

TOPS-10 IBM Emulation/Termination

AA-D612B-TB

February 1983

This manual describes the installation, operation, and use of TOPS-10 IBM communications software. This software enables a TOPS-10 host to communicate with an IBM host or with a remote station such as a DATA 100.

This manual completely supersedes the manual numbered AA-D612A-TB. Please read it in its entirety.

OPERATING SYSTEM: TOPS-10 V7.01

SOFTWARE: TOPS-10 2780/3780 E/T V4.0
TOPS-10 2780/3780/HASP V1.0
GALAXY V4.1

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CONTENTS

PREFACE

CHAPTER 1 INTRODUCTION

- 1.1 CONFIGURATIONS 1-1
- 1.2 PRODUCT DESCRIPTIONS 1-4

CHAPTER 2 IBM COMMUNICATIONS USER PROCEDURES

- 2.1 THE TOPS-10 BATCH AND SPOOLING SYSTEM 2-1
- 2.2 THE USER AT A TOPS-10 HOST 2-3
 - 2.2.1 Using Termination 2-3
 - 2.2.2 Using Emulation 2-5
- 2.3 THE USER AT A REMOTE BATCH STATION 2-10
- 2.4 THE USER AT AN IBM HOST 2-11

CHAPTER 3 IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- 3.1 INSTALLATION SUMMARY 3-2
 - 3.1.1 Prepare for Installation 3-2
 - 3.1.2 Install the Software 3-3
 - 3.1.3 Manually Verify the Installed Software 3-3
 - 3.1.4 Edit the System Files 3-4
 - 3.1.5 Shutdown and Restart the System 3-4
- 3.2 PREPARE FOR INSTALLATION - PHASE 1 3-5
 - 3.2.1 Prototype Nodes 3-5
 - 3.2.2 Collect Information 3-6
 - 3.2.3 Installation Worksheet 3-13
- 3.3 INSTALL THE SOFTWARE - PHASE 2 3-14
- 3.4 MANUALLY VERIFY THE INSTALLED SOFTWARE - PHASE 3 3-20
 - 3.4.1 Startup Failures 3-29
- 3.5 EDIT THE SYSTEM FILES - PHASE 4 3-31
- 3.6 SHUTDOWN AND RESTART THE SYSTEM - PHASE 5 3-34

CHAPTER 4 IBM COMMUNICATIONS OPERATOR PROCEDURES

- 4.1 THE TOPS-10 OPERATOR 4-3
 - 4.1.1 Loading the Communications Front End 4-3
 - 4.1.2 Defining an IBM Node 4-4
 - 4.1.3 Setting IBM Node Parameters 4-5
 - 4.1.3.1 Examining Node Status 4-6
 - 4.1.4 Starting an IBM Node 4-7
 - 4.1.5 Shutting Down a Node 4-9
 - 4.1.6 Dialing Up a Remote Site 4-10

CONTENTS (Cont.)

4.1.7	Using Error Messages from IBMSPL	4-11
4.1.8	TOPS-10 Host to IBM Host	4-12
4.1.9	TOPS-10 Host to IBM-type Remote Station	4-13
4.2	THE TERMINATION STATION OPERATOR	4-14
4.2.1	Beginning Communications	4-14
4.2.2	Starting and Ending Jobs	4-16
4.2.3	Using OPR Commands	4-17
4.3	THE IBM HOST OPERATOR	4-17

APPENDIX A FOR THE INSTALLER

A.1	THE IBM COMMUNICATIONS DISTRIBUTION TAPES	A-1
A.2	FRONT-END TRANSLATE TABLES	A-3
A.3	IBMSPL ASSEMBLY	A-6
A.4	SUMMARY OF TOPS-10 MONITOR AND GALAXY INSTALLATION	A-9
A.5	MODEMS	A-11
A.6	CHK60, THE HARDWARE-TEST PROGRAM	A-12
A.7	USING D60SPD	A-14
A.7.1	D60SPD Error Messages	A-23
A.7.2	TESTING WITH D60SPD AND OPSEB	A-29

APPENDIX B FOR THE OPERATOR

B.1	IBM COMMUNICATIONS STOP CODES	B-1
B.2	TOPS-10 HOST OPR COMMANDS FOR IBM COMMUNICATIONS	B-2
B.2.1	TOPS-10 HOST OPR COMMANDS	B-3
B.2.1.1	The DEFINE Command	B-3
B.2.1.2	The SET NODE Command	B-3
B.2.1.3	The SHOW STATUS Command	B-5
B.2.2	The SHUTDOWN Command	B-6
B.2.3	The START Command	B-6
B.2.4	The OPR HELP Facility	B-7
B.3	TERMINATION STATION OPR COMMANDS	B-8
B.4	OPERATOR ERROR MESSAGES	B-46

GLOSSARY	Glossary-1
----------	------------

INDEX	Index-1
-------	---------

CONTENTS (Cont.)

FIGURES

FIGURE	1-1	Emulation	1-3
	1-2	Termination	1-3
	2-1	The GALAXY System in Emulation	2-2
	2-2	The GALAXY System in Termination	2-2
	2-3	Host Implementations	2-8
	2-4	A Typical Job Deck	2-11
	3-1	Emulation Signon	3-7
	3-2	Dial-In Termination Signon	3-8
	3-3	A KL10 Running IBM Communications Software	3-14
	3-4	Ports on a DECsystem-10 with DL10s	3-21
	3-5	Ports on a KL10	3-22
	4-1	Emulation with GALAXY and the Operator Interface	4-2
	4-2	Termination with GALAXY and the Operator Interface	4-2
	A-1	IBMSPL Assembly	A-7
	A-2	Monitor Building Process	A-9
	A-3	GALAXY Building Process	A-10

TABLES

TABLE	1-1	IBM Communications Configurations	1-1
	2-1	IBMSPL Switches	2-7
	3-1	Front-End Port Numbers	3-11
	A-1	TOPS-10 2780/3780 Files	A-2
	A-2	TOPS-10 2780/3780/HASP	A-3
	A-3	IBMSPL Assembly/Link Modules	A-8
	A-4	Modems and Defined Delay d	A-11
	A-5	M7818 Switch Settings	A-14
	A-6	CHK60 Stop Codes	A-14
	A-7	D60SPD Commands	A-15
	A-8	[D60SPD Error Messages]	A-23
	A-9	CAL11. Error Codes	A-28
	B-1	Stop Codes and their Meanings	B-1
	B-2	SET NODE Parameters	B-4
	B-3	OPR Command Functions	B-9
	B-4	OPR Objects	B-10
	B-5	OPR Commands	B-11

PREFACE

This guide provides information on the installation, operation, and use of TOPS-10 IBM communications software. Installers will need to use the entire document; others can ignore the installation procedure and the installer's appendixes.

TOPS-10 IBM communications software products permit communication between TOPS-10 hosts and IBM-type remote stations or hosts. This manual describes the IBM communications products currently available with TOPS-10. These products are:

TOPS-10 2780/3780 E/T
TOPS-10 2780/3780/HASP

These products are distributed on separate tapes. The TOPS-10 2780/3780 tape contains only the software that emulates/terminates 2780/3780 systems. The TOPS-10 2780/3780/HASP tape contains the HASP multileaving software; it also contains the 2780/3780 product, a subset of the multileaving software.

ORGANIZATION

- Chapter 1 is an overview of the configurations and products described in this manual
- Chapter 2 describes the procedures for the user at a TOPS-10 host, at a termination station, and at an IBM host using the TOPS-10 software
- Chapter 3 provides planning and installation procedures for the software installer. The installation procedures are presented in a step-by-step fashion and are supplemented by several appendixes.
- Chapter 4 describes procedures for the operator, including how to load the software, define an IBM node in the TOPS-10 network, start the node and dial up a remote site. Commands the termination station operator can issue also appear in this chapter, with a brief description of IBM host operator activities related to communication with TOPS-10.

- Appendix A contains the installer's sub-appendixes.
- A.1 describes the distribution tapes.
 - A.2 describes how to change the translation tables in the front-end software.
 - A.3 describes the components of IBMSPL the installer can rebuild.
 - A.4 summarizes TOPS-10 monitor and GALAXY 4.1 installations, prerequisites for completing the installation described in this manual.
 - A.5 briefly describes modems with reference to their clear-to-send values.
 - A.6 describes CHK60, the program that performs an initial hardware check.
 - A.7 describes D60SPD, used to test the software, with error messages and examples of how to use D60SPD with OPSER.
- Appendix B contains the operator's sub-appendixes
- B.1 gives the stop codes the TOPS-10 host operator may encounter.
 - B.2 gives the commands used for IBM communications by the TOPS-10 host operator.
 - B.3 gives the commands used by the termination station operator.
 - B.4 describes all error messages trapped by OPR that the operator using OPR may encounter.

ASSOCIATED DOCUMENTS

This manual assumes that the reader has access to the following TOPS-10 documents:

Title	Order Number
<u>TOPS-10/TOPS-20 Batch Reference Manual</u>	AA-H374A-TK
<u>TOPS-10 Operating System Commands Manual</u> and its update	AA-0916D-TB
<u>TOPS-10 Operator's Guide</u> and its update	AA-H283A-TB
<u>TOPS-10 Monitor Installation Guide</u> and its update	AA-5056B-TB

The installer may also wish to use the following specifications:

BOOT11 PDP-11 Bootstrap over DL10
 DTELDR Load/Dump Utility for PDP-11 over DTE
 BACKUP Program for Reading Distribution Tapes

The software installer and the operators should understand the procedures for running TOPS-10 and be familiar with the remote system with which the IBM communications software communicates.

AUDIENCE

This document is addressed to the following readers:

- TOPS-10 users who will submit jobs to IBM hosts.
- Users at IBM-type remote stations who will submit batch jobs to the TOPS-10 host.
- System programmers installing the IBM communications software.
- Operators at the TOPS-10 host where the IBM communications software is running.
- Operators at IBM-type remote stations (termination stations).

HOW TO USE THIS MANUAL

Users should read Chapters 1 and 2; system programmers should read Chapters 1, 3, and the appendixes for the installer. The TOPS-10 host operator should read Chapters 1, 4, and the appendix for the TOPS-10 Host Operator. The termination station operator should familiarize himself with Chapter 1, and read the beginning of Chapter 4, Section 4.2, and the appendix containing Termination Station OPR commands.

The following notational conventions are used:

Symbol	Indicates
<code>ESC</code>	the ESCAPE (ESC, ALT, ALTMODE or PREFIX) key
<code>RET</code>	the RETURN key
<code>.</code>	the TOPS-10 prompt
<code>\$</code>	the first character of a GALAXY batch control card, or the echo of the <ESC> key
<code>\$\$</code>	the first characters of a card command to OPR/ORION
red print	what you type on your terminal
black print	what the system prints or displays on your terminal
lower-case print in commands	user-defined entries
UPPER-CASE print in commands	system-defined entries
[KI10]	A step or procedure applicable only to the KI10.
[KL10]	A step or procedure applicable only to the KL10.

CHAPTER 1

INTRODUCTION

The IBM communications products permit a TOPS-10 host to communicate with either an IBM host or an IBM-type remote job entry (RJE) station. The IBM communications software has two modes of operation: emulation and termination. In emulation mode, the software communicates with an IBM host and emulates an IBM-type RJE station. In termination mode, the software communicates with an IBM-type RJE station and provides a terminus for the RJE station. Communications proceed using the IBM Binary Synchronous protocol.

The software consists of a set of programs; some of the programs run in the TOPS-10 host processor and some run in a communications front end attached to the TOPS-10 host. The software in the communications front end communicates both with the TOPS-10 operating system and, via modems, either with a remote station or a remote host computer.

The software that runs in the TOPS-10 host includes the normal components of the GALAXY batch system (QUASAR, LPTSPL, CDRIVE and SPRINT). These components must always be running in the TOPS-10 host to support local units, and service the IBM communications termination stations. To support emulation, (communications with an IBM host), the emulation spooler, IBMSPL, must also be running in the TOPS-10 host.

1.1 CONFIGURATIONS

IBM communications software products support multiple synchronous lines on a communications front end with TOPS-10 running in a KI10 or KL10.

The following configurations are allowed:

Table 1-1
IBM Communications Configurations

Processor	Product	Supported Lines
KI10/KL10 KI10/KL10	2780/3780 2780/3780/HASP	6 4 (of which only 2 can be HASP)

INTRODUCTION

The IBM communications software supports connections of a TOPS-10 host to:

- an IBM System/370 or 303x running:

Operating Systems:

OS/MVS
OS/MVS/SE
OS/MVT
OS/SVS
OS/VS1

Job Entry System:

HASP
JES1
JES2
JES3

Remote Job Entry Station:

DATA 100 Model 76 remote station

In termination mode, the IBM communications software can transfer TOPS-10 batch jobs from a remote station to a TOPS-10 host for execution at the TOPS-10 host. It can also send printed output to the remote station. In emulation mode, the IBM communications software can transfer batch jobs from a TOPS-10 host to an IBM host and similarly transfer log files sent from an IBM host to a TOPS-10 host. Binary files cannot be transferred with the IBM communications software.

The DIGITAL software required to support this emulation and termination is:

- the TOPS-10 operating system, Version 7.01
- the GALAXY batch system, Version 4.1
- either 2780/3780 software, Version 4.0, or 2780/3780/HASP software, Version 1.0

The minimum DIGITAL hardware required to support IBM communications on a KI10 is:

- a KI processor
- a communications front end with one synchronous line
- a DL10 front-end interface

The minimum DIGITAL hardware required to support IBM communications on a KL10 is:

- a KL processor
- a communications front end with one synchronous line
- a front-end interface (DTE20 or DL10)

INTRODUCTION

The modems that can be used to connect TOPS-10 to remote stations/computers:

- must meet the pertinent EIA RS-232-C or CCITT V.24 (Volume VIII Green Book) standards
- must be end-to-end compatible with the remote modem
- and are listed in Appendix A.5, "Modems"

The configuration can contain either full-duplex or half-duplex modems, but only half-duplex capabilities are utilized. (The bisync protocol only permits half-duplex operation.)

Figures 1-1 and 1-2 illustrate multiple emulations and terminations with connections through both a DTE20 and a DL10. Abbreviations are: CFE, console front end; CTY, operator's console terminal; DTE, Data Ten-Eleven interface; CPU, central processing unit; DL10, data link; m, modem.

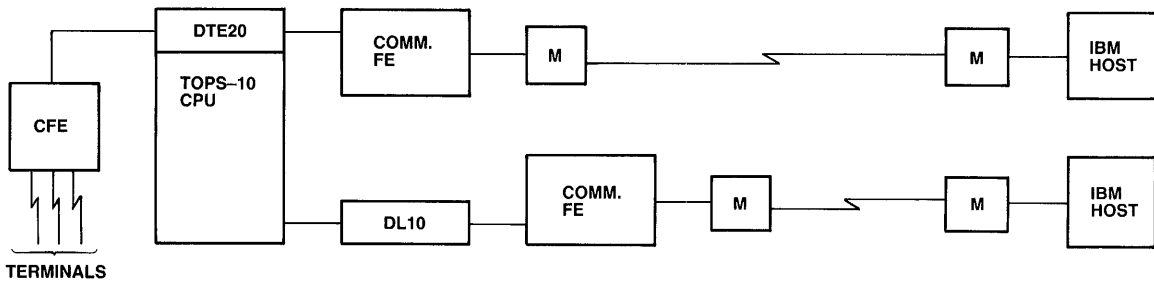


Figure 1-1 Emulation

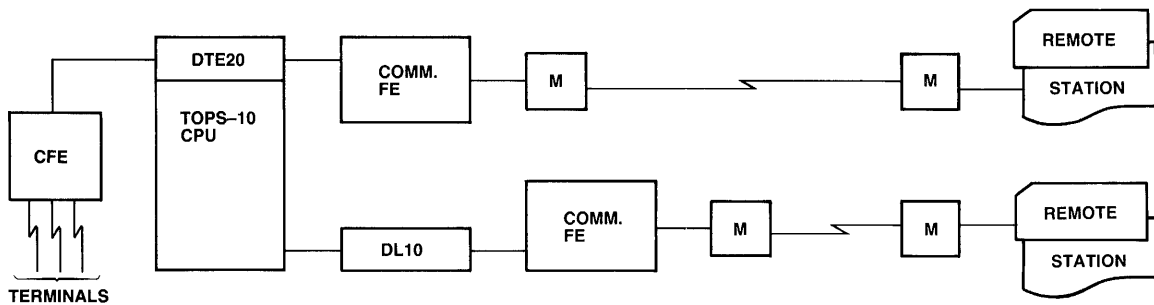


Figure 1-2 Termination

Consider a TOPS-10 host connected via dial-up modems to a termination station. The TOPS-10 host has a communications front end processor running the IBM communications software, with a line defined in termination mode. To send a TOPS-10 batch job from the remote station to the TOPS-10 host, execute it on the TOPS-10 host, and send printer output back to the remote station printer, the remote user need only arrange his/her cards in a job deck and read them in the card reader. His/her output returns automatically to his station.

INTRODUCTION

To send a job to a remote IBM host, the procedure is similar. The TOPS-10 host has a communications front end running the IBM communications software with a line defined in emulation mode. The user need only put his JCL commands in a file and send the file to the IBM host with a SUBMIT command.

1.2 PRODUCT DESCRIPTIONS

The TOPS-10 administrator and operator should be familiar with the hardware and software products that communicate with IBM systems. These products are:

1. DN20 - A front end based on a PDP-11/34, has a 32K word memory and can provide up to 6 synchronous lines with the 2780/3780 product, up to 4 with the 2780/3780/HASP product of which only 2 can be HASP. The DN20 can be used on a KL and must be connected to the host with a DTE.
2. DN87 - A front end based on a PDP-11/40, has a 32K word memory and can provide up to 6 synchronous lines with the 2780/3780 product, up to 2 with the 2780/3780/HASP product. It is connected to the KI or KL with a DL10. On a dual-processor system, the DL10 must be on CPU0.
3. DN87S - A front end based on a PDP-11/40, has a 32K word memory and can provide up to 6 synchronous lines with the 2780/3780 product, up to 2 with the 2780/3780/HASP product. It is connected to the KL with a DTE20.
4. 2780/3780 E/T - The product that supports remote connections to sites that emulate/terminate 2780/3780-like remote stations on a KI or KL running TOPS-10.
5. 2780/3780/HASP - The product that supports remote connections to sites that emulate/terminate 2780/3780/HASP work stations on a KI or KL running TOPS-10.

CHAPTER 2

IBM COMMUNICATIONS USER PROCEDURES

This chapter is intended for the programmer or user, familiar with TOPS-10, who wishes to send jobs or data to remote hosts or stations. Sections 2.2 and 2.4 on connecting to IBM hosts further assume that the reader is familiar with the IBM host as an ordinary batch processing system.

The IBM communications software is used for two purposes:

- to connect IBM-type batch stations to TOPS-10 (termination mode)
- to connect IBM central processors to TOPS-10 (emulation mode)

The user can therefore be at a remote station, at a remote IBM host site, or at a TOPS-10 terminal. A program to be executed on a TOPS-10 host must be written in a TOPS-10 language; a program to be executed on an IBM host must be written in an IBM host language. Binary files cannot be transferred between TOPS-10 and IBM systems or remote stations.

All IBM communications operations are essentially batch operations, since IBM remote job stations normally operate in batch mode. The communications between TOPS-10 and any other system are done with the TOPS-10 batch system.

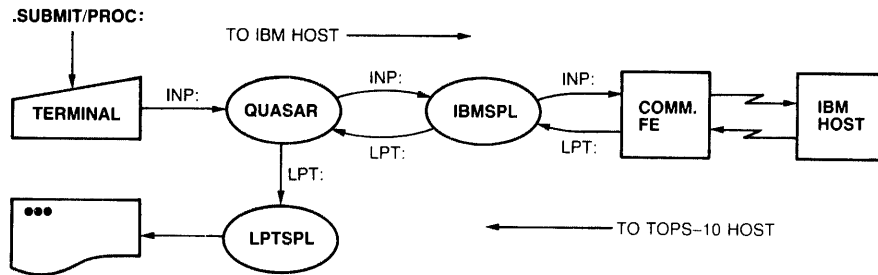
2.1 THE TOPS-10 BATCH AND SPOOLING SYSTEM

In the traditional world of batch operations, a local host computer accepts batch jobs on decks of cards that are submitted one at a time through a card reader. Depending upon parameters set on the first cards of the deck, a job can be run immediately or at some later time. When the job is done, the user gets back his deck of cards and whatever output his job produced.

The batch system developed for TOPS-10 has many similar properties but does not usually deal with decks of punched cards. The user gains efficiency and convenience by storing files on disk, rather than on cards, and manipulates them from the user terminal. For example, the user at a terminal can prepare several files (using any TOPS-10 editor such as TECO), each containing a separate program, in any of the TOPS-10 languages, and then prepare a single control file for the batch system which calls each of these files. Then a single command to execute the control file will execute all the programs specified in the files. These operations are controlled by the program called BATCON, the batch controller.

IBM COMMUNICATIONS USER PROCEDURES

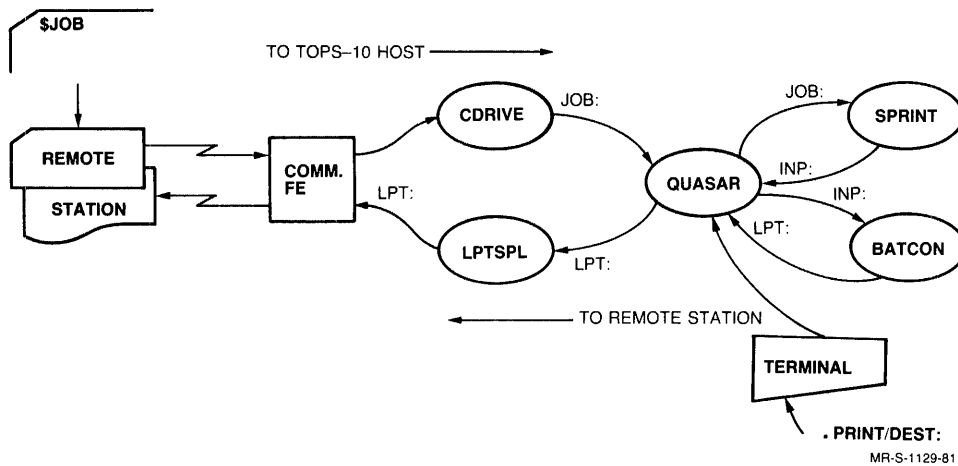
The TOPS-10 GALAXY batch system contains several programs that control the queuing of input and output operations for slow devices. These programs are transparent to the user but also form the basis for the IBM communications activities. When the system is in emulation mode, the GALAXY program QUASAR, with the emulation spooler, IBMSPL, is in use (see Figure 2-1). When the system is in termination mode, the GALAXY programs QUASAR, CDRIVE, SPRINT, BATCON, and LPTSPL are used.



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Figure 2-1 The GALAXY System in Emulation

In the diagram, the programs are: QUASAR, BATCON, CDRIVE, LPTSPL, IBMSPL, ORION, and OPR; the names of the queues are: LPT:, JOB:, and INP:. All user operations between remote units and TOPS-10 are initiated using TOPS-10 commands.



MR-S-1129-81

Figure 2-2 The GALAXY System in Termination

IBM COMMUNICATIONS USER PROCEDURES

2.2 THE USER AT A TOPS-10 HOST

The user at any terminal at a TOPS-10 site can send jobs either to a termination station, or to a remote IBM host. Only print jobs can be sent to a termination station. A job sent to a remote IBM host must be executable on that host, and can only contain ASCII files.

When you use IBM communications, you may encounter two kinds of nodes. These are emulation nodes and termination nodes. You use an emulation node when you send jobs to an IBM host. You use a termination node when you send a print request to a termination station.

A system programmer defines the names for emulation and termination nodes and uses the privileged OPR program to define them to the system. Ask your system programmer or operator for these names. An emulation nodename is normally alphanumeric and can be up to 6 characters long. A termination nodename is numeric and can be two digits (to a maximum of 77 octal). All termination nodes with identical characteristics are initially defined with a prototype nodename up to 6 characters long, but as soon as the termination station signs on, the station is recognized as a nodenumber.

To print a file at a termination station, the user must employ the nodenumber. If the termination station has not yet signed on when the user executes a PRINT command, the print request simply remains in the print queue until the station comes on line.

2.2.1 Using Termination

To print a file at a termination station, use a PRINT command. You must know the name assigned to the destination node (the node where you wish your file to print). The nodenumber is established at installation time and will be known to the TOPS-10 operator (see Chapter 4, "IBM Communications Operator Procedures"). Your system administrator will also know the nodenumbers of termination nodes in your network.

The information you wish to print at the termination station must be stored in a file on the TOPS-10 host. To print the information at the termination station, execute a PRINT command with a /DEST switch. Follow /DEST: with the nodenumber of the destination node. For example, type the following:

```
PRINT filename /DEST:nodenumber RET
```

The system responds as follows:

```
.PRINT filenm /DEST:77  
 [Printer job filenm queued, request #244, limit 27]  
.
```

IBM COMMUNICATIONS USER PROCEDURES

NOTE

The node name you give (77 in the example) must be a nodenumber defined in the network.

You can use other available PRINT switches (see the TOPS-10 Commands Manual). In the example, the nodenumber is 77 and the request # (assigned by the spooling system) is 244.

NOTE

If you issue a PRINT command with switches that do not apply to the printer at the termination station (for example, you use a LOWERCASE switch for a destination node that has only an UPPERCASE printer), your request will be queued but the file will not be printed.

The IBM communications software transmits a formfeed after every 60 lines when sending a file to a termination station, skipping the perforation on 66-line output paper. You cannot suppress this feature.

You can also send a print request to a remote station with a QUEUE command. However, it is preferable to use the PRINT command.

To ascertain if print requests are being sent to remote stations, you can examine the printer queues with the TOPS-10 PRINT command. For example, type the following:

```
.PRI RET
```

This command lists all files in all printer output queues:

```
Printer Queue:
Job Name      Req #      Limit      User
-----      -
LP            56         60         USER[p,pn] /Dest:77
LPT34        59         78         SMITH[p,pn]
IBM          65         20         MAX[p,pn]
There are 3 jobs in the queue (none in progress)
```

A print request followed by a message of the form shown below is in the process of being sent to the remote site.

```
Started at hh:mm:ss, printed xx of yy pages
```

An asterisk precedes an in-process print request.

IBM COMMUNICATIONS USER PROCEDURES

To cancel a job sent to a termination station printer, use the CANCEL PRINT command followed by the request number (Req #). For example, type the following:

```
.CANCEL PRI 56 (RET)
```

The command illustrated above cancels a job that was to send a file to the remote station printer.

You can also use a PRINT command with a /KILL switch to cancel a job sent to a remote station printer. For example, type the following:

```
.PRI jobname = /K (RET)  
[1 Job Canceled]
```

2.2.2 Using Emulation

To send a job to an IBM host, prepare a disk file on the TOPS-10 host. This file must contain all the JCL (Job Control Language) statements needed by the IBM system to execute your batch job, including your JOB card. Lines in the file cannot exceed 80 characters.

When the file is ready, send it to the IBM host using a SUBMIT command and a /PROC switch. Follow /PROC: with the nodename of the host processor. For example, type the following:

```
SUBMIT MYFILE/PROC:nodename (RET)
```

The system displays the following:

```
.  
[Job MYFILE Queued, Request 252, Limit 0:05:00]  
.
```

To determine if jobs are queued for the IBM host, you can use the SUBMIT command with no arguments. For example,

```
.SUB (RET)
```

The system displays the following:

Batch Queue:

Job Name	Req#	Run Time	User	
-----	----	-----	----	
MYFILE	252	00:05:00	USER	/Proc:IBM1

IBM COMMUNICATIONS USER PROCEDURES

When the IBM host has completed the job, output is normally returned to the printer of the TOPS-10 host. To have the data retained on the TOPS-10 disk, you must include certain switches as part of your output to be printed at the TOPS-10 host. These switches must be part of the file you send to the IBM host. The IBM host software ignores these switches, but the IBM communications software recognizes them and takes appropriate action. Any unrecognized switches are ignored.

You include these switches in the file that you transmit to an IBM host by disguising them as comments.

The switches you can use to indicate disposition of your output at the TOPS-10 host are:

```
/PNAME:p,pn                (your project, programmer number)
/ACCOU:acctstring
/DEST:nodeid
/LNAME:jobname             (up to 6 characters)
/LDISP:parameter
/LFORM:form-name
/LSTR:physical-device
/ENDLI
```

These switches are optional. If you use them, they can be in any order, but /ENDLI must be last. If you use no switches, your output returned from the IBM host is printed and the file deleted.

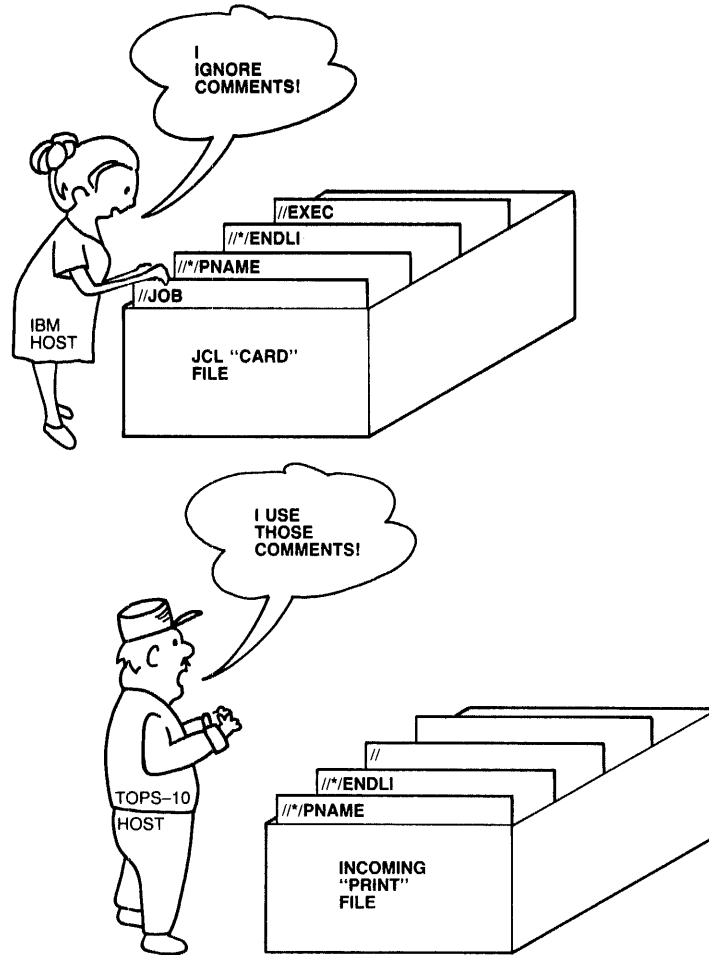
IBM COMMUNICATIONS USER PROCEDURES

The switches are described in Table 2-1.

