SPERRY UNIVAC

ATTN: CHARLIE GIBBS

00390
CAV208M45541 UP 8990

UAS

SPERRY UNIVAC
1 - 1818 CORNWALL STREET
VANCOUVER B C V6J 1C7 CANADA

CAV

PUBLICATIONS RELEASE

Operating System/3 (OS/3)

Integrated Communications Access Method (ICAM) Remote Terminal Processor (RTP)

User Guide

UP-8990

This Library Memo announces the release and availability of the "SPERRY UNIVAC® Operating System/3 (OS/3) Integrated Communications Access Method (ICAM) Remote Terminal Processor (RTP) User Guide", UP-8990.

This is a new manual describing a new product available with the OS/3 8.0 release. This manual describes how to generate and use RTP to provide remote job entry capabilities for the OS/3 user to large-scale IBM host processors.

This manual describes:

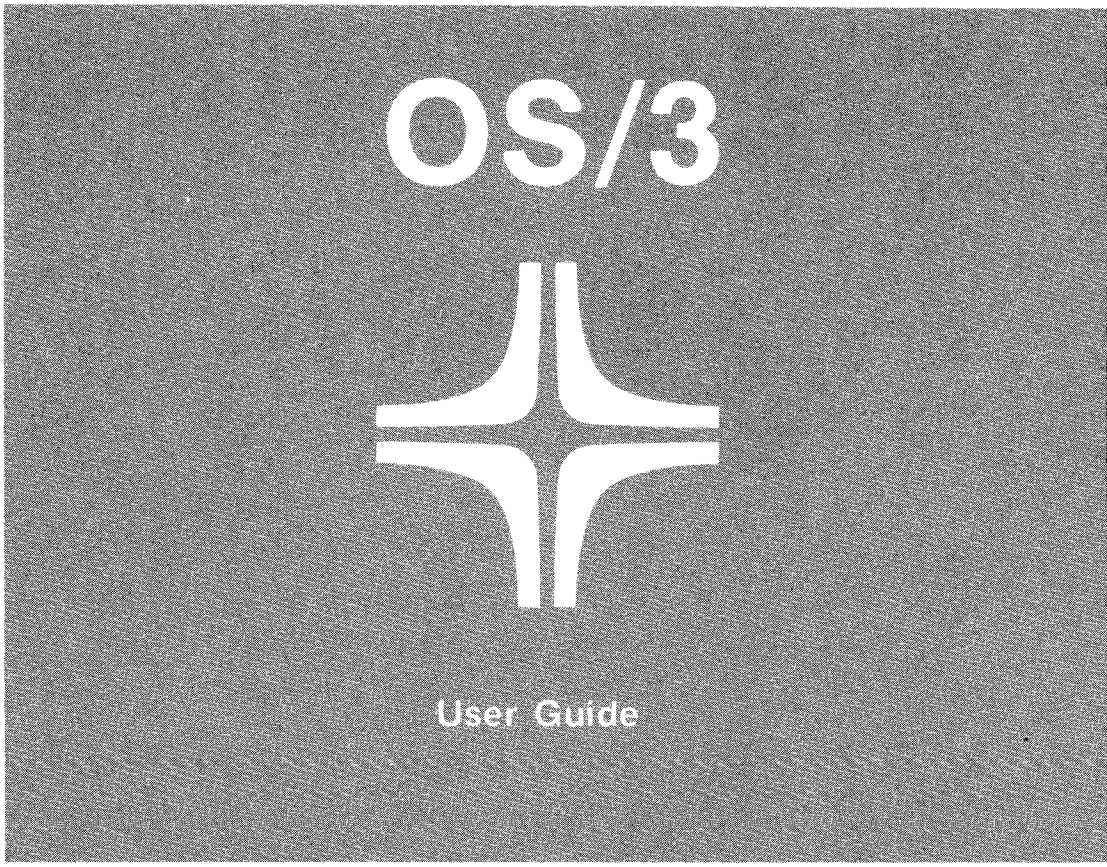
- the concepts, functions, and structure of RTP,
- the procedure for installing, generating, and executing RTP,
- the console commands for controlling and monitoring RTP operations,
- the procedure for communicating with the host and for sending and receiving jobs and files,
- the format and structure of RTP messages.

Additional copies may be ordered by your local Sperry Univac representative.

LIBRARY MEMO ONLY	LIBRARY MEMO AND ATTACHMENTS	THIS SHEET IS
Mailing Lists BZ, CZ and MZ	Mailing Lists A00, A31, B00, B31 (Cover and 76 pages)	Library Memo for UP-8990
		RELEASE DATE: December, 1982

Integrated Communications Access Method (ICAM)

Remote Terminal Processor (RTP)



SPERRY UNIVAC

This document contains the latest information available at the time of preparation. Therefore, it may contain descriptions of functions not implemented at manual distribution time. To ensure that you have the latest information regarding levels of implementation and functional availability, please consult the appropriate release documentation or contact your local Sperry Univac representative.

Sperry Univac reserves the right to modify or revise the content of this document. No contractual obligation by Sperry Univac regarding level, scope, or timing of functional implementation is either expressed or implied in this document. It is further understood that in consideration of the receipt or purchase of this document, the recipient or purchaser agrees not to reproduce or copy it by any means whatsoever, nor to permit such action by others, for any purpose without prior written permission from Sperry Univac.

Sperry Univac is a division of the Sperry Corporation.

This document was prepared by Systems Publications using the SPERRY UNIVAC UTS 400 Text Editor. It was printed and distributed by the Customer Information Distribution Center (CIDC), 555 Henderson Rd., King of Prussia, Pa., 19406.

PRINTED IN U.S.A.

PAGE STATUS SUMMARY

ISSUE: UP-8990

Part/Section	Page Number	Update Level
Cover/Disclaimer		
PSS	1	
Preface	1 thru 3	
Contents	1 thru 4	
1	1 thru 7	
2	1 thru 17	
3	1 thru 9	
4	1 thru 18	
5	1 thru 4	
Appendix A	1 thru 3	
Appendix B	1	
Index	1 thru 7	
User Comment Sheet		

Part/Section	Page Number	Update Level

Part/Section	Page Number	Update Level

All the technical changes are denoted by an arrow (➔) in the margin. A downward pointing arrow (↓) next to a line indicates that technical changes begin at this line and continue until an upward pointing arrow (↑) is found. A horizontal arrow (➔) pointing to a line indicates a technical change in only that line. A horizontal arrow located between two consecutive lines indicates technical changes in both lines or deletions.

Preface

This manual is one of a series that describes the purpose and use of the SPERRY UNIVAC Operating System/3 (OS/3) Integrated Communications Access Method (ICAM). It describes how the remote terminal processor (RTP) enables you to use your SPERRY UNIVAC System 80 or Series 90 processor as a remote job entry terminal to an IBM large-scale host processor. This manual is for the applications programmer who is familiar with OS/3, ICAM, and the selected IBM host system.

This manual consists of:

- Section 1. Remote Terminal Processor Overview

  A description of the basic concepts, functions, and structure of RTP, and the IBM systems with which it can communicate.

- Section 2. RTP Installation and Generation

  A step-by-step description of how to install the RTP software, generate the RTP system to include the features you need, and then link and execute your RTP program.

- Section 3. Console Commands

  The definition and format of the OS/3 console commands for monitoring and controlling the functions of the RTP virtual terminals and peripherals.

- Section 4. RTP Operations

  A description of how to communicate with the host and how to send and receive jobs and files.

- Section 5. RTP Messages and Responses

  A description of message format and a reference list of the RTP messages by function. (See the OS/3 system messages programmer/operator reference, UP-8076, current version, for a complete description of all messages.)

As one of a series, this manual is designed to guide you in programming and using the OS/3 integrated communications access method. Depending on your need, you may wish to refer to the current version of one of the other ICAM manuals that relate to the use of RTP:

- Integrated Communications Access Method (ICAM) Concepts and Facilities, UP-8194

  Provides an overview of the facilities offered by ICAM including the hardware supported, the types of programming languages supported (assembler, COBOL, and RPG II), and the services provided such as polling, queueing, and buffering.

- ICAM Network Definition and Operations User Guide, UP-8947

  This user guide describes how to define an ICAM network, submit it to the system generation procedure, and load and operate the resulting ICAM symbiont. Many sample network definitions are provided to make it easier to define your ICAM network. In addition, most of the required operational functions such as loading ICAM, establishing a dynamic session from a terminal, and communicating with ICAM are described.

- ICAM Communications Physical Interface (CPI) User Guide, UP-8945

  This interface requires the least amount of main storage, but it also provides a minimum amount of support. If you use this interface, you must have considerable knowledge of data communications because your program must initialize the hardware, format all output messages using the appropriate protocol, perform any required translations, acknowledge and process all input messages, and perform all error detection and recovery procedures. In addition, your program must be written in basic assembly language (BAL) and, therefore, your system must include the OS/3 assembler.

- ICAM Programmer Reference, UP-8269

  This reference summarizes the information found in the other ICAM manuals. No introductory information or examples are given; however, it is a useful document when you are familiar with ICAM and you need a quick reference to macroinstructions, formats, and tables.

Within this manual, there are several references to OS/3 system manuals. The references are made to a general title without identifying the individual Series 90 and System 80 publications. Therefore, the following list of manuals is included to help you identify the book you need.

OS/3

UP-8065 Job Control User Guide
UP-8068 Basic Data Management User Guide
UP-8845 Interactive Services Commands and Facilities UG/PR
UP-8869 Spooling and Job Accounting Concepts and Facilities

Series 90

UP-8062 System Service Programs (Series 90) User Guide
UP-8072 90/30, 40 Handbook For Operators
UP-8074 System Installation (Series 90) User Guide/Programmer Reference
UP-8511 90/25 Handbook For Operators

System 80

UP-8839 System Installation (System 80) User Guide/Programmer Reference
UP-8841 System 80 System Service Programs User Guide
UP-8859 System 80 Handbook For Operators

Contents

2. RTP INSTALLATION AND GENERATION

3. CONSOLE COMMANDS

4. RTP OPERATIONS

INDEX

USER COMMENT SHEET

FIGURES

TABLES

1. Remote Terminal Processor Overview

1.1. PURPOSE OF THE REMOTE TERMINAL PROCESSOR

The remote terminal processor (RTP) is a data communications program that permits your SPERRY UNIVAC Series 90 or System 80 processor to function as a remote job entry terminal to one or more IBM host processors. Using the SPERRY UNIVAC Operating System/3 (OS/3) Integrated Communications Access Method (ICAM) software, RTP enables you to send jobs to an IBM host, transmit and receive files on tape, transmit files from diskette, send messages to the central site, and receive print or punch files and console messages from the IBM host.

RTP is controlled through the OS/3 system console. Simple keyins direct the operation of RTP. In addition, control cards are used when sending jobs and data to the host. Messages generated as a result of RTP activities or sent to the SPERRY UNIVAC remote system from the host are displayed on the OS/3 system console.

1.2. RTP FUNCTIONS

RTP emulates an IBM multileaving workstation utilizing the binary synchronous communications (BSC) protocol. RTP can:

- send card-image input job streams to the host;
- accept card-image output from the host;
- accept printer output from the host and provide printer forms control;
- send and receive tape files from the host; and
- provide a dialog between the host console operator and the OS/3 console operator.

1.3. RTP INTERFACES AND SYSTEM REQUIREMENTS

RTP can interface with the following IBM software systems using the IBM operating systems listed in Table 1-1:

- Job entry system 2 (JES2)
- Job entry system 3 (JES3)
- Asymmetric multiprocessing system (ASP)
- Houston automatic spooling program (HASP)

You can select either ASCII or EBCDIC transparent mode. The communications mode required can be selected at line-activation or sign-on time.

Lines to the host can be dedicated or switched, full-duplex or half-duplex.

Table 1–1. IBM Host Systems Supported by RTP

Operating Systems	Remote Job Entry (RJE) Software
OS/VS2(MVS)	JES2/JES3
OS/VS2(SVS)	ASP/HASP
OS/VS1	HASP

1.4. RTP OPERATION

RTP provides up to seven logical paths between a SPERRY UNIVAC Series 90 or System 80 and one or more IBM hosts. Each logical path can connect to a separate host or, as illustrated in Figure 1–1, two or more paths can be routed to the same host.

Input to the host from OS/3 originates as IBM job control images bracketed by RTP controls and data from tape. IBM job control images are accepted from a card reader or diskette and are written to the OS/3 spooler by a separate program (RT$SPL). The creation and transmission of jobs are asynchronous functions. When loaded, RTP cycles continuously looking for spooled jobs consigned to active logical paths. Data from tape is read directly by RTP when it encounters a job stream with this requirement.

Output from the host is directed to a priner, a punch, or (if the Bank of Montreal package is included in the host system) to tape. Each logical path supports seven printers and seven punches – the maximum supported by the system.

The host identifies the printers as PR1 through PR7 and the punches as PU1 through PU7. These devices are described to OS/3 job control and are known internally to RTP as PRTpn and PUNpn, where p identifies the number of the logical path and n is the unique number of the device. PRT34 for example would be the fourth printer on logical path 3.

