatly speed problem determination. VTAM IO and BUF traces of a failing printer are very helpful. If ACF/VTAM is installed the VTAM Internal Trace running with options API and PIU with MODE=EXT is extremely helpful. GTF (Generalized Trace Facility) should be running with option RNIO for VTAM IO trace, and/or USR for both BUF and the VTAM Internal Trace (VIT).

APPENDIX B

The following procedure may be used to execute two copies of DSPRINT simultaneously for testing modifications or in shared DASD configurations.

1. Make copies of the modules CPF5798#, CPF5798A, CPF5798B, (and CPF5798C, if SNA Extension Feature is installed) and put them in a different library. Make a copy of module DSPRINT and name it DSPTEST, but do not put it in a different library. All changes suggested below are to be made to these new modules. Though the changes are given with source code line numbers, they can easily be zapped in if you use your current assembly listings to find the displacements.
2. Make a copy of the background proc that will invoke the new CPF5798#. Change the label on the EXEC statement in that proc. Add a STEPLIB DD statement referring to the library in step 1.
3. Add an APPL statement to an appropriate member of SYS1.VTAMLST. Make the appl name the same as the label on the EXEC statement in step 2.
4. Make a second request queue data set with a different name, e.g., DSPRINT.REQTEST.QUEUE.
5. Change the ENQ Q-name from DSPRINTQ to DSPTESTQ. This is done in (the new) module CPF5798# at source line number 02116000 and in DSPTEST at line number 05710000.
6. Change the interim print data set name model from DSPRINT.REQUEST.# to DSPTEST.REQUEST.#. This is done in the DSPTEST module at source line 05501000, in module CPF5798A at source line number 04941000, and in module CPF5798C at source line number 05460000.
7. Change the request queue data set name from DSPRINT.REQUEST. QUEUE to DSPRINT.REQTEST.QUEUE (the same as the name in step 4). This is done in module CPF5798# at source line numbers 00288000, 00914000, 01060000, 01937000, and 02064000, and in module DSPTEST at source line numbers 00557000 and 05726000.
8. Change the request queue DDname from DSPRQSTQ to DSPTESTQ. This is done in module DSPTEST at source lines 05496000, 05719000, and 05904000.

READER'S COMMENT FORM

(5798- CPF)

SB21-2070-1
Program Description/Operation Manual

Customer name _____

Customer address _____

IBM Branch Office _____ Installed date _____

Fold

PROBLEM:

- Required functions are not in product.
- Product did not work.
- Documentation unsatisfactory.
- Error correction ("fixes") unsatisfactory.
- Other (please describe).

Please comment on the usefulness and readability of this publication, suggest additions and deletions, and list specific errors and omissions (give page numbers). Also include any comments you have on the program code and your general satisfaction with this product. IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply. If you wish a reply, be sure to include your name and address.

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