Table 2-1
IBMSPL Switches

PNAME	specifies the [p,pn] where output is placed when it is returned from the IBM host. This switch is required and should occur first. If you omit this switch, output is printed with an OPERATOR banner page.								
ACCOU	specifies the account string valid for PNAME.								
DEST	specifies the nodeid of a node where printing is to occur. This switch is needed only to print output at a node other than the TOPS-10 host. Use any valid TOPS-10 network nodeid.								
LNAME	specifies the jobname placed on the banner pages of printed output, or the filename if data is to be held for the user.								
LDISP	specifies the disposition of job output as follows: <table style="margin-left: 40px; border: none;"> <thead> <tr> <th style="text-align: left;"><u>Parameter</u></th> <th style="text-align: left;"><u>Function</u></th> </tr> </thead> <tbody> <tr> <td>DELETE</td> <td>deletes the output file without printing it;</td> </tr> <tr> <td>HOLD</td> <td>retains output file on TOPS-10 disk, without printing;</td> </tr> <tr> <td></td> <td>prints output on TOPS-10 host printer, with banner pages containing PNAME and LNAME. This is the default.</td> </tr> </tbody> </table>	<u>Parameter</u>	<u>Function</u>	DELETE	deletes the output file without printing it;	HOLD	retains output file on TOPS-10 disk, without printing;		prints output on TOPS-10 host printer, with banner pages containing PNAME and LNAME. This is the default.
<u>Parameter</u>	<u>Function</u>								
DELETE	deletes the output file without printing it;								
HOLD	retains output file on TOPS-10 disk, without printing;								
	prints output on TOPS-10 host printer, with banner pages containing PNAME and LNAME. This is the default.								
LFORM	specifies the name of the output form that must be mounted by the TOPS-10 operator. Any form specified with this switch must be defined as usual in LPFORM.INI.								
LSTR	specifies a physical device such as DSK: or DSKA;; not an ersatz device. Output is placed on the specified physical device. The default structure is D60:								
ENDLI	terminates the command list. ENDLI should be kept close to the other switches. IBMSPL searches for switches only until it encounters the ENDLI switch. Therefore, to reduce overhead in processing the file, keep these switches close to the beginning of the control file and keep them close together.								

IBM COMMUNICATIONS USER PROCEDURES



MR-S-1130-81

Figure 2-3 Host Implementations

For example, the following JCL file submitted to an IBM host executes a routine on the IBM host and returns the output to a file on the TOPS-10 disk:

```
// ...JOB ...(rest of JCL for job card)
//*
//* Switches for IBMSPL as comments
//*
//* /PNAME:p,pn
//* /LNAME:jobname
//* /LDISP:HOLD
//* /ENDLI
//*
// (rest of JCL for IBM 370)
```

IBM COMMUNICATIONS USER PROCEDURES

The output is stored on disk as the file:

```
DSK:[p,pn]jobname.ext
```

where ext is assigned in the following sequence:

```
LPT, L00, L01, ..., L99
```

If the last extension is used, the operator is warned that the file could not be renamed to the user area and the file remains in D60:. LNAME affects how the file is renamed but not its disposition. It is common to rename a file and print it. If a file is aborted, its extension becomes .ABT. To reconstruct an aborted file, remember that any switches in the file are probably in its very first segment. They may need to be placed in another part of the file to have things work correctly.

The IBM communications software can transfer card-image ASCII files from the TOPS-10 host to an IBM host. It transfers print images (with the 2780/3780 protocol) or files of punch images (with the multileaving protocol) from the IBM host to the TOPS-10 host.

To transfer your TOPS-10 ASCII file to the IBM host, you must include the file in a job. For example, create a file containing your card images. Precede the card images with a single line containing the following command to the IBM operating system:

```
//ddname DD *
```

NOTE

Not all ASCII characters are passed by all IBM software. Brackets [], for example, are blanked out by some versions of HASP.

Records in the transmitted file are limited to 80 characters in length.

For example, the following JCL file is a sample batch data file for an IBM host. Use a SUBMIT command to submit it.

```
//DEC14 JOB DN60, DIGITAL, PRTY=6, CLASS=A
//*
//* Switches as comments
//*
//* /PNAME:[27,5117]
//* /LNAME:TEST
//* /ENDLI
//*
//STEP1 EXEC PGM=IEBPTPCH
//SYSIN DD *
    PRINT
/*
//SYSUT1 DD *
    1. This is a sample data deck
    2. with three lines.
    3. This is the last line.
/*
//SYSUT2 DD SYSOUT=A
//SYSPRINT DD SYSOUT=A
//
```

IBM COMMUNICATIONS USER PROCEDURES

To cancel a job queued to be sent to an IBM host, use the CANCEL BATCH command, specifying the jobname or Request-ID. For example, type the following:

```
.CANCEL BAT 22 RET
[1 Job Canceled]
```

The command illustrated above cancels the specified job (so long as it has not been completely sent) and removes it from the queue. A job that has been transmitted to the IBM system cannot be canceled. Do not cancel a job under the HASP protocol being sent to the IBM host as it requires operator action at the IBM host. If in doubt, ask the TOPS-10 host operator what protocol is in use.

You can also use a SUBMIT command with a /KILL switch to cancel a job queued to be sent to a remote host. For example, type the following:

```
.SUB jobname = /K RET
[1 Job Canceled]
```

2.3 THE USER AT A REMOTE BATCH STATION

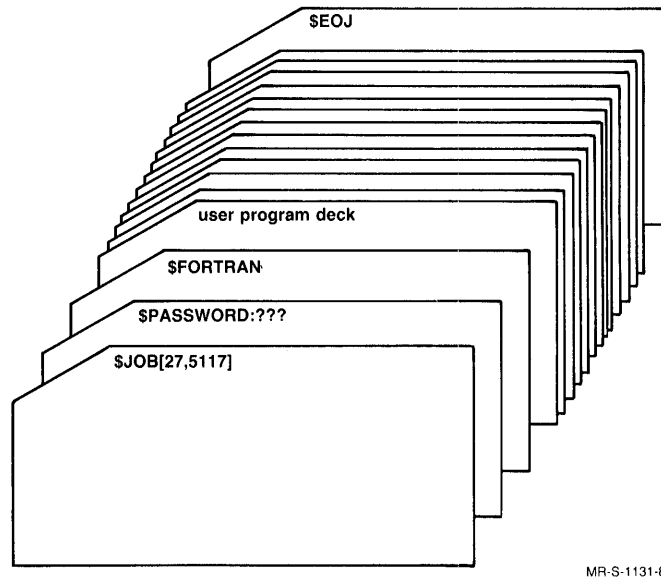
You can submit a batch job on cards from an IBM-type remote batch station for execution on a TOPS-10 host, and have the printed output returned to the remote printer.

First, prepare a job deck containing TOPS-10 batch control commands (\$JOB, \$PASSWORD, \$language, \$EOJ, and so on.) and the programs you wish to run under TOPS-10. (For information about the batch control cards and other TOPS-10 commands, see the Batch Reference Manual, and the TOPS-10 Commands Manual.) When you submit a batch job to the TOPS-10 host, the batch log file is automatically printed at your remote station when the job is done.

Your station operator should have started the station and signed on at the TOPS-10 host. To submit your batch job:

- Clear the card reader to be sure that no cards remain in its read path.
- Place your job deck in the card-reader hopper. A typical deck might be set up as shown in Figure 2-4.

IBM COMMUNICATIONS USER PROCEDURES



MR-S-1131-81

Figure 2-4 A Typical Job Deck

NOTE

Programs must be written in TOPS-10 languages and use TOPS-10 commands.

- Press the appropriate switch to read in cards.
- If necessary, press any additional switches on your unit to transmit the information.
- Once you have submitted your job deck and all cards have been read in, wait for output to be printed on your printer. (With the multileaving software running at the TOPS-10 host, and the multileaving capability at your termination station, you can read in cards and print files simultaneously.)

2.4 THE USER AT AN IBM HOST

To send data from an IBM host to a TOPS-10 host, you can send it either in the printer output file of a job (in SYSOUT=A) or in the punch file (in SYSOUT=B). You can, for example, use IEBGENER or IEBTPCH on an IBM host running OS.

To print a file at the TOPS-10 host with lines 132 characters long and banner pages, use SYSOUT=A; this provides printer output with lines 132 characters long, <CRLF> after each line, and <CR><DC3> after every 64th line. Data are converted to ASCII.

IBM COMMUNICATIONS USER PROCEDURES

If you use SYSOUT=A, the output banner pages normally printed on the line printer for job identification may also appear in the output file received at the TOPS-10 site. These pages look like header lines in your output and must be stripped off to get the significant part of your output. In output returned in this manner, record length can be up to 132 characters.

To print a file at the TOPS-10 host with lines only 80 characters long, with no <DC3>s, and no output banner pages, use SYSOUT=B. If you use SYSOUT=B, your output data is sent to the TOPS-10 host with fewer extraneous header lines. When using SYSOUT=B, you must identify your output for IBMSPL with PNAME, LNAME, LDISP and optionally LFORM fields on your card images. See Table 2-1, "IBMSPL Switches".

Omit the /* before each switch. If this information is not present to be passed to IBMSPL, the file will simply be printed at the TOPS-10 host.

For example, if the first cards in your job deck contain:

```
/PNAME:27,5117  
/LNAME:TEST  
/LDISP:HOLD  
/ENDLI
```

Card images of your output will be placed on the TOPS-10 disk in:

```
DSK:[27,5117]TEST.LPx
```

CHAPTER 3

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

This chapter is written for the person who must install the IBM communications software on the TOPS-10 host. It assumes that the installer will always install this software from scratch, as these procedures describe entirely new products, not updates of earlier IBM communications products. The installer must be familiar with both the hardware and the TOPS-10 operating system.

NOTE

It is strongly recommended that the TOPS-10 operator and the operators of any remote stations or computers with which the TOPS-10 host is communicating be able to talk by telephone.

TOPS-10 IBM communications software products are unbundled software products obtained separately from the TOPS-10 operating system. There are two IBM communications products; each is available on a separate distribution tape. The products are:

TOPS-10 2780/3780 E/T
TOPS-10 2780/3780/HASP

Each distribution tape contains one saveset (see Appendix A.1, "The IBM Communications Distribution Tapes").

The IBM communications software contains the following components:

1. The emulation spooler IBMSPL.
2. The test and analysis programs D60SPD and CHK60.
3. The software for the communications front end processor. You can use only one of the IBM communications products at a time.
4. The communications front end loaders BOOT11 and DTELDR.
5. A document file for D60SPD.

The GALAXY programs LPTSPL, CDRIVE, and SPRINT must also be available. The GALAXY software is on the standard TOPS-10 Monitor Tape; all other software is on the IBM Communications Distribution Tape.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

3.1 INSTALLATION SUMMARY

As the IBM communications installer, you must install the IBM communications software after the TOPS-10 operating system and the GALAXY batch and spooling system have been successfully installed. The TOPS-10 installation places all the appropriate versions of the monitor and GALAXY programs on [1,4]. The IBM communications installation consists of taking the IBM Communications routines from the IBM Communications Distribution Tape, placing them in a directory of your choice, copying assembled software to [1,4], and making a few changes to certain existing system files.

The installation of IBM communications software on a TOPS-10 host has five phases.

You should perform these phases in order:

1. prepare for installation
2. install the software
3. manually verify the installed software
4. edit the system files used for automatic startup
5. shut down the system and restart it, with the edited system files

The first four phases can be done under normal timesharing by an installer logged in as [1,2]; the last phase must be done with a stand-alone system.

3.1.1 Prepare for Installation

Before you begin your installation, you must collect information about both your hardware and software configurations. You must determine the following:

- what site or sites you will connect to
- what the signon procedure for each remote site is
- what protocol (2780, 3780, or HASP multileaving) you will use for each site
- whether the default ASCII/EBCDIC translate tables used for transmissions between TOPS-10 and the IBM host are acceptable
- what communications front end (DN20, DN87, or DN87S) you will use
- what synchronous line interface (DUP or DQ) you will use
- what modems you will use

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

3.1.2 Install the Software

To install the software, you must:

- perform the normal installation of the TOPS-10 operating system. This should include running MONGEN to define the communications front-end running IBM communications software and the synchronous lines attached to the front end.
- perform the normal GALAXY installation including running GALGEN to define the required GALAXY features.
- run BACKUP to extract the IBM communications supplementary documentation, executable binaries, and sources from the IBM Communications Distribution Tape.
- read the Beware file (BEWARE.MEM) from the IBM Communications Distribution Tape.
- optionally, reassemble the front-end code.
- create the UFD for ersatz device D60: (used for IBM signon/signoff files and as a temporary holding area), if it is not already available.
- create the necessary signon and signoff files, and put them in D60.
- copy files to the system area [1,4].

3.1.3 Manually Verify the Installed Software

To perform manual verification, you should:

1. run BOOT11 or DTELDR to load the communications front end;
2. run D60SPD, the software diagnostic, to verify if the TOPS-10 host can communicate with the communications front end, or to do loopback testing.
3. run OPR to:
 - DEFINE the IBM-type node
 - SET node transmission/modem parameters
 - START scheduling for the node
4. If doing emulation, you must then:
 - run IBMSPL
 - ascertain that the IBM operator has conditioned a line on his host to your TOPS-10 system in the appropriate manner
 - enable modems (dial up) (within five minutes of starting node scheduling)
 - submit a job containing a JCL-image file to the IBM host
 - wait for data to be returned

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

5. If doing termination, you must then:
 - verify that LPTSPL and CDRIVE are running
 - enable modems (dial up)
 - have the remote station operator turn on his system and read in a signon card
 - send a print file to the remote station
 - have the remote station operator read in a deck of cards containing GALAXY commands and wait for output

3.1.4 Edit the System Files

To edit the system files used for automatic startup, you should:

- place all the OPR commands needed to DEFINE each node and specify its transmission/modem characteristics in a command file. You can create a separate file called IBM.CMD, or any name you prefer, for this purpose, or you can place these commands in your system command file, SYSTEM.CMD.
- edit OPR.ATO to have OPR execute the commands in IBM.CMD or SYSTEM.CMD and run the front-end loader and IBMSPL, as needed. The usual spoolers (LPTSPL and CDRIVE) support up to 15 local and remote line printers and card readers.

You must always load the front end once; you then run IBMSPL to support emulation. LPTSPL must be running to support termination. Start CDRIVE only if one is not running, or the running CDRIVE is fully occupied (more than 15 card readers in the network).

3.1.5 Shutdown and Restart the System

To verify the automatic startup, you must:

- shut down the system and restart it
- have OPSE run the appropriate spoolers and command files and run OPR to TAKE IBM.CMD
- run OPR to START scheduling for your network nodes
- transmit data and wait for the output to be returned

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

3.2 PREPARE FOR INSTALLATION - PHASE 1

With IBM communications products, there are several node types in your network. When you use an OPR SHOW STATUS NETWORK-NODE command, you see a list of all nodes in your network. For example:

```
OPR> SHO STA NET RET
hh:mm:ss      -- System Network Status --

Node          Status
-----
ALPHA         Online
IBM1          Offline (IBM Emulation)
JACK          Offline (IBM Termination)
JILL          Offline (IBM Termination)
KERMIT        Online
TERM          Offline (IBM Proto-termination)
VOGON         Online
```

There are 7 nodes in the network

All nodes for which the status reported is only Offline or Online are non-IBM communications nodes. Nodes marked "IBM..." represent IBM-type sites. You will not see such nodes until you have installed your new IBM software.

3.2.1 Prototype Nodes

IBM communications software allows the TOPS-10 host to communicate with IBM hosts and IBM-type remote job entry (RJE) stations. Communicating with IBM hosts is called **emulation**, communicating with RJE stations is called **termination**. In your node list, any node listed as "IBM Emulation" is an IBM host, such as an IBM 370, at some remote location. With termination, you use both **prototype nodes** and **actual termination nodes**. In your node list, any node listed as "IBM Termination" is an actual RJE station at some remote location. A node listed as "IBM Proto-termination" is not an actual RJE station, but is used as a link between TOPS-10 and an RJE station, or a group of RJE stations, that dial in to TOPS-10.

Each emulation node and each prototype termination node is always associated with a particular port/line combination. An actual termination node is not; with the appropriate setup, an actual termination node can dial in to TOPS-10 through more than one prototype node (port/line combination). A prototype termination node has no printer or card reader; only an actual termination node can have these units. When an actual termination node is Online, the prototype termination node associated with it becomes Active.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

3.2.2 Collect Information

Before you begin your installation on the system, collect information about your hardware and software configurations. This information becomes part of the installation and can be recorded in the manual or on Installation Worksheet Section 3.2.3. If you cannot obtain all this information, you cannot complete your installation.

1. Determine if you need to change the control files you use to generate your new monitor and the new version of GALAXY. You will probably edit the control files to meet your own requirements. For information on regenerating your monitor, see the Monitor Installation Guide for your system; for information on rebuilding GALAXY, see the Monitor Installation Guide.
2. Determine what sites you will connect to, and record their names and whether they are hosts or termination (RJE) stations. Also, assign each termination station a TOPS-10 network nodenumber (1-77 octal). The TOPS-10 network nodenumber must be unique in the network.

Record these items under "software" on your Installation Worksheet (Section 3.2.3).

3. Determine which protocol (2780, 3780, or HASP multileaving) to use for transmissions. To communicate with a termination station dedicated to a specific protocol, you must use the protocol of the station. To communicate with a remote host, you may have more flexibility in your choice of protocol; but note that the 2780 protocol does not allow compression and that to send and receive at the same time on the same line, you must use the HASP multileaving protocol. With the 2780 or 3780 protocol, a job being sent must complete or terminate before a job can be received. Your choice of protocol also depends on which software you have, and how many lines you must support.
4. To establish node names for IBM communications in emulation mode (see Figure 3-1) you will:
 - use the OPR DEFINE command to define an emulation node with an alphanumeric nodename up to 6 characters long.
 - create a signon file in ersatz device D60 called nodename.SON.
 - place in nodename.SON the signon message that TOPS-10 must transmit to the IBM host. Obtain the signon message from the system programmer at the IBM site or from your System Administrator. The system programmer at the IBM site must tell you the exact format of the signon message his system expects. You can record the signon message here or in a more secure location.
 - you will use an OPR START NODE command to start scheduling for your emulation node.
 - you will use a TOPS-10 SUBMIT command with the nodename.SON file to send the signon file to the IBM host.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

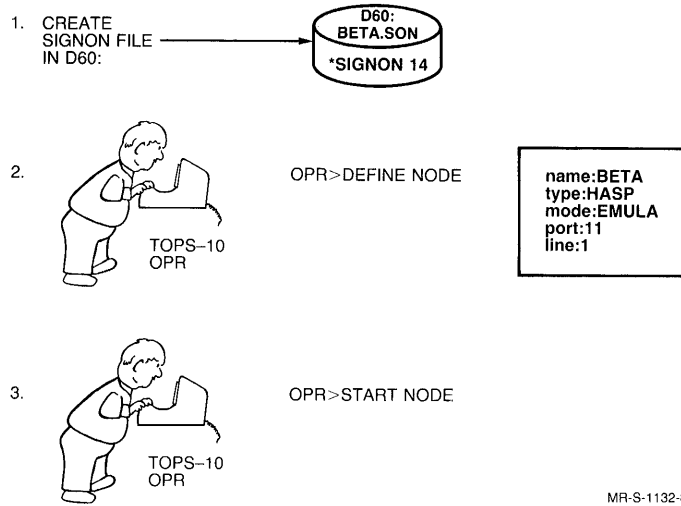


Figure 3-1 Emulation Signon

5. Determine if your connection to the IBM host expects a signoff message. If it does, record the message in the signoff file nodename.SOF and on your Installation Worksheet.
6. To establish nodeids for termination over a fixed line use the following conventions:
 - use the OPR DEFINE command to define a termination node with an alphanumeric nodename up to 6 characters long.
 - create a signon file in ersatz device D60 called nodename.SON and place in it a line pair containing the following:

free-form signon data (line 1)
TOPS-10 network node number (line 2)

The TOPS-10 network node number must be unique in the entire TOPS-10 network and cannot be greater than octal 77.

- the line specified in the OPR DEFINE command must be connected to the modem on the fixed line to the termination station.
- you will use an OPR START NODE command to start scheduling for your termination station.
- you will have the operator at the termination station read in the signon card.
- the message sent from the termination station is compared with the signon image in the file nodename.SON to find a match. If there is no match, the station cannot signon.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

7. To establish nodeids for termination with dial-in capabilities (see Figure 3-2):

- use the OPR DEFINE command to define a prototype termination node for all nodes that have identical characteristics.
- assign the node a nodename not more than 6 characters long. The dial-in termination nodename is a dummy variable and is used only until the termination station signs on. Once the station signs on, the TOPS-10 network node number is used.

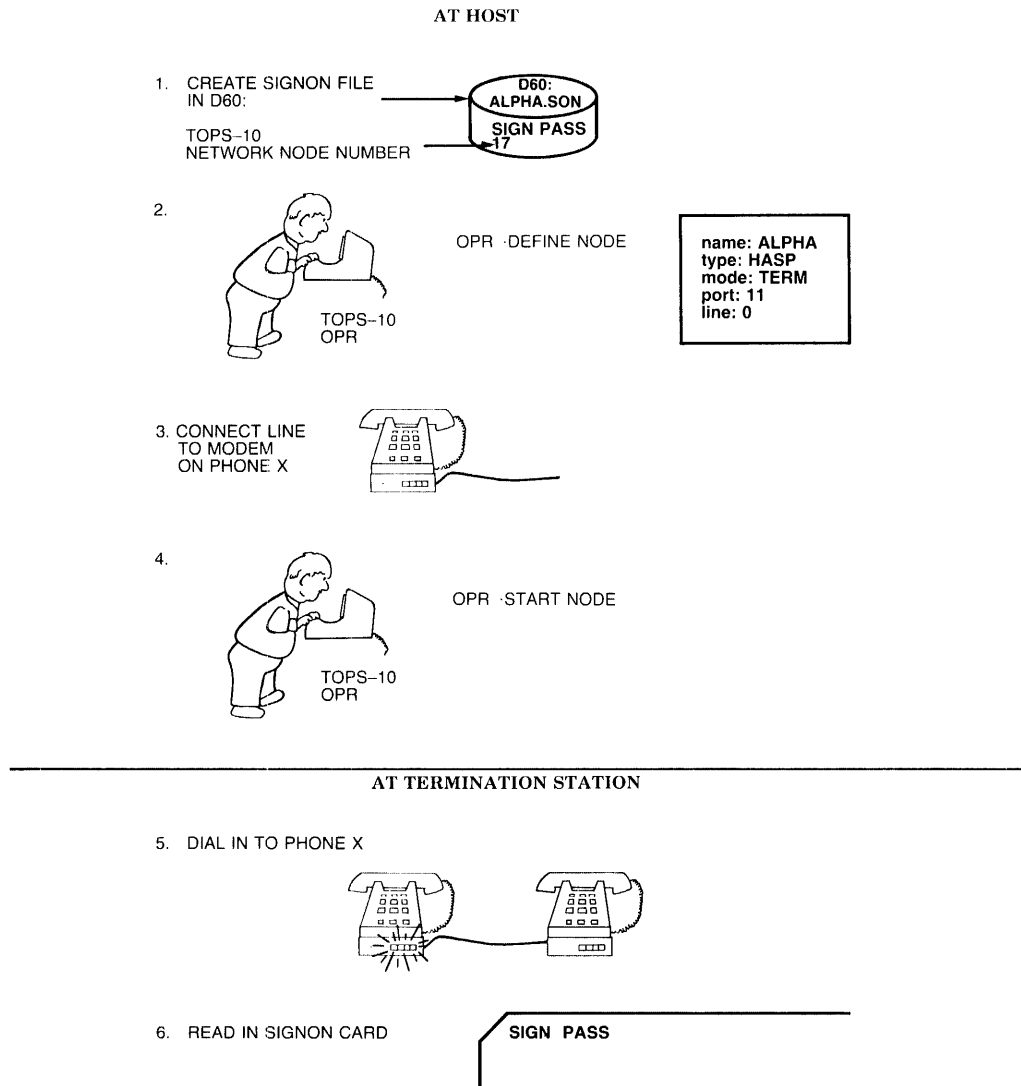


Figure 3-2 Dial-In Termination Signon

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- create a signon file in D60 called nodename.SON and place in it line pairs for all termination stations that will dial in on the specified line. Each line pair must contain:

```
free-form signon data (line 1)
TOPS-10 network node number (line 2)
```

The TOPS-10 network node number must be unique in the entire TOPS-10 network and cannot be greater than octal 77.

- connect the line specified in the DEFINE command to the modem on the phone where the termination stations will call.
- you will use the OPR START NODE command to start scheduling for the termination stations.
- you will have the operator at the termination station dial-in and read in the signon card. When the signon card is read, the message from the termination station is compared with the signon images in the file nodename.SON until a match is found. Once the match is made with the free-form signon data (intervening blanks are ignored when matching strings), the station signs on as the station with the nodenumber from the nodename.SON file.
- once the termination station signs on, it will be listed by its nodenumber and its nodenumber will appear in all OPR messages that refer to that station.

For example, DEFINE a dial-in termination node as ALPHA on port 11, line 0 (see Figure 3-2). The TOPS-10 host operator issues a START NODE ALPHA command to start scheduling for the node. The file ALPHA.SON contains:

```
SIGN      PASS
17
SIGNON    WORD
14
```

A termination station calls the phone/modem attached to line 0, and reads in a single signon card containing:

```
SIGNON    WORD
```

The signon information matches stringwise what is in ALPHA.SON, and OPR sends a message back to the termination station of the following form:

```
- IBM Remote 14 SIGNED ON -
```

NOTE

The TOPS-10 operator can START NODE ALPHA or shutdown node 14 (a subnode of node ALPHA), but he cannot START NODE 14 by itself.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

8. To connect to an IBM host, have the system programmer at the IBM host run a HASPGEN or equivalent system program.

With the 2780 or 3780 protocol, have the HASPGEN run to define the TOPS-10 host as:

- an IBM 3780 with:
 - compression
 - horizontal format control
 - 132-character line
 - no transparency
 - card punch
 - a nondedicated line (to require signon)

If compression and horizontal format control are not allowed together, have the HASPGEN omit horizontal format control. If the line cannot be nondedicated, have it made dedicated and place a HASP comment in your signon file, nodename.SON. For example, a message of the following form would do the job:

```
/*MESSAGE TOPS-10 SIGNING ON
```

With the HASP multileaving protocol, have the HASPGEN run to define the TOPS-10 host as:

- a HASP station with:
 - compression
 - horizontal format control
 - 132-character line
 - no transparency
 - card punch
 - perhaps, a TOPS-10 nondedicated line (to require signon)

The line must be nondedicated as signon is always required. The specification of no transparency allows transparent-mode files to be read, but not transmitted.

9. Decide if you need to change the ASCII to EBCDIC translate tables used in transmissions. (See Appendix A.2, "Translate Tables" to help make this decision.) You must reassemble the front-end code if you need to change the translate tables. You need to change the translate tables only if the symbols provided by the front-end code do not agree with the symbols on your remote printer.

```
Reassembly Needed?  -----  -----  
                    yes      no
```

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

10. Determine the hardware configuration of your communications front end. You can use one front end to run IBM communications software with TOPS-10. On a dual processor, the front end must be on CPU0. This front end can be a DN20, DN87, or DN87S. The connection between the TOPS-10 host processor and the communications front end determines the number of the port to which the front end is connected (see Figures 3-3 and 3-4). Record the port number of your communications front end on your Installation Worksheet (consult Table 3-1).

Table 3-1
Front-End Port Numbers

Front End	Connection	Port Number
DN87	DL10	0 to 7
DN20 DN87S	DTE20	10 to 13

If in doubt, ask your Field Service Representative.

11. Determine what synchronous line interfaces are used with your communications front end. A DN20 has KMC11/DUP11 interfaces; a DN87 and a DN87S has DQ11 interfaces. If in doubt, ask your Field Service Representative.
12. Write down the line numbers of your synchronous lines. You can have up to six lines on a DN20, DN87, or DN87S. Lines are numbered 0 to 5.
13. Determine what modems you will use to dial up the remote site. Each type of modem has a different clear-to-send delay which you may have to set (see Appendix A.5, "Modems"). Modem literature (not supplied by DIGITAL) generally indicates the clear-to-send delay for each modem. If you need to set the clear-to-send delay for the modem on a particular line, record the CSD value under 'Special Parameters' on your Installation Worksheet.
14. Determine the values for the following parameters for each node. Preferably use the defaults. Where a node cannot use the default value for a parameter, change the value of that parameter with a SET command to OPR. The parameters are listed here and explained below.

Transparency (Trans) (ON or OFF, default is OFF)

Clear-to-send-delay (CSD) (0,3,7,9, or 13 have been used with specific modems; default is 3. Use any value that works.)

Records-per-message (RPM) (0,2, or 7; defaults:3 for 3780, 7 for 2780)

Bytes-per-message (BPM) (400 or 512; defaults:400 for 2780 and HASP multileaving; 512 for 3780 and newer operating systems)

Signon required? (yes or no; default is yes)

Timeout category (primary or secondary, default is primary for termination, secondary for emulation)

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

TRANSPARENCY

The TRANS value in your node definition describes how the software transmits control characters. When you set TRANS ON, recognition of control characters is suppressed. The software receives transparent data regardless of the setting of the TRANS value, but cannot send transparent data. Leave this setting OFF.

CSD

The CSD value in your node definition must reflect the modem that you use on that node. CSD values for some common modems are listed in Appendix A.5, "Modems." The values are in jiffies; one jiffy is about 16 milliseconds at 60 Hertz (slightly more at 50 Hertz). You can set this to any workable value.

RPM

The RPM value indicates the number of records per message transmitted. The value can be 0 (the default for 3780), which indicates an unlimited number of records; 2 for a unit with no multirecord capability; or 7 (the default for 2780) for a unit having multirecord capability. Normally, you do not need to change these values since the defaults apply automatically.

BPM

The BPM value indicates the number of bytes in a message. Normally, do not change this value since the defaults give optimum use. This value represents the maximum number of bytes transmitted in a single message.