Because all print and punch files are directed to the OS/3 spooler, it is not necessary to have separate physical devices for each logical path. Printers or punches are shared and particular printers are selected based upon the host specification of special forms.

Tape data received from the host is not spooled. These files are written by RTP directly to tape. If a single tape drive is used by several logical paths, you must be sure the unit is available when required.

The OS/3 console is shared by all logical paths. RTP annotates messages to identify the associated path. You must also be sure that the host identifies the Sperry Univac system as an intelligent terminal (one equipped with a console) to avoid having the host direct console traffic to print files.

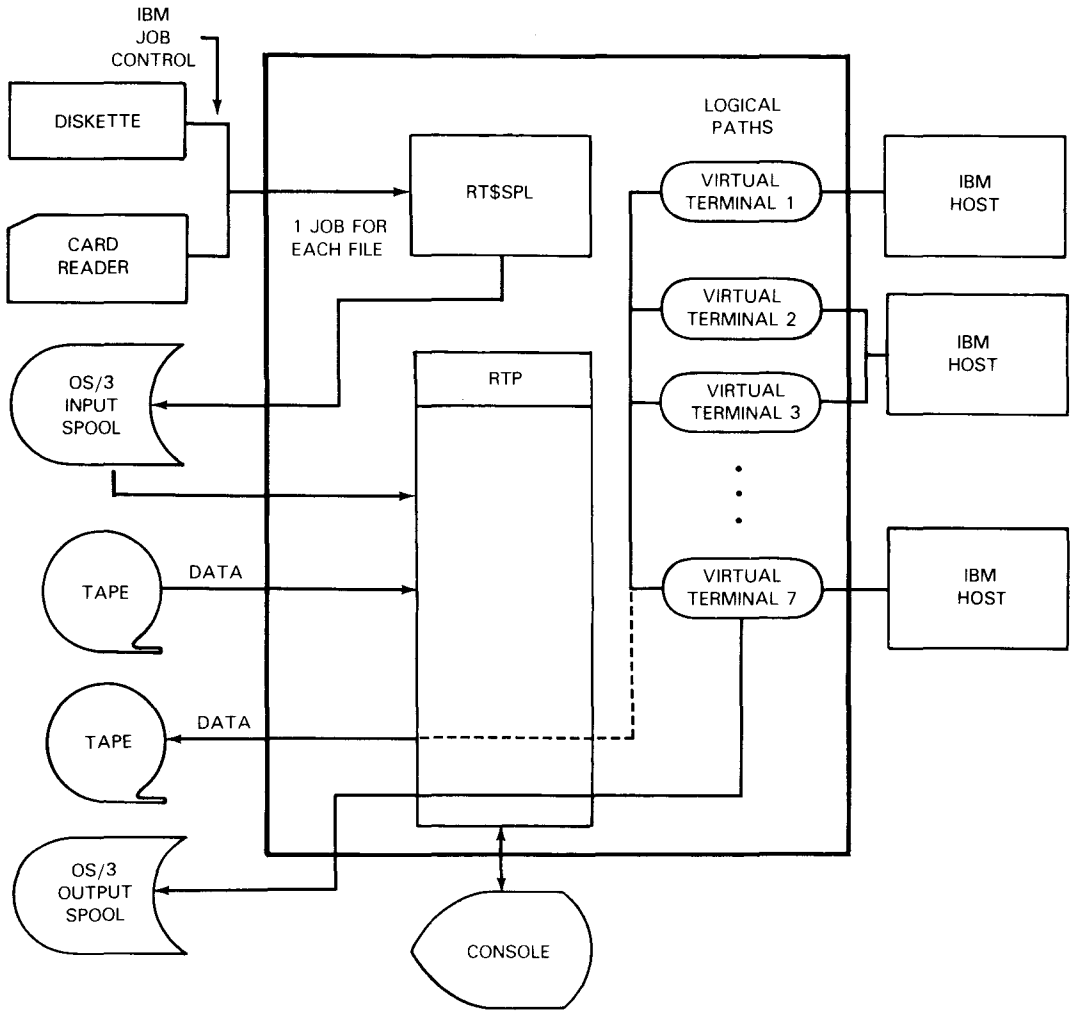


Figure 1–1. RTP Input/Output Configuration

1.5. RTP COMPATIBILITY

RTP supports:

- Intermixing of records within a transmitted block (multileaving)
- Deletion and recomposition of repeated fields (data compression)
- Connection, session establishment, and disconnect procedures recognized by the host
- Subset of the binary synchronous communications (BSC) protocol used to frame and control messages.

1.5.1. Session Establishment

The host system can be connected to the Series 90 or System 80 by switched or dedicated facilities. Dedicated circuits may be full-duplex or half-duplex. RTP issues a console message to establish a switched connection when dialed access is configured, but does not support either automatic dialing or unattended answering.

When a switched connection is established, RTP issues an ENQ sequence and expects an acknowledgment ACK(0) response. (See Appendix A for a summary of controls that are employed.) RTP transmits the SIGNON sequence when the ACK is detected.

If you specify ASCII mode, the SIGNON text and terminating (ETB) character will be in ASCII. RTP transmits a SIGNON image at your direction.

1.5.2. Session Disconnect

In response to the RTP operator signoff (SO) command, RTP transmits the character sequence /*SIGNOFF. Terminal identification and passwords are not appended.

1.6. CANNED JOB CONTROL STREAMS

The RTP software includes a set of canned job control streams that performs a variety of functions related to the generation and operation of RTP. (See Section 2 for the job control functions.) Some of the control streams must be run by yourself during system generation as explained in Section 2.

The canned control streams are:

- ADDSRC (2.3.3)

  Inserts the RTP parameter stream into the source library, YSRC.

- ARTP (2.3.3)

  Generates the RTP logical path control tables.

- LINKRT (2.5)

  Genarates two programs – RTP (with tables) and RT$SPL (4.2.1).

- RTPVFB (2.4.1)

  Generates the vertical format buffers (VFB).

These control streams are part of the RTP software and are stored in the system job control library YJCS.

1.7. REQUIRED SUPPORT FOR RTP

1.7.1. Hardware

RTP requires a Series 90 or System 80 processor with a minimum main storage of 512 KB. A communications adapter (CA) for the Series 90 processor or a single line communications adapter (SLCA) for the System 80 processor is needed that can handle the BSC protocol. The hardware supported by RTP is shown in Figure 1–2.

A minimum RTP system consists of one communications line, a printer, and a card reader or diskette. The system is structured as follows:

- Series 90 or System 80 processor with standard instruction set
- CA or SLCA (synchronous)
- 512 KB main storage
- Disk drive
- Card reader or diskette
- Printer

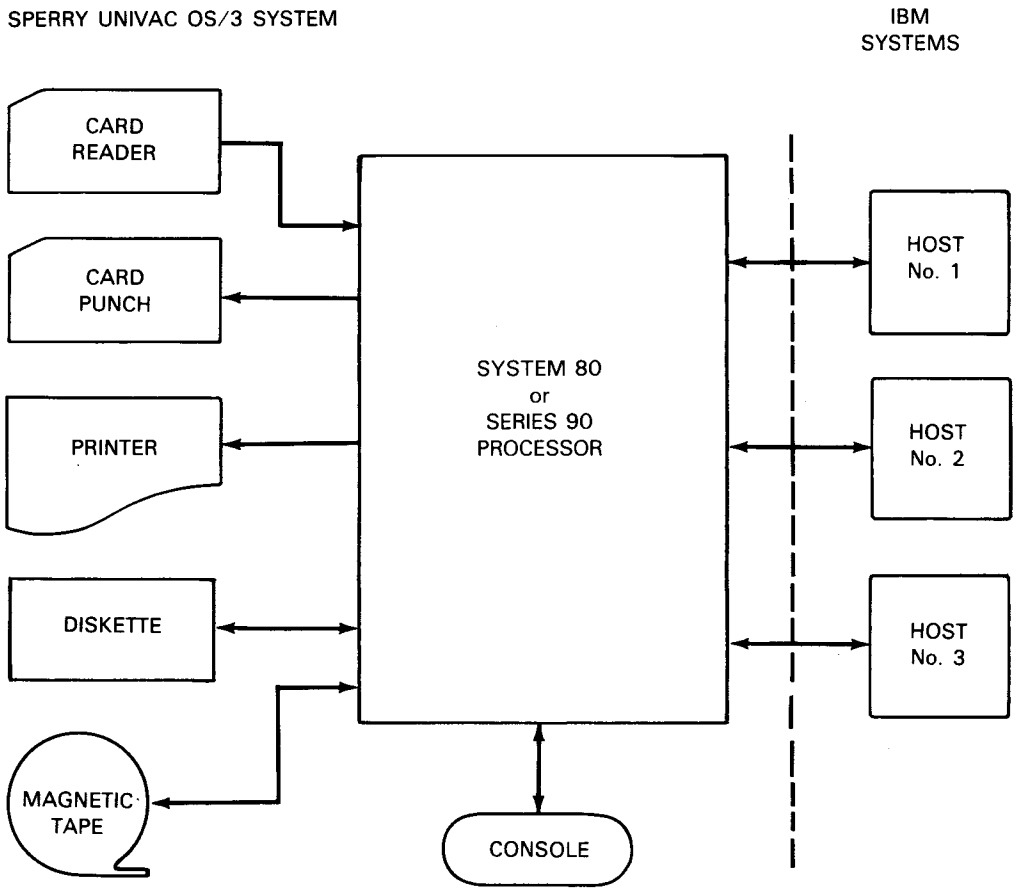


Figure 1–2. SPERRY UNIVAC Devices Supported by RTP

1.7.2. Software

The size and capability of RTP depends on the generation options you select. Table 1–2 lists and helps you estimate the size of your RTP program.

Table 1–2. RTP Main Storage Requirements

Function	Size (bytes)
RTP basic program	24,000
Each VCT (1 required)	1,900
Each virtual printer (1 required)	250
No. of COMBUFS x (CBUFLEN + 4) + 300 (see 2.3.1)	-
No. of NUMTANKS x (TANKLEN + 12) + 14 (see 2.3.1)	-
Each virtual punch (optional)	150
Tape support (optional)	5,000
Each tape unit	400
No. of NUMTAPS x TBUFLEN + 20 (see 2.3.1)	-

NOTES:

1. Series 90 systems must be generated with consolidated data management.
2. The RT$SPL input program that runs as a separate job requires 16,000 bytes of main storage.
3. RTP does not support:
   - Paper tape
   - Column binary cards
   - Punched card stacker select
   - UNISERVO VI-C tape units
   - Autodial

Using the parameter values given in the sample RTP generation (2.3.3) results in an estimated link size of 51,000 bytes. The average RTP job region (including task control blocks, spool buffer, and spool buffer table) for this generation is approximately 62,000 bytes.

2. RTP Installation and Generation

The following steps outline the procedure for installing and generating your RTP system. A detailed description of each step is included in 2.1 through 2.6.

1. Receive and install RTP tapes or diskettes in accordance with the standard software installation procedure (2.1).

2. Generate the OS/3 system including features required for RTP. The system must include the integrated communications access method (ICAM) using the communications physical interface (CPI) to define the lines included in the RTP network (2.2).

3. Generate your RTP program by coding the RTP generation stream and running the add RTP source job (2.3):

```
RU ADDSRC
```

   This new source module and the resultant load module replaces any previous version in YSRC or YLOD.

   Upon completion of the add source job, run the RTP generation program:

```
RV ARTP,,SR=RTPTABLE,OT=Y
```

4. Generate your vertical format buffer (VFB) tables (2.4):

   a. Code VFB generation parameters and run generation job:

```
RU RTPVFB
```

   b. Code automatic VFB tables and run generation job:

```
RU ARTP,,SR=N,OT=Y
```

5. Link all of the various defined modules and tables by running the RTP link job (2.5):

```
RV LINKRT
```

6. Execute the RTP program by coding the RTP execution job control stream and running the job stream using your assigned job name (2.6).

2.1. INSTALLING RTP TAPES OR DISKETTES

Your RTP program product is delivered either on tape or on diskette. Follow the standard Sperry Univac procedure for transferring the product from the delivery media to your system. Once the software is transferred to your system, you can generate your software.

If you are adding RTP to an active system, you might have to regenerate your system. But if you are installing RTP on a new system, you must generate the system before installing RTP. The exact procedure varies from system to system, but you will receive explicit instructions when the software is delivered.

2.2. OS/3 SYSTEM AND ICAM GENERATION

You must be familiar with the host system configuration since you are required to match certain parameters that define the SPERRY UNIVAC system both during system and communications generation and when generating the RTP system to the characteristics of the host system.

RTP requires OS/3 consolidated data management (CDM) during system generation to interface with peripheral devices. System 80 provides consolidated data management automatically. For Series 90 processors, you must configure consolidated data management with RTP during system generation. In each case, you must include input spooling.

RTP requires the OS/3 integrated communications access method (ICAM) because RTP operates as a communications user program (CUP) using the ICAM communications physical interface (CPI). You must define a CPI during the communications generation portion of system generation.

RTP itself is defined by coding a series of parameter statements and submitting them to an RTP build program provided by SPERRY UNIVAC. During this operation you define the lines, buffers, and other resources that RTP uses.

If tape is used with RTP, you must specify a punch in the OS/3 system, the RTP generation, and the RTP run deck – but you do not need the device itself unless cards are to be punched. OS/3 will accept I/O to a punch that is generated into the system if the logical device is first set DOWN and AVAILABLE.

When defining virtual devices (printers and punches) include enough main storage to meet the systems requirements plus those required for RTP.

When generating ICAM and RTP, the communications facility that links System 80 to the IBM host can be configured as either full-duplex or half-duplex. However, you must specify in your ICAM generation that the link is half-duplex because RTP operates with a 2-way alternate binary synchronous communications (BSC) protocol.

For more information on the generation of your system, refer to the current version of the system installation user guide/programmer reference.

2.3. DEFINING AND GENERATING YOUR RTP PROGRAM

You must define all the resources needed by RTP including the communications lines and associated logical path, buffers, and tapes. Two generation statements handle these resources:

- GNOPT – Defines the RTP features common to all logical paths.
- GNVCT – Defines the lines and logical paths. You must code one GNVCT statement for each logical path included in the system.

The formats for these statements are described in 2.3.1 and 2.3.2. A sample input stream is included in 2.3.3.

When defining RTP, select your entries on the basis of the resources available on your SPERRY UNIVAC system and also on the characteristics of your host IBM processor. Since the SPERRY UNIVAC processor should be viewed by the host as an intelligent remote job entry terminal and is defined as such, many of the parameters that you specify on the RTP generation statements must match the parameters defined within the IBM system for the SPERRY UNIVAC processor.

See Appendix B for a sample host generation.

After you code your generation statements, you must run two jobs, ADDSRC and ARTP. These jobs generate the logical path control tables that RTP uses.

2.3.1. Defining RTP Program Options (GNOPT)

The GNOPT generation statement defines the features you want included in your RTP program.

Format:

```
GNOPT [PUN={NO }] [,NUMTANKS={nnn}] [,TANKLEN={120}] [,COMBUFS={nn}]
      [    {YES}]           {20 }          {132}          {6 }
      [,CBUFLEN={400}] [,NUMTAPS={n}] [,TBUFLEN={nnnn}] [,UNAT={NO }]
      [         {800}          {0}          {0   }          {YES}]
      [         {1200}]
```

Parameters:

PUN=

Specifies whether or not punch modules are to be included in the RTP program.

NO

Indicates that punch modules are not to be included.

YES

Indicates that punch modules are to be included. If you specify NUMTAPS=n, you must also specify PUN=YES even if you do not have a punch and do not expect to receive punch files. It is sufficient to generate OS/3 with a dummy punch and include a punch DVC-LFD sequence in your RTP run deck. At system IPL time you must set this dummy punch DOWN and AVAILABLE.

NUMTANKS={nnn / **20**}

Specifies the number of tanks (data buffers) for compression and decompression* Valid entries are 10 to 160. You should specify 2 or 3 tanks for each communications buffer (COMBUFS) specified.

TANKLEN={120 / **132**}

Specifies the length, in bytes, of the tanks for compression and decompression. Your entry must match the length of your print line.

NOTE:

RTP adds 12 bytes to each tank for control use. If the tank length specified is 132, the actual size of the tank is 144. Thus the actual default length is 144.

COMBUFS={nn / **6**}

Specifies the number of communications line buffers. Include at least 6. The maximum number of buffers that you can specify in a system is 32 plus 3n, where n is the number of lines.

CBUFLEN={**400** / 800 / 1200}

Specifies the communications line buffer length in bytes. The value selected must be equal to or greater than that used in the host. If 1200 is used with Series 90, specify USERS=2 for the ICAM PIOCS macroinstruction to ensure support for buffer sizes greater than 1024 bytes.

* *Required for compatability with IBM multileaving data compression.*

NUMTAPS={n / 0}

Specifies the number of concurrent tape operations. The number must be less than or equal to the number of tape drives on your system. If you specify that tape support is provided (NUMTAPS=n), you must also specify PUN=YES. The maximum is the number of logical paths generated multiplied by 2.

TBUFLEN={nnnn / 0}

Specifies the length, in bytes, of the tape buffers. Valid entries are decimal numbers from 1 to 8192. Set your tape buffer length equal to the largest tape block you expect to handle.

UNAT=

Specifies that the unattended sign-on module is included in the RTP load module. The unattended feature presumes that the host is connected – normally by a dedicated facility but permissable on the switched network.

When triggered by an unsolicited operator entry of SU (see 3.8), the unattended facility generates an activate (AC) command every five minutes until the SIGNON image is transmitted.

NO

Does not support unattended sign-on.

YES

Supports unattended sign-on.

2.3.2. Defining RTP Lines and Virtual Terminals (GNVCT)

The GNVCT generation statement defines the lines and virtual terminals used by RTP. The parameters you specify depend on the characteristics of your host system and the parameters you defined for this line within your host system. A GNVCT statement is required for each virtual terminal (logical path).

Format:

```
GNVCT TYP=DC,REMOTE=(rr,remote-name,n),PORTID=nn[,RTY={nn }]
                                                 {5  }

      [,LNECOD={ASCII }][,DIALUP={NO }][,PASSWORD='password'][,STDFM={n}]
               {EBCDIC}         {YES}                            {1}

      [,NUMPUN={n}][,TAP={NO }][,RDELAY={nn}][,TIMEOUT={nnn}][,TDELAY=80]
               {0}       {YES}          {20}           {4  }

      [,RMLOC={nn}][,HRLOC={nn}][,ACCTLOC={nn}][,ACCT='account-number']
              {16}         {0}           {0}

      [,VFB={NONE    }][,OS={ASP  }][,IDLEN=n][,IDLOC=nnn][,IDLIN=nnn]
            {vfb-name}       {HASP}
                             {JES2}
                             {JES }

      [,DUPLEX={F}][,NUMPRT={n}][,LAST={NO }]
               {H}          {1}         {YES}
```

Parameters:

TYP=DC
: Code this parameter exactly as shown.

REMOTE=(rr,remote-name,n)
: Specifies the remote ID number and remote ID name assigned to the virtual terminal by the host processor. (See IBM host administrator.)

  rr
  : 1- or 2-character remote ID number.

  remote-name
  : 1- to 6-character alphanumeric remote-name.

  n
  : Number specifying length of remote-name. Valid entries are decimal numbers 1 to 6.

  Example: (17,RJPO,4) generates RJPO17.

PORTID=nn
: Specifies the communications adaptor or single line communications adaptor assigned to a virtual terminal that is line-connected to the host. Valid entries are 4 to 15 and 20 to 31 for Series 90 processors and 8 to 15 for System 80 processors.

RTY={nn}
    {5 }
: Specifies the number of times RTP will retry a communications operation. Valid entries are decimal numbers from 1 to 64.

LNECOD=
Specifies the line discipline of the host.

ASCII
Line discipline is ASCII. (Messages are translated to ASCII.)

EBCDIC
Line discipline is EBCDIC.

DIALUP=
Specifies whether the line is a dialup line.

NO
Directly-connected line.

YES
Dialup line.

PASSWORD='password'
Specifies the password used to access the system. The password can be from 1 to 8 alphanumeric characters. Code apostrophes as shown.

If omitted, it is assumed that no password is required.

STDFM={n / **1**}
Specifies the number of forms printed on standard paper. All forms must be specified at the top of the VFBTABLE. Valid entries are 1 to 255.

NOTE:

When generating more than one virtual terminal, specify the same value for the STDFM parameter in every GNVCT statement.

NUMPUN={n / **0**}
Specifies the number of punches in the host line definition. Up to seven punches can be specified.

TAP=
Specifies whether this virtual terminal supports tape operations.

NO
Does not support tape operations.

YES
Supports tape transmission and reception.

RDELAY={nnn / **20**}

Specifies the time (in seconds) between scans of the input queue. You can specify from 1 to 256 seconds.

TIMEOUT={nnn / **4**}

Specifies how long (in seconds) RTP waits for completion of a communications operation before assuming an error occurred. You can specify from 1 to 255 seconds.

TDELAY=**8Ø**

Specify this parameter only if the host system runs under HASP or if using 50 KB lines with tape transmission. Otherwise, omit this parameter.

RMLOC={nn / **16**}

Specifies the position on the SIGNON card where the remote name must begin. Valid entries are 9 to 80 minus the length of the remote name.

HRLOC={nn / **0**}

Specifies the location of the hot reader indicator on the SIGNON card. Valid entries are decimal numbers from 9 to 80. Default to 0 if the host has no hot reader.

ACCTLOC={nn / **0**}

Specifies the starting position on the SIGNON card of the account number field. Valid entries are decimal numbers from 9 to 75. Default to 0 if you do not use an account number.

ACCT='account-number'

Specifies the host-assigned job account number or special characters. Account-number can be any 1- to 16-character alphanumeric entry enclosed by apostrophies. Entries less than 16 characters in length are left-justified. The field is placed on the SIGNON card starting in the column specified by the ACCTLOC parameter. Code apostrophies as shown. See the IBM host administrator for account numbers.

Omit this parameter if no account number is required.

VFB={**NONE** / vfb-name}

Specifies the VFB name for standard forms.

NOTE:

If you omit this parameter or specify NONE, include a VFB named NONE on your VFB tables. (See 2.4.)

OS=

Specifies the operating system remote support subsystem of your host processor.

ASP

Asymmetric multiprocessing system.

HASP

Houston automatic spooling program.

JES2

Job entry system 2.

JES

Job entry system 3.

IDLEN=n

Specifies length of the host job name or number on the print header line. Valid entries are 1 to 8. This parameter is used in conjunction with the IDLOC and IDLIN parameters. You must either specify entries for all three parameters or omit all three.

If omitted, no job name or number appears on the print header line.

IDLOC=nnn

Specifies the position within the print header line of the host job number or name. Valid entries are 1 to length of print line minus the length of the job name or number.

If omitted, no job name or number appears on the header line.

IDLIN=nnn

Specifies the number of lines from the start of transmission that the host job name or number can be found. Valid entries are decimal numbers from 1 to 255.

If omitted and IDLOC and IDLEN are specified, then the job name or number is assumed to be in the first line of the transmission.

DUPLEX=

Specifies the type of line used. System 80 users must specify H (half-duplex). The communications facility may be configured for full-duplex operation, but you must specify the logical path as half-duplex in both ICAM and RTP.

F

Specifies a full-duplex line. Use full-duplex lines for line speeds equal to or greater than 19.2 KB.

H

Specifies a half-duplex line.

NUMPRT={n / 1}

Specifies the number of printers in the host line definition. Valid entries are 1 to 7.

LAST=

Specifies whether the current virtual terminal definition is the last definition in the RTP generation stream.

NO

Current definition is not the last definition.

YES

Current definition is the last definition.

NOTE:

The IDLEN, IDLOC, and IDLIN parameters identify print files on the OS/3 spool file by a host-assigned job name or number. If your host system supplies the job name or number in each print file, these parameters can be used to specify the location of the job name to RTP. RTP takes the job name or number and uses it to name the OS/3 spool file for this job. The OS/3 console operator can then use the name in certain OS/3 console commands to control the print spool operations.

2.3.3. Generating Your RTP Program

To generate your program, you must submit your generation cards to an RTP generation program. But first, code the following control stream and insert the generation cards where indicated:

```
1         10    16
          ELE   D1,S,RTPABLE
RTPTABLE  START 0
          GNOPT parameter,parameter,...,parameter
          GNVCT TYP=DC,REMOTE=(params),PROTID=n,parameter
          END
          EOD
// FIN
```

NOTES:

1. *At least one blank space must appear before the ELE statement; therefore, the statement must not start in column 1.*

2. *Continuation cards are permitted for the RTP generation parameters. To indicate continuation, place a comma after the last parameter on the card and place any character in column 72. Start the continuation card in column 16.*

3. *The name of the START statement must be RTPTABLE.*

4. *Each new version of RTPTABLE overlays the prior generation.*

If the stream you code is on cards, place the cards in the card reader and enter the following at the system console:

```
RU ADDSRC
```

Upon successful completion, enter the following at the system console:

```
RV ARTP,,SR=RTPTABLE,OT=Y
```

The RTP program and required tables are automatically generated.