SIGNON

When signon is required for a node, leave the value of signon-required as the default. Only change the value if signon is not required. Generally, signon should be required from all dial-up remote sites.

TIMEOUT CATEGORY

The Timeout category is used by the BSC protocol to determine how connecting systems bid for use of a line. Two systems bidding for the use of a line cannot be in the same timeout category, since this condition can result in simultaneous bids for the line and a "deadly embrace", where the systems are permanently bidding for the line without success. To prevent such a deadly embrace, one system must be in the primary timeout category, and the other in the secondary.

When a TOPS-10 host connects to an IBM host using HASP in its operating system, the TOPS-10 node definition should be PRIMARY, since the HASP spooler is always in the SECONDARY timeout category. When a TOPS-10 host connects to a true IBM 2780 or 3780, usually hardwired as PRIMARY, the TOPS-10 node definition for these RJE stations must be SECONDARY. When a TOPS-10 host connects to an IBM host using ASP (not HASP) in its operating system, it may be necessary for the node definition to be SECONDARY, since the timeout category for the ASP spooler is often PRIMARY.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

15. Determine what p,pn to use for ersatz device D60. Ersatz device D60 is used by IBM communications software as a temporary holding area for files received by the TOPS-10 host from remote sites. It also is used to hold all signon and signoff files. Ersatz device D60: is usually assigned to p,pn [5,32], but if this p,pn is already in use, you must assign another p,pn when you run MONGEN.

p,pn for ersatz device D60 :-----
 ([5,32] or other)

16. Decide what p,pn to use for IBM communications sources. To facilitate the segregation of sources, modified sources, and assembled code, set aside a p,pn with at least one sub-file directory (SFD). Then place the sources from the IBM Communications Distribution Tape in an inviolable SFD, and do any modifications or assemblies in another.

p,pn for source files -----

3.2.3 Installation Worksheet

Fill in each of the answers as you go along:

Software:

sites to connect to:									
Site Type (host/RJE)	Node Name	Node Number	Protocol (2/3780/HASP)	Mode (E/T)	Signon Message	Signoff Message	Port No.	Line No.	Special Parameters
-----	----	-----	-----	-----	-----	-----	----	----	-----
-----	----	-----	-----	-----	-----	-----	----	----	-----
-----	----	-----	-----	-----	-----	-----	----	----	-----
-----	----	-----	-----	-----	-----	-----	----	----	-----
-----	----	-----	-----	-----	-----	-----	----	----	-----
-----	----	-----	-----	-----	-----	-----	----	----	-----
-----	----	-----	-----	-----	-----	-----	----	----	-----

Hardware:

Front end (DN20/DN87/DN87S): _____
 Port Number (0 to 7 (DL10), 10 to 13 (DTE20)): _____
 Synchronous Line Interface (KMC/DUP or DQ): _____
 Number of lines (1 to 6): _____

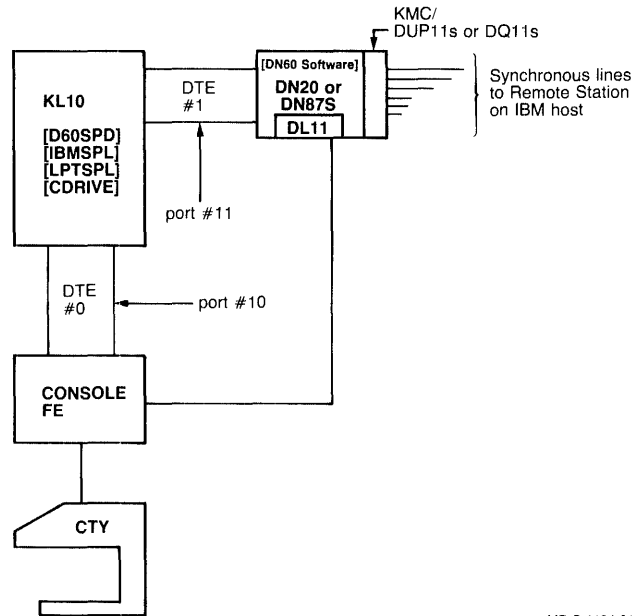
Modems:

Port No.	Line No.	Modem Model	Clear-to-send Delay
-----	----	-----	-----
-----	----	-----	-----
-----	----	-----	-----
-----	----	-----	-----
-----	----	-----	-----
-----	----	-----	-----
-----	----	-----	-----
-----	----	-----	-----

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

3.3 INSTALL THE SOFTWARE - PHASE 2

Before you begin your installation, be sure you have found answers to all the questions in Section 3.2.



MR-S-1134-81

Figure 3-3 A KL10 Running IBM Communications Software

NOTE

In these installation procedures, extensive use is made of the abbreviated input features of TOPS-10. Red print in characters to be typed indicates user input; black print indicates system output. System output can be both uppercase and lowercase.

- ➡ Step 1: Be sure the Release 7.01 TOPS-10 Main Monitor and CUSP files are in your disk area.

Before you can begin installation of the IBM communications software, the TOPS-10 operating system must be up and running.

Before you reassemble your monitor, run the 7.01 version of MONGEN. When you run MONGEN, you must answer questions in its HDWGEN portion that pertain to IBM communications. These questions are shown below. The numbers in parentheses indicate the default, if any, and the range of values allowed by MONGEN. The comments describe the support provided by DIGITAL.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

Prompt	Typical Response	Comment
# DN60's (0,0-11) [IBM BSC INTERFACES]:	1	Decimal value; up to one supported
For DN60 0:		Octal values
Which port is the DN60 connected to (0, 0-13) [DL10 NUMBER 1 HAS PORTS 0-3, DL10 NUMBER 2 HAS PORTS 4-7, DTE 0-3 ARE PORTS 10-13]		See Section 3.2
DECIMAL LINES ON THE DN60 (1-12) [EACH DN60 CAN SUPPORT UP TO 12 IBM BSC INTERFACES]:	2	Decimal value; up to 6 lines are supported
Type "ersatz-device",P,Pn, search-list-type: D60,5,32,ALL		You can use any free p,pn

If you cannot run your new monitor, return to the TOPS-10 Monitor Installation Guide and complete the necessary steps. A summary of the monitor installation is provided in Appendix A.4 of this manual.

- ➡ Step 2: Be sure the GALAXY Version 4.1 software has been successfully installed.

The GALAXY software must be up and running. You may have to edit the GALAXY control file and rebuild GALAXY. For information on reassembly of GALAXY, see the TOPS-10 Monitor Installation Guide.

- ➡ Step 3: Be sure you are logged in as [1,2].

You must be logged in as [1,2] to perform these procedures. You should see the system prompt (.). If you do not see the system prompt, press CTRL/C and log in.

(CTRL/C)

```
.
LOGIN 1,2
JOB46 RZ124A KL #1026/1042 TTY36
Password:
09:51 3-Nov-80 Mon
```

- ➡ Step 4: GET SYS:CDRIVE (RET)

Use the GET and VERSIO commands to verify that CDRIVE is on SYS and that you have the right version. Your version number must equal or be greater than the number in the example. If it is not on SYS, you must review your TOPS-10 installation and retrieve it.

.GET SYS:CDRIVE

Job setup

```
.VERSIO
CDRIVE 1(56)
```

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 5: Type GET SYS:LPTSPL (RET)

Repeat the above step for LPTSPL.

```
.GET SYS:LPTSPL
```

Job setup

```
.VERSIO  
LPTSPL 104 (2700)
```

.

➡ Step 6: Type MOU MTA0/REELID:DN60/LABEL:NOLABEL/VID:IBMM (RET)

You must assign a physical magnetic tape drive so that your job can access it. Use any available drive. Your display will be different if MDA is running.

```
.MOU MTA0/REELID:DN60/LABEL:NOLABEL/VID:IBMM  
REQUEST QUEUED  
WAITING...2 ^C'S TO EXIT  
MTA MOUNTED
```

.

➡ Step 7: Mount your IBM Communications Distribution Tape or send a message to the system operator to mount your tape.

Be sure the tape is properly threaded on the drive and that the door of the drive is properly closed. Use the LOAD switch on the tape drive to position your tape at the load point. The ON LINE switch on the tape drive should light up.

➡ Step 8: Restore files from the tape to a selected p,pn or p,pn,sfd with BACKUP. (After you type R BACKUP, the BACKUP prompt (/) appears.)

```
.R BACKUP  
/TAPE MTA0  
/DENSITY 1600  
/REW  
/INTER  
/SUPER ALWAYS  
/REST p,pn=DSK:  
DONE  
/UNLOAD  
/EXIT
```

These commands restore the one saveset on the IBM Communications Distribution Tape to your selected p,pn. They specify that the tape was recorded in INTERCHANGE format at 1600 bpi. After the restore is done, you can unload the tape and exit from BACKUP. You can also print BACKUP.LOG, if needed.

NOTE

For more information about BACKUP, particularly about error messages, see the TOPS-10 Commands Manual.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 9: Remove your magnetic tape from the drive, or have the operator remove it.

➡ Step 10: Type DIR D60:

Use the DIRECT command to determine if the IBM communications directory (ersatz device D60:) already exists.

.DIR D60:

filename.ext DSKC: [5,32]

.
.
.
.

If a p,pn for the ersatz device does not exist, you must create a UFD for it. If it is already there, skip to Step 13.

➡ Step 11: Type R CREDIR and enter input and output limits.

You must create a UFD for the ersatz device called D60:. This ersatz device holds your IBM signon files and acts as a temporary holding area for the emulation output files returned from the IBM host. The ersatz device should have storage limits as large as possible (100,000 or any limit that appears reasonable).

If your system periodically deletes files in areas that are over quota, make the area large enough to accommodate all files from an IBM host.

.R CREDIR

CREATE DIRECTORY:DSK:[5,32]/IN:100000/OUT:100000/EXIT

CREATE DIRECTORY:DSK:[5,32]/IN:100000/OUT:100000/EXIT
CREATED DSKB0:[5,32].UFD/PROTECTION:775

.

➡ Step 12: Type DIR [5,32] .UFD/DET to verify that D60: has been set up correctly. The logged in and logged out quotas should be as you have entered them in Step 11.

.DIR[5,32].UFD/DET

DSKB1:5,32.UFD[1,1]

Access date: 14-Feb-80

Creation time, date: 17:59 11-Apr-79

Access protection: 775

Mode: 17

Words written: 128.

Blocks allocated: 5.

Written on: Unit(s) 2 on controller 1 on CPU 1026

Status bits: 420000

Logged in quota: 100000.

Logged out quota: 100000.

.
.
.
.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 13: Type R TECO (RET)

You must now create the signon and, optionally, signoff files to place in D60: Use any available editor to create your files. The examples use TECO.

➡ Step 14: To connect to an IBM host, the filename must be the nodename with extension .SON.

The filename cannot be more than six characters long.

The format of the IBM host signon message depends on how the IBM host is set to interface with the TOPS-10 host. IBM hosts frequently look at the TOPS-10 host as a numbered (not a named) station. For example, for an IBM 370/168 running OS/VS2 (Release 1.7 with HASP II, Version 4) expecting to see TOPS-10 as an IBM 3780 that will sign on as station 14, the signon message could be:

```
/*SIGNON      14
```

(You have recorded this information in Section 3.2, the Installation Worksheet.)

The message must start in column 1 of the file. Enter the message (with the appropriate spaces); the spaces before the 14 are required to place the number in columns 16 and 17, as required by the IBM host system.

NOTE

If you are connecting to multiple IBM hosts, you must create a separate signon file for each host.

Create your signon file (* is the TECO prompt, \$ is the echo of the (ESC) key).

```
.R TECO
*FW14.SON$$
*I/*SIGNON      14 (RET) $$
*EX$$
```

➡ Step 15: To connect to a termination station over a fixed line, create a file called nodename.SON. Create one file for each port and line combination, and place in it one line pair for each termination station. The line pair must be in the following format:

```
free-form signon data (line 1)
TOPS-10 network node number (line 2)
```

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

The next lines illustrate the creation of a signon file for a termination station that the TOPS-10 host looks at as node 77 with password SAM.

```
.R TECO
*EWP01L01.SON$Y$$
*ISAM(RET)$ $
*I77(RET)$ $
*EX$$
.
```

NOTE

If the signon file does not exist, an error message appears at the terminal running OPR when the termination station attempts transmissions, and the node shuts down. The node must be restarted by the operator after such an abort (the TOPS-10 operator must issue a START NODE command to OPR).

- ➡ Step 16: To connect to a termination station over a dial-up line create a prototype file called nodename.SON. This file can contain the signon data for all termination stations that can dial in on the specified line, but they must all have identical characteristics, which you specify with an OPR DEFINE command.

For example, a prototype file for two RJE stations could contain the following lines:

```
SAM
77
SEVENTEEN
17
```

- ➡ Step 17: Type COPY D60:=*.SON (RET)

Copy the signon files you have created into the p,pn that corresponds to ersatz device D60:. If you created a signoff file, also copy it into D60:.

```
.COPY D60:=*.SON
```

- ➡ Step 18: Reassemble your front-end code.
[optional]

If you need to alter the ASCII/EBCDIC translate tables in the front-end code (see Appendix A.4, "Translate Tables"), you can change the values in the source module called TRNTAB.P11 and reassemble the front-end code. Do this only if the printer at your site or at the remote site does not correctly print the files it receives (not all printers have the same character sets). Generally, if the distributed tables suit your printer, you do not need to change the translate tables. To reassemble the front-end code, follow the directions in Appendix A.2. If you do not need to reassemble your front-end code, proceed to Step 19.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- ➡ Step 19: Reassemble IBMSPL, the emulation spooler.
[optional]

If you need to add user-specific code to the emulation spooler to accept special files returned from the IBM host, follow the instructions in Appendix A.3, "IBMSPL Assembly." Return to Step 20 when done.

- ➡ Step 20: This completes phase 1 of the IBM communications installation. To verify that the programs are working correctly, perform the steps described in the next section which involve running the front-end loader (BOOT11 or DTELDR), D60SPD, OPR and IBMSPL.

3.4 MANUALLY VERIFY THE INSTALLED SOFTWARE - PHASE 3

To verify your IBM communications installation manually, perform the following steps:

- run BOOT11 or DTELDR to load the communications front end;
- run the IBM communications test program D60SPD.

When these programs have executed correctly, you can run OPR to define the communications front end as a network node and send a trial job to the IBM-type remote host/station.

- ➡ Step 21: Choose the binary file for your configuration from the following list:

Processor	Connection	Line	Protocol	Binary File Name
KL10/KI10	DL10	DQ	2780/3780	D6LQ3.BIN
KL10/KI10	DL10	DQ	HASP	D6LQH.BIN
KL10	DTE	KMC/DUP	2780/3780	D6TK3.BIN
KL10	DTE	DQ	2780/3780	D6TQ3.BIN
KL10	DTE	KMC/DUP	HASP	D6TKH.BIN
KL10	DTE	DQ	HASP	D6TQH.BIN

You may need to use the information you collected in Section 3.2, on the Installation Worksheet, to help you choose the binary file.

- ➡ Step 22: Determine the port number for your communications front end. You can use the information you collected on your Installation Worksheet to help you determine the port number.

- ➡ Step 23: Record your answers from Steps 20 and 21 here:

Processor (KL10/KI10): _____

Connection (DTE20, DL10): _____

Port number:

Binary file name: SYS:_____ .BIN

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

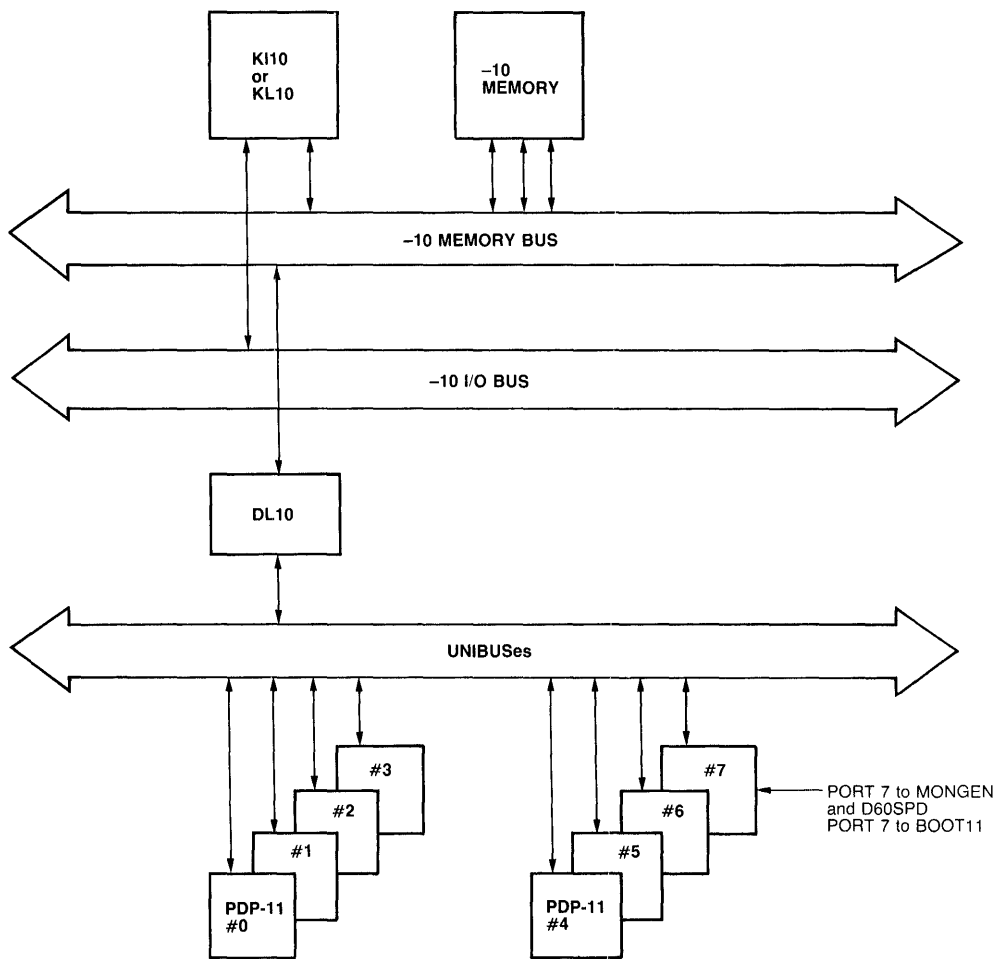
➡ Step 24: Type R program-name (RET)

You can now load the communications front end with the IBM communications software. Two programs are available to load the communications front end. Use the one appropriate for your configuration. To load over a DL10, use BOOT11 (proceed to Step 25). To load over a DTE, use DTELDR (proceed to Step 26).

➡ Step 25: Use BOOT11 to load over a DL10.
[KI10/KL10]

To load the KL10/KI10 HASP code over a DL10 on port 7 with a DQ line interface, use the following:

```
.R BOOT11 (RET)
File:SYS:D6LQH.BIN/P:7 (RET)
```



MR-S-1135-81

Figure 3-4 Ports on a DECsystem-10 with DL10s

For more information on BOOT11, see the BOOT11 specification. To exit from BOOT11, type (CTRL/C).

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- ➡ Step 26: To load the KL10 HASP code over a DTE on port 12 with a [KL10] KMC/DUP line interface, use the following:

```
.R DTELDR (RET)
*SYS:D6TKH.BIN/RELOAD:2/NODUMP (RET)
```

NOTE

When you run MONGEN and D60SPD, this front end is specified as "port 12."

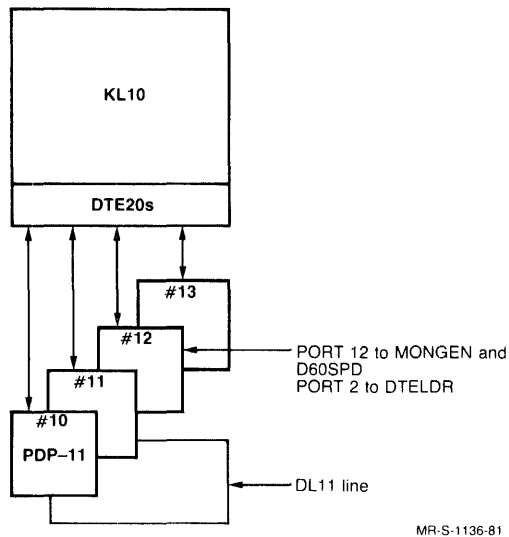


Figure 3-5 Ports on a KL10

For more information on DTELDR, see the DTELDR specification. To exit from DTELDR, type (CTRL/C).

- ➡ Step 27: Examine the CHK60 output.

When the communications front end is successfully loaded, a test program called CHK60 runs. If the front end where your terminal is connected has a line to the DL11 on the communications front end (see Figure 3-5), the CHK60 output appears on your terminal. Otherwise detailed CHK60 output is lost, and you see only abbreviated processing messages. CHK60 provides information on hardware components of the communications front end that may be malfunctioning. An example of normal CHK60 output executed on a DN20 is shown below. (For more information on CHK60, see Appendix A.6 of this manual.)

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

```
Initializing D6TQH IBM HASP/3780/2780 DECSYSTEM-10 FRONT END,  
      WITH DTE INTERFACE ON A DEC-10 V4(160)  
      KD11-A (11/35 or 11/40)  
      160000 bytes of memory  
      MF11-UP  
      KW11-L  
      KG11-A  
      1 DL11-A  
      1 DTE20  
      2 DQ11's  
Starting D6TQH IBM HASP/3780/2780 DECSYSTEM-10 FRONT END,  
      WITH DTE INTERFACE ON A DEC-10
```

NOTE

If you have 5 or 6 DUP11s, 2 KMC11s are normally listed; if you have 1 to 4 DUP11s, 1 KMC11 is normally listed.

Without a DL11 connection, CHK60 output contains messages of the following form:

```
front end xx loading from file zzzz  
front end xx initializing  
front end xx started
```

If you get a message of the following form, a hardware failure has occurred in the PDP-11.

```
?unit #n (ADR=addr)  
ERROR DETECTED AT PC listing message
```

If you have such a hardware failure, contact your Field Service Representative.

If no CHK60 error messages appear, the system has successfully loaded the communications front end and you can begin testing.

➡ Step 28: Type R D60SPD RET

You can now run the IBM communications test program D60SPD. This program performs verification of the installed IBM communications software by simulating the activities and attributes of a remote host or station.

```
.R D60SPD  
[ D60SPD Test program for DN62/DN65 IBM communications]  
/
```

Normally you use D60SPD by typing a SET SUPPORT or SET SIMULATE command, specifying the transmission protocol (2780, 3780, or HASP multileaving), followed by a request for STATUS. D60SPD then gives specific information on the current attributes of the system. It can also issue error messages if the information provided was incorrect or incomplete (see Appendix A.7, "Using D60SPD", for more information on D60SPD switches).

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 29: Type SET SUPPORT/PO:12/LI:0/DEV:0 RET

This command line exercises the support/primary features of the IBM communications software and produces the following output:

```
/SET SUPPORT/PO:12/LI:0/DEV:0

Set Line:0/Cmd:5/CSD:3
Set Line:0/Cmd:8
Set Line:0/Cmd:6/SILWAR:64
Set Line:0/Cmd:9/TBL:512
Set Line:0/Cmd:10/RPM:0
Set Line:0/Cmd:2
Set Line:0/Cmd:11/SIG:65535
Set Device:0/Cmd:24
Set Device:0/Cmd:27
Set Device:0/Cmd:26
Set Device:0/Cmd:29
Set Device:0/Cmd:7
Set Device:0/Cmd:8
Set Device:0/Cmd:12/COMPCD:0
Set Device:0/Cmd:13
Set Device:0/Cmd:17
Set Device:0/Cmd:20
Set Device:0/Cmd:32/RECSIZ:80
```

➡ Step 30: Type STATUS/PORT:12 RET

This STATUS command to D60SPD causes it to give the status of the designated port.

```
/STATUS/PORT:12
DN60 STATUS
0-7   DN60 Version 4
8-9   Window Version 3
10-11 Free Chunks 104
12-13 Lines 3
14-15 Chunk data length in bytes 188
16-17 3       IBM 3780/2780
        HASP Multileaving
18-25 KMC11 Microcode Version 1(6)
32-35 Line 0 active 377777777777
        Console input
        Console output
        Card Reader 0 active
        Line Printer 0 active
/
```

To obtain an interpretation of the defaults set, use the STATUS ALL command.

➡ Step 31: Type EXIT RET

To exit from D60SPD, type EXIT.

```
/EXIT
[ D60SPD stop]
```

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 32: Connect your synchronous lines.

Before connecting to a remote site, be sure your synchronous lines are physically connected to the appropriate modems. You will next run OPR to define and set parameters for your node, set the appropriate spoolers running, and send some jobs. Successful transmission and reception of jobs from your remote site is the ultimate test of your installation.

The procedures outlined in the next few steps describe the setup and starting of a single node, communicating over a single line. To test multiple nodes manually, repeat the DEFINE and START NODE commands for each node.

➡ Step 33: Type R OPR RET

Run OPR with this command. You use OPR to DEFINE your node, SET node parameters, and START scheduling for the nodes. The OPR> prompt appears.

```
.R OPR
OPR>
```

➡ Step 34: Decide on the following (use your Installation Worksheet)

```
Nodeid?           -----
2780,3780 or HASP? -----
Emulation or Termination? -----
Port number?     -----
Line number?     -----
```

➡ Step 35: Type

```
DEF N N nodeid N { 2780
or
3780
or
HASP } { /SIGNON-REQUIRED
/NO-SIGNON-REQUIRED } M { emulation
or
termination } N port-number N line-number N
```

This command associates your node with a specific port and line. For example, for a node with nodeid IBM1, doing HASP emulation over port 11 and line 0, issue the command shown below. When you use the ESC key, OPR fills in keywords and guide words. You can also use abbreviations. The OPR prompt reappears. After the DEFINE command is accepted, an acceptance message appears.

```
OPR>DEFINE NODE (name)IBM1::(type) HASP/SIGNON-REQUIRED (mode) EMULATION (port) 11 (Line) 0 RET
OPR>
hh:mm:ss      -- Define for Node IBM1 Accepted --
OPR>
```

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- ➡ Step 36: Determine if you need to change any of the following parameters for the node:

```

Transparency (default is OFF)           -----
Clear-to-send delay (default is 3)?     -----
Records-per-message (default is 7 for 2780)? -----
Signon-required (default)              -----
No-signon-required                      -----
Bytes-per-message                       -----
Timeout-category                        -----
  
```

(You have placed this information in a list on your Installation Worksheet.)

- ➡ Step 37: Type SET N nodeid CL 9
[optional]

This SET NODE command sets the clear-to-send delay. There are no guidewords in the SET NODE command, but you can use abbreviations. You have recorded your clear-to-send delay on your Installation Worksheet.

```

OPR>SET NODE IBM1 CLEAR-SEND-DELAY 9
OPR>
hh:mm:ss      -- Set for Node IBM1 Accepted --
OPR>
  
```

- ➡ Step 38: Type SHO P N
[optional]

To see what parameters have been set for your IBM nodes, issue a SHOW PARAMETERS NETWORK-NODE command

```

OPR>SHOW PARAMETERS NETWORK-NODE
OPR>
hh:mm:ss      --IBM Network Parameters--
Node Name      Type      Port Line  Trans CSD   RPM   BPM   Timeout
-----
IBM1           HASP/Emulation  11    0    Off   9     0   400   Secondary
      Signon Required
There is 1 IBM node defined in the network.
  
```

OPR recognizes the following objects:

```

batch-stream
card-reader
IBM remote
node
printer
  
```

("Object" is used as a guideword in the OPR program; it refers to those entities that OPR controls and for which the batch system provides queues.)

For an emulation node, OPR initiates scheduling for a batch stream. For a termination node, OPR initiates scheduling for a card reader and printer. You issue a START NODE command to OPR to initiate scheduling. In the current example, scheduling is initiated for an emulation node.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 39: Type EX (RET)

EXIT from OPR to return to monitor command level.

OPR> EX

.

➡ Step 40: Type R OPSE (RET)
[emulation only]

You can use OPSE to control the job you need to run in support of IBM emulation. To support this software, you must run IBMSPL. The examples from here on show OPSE controlling several subjobs. You can either follow the examples or run each of the indicated programs independently, but if you run them independently you will need more than one terminal to do the job. If your system supports termination stations only, skip to Step 47.

. R OPSE

*

➡ Step 41: Type :LOGIN (RET)

Log in to create an OPSE subjob.

* :LOGIN

hh:mm:ss(0)

JOB 51 RZ-124A KL #1026/1042 TTY647

[LGNJSP other jobs same PPN:68]

11:54 7-Jan-81 Wed

.

*

➡ Step 42: Type R SYS:IBMSPL (RET)

You must run IBMSPL to send any jobs back and forth between TOPS-10 and an IBM host. IBMSPL can be on SYS or in another area.

* R SYS:IBMSPL

!hh:mm:ss(0)

*

➡ Step 43: Type :WH (RET)

Use the WH command to verify that IBMSPL is running.

* :WH

0 41 1,2 IBMSPL ^C SW hh:mm:ss

*

➡ Step 44: Be sure the operator at the IBM host has started the line.

NOTE

HASPGEN requirements are listed in Section 3.2.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

➡ Step 45: Type :LOGIN

Log in another subjob.

```
*:login
hh:mm:ss (1)
      Job 77 RZ-124A KL #1026/1042 TTY650
      [LGNJSP other jobs same PPN:68,69]
      11:55  7-Jan-81  Wed
      .
*
```

➡ Step 46: Enable your modems.

Go to the modem attached to the line over which you are communicating, and dial up the IBM host. (For the exact sequence, see Chapter 4, "IBM Communications Operator Procedures.")

➡ Step 47: Type R OPR

Start a copy of OPR so you can start the IBM communications nodes.

```
*r opr
!hh:mm:ss (1)
      OPR>
!hh:mm:ss (1)
      hh:mm:ss      Printer 0 --Begin--
      Job OUTPUT Req #379 for SMITH [30,100]
      OPR>
!
```

NOTE

The communications front end must be running before you can issue these node commands to OPR.

➡ Step 48:L Type STA N nodename

Issue a START command to start scheduling for the node. You cannot use recognition on the nodename.

```
sta n  ibm2  
      ! 15:47:11 (1)
      STA N  IBM2::
      !
```

NOTE

Use double colons after nodenames in OPR commands; do not use colons after nodenames in TOPS-10 commands.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- ➡ Step 49: OPR responds after an interval with a message of the following form:

```
OPR>
hh:mm:ss  Batch-Stream 0 [nodename] -- Startup Scheduled --
```

- ➡ Step 50: Type SHO STA NET RET

To verify that the batch stream for the node is scheduled, use the SHOW STATUS command. The node does not come online until the spooler (IBMSPL or CDRIVE) that supports it is running, and you have dialed the remote site.

```
! SHO STA NET
OPR>
hh:mm:ss          -- System Network Status --
Node Name        Status
-----
   IBM1          Online          (IBM Emulation)
   IBM2          Offline         (IBM Termination)
```

There are 2 nodes in the network

OPR>

- ➡ Step 51: Go to another terminal to SUBMIT a job to the IBM host.

You should leave IBMSPL running and prepare a file containing all the JCL card images needed at the IBM host. Prepare the file with any TOPS-10 editor.

- ➡ Step 52: Type SUBMIT filename /PROC:nodename RET

Use the SUBMIT command with a /PROC switch to submit your job to the IBM host. In this example, the filename is TEST1 and the nodename is IBM1. Use the nodename you assigned to the IBM host with the DEFINE command.

```
.SUBMIT test1/PROC:IBM1
[Job TEST1 Queued, Request-ID 104, Limit 0:05:00]
```

- ➡ Step 53: Wait for data to be returned from the IBM host.

When data are received from the IBM host, your system installation has been verified.

3.4.1 Startup Failures

If the above procedures fail to initiate communications on your system, you must determine which unit is malfunctioning. In the usual setup you may have:

- a TOPS-10 host
- a processor interface (DTE20 or DL10)
- a communications front end (DN20)

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- associated software
- two modems
- a communications carrier
- a remote station
- an IBM host

Since any one of these may be causing the problem, examine each separately.

Start at your host and work towards the remote site.

1. You can verify that your host is running by typing commands at your terminal.
2. Verify that your front end is running with D60SPD.
3. Verify that your modem is working by looking at the lights on it.
4. Verify that carrier is available by examining the lights on the modem (If the carrier light is out, you have lost carrier and must dial up again.)
5. Verify that data are passing over the line by using a line monitor such as a datascope.
6. Verify that your remote site is working by calling the operator at the remote location.

If IBMSPL crashes, use the standard procedure for restarting GALAXY components:

- using OPR commands, shut down any emulation nodes that IBMSPL was running
- attach to the job running IBMSPL
- restart IBMSPL
- detach from the job running IBMSPL
- restart the nodes you previously shut down

When IBMSPL crashes, currently active communications to IBM-type sites are ended.

Because GALAXY components are used to drive the IBM communications products, failures in the components can require direct action to have IBM communications continued. All GALAXY components do not have the same effect when they fail; the effect depends on their importance in the GALAXY system. The effect of failure in each GALAXY component is described below.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

QUASAR has a system PID (Process ID), and needs to know which spoolers are running (including CDRIVE, LPTSPL, IBMSPL, BATCON, SPRINT, SPROUT, and PULSAR). If QUASAR crashes, you must restart it, and restart all the spoolers that are normally running. To do this, shutdown all the spoolers in an orderly fashion, then restart them (you can use a restart control file if it is available). You do not need to restart ORION. Because QUASAR has a system PID, you must restart it in the same job it was in when it crashed (attach to the job, restart it, detach from the job).

If ORION crashes, it also has a system PID and must be restarted in the same job it was in when it crashed. ORION needs to recognize all the OPRs that were running when it crashed. To do this, have the user of each OPR either give a command or restart OPR. When a user gives an OPR command after ORION has been restarted, ORION ignores the command but subsequently recognizes the OPR that sent it. It thus responds to subsequent commands from that OPR.

If BATCON crashes, and you restart it, all current batch jobs are terminated and currently active batch jobs are detached. You must delete all the detached jobs and restart them. (Restarting occurs automatically if the user includes a RESTART switch when submitting the job initially.)

If CDRIVE crashes, and IBM termination is currently active, you must restart CDRIVE and restart the node doing termination. If the communication is not active, you can just restart CDRIVE.

If LPTSPL crashes, you must restart it. When it crashes, currently active jobs are terminated, but local jobs will be continued from their last checkpoint when you restart LPTSPL. You should verify that all is well, if you have an RJE station serviced by LPTSPL, by talking to the remote site operator. While LPTSPL is absent, any OPR messages intended for the RJE station will appear on the TOPS-20 OPR terminal.

If SPRINT or SPROUT crash, and you restart them, current jobs are terminated. You must resubmit them.

If PULSAR crashes, current jobs controlled by PULSAR will probably have to be redone.

3.5 EDIT THE SYSTEM FILES - PHASE 4

Once you know that you can communicate with the remote IBM-type host or station, you can set up your system files so that all the necessary parts of the system run automatically. In the following description the system files are called OPR.ATO and SYSTEM.CMD. Your installation may use different filenames. To edit these files, you must be logged in as [1,2].

OPR.ATO contains the commands to load the communications front end, to start IBMSPL, and to run OPR to TAKE SYSTEM.CMD.

SYSTEM.CMD normally contains all the OPR commands needed to DEFINE a node, SET its transmission characteristics, and start scheduling for its objects. If you have manually issued these commands, you already know their exact format.

Any special form that a user needs for printing files returned from the IBM host must be specified in the system file LPFORM.INI.

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

- ➡ Step 54: Copy OPR.ATO to your area for editing, and call your preferred editor such as TECO.

Edit the OPR.ATO file to

- load the communications front end
- have OPR take the file SYSTEM.CMD

The entries you place in OPR.ATO depend upon whether you are connecting to a remote host (IBM 370/303x) or remote station. They also depend upon whether you are using 2780, 3780 or HASP functions. (See the appendixes for explanations of all host OPR commands and parameters that can be used.)

To load the communications front end and run IBMSPL manually, do not edit these system files. If you have already manually loaded the front end and done some communications to remote sites, you have recorded the port numbers for each connection on your Installation Worksheet.

```
.COPY = SYS:OPR.ATO (RET)
.R TECO (RET)
*EROPR.ATO$EWOPR.ATOSY$$
*
```

Select the commands to place in OPR.ATO from the groups below. Select one of the first two groups; always use group 3; use group 4 only when communicating with an IBM host.

1. To load over a DL10, insert lines of the following form in OPR.ATO:

```
:SLOG
:DEF DL101=
DL101-R BOOT11
DL101-SYS:D6LQH.BIN/P:7
```

Give the filename of the file to load into the front end (e.g., D6LQH.BIN), and the port number of the front end (e.g., P:7). (See Figure 3-4.)

2. To load over a DTE20, insert lines of the following form in OPR.ATO:

```
:SLOG
:DEF DTE1=
DTE1-R DTE1DR
DTE1-/INIT:03
DTE1-SYS:D6TKH.BIN/RELOAD:03/NODUMP
```

Give the filename of the file to load into the front end (e.g., D6TKH.BIN), and the DTE number of the front end (e.g., P:3). (See Figure 3-5.)

3. To run a copy of OPR and execute the command TAKE SYSTEM.CMD, use lines of the following form:

```
:SLOG
:DEF OPR=
OPR-R OPR
OPR-TAKE SYS:SYSTEM.CMD
OPR-EXIT
```

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

4. To connect to a remote host, insert the following lines in OPR.ATO:

```
:SLOG
:DEF IBM=
IBM-R IBMSPL
```

- ➡ Step 55: Type EX\$\$ to end your edit and save the file.

```
*EX$$
```

.

- ➡ Step 56: Type COPY [1,4]=OPR.ATO (RET)

Copy the file you have just created or edited to SYS:.

- ➡ Step 57: Copy SYSTEM.CMD from SYS to your area for editing, and use any preferred editor such as TECO.

```
.COPY =SYS:SYSTEM.CMD (RET)
```

Enter all the commands for OPR. Do not abbreviate, and insert one space between each argument. The lines in the following example illustrate only one case for each transmission mode. For your installation, parts of these commands can be different. You must always have at least a **DEFINE** for every node you define that is to do IBM communications. See your Installation Worksheet for the definitions you have created for each IBM node.

```
[example for emulation]
.R TECO (RET)
*ERsystem.CMD$EWSsystem.cmd$y$$
*Idefine node ibml:: hasp emulation 11 0 (RET) $$
*Iset node ibml:: clear-send-delay 9 (RET) S$
*EX$$
```

.

```
[example for termination]
.R TECO (RET)
*ERsystem.CMD$EWSsystem.cmd$y$$
*Idefine node rjel:: 3780 termination 13 0 (RET) $$
*EX$$
```

.

- ➡ Step 58: Type TY system.cmd (RET)

Type out the file you have just created to verify that it is correct. The file should have no line numbers.

```
$TY SYSTEM.CMD
define node ibml:: hasp emulation 11 0
set node ibml:: clear-send-delay 9
```

- ➡ Step 59: Type COPY [1,4]=SYSTEM.CMD (RET)

Copy the file you have just created or edited to SYS:

IBM COMMUNICATIONS SOFTWARE INSTALLATION PROCEDURES

3.6 SHUTDOWN AND RESTART THE SYSTEM - PHASE 5

When you have edited your system files, you can go to the operator's console (the CTY), shut down the system and bring it up again. Before doing this, be sure that no other users are on the system.

➡ Step 60: Go to the CTY and shutdown the system. For detailed information on system shutdown, see the TOPS-10 Operator's Guide.

➡ Step 61: Bring up your system and verify that the system files have been executed.

➡ Step 62: Type R OPR

Run OPR to start your IBM communications nodes.

```
R OPR
OPR>
```

➡ Step 63: Type SHO STA NET

Verify that your nodes have been defined in the network with the SHOW STATUS NETWORK-NODES command.

```
OPR>
hh:mm:ss      -- System Network Status --

Node Name      Status
IBM1           Offline (IBM Emulation)

There is 1 node in the network
OPR>
```

➡ Step 64: Type STA NO IBM1::

Use the START NODE command to start your node.

```
OPR>STA NO IBM1::
OPR>
hh:mm:ss      Batch-Stream 0 [IBM1] -- Startup Scheduled --
OPR>
```

➡ Step 65: Dial up the remote site.

You must dial up the remote site within five minutes of issuing your START NODE command.

➡ Step 66: Pause

This completes your installation of IBM communications software and as much verification of the system as is necessary. The final test of your system is its daily use for IBM emulation and/or termination.

CHAPTER 4

IBM COMMUNICATIONS OPERATOR PROCEDURES

The IBM communications software can be accessed by three types of operators:

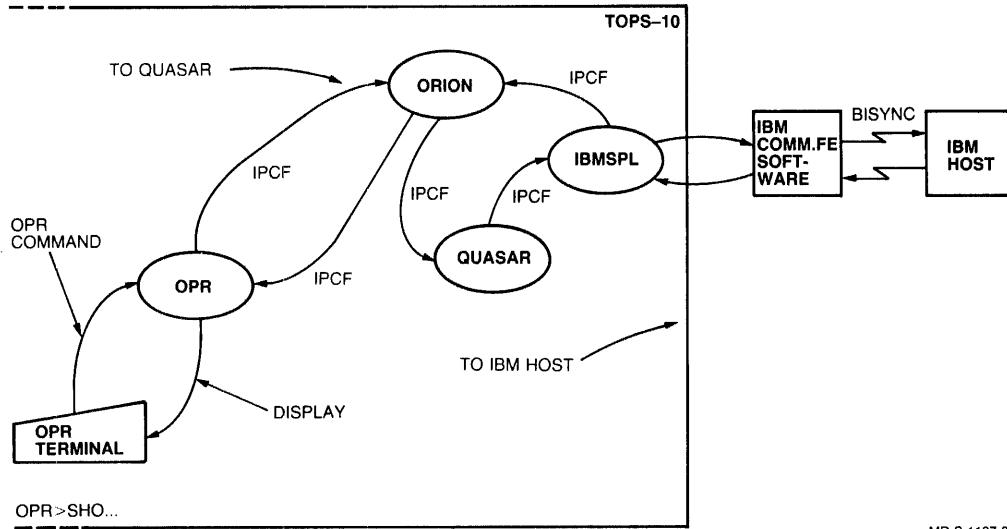
- TOPS-10 host operators
- remote station operators at DATA 100 sites acting as 2780, 3780 or HASP multileaving stations
- IBM host operators

As the TOPS-10 operator, you are the controlling operator of the entire process. It is up to you to be sure that the communications front end has been loaded and that the necessary spoolers are running. Communicating with remote stations is supported by LPTSPL and CDRIVE; communicating with any number of IBM host computers is supported by IBMSPL. A typical configuration running IBM communications software is illustrated in Figure 3-1 (see the IBM Communications Software Installation Procedures).

The lines attached to the communications front end are generally connected to dial-up modems. As the TOPS-10 operator, you must call the remote system over the dial-up line to make the connection and permit sending and receiving jobs. The remote station operator is responsible for turning on his card reader and printer, keeping the printer filled with paper, and reading in job decks. The IBM host operator has control over jobs in the input and output queues of the IBM system that are being sent to and received from the TOPS-10 host. As the TOPS-10 operator, you also have some control over jobs which you contact with the OPR command SEND (To) BATCH-STREAM.

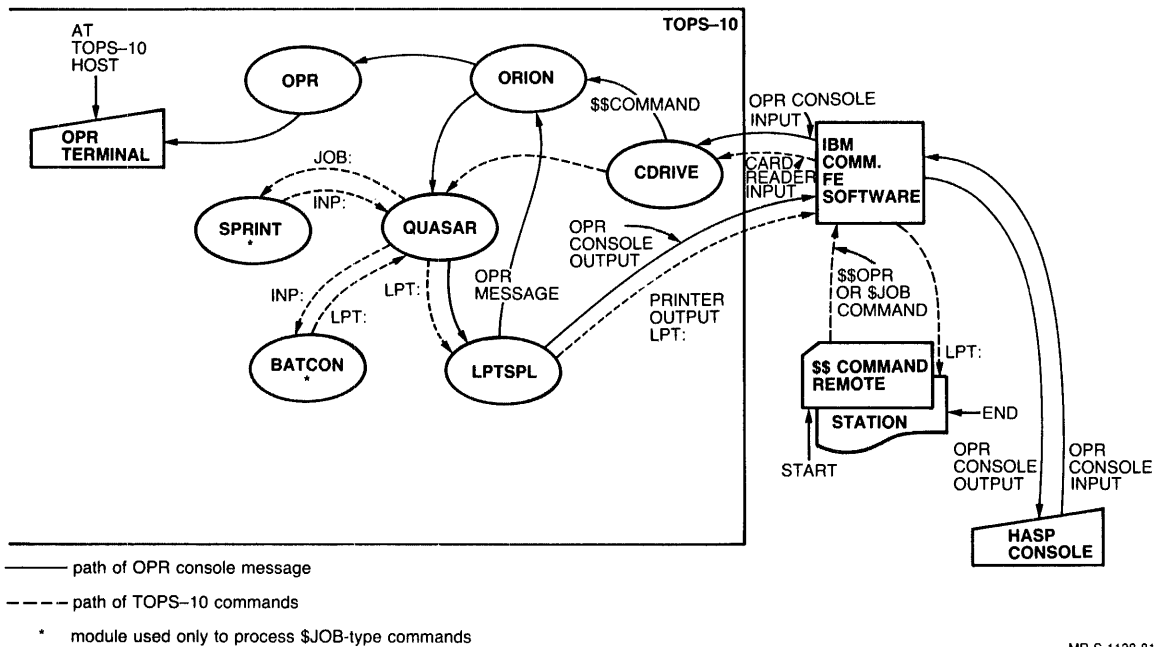
The software components you use contain components of GALAXY such as LPTSPL and OPR, as well as the IBM communications software (see Figures 4-1 and 4-2).

IBM COMMUNICATIONS OPERATOR PROCEDURES



MR-S-1137-81

Figure 4-1 Emulation with GALAXY and the Operator Interface



MR-S-1138-81

Figure 4-2 Termination with GALAXY and the Operator Interface

In emulation mode, the software communicates between a TOPS-10 host and an IBM host. As jobs and log files are received from remote components, files are created on the TOPS-10 disk. These files are temporarily stored in the ersatz device D60, and later placed in the user p,pn, or, if no user is specified, printed and deleted. In emulation, a job is submitted to an IBM host from the TOPS-10 host, executed, and returned to the TOPS-10 host. The files are then recorded on the TOPS-10 disk and printed on the printer.

IBM COMMUNICATIONS OPERATOR PROCEDURES

In termination mode, the software communicates between a TOPS-10 host and an IBM-type remote station. In termination, a job deck read at the remote site is sent to the TOPS-10 host and executed. The created files are then recorded on the TOPS-10 disk and the .LOG file is returned to the station that originated the job.

The TOPS-10 batch system contains programs that control queuing of input and output operations for slow devices (card readers and line printers). It is therefore most of all a queue management system, with an overall controlling program called QUASAR. QUASAR is generally invisible to the terminal user, but other components of GALAXY are not. LPTSPL is the spooler that copies print images from disk to local and remote line printers; CDRIVE is the spooler that copies card images from local and remote card readers to disk; IBMSPL is the spooler that copies data files from the TOPS-10 disk, sends them to an IBM host, captures data returned from the IBM host, and places it on the TOPS-10 disk; ORION and OPR are components of the facility provided for the operator at the TOPS-10 host site.

4.1 THE TOPS-10 OPERATOR

As the TOPS-10 operator, to begin IBM communications operations, you must:

- run the spoolers (IBMSPL, LPTSPL, CDRIVE)
- load your communications front end (if it is not running)
- be sure the appropriate signon files exist
- use OPR to DEFINE, SET, and START each node
- dial up the remote site

4.1.1 Loading the Communications Front End

There are two programs for loading the communications front end, BOOT11, and DTELDR. Use the one that applies to your hardware:

1. To load over a DL10, use BOOT11
2. To load over a DTE20, use DTELDR

BOOT11 requires a filespec (for example, D6LQH.BIN) and a DL10 port number (0 to 7).

For example, to load over a DL10, use commands of the following form:

```
.R BOOT11 RET  
File: SYS:D6LQH.BIN/P:7 RET
```

(See Figures 3-4 and 3-5)

DTELDR requires a filespec (e.g., D6TKH.BIN) and a DTE number (1 to 3).

IBM COMMUNICATIONS OPERATOR PROCEDURES

For example, to load over a DTE, use commands of the following form:

```
.R DTELDRET  
*SYS:D6TKH.BIN/RELOAD:02/DUMPRET
```

(See Figure 3-5)

For details of the arguments applicable at your installation, consult your Operations Supervisor, Systems Programmer, or the installation procedures in this manual. The information collected is also summarized on the Installation Worksheet.

4.1.2 Defining an IBM Node

To notify QUASAR that it is to communicate with a termination station acting as an IBM 3780, use commands to OPR as in the following example:

```
OPRRET  
OPR>DEFINE NODE (name)IBMTERT: (type) 3780/SIGNON-REQUIRED (mode) TERMINATION (port) 11 (line) 0RET  
OPR>
```

The arguments to this command are:

Name:	Nodename (up to 6 characters)
Type:	2780, 3780 or HASP
Signon:	/SIGNON-REQUIRED or /NO-SIGNON-REQUIRED
Mode:	Emulation or termination
Port:	For a DL10: 0 to 7 For a DTE: 11, 12, or 13
Line:	0 to 5

You can define multiple nodes for the same line, but you can only start one node on a line at a time.

If you try to start more than one node on a line at a time, you receive an error message:

```
-- Illegal Start Command --
```

```
Port n/Line m already started as node xxx
```

Once this command has been executed, OPR responds with a message of the following form:

```
OPR>  
14:41:15 -- Define for Node nodename Accepted --
```

Before you define a prototype termination node, the signon file for all the actual termination nodes under that prototype termination node must exist. (See Section 3.2.1, "Prototype Nodes," for an explanation of prototype nodes.) If the signon file does not exist, you receive a message:

```
-- Define for Node xxx Ignored --  
Failed to open signon file - File not found
```


IBM COMMUNICATIONS OPERATOR PROCEDURES

This type of message can also occur if there is an error in the signon file.

When you define a prototype termination node, all the actual nodes in the signon file appear in the response:

```
hh:mm:ss  -- Define for Node JACK Accepted --  
hh:mm:ss  -- Define for Node Jill Accepted --  
           and so on.
```

NOTE

You cannot define a prototype node that already has devices started, and you cannot redefine an IBM node as a non-IBM node.

NOTE

The communications front end should be running and, for a termination node, you must have the appropriate signon files in D60: before you give OPR DEFINE and START commands.

You cannot start actual termination nodes. You can start only the prototype termination node; it, in turn, starts scheduling for the actual node that signs on.

4.1.3 Setting IBM Node Parameters

The SET NODE command specifies modem-related and data-transfer-related parameters. It can be used to specify these parameters only for nodes that perform IBM communications. For termination, use SET NODE only for the prototype node.

You can use the SET NODE command to OPR to specify any or all of the following:

```
BYTES-PER-MESSAGE  
CLEAR-SEND-DELAY  
RECORDS-PER-MESSAGE  
TIMEOUT-CATEGORY  
TRANSPARENCY
```

When you set the parameters, their values are stored to take effect when you issue a START NODE command.

For more information on these commands, see Appendix B.2, "TOPS-10 Host OPR Commands for IBM Communications." In many cases, you will not need to issue these commands since you can use the defaults.

IBM COMMUNICATIONS OPERATOR PROCEDURES

You may need to set the clear-to-send delay (CSD) parameter, if the modem you are using does not have a 50 msec delay or you need to change it (for example, you may need a longer CSD if you are transmitting jobs over exceptionally long distances). The allowable settings of the CSD parameter are given in Appendix A.5, "Modems." To change the CSD, issue the following command to OPR:

```
OPR>SET NODE nodeid CL ESC n RET
```

where n is taken from the table in Appendix A.5.

4.1.3.1 Examining Node Status - Use the SHOW STATUS command to examine the status of nodes in your network. The SHOW STATUS command has two forms. Use the first form to examine status of all nodes in the network, use the second to examine the status of a single node. The two forms are illustrated below.

To see the status of all network nodes, use SHOW STATUS NETWORK-NODE

```
OPR>SHOW STA NET
```

```
hh:mm:ss          -- System Network Status --
```

<u>Node Name</u>	<u>Status</u>
KL2102	Online
ONE	Offline (IBM Emulation)
KATHY	Active (IBM Proto-termination)
JACK	Offline (IBM Termination)
JILL	Online (IBM Termination)

There are 5 nodes in the network

```
OPR>
```

If the actual node (for example, JACK) is on line, its prototype termination node is listed as "Active" rather than "Online."

You will also see, on the terminal where you run OPR, nodenames displayed as the network nodes go on and offline.

For example:

```
-- Network topology --
```

```
Nodes on-line:
```

```
D2102A      KL2102
```

```
Nodes off-line:
```

```
DN200
```

To see the status of a specific node, use SHOW STATUS/NODE:nodename:.. An emulation node status has the following form:

```
OPR>SHO ST /NODE:nodename:..
```

```
OPR>
```

```
hh:mm:ss          -- IBM node NODENAME device status --
```

IBM COMMUNICATIONS OPERATOR PROCEDURES

When transmissions occur, the node status changes and the following forms are seen:

```
OPR>SHO STA /NODE:nodename::
OPR>
hh:mm:ss          -- IBM node NODENAME device status --

  Device           Status           Seq#           Jobname           Username
Line printer      Idle
Card punch        Idle
Card reader       Sending job  1227      JOBNM           USER
  Transfer started at: date hh:mm:ss
```

If the node has not been started, OPR displays the message:

```
-- There are no devices started --
```

With the SHOW STATUS NET nodename command, OPR can also display the message:

```
-- Node xxx is Offline (IBM Termination) --
```

If the node has not been defined, OPR displays the message:

```
-- Node xxx does not exist --
```

A actual termination node status has the following form:

```
OPR>SHO STA /NODE:nodename::
OPR>
hh:mm:ss          -- System Device Status --
```

Printer Status:

<u>Unit</u>	<u>Node</u>	<u>Status</u>
0	NODENAME	Idle

Reader Status:

<u>Unit</u>	<u>Node</u>	<u>Status</u>
0	NODENAME	Idle

4.1.4 Starting an IBM Node

To start scheduling for each node, use a START NODE command to OPR, as follows:

```
OPR>START NODE nodename:: (RET)
```

For an emulation node, the nodename you give is the name of the actual node; for a termination node, the nodename you give is the name of the prototype termination node.

OPR starts scheduling for a batch stream for each emulation node, and eventually starts scheduling for a printer and a card reader for each signed-on actual termination node listed in the signon file of the prototype termination node.

IBM COMMUNICATIONS OPERATOR PROCEDURES

For a termination station with dial-in capabilities, start scheduling for the prototype termination node that applies to the termination station. Then ask the termination station operator to read in the signon card and dial in (or to dial in and read in the signon card).

For emulation, give a START NODE command and dial up the IBM host (if your line is not hardwired). The START NODE command starts scheduling for a batch stream associated with the node.

Do not start more than one node at a time on the same line. If you define more than one node at a time on the same line and try to start more than one, you receive the following error message:

```
hh:mm:ss      -- Illegal Start Command --  
Port x/Line y already started as node zzz
```

When using termination, use the START command to start the prototype termination node. If you try to start an actual termination node, you receive the message:

```
-- Illegal to start termination node xxx --  
Only a defined prototype node may be started
```

NOTE

If your DEFINE NODE command is in an OPR command file for execution at system startup time, and your termination signon file is not available when the system starts up, the node will not be defined. If the command file also contains a START NODE command for the prototype termination node, scheduling starts for a node with the nodename of the prototype node. However, the node will not be an IBM-type node. You must shut it down, retrieve the signon files, and try again to execute the command file.

When you start an emulation node, the following sequence occurs:

```
OPR> START NODE nodename: (RET)  
OPR>  
hh:mm:ss      Batch-Stream 0 [nodename]  -- Startup Scheduled  --  
OPR>  
hh:mm:ss      Batch-Stream 0 [nodename]  -- Signed on  --  
OPR>  
hh:mm:ss      -- Network Node nodename is online  --  
OPR>  
hh:mm:ss      IBM Remote 0 [nodename]  -- Console output  --
```

IBM COMMUNICATIONS OPERATOR PROCEDURES

When you start a prototype termination node, the following sequence occurs:

```
OPR> START NODE nodename: (RET)
OPR>
hh:mm:ss      Reader 0 [nodename]  -- Startup Scheduled  --
OPR>
hh:mm:ss      Reader 0 [nodename]  -- actual-nodename signed on  --
OPR>
hh:mm:ss      Reader 0 [actual-nodename]  -- Started  --
hh:mm:ss      Printer 0 [actual-nodename]  -- Startup Scheduled  --
hh:mm:ss      -- Network Node ACTUAL-NODENAME (PROTOTYPE-NODENAME) is online  --
OPR>
```

OPR commands are described in more detail in the TOPS-10 Operator's Command Language Reference Manual, and are used in examples shown in Chapter 4 of this manual, "IBM Communications Operator Procedures."

4.1.5 Shutting Down a Node

To shutdown a node, use the SHUTDOWN command.

To shut down a node defined as an IBM node, use the OPR SHUTDOWN NODE command. For example,

```
OPR> SHUT NODE nodename: (RET)
```

For an emulation node, this shuts down scheduling for the batch streams associated with the node.

To shut down a termination node use the SHUTDOWN nodename (or nodenumber) command naming the actual node you intend to shutdown. This shuts down the actual termination node. Once all the printers for the actual nodes have been shutdown, the prototype node, and the card readers go offline. You can also shutdown the prototype node.

For an emulation node, the SHUTDOWN command produces the following output:

```
OPR> SHUT NODE nodename: (RET)
OPR>
hh:mm:ss      Batch-Stream 0 [nodename]  -- Shutdown  --
hh:mm:ss      -- Network Node nodename is offline  --
OPR>
hh:mm:ss      Batch-Stream 0 [nodename]  -- Line 3 on port 13 signing off  --
OPR>
hh:mm:ss      Batch-Stream 0 [nodename]  -- Hanging up line 3 on port 13  --
```

IBM COMMUNICATIONS OPERATOR PROCEDURES

For a termination node, the SHUTDOWN command produces the following output:

```
OPR>SHUT NODE nodename:: RET
OPR>
hh:mm:ss      Reader 0 [nodename]  -- Shutdown at EOJ Scheduled  --
OPR>
hh:mm:ss      Printer 0 [nodename] -- Shutdown  --
OPR>
hh:mm:ss      Reader 0 [nodename]  -- Shutdown  --
```

These messages can be accompanied by other messages as follows:

```
hh:mm:ss      --Network Node actual (prototype) nodenames
hh:mm:ss      --No operator Console for IBM Remote actual-nodename
```

4.1.6 Dialing Up a Remote Site

As the operator at the TOPS-10 host, you may have to deal with several dial-up situations.

1. You may have a hardwired link between your communications front end and the remote site.
2. You may have multiple termination sites that will dial up a specific modem at your site.
3. You may have to dial up the modem at the IBM host site.

If you have a hardwired link, communications begin and end without your dial-up intervention. You must only ascertain that any modems in the transmission path are on and at the right speed. (Modems on each end of the line must run at the same speed.)

If you have termination sites that will dial up a specific modem, you must be sure that your signon files are properly set up and that the modem is on and set at the right speed. A line with an autoanswer modem can be dialed up from either end.

To establish communication from the TOPS-10 host to either an IBM-type station or an IBM host, you must call it on the telephone after your front end is running, unless you communicate over a leased line. (Each synchronous line must be connected to a suitable modem.) A line with an auto-answer modem can be dialed up from either end. Without an auto-answer modem, only the TOPS-10 operator can dial-up a remote site.

For most modems, the procedure is as follows:

1. Go to the telephone attached to the modem.
2. Dial the telephone number of the system with which you wish to communicate.
3. Listen for the normal ring, a normal answer 'click' and a high-pitched tone.
4. Press the DATA button on the telephone.
5. Place the telephone receiver in its cradle.

IBM COMMUNICATIONS OPERATOR PROCEDURES

The line is now ready to transmit jobs to communicating systems.

A remote station operator must be near the remote printer to turn it on and off, submit card decks and change paper. The remote station operator at a termination station running HASP may have a terminal that can send a limited set of commands to OPR. An operator at a termination station with no operator console can issue OPR commands by punching them on cards. Provision should be made to communicate directly with the remote operator by telephone.