2.3.4. Sample RTP Program Generation

The following is a sample input stream for the generation of a typical RTP program.

```
1         10        16                                                  72
          ELE   D1,S,RTPTABLE
RTPTABLE  START 0
          GNOPT PUN=YES,NUMTANKS=25,COMBUFS=8,CBUFLEN=800               X
                TBUFLEN=4096,NUMTAPS=2
          GNVCT TYP=DC,REMOTE=(16,REMOTE,6),PORTID=4,NUMPRT=3,          X
                DIALUP=YES,OS=HASP,PASSWORD='UNIVAC',TAP=YES,           X
                RTY=15,VFB=FB02,STDFM=3,DUPLEX=H,NUMPUN=1,LAST=YES
          END
          EOD
// FIN
```

2.4. DEFINING YOUR PRINTING REQUIREMENTS

If you receive print files from your IBM host, you must specify the SPERRY UNIVAC printer you need and define the format of the print page for each form required.

First, you set up a vertical format buffer (VFB) for each IBM forms control buffer (FCB) (2.4.1). Then, you generate a table (VFBTABLE) that links the IBM printing form name to a corresponding VFB name (2.4.2). This permits RTP to automatically load the proper VFB for any print file. An operator message is displayed to ensure that any special forms required for a particular print file are loaded before printing begins. The same VFBTABLE can be used by all virtual terminals and hosts.

2.4.1. Generating Vertical Format Buffers

Each vertical format buffer is defined by one or more parameter cards. If more than one card is used, each card except the last must be terminated by a comma and a continuation symbol (any character) in column 72. Additional parameters must begin in column 16 of a continuation card.

```
symbol VFBGEN [FL={nnn|66}][,LPI={8|6}][,OVF={nnn|length-5}][,OFFSET={nn|0}]
              [,CD1={line|5},CD2=line,...,CD15=line]
```

Label

symbol
: Is a 1- to 4-character name of this vertical format buffer, the first character of which is alphabetic. This entry is mandatory. The name used becomes the name of a load module created by RT$SPL. If an identical name exists in YLOD, it will be replaced by this load module.

Parameters:

FL={nnn|66}
: Specifies the total length, in lines, of the form. Valid entries are decimal numbers from 1 to maximum permitted by OS/3 data management.

LPI={8|6}
: Specifies the line density of the form in lines per inch.

OVF={nnn|length-5}
: Specifies the form overflow line. If omitted, the default is the length of the form minus 5. If form length (FL=) is omitted, overflow is line 61 (the form length default minus 5).

OFFSET={nn|0}
: Specifies the number of columns to the right that the line is shifted before printing begins (right-most columns are dropped). Valid entries are 0 to 15.

CD1={line|5},CD2=line,...,CD15=line
: Specifies the line or lines where an associated skip code is entered into the vertical format buffer. CD= specifications may be entered in any order and may be sublisted such as CDn=(line,line,...,line). If a line is repeated, the last skip code associated with that line is used.

CD1, skip code 1, is assumed to be the IBM home paper code. The SPERRY UNIVAC home paper code (07) is entered into the line designated for CD1. If CD1 is omitted, line 5 will contain the 07 home paper code. Because CD1 is treated as home paper, it should be less than any other CD= line number.

A CD7= causes generation of hexadecimal 0D in the specified lines because 07 is the SPERRY UNIVAC home paper code.

All other CD= specifications generate equivalent hexadecimal codes.

For details on the conversion of skip codes, see the OS/3 basic data management user guide, UP-8068 (current version).

Example:

```
1         10    16                                                    72
FRM1      VFBGEN FL=144,LPI=6,OVF=136,OFFSET=10,CD4=(6,16,40),         X
                 CD1=4,CD15=(100,120)
```

After coding the appropriate parameter cards, you must submit them to the VFB generation program. Place the cards, followed by a // FIN job control card, in the card reader and enter the following at the system console:

```
PVFB,,VFB=vfbname [,TEST={Y}]
                      {N}
```

Execution of the RTPVFB job stream assembles the vertical format buffer. The name of the vertical format buffer (the label of the first VFB parameter statement) must be specified. If TEST= is specified as N or defaulted, the assembled VFB is linked and written to YLOD. If TEST=Y is specified, no load module is generated.

The appropriate vertical format buffers are automatically generated.

2.4.2. Generating the VFBTABLE

RTP uses a 2-column vertical format buffer name table (VFBTABLE) that lists the IBM printer form name and related RTP VFB name to automatically load the proper VFB when a host requests a special print form.

You generate the VFBTABLE by coding a series of source statements and submitting them to the VFBTABLE generation program. For each form-name/VFB pair, you must code an entry for the VFBTABLE. Each entry consists of an 8-byte field. The first four bytes contain the form name sent by the host. The last four bytes contain the name of the VFB used to print the file. (See Table 2–1 for VFBTABLE structure.) The last entry in the VFBTABLE must be ENDVENDV. Even if the VFBTABLE function is not needed, you must still generate a VFBTABLE containing only the entry ENDVENDV.

Table 2–1. VFBTABLE Structure

Host Form Name	RTP VFB Name
xxx1	yyy1
xxx2	xxx2
.	.
.	.
.	.
ENDV	ENDV

If your site uses a standard form to print a number of different files, each with a different VFB, you can eliminate a number of extraneous "mount-forms" messages by grouping all the form-name/VFB combinations at the beginning of the VFBTABLE.

To prevent OS/3 from issuing a mount message for each of these forms, proceed as follows:

1. Generate a VFB for each VFB name used in the VFBTABLE.

2. Prepare the VFBTABLE with all form-name/VFB-name entries to be printed on standard paper grouped at the beginning of the table.

3. Enter all the form-name/VFB-name entries to be printed on special forms and place them after the standard forms entries.

4. Specify the number of VFBTABLE entries to be printed on standard paper on the STDFM= parameter of the GNVCT generation statement. (Make sure that all the GNVCT statements specify the same number of standard forms entries.)

Each time the host sends a mount-forms message to the remote terminal, RTP intercepts the message and searches the VFB tables for the form name included in the message. If RTP finds the name, it uses the name to initialize the OS/3 spool file.

When RTP finds the requested host form name in the standard form part of the VFBTABLE, it substitutes STAND1 as the form name in the OS/3 spool file. RTP also loads the proper VFB as directed by the VFBTABLE entry. Using STAND1 as the form name prevents OS/3 from issuing unneeded mount-forms messages to the operator.

RTP then sends a print-start command to the host. Only if the form name is not found in the VFB table does the operator have to respond to the host mount-forms message. The automatic VFB operational procedure assumes that the host processor is sending a load-forms message for each print file.

If the host does not send a mount-forms message to the remote terminal, RTP uses STAND1 as the form name and the default VFB name to initialize the OS/3 spool file. The default VFB name is specified by the VFB= parameter in the GNVCT statement (2.3.2). This VFB name must also be generated.

Sample VFBTABLE generation:

```
VFBTABLE  START Ø                 First statement (Label must be VFBTABLE)
          DC    C'ØØØ1VFB1'       First form-name/VFB pair
          DC    C'FØØ2FBØ2'       Second form-name/VFB pair(using same VFB)
          DC    C'ABCDWXYZ'       Third form-name/VFB pair
          DC    C'SPØ1VFB1'
          DC    C'SPØ2SPC1'
          DC    C'ENDVENDV'       Indicates end VFBTABLE entries
          END
// FIN
```

After coding the required source statements, place them in the card reader followed by a // FIN job control statement and enter the following at the system console:

```
RU ARTP,,SR=N,OT=Y
```

The VFBTABLE is automatically generated and placed in your OS/3 system object library. It is linked to the RTP program at link-edit time.

Sample VFBTABLE structure:

```
VFBTABLE
ØØØ1VFB1      VFB1 is loaded as the VFB for form 0001.
FØØ2FBØ2  }   These forms are printed on standard paper.
ABCDWXYZ  }
SPØ1VFB1  }   These forms are printed on special forms.
SPØ2SPC1  }
```

Sample GNVCT entry:

```
GNVCT TYP=DC,REMOTE=(16,REMOTE,6),PORTID=4,STDFM=3,...
```

If you have only one VFB that is to use the standard paper, you must place the corresponding form-name/VFB entry at the top of the VFBTABLE.

2.5. LINKING YOUR RTP MODULES AND TABLES

After you generate your RTP program and all required tables including vertical format buffer tables, link the modules together using the following command at the system console:

```
RV LINKRT
```

When linking is completed, your RTP system and program to spool input (RT$SPL) are generated and ready for execution.

2.6. EXECUTING YOUR RTP PROGRAM

To execute your RTP program, you must code and run a job control stream. The job control stream assigns the resources required by RTP and executes the program. But before running the job control stream, you must initialize the ICAM symbiont that interfaces with RTP using the console type-in Cn or Mn where n identifies the ICAM symbiont that supports RTP.

The following job control stream can be used as a model for developing your own entries:

```
1.  // JOB RTPJOB,,,,10
2.  // DVC 40 // SPL ,,,,204800 // LFD PUN11
    // DVC 41 // SPL ,,,,204800 // LFD PUN12
3.  // DVC 20 // VFB LENGTH=66
    // SPL ,2X2,,14,204800,,NOHRD // LFD PRT11
    // DVC 21 // VFB LENGTH=66
    // SPL ,2X2,,14,204800,,NOHDR // LFD PRT12
4.  // OPTION SYSDUMP
    // DVC 22 // LFD PRNT
5.  // OPTION OFT=+n
6.  // EXEC RTP,,2
7.  /&
    // FIN
```

Explanations:

1. The // JOB control card identifies the job as RTPJOB. You can select any job name you choose but it must be unique. You use the job name to identify the job on the RUN command that executes the program.

   The load module is in YLOD. The number of tasks required varies according to the RTP configuration. Each RTP system requires 9 tasks plus 1 for each logical path defined. This example uses 1 logical path table; therefore, 10 tasks are specified.

2. The device assignment sets allocate the physical punches that the system requires. The DVC statements identify the devices through the logical unit numbers.

   The SPL statements specify the maximum of I/O operations for the spool file. When this number is reached, the operator is asked whether the job should be continued. By specifying 204800, you can cut down on the frequency of the operator messages. This is especially useful when dialing with large files.

   The LFD statements link the virtual punches defined by RTP and the physical punches. These match corresponding names generated for the virtual punches within RTP. PUN11 identifies the file as a punch file, specifies that it belongs to logical path 1 and is the first punch. PUN12 is the second punch in logical path 1. An lfd-name of PUN21 would identify the first punch in logical path 2.

You can also use the EQU job control statement assigning additional logical unit numbers when defining additional virtual devices. When generating your system, be sure to include a sufficient number of virtual printer and punch definitions to meet the requirements of RTP and any other jobs that may be running concurrently.

3. These two device assignment sets allocate the printers that RTP requires. The SPL statements perform the same function as those used in the device assignment sets for the punches; the 204800 parameter eliminates the majority of extraneous operator messages. The 2X2 parameter establishes buffers for the printer: 2 buffers each 512 bytes in length. The 14 indicates the maximum number of lines that contain skip codes.

   The LFD names link the virtual printers defined by RTP and the physical printers. These match corresponding names generated for the virtual printers within RTP. The PRT11 identifies the file as a printer file, specifies that it belongs to logical path 1, and that it is the first printer. PRT12 is the second printer in logical path 1.

4. The OPTION statement provides for an automatic system dump in case of error to the desginated printer.

5. The OPTION statement is required if you specify the NUMTAPS parameter in the GNOPT statement. The parameter values must be the same.

NOTE:

Tape devices and files are not assigned with JCL. RTP dynamically acquires and releases tapes from OS/3 as they are needed.

6. The EXEC statement executes the RTP program assigning a task priority of 2 to the program.

7. The /& and FIN statements indicate the end of the job and terminate the card reader, respectively.

3. Console Commands

The OS/3 console commands for RTP monitor and control the functions of the RTP virtual terminals and the related virtual and real peripheral equipment. These commands are listed in 3.1 and described in detail in 3.3 through 3.9. Section 4 describes how the commands are used.

3.1. COMMANDS

- AC Activate an RTP virtual terminal (3.3).
- FB Set forms control for a virtual printer (3.4).
- PS Display virtual printer status (3.5).
- SO Sign off a virtual terminal (3.6).
- ST Display virtual terminal status (3.7).
- SU Activate or deactivate the unattended sign-on facility (3.8).
- EOJ Terminate the RTP program (3.9).

3.2. COMMON COMMAND FIELDS

The general format for RTP console commands is:

$$nm\ command.\left\{\begin{matrix}vid\\RMrr\end{matrix}\right\}.parameter_1.parameter_2.\ldots.parameter_n$$

where:

nm

Is the RTP job slot/message number indicator in hexadecimal. The first digit (n) is the job slot that RTP occupies. The second digit (m) is the message number. If entering an unsolicited message, use 0 as the first digit. If responding to an RTP message, enter the number of the message to which you are responding.

command
Is the command mnemonic.

{vid / RMrr}
Is the virtual terminal identifier; either the virtual terminal ID (vid) or the remote ID (rr) that identifies the terminal to the host. The vid is the sequence number of the logical path in OS/3 generation. It is applicable to some but not all message.

parameters
Are parameters that you enter with the command. Separate parameters with periods.