4.1.7 Using Error Messages from IBMSPL

When IBMSPL is running, it sends status and error messages directly to OPR. You can monitor these messages or you can ignore them. To suppress them, issue a command of the following form to OPR:

```
DISABLE OUTPUT-DISPLAY IBM-MESSAGES
```

To suppress the display of status messages for all OPR objects except IBMSPL, use the following commands to OPR:

```
DISABLE OUTPUT-DISPLAY ALL-MESSAGES  
ENABLE OUTPUT-DISPLAY IBM-MESSAGES
```

You may get a message of the following form:

```
OPR>  
hh:mm:ss --Error xx opening signon file--
```

where xx can be one of the following:

```
A System Limit Was Exceeded  
Illegal File Specification  
File Not Found  
Protection Violation  
Device Was Not Available  
Unexpected System Error
```

Any of these errors can occur if the file containing the signon information required at a remote site does not exist or is not available. You must retrieve or create the signon file, place it in D60:[5,32], and restart the node with a START NODE command to OPR. (See Chapter 3, "IBM Communications Software Installation Procedures.") Other error messages you can receive from IBMSPL are described in Appendix B.4, Operator Error Messages. If IBMSPL crashes, use the standard procedure for restarting GALAXY components:

- attach to the job running IBMSPL
- restart IBMSPL
- shut down any nodes that IBMSPL was running
- restart the nodes you previously shut down

If GALAXY components CDRIVE, ORION or QUASAR go down, any active termination node is shutdown. You must restart the termination node. If LPTSPL goes down, you can simply restart it; you do not need to restart any termination node serviced by LPTSPL. While the servicing LPTSPL is absent, however, any OPR messages intended for the termination station appear on the terminal at the TOPS-10 host where OPR is running.

IBM COMMUNICATIONS OPERATOR PROCEDURES

4.1.8 TOPS-10 Host to IBM Host

To connect to an IBM host, you must run IBMSPL, and the IBM host operator must enable the line to the TOPS-10 host. He does this in the same way as he enables any line to a batch station (see Section 3.2, Prepare for Installation - Phase 1).

You should check or do the following:

1. The communications front-end must be loaded and started
2. You must have IBMSPL running
3. The signon file must exist (unless signon is not required)
4. You must DEFINE and START the emulation node with OPR
5. If you are using a dial-up line, you must now go to the modem and dial up the IBM host.

IBMSPL can receive output files from the IBM host, place the files on the TOPS-10 disk, delete them or print them according to user specifications.

IBMSPL sends jobs from TOPS-10 users to the IBM host as soon as the two hosts are communicating. If a TOPS-10 user submits a job intended for the IBM host and the job cannot be sent, it is held in the batch input queue for the IBM host until it can be sent.

If you are using HASP, you can issue operator commands at the IBM site with OPR. For example, to examine the IBM queues, run OPR and issue a SEND command of the following form:

```
OPR> SEND BATCH-STREAM 0/NODE:nodeid:: (RET)
```

You then get a response as follows:

```
Enter Text and Terminate with ^Z
```

To send a one-line message no more than 50 characters long, you can enter the message and then press (RET). For example, with some IBM operating systems, to examine the queues at the IBM host, you use the following (the \$ character is a dollar sign, not an echo of the (ESC key):

```
$ DA (RET)
(CTRL/Z)
OPR>
hh:mm:ss -- IBM Remote 1 [IBM1] -- Console output--
```

The IBM host responds by displaying the status of the queues at the IBM host at your terminal. You must use a syntax appropriate for your IBM host.

IBM COMMUNICATIONS OPERATOR PROCEDURES

To signoff, when required, from an IBM host, merely have the appropriate signoff file (nodename.SOF) in D60:. IBMSPL sends it if it exists.

NOTE

With some systems, you can get information by using a control file with a SEND command if the host supports operator questions through the remote card reader.

4.1.9 TOPS-10 Host to IBM-type Remote Station

To connect to IBM-type remote stations, you must verify that LPTSPL and CDRIVE are running. They will normally have been placed in the OPR.ATO file at installation time (see Chapter 3, the IBM Communications Software Installation Procedures).

Once you have loaded the front end, defined and started scheduling for the node that is the remote station, started the spoolers, and dialed up the remote station, jobs can be received from or sent to the station. You can also use an OPR SEND command to send messages to the operator at the remote station.

For example, to send a message to the operator at the remote station, run OPR and issue a SEND command with a /NODE: switch.

```
OPR> SEND OPERATOR /NODE:nodeid:: (RET)
```

OPR responds with a message as follows:

```
Enter Text and Terminate with ^Z
```

Type in your message and press (CTRL/Z) . The message is sent to the operator at the remote site in the following form:

```
OPR>
hh:mm:ss From Operator Terminal xx:
=>text
```

If there is no console at the remote station, the message appears on the printer at the remote station.

At your terminal, you see a message as follows:

```
hh:mm:ss      -- SEND command completed  --
```

IBM COMMUNICATIONS OPERATOR PROCEDURES

4.2 THE TERMINATION STATION OPERATOR

The operator at the remote station is responsible for turning on the station components, making them operational, keeping the printer filled with paper, and submitting card decks. As the remote termination station operator, you have remote operator privileges only. You can control all devices at your station and view status of jobs and devices at the host, but you cannot control devices at the host.

NOTE

Because this section is written to be applicable to a number of different remote stations, specific information about switches and lamps is not included. For these specifics, operators should consult the literature supplied by the manufacturer of the remote station.

To make contact with TOPS-10, as the station operator, you must turn on the card reader and printer, and make your station operational. Depending on the modems at your station and the procedures established by the TOPS-10 host operator, you can either dial up the TOPS-10 host or wait for the TOPS-10 operator to dial up your station.

For example, at some remote stations, such as DATA 100's masquerading as IBM 3780's, you must load operating software for the station itself from a deck of punched cards.

4.2.1 Beginning Communications

Once the appropriate software has been read into the station's memory, you can begin communications activities. To do this, perform the following steps:

1. Prepare a signon card. The card is punched in free format and can contain any desired character strings. For example:

```
$SIGNON nodeid password
```

Nodeids recognized by the TOPS-10 host as belonging to IBM-type stations generally contain numbers. When the signon information arrives at the TOPS-10 host, it is compared with the signon information stored in the prototype signon file. If there is no match, the station cannot signon.

2. Establish the communications path as follows (the example illustrates use of a Bell 208B modem and shows the remote station operator dialing up the TOPS-10 host):
 - Be sure the printer is operational and turned on. If you have a Bell 208B or similar modem, the TR (Terminal Ready) status lamp should be lit.
 - On the card reader, be sure the card-feed mechanism is clear.

IBM COMMUNICATIONS OPERATOR PROCEDURES

- Place the signon cards and the card weight in the card hopper.
- Press the TALK button on the telephone attached to the modem and dial the telephone number of the TOPS-10 host.
- Listen for a normal ringing sound followed by a normal answering sound. This is followed by a high-pitched tone.

NOTE

If the system does not answer, the TOPS-10 operator may not have started the line. Contact him/her to get it started.

- At the tone, press the DATA button on the telephone and place the telephone receiver in its cradle. If you have a Bell 208B or similar modem, the MR (Modem Ready) status lamp on the modem should be lit.
- Run the signon cards into the card feed doing whatever is necessary to get the station to read the cards (details will depend on your station).
- After a short interval, the printer prints the message returned from TOPS-10:

```
hh:mm:ss PRINTER 0 -- STARTED --
```

The nodeid you see in the response will be a two-digit number.

- If the telephone answers, but the signon card does not read, run the card through again. If the card still does not read, you may have a bad connection. In this case, hang up the telephone and repeat the procedure. If you still have no success, the TOPS-10 operator may not have started the line. Call him/her on the telephone.

It may take about half a minute for the printer to begin printing output for your station. If the printer remains idle for a while, you can begin reading jobs into the card reader. You must indicate EOF (perhaps by pushing a switch) between jobs, and you should wait about half a minute to get any printed output after each job is read in. Usually each job you read in will produce some output, but some jobs may produce no output or may wait a long while before producing any; sometimes output will be printed by a timesharing user. You may receive messages on the HASP console, if you are running HASP and your station has an operator's console.

IBM COMMUNICATIONS OPERATOR PROCEDURES

4.2.2 Starting and Ending Jobs

1. To transmit jobs:

- Clear the card reader feed.
- Place a job deck in the hopper of the card reader.

NOTE

IBM communications software cannot read binary decks.

- Get the unit to read the cards.
- As the unit is activated, a request-to-transmit is sent over the line to TOPS-10. Once TOPS-10 accepts the bid, the cards begin reading into the stacker. Unless your station uses the HASP multileaving protocol, if your printer is printing, it must complete the print job before cards can be read in. With the HASP protocol, your station can read cards and print simultaneously.

NOTE

On some units, such as a DATA 100, if the XMIT CHECK lamp is lit at the start of or during successful data transmission, it can be ignored. However, if no transmission occurs, see the documentation for your remote station for specific information on equipment status.

Always keep the printer ready, even when reading cards, so that TOPS-10 can send you printed output whenever needed. The printer is ready if:

1. It is filled with paper.
2. The cover is closed.
3. The printer is on.

To terminate transmissions, turn off your units and hang up the telephone (pick up the receiver, push TALK, and replace the receiver in its cradle).

IBM COMMUNICATIONS OPERATOR PROCEDURES

4.2.3 Using OPR Commands

As the operator at a remote IBM-type station, you can issue commands to OPR for control of those devices that are at your station. You cannot issue commands to affect devices at other remote nodes or at the TOPS-10 host, and you cannot use CTRL/H or ? for recognition.

At your termination site, you can issue only a subset of OPR commands. You issue these commands either by typing them at a HASP console terminal, or by punching each command and its parameters on a card. Precede each command on a card with a double dollar-sign (\$\$). CDRIVE removes the \$\$ and sends the command to ORION. For example, the following card sends a command to OPR to hold all jobs in the printer queue for your remote station:

```
$$HOLD PRINTER-JOBS *
```

The OPR commands that you can issue from a remote site are listed in Appendix B.3, "Termination Station OPR Commands."

If you are running the HASP multileaving protocol, and you have a station with an operator's console, you can issue these OPR commands from your console. Type the commands, do not precede them with \$\$\$. You can issue the subset of commands to OPR, but you cannot give other TOPS-10 commands. To issue TOPS-10 commands however, punch each on a card preceded with a single dollar-sign (\$). (See the GALAXY batch manuals for information on the commands you can use with punched cards.) Do not put \$\$ commands to OPR between TOPS-10 \$JOB and \$EOJ cards.

4.3 THE IBM HOST OPERATOR

The operator at the remote IBM host must know what line the TOPS-10 host is communicating over and have a way to contact the TOPS-10 operator.

The IBM host operator must enable the line communicating with TOPS-10 in the same way as he enables a line to any batch station.

Note to IBM Host Operator

Do not issue a \$TRMxx.PR1,S=N command to the remote "printer" which is TOPS-10. If this command to suppress banner pages and operator messages has been given, and it causes problems at the TOPS-10 host, turn it off with a \$TRMxx.PR1,S=Y command. If you need to use this command, check with the TOPS-10 operator that it does not alter files being sent.

APPENDIX A
FOR THE INSTALLER

A.1 THE IBM COMMUNICATIONS DISTRIBUTION TAPES

The IBM communications software is distributed on nine-track, 1600 BPI tapes in INTERCHANGE format. It can also be distributed in a seven-track or 800 BPI version. Each distribution tape contains one saveset and includes text, binary and source files. These files include the following: a document text on D60SPD, the IBM communications Beware file, binary and source files for the communications front end and the TOPS-10 host. (Files with both .BIN and .EXE extensions are .BIN versions for the communications front end and .EXE versions to use with DDT60). Those IBM communications software components that are part of the TOPS-10 batch system (LPTSPL and CDRIVE) are on the TOPS-10 GALAXY CUSP tape.

The naming conventions for the IBM communications binary files define the interface that the product uses, the protocol it supports, and the type of synchronous lines used in the communications front end. The file names are formed as follows:

D6xyza.ext

The first character is always D and signifies that the file contains a product for a communications front-end.

The second character is always 6.

The third character (x) specifies the host-to-front-end interface as follows:

Character	Interface
L	DL10
T	DTE20

The fourth character (y) indicates the type of synchronous lines used.

Code	Line Type
Q	DQ11
K	KMC11/DUP11

The fifth character (z) identifies the protocols the software supports.

z	Supports
3	2780/3780
H	HASP/3780/2780

FOR THE INSTALLER

The sixth character is either blank (for the normal files) or D (for debugging files).

The filename extension can be:

BIN = executable front-end files
CTL = control files
EXE = executable files with debugging features
LOG = log files
P11 = source files

The files on each of the IBM communications distribution tapes are listed below. The tape you receive may contain additional files not listed in this appendix. They are provided for the convenience of the installer. The files are grouped by product. Table A-1 lists files for TOPS-10 2780/3780; Table A-2, files for TOPS-10 2780/3780/HASP.

Table A-1
TOPS-10 2780/3780 Files

10TK3.P11	D6TQ3.EXE	LINDRV.P11
CHK60.P11	D6TQ3D.BIN	MACROS.P11
D60JSY.MAC	D6TQ3D.CTL	MDCODE.P11
D60SPD.CTL	D6TQ3D.EXE	MININT.P11
D60SPD.EXE	DDT11.MAC	MSGHDL.P11
D60SPD.MEM	HBSC.P11	PROD.P11
D60UNV.MAC	IBMCOM.BWR	QUEING.P11
D6LQ3.CTL	IBMMAC.MAC	S60.P11
D6LQ3D.CTL	IBMMAC.UNV	STGMAN.P11
D6TK3.BIN	IBMPAT.MAC	TRNTAB.P11
D6TK3.CTL	IBMSPL.CTL	XDEFIN.P11
D6TK3.EXE	IBMSPL.EXE	XDISPA.P11
D6TK3D.BIN	IBMSPL.MAC	XDL10.P11
D6TK3D.CTL	IBMUSR.MAC	XDTE10.P11
D6TK3D.EXE	INIT.P11	XL3780.P11
D6TQ3.BIN	INIT1.P11	XTENCM.P11
D6TQ3.CTL	INIT2.P11	

FOR THE INSTALLER

Table A-2
TOPS-10 2780/3780/HASP

10TK3.P11	D6TK3D.EXE	IBMPAT.MAC
10TKH.P11	D6TKH.BIN	IBMSPL.CTL
CHK60.P11	D6TKH.CTL	IBMSPL.EXE
D60SPD.CTL	D6TKH.EXE	IBMSPL.MAC
D60SPD.EXE	D6TKHD.BIN	IBMUSR.MAC
D60SPD.MAC	D6TKHD.CTL	INIT.P11
D60SPD.MEM	D6TKHD.EXE	INIT1.P11
D60UNV.MAC	D6TQ3.BIN	INIT2.P11
D60UNV.UNV	D6TQ3.CTL	LINDRV.P11
D6LQ3.BIN	D6TQ3.EXE	MACDLX.EXE
D6LQ3.CTL	D6TQ3D.BIN	MACROS.P11
D6LQ3.EXE	D6TQ3D.CTL	MDCODE.P11
D6LQ3D.BIN	D6TQ3D.EXE	MININT.P11
D6LQ3D.CTL	D6TQH.BIN	MSGHDL.P11
D6LQ3D.EXE	D6TQH.CTL	PROD.P11
D6LQH.BIN	D6TQH.EXE	QUEING.P11
D6LQH.CTL	D6TQHD.BIN	S60.P11
D6LQH.EXE	D6TQHD.CTL	STGMAN.P11
D6LQHD.BIN	D6TQHD.EXE	TRNTAB.P11
D6LQHD.CTL	DDT11.DOC	XDEFIN.P11
D6LQHD.EXE	DDT11.EXE	XDISPA.P11
D6TK3.BIN	DEBUG.P11	XDL10.P11
D6TK3.CTL	HBSC.P11	XDTE10.P11
D6TK3.EXE	IBMCOM.BWR	XL3780.P11
D6TK3D.BIN	IBMMAC.MAC	XLHASP.P11
D6TK3D.CTL	IBMMAC.UNV	XTENCM.P11

A.2 FRONT-END TRANSLATE TABLES

The ASCII-to-EBCDIC and EBCDIC-to-ASCII translate tables used by the communications front end can be changed if necessary. Generally, change the translate tables only if your printer has symbols that are not correctly represented by the current translate tables.

The macros in TRNTAB.P11 used to define the character mapping between EBCDIC and ASCII have the following form:

CHAR EBCDIC-hexcode, ASCII-representation, description,
description-prefix, offset, octal-flag

where:

EBCDIC-hexcode contains the hexadecimal code of the EBCDIC character to be translated to ASCII.

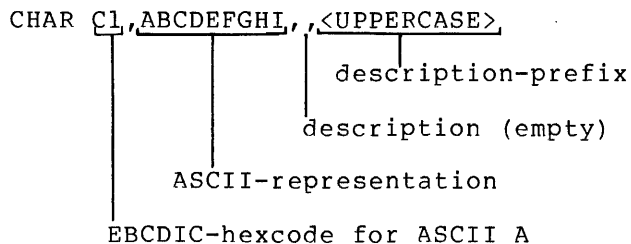
ASCII-representation contains the equivalent ASCII character or its octal equivalent. This representation can be a string of characters, or a string of octal values separated by commas and enclosed in angle brackets. When the ASCII-representation contains octal values, the last parameter (octal-flag) must contain the word OCTAL.

FOR THE INSTALLER

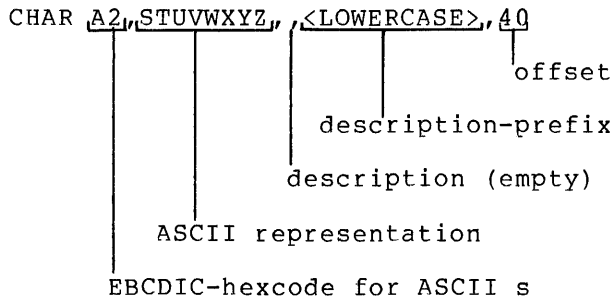
When the ASCII-representation contains a string of characters (or octal values), the EBCDIC-hexcode corresponds to the first character in the string, and TRNTAB assigns the ASCII values to successively higher EBCDIC-hexcodes. (For example, if the EBCDIC-hexcode contains C1, and the ASCII-representation contains ABCDE, then EBCDIC C1 corresponds to ASCII A; EBCDIC C2, to ASCII B, and so on.)

- description describes the character, for example, <SPACE>. If the description is omitted, the character itself, shown in the ASCII-representation, is the translated character.
- description-prefix describes the character when the description is omitted.
- offset contains an octal value to add to the octal value of each character in the current line.
- octal-flag must contain a value (such as the word OCTAL) when ASCII-representation contains octal values. Otherwise, it must be empty.

For example, the following line gives the translation for the first (uppercase) letters of the alphabet:



The following line gives the translation for the last (lowercase) letters of the alphabet:



FOR THE INSTALLER

The following line gives the translation for a comma:

```
CHAR 6B, 54, COMMA, , , OCTAL
```

The following line gives the translation for a backslash:

```
CHAR E0, ^!\!, <<REVERSE SLASH>>
```

For more information on these parameters and more examples, see TRNTAB.P11 itself.

To change the translate tables, perform the following steps:

- Log in to a directory from which you can obtain the IBM communications source files. If you have followed the procedures in Chapter 3, you are logged in as [1,2] and you have placed the source files on a selected p,pn,sfd.
- Use the directory command (DIR [p,pn,sfd]*.CTL) to find the control file for reassembly of your front-end code. The control file is named D6LQ3, D6LQH, D6TK3, D6TKH, D6TQ3, or D6TQH and has a file type .CTL.
- When you have identified the appropriate control file, copy the control file to another working [p,pn]. This leaves the control file and its binary file untouched on [p,pn,sfd] and protects against its loss when you reassemble.
- Familiarize yourself with the source module TRNTAB.P11 before editing it (type/display it on your terminal or print it).
- To change a character in the existing table, change the correspondence in the appropriate line of TRNTAB.P11. For example, to have the EBCDIC hexadecimal value 4F represented in ASCII as a vertical bar rather than as an exclamation point, change the line containing CHAR 4F as follows:

```
CHAR 4F,174,<VERTICAL BAR>,,,OCTAL
```

(The ASCII character represented by an octal 174 is a vertical bar.)

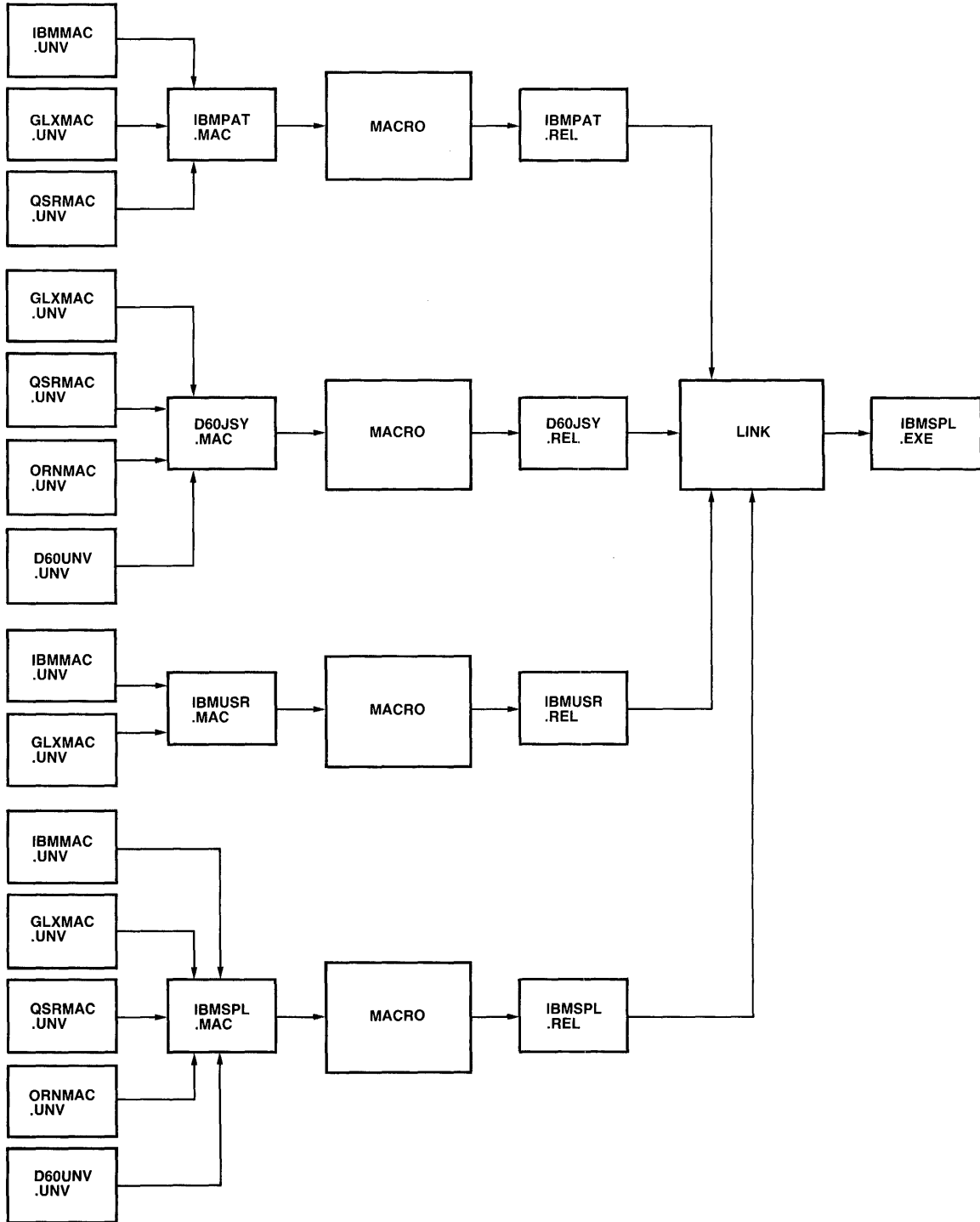
FOR THE INSTALLER

6. Edit the control file you have selected to remove any unwanted assemblies. For example, the control file may create document files that you may not wish to recreate.
7. Submit your control file to the batch system to reassemble your front-end code. The result of reassembly should be an executable binary file with a .BIN extension.
8. Copy your new .BIN file to [1,4] or [1,5]. You have left the previous version of this file on a selected subfile directory.
9. Return to the installation procedures to complete installing your software (Step 19).

A.3 IBMSPL ASSEMBLY

You can reassemble the emulation spooler, IBMSPL, if you wish to alter its modules. The modules you need to assemble and link IBMSPL are listed in Table A-3; normal procedure is shown in Figure A-1. Generally use IBMUSR to add special procedures needed for your site. You can use IBMSPL.CTL to reassemble your modules.

FOR THE INSTALLER



MR-S-1139-81

Figure A-1 IBMSPL Assembly

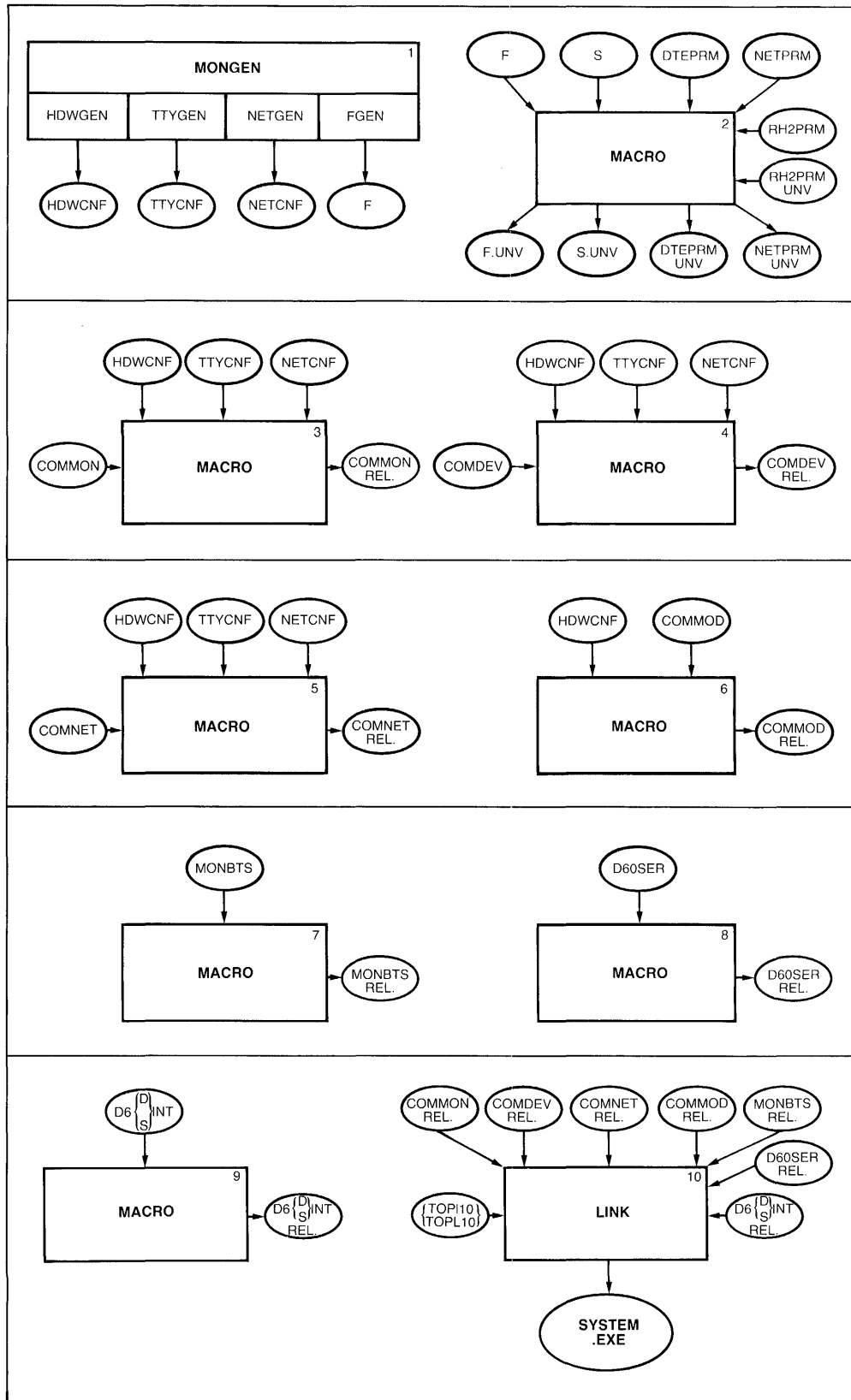
FOR THE INSTALLER

Table A-3
IBMSPL Assembly/Link Modules

Module	Function
IBMMAC GLXMAC	IBMSPL-specific data-base definitions. GALAXY macros and symbols including foundation patterns for the pattern recognition done by IBMPAT.
QSRMAC	Symbols for setup message.
ORNMAC	ORION communication symbols.
D60UNV	Universal linkage symbols for IBM communications modules.
IBMSPL	Emulation spooler.
IBMPAT	Scans each "print" line sent from an IBM host to detect patterns for log files, console output, and user switches such as PNAME, LNAME.
IBMUSR	Called once for each record sent from an IBM host; the user can supply in this module any special action needed to analyze or process data returned by the IBM host. Added code must be written in MACRO.
D60JSY	Interface routine connecting the IBMSPL and front-end software.

FOR THE INSTALLER

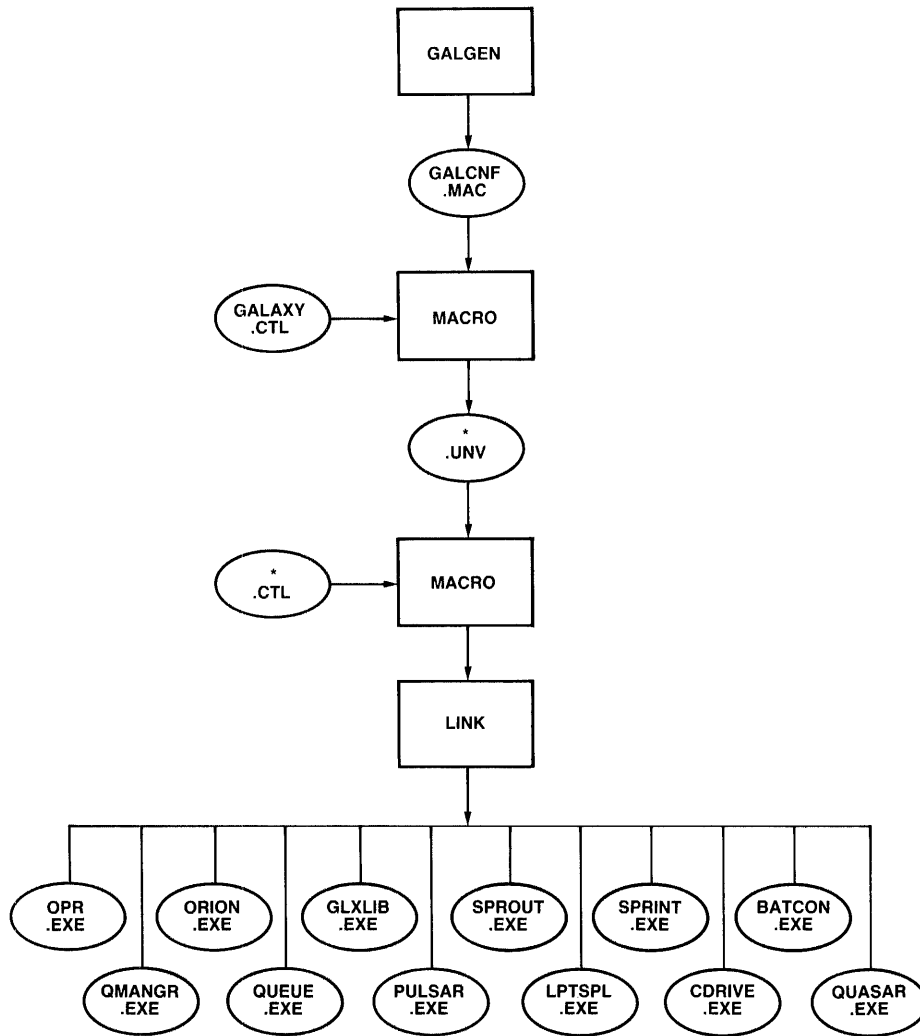
A.4 SUMMARY OF TOPS-10 MONITOR AND GALAXY INSTALLATION



MR-S-1125-81

Figure A-2 Monitor Building Process

FOR THE INSTALLER



MR-S-1140-81

Figure A-3 GALAXY Building Process

FOR THE INSTALLER

A.5 MODEMS

Modems are used between two systems at each end of a communications channel to convert the computer's digital information to analog signals that can be transmitted. Since there are many different kinds of modems, only some basic information is included here. For more information about individual modems, see the manufacturer's literature.

A few modems are listed in Table A-4. The front panel of most modern modems contains a set of push-button switches and a set of condition lamps. Numbers such as 2400 or 4800 on the front panel indicate the transmission rate (in bits per second) at which the modem can operate (for example, 2400 indicates 2400 bits per second). Switches and lamps are used in modem setup and to verify that transmission is going on.

If you are using Bell 208B modems, or equivalent, you need issue no special commands to OPR. You should, however, be sure that the '50' button on the modem is pressed in. If you are using a different modem, you may need to give the following command to OPR:

```
OPR> SET NODE nodeid:: CLEAR-SEND-DELAY d
```

where d is taken from the following table.

Table A-4
Modems and Defined Delay d

Modem	Clear-to-Send Delay (d) in Jiffies
201C	0 for 4-wire (with 8 ms clear-to-send), or 9 for 2-wire.
208A and B	3 for 50 millisecond setting (the default), or 9 for 150 millisecond setting.
209A	0 for switched RTS (recommended), or 1 for continuous RTS (not recommended). 9 may be used for switched carrier but this is definitely not recommended.
ICC COMLINK II	1
synchronous null modem	1

Use the 0 setting initially only with a modem that provides at least 8 milliseconds of delay between request-to-send and clear-to-send, since some IBM hosts need this time delay. A modem which provides 0 time (some 4-wire modems) should have clear-to-send delay set to 1 to provide 16 milliseconds of delay. When installing an IBM communications software system, experiment may show that the particular IBM host can support a 0 setting for clear-to-send delay. If this is the case, use 0 to provide maximum throughput.

FOR THE INSTALLER

If you use a modem eliminator (synchronous null modem) to connect two hosts (which cannot, in this case, be more than fifty feet apart), you must be sure that the DTR and DSR signals are crosswired (as are RTS and CO, or SD and RD). Do this so that TOPS-10 will see DSR fall whenever the IBM host crashes (and thus drops DTR). If these signals are not crosswired, the IBM host may be reloaded without TOPS-10 realizing that it must sign on again. If the DTR and DSR signals cannot be crosswired, the TOPS-10 host must be HASPGENed as **dedicated** by the IBM host so that signon is not required.

A.6 CHK60, THE HARDWARE-TEST PROGRAM

CHK60 is a program that performs a cursory analysis and verification of the hardware. Once the loader has loaded the communications front end, CHK60 runs automatically and provides information at the CTY (on the console front end). Initially, CHK60 outputs a list of all device functions present in the system. If it detects a problem, it prints error messages on the CTY. The normal output for CHK60 when used on a DN20 front end is:

```
INITIALIZING [filename - product name] DECSYSTEM-10 FRONT END,  
    WITH DTE INTERFACE ON A DEC-10 V4(160)  
    KD11-A (11/35 or 11/40)  
    160000 bytes of memory  
    MF11-UP  
    KW11-L  
    KG11-A  
    1 DL11-A  
    1 DTE20  
    1 KMC11  
    2 DUP11's  
STARTING [filename - product name] DECSYSTEM-10 FRONT END,  
    WITH DTE INTERFACE ON A DEC-10
```

There can be 1 DTE20; there is one KMC11 for each set of four synchronous lines on a DN20; the number of DUP11s reflects the number of attached synchronous lines; the number of bytes of memory is an octal value representing the number of available bytes in the 32K-word processor. Configurations on DN87 and DN87S processors are slightly different and give a different list of components. The version number is 4, followed by a number in parentheses that is the sum of the edit numbers of all the modules assembled for the front end (typically 160 or 212).

FOR THE INSTALLER

If it encounters an error, CHK60 outputs a message in the following format:

```
? unit #n (ADR=addr)
  ERROR DETECTED AT PC listing
    message
  ADR/REG=addr GD=exp.value BD=value XOR=bits
```

where: unit is the name of the device or unit.

n is the number of the unit.

addr is the address of the register under test.

listing is the address in the CHK60 source listing where the error can be found.

exp.value is the expected value to be found in that register.

value is the value actually found in the register.

XOR is the exclusive OR of the expected and found values.

If CHK60 encounters a non-fatal error, it displays the following message:

```
DELETE EXECUTION [Y or N]
```

Answer Y to skip completion of CHK60, or N to continue running the front end.

If the problem encountered causes the communications front end to crash, CHK60 outputs the following message:

```
[FATAL ERROR]
```

If you receive a fatal error, try once more. If the error persists, call Field Service. Your hardware is probably broken.

CHK60 initially performs a hardware survey of all attached devices and then outputs their names and numbers. It then performs tests of bit clearing/setting in various registers and interrupt tests to verify that various devices interrupt correctly. Then it performs a memory test (using a sliding bit pattern) to exercise each bit in memory. Finally, for a DN20 or DN87S, it determines the DTE20 base address.

When CHK60 encounters an error, it can output any of several messages. With a fatal error, a stop code is placed in R0 (see Table A-6, CHK60 Stop Codes). You can find CHK60 error messages described in the CHK11 Reference Manual. Generally, if CHK60 encounters an error, there is a hardware problem on your front end.

FOR THE INSTALLER

If CHK60 issues error messages about one or more DQ11s, there may be a problem in the switches on the M7818 ROM. For the 2780/3780 product, set the switches as follows:

Table A-5
M7818 Switch Settings

Package	Switches	Settings
1	8 - 1	all off
2	16 - 9	all off
3	24 - 17	all off
4	32 - 25	on, on, off, on, off, off, on, off (character = 055)
5	40 - 33	on, on, off, off, off, on, on, on
6	48 - 41	on, on, on, on, on, on, off, off (character = 003)
7	56 - 49	on, on, off, on, on, off, off, on (character = 046)

Table A-6
CHK60 Stop Codes

Code	Meaning
1	Timeout or bus error; trap to address 4.
2	DTE20 error.
5	No CTY.
6	Memory error.
7	KW11 error.
10	Other.

Stop Codes are set in R0 when the communications front end crashes.

A.7 USING D60SPD

D60SPD is a measurement and diagnostic tool that can be used by the software installer to exercise the IBM communications front end routines. D60SPD runs in the TOPS-10 host and permits the user to specify port, line, and device numbers as well as other parameters. With D60SPD, the installer can communicate over a synchronous line in a simulation of communication with a remote station or host computer. To use D60SPD, HELPER.REL must be an REL:[5,11].

As D60SPD executes, it generates reports on the terminal from which you run it. Status can be examined by giving the STATUS command, and the user has several options for specifying input/output operations. Several D60SPD commands have multiple switches. D60SPD commands are explained in Table A-7. Commands with switches are explained after the table.

FOR THE INSTALLER

Use D60SPD to do the following:

- check on the status of a link to an IBM host
- check error counters
- do a loopback test
- test input or output for a remote station

Table A-7
D60SPD Commands

Command	Operation
ABORT*	Issues either an input or output abort command to the IBM communications software.
AUTO filespec	Automatically executes D60SPD commands that are stored in filespec. The default filespec is DSK:D60SPD.ATO.
DDT	If DDT has been loaded, this command brings the user to DDT command level. If DDT has not been loaded, an error message is issued.
EOF	Sends an End-of-File (EOF) while D60SPD is doing output.
EXIT	Exits D60SPD.
HELP	Outputs the D60SPD.HLP file.
INPUT*	Receives input from the front end.
NOTYPEAHEAD	Commands D60SPD not to scan for type-ahead.
OUTPUT*	Writes/prints a specified file to the IBM communications software.
PARAM	Prints the contents of the CAL11. UO0 six-word parameter block.
RESTART	Restarts D60SPD execution.
SET*	Specifies port, line, and device numbers; support, simulate mode; and protocol (2780, 3780 and HASP).
STATUS*	Outputs software version, number of free chunks, number of lines, port and device status.
TYPEAHEAD	Accepts type-ahead during D60SPD execution.
WHAT	Outputs port, line and device numbers.

* Switches to this command are described on the next few pages.

FOR THE INSTALLER

The syntax and switches for D60SPD commands follow. Switches can appear in any order. Once you specify a port or line number, D60SPD uses that port or line number in subsequent commands until you specify another port or line. In the syntax specification, the following conventions are used:

- [] indicates optional parameters.
- { } indicates a choice - one must be selected.
- d indicates a decimal value.
- o indicates an octal value for the port number. For a KI10, this is the DL10 number, 0 to 7; for a KI10 or KL10, this is the DTE number plus 10 (octal); that is, 11, 12 or 13.

NOTE

Never use port 10 on a KL10; you may disable the console front end.

l indicates the synchronous line number (0 to 5).

ABORT

Syntax: ABORT[sw] [sw]...[sw]

Switch

Specifies

/DEVICE:d	Device number (always 0).
/INPUT	Abort the input (default).
/LINE:l	Line number.
/NOWAIT	Do not wait for abort-complete.
/OUTPUT	Abort the output (default).
/PORT:o	Port number.
/WAIT	Wait for abort-complete and clear it.

FOR THE INSTALLER

INPUT

Syntax: INPUT[dev:] [filespec.ext] [sw] [sw]...[sw]

Switch	Specifies
/BUFSIZ:b	Size of KL10 data buffer, in words (default equal to /NUMBYT).
/BYTPOS:m	Position of the first byte in the data buffer (default=0).
/BYTWRD:n	Number of bytes per word in the data buffer (default = 5 seven-bit bytes); the value of n can be: 4 = 8 bits/byte 5 = 7 bits/byte 6 = 6 bits/byte
/CCC:asc	Control character inserted after carriage return with automatic character generator (default = octal 012 - line feed if CCC: is not used).
/DEVICE:d	Device number (always 0).
/DEVTYP:u	Device type (0 = unknown (this is the default), 1 = console output, 2 = console input, 3 = card reader, 4 = printer, 5 = card punch).
/FCHAR:asc	First character to be output with automatic character generator (default = octal 040 - ASCII space character).
/LCHAR:asc	Last character to be output with automatic character generator (default = octal 176 - ASCII tilde character).
/LINE:l	Line number (0 to 5).
/NUMBYT:b	Number of bytes in the buffer to use (default = 4000).
/NUMCHR:d	The number of characters to transmit before sending an EOF (default = 0; no limit).
/OFFSET:m	Word in the buffer to do transfers to/from (default = 0).
/PORT:o	Port number.
/TIME:m	Time between reports (default = 10 seconds). If 0 is specified, no reports are made. Format is seconds or mm:ss.
/WIDTH:wid	Line length when using the automatic character generator (default = 132 characters).

where:

asc = octal representation of ASCII character (000 to 176)
b = 0 to 4095
d = 0
dev: = logical device name
l = 0 to 5
m = any decimal integer
n = 4 to 6
o = 0 to 7, 10 to 13
u = unit:1=printer, 3=card reader
wid = 1 to 132

FOR THE INSTALLER

If the INPUT command is used with no dev: or filespec, the data is discarded.

Examples:

```
INPUT RET
INPUT /PORT:11/LINE:0 RET
INPUT MYFILE.TXT/TIME:60 RET
```

OUTPUT

Syntax: OUTPUT[dev:] [filespec.ext] [sw] [sw]...[sw]

Switches and operation are the same as for INPUT.

If the OUTPUT command is used with no dev: or filespec, the automatic character generator is invoked.

Examples:

```
OUTPUT RET
OUTPUT /FCHAR:101/LCHAR:105/WIDTH:5/NUMBYT:100 RET
```

SET

Syntax:

SET { DEVICE:d
LINE:l
PORT:o
SIMULATE
SUPPORT } [sw] [sw]...[sw]

Each of these SET commands is explained separately below.

SET DEVICE:d [/CMD:c
/CMD:1[/DEV TYP:a]
/CMD:2[/RECORDS:r] [/LINE:l] [/PORT:o]
/CMD:12[/COMPCD:e]
/CMD:14[/PLC:p]
/CMD:16[/BUFSIZ:b]

where:

- a = 0 to 3
- b = 1 to 512
- c = 1 to 29 (see below)
- d = 0
- e = 1 or 2
- l = 0 to 5
- o = 0 to 7, 10 to 13
- p = 0 to 66
- r = 0 to 50

FOR THE INSTALLER

Switch	Specifies
/CMD:1	Set characteristics: /DEVTYPE:a a = 0 = unknown 1 = console output 2 = console input 3 = card reader 4 = line printer 5 = card punch
/CMD:3	Dump the output buffers.
/CMD:4	Clear input-permission was requested.
/CMD:6	Set unit to be a printer, interpret input carriage control.
/CMD:7	Clear 'interpret input carriage control'.
/CMD:8	Set 'interpret carriage control on output'.
/CMD:9	Clear 'interpret carriage control on output'.
/CMD:12	Specify output component selection. /COMPCD:e e = 1 = printer 2 = punch 3 = console [?] 4 = console [?] 5 = console [?]
/CMD:13	Do not do output component selection.
/CMD:14	Set printer line counter (0 to 66 lines). /PLC:p
/CMD:15	Disable printer line counter overflow.
/CMD:17	Do space compression on output.
/CMD:18	Do not do space compression on output.
/CMD:19	Use old protocol.
/CMD:20	Do not use old protocol.
/CMD:21	Request output permission.
/CMD:22	Grant input permission.
/CMD:23	Signal output EOF.
/CMD:24	Clear output EOF complete.
/CMD:25	Signal output abort.
/CMD:26	Clear output abort complete.
/CMD:27	Clear input EOF complete.
/CMD:28	Signal input abort.
/CMD:29	Clear input abort complete.
/CMD:30	Suspend HASP device.
/CMD:31	Engage HASP device.
/CMD:32	Set device record size. /RECSIZ:d
/LINE:l	Line number (0 to 5).
/PORT:p	Port number.

FOR THE INSTALLER

Examples:

```
SET DEVICE:0/CMD:24 (RET)
SET DEV/CMD:26 (RET)
```

```
SET LINE:1 [ /CMD:c
             /CMD:1[/TERMINAL:t] [/PORT:o]
             /FLAGS:f]
            /CMD:5 /CSD:q
            /CMD:6 /SILWAR:sil
            /CMD:9 /TBL:d
            /CMD:10/RPM:d
            /CMD:11/SIG:d
```

where:

```
c = 1 to 11
d = decimal value
f = 1 to 2
l = 0 to 5
o = 0 to 7, 10 to 13
q = 0, 1, 3, 9 or 13
t = 0 to 3
sil = 64, 128, 180
(see below)
```

Switch	Specifies
/CMD:1	Enable the line with these characteristics: <div style="margin-left: 40px;"> /TERMINAL:t t = 0 = unknown 1 = IBM 3780-like 2 = IBM 2780-like 3 = IBM HASP multileaving /FLAGS:f f = 1 = simulate 2 = primary </div>
/CMD:2	Set DTR on.
/CMD:3	Abort all data transfers and hang up (clear DTR).
/CMD:4	Disable the line.
/CMD:5	Set clear-to-send delay for connecting to modems. Specify the value in jiffies for the appropriate delay with the /CSD: switch as follows:

<u>Modem</u>	<u>Clear-to-Send Delay</u>
201A,B	1 = 4-wire, 13 = 2-wire
201C	0 = 4-wire, 9 = 2-wire
208A,B	3 = 50 msec, 9 = 150 msec
209A	0 = switched RTS
null	1

FOR THE INSTALLER

Switch	Specifies
/CMD:6	Set silo warning level with the /SILWAR: switch (default = 64); allowable settings: 64, 128, 180. Use values higher than 64 only if you are running the software near or at its rated maximum and you are getting silo overflows. Under most circumstances, 64 is an adequate value. This value must be an even number.
/CMD:7	Set output in transparent mode.
/CMD:8	Set output in non-transparent mode (default).
/CMD:9	Set maximum transmission block size in 8-bit bytes.
/TBL:d	
/CMD:10	Set number of records per transmission block.
/RPM:d	
/CMD:11	Set line signature (if 0, no signature required).
/SIG:d	
/CMD:12	Set station signed on.

Examples:

```
SET LINE:0/CMD:4 (RET)
SET LINE/CMD:1/TERM:1/FLAGS:2 (RET)
SET LINE/CMD:5/CSD:3 (RET)
SET LINE/CMD:6 (RET)
```

```
SET PORT:o[/LINE:l] [DEVICE:d]
```

where:

```
d = 0 (for 2780/3780) or LPT/CDR (for HASP)
l = 0 to 5
o = 0 to 7, 10 to 13
```

On a KI10 with a DL10, port number is 0 to 7; on a KI10 or KL10, the port number is the DTE number plus 10 (octal); the DN20 uses port 11 to 13, the console front end uses port 10.

Examples:

```
SET PORT:11 (RET)
SET PORT:11/LINE:0 (RET)
SET PORT:11/LINE:1 (RET)
```

```
SET SIMULATE[/PORT:o] [/LINE:l] [/DEVICE:d] / { 2780
                                                3780
                                                HASP }
```

where:

```
d = 0
l = 0 to 5 (line number)
o = 0 to 7, 10 to 13 (port number)
```

FOR THE INSTALLER

In simulate mode, TOPS-10 accepts files in LPT form and sends files in CDR form. This simulates connection to remote IBM hosts. You specify the transmission protocol with a 2780, 3780 or HASP switch.

```
SET SUPPORT[/PORT:o] [/LINE:l] [/DEVICE:d] / { 2780
                                              3780
                                              HASP }
```

where:

```
d = 0
l = 0 to 5 (line number)
o = 0 to 7, 10 to 13 (port number)
```

In support mode, TOPS-10 accepts files in CDR form and sends files in LPT form. This is used to simulate connection to remote IBM-type stations. You specify the transmission protocol with a 2780, 3780 or HASP switch.

Examples:

```
SET SUPPORT/PO:11/LINE:0/DE:0/3780 (RET)
SET SIMULATE/PO:12/LINE:1/HASP (RET)
```

STATUS

Syntax:

```
STATUS { ALL
        DEVICE:d
        DN60:o
        LINE:l
        PORT:o } [/PORT:o] [/LINE:l] [/DEVICE:d]
```

where:

```
d = 0 (for 2780/3780) or LPT/CDR (for HASP)
l = 0 to 5 (line number)
o = 0 to 7, 10 to 13 (port number)
```

The STATUS command outputs information about software version, number of lines, port and device number. It also indicates the window version number and the number of 'free chunks' available.

Examples:

```
STATUS PORT:11 (RET)
STATUS ALL (RET)
STATUS PORT:11/LINE:0 (RET)
STATUS LINE:0/PORT:12 (RET)
```

FOR THE INSTALLER

A.7.1 D60SPD Error Messages

D60SPD outputs many error messages that can be of value when you are testing your hardware, software, and transmission facilities. They are listed in Table A-8 with suggested recovery procedures. Table A-9 contains the error codes you can receive with the CAL11. UO.

Table A-8
[D60SPD Error Messages]

Message	Meaning	Recovery/Response
Abort from DN60	Front end has gone down.	Restart the front end.
Already doing an ABORT	You have tried to interrupt D60SPD when an INPUT or OUTPUT abort was in progress.	Wait until the initial abort is completed.
Already doing I/O	An INPUT or OUTPUT command is in process.	Wait until the initial abort is completed.
Ambiguous switch	You entered too few letters in your switch to D60SPD.	Spell out the switch more completely.
Bad BCC's	CRC statistic.	None.
CAL11. UO error (n)	The UO can have several error codes.	See Table A-9 or the TOPS-10 Monitor Calls manual for values of n.
CAL11. UO in use	Another program is using the port.	Be sure you are using the right port, or negotiate with the other user for free time on the port.
Can't clear output abort complete	Front end is failing.	Try to restart front end.

FOR THE INSTALLER

Table A-8 (Cont.)
[D60SPD Error Messages]

Message	Meaning	Recovery/Response
CLOSE UWO error	File transmission error has occurred.	Retry transmission.
COMMAND DELAY FAILURE FOR COMMAND	A failure occurred when D60SPD called the CALL1. UWO to execute a line or device command.	Try again.
Command Error-Retype Line	You have either spelled a parameter wrong or left one out.	Retype the line correctly.
CORE UWO failed	A failure occurred when D60SPD was getting or releasing memory.	Try again or verify that the front end is running.
CORE UWO failure	A failure occurred when D60SPD was getting or releasing memory.	Verify that the front end is running.
D60SPD is confused at PC:	You entered conflicting commands.	You may need to restart D60SPD.
DDT not loaded	You have tried to use DDT before it has been loaded.	Either load DDT or execute another command.
Device...: is in use by Job...	You cannot use the device you specified.	Use another device or wait until the first device is free.
Device number unknown	The device number you have specified is out of range.	Specify a device number in the allowed range.
Double Device Illegal	You have given more than one device in a command.	Give only one device in a command.

FOR THE INSTALLER

Table A-8 (Cont.)
[D60SPD Error Messages]

Message	Meaning	Recovery/Response
Double Directory Illegal	You have given more than one directory name in a command.	Give only one directory in a command.
Double Extension Illegal	You have given more than one extension to a filename.	Give only one extension in a command.
Double Filename Illegal	You have given more than one filename in a command.	Give only one filename in a command.
DQ11/DUP11 status register 1 at last error	Status register contents.	See the last error.
DQ11/DUP11 status register 2 at last error	Status register contents.	See the last error.
ENTER failure for file	File handling error.	Check that your file exists.
EOF set after issuing clear EOF	Front end failure.	You may need to reload the front end.
ERROR on device...	Device is failing.	Check your device or device specification.
Function... rejected	Front end rejects your command.	Retype your command correctly.
Illegal character range	Character you entered is out of range.	Type your command again.
Illegal Directory Specification	Directory you entered is not legal	Verify the directory name.
Illegal LUUO in D60SPD	Fatal error.	Restart D60SPD.
Illegal number of bytes	Number of bytes you entered is illegal.	Enter a correct number of bytes.
Incorrect time in command	You have entered the wrong time in a command.	Enter the correct time or interval.

FOR THE INSTALLER

Table A-8 (Cont.)
[D60SPD Error Messages]

Message	Meaning	Recovery/Response
IN UO error reading AUTO file	File error.	Verify the AUTO file.
Input aborted	Fatal line conditions occurred.	Recondition the line.
Input Result 3 without EOF or ABORT	Fatal error.	Restart D60SPD.
Invalid .Cll QU function	Fatal error.	Restart D60SPD.
Invalid DEPOSIT/ EXAMINE address or data	You entered invalid data.	Correct your data.
Invalid port number	The port number given is out of range.	Give a valid port number.
... is an Illegal Command	You entered an illegal command.	Enter a legal command.
Line is not enabled	You did not condition the line.	Condition the line (SET SUPP or SET SIM).
Line number unknown	You have given a line number out of range.	Give a correct line number.
LOOKUP error for...	A LOOKUP error occurred.	Check your input files.
LOOKUP failure for file	A LOOKUP failure occurred.	Check your input files.
Must have POKE privileges	You must have POKE privileges to run D60SPD.	Obtain the appropriate privileges from your system administrator.
No answer from front end	Front end not running.	Reload the front end.
No such device as...	You gave an invalid device name.	Use a correct device name.
Not enough arguments	The command you have issued needs more arguments.	Examine the command syntax and be sure to use all parameters.

FOR THE INSTALLER

Table A-8 (Cont.)
[D60SPD Error Messages]

Message	Meaning	Recovery/Response
Null Device Illegal	You must specify a device with HASP multileaving software.	Specify a device.
OPEN error for device	Device did not open.	Verify your device and device name.
OPEN failure for device	Device did not open.	Verify your device and device name.
Output permission wasn't granted	No output permission given.	Check your modems.
PATH. UWO failure	An error occurred when D60SPD read a user's path.	Verify the path and structures on it.
Port number unknown	You have given a port number out of range.	Give a valid port number.
Queue entry too short	Your entry was too short.	Check your entry.
Received a NULL	Informational message.	None.
Reserved command	Command you cannot use.	Use another command.
SFD Nesting Too Deep	You used too many sub-file directories.	Use fewer SFDs.
Switch not yet implemented	You used an incorrect switch.	Use another switch.
Time out while waiting for EOF complete	Front end has timed out.	Restart the front end.
Undefined function	You used an incorrect function.	Use another function.

FOR THE INSTALLER

Table A-8 (Cont.)
[D60SPD Error Messages]

Message	Meaning	Recovery/Response
Undefined function on this type of front end	You used an incorrect function.	Use another function.
Unknown monitor type	The monitor seen by D60SPD is unknown. D60SPD/monitor version skew.	Check your software versions.
Unknown type of CPU- assuming non KL	The CPU seen by D60SPD is unknown.	Check your software version and hardware.
Value missing for switch	You gave an incomplete command.	Give a complete command.
Waiting for input abort complete to set	D60SPD is waiting.	None.

Table A-9
CALL1. Error Codes

Code	Meaning
1	Caller does not have POKE privileges.
2	The function is undefined on this front end.
3	Invalid port number.
4	CALL1. facility in use, try later.
5	No answer from the front end (after about 2 seconds.)
6	Queue entry too short (DC76 only).
7	Not enough arguments.
10	Invalid examine/deposit address (more than 16 bits or front end flagged it as invalid), or deposit data was more than 16 bits.
11	In QUE11. (queue-request function), illegal function code, address check, illegal byte size, byte offset outside buffer, or buffer is too large (requires more than 16 DL10 byte pointers or more than 4095 bytes through a DTE20).
12	DTESER could not get any free core.
13	For a DTE20, the reload bit is set or the primary protocol is not running; the front end is down.
14	For a DTE20, there is not enough Executive Virtual Memory.

FOR THE INSTALLER

A.7.2 TESTING WITH D60SPD AND OPSER

To test the operation of the front-end code and the transfer of data to remote sites without using the spoolers (CDRIVE, LPTSPL, and IBMSPL), you can use OPSER and D60SPD. Several tests are described below. Select the test that is closest to your normal use of the communications software. The tests are:

- 2780 or 3780 termination
- 2780 or 3780 emulation
- HASP termination
- HASP emulation

Before you run any of these tests, be sure that no IBM nodes have been started, and that the spoolers to support the IBM nodes are not running. Furthermore, be sure you have loaded the front end with the appropriate software.

For each test, create the test file shown and use OPSER to run it (use an :AUTO command to OPSER). Each test runs one or two copies of D60SPD and transfers data to a remote site. When you create your test files, insert your own port number (PO:xx) and line number LI:y). The tests are designed to run on a single port and line. You should log in as [1,2].

When you create your test files, omit the text shown in brackets ([]), that are provided for your information only. Entries in parentheses (()) are optional. Use only uppercase letters in your test files; use filenames no more than six characters long, with three-character extensions. You must have, if connecting to an IBM host, a host signon file in IBM.SON and a file that contains a virtual deck of JCL card images to send to the IBM host.

Execute the illustrated IN and OUT commands only when your system is communicating with the remote station or host; these commands transfer data in the appropriate directions. Once you issue an IN or OUT command, you must wait for it to complete before issuing another IN or OUT command. When testing termination, the operator at the remote site can read the signon card into his card reader after you issue your IN command. However, D60SPD treats the first card read as a signon card, no matter what it contains.