NOTE:

If you enter an invalid parameter in an RTP console command, the system does not accept the command and responds with a pointer (^*) under the faulty parameter. You must correct the faulty parameter before you can continue.*

3.3. ACTIVATE A VIRTUAL TERMINAL (AC)

Purpose:

The AC command activates a specified virtual terminal (line) and notifies the host processor of the action by sending it a SIGNON card image. Communications with the host processor can begin immediately after it acknowledges the SIGNON message.

Format:

```
nm AC.{vid / RMrr}[.RMrr][.PW=password][.PT=nn] [.SW={N / Y}][.CD={A / E}][.OS={H / A / J / J2}]
[.DX={F / H}][.HL={hh / NO}] [.RL=rr] [.AL={NO / aa}] [.AN=account-number][.IL=ii]
[.IN=n][.PF=ffffff]
```

NOTE:

All keyword parameters are optional; use them only when you want to override entries in the virtual terminal control table generated at RTP generation.

Parameters:

RMrr
Changes the remote ID of the virtual terminal. The ID reverts back to the originally generated ID when the terminal is deactivated.

PW=password
Specifies a 1-to 8-character password for the IBM SIGNON card image.

PT=nn
Specifies the Series 90 communications adaptor (CA) port number or the System 80 single line commmunications adaptor (SLCA) port number. Valid entries for Series 90 CA are 4 to 15 and 20 to 31. Valid entries for the System 80 SLCA are 8 to 15.

SW=
Specifies the communications line as switched (Y) or dedicated (N).

CD=
Specifies the data format of the communications line as EBCDIC (E) or ASCII (A).

OS=
Specifies the operating system of the host IBM system as HASP (H), ASP (A), JES3 (J), or JES2 (J2).

DX=
Specifies the communications line as full-duplex (F) or half-duplex (H). System 80 users must use H.

HL=
Specifies that the host computer has a HOT reader indicator. The location of the indicator is denoted on the SIGNON card by 'hh'. If no indicator is required, the location must be NO.

RL=rr
Specifies the location of the remote ID on the SIGNON card.

AL=
Specifies the location on the SIGNON (columns 9 to 75) of the start of a 16-character field used to specify an account number or any host-assigned special characters. If NO, no account number or special characters are assumed.

AN=account number
Specifies a 1-to 16-character account number that must be supplied on the SIGNON card. This field can also be used for special characters requested on the SIGNON card by the host computer. (See ACCT= parameter in 2.3.2 for further information.)

IL=ii
Specifies the location of the job number or job name provided on host transmitted jobs. This keyword parameter allows for each received job file to be identified on OS/3 spool file.

`IN=n`
Specifies the length of the job number or job name provided on host transmitted jobs.

`PF=ffffff`
Specifies the remote ID name.

Examples:

`1Ø AC.1`
Activates virtual terminal 1 using all default values specified in GNVCT.

`1Ø AC.RM12`
Activates the virtual terminal whose remote ID is specified as 12 in GNVCT.

`1Ø AC.1.OS=A.PF=REMOTE.RL=1Ø.HL=22.AL=25.AN=REMOTE12`
Activates virtual terminal 1 using the specified keyword parameters to override those specified in GNVCT.

3.4. SET FORMS CONTROL FOR VIRTUAL PRINTER (FB)

The FB command sets up the OS/3 spool file to control forms mounted on the real printer at output writing time. Only use this command when a print file is received or is about to be received with a forms name that is not listed on the VFBTABLE. Enter the form name and then the name of the VFB that you want to print the file.

Format:

```
nm FB.{vid  }.PRn[.F=ffff][.C=cccc]
      {RMrr}
```

Parameters:

`PRn`
Specifies the virtual printer to be set up.

`F=ffff`
Specifies the form name (up to four characters) of the next file to be sent.

`C=cccc`
Specifies the vertical format buffer name (up to four characters) to be loaded into the real printer carriage control buffer when file printing starts. This VFB name must reside in the OS/3 load library.

NOTES:

1. *If the F= and C= parameters are both omitted, the virtual terminal standard forms are set up and the last received file is made ready for printing.*

2. *If the vertical format buffer specified in the C= parameter is not in the OS/3 load library, RTP points to the faulty operand.*

Examples:

```
1Ø FB.RM15.PR1.F=ABCD.C=XYZQ
```
Sets up printer 1 of virtual terminal RM15 to receive a job whose form name is ABCD and that uses the carriage control definition of XYZQ.

```
1Ø FB.RM15.PRI
```
Sets up standard forms in the same printer.

```
1Ø FB.RM15.PRI.F=ZONK
```
Sets up form ZONK for the same printer. The correct carriage control buffer is found by scanning the VFBTABLE for form ZONK.

3.5. DISPLAY VIRTUAL PRINTER STATUS (PS)

The PS command displays the following information about all virtual printers belonging to a virtual terminal:

- forms currently set up for each virtual printer,
- the active or idle status of each virtual printer, and
- the number of print lines received but not breakpointed.

Format:

```
nm PS.RMrr
```

NOTE:

You cannot specify the virtual terminal ID (vid) with this command; you must use the remote ID (RMrr).

Example:

```
1Ø PS.RM15
```
Display current status of all virtual printers for the virtual terminal identified as RM15.

System Response:

```
PS#Ø1{RMrr.PRn}{ACTIVE} F=form-name,C=vfb-name,L=lines
     {jobname }{*IDLE*}
```

where:

PRn
Specifies the virtual printer whose status is displayed.

ACTIVE
Specifies the virtual printer currently receiving data.

jobname
Specifies the job name of the file being received. The GNVCT parameters IDLEN, IDLOC, and IDLIN must have been specified.

IDLE
Specifies the virtual printer currently idle.

F=form-name
Specifies the IBM form name the printer is set up to receive.

C=vfb-name
Specifies the vertical format buffer that is loaded into the real printer when the file is printed.

L=lines
Specifies the number of lines received since start of transmission or last breakpoint.

3.6. SIGNING OFF A VIRTUAL TERMINAL (SO)

The SO command transmits the IBM SIGNOFF card image to the host processor. The communications line assigned to the virtual terminal is then deactivated.

Format:

```
nm SO.{vid  }
      {RMrr}
```

Examples:

10 SO.RM15
Transmits the SIGNOFF card image for the virtual terminal whose remote ID is 15.

10 SO.1
Transmits the SIGNOFF card image for virtual terminal 1.

3.7. DISPLAY VIRTUAL TERMINAL STATUS (ST)

The ST command displays a summary of the status of a virtual terminal.

Format:

```
nm ST.vid
```

System Response:

```
hhmmss STATUS={ACTIVE  } VID=n RM=rr PT=nn SW={N} CD={A} OS={A} DX={F}
              {INACTIVE}                      {Y}    {E}    {H}    {H}
              {SIGNON  }                                    {J}
PF=prefix RD1={ACTIVE  } RECEIVE={ACTIVE  }
              {INACTIVE}         {INACTIVE}
```

where:

hhmmss
: Specifies the time in hours, minutes, and seconds at which the status of this terminal was taken.

STATUS=
: Specifies whether the virtual terminal is active, inactive, or in the process of being signed on.

VID=n
: Specifies the virtual ID number of the virtual terminal whose status is being displayed.

RM=rr
: Specifies the remote ID number associated with this virtual terminal.

PT=nn
: Specifies the communications adapter (Series 90) or single line communications adapter (System 80) port identifier to which the line for this logical path is connected.

SW=
: Specifies whether the line to which this virtual terminal is connected is switched (Y) or dedicated (N).

CD=
: Specifies the protocol of the line to which this virtual terminal is connected as being ASCII (A) or EBCDIC (E).

OS=
: Specifies the software system that the host processor is operating under: ASP (A), HASP (H), or JES2 or JES3 (J).

DX=
Specifies whether the line to which this virtual terminal is connected is full-duplex (F) or half-duplex (H).

PF=prefix
Specifies the prefix to the remote ID.

RD1=
Specifies whether the input reader for this virtual terminal is active (ACTIVE) or inactive (INACTIVE).

RECEIVE=
Specifies whether this virtual terminal is receiving data (ACTIVE) or not receiving data (INACTIVE).

NOTE:

RD1 and RECEIVE are displayed only when the virtual terminal is active.

Example:

```
10 ST.2
```
Displays the current status of virtual terminal 2.

3.8. ACTIVATE OR DEACTIVATE THE UNATTENDED SIGN-ON FACILITY (SU)

The SU command activates or deactivates the unattended sign-on facility. After the facility is activated, the system attempts to sign on to the line every five minutes whenever the line is inactive.

Format:

```
nm SU.vid.{ON }
          {OFF}
```

Parameters:

vid
Specifies the sequence number of the virtual terminal for which the unattended sign-on facility is to be activated or deactivated. The RMxx form is not accepted.

ON
Activates the unattended sign-on facility.

OFF
Deactivates the unattended sign-on facility. It does not issue a SIGNOFF or terminate RTP.

Example:

```
1Ø SU.4.ON
```

Activates the automatic sign-on facility for the virtual terminal connected to line 4.

3.9. SHUTTING DOWN THE RTP PROGRAM (EOJ)

The EOJ command terminates the RTP program. All virtual terminals must be signed off before entering this command.

Format:

```
nØ EOJ
```

Parameters:

n

Specifies the job slot in which RTP is running.

4. RTP Operations

4.1. CONTROLLING RTP COMMUNICATIONS WITH THE HOST

4.1.1. Establishing Communications

The first step in establishing communications with the host is to issue the Activate (AC) command (3.3) at the OS/3 console. The next step depends on how the SPERRY UNIVAC system is connected to the IBM host: direct-connect or dialup.

For a directly-connected host processor, an enquiry (ENQ) control sequence is transmitted and, when acknowledged, the SIGNON card image is sent to the host. Communications processing can then begin.

For a host you dial up, RTP responds to the AC command with the message:

```
CM#14 CONNECT LINE - DIAL HOST OR WAIT FOR RING
```

The operator must make the connection for RTP. Approximately two minutes are allowed to make the connection and for the host to acknowledge the connection.

NOTE:

You can calculate the actual connection time using the formula:

```
t = (2 x number-of-retries) x line-type-factor
```

where:

`t`
: Is the time in seconds.

`number-of-retries`
: Is the number of retry attempts specified in the RTY parameter of the GNVCT statement.

`line-type-factor`
: Is either 15 for a half-duplex line or 7 for a full-duplex line.

For example, if a retry count of 5 is specified for a full-duplex line, RTP allows 70 seconds before the AC command must be reissued. One hundred and fifty seconds (2.5 minutes) is allowed if the line is half-duplex.

If a connection is not made within the allowed time or if no acknowledge is received on a dedicatd circuit, RTP issues the following message:

```
CM#21 LINE CONNECTION TIME HAS EXPIRED - REACTIVATE
```

Reissue the AC command to attempt another connect. Once a dialed line is connected, the ENQ and SIGNON are sent as for a dedicated line.

4.1.2. Reestablishing Communications after Abnormal Termination

After an abnormal termination, use the AC command to reestablish communications because the IBM host normally retransmits any files interrupted by the termination. However, you must make certain that your remote system is set up to automatically receive retransmitted files.

For print files, set up the virtual printers with the forms required to receive the files lost by the termination before reactivating the terminal. The host assumes the forms will be the same as last used.

RTP card and tape files are automatically restarted by the host when the line is reactivated. (Consult the appropriate host workstation manual for procedures to recover files being received.)

NOTE:

If you operate with unattended sign-on, RTP tries to reestablish communications every five minutes after an abnormal termination. If files were being transmitted when the abnormal termination occurred, use the SU (3.8) command to deactivate the facility until the host or the virtual terminal is ready to receive retransmitted files.

4.1.3. Communicating with the Host from the OS/3 Console

You can send messages directly to and receive messages directly from the host at the OS/3 console. Messages sent to the host are either informational for display on the host console or commands that the host processor executes. The host processor analyzes the messages to determine which are for display and which require an action.

4.1.3.1. Messages to the Host

To send a message to the host, enter:

1. the RTP job slot and message number,

2. the remote ID of the virtual terminal, then

3. a period followed by your message.

For example:

```
10 RM15.$DA
```

This command sends the message '$DA' to the host. If the virtual terminal having the remote ID of 15 is not active, the following message is displayed:

```
TERMINAL NOT ACTIVE
```

4.1.3.2. Messages from the Host

All messages from the IBM host to your OS/3 system are displayed on the system console. For example:

```
nm RM15 $10.11.24 OK
```

The message identifies the terminal, RM15, followed by the message sent.

4.1.4. Terminating Communications

The sign-off command (SO) disconnects a virtual terminal from the host. Before issuing the SO command, you may have to command the host system to stop or drain all transmission to the virtual terminal. The procedure for doing so varies from host-to-host and also depends on the type of IBM terminal your virtual terminal is emulating. Refer to the appropriate IBM documentation for details.

4.1.5. Shutting down the RTP Program

Before shutting down the RTP program, sign off all virtual terminals as explained in 4.1.4. Then shut down the RTP program by entering the EOJ command at the OS/3 system console specifying the job slot in which RTP is running. For example:

```
10 EOJ
```

The first numeral indicates that RTP is running in job slot 1.