2780/3780 Termination Test File:

```
[TEST1.ATO]
:KILL T1
:SLOG                               [log in]
:DEFINE T1=                          [define a subjob]
T1-RU D60SPD                         [run D60SPD]
T1-ST/PO:xx                          [show status]
T1-SET SUP/LI:y/DEV:0/3780          [enable port/line; you can also use
                                   2780]

T1-STATUS
T1-IN                               [read signon card]
                                   [**-dial up station here]
```

Use the following commands to complete the operation:

```
T1-IN any-file                      [read in cards]
T1-OUT any-file                     [print at remote printer]
```

FOR THE INSTALLER

2780/3780 Emulation Test File:

```
[TEST2.ATO]
:KILL E0
:SLOG [log in]
:DEFINE E0= [define subjob]
E0-RU D60SPD [run D60SPD]
E0-ST/PO:xx [show status]
E0-SET SIM/PO:xx/LINE:y/DEV:0/3780
[enable port/line]
[you can also use 2780]

E0-STATUS
E0-OUT IBM.SON [send signon message; required]
[**-dial up host here-]
```

Use the following commands to complete the operation:

```
E0-OUT JCL-file [send to host]
E0-IN any-file [receive from host]
```

HASP Termination Test File:

```
[TEST3.ATO]
:KILL T1
:SLOG [log in]
:DEFINE T1= [define as card reader]
T1-RU D60SPD [run D60SPD]
T1-SET SUP/LI:y/LPT/HASP
[enable port/line]

T1-STATUS
T1-IN any-file [read signon card]
[**-dial up station here-]
```

Use the following commands to complete the operation:

```
T1-IN any-file [optional-read cards]
T1-OUT any-file [send to printer]
```

HASP Emulation Test File:

```
[TEST4.ATO]
:KILL E0
:KILL T1
:SLOG [log in]
:DEFINE E0= [define subjobs]
:SLOG
:DEFINE T1=
E0-RU D60SPD [run D60SPD]
T1-RU D60SPD
E0-ST/PO:xx
T1-ST/PO:xx
E0-SET SIM/LI:y/HASP/CDR [enable port/line 0]
T1-SET SUP/LI:y/HASP/LPT [enable port/line 1]
E0-ST [keep port/line enabled]
T1-ST
E0-SET DEV/CMD:12/COMPCD:360
[make card reader the signon device]
E0-OUT IBM.SON [send signon to "host"]
T1-IN TTY: [input signon data from terminal]
E0-SET DEV/CMD:12/COMPCD:223
```

Use the following commands to complete the operation:

```
E0-OUT any-file [send a file]
T1-IN any-file [receive from "host"]
```

APPENDIX B
FOR THE OPERATOR

B.1 IBM COMMUNICATIONS STOP CODES

If the communications front end crashes (you see a stop code on the CTY), it may be necessary to take a memory dump of the PDP-11. For this purpose, use your front-end loader and its DUMP command. Then analyze the dump with DDT11. When you examine a core dump, the IBM communications stop codes (in location TRPCOD) have the following significance:

Table B-1
Stop Codes and their Meanings

Stop Code	Meaning
1	Bus trap, address error, or other trap 4.
2	DL10 error -- NXM, WCOV, and so on.
3	Chunks are messed up.
4	Illegal instruction, or IOT, trace trap, and so on.
5	No DL11-W for a console terminal.
6	Memory error (parity error, or some bits cannot be read or written).
7	Error in KW11-L (the line frequency clock); this is part of the DL11-W.
10	CHK60 detected an error.
11	Not enough front-end core for initialization.
12	The line frequency clock has stopped ticking (or the program is running on a faster CPU than the program was intended for).
13	Loop in low priority code (or the program is running on a slower CPU than the program was intended for).
14	Debugging stop (can only happen with DEBUG=1).
40	Bad address in subroutine FRECHK.
42	Unexpected receiver interrupt.
43	Unexpected transmitter interrupt.
44	DUP11 in wrong state on call of DUP11 subroutine.
45	This front end has no DUP11s.
46	Fatal DUP11 hardware error.

FOR THE OPERATOR

Table B-1 (Cont.)
Stop Codes and their Meanings

Stop Code	Meanings
47	DUP11 transmitter chunk-handling confusion.
50	DUP11 receiver chunk-handling confusion.
51	BCC accumulation error.
52	Translator message-building error.
53	TENTSK TCB vanished with a TOPS-10 interrupt.
54	Protocol error from the TOPS-10 host.
55	Error in horizontal tabulation setting message.
56	DTE20 initialization error.
57	DTE20 "to-20 done" error.
60	DTE20 "to-11 done" error.
61	DTE20 doorbell error.
62	DTE20 "E-bus parity" error.
63	DTE20 queued-protocol count broken.
64	DTE20 protocol broken.
65	DTE20 protocol broken.
66	DTE20 protocol broken.
67	KMC11 complete on an idle LCB.
70	KMC11 not following active flag.
71	KMC11 not running.
72	KMC11 keep-alive ceased.
73	KMC11 missing for a present DUP11.
74	KMC11 kill failed (timed out).
75	Trouble building HASP transmission block.
76	Pointer to device messages is zero.
77	Pointer to BSC TCB is zero.
100	Pointer to device XLATE TCB is zero.
101	Trying to do input on an output device.
102	RCB or SCB format error.
105	Format error in receive data.
106	Device number out of range.
110	Message stuck in XLHASP, could not go to BSC task.
111	Task Control Block (TCB) missing from queue.
120	DTE service errors.
141	Device number out of range.

B.2 TOPS-10 HOST OPR COMMANDS FOR IBM COMMUNICATIONS

OPR is the TOPS-10/GALAXY program for the operator. It provides commands to schedule operator tasks and certain special commands specifically designed to implement IBM communications. All OPR commands can be issued by an operator at the TOPS-10 host site; a restricted subset of OPR commands is available to the operator at an IBM-type termination station. The restricted subset is shown in Appendix B.3.

FOR THE OPERATOR

B.2.1 TOPS-10 HOST OPR COMMANDS

The OPR commands you use to specify a node for IBM communications are:

```

DEFINE NODE
SET NODE
SHOW STATUS [ /NODE:
              NETWORK-NODE ]
SHUTDOWN NODE
START NODE
    
```

These commands are described below.

B.2.1.1 The DEFINE Command - This command specifies the name of an IBM communications node, whether it is to be a 2780, 3780 or HASP node, whether it is to do emulation (communicate with a host) or termination (communicate with a remote station), and what port number and line number it is to use. The syntax is as follows:

```

DEFINE NODE (Name) nodeid (Type) { 2780 } (Mode) { EMULATION } (Port) { 0 } (Line) { 0 }
                                { 3780 }          { TERMINATION }      { 1 }
                                { HASP }
                                { 4 }
                                { 5 }
                                { 6 }
                                { 7 }
                                { 10 }
                                { 11 }
                                { 12 }
                                { 13 }
                                { 3 }
                                { 4 }
                                { 5 }
    
```

The default type is HASP, the default mode is TERMINATION. Once you DEFINE a node with this command, you can change its parameters but you cannot undefine it.

B.2.1.2 The SET NODE Command - This command specifies modem-related and data-transfer-related parameters. It can be used to specify these parameters only for IBM communications nodes. When you issue these commands, their values are stored until you issue a START NODE command.

The syntax is as follows:

```

SET NODE nodeid { BYTES-PER-MESSAGE b
                  CLEAR-SEND-DELAY d
                  DATA-TERMINAL-READY on/off
                  NO-SIGNON-REQUIRED
                  RECORDS-PER-MESSAGE
                  SIGNON-REQUIRED
                  SILO-WARNING-LEVEL nn
                  TIMEOUT-CATEGORY primary/secondary
                  TRANSPARENCY on/off }
    
```

FOR THE OPERATOR

These parameters are explained below.

Table B-2
SET NODE Parameters

Parameter	Sets
BYTES-PER-MESSAGE b	The number of bytes-per-message, where b is a decimal value. For 2780 and HASP multileaving protocols, the default is 400; for 3780, the default is 512.
CLEAR-SEND-DELAY d	Clear-to-send delay where d = 0, 1, 3, 9 or 13 normally (see Table A-4). The default CLEAR-SEND-DELAY is 3 jiffies (one jiffy is 16.6 milliseconds at 60 Hertz, 20 ms at 50 Hertz). You can use any value.
RECORDS-PER-MESSAGE r	Number of records per message, where r = 0 unlimited (default for 3780); 2 for a unit with no multirecord feature; 7 for a unit like an IBM 2780 with the multirecord feature (default for 2780).
TIMEOUT-CATEGORY primary/secondary	The timeout category used by the BSC protocol to determine how connecting systems bid for use of a line. When the TOPS-10 host connects to an IBM host running HASP, it should generally be placed in the PRIMARY timeout category. When the TOPS-10 host connects to IBM 2780- or 3780-like, it should usually be placed in the SECONDARY timeout category. The default timeout category for termination is PRIMARY; for emulation, SECONDARY.
TRANSPARENCY ON/OFF	Transparency describes a transmission mode where the recognition of most control characters is suppressed. This parameter can only be specified when using HASP. The default TRANSPARENCY is OFF.

FOR THE OPERATOR

B.2.1.3 The SHOW STATUS Command - Use the SHOW STATUS command to examine the status of nodes in your network. The SHOW STATUS command has two forms. Use the first form to examine status of all nodes in the network; use the second to examine the status of a single node. The two forms are illustrated below. A node defined as an IBM emulation or termination node appears in the network node list with the words (IBM Emulation) or (IBM Termination).

To see the status of all network nodes, use SHOW STATUS NETWORK-NODE.

```
OPR>SHOW STA NET
OPR>
hh:mm:ss                --System Network Status--

      Node Name      Status
      2102(20)       Online
      ONE(30)        Offline
      13              Online      (IBM Termination)
      IBM1            Offline     (IBM Emulation)
```

There are 3 Nodes in the Network

OPR>

To see the status of a specific node, use SHOW STATUS/NODE:nodename. An emulation node status has the following form:

```
OPR>SHO ST/NODE:nodename::
OPR>
hh:mm:ss                --IBM node NODENAME device status--

      Device          Status      Seq#      Jobname      Username
      Line printer    Idle
      Card punch      Idle
      Card reader     Idle
```

When transmissions occur, the node status changes and the following forms are seen:

```
OPR>SHO STA/NODE:nodename::
OPR>
hh:mm:ss                --IBM node NODENAME device status--

      Device          Status      Seq#      Jobname      Username
      Line printer    Receiving Job
      Started at:    date hh:mm:ss transferred  xxxx bytes
      Card punch      Idle
      Card reader     Idle
```

```
OPR>SHO STA/NODE:nodename::
OPR>
hh:mm:ss                --IBM node NODENAME device status--

      Device          Status      Seq#      Jobname      Username
      Line printer    Idle
      Card punch      Idle
      Card reader     Sending job  1227      JOBNM      USER
      Transfer started at:  date  hh:mm:ss
```

FOR THE OPERATOR

A termination node status has the following form:

```
OPR>SHO STA/NODE:nodenum::  
OPR>  
hh:mm:ss                --System Device Status--
```

Printer Status:

Unit	Node	Status
0	NODENUMBER	Idle

Reader Status:

Unit	Node	Status
0	NODENUMBER	Idle

B.2.2 The SHUTDOWN Command

To shutdown a node, use the SHUTDOWN command. For an emulation node, the SHUTDOWN command produces the following output:

```
OPR>SHUT NODE nodeid::  
OPR>  
hh:mm:ss      Batch-Stream 0 [nodeid]  --Shutdown--
```

For a termination node, the SHUTDOWN command produces the following output:

```
OPR>SHUT NODE nodename::  
OPR>  
hh:mm:ss      Reader 0 [nodeid]  --Shutdown at EOJ scheduled--  
OPR>  
hh:mm:ss      Printer 0 [nodeid] --Shutdown--  
OPR>  
hh:mm:ss      Reader 0 [nodeid]  --Shutdown--
```

These messages can be accompanied by other messages as follows:

```
hh:mm:ss  --No Operator Console for IBM Remote "NODEID"--  
hh:mm:ss  --Network Node NODEID is Offline--
```

B.2.3 The START Command

The command to start scheduling for a node that has been defined as an IBM node has the following form:

```
START NODE nodeid::
```

NOTE

Do not start more than one node at a time on the same line.

FOR THE OPERATOR

When you start an emulation node, the following sequence occurs:

```
OPR>START NODE nodename::
OPR>
hh:mm:ss    Batch-Stream 0 [nodename]  --Startup Scheduled--
OPR>
hh:mm:ss    Batch-Stream 0 [nodename]  --Signed on--
OPR>
hh:mm:ss    --Network Node nodename is Online--
OPR>
hh:mm:ss    IBM Remote 0 [nodename]  --Console output--

"IBM Remote" is an OPR object recognized by IBMSPL.
```

When you start a termination node, the following sequence occurs:

```
OPR>START NODE nodenumber::
OPR>
hh:mm:ss    Printer 0 [nodenumber]  --Startup Scheduled--
OPR>
hh:mm:ss    Reader 0 [nodenumber]  --Startup Scheduled--
OPR>
hh:mm:ss    Reader 0 [nodenumber]  --Started--
OPR>
hh:mm:ss    --Network Node nodenumber is Online--
```

OPR commands are described in more detail in the TOPS-10 Operator's Manual and, are used in examples shown in Chapter 4 of this manual, "IBM Communications Operator Procedures."

B.2.4 The OPR HELP Facility

OPR has a convenient HELP facility that can be used if you are at a TOPS-10 host site. To obtain information about the next element in a command, type ?; to see the default, press **ESC**; to see a guideword, press **ESC**. If you press **ESC** when doing so is invalid, a bell or buzzer sounds.

For example, you can use the HELP facility to obtain information about the SET NODE command as follows:

1. The OPR> prompt must be visible.

```
OPR>
```

2. Type set n **ESC**

```
  ESC
  ↓
```

```
OPR> set nODE
```

3. Type ? the HELP facility provides informative text and the current form of the command is displayed on the next line.

```
OPR>set nODE ? Nodeid
OPR>set nODE
```

4. Type your nodeid (for example, IBMJJ **ESC**)

```
  ESC
  ↓
```

```
OPR>set nODE ibmjj
```

FOR THE OPERATOR

5. Type ? the HELP facility provides information.

OPR> set nODE ibmjj: ? one of the following:

BYTES-PER-MESSAGE	CLEAR-SEND-DELAY	DATA-TERMINAL-READY
NO-SIGNON-REQUIRED	RECORDS-PER-MESSAGE	SIGNON-REQUIRED
SILO-WARNING-LEVEL	TIMEOUT-CATEGORY	TRANSPARENCY

OPR>set nODE ibmjj:

6. Type C to set the clear to send delay.

OPR>set nODE ibmjj::CLEAR-SEND-DELAY

7. Type ? to get the next HELP message.

OPR>set nODE ibmjj::CLEAR-SEND-DELAY ? Time in Jiffies
OPR> set nODE ibmjj::CLEAR-SEND-DELAY

8. Type to see the default.

OPR>set nODE ibmjj::CLEAR-SEND-DELAY 3

9. To accept the default, press ; to reject it, press the DELETE key, insert another value and press

OPR>set nODE ibmjj::CLEAR-SEND-DELAY 3
OPR>

10. If you press ? before pressing , you get the message: confirm with carriage return.

This indicates that you have entered all parameters for the command.

11. When you press , the OPR prompt, OPR>, reappears immediately. After the OPR command has been accepted, you receive a message of the following form:

OPR>
hh:mm:ss -- Set for Node IBMJJ Accepted --

12. If you type an illegal combination of values, you get the message:

?Not confirmed

Other error messages, most of which are self explanatory, are described in the Operator's Command Language Manual.

B.3 TERMINATION STATION OPR COMMANDS

The following OPR commands can be issued from an IBM-type station to control the devices at that station. You can punch them on cards or, if you are using HASP multileaving, type them in at the operator's console. When using HASP multileaving with a DATA 100 operator's console, OPR is available as soon as the station and the TOPS-10 host are communicating. Just type commands directly. (On a DATA 100's console, you may have to type CTRL A before typing OPR commands.) When you punch an OPR command on a card, precede the command with \$\$\$. You can abbreviate but you cannot use recognition.

FOR THE OPERATOR

Table B-3 lists OPR commands by function. Table B-4 lists OPR objects, and Table B-5 summarizes the OPR commands, and specifies any restrictions on their use at your termination station. Subsequent sections describe the format and use of the commands. These OPR commands provide a help facility with a HELP command, but recognition in commands using <ESC> is not supported at termination stations.

The TOPS-10 Operator's Command Language Reference Manual provides a more detailed discussion of all OPR commands, with complete syntax information.

Table B-3
OPR Command Functions

To use with the printer	ABORT ALIGN BACKSPACE FORWARDSPACE CANCEL CONTINUE STOP FORWARDSPACE BACKSPACE HOLD RELEASE RELEASE HOLD REQUEUE SET PRINTER SHUTDOWN START START SHUTDOWN STOP CONTINUE SUPPRESS
To use with the card reader	ABORT CONTINUE STOP HOLD RELEASE SHUTDOWN START START SHUTDOWN STOP CONTINUE
To direct OPR output	DISABLE OUTPUT-DISPLAY ENABLE OUTPUT-DISPLAY
To obtain information	HELP MESSAGES OPERATORS PARAMETERS SHOW QUEUES ROUTE-TABLE STATUS TIME
To communicate in the network	REPORT RESPOND SEND
To control jobs	MODIFY JOBS
To exit from OPR	EXIT

FOR THE OPERATOR

The objects shown below indicate the device or queue on which a given OPR command operates. These objects can be specified in the commands described in subsequent sections.

Table B-4
OPR Objects

Object	Meaning
BATCH-REQUEST	Request in the batch input queue.
BATCH-STREAM	Batch input stream, controlled by BATCON.
PRINTER	Line printer, controlled by LPTSPL, the output spooler.
READER	Card reader, controlled by CDRIVE, the input spooler.
ALL-JOBS	All jobs waiting or held in all queues in the system.
BATCH-JOBS	All jobs or a specified job waiting in the batch input queue, the list of jobs waiting to be processed by the GALAXY batch system.
PRINTER-JOBS	All jobs or a specified job waiting in the printer output queue.
PRINTER-REQUEST	Request in the print queue.
READER-JOBS	All jobs or a specified job waiting in the card reader input queue.

From termination nodes, you cannot execute commands containing the following OPR objects:

BATCH-STREAM
CARD-PUNCH
PAPER-TAPE-PUNCH
PLOTTER

FOR THE OPERATOR

Table B-5
OPR Commands

Command	Function	Restrictions
ABORT	Terminates a currently running job.	Only jobs queued for your termination station.
ALIGN	Prints an alignment file.	Prints only on the printer at your station.
BACKSPACE	Backspaces a print file queued to the line printer to allow repeating the printing of a job, file, or page(s).	Only backspaces a file at your station.
CANCEL	Cancels a job or jobs in a queue.	Only jobs initiated at your station and your station devices.
CONTINUE	Restarts a device temporarily stopped by the STOP command.	Only your station devices.
DISABLE	Stops the output of various types of messages.	Only messages with your station as destination.
ENABLE	Allows the output display of various types of messages.	Only messages with your station as destination.
EXIT	Exits from OPR and drops all links between OPR and the termination station.	Suppresses all OPR activity. You can only restart OPR by shutting your station down and restarting it.
FORWARDSPACE	Spaces a print file forward on the line printer to allow you to skip the printing of a job, file, or page(s).	Only for a file printing on the printer at your termination station.
HELP	Displays information about OPR commands.	Does not distinguish between information applicable at the host and at the remote site.

FOR THE OPERATOR

Table B-5 (Cont.)
OPR Commands

Command	Function	Restrictions
HOLD	Stops the scheduling for a given device.	Only for devices at your station.
MODIFY	Changes the priority of a job request.	Only jobs initiated at your station and for your station devices.
RELEASE	Starts scheduling jobs held in a GALAXY queue with a HOLD command.	Only jobs initiated at your remote site and for your station devices.
REPORT	Places a comment in the system error file ERROR.SYS.	None.
REQUEUE	Terminates a task queued to an I/O device and reschedules it for processing later.	Only jobs initiated at your station and your station devices.
RESPOND	Answers a message that has been sent to you.	One-line response to messages sent to you.
ROUTE	Transfers output from one node to another.	Only output destined for your station.
SEND	Sends text messages.	One-way-at-a-time communication.
SET	Sets parameters for OPR objects.	Only parameters for the printer at your station.
SHOW	Displays system information.	Mostly information that pertains to your station.
SHUTDOWN	Terminates scheduling for devices.	Only devices at your station.
START	Starts scheduling for devices.	Only devices at your station.
STOP	Temporarily stops devices.	Only devices at your station.
SUPPRESS	Suppresses the printing of blank lines on the printer.	Only printer at your station, and only one file or job.

FOR THE OPERATOR

ABORT: ABORTING JOBS

The ABORT command terminates a currently running job. At your station, you can only abort jobs queued for your own devices.

Format:

```
ABORT {PRINTER  
      READER} n [ /PURGE  
                /REASON:comment  
                /REQUEST-ID:nnnn ]
```

Where:

PRINTER	The printer at your termination station.
READER	The card reader at your termination station.
n	0 for a termination station (only one printer and one card reader supported).
/PURGE	Remove the job from the system. Also aborts all output from the job. For a printer job, no header and/or trailer pages are kept. ¹
/REASON:comment	Comment indicating why you aborted the job. This command appears in the user's log file or on the printed output. The comment cannot exceed a single line. The command is also recorded in the system log files ORNLOG.001 and ERROR.SYS.
/REQUEST-ID:nnnn	Request identification number assigned by the system. ¹

You cannot use the following keywords and switches to this command at a termination station:

```
BATCH-STREAM  
/NODE  
/ERROR-PROCESSING  
/NOERROR-PROCESSING
```

Example:

```
ABORT PRINTER 0 /REQUEST-ID:42 RET  
09:34:45          PRINTER 0 [DAT100]          --ABORTING--
```

¹ Switch not valid for card reader.

FOR THE OPERATOR

ALIGN: ALIGNING PRINTER PAPER

The ALIGN command halts the printer and allows you to print a special alignment file to align forms in the printer. Use the alignment file when you must align special forms such as payroll checks or invoices.

Format:

```
ALIGN PRINTER n [ Alignment Filespec  
                  /PAUSE:nnn  
                  /REPEAT-COUNT:nnnn  
                  /STOP ]
```

Where:

PRINTER	The printer at your termination station.
n	0 for a termination stations (only one printer supported).
Alignment Filespec	Name of the file (name and type) used to align the forms. The default file specification is SYS:forms.ALP, where "forms" contains the form name (for example, NARROW).
/PAUSE:nnn	Time in seconds (nnn) for the printer to wait before printing. Default: 10 seconds.
/REPEAT-COUNT:nnnn	Number of times to print the file. Default: 25
/STOP	Resume normal printing and stop aligning forms on the printer.

Example:

```
ALIGN PRINTER 0 /PAUSE:30 (RET)  
10:34:03          PRINTER 0 [77]  --ALIGNMENT SCHEDULED--
```

FOR THE OPERATOR

BACKSPACE: BACKSPACING WITHIN A FILE

The BACKSPACE command backspaces a print file destined for your printer to allow you to repeat the printing of a job, file, or page(s). For example, if forms become jammed in the printer, this command enables you to backspace the print file to repeat the damaged pages.

Format:

```
BACKSPACE PRINTER n { /COPIES:nn }
                    { /FILE
                    { /PAGES:nnnn }
```

Where:

PRINTER	The printer at your station.
n	0 for a termination station (only one printer supported).
/COPIES:nn	Number of additional copies to be printed; this number is added to the number previously queued with the PRINT command.
/FILE	Backspace and print one file.
/PAGES:nnnn	Number of pages to backspace a file currently being printed.

If you do not specify either /COPIES or /FILE, you must specify /PAGES.

You cannot use the /NODE switch with this command from a termination station.

Example:

```
BACKSPACE PRINTER 0 /PAGES:12 
10:23:50      PRINTER 0 [77]      --BACKSPACED 12 PAGES--
BACK PRI/PA:12 
hh:mm:ss      PRINTER 0 [nodenumber]  --BACKSPACED 12 PAGES--
```

FOR THE OPERATOR

CANCEL: CANCELING REQUESTS

The CANCEL command cancels job requests for jobs currently processing or waiting to be processed. If an active request is canceled, that request is aborted automatically. At your station, you can cancel requests that are in your printer queue, and you can cancel requests in the batch input queue that were initiated at your termination station.

Format:

```
CANCEL { BATCH-REQUEST
        PRINTER-REQUEST } { nnnn
                           [Proj, Prog]
                           * }
```

Where:

BATCH-REQUEST	Request in the batch input queue.
PRINTER-REQUEST	Request in the printer queue.
nnnn	Request number assigned by the system. Use request number to cancel a single request in the queue.
[Proj, Prog]	[Project, Programmer] number that identifies the user.
*	All requests in the given queue.

You cannot use the following keywords to this command from a termination station:

```
CARD-PUNCH-REQUEST
MOUNT-REQUEST
PAPER-TAPE-PUNCH-REQUEST
PLOTTER-REQUEST
```

Example:

```
CANCEL BATCH-REQUEST * RET
12:05:41                      --10 JOBS CANCELED--
```

FOR THE OPERATOR

CONTINUE: RESTARTING A STOPPED DEVICE

The CONTINUE command continues processing on a device temporarily stopped by the STOP command. At your station, you can only continue processing for your own devices.

Format:

CONTINUE { PRINTER
 READER n }

Where:

PRINTER The printer at your station.

READER The card reader at your station.

n 0 for a termination station (only one printer and one card reader supported).

You cannot use the following keywords, switches, and parameters to this command from a termination station:

BATCH-STREAM
CARD-PUNCH
PAPER-TAPE-PUNCH
PLOTTER
/NODE
x:y (range of devices)

Example:

CONTINUE PRINTER 0 RET
11:40:23 PRINTER 0 [77] --CONTINUED--

FOR THE OPERATOR

DISABLE: STOPPING MESSAGE DISPLAYS

The DISABLE command allows you to control the messages that you receive. You can disable the display of messages for any of your devices, or you can disable messages by message type (for example, JOB-MESSAGES). A simple way to select only some messages is to DISABLE OUTPUT-DISPLAY of ALL-MESSAGES, and then ENABLE OUTPUT-DISPLAY of only those you wish to see. (See the OPR ENABLE command.)

Format:

```
DISABLE OUTPUT-DISPLAY { ALL-MESSAGES
                        BATCH-MESSAGES
                        CARD-PUNCH-MESSAGES
                        CARD-READER-INTERPRETER-MESSAGES
                        IBM-MESSAGES
                        MOUNT-MESSAGES
                        PAPER-TAPE-PUNCH-MESSAGES
                        PLOTTER-MESSAGES
                        PRINTER-MESSAGES
                        READER-MESSAGES
                        USER-MESSAGES } [ /INFORMATION-MESSAGES
                                         /JOB-MESSAGES
                                         /OPR-ACTION-MESSAGES ]
```

Where:

ALL-MESSAGES	Disables all messages sent to your station.
BATCH-MESSAGES	Disables messages about batch jobs.
CARD-PUNCH-MESSAGES	Disables messages about card-punch jobs at the host.
CARD-READER-INTERPRETER-MESSAGES	Disables messages about the card reader interpreter supporting your station.
IBM-MESSAGES	Disables messages about IBMSPL.
MOUNT-MESSAGES	Disables all messages about mounting structures and tapes.
PAPER-TAPE-PUNCH-MESSAGES	Disables messages about the paper tape punch.
PLOTTER-MESSAGES	Disables messages about the plotter at the TOPS-10 host.
PRINTER-MESSAGES	Disables messages about printer jobs or your printer.
READER-MESSAGES	Disables messages about card reader jobs or your card reader.

FOR THE OPERATOR

USER-MESSAGES	Disables user messages for your station.
/INFORMATION-MESSAGES	Disables informational messages for the specified device or message type.
/JOB-MESSAGES	Disables messages about jobs for the specified device or message type.
/OPR-ACTION-MESSAGES	Disables messages for which operator action is needed for the specified device or message type.

Example:

DISABLE OUTPUT-DISPLAY USER-MESSAGES /JOB-MESSAGES

FOR THE OPERATOR

ENABLE: STARTING MESSAGE DISPLAYS

The ENABLE command allows you to control the messages that are displayed at your HASP terminal or on your termination station printer. At the remote station, you can enable the display of messages for both your devices and for devices running at the TOPS-10 host.

Format:

```
ENABLE OUTPUT-DISPLAY { ALL-MESSAGES
                       BATCH-MESSAGES
                       CARD-PUNCH-MESSAGES
                       CARD-READER-INTERPRETER-MESSAGES
                       IBM-MESSAGES
                       MOUNT-MESSAGES
                       PAPER-TAPE-PUNCH-MESSAGES
                       PLOTTER-MESSAGES
                       PRINTER-MESSAGES
                       READER-MESSAGES
                       USER-MESSAGES } [ /INFORM-MESSAGES
                                         /JOB-MESSAGES
                                         /OPR-ACTION-MESSAGES ]
```

Where:

ALL-MESSAGES	Enables the display of all OPR messages.
BATCH-MESSAGES	Enables the display of messages about batch jobs.
CARD-PUNCH-MESSAGES	Enables the display of messages about the host card punch.
CARD-READER-INTERPRETER-MESSAGES	Enables the display of messages about the card reader interpreter. Such messages occur when cards are in the wrong format or contain illegal commands.
IBM-MESSAGES	Enables the display of messages about the IBM communications spooler, IBMSPL.
MOUNT-MESSAGES	Enables the display of messages about mounting tapes and disks.
PAPER-TAPE-PUNCH-MESSAGES	Enables the display of messages about the paper tape punch at the host.
PLOTTER-MESSAGES	Enables the display of messages about the host plotter.
PRINTER-MESSAGES	Enables the display of messages about printer jobs or your printer.

FOR THE OPERATOR

READER-MESSAGES	Enables the display of messages about the card readers.
USER-MESSAGES	Enables the display of user messages.
/INFORMATION-MESSAGES	Enables the display of informational messages about a specified device or type of message.
/JOB-MESSAGES	Enables the display of messages about jobs destined for a specified device or type of message.
/OPR-ACTION-MESSAGES	Enables the display of messages that require operator action (for example, PLEASE or forms change requests).

Examples:

ENABLE OUTPUT-DISPLAY PRINTER-MESSAGES /JOB-MESSAGES

ENA OUT CARD-READER-I

FOR THE OPERATOR

EXIT: LEAVING OPR

The EXIT command terminates your connection with OPR and suppresses all OPR messages destined for your termination station. CTRL/Z also exits from OPR. To resume your connection with OPR you must SHUTDOWN your station and restart it. It is therefore good practice never to exit from OPR.

Format:

EXIT

FOR THE OPERATOR

FORWARSPACE: SKIPPING PRINT FILES

The FORWARSPACE command skips forward in a file destined for your printer to omit printing an entire job, file, or a specified number of pages. If you require only a portion of some printed output, this command lets you save paper and print only the output you need.

Format:

```
FORWARSPACE PRINTER n { /COPIES:nnnn }
                       { /FILE           }
                       { /PAGES:nnn   }
```

Where:

PRINTER	The printer at your termination station.
n	Always 0 (only one printer is supported at a remote station).
/COPIES:nnnn	Skip the indicated number of copies; this number is subtracted from the number of copies queued with the PRINT command.
/FILE	Skip one file.
/PAGES:nnnn	Skip the indicated number of pages in the file currently being printed.

You must specify either /COPIES, /FILE, or /PAGES with the FORWARSPACE command.

You cannot use the /NODE switch to this command at a termination station.

Example:

```
FORWARSPACE PRINTER 0 /COPIES:15 RET
13:21:09          PRINTER 0 [77]      --FORWARD SPACED 15 COPIES--
```

FOR THE OPERATOR

HELP: OBTAINING INFORMATION

The HELP command displays information about any of the OPR commands on your terminal. If you type HELP, OPR displays a list of available OPR commands. To obtain information about a specific OPR command, type HELP and the command name. For information about all OPR commands, type HELP *. You cannot use command recognition from a termination station.