4.2. SENDING A JOB TO THE HOST

The procedures for sending a job to the host processor is described in 4.2.1. Remote record format is discussed in 4.2.2.

4.2.1. Job Stream Format and Transmission

To send a job to the host processor, place the job on the transmission queue for the host that is to receive the job. Transmission queues are automatically established for each host configured during RTP generation. Then, RTP automatically transmits the job to the host as soon as the virtual terminal is available.

The RT$SPL program places jobs destined for the IBM host on the RTP transmission queues. The jobs must reside on cards or as card images on a fixed, unblocked, 80-character, data set label diskette. Control cards that you insert in the job deck initialize the RT$SPL program and specify the remote ID of the host to which the job is to be transmitted. Figure 4–1 shows the procedure involved for the following job stream:

```
    // JOB RT$SPL
1.  // DVC 30,332  // LFD INPUT
    // EXEC RT$SPL,,1
2.  /&
3.  // FIN
4.  .*RM15                          IBM Host 1
    //A JOB
          .
          .
          .
    //B JOB
          .
          .
          .
5.  .*RM16                          IBM Host 2
6.  // DD
    //C JOB
          .
          .
          .
7.  // FIN
```

Job Stream Notes:

1. The RT$SPL job control deck includes the specification of the input device LFD INPUT and the physical address (332 on the DVC card) of the card reader. Insert the physical address (cuu) of the card reader on your system.

2. The /& marks the end of the job that executes the RT$SPL program. The remainder of the control stream is the actual input to the program.

3. The // FIN job control statement shuts off the card reader until the RT$SPL program is ready to input the rest of the control stream. The job decks must follow immediately behind the // FIN card.

4. The .*RM15 statement identifies the host processor receiving the jobs that follow.

5. The .*RM16 statement identifies the host processor receiving the job that follows.

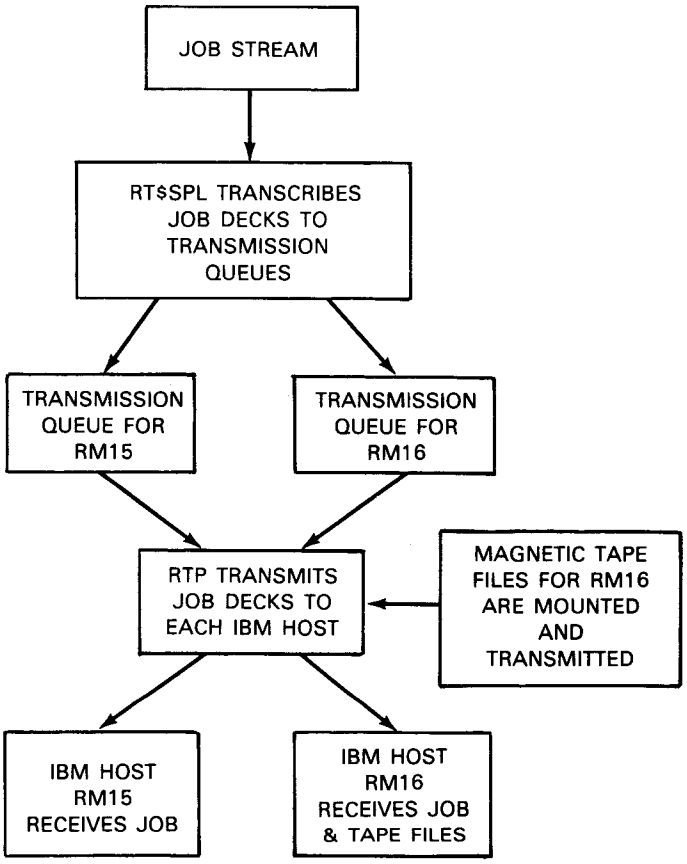
6. The // DD control statement indicates that tape files will be transmitted with this job.

7. The final // FIN job control statement indicates the end of data to RT$SPL. A blank card must follow the // FIN statement.

For a diskette, replace the DVC statement with a DVC, VOL, LBL statement sequence specifying the data set labeled diskette file as follows:

```
// DVC 130 // VOL D00100 // LBL FILE1 // LFD INPUT
```

The diskette file must contain the 80-character RTP control card records and the IBM job deck images (.*RM15 to // FIN). The .*RM statement can include an optional parameter DATA to specify that all records following the statement are data records until another .*RM or a // FIN statement is read. Both single and multivolume diskettes are supported.



* The RT$SPL program files jobs in the spooler HOLD or NORMAL queue before transcribing them to the transmission queue. Jobs in the HOLD queue must be executed separately from jobs in the NORMAL queue. They must not be intermixed.

Figure 4–1. Transmission of Job Decks to IBM Hosts

To execute RT$SPL:

1. Place an RT$SPL envelope around the host-destined job deck.

2. Place the entire deck in the card reader.

3. On the card reader, press the STOP button, then the RUN button.

The RT$SPL program is not transparent to the IBM job control parameter DLM=xx. This parameter causes RT$SPL to handle all records following it as data until the xx value appears in columns 1 and 2. Therefore, do not insert the DD control statement (4.4.1.3) or any other RT$SPL directive (such as .*RMrr or // FIN) within the DLM=xx to xx envelope.

The OS/3 job scheduler reads in the RT$SPL job control deck and schedules RT$SPL for execution. RT$SPL, when executed, reads the host-destined job deck, transcribing it to the remote ID transmission queue file. RT$SPL reads and transcribes any number of IBM job decks to any number of IBM hosts through the virtual terminals.

NOTE:

Host-destined jobs previously loaded into the reader spool directory cannot be accessed by RT$SPL.

At this point, the jobs are on the appropriate transmission queues. Every few seconds, RTP scans the queues for jobs awaiting transmission. If one or more host-destined jobs are ready for transmission and the virtual terminal is currently idle, RTP starts transmitting the first job on its queue automatically. Jobs on the transmission queues are transmitted on a first-in first-out basis.

After a job is transmitted to the host, the job is deleted from the transmission queue. If the transmission is interrupted causing loss of the communications line, the job remains on the queue and is retransmitted when the line is reactivated.

4.2.2. Remote ID Record Format

The remote ID record format immediately precedes the first input record to RT$SPL. All parameters of the remote ID record are optional but, if specified, must be coded in the order shown. The parameters specified are applied to all job streams processed until another remote ID record is read.

Format:

```
.*RMrr,[{spool-label}] ,[DISP=(H)],[CLASS=(A)]
       [{DATA      }]      [    (Q)]       (1)
                            [    (R)]       (2)
```

where:

.*RMrr
Is the record identifier. The record starts in column 1.

{spool-label / DATA}
Spool-label is a 1- to 8-character label to be entered on the RDR spool file for all input job streams following this record. This name replaces the label entered from the // JOB record. If a label is not specified here, the name from the // JOB record is used. Spool labels for job streams are prefixed with RTP for identification.

DATA specifies that a data file follows this record, not a job stream. The spool label for a data file is RTP.

DISP=
Specifies the disposition of the job stream on the OS/3 spooler.

H
Place jobs on a hold queue.

Q
Place jobs on a normal queue.

R
Jobs are retained on the spool file after transmission to the host.

CLASS=
Specifies the priority of the job stream on the OS/3 spooler. RTP transmits the job streams to the host on a first-in first-out basis within the priority class.

0
Normal priority.

1
High priority.

2
Preemptive priority.

4.3. RECEIVING PRINT AND PUNCH FILES FROM THE HOST

Print and punch files are transmitted from the host to your remote Sperry Univac system either as a result of a job sent to the host or through a request sent directly to the host system. In either case, the general procedure for receiving print or punch files is the same. Variations to the general procedure occur because of a specific requirement of individual files such as the requirement for special forms.

The host system transmits a print or punch file to your OS/3 system when it appears to the host that a printer or punch is available with the correct forms mounted. Since OS/3 uses spooling, it always appears to the host that a printer or punch is available to receive a file. If the form name associated with a print file is placed on the VFBTABLE, then it also appears that the form is properly loaded.

For these reasons, most print files are transmitted from the host to RTP without waiting until the entire file is received or the operator issues a breakpoint. Once the entire file is received, spooling directs the file to the proper printer and printing on standard forms can begin immediately. Printing on special forms, however, cannot begin until the operator mounts them.

If the host attempts to transmit a file with a form name that is not on the VFBTABLE, the operator must print the file on an existing form using an existing VFB or cancel the transmission of the file from the host.

4.3.1. Procedure for Receiving Files

To receive print and punch files:

1. Command the host to stop or drain the virtual terminal print or punch device. (Optional)
2. Establish the virtual terminal virtual printer or punch to receive the specific forms.
3. Insert the proper FB command. (Print files only)
4. Inform the host system of the setup.
5. Command the host to start the printer or punch file. (Only required if step 1 is used.
6. Receive the file.

4.3.1.1. Commanding the Host to Stop a Virtual Printer or Punch

This command is sometimes necessary before setting up the virtual device with the forms required to receive a specific file. The host-directed command to stop a device depends on the software system residing in the host processor. Refer to the proper IBM system reference manual for the format of the stop or drain command.

Example:

```
10 RM15.$PRM15.PR1
```

RTP resides in OS/3 job slot 1 and will send the stop command to the host for RM15. The host is running under HASP, which is directed to drain printer PR1.

4.3.1.2. Setting up a Virtual Printer

The FB command (3.4) sets up the OS/3 spool file to control forms mounting on the real printer at output writing time. If the virtual printer is not set up to receive the forms, enter the FB command in the proper format as shown in 3.4.

If the FB command is successfully processed, the following message is displayed on the console:

```
RMrr FCB PROCESSED
```

If the vertical format buffer specified in the C= parameter is not in the OS/3 load library, RTP points to the C= parameter as an invalid parameter.

4.3.1.3. Determining the Virtual Printer Status

From the OS/3 console, you can inquire as to the forms currently set up for a virtual printer, the active or idle status of a virtual printer, and the number of lines of print received but not breakpointed. (Refer to 3.5 for the printer status (PS) command and system response format.)

The status of all virtual printers belonging to a virtual terminal are displayed with a single PS command.

Example:

Operator Command:

```
10 PS.RM15
```

System Response:

```
1D PS#01 RM15.PR1 ACTIVE,F=PROL,C=0006,L=797
1E PS#01 RM15.PR2 *IDLE*,F=STD1,L=000
```

1. The virtual printer PR1 of RM15 is receiving data (ACTIVE) and is set up for form name PROL; carriage control 0006 is loaded by the OS/3 output writer where the file is printed. The virtual printer has received 797 lines of print so far.

2. PR2 is not receiving data (*IDLE*) but is set up for form name and carriage control (STD1).

4.3.1.4. Informing the Host of the Device Setup

After setting up the virtual device with the FB command, you must inform the host of the setup so that files will be sent to the virtual device with the forms required by each file. (Refer to the appropriate IBM workstation reference manual for the host-directed set-up command.)

Example:

```
10 RM15.$TRM15.PR1 F=PRL,C=AC62
```

The RM15 host (a HASP system) is informed that PR1 is set up to receive form PRL and carriage control AC62.

4.3.1.5. Commanding the Host to Start the Printer or Punch

If the host is instructed to stop the printer or punch that is set up to receive the file, the host must be instructed to start the device before transmission can begin.

The host-directed command to start a device depends on the software system residing in the host. Refer to the appropriate IBM workstation reference manual to find the host-directed start-device command.

Example:

```
10 RM15.$SRM15.PR1
```

The RM15 host (a HASP system) is commanded to transmit any of the RM15 print files that require the forms setup of PR1.

4.3.1.6. Receiving the Print File

A print file received by RTP is not ready for printing until it is breakpointed by RTP. Breakpointing occurs when:

- A file that requires the virtual terminal standard form and carriage control (VFB) is completely received.
- A file or contiguous series of files that require the same special form is received, and the RTP operator requests that the virtual device to which the files were sent be set up to receive a different form. (The FB command was directed to the virtual device.)
- The operator issues an OS/3 command to breakpoint the spooled file.

4.3.2. Printing on Standard Forms

No operator intervention is required when receiving files for printing on standard forms. Intervention is required only if special print forms are required.

4.3.3. Printing on Special Forms

When RTP receives a file for printing on special forms, it loads the printer vertical format buffer with the VFB specified in the FB command or from the VFBTABLE. When the complete file is received and the OS/3 output writer is ready to print the file, the following message is used:

```
Øm?MOUNT form-name ON DVC did
```

where:

Øm
: Specifies the job slot (0) and message number (m).

form-name
: Specifies the name of the special form to be loaded.

did
: Specifies the device address of the device on which the forms are to be mounted. The first digit is the channel number; the second and third, the hardware address.

The operator should mount and align the forms and reply:

```
Øm R
```

The following message is then displayed:

```
Øm?did PRINT TEST LINES PAGE? **YN**
```

To reply, enter:

```
Øm {Y}
   {N}
```

The 0m, representing the message number for the output writer, must match the 0m of the message to which you are responding. A reply of Y prints a test page so that you can check forms alignment and adjust if necessary. After printing a test page, the system repeats the test page message. Respond Y until you are satisfied that the forms are aligned properly. Printing of the file starts immediately after you respond N to the test page query.

4.3.4. Redirecting a Print File

You can stop a printer after it has started printing a file and redirect the file to another printer. This is a useful capability in case of trouble with the printer or, possibly, an incorrect form in the printer. This facility is fully described in the OS/3 spooling and job accounting concepts and facilities, UP-8869 (current version).

4.3.5. Punching Card Files

Card files received by RTP for punching on standard cards are punched without operator intervention as soon as the entire file is received. For punching on special forms, the operator is instructed to load the cards with the following message:

```
Øm?MOUNT form-name ON DVC did
```

This message instructs the operator to mount the specified special card form on the device identified by the device address (did). Load the specified card stock into the specified device and reply:

```
Øm R
```

Punching of the files starts immediately.

You can punch a file before it is completely received by issuing the OS/3 breakpoint command containing the identity of the virtual punch designated as the receiving punch.

4.4. SENDING AND RECEIVING TAPE FILES

The tape files that you transfer between RTP and the host can be either single or multivolume. They can be labeled (standard or nonstandard) or they can be unlabeled. Records can be fixed in length or variable, and can be blocked, unblocked, or undefined.

Since the IBM workstation protocol is oriented toward an 80-character record, RTP automatically segments individual magnetic tape data blocks into multiple 80-character records for transmission, and reassembles them into their original form upon reception.

RTP can activate one input and one output tape file for each virtual terminal generated (2.3.2).

NOTE:

When sending or receiving tape files, the tape must be available when the RTP job is run. If the tape is not available and the console operator responds with a C to the JC10 MOUNT DEV message, the RTP job run is canceled.

4.4.1. Sending Tape Files

When a host-destined job stream requires a magnetic tape file for a particular job, you must insert a // DD control statement at the appropriate location within the control stream.

When the // DD control statement is detected in the input stream, RTP requests a tape device from the OS/3 system. If a device is available, the console operator is instructed to mount the proper tape reel.

After the operator mounts the designated tape volume and it is validated by the OS/3 system, RTP issues a message (RMrr TX#06) notifying the operator that tape transmission has started. (See Section 5 for complete message formats.)

Unlabeled tape reels must not be premounted. OS/3 will specify the device address at the time the tape is required to be mounted. Unlabeled tape files cannot be multivolume.

4.4.1.1. Transmitting Multivolume Tape Files

As the transmission of each volume in a multivolume tape file is completed, OS/3 notifies the operator to mount the next volume in the group. The operator then mounts the next volume on the same tape unit that the previous volume was mounted on. The OS/3 system validates the sequence of volumes.

4.4.1.2. Completing Tape File Transmission

After the last volume of a tape file is transmitted, the console operator is notified that the operation is complete (RMrr TX#09). RTP releases the tape device to the OS/3 system for use by another job.

4.4.1.3. Tape Control Statement (DD)

The DD control statement, formatted for RTP, initiates the start of tape transmission. Columns 1 to 69 are used for tape parameter information. If more than one card is needed or if you want to place parameters on separate cards, interrupt the field after a complete parameter (including the comma that follows it) at or before column 69. Code // in columns 1 and 2 of the following card and continue the tape parameter specifications starting in column 10. No coding is permitted in columns 70 through 80 on any RT$SPL tape parameter card.

Format:

```
//{ddname        } DD {+},BLKSIZE=block-size[,{DSNAME}=data-set-name]
  {procstepname.}    {&}                      {DSN  }
  {  ddname     }    {U}
  [,LABEL=({data-set-seq-num},{NL})] [,VOL=SER=vol-serial-num]
           {1               } {SL}
  [,RECFM={F}][,TRTCH={C }][,DEN={0}] [,UNIT={TAPE       }]
          {U}         {E }       {1}        {unit-address}
          {V}         {T }       {2}
                      {ET}       {3}
```

Label:

```
//{ddname                  }
 {procstepname.ddname      }
```

The // characters in columns 1 and 2 are required for RTP. The ddname or procstepname.ddname, starting in column 3, is not used by RTP but is provided for use by the IBM host. The label must conform to the rules described for the host system in the appropriate IBM JCL manual.

Parameters:

```
{+}
{&}
{U}
```

Identifies this DD statement as an RTP instruction. This positional parameter must be the first parameter in the statement. It specifies whether a blank precedes each transmitted tape record.

+

A blank preceding each record.

&

No blank preceding each record. The tape format is the same as card reader format.

U

A blank preceding each record and the block size given as the first two characters of each physical block (RECFM=U implied).

```
BLKSIZE=block-size
```

Specifies the block size of the data set (file). The parameter must be one to four numeric characters.

```
{DSNAME}=data-set-name
{DSN   }
```

Specifies the name of the data set. Data-set-name can contain from 1 to 44 characters, including ampersands and apostrophies, with no blanks or commas. If the name consists of more than 17 characters, only the rightmost 17 are entered in the parameter and are used in the HDR1 label.

DSNAME must be coded for standard labeled tapes. It is optional for nonlabeled tapes, but can be coded for identification purposes:

```
LABEL= {data-set-seq-num}[,{NL}]
       {1               } [,{SL}]
```

```
{data-set-seq-num}
{1               }
```

Specifies the relative position of a data set on a tape volume. It can be one to four numeric characters.

{NL / SL}

Specifies whether the data set has no labels (NL) or has standard or standard mixed with user labels (SL). User labels are bypassed and, therefore, not processed.

Coding Rules:

a. The subparameters are positional. Indicate the absence of the first one by a comma.

b. If you do not specify the second subparameter, omit the parentheses.

c. Standard labels can be in the IBM BPS, TOS, DOS, or OS formats.

d. If the data set sequence number is omitted or specified as zero, it defaults to 1.

VOL=SER=vol-serial-num

Specifies the serial number of the volume containing the data set. The number must consist of six nonblank characters.

The serial number is required for all standard labeled tapes. It is optional for nonlabeled tapes, but can be coded for identification of the external tape label.

RECFM={F / U / V}

F

Fixed-length records. F is the default value unless U is specified as the first DD parameter.

U

Undefined records. U is the default value if U is specified as the first DD parameter.

V

Variable-length records.

TRTCH={C / E / T / ET}

Specifies options (parity, translation, and data conversion) for 7-track tapes. When used, the DEN parameter must also be specified. This parameter is required for 7-track tapes. If not specified, 9-track tape is assumed.

C

Data conversion feature with odd parity and no translation.

E

Even parity with no conversion and no translation.

T

Odd parity with no conversion. BCD to EBCDIC translation is required when reading.

ET

Even parity with no conversion. BCD to EBCDIC translation is required when reading.

DEN={0|1|2|3}

Specifies tape recording density and is required for 7-track tape. DEN is optional for 9-track tape and, if omitted, the density specified on the OS/3 SYSGEN is used.

Density	(bits/inch) (bpi)
0	– 200
1	– 556
2	– 800
3	– 1600

UNIT={TAPE|unit-address}

This parameter is not used by RTP but is accepted for compatibility.

NOTE:
You can insert comments at the end of the statement following a separation of at least one blank.

Examples:

```
//DDAINPC DD +,BLKSIZE=100,,LABEL=(1,NL),VOL=SER=MYTAPE
```

Defines a data set on an unlabeled tape with an external identification of MYTAPE.

```
//GO.SYSIN DD +,BLKSIZE=100,DSNAME=SY273,VOL=SER=000001
```

Defines the first data set on a standard labeled tape. The data set name is SYS273 and the tape volume is 000001. Each record has a blank appended before transmission to prevent premature end of file.

```
//SYSUTI DD &,BLKSIZE=100,DSN=DATA,LABEL=(,NL)
```

Defines a data set named DATA. It is the first file on the tape and has no labels. No blanks will precede the transmitted record.

4.4.2. Receiving Tape Files

Magnetic tape files ready to transmit to RTP reside on the host system special forms queue as card image (punch) files. Thus, the procedure to receive magnetic tape files closely resembles the procedure to receive print or punch files.

You must notify the host that an RTP workstation punch is set up to receive the forms specified in the magnetic tape file special forms queue entry. For example:

```
10 RM15.$TRM15.PU1,F=TAPE
```

RTP, residing in job slot 1, sends the message to the host (a HASP system), stating that PU1 is set up to receive a file requiring form name TAPE.

When the host begins to send the card-image file, RTP recognizes the file as a magnetic tape file. The host specifies the volume serial number of the tape to be created, and RTP acquires a tape device from the OS/3 system.

The operator mounts the appropriate tape volume, as specified by the OS/3 system, and preps the tape with the correct volume serial number. Unlabeled tapes must have a leading tape mark.

After the OS/3 system validates the mounted tape, tape file reception begins.

All tape files created by RTP are written as undefined (U) record format.

4.4.2.1. Receiving Multivolume Tape Files

If a received tape file does not fit on a single tape volume, the OS/3 system requests the operator to mount each additional tape volume. All volumes of the same file must be mounted on the same tape device. If the file is labeled, prep each additional volume with a VOL1 record. For unlabeled tapes, each additional volume must have a leading tape mark. In either case, OS/3 will ask the operator to mount a scratch volume.

4.4.2.2. Completing Tape File Reception

As the last record of a magnetic tape file is received and ending file labels are processed and written, RTP verifies that the correct number of blocks were received. If so, the operator is informed of a normal tape transmission termination as follows:

```
RMrr TR#09 EOF,VOL=vol-serial-num,BLKCT=block-count
RMrr TR#09 DSN=data-set-name
```

RTP closes the tape file and releases the tape drive to OS/3 for use by other jobs.

4.5. SYSTEM DIAGNOSTICS REQUIREMENTS

If you encounter a problem that requires the help of Sperry Univac, please provide the following documentation:

1. A system dump.

2. An RTP generation listing.

   This is the result of an RV ARTP job (2.3.3).

3. An RTP link listing.

   This is the result of an RV LINKRT job (2.5).

5. RTP Messages and Responses

The complete listing of RTP messages and responses is provided in the OS/3 system messages programmer/operator reference, UP-8076 (current version). The information contained in this section describes the categories, formats, and purposes of the messages to enable you to better understand and use them.

RTP messages fall into the following categories:

- RTP system generation messages (5.1)
- Prefixed RTP system operation messages (5.2)
- Unprefixed RTP system operation messages (5.3)

5.1. RTP SYSTEM GENERATION MESSAGES

These messages are generated when errors are detected in the GNVCT generation parameters. The error messages are printed on the assembly listings produced during RTP system generation. The corrective action is to correct the indicated error and reassemble the RTP tables. The following are examples of RTP system generation messages:

```
LAST VCT NOT SPECIFIED
MACRO CALLS OUT OF ORDER
```

5.2. PREFIXED RTP OPERATIONAL MESSAGES

Most RTP console messages are prefixed by a time stamp, a 2-character module identifier, and a 2-digit message number. An RTP message that requires a response is followed by the allowed responses. The responses are:

I – Ignore the error condition.

R – Retry the operation.

C – Terminate the operation

A – Abort the operation.

A frequently used RTP message format is:

```
nm?hhmmss ii#nn text.....   (I, R, C, or A)
```

where:

nm
: Specifies the RTP job slot and message numbers.

?
: Indicates that a response to this message is required.

hhmmss
: Is the time of day in hours, minutes, and seconds, when the message was issued. (This parameter is not included in all messages.)

ii
: Is the code identifying the RTP module that issued the message. The identifying codes are listed as follows:

BR	RT$SPL, the RTP input reader program
CM	RTP communications interface to ICAM
PR	Printer service routine
PS	Display printer status routine
PU	Card punch routine
SU	Unattended sign-on command
TR	Tape receive routine
TX	Tape transmit routine

nn
: Is the RTP message identification number.

text
: Is the text of the message.

NOTE:

A number of the RTP messages identify various devices through the 3-digit device address or id (did). The first digit is the channel number; the second and third are the hardware address.

- Messages from the input reader, RT$SPL (BR)

```
BR#01 REMOTE CARD MISSING, REPLY R OR C
BR#02 FIRST CARD NOT JOB CARD, REPLY R OR C
BR#03 TAPE PARAM ERRORS, WILL SKIP JOB jobname
BR#04 EOF ON INPUT, // FIN ASSUMED
BR#05 UNRECOVERABLE INPUT ERROR, WILL TERMINATE jobname
BR#06 ERROR DURING FILE OPEN, WILL TERMINATE
```

- Messages from communications routine (CM)

```
CM#01 THERE ARE NO FREE BUFFERS TO SIGNON THE LINE****
CM#02 - RTP ABTERM - ICAM PROBLEM
CM#04 ERROR DURING LINEUP STATUS=nnnn PORT=90/30-port/SLCA-id SEN2=nn
CM#05 LINE IS IN USE OR WAS NOT GENED INTO ICAM
CM#06 THERE ARE NO FREE CA TABLES**********
CM#10 SIGNOFF COMPLETE
CM#14 CONNECT LINE - DIAL HOST OR WAIT FOR RING
CM#16 *HOST NO RESPONSE*
CM#17 PARITY ERROR DOWN
CM#18 *LINE RELEASED* PORT=n,RM=rr,VID=nnn,PASS=(password)
CM#19 DSR OFF DURING SIGNON - RE-ENTER ACTIVATE
CM#20 UNREC STATUS nnnn
CM#21 LINE CONNECTION TIMER HAS EXPIRED - REACTIVATE
CM#22 NAK LOOP - LINE SHUTDOWN
```

- Messages from printer services routine (PR)

```
PR#01 PRTnn (jobname) PRINT READY,LINES - number-of-lines
PR#02 FCB PROCESSED
PR#03 PRINTER ACTIVE - FCB NOT PROCESSED
PR#04 PRTnn (jobname) PRINT RECEPTION STARTED
PR#05 FORM=form-name NOT IN VFBTABLE
PR#99 REMOTE rr PRINT REQUEST FOR UNASGN PRINTER
```

- Message from virtual printer status routine (PS)

```
PS#01 {RMrr;PRn  } {ACTIVE } ,F=form-name,C=vfb-name,L=number-of-lines
      {jobname   } {*IDLE* }
```

- Messages from card punch routine (PU)

```
PU#01 FILE filename RECEIVED
PU#02 REMOTE nn INVALID DVC ID - CARD IGNORED
```

- Messages from the unattended sign-on command (SU)

```
SU#01 SU FUNCTION COMPLETED
SU#02 INVALID TERMINAL NUMBER - REENTER
```

- Messages from the tape receive routine (TR)

```
RMrr TR#01 NO TAPE SUPPT. - TP RCV ABORT
RMrr TR#02 STOP HOST TAPE XMIT - REPLY 'A' WHEN DONE
RMrr TR#03 ALL TAPE FACIL. IN USE   I, R, A ?
RMrr TR#04 ERR ON TAPE DVC ALLOC   I, R, A ?
RMrr TR#05 ERR ON TAPE OPEN   I, R, A ?
RMrr TR#06 I/O ERR WRITING TAPE   I, R, A ?
RMrr TR#07 TAPE BUFFER OVERFLOW
RMrr TR#08 BKCT ERR,EOF1=block-count1,COMP=block-count2
RMrr TR#09 EOF,VOL=vsn,BKCT=block-count
RMrr TR#09 DSN=data-set-name
RMrr TR#10 ERR ON TAPE CLOSE   I, R, A ?
```

- Messages from the tape transmit routine (TX)

```
RMrr TX#01 NO TAPE SUPPT. - JOB ABORTED
RMrr TX#02 BLKSIZE INVALID,=blocksize
RMrr TX#03 ALL TAPE FACIL. IN USE   I, R, A ?
RMrr TX#04 ERR ON DVC ALLOC   I, R, A ?
RMrr TX#05 ERR ON TAPE OPEN   I, R, A ?
RMrr TX#06 SENDING TAPE,VOL=vsn,DSN=data-set-name
RMrr TX#07 I/O ERR READING TAPE   I, R, A ?
RMrr TX#08 ERR ON TAPE CLOSE   I, R, A ?
RMrr TX#09 XMIT FINI,BKCT=block-count
```

5.3. UNPREFIXED RTP OPERATIONAL MESSAGES

The following are unprefixed RTP operational messages:

```
CONSOLE PROCESSOR BUSY
LINE LOST, MESSAGE NOT SENT
MESSAGE ROUTINE BUSY
NOT SIGNED ON - REQUEST IGNORED
PROBLEM LOADING VFB vfb-name
RMrr INPUT ACTIVE   SO,IR
RMrr TERMINAL CURRENTLY ACTIVE
RTP READY
SIGNON BUSY - RETRY
SIGNOFF SENT
hhmmss STATUS= VID= RM= PT= SW= CD= OS= DX= PF= RD1= RECEIVE=
TERMINAL NOT ACTIVE
VERTICAL FORMS CONTROL BUFFER INVALID,VFB=vfb-name
```

Appendix A. RTP Control and Message Format

OS/3 and an IBM host communicate by means of control sequences and a variety of messages. You can tell the difference between a control sequence and a message because a message always contains a DLE/STX sequence. Both type of transmissions can be found in the user generated buffers that are part of the virtual terminal control tables.

Figure A–1 shows the format of the three types of control sequence OS/3 and the IBM host use to communicate, their composition, and their hexadecimal values. They are:

ENQ Inquiry

ACK Acknowledge,

NAK Negative acknowledge

Figure A–2 shows the format of each of the various messages that may be sent/received by OS/3 or the IBM host. Only OS/3 sends SIGNON or PERMISSION TO SEND; and only the IBM host sends REQUEST TO SEND. Either computer can send the other messages as appropriate.

Follow the arrow in Figure A–2 to determine the format of each type message given. For example, the format of a message containing text would be:

S	S	S	S	D	S	B	F	F	R	S	S		S	R	C	C	P
Y	Y	Y	Y	L	T	C	C	C	C	R	C	text	C	C	R	R	A
N	N	N	N	E	X	B	S	S	B	C	B		B	B	C	C	D
C	C	C	C				1	2		B							

The hexadecimal equivalent of each character is also shown.

Enquiry (ENQ)

SYN 32	SYN 32	SYN 32	SYN 32	01	2D

Acknowledgement (positive) (ACK)

SYN 32	SYN 32	SYN 32	SYN 32	10	70

Negative Acknowledgement (NAK)

SYN 32	SYN 32	SYN 32	SYN 32	3D	[3D]

Figure A–1. SPERRY UNIVAC RTP-IBM Host Control Sequences

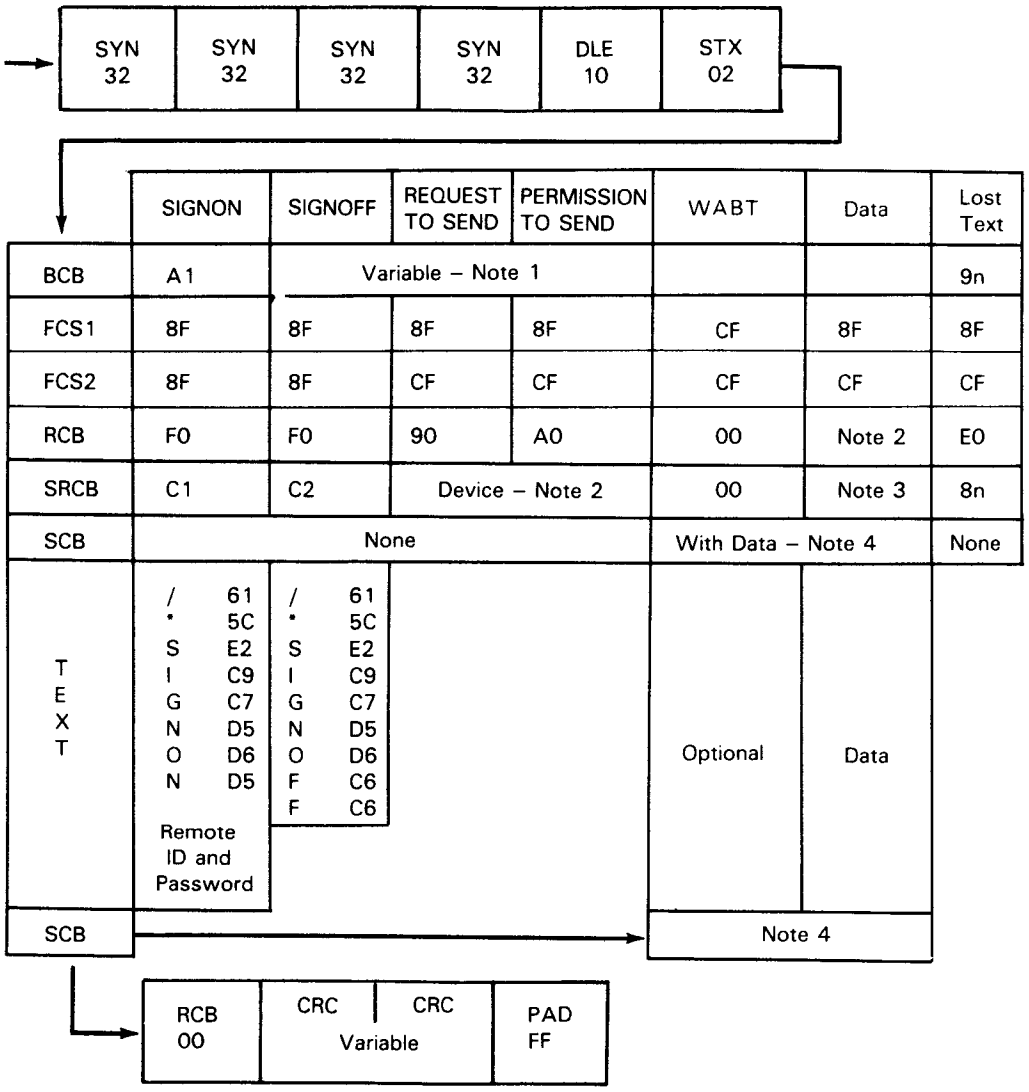


Figure A–2. SPERRY UNIVAC OS/3-IBM Host Message Formats (Part 1 of 2)

NOTE 1:

BCB (Block Control Byte)

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
x	x	x	x	c	c	c	c
1	0			Mod 16 Counter			

(80) = Normal transmission
(90) = Bypass verification of cccc
(A0) = My next message number will be cccc

NOTE 2:

RCB (Record Control Byte)

90 = Request to send
91 = Host console to RTP
92 = RTP to host console
93 = Reader
94 = Printer
95 = Punch
A0 = Permission to send
E0 = Lost text message
F0 = SIGNON/OFF

NOTE 3:

SRCB (Sub-record Control Byte)

C1 = SIGNON
C2 = SIGNOFF
80 = Reader
8n = Lost text message (n = message lost)
93 – F3 = Tape
94 – F4 = Printer
95 – F5 = Punch

Printer

2^7 = 0 2^6 = Not Used

2n = Space immediate 0n = Space after print
3n = Skip immediate 1n = print and skip to n

(n = line number or count of lines)

NOTE 4:

SCB (String Control Byte)

00 = Terminate this record
80 = Record continues in next block
81--9F = Duplicate string of 1 to 31 blanks
A1--BF = Duplicate following character 1 to 31 times
C1--FF = Nonduplicated string of 1 to 63 characters

Figure A–2. SPERRY UNIVAC OS/3-IBM Host Message Formats (Part 2 of 2)

Appendix B. Sample Host Configuration Parameters

```
*********************************************************************
*RMT114 ABC COMPANY                                          USER: F716
*********************************************************************
RMT114    S/360,CONSOLE,PASSWORD=LEADER,TRANSP,MULTI
RMT114    HUMRD=1,HUMPU=2,HUMPR=2
R114.PR1   CLASS=A,START,FCB=STD3,FORMS=STD.,SEP,PRWIDTH=132,UCS=P11
R114.PR2   CLASS=A,START,FCB=STD3,FORMS=STD.,SEP,PRWIDTH=132,UCS=P11
R114.RD1   CLASS=A,START,PRIOLIM=9
R114.PU1  CLASS=B,DRAIN,FORMS=STD.,SEP
R114.PU2  CLASS=B,DRAIN,FORMS=STD.,SEP
*********************************************************************
*RMT157 ABC COMPANY                                          USER: F716
*********************************************************************
RMT157   S/360,CONSOLE,PASSWORD=TALLSHIP,TRANSP,MULTI
RMT157   HUMPR=2,NUMRD=1,NUMPU=1
R157.PR1   CLASS=A,START,FCB=STD3,FORMS=STD.,SEP,PRWIDTH=132,UCS=P11
R157.PR2   CLASS=A,START,FCB=STD3,FORMS=STD.,SEP,PRWIDTH=132,UCS=P11
R157.RD1  CLASS=A,START,PRIOLIM=9
R157.PU1 CLASS=B,DRAIN,FORMS=STD.,SEP
```

Figure B–1. Sample Job Entry System (JES2) Host Configuration Parameter Listing

Index

R

SPERRY UNIVAC

USER COMMENT SHEET

Your comments concerning this document will be welcomed by Sperry Univac for use in improving subsequent editions.

Please note: This form is not intended to be used as an order blank.

_____

(Document Title)

_____ _____ _____

(Document No.) *(Revision No.)* *(Update No.)*

Comments:

Cut along line.

From:

_____

(Name of User)

_____

(Business Address)

Fold on dotted lines, and mail. (No postage stamp is necessary if mailed in the U.S.A.)
Thank you for your cooperation

FOLD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 21 BLUE BELL, PA.

POSTAGE WILL BE PAID BY ADDRESSEE

SPERRY UNIVAC

ATTN.: SYSTEMS PUBLICATIONS

P.O. BOX 500
BLUE BELL, PENNSYLVANIA 19424

CUT

FOLD