Format:

```
HELP  [ [Command] ]  
      [ [*] ]
```

Where:

Command Any OPR command name.

Example:

```
HELP RESPOND (RET)
```

THE RESPOND COMMAND ALLOWS YOU TO REPLY TO ANY MESSAGE THAT WAS SENT TO YOU VIA WTOR (WRITE TO OPERATOR WITH RESPONSE, FROM A USER).

THE FORMAT IS:

```
RESPOND <MESSAGE-NUMBER> RESPONSE
```

WHERE <MESSAGE-NUMBER> IS AN OUTSTANDING MESSAGE NUMBER FOLLOWED BY A SINGLE OR MULTIPLE LINE RESPONSE.

FOR THE OPERATOR

HOLD: HOLDING JOBS IN A QUEUE

The HOLD command stops scheduling jobs that are waiting in a GALAXY queue. After you issue a HOLD command, jobs can still be submitted, but they are not scheduled for processing until you issue a RELEASE command. If a job has already been processed, it cannot be held.

At the termination station, you can only use the HOLD command to hold batch jobs submitted from your station and printer jobs destined for your station.

Format:

$$\text{HOLD } \left\{ \begin{array}{l} \text{BATCH-JOBS} \\ \text{PRINTER-JOBS} \end{array} \right\} \left\{ \begin{array}{l} \text{nnnn} \\ \text{[Proj, Prog]} \\ * \end{array} \right\}$$

Where:

BATCH-JOBS	Jobs in the batch input queue.
PRINTER-JOBS	Jobs in the printer queue.
nnnn	Request number assigned by the system.
[Proj, Prog]	[Project, Programmer] number that identifies the user.
*	All job requests in the specified queue.

You cannot use the following keywords and switch to this command at a termination station:

CARD-PUNCH-JOBS
PAPER-TAPE-PUNCH-JOBS
PLOTTER-JOBS
/NODE

Example:

```
HOLD PRINTER-JOBS * (RET)
13:19:04          --10 JOBS HELD--
```

FOR THE OPERATOR

MODIFY: MODIFYING REQUESTS

The MODIFY command allows you to change the priority of a batch job or printer request. Higher priority numbers are processed first. At the termination station, you can only change the priority of jobs queued for your printer and of jobs in the batch input queue submitted from your station.

Format:

```
MODIFY { BATCH-REQUEST
        PRINTER-REQUEST } { nnnn
                             [Proj, Prog] } PRIORITY nn
        *
```

Where:

BATCH-REQUEST	Requests in the batch input queue.
PRINTER-REQUEST	Requests in the line printer queue.
nnnn	Request number assigned by the system.
[Proj, Prog]	[Project, Programmer] number that identifies the user.
*	All requests in the queue for your station.
PRIORITY nn	The priority (nn) you assign to the request; must be an integer in the range 1-63.

You cannot use the following keywords to this command from a termination station:

```
ACTIVE-SWAPPING-LIST
CARD-PUNCH-REQUEST
CRASH-DUMP-LIST
PAPER-TAPE-PUNCH-REQUEST
PLOTTER-REQUEST
```

Example:

```
MODIFY PRINTER-REQUEST [27,5117] PRIORITY 5 (RET)
14:01:29          --xx REQUESTS MODIFIED--
```

FOR THE OPERATOR

RELEASE: RELEASING JOBS IN THE QUEUE

The RELEASE command restarts the scheduling of jobs for your station. Any jobs held with the HOLD command are scheduled for processing after you issue the RELEASE command.

At the termination station, you can use the RELEASE command only to release jobs queued for your station and jobs in the batch queue initiated from your station.

Format:

RELEASE { BATCH-JOBS
 PRINTER-JOBS } { nnnn
 [Proj, Prog] }
 *

Where:

BATCH-JOBS	Jobs in the batch input queue.
PRINTER-JOBS	Jobs in the printer queue.
nnnn	Request number assigned by the system.
[Proj, Prog]	[Project, Programmer] number that identifies the user.
*	All job requests held in the queue.

You cannot use the following keywords to this command at a termination station:

CARD-PUNCH-JOBS
PAPER-TAPE-PUNCH-JOBS
PLOTTER-JOBS

Example:

RELEASE BATCH-JOBS * RET
14:23:45 --2 JOBS RELEASED--

FOR THE OPERATOR

REPORT: RECORDING COMMENTS

The REPORT command allows you to report existing conditions in the system log file named ERROR.SYS. (This file is read with SYSERR.) Use REPORT when you do not wish to specify a reason with the /REASON: switch to an ABORT or REQUEUE command.

When you issue a REPORT command, your comment is placed in the ORION log file [3,3]ORNLOG.001 and in ERROR.SYS.

You can enter a single or multiple line message. Terminate a single line message with <RET>, a multiline message with CTRL/Z.

Format:

```
REPORT [User Name] [Device] [Text]
```

Where:

User Name	User name to identify the person making the report.
Device	The device that is the subject of this report; omit the device name if the report does not concern a device.
Text	A comment describing the condition to be logged.

Examples:

```
REPORT OP170 CDR170: TOO MANY PICK CHECKS (RET)
```

```
REPORT OP170 PTR (RET)
ENTER TEXT AND TERMINATE WITH ^Z
THE PRINTER AT THIS STATION IS GIVING A LOT OF PRINT HAMMER
ALARMS. F.S. HAS BEEN CALLED. (RET)
(CTRL/Z)
```

```
hh:mm:ss -- SYSERR ENTRY MADE BY THE REPORT COMMAND --
```

The SYSERR entry has the following form:

```
sequence-number. hh:mm:ss SYSTEM LOG ENTRY BY OP170 FOR DEVICE
PRT on TTY # XXX
```

```
MESSAGE: (text of message)
```


FOR THE OPERATOR

REQUEUE: RESCHEDULING JOBS

The REQUEUE command terminates a job currently in the printer queue and reschedules it for processing at a later time. The requeued job is held and its current processing terminates. To reschedule the job, issue a RELEASE command.

At your station, you can only requeue jobs queued for your own printer.

Format:

```

REQUEUE PRINTER n
    [
    /REQUEST-ID:nnnn
    BEGINNING-OF { COPY
                  FILE
                  JOB }
    CURRENT-POSITION
    /REASON:comment
    ]

```

Where:

PRINTER	The printer at your termination station.
n	Always 0.
/REQUEST-ID:nnnn	Request number assigned by the system.
BEGINNING-OF COPY	Requeue from the beginning of the copy (Also see the BACKSPACE and FORWARDSpace commands).
BEGINNING-OF FILE	Requeue from the beginning of the current file.
BEGINNING-OF JOB	Requeue from the beginning of the current job. With the JOB parameter, the entire job is reprinted.
CURRENT-POSITION	Requeue from the current position of the current job on your printer.
/REASON:comment	Record a comment indicating why you requeued the job. The comment is recorded in the OPR log file [3,3] ORNLOG.001, and in ERROR.SYS.

You cannot use the following keywords and switch to this command at a termination station:

- BATCH-STREAM
- CARD-PUNCH
- PAPER-TAPE-PUNCH
- PLOTTER
- /NODE

Example:

```

REQUEUE PRINTER 0 BEGINNING-OF JOB (RET)
15:51:06 PRINTER 0 [77] --REQUEUED--

```

FOR THE OPERATOR

RESPOND: ANSWERING MESSAGES

The RESPOND command allows you to answer a message sent from a user and waiting for a response. When a user sends a message that requires a response, OPR assigns a number to the message so that you can keep track of it. The SHOW MESSAGES command allows you to view outstanding messages. You can give a single or multiple line response.

At the remote station, you can respond only to messages that have been sent to your station.

Format:

```
RESPOND nnn Text
```

Where:

nnn Outstanding message number.

Text Response to the outstanding message.

Examples:

```
SHOW MESSAGES (RET)
hh:mm:ss      -- SYSTEM MESSAGES OUTSTANDING --

<2>          PRINTER 0 [77]
              PLEASE LOAD FORMS TYPE 'NARROW'
              Type 'RESPOND <NUMBER> CONTINUE' WHEN READY

RESPOND 2 CONTINUE (RET)
              PRINTER 0 [77] -- LOADING VFU WITH 'NARROW' --
```

FOR THE OPERATOR

SEND: SENDING MESSAGES

The SEND command sends messages to the operator at the TOPS-10 host, to a job, to a terminal, or to all terminals in the network. To send a single line message, enter the text and terminate it with <RET>. To enter a multiline message, press <RET> before entering your text, then enter the text and terminate your message with CTRL/Z.

Format:

```
SEND { ALL
      JOB nnnn
      OPERATOR
      TERMINAL nnnn } [/NODE:nodeid] Text
```

Where:

ALL	The message is sent to all terminals in the network.
JOB nnnn	The message is sent to the job with the specified number.
OPERATOR	The message is sent to the operator at the host.
TERMINAL nnnn	The message is sent to the terminal with the specified number.
nodename	The name of the node where you are sending the message.
Text	The text of the message to be sent.

You cannot use the following keyword to this command at a termination station:

BATCH-STREAM

Example 1:

```
SEND OPERATOR WHAT IS NEW STAND-ALONE SCHEDULE (RET)
14:22:50          --SEND COMMAND COMPLETED--
```

At the central site, the operator's terminal buzzer sounds and the following message is displayed:

```
hh:mm:ss From Operator 77:
=> what is new stand-alone schedule
```

Example 2:

```
SEND OPERATOR/NODE:77:: TIME TO SHUTDOWN YOUR NODE (RET)
```

At the remote site, the following message appears on the printer:

```
hh:mm:ss FROM OPERATOR TERMINAL 363:
=>TIME TO SHUT DOWN YOUR NODE
```

FOR THE OPERATOR

SET: SETTING PRINTER PARAMETERS

The SET PRINTER command sets characteristics for your printer. You can specify the name of a forms-type, what action to take when a job exceeds the output page-limit, what page-limits are allowed, and what are the priority-limits for any job in the queue for your printer. Use the SHOW PRINTER PARAMETERS command to see what values have been set. Some are initially set by default. You cannot set parameters for a printer at another node.

Format:

```
SET PRINTER      n      { /NODE:nodeid
                        FORMS-TYPE name
                        LIMIT-EXCEEDED-ACTION { ABORT
                                                ASK
                                                IGNORE }
                        PAGE-LIMITS { nnnn
                                     n:m }
                        PRIORITY-LIMITS { nn
                                          n:m } }
```

Where:

PRINTER The printer at your termination station.

n Always 0 for a termination station printer.

FORMS-TYPE name The name of the form to load into the printer.

LIMIT-EXCEEDED-ACTION Action to take if the print job exceeds the specified output page limit. You specify what action to take as follows:

 ABORT The print job terminates.

 ASK You are asked what to do (abort or continue).

 IGNORE The print job continues and the page limit is ignored.

PAGE-LIMITS Maximum number of pages allowed for printed output specified as a number (nnnn), or minimum to maximum number of pages given as a range (n:m). If you give a minimum, jobs containing less than that number of pages are not printed; if you give a maximum, jobs containing more than that number of pages are not printed.

FOR THE OPERATOR

PRIORITY-LIMITS

Priority limits of a particular printer. A normal job for your printer receives the system default priority given by the System Administrator. As the printer operator, you can give a priority range for your printer. The priority must be in the range 1-63 with higher numbers receiving service first. A user can modify the priority of his job with the MODIFY command, or set the priority of a job with a /PRIORITY switch. A job with priority outside the range is queued, but not printed. An unprivileged user can specify priority only as high as 20; he can use priority 1 to print files in the order entered, not smallest first.

Example:

```
SET PRINTER 0 LIMIT-EXCEEDED-ACTION ASK (RET)
```

FOR THE OPERATOR

SHOW: DISPLAYING SYSTEM INFORMATION

The SHOW command provides information about the system.

Use it to display the date and time, outstanding messages for your station, the parameters set for your printer, the queues and route tables, the network operators, and status of printers and card readers. Obtain information about a specific node with the /NODE: switch. Because the SHOW command has several keywords and switches, each keyword is described separately.

Format:

```
SHOW      keyword [/NODE:nodeid]
```

Where:

```
keyword  {
          MESSAGES
          OPERATORS
          PARAMETERS
          QUEUES
          ROUTE-TABLE
          STATUS
          TIME
        }
```

nodename The name of the node about which you want information.
Always follow a nodename with a double colon (::).

The following keywords to this command cannot be used at a termination station:

```
ALLOCATION
CONTROL-FILE
SYSTEM-LISTS
```

FOR THE OPERATOR

SHOW MESSAGES: Displaying Messages

The SHOW MESSAGES command displays any outstanding messages for your station. Use the RESPOND command to reply to a message, or simply take the required action. To use SHOW MESSAGES, you must ENABLE OUTPUT-DISPLAY of ALL-MESSAGES (the default) or ACTION-MESSAGES.

At the remote station, only the messages outstanding for your station are displayed.

Format:

```
SHOW MESSAGES [nnnn] [/NODE:nodeid:]
```

Where:

nnnn Outstanding message number (0 to 9999). If no number is entered, all outstanding messages, with their sequence numbers, are displayed.

nodename The name of the node about which you want information.

Example:

```
SHOW MESSAGES RET
12:31:29 -- SYSTEM MESSAGES OUTSTANDING --

12:30:30 <47> BATCH-STREAM 1 JOB #19
             SPRINT: PLEASE START THE CARD-READER.
             SEND MESSAGE TO USER: [user-id] WHEN DONE.
```

FOR THE OPERATOR

SHOW OPERATORS: Displaying Network Operators

The SHOW OPERATORS command displays information about all users in the network who are running OPR. You can use the /NODE switch to display only the users running OPR at a given node.

Format:

```
SHOW OPERATORS    [/NODE:nodeid]
```

Where:

```
nodename          The name of a specific node.
```

Example:

```
SHOW OPERATORS
14:03:31          --OPERATORS--

NODE    TYPE    TERMINAL  JOB    USER
----    -
KL1026  SYSTEM  221      61    USER[1,2]
77      REMOTE  374      2     OPR[177,2]
```


FOR THE OPERATOR

SHOW PARAMETERS: Displaying Printer Parameters

The SHOW PARAMETERS command displays the parameters set for a printer or batch stream.

Format:

```
SHOW PARAMETERS { BATCH-STREAM
                  CARD-PUNCH
                  NETWORK-NODE
                  PAPER-TAPE-PUNCH
                  PLOTTER
                  PRINTER } n [ /NODE:nodeid ]
```

Where:

BATCH-STREAM The batch streams established at your host.

CARD-PUNCH The card punch at your host.

NETWORK-NODE The IBM communications nodes established at your host.

PAPER-TAPE-PUNCH The paper-tape-punch at your host.

PARAMETERS Printer and batch stream entities for which values can be set.

PLOTTER The plotter at your host.

PRINTER The printer at your termination station.

n Always 0 for termination stations.

Example:

```
SHOW PARAMETERS PRINTER 0 (RET)
```

```
07:35:07                    -- SYSTEM DEVICE PARAMETERS--
```

```
PRINTER PARAMETERS:
```

UNIT	NODE	PAGE LIMITS	FORM	PRIO	LIM-EX	DEV-CHARS
0	DAT100	1:500	NORMAL	1:63	ASK	LOWER

```
SHOW PARAMETERS NETWORK-NODE (RET)
```

```
10:34:04    IBM NETWORK PARAMETERS
```

NODE NAME	TYPE	DTR	TRANS	PORT	LINE	CSD	RPM	BPM	SWL
77	3780/TERMINATION	ON	OFF	12	0	3	0	512	64

FOR THE OPERATOR

SHOW QUEUES: Displaying Queued Jobs

The SHOW QUEUES command displays the list of jobs that are waiting in a queue to be processed and any jobs that have been held for rescheduling. You can display all jobs for your station or only batch or printer jobs. If a job for which a HOLD command has been specified is displayed, the /HOLD switch is also displayed.

Format:

```
SHOW QUEUES { ALL-JOBS
              BATCH-JOBS
              CARD-PUNCH-JOBS
              MOUNT-REQUESTS
              PAPER-TAPE-PUNCH-JOBS
              PLOTTER-JOBS
              PRINTER-JOBS } [ /ALL
                              /NODE:nodeid
                              /SHORT ]
```

Where:

ALL-JOBS	All jobs in all system queues.
BATCH-JOBS	Only jobs in the batch input queue.
CARD-PUNCH-JOBS	Jobs queued for the host card punch.
MOUNT-REQUESTS	Requests to mount a tape or structure.
PAPER-TAPE-PUNCH-JOBS	Jobs queued for the host paper tape punch.
PLOTTER-JOBS	Jobs queued for the host plotter.
PRINTER-JOBS	Jobs queued for the printers.
/ALL	Displays complete information on the queued job or request.
/NODE:nodename	Displays information on a job or request at the given node.
/SHORT	Displays an abbreviated version of the information.

Example:

```
SHOW QUEUES PRINTER-JOBS (RET)
14:26:16          -- SYSTEM QUEUES LISTING --

PRINTER QUEUE:
JOB NAME  REQ#  LIMIT  USER
-----  -
LPTEST   317   108   ACARLSON
THERE IS 1 JOB IN THE QUEUE (NONE IN PROGRESS)
```

FOR THE OPERATOR

SHOW STATUS: Displaying Device/System Information

The SHOW STATUS command displays the current status of the batch stream and devices for your station, and of specified nodes in the network. You can use this command to determine whether your devices are active or idle. If you omit the PRINTER or READER keyword, all devices at your station for which scheduling has been started are displayed.

Format:

```
SHOW STATUS { BATCH-STREAM n
             CARD-PUNCH n
             DISK-DRIVE n
             NETWORK-NODE
             PAPER-TAPE-PUNCH n } [/NODE:nodeid] [/SHORT]
             PLOTTER n
             PRINTER n
             READER n
             STRUCTURE
             TAPE-DRIVE
```

Where:

n	Unit number for the specified device.
BATCH-STREAM	A batch input stream.
CARD-PUNCH	A card punch at the host.
DISK-DRIVE	A disk drive at the host.
NETWORK-NODE	A node in the network defined at the host.
PAPER-TAPE-PUNCH	A paper-tape-punch at the host.
PLOTTER	A plotter at the host.
PRINTER	A printer.
READER	A card reader.
STRUCTURE	A structure at the host.
TAPE-DRIVE	A tape drive at the host.
nodeid	The name of a node in the network.
/SHORT	Displays an abbreviated version of the status list. If /SHORT is not specified, complete information is displayed.

FOR THE OPERATOR

Example:

SHOW STATUS PRINTER (RET)

-- SYSTEM DEVICE STATUS --

PRINTER STATUS:

UNIT	NODE	STATUS	JOBNAME	REQ#	USER
0	77	ACTIVE	NRM	14	[user-id]

STARTED AT 19:28:55, PRINTED 0 OF 27 PAGES

NOTE

The last three columns appear only if there is an active device.

SHO ST NET (RET)

05:10:22 --SYSTEM NETWORK STATUS--

NODE NAME	STATUS
KL1026(26)	ONLINE
DN92(22)	ONLINE
COMET(70)	OFFLINE
IBM1	ONLINE (IBM Termination)

THERE ARE 4 NODES IN THE NETWORK

FOR THE OPERATOR

SHOW TIME: Displaying Date and Time

The SHOW TIME command displays the current date and time. The date is shown in the format dd-mmm-yy (day, month, year) and the time in the form hh:mm:ss (hour, minutes, seconds).

Format:

SHOW TIME

Example:

SHOW TIME
4-DEC-80 11:55:34

FOR THE OPERATOR

SHUTDOWN: TERMINATING DEVICE SCHEDULING

The SHUTDOWN command terminates scheduling for a specified device at your termination station. When you issue a SHUTDOWN command, the current job that is processing continues until it is completed. Then scheduling of jobs for the device terminates and no further jobs that require the device are processed.

At your station, you can terminate scheduling only for your own printer or card reader; you cannot terminate scheduling for devices at other nodes.

Format:

```
SHUTDOWN {PRINTER}
          {READER} n
```

Where:

PRINTER	The printer at your termination station.
READER	The card reader at your termination station.
n	Always 0 for these devices at a termination station.

Example:

```
SHUTDOWN PRINTER 0 RET
16:23:07 PRINTER 0 [77] --SHUTDOWN SCHEDULED--
```

FOR THE OPERATOR

START: STARTING DEVICE SCHEDULING

The START command starts scheduling for your printer or card reader. Use it to restart scheduling terminated by a SHUTDOWN command. At the termination station, you can start scheduling only for your own printer or card reader. You cannot start scheduling for devices at other nodes.

Format:

```
START    { PRINTER }
          { READER  }    n
```

Where:

PRINTER	The printer at your termination station.
READER	The card reader at your termination station.
n	Always 0 for these devices at a termination station.

Example:

```
START PRINTER 0 RET
20:03:09          PRINTER 0 [77]          --STARTUP SCHEDULED--
```

FOR THE OPERATOR

STOP: STOPPING DEVICES TEMPORARILY

The STOP command temporarily stops your printer or card reader. The device remains active. It is not shutdown and jobs requesting that device can still be scheduled. Restart a stopped device with a CONTINUE command.

Format:

STOP { PRINTER
 READER } n [AFTER { CURRENT-REQUEST
 EVERY-REQUEST }
 IMMEDIATELY]

Where:

- PRINTER The printer at your termination station.
- READER The card reader at your termination station.
- n Always 0 for these devices at a termination station.

You cannot use the following switch to this command at a termination station:

/NODE:

Example:

STOP READER 0 (RET)
21:04:37 READER 0 [77] --STOPPED--

FOR THE OPERATOR

SUPPRESS: SUPPRESSING CARRIAGE CONTROL

The SUPPRESS command suppresses blank lines on the printer. All output is single-spaced.

Format:

```
SUPPRESS PRINTER n [ /FILE  
                    /JOB  
                    /STOP ]
```

Where:

PRINTER	The printer at your termination station.
n	Always 0 for the printer at a remote station.
/FILE	Suppresses blank lines while printing the file currently being printed.
/JOB	Suppresses blank lines for the current job being printed regardless of how many files or switches were specified when the job was originally queued to print. This is the default.
/STOP	Resumes normal printing. The job currently printing reverts back to the print format in effect before the SUPPRESS command was issued.

Example:

```
SUPPRESS PRINTER 0 /FILE (RET)  
18:23:45          PRINTER 0 [77]  --SUPPRESSED--
```

FOR THE OPERATOR

B.4 OPERATOR ERROR MESSAGES

As the operator, you see error messages as they are trapped by OPR. The messages appear at the terminal from which you run OPR and are captured in the file [3,3]OPERAT.LOG. An error message output by OPR contains two parts:

- a header describing what general process failed
- a message describing what specific function failed

With IBM communications software, the general processes you are likely to have running are CDRIVE and LPTSPL; you may also have the emulation spooler IBMSPL. The interface between the general processes and the software that runs in the communications front end contains the modules D60JSY and D60UNV; either of these modules can generate error messages in the message part of your OPR output. Other messages come from other components of GALAXY such as QUASAR.

For example, say you run OPR and issue a START NODE command to start a termination node. The operator at the termination station reads in the signon card at the station, but the matching signon entries are missing from the signon file at your host. You receive the following messages from CDRIVE and D60UNV:

```
OPR>
hh:mm:ss      Reader 0 [IBMTER] -- Can't Condition DN60 front-end --
              signon failure
```

(IBMTER is the nodename given in your previous DEFINE and START node commands. To recover, shutdown the node, create the matching signon entries in the signon file and try again.)

Error messages are listed in alphabetical order. Output from the header or message parts is listed separately. Thus, you can find the above messages in two places: under "Can't condition..." and under "signon failure." In the list, each message precedes the name of the routine that generated it, in square brackets.

Message	Meaning	Recovery/Response
Attribute may not be changed [QUASAR]	QUASAR refuses to change an attribute.	You cannot change some attributes of active devices.
Bad IPCF message, IBMSPL IPCF error message:.... [IBMSPL]	IBMSPL received an IPCF message in an unrecog- nizable format.	Probably GALAXY version skew. You may need to rebuild IBMSPL.
Bad IPCF message, message received from unknown system component [IBMSPL]	IBMSPL expects messages only from QUASAR or ORION.	None.
Bad IPCF message, message received with unknown type code [IBMSPL]	IBMSPL expects messages only from QUASAR or ORION.	None.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Bad IPCF message, message type... not allowed for this component type [IBMSPL]	IBMSPL expects messages only from QUASAR or ORION.	None.
Byte count not negative [D60UNV]	Software bug.	
Can't condition DN60 front-end [CDRIVE]	The front-end cannot be accessed by the software, a protocol error has occurred, line went away, front end died, or signon failed.	Verify your DEFINE, START, and load commands or your signon file.
Can't Disable DN60 Line [CDRIVE]	Line or front end down.	Reload front end.
Can't find signon device handle after creating it. [D60JSY]	System has lost part of data base.	Redo signon.
Can't get output permission [D60UNV]	Line direction contention for 2780/3780 failed.	Check your modems and lines.
Can't open a front end for use [D60UNV]	The port number used may be wrong, or the front end may be down.	Verify the port number and try again.
Can't open DN60 Console [LPTSPL]	Enqueued to a wrong component.	
Can't open DN60 Printer [LPTSPL]	Enqueued to a wrong component.	
Can't open HASP Console [CDRIVE]	Enqueued to a wrong component.	
Can't open remote DN60 reader [CDRIVE]	Enqueued to a wrong component.	
Can't perform function on a node which is online.	Attempt to perform a function failed.	Verify your nodename. When actual nodes are started, certain functions cannot be performed.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Can't perform function on a proto node which has an actual node started.	Attempt to perform a function failed.	When actual nodes are started, certain functions cannot be performed.
Can't perform function on a node which has devices started.	Attempt to perform a function failed.	Once your devices at a node have started, you cannot change their characteristics. Shutdown the device first.
Can't Release DN60 console [CDRIVE,LPTSPL]	Line or front end is down.	Recondition line or reload front end.
Can't Release DN60 Printer [LPTSPL]	Line or front end is down.	Recondition line or reload front end.
Can't Release DN60 Reader [CDRIVE]	Line or front end is down.	Recondition line or reload front end.
Check point error, Error... trying to checkpoint hold file [IBMSPL]	File handling problem.	
Console error, couldn't allocate transmission buffer [IBMSPL]	File handling problem.	Try to delete some files.
Console error, Error xxx processing send message xxx: first block in msg not object can't find task for object block second block in msg not text illformed IBM console msg cannot create CNI queue entry [IBMSPL]		
Console send error; Error was... Message was... [IBMSPL]	An error occurred when sending a message queued to an IBM host.	Verify that the line is up, and try again.
Couldn't delete batch file; failure to delete user batch file... [IBMSPL]	A user's file cannot be deleted as it is in an unreleased state.	

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Couldn't delete hold file; failure to delete hold file [IBMSPL]	A file used to hold data cannot be deleted as it is in an unreleased state.	
Couldn't hold file... requeued to LPT [IBMSPL]	Insufficient resources or quota prevents the file from being held as rename attempts failed.	Purge some files to free areas for new files.
Couldn't queue file; will attempt to delete [IBMSPL]	A queued file could not be placed in the queue.	None.
D60JSY attempt to make SYSERR... [D60JSY]	An entry could not be made to the log for SYSERR.	Check the ERROR.SYS log for the cause.
D60JSY error, error... opening device... [IBMSPL]	Fatal error.	Restart IBMSPL.
D60JSY error, Error... while reading console output [IBMSPL]	Fatal error.	Try to restart IBMSPL.
... deleted, hold file... deleted [IBMSPL]	Attempt to delete an un- wanted hold file has been successful.	None needed.
Device can't do input [D60UNV]	Attempt made to do input on an output-only device.	Verify your command string.
Device can't do output [D60UNV]	Attempt made to do output on an input-only device.	Verify your command string.
Device Invalid for Emulation [QSRADM]	Attempt to start or use a device that is not useable in emulation.	Verify your command string.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Device offline [D60UNV]	A device started through OPR has gone offline due to a malfunction or action by the operator.	Have the device checked reactivated and restarted.
disposing of old hold file [IBMSPL]	IBMSPL is deleting an old hold file (left over from a previous system crash).	None needed.
DN60 Console input error [CDRIVE]	Fatal error.	Restart node.
DN60 Console output error [LPTSPL]	Fatal error.	Restart node.
DN60 Input device error [CDRIVE]	Fatal error.	Restart node.
DN60 not running [D60UNV]	The communications front end has crashed.	Reload the front end.
DN60 Output Error [LPTSPL]	Fatal error.	Restart node.
DN60 Remotes are not supported [QSRADM]	Software for IBM communications is not available.	Retrieve all needed code from distribution tapes.
DSR not up, line is not connected [D60UNV]	The DSR signal from the modem is not active.	Check your physical connections and restart your node.
Error reading signon file, blank signon nodename.	Blank nodename found in the termination signon file.	Blank nodename must not be imbedded in the signon file, although it may appear at its end. Correct the signon file.
Error reading signon file, invalid character -x-	The termination signon file contains an illegal character.	Valid characters are UPPERCASE letters A to Z, and digits 0 to 9. Correct the signon file.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Error while sending EOF, stream aborted [D60UNV]	An error occurred when sending data to an IBM site.	Try to resend the data on another stream.
Failed to close DN60 Console [LPTSPL]	Line or front end down.	Recondition line or reload front end.
Failed to close DN60 Output [LPTSPL]	Line or front end down.	Recondition line or reload front end.
Failed to Open signon file - ... Retrieve the file	Signon file could not be found.	Retrieve the file and try again.
File error, Error... opening hold file... [IBMSPL]	Fatal error; IBMSPL cannot continue.	Try to restart IBMSPL.
File error... on queue info hold file [IBMSPL]	File disposition information lost.	None.
File held for user [IBMSPL]	A file received from an IBM host has been saved in D60.	Notify user that the file is there.
File queued to printer [IBMSPL]	A file received from an IBM host is being printed.	Notify user that the file was printed and not stored.
Function not implemented [D60UNV]	A function you have used is not in the software.	None.
Hanging up line... on port... [IBMSPL]	A line you are using to connect to a remote IBM site has gone down. IBMSPL is shutting it down gracefully. This is normal shutdown action.	Check your connections and restart the line if needed.
hold file copied to user area [IBMSPL]	The file returned from the IBM host held in D60 is copied to the user's area.	None needed.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
hold file evaporated! couldn't dispose of hold file 'cause it wasn't there [IBMSPL]	A hold file has unexpectedly disappeared.	Retrieve the files from their source if possible. Notify user.
IBM Node ... has signed on twice in error [QSRNET]	More than one user from a remote node has signed on.	This is only possible if you are running 2 CDRIVES. Shut one down.
illegal error code [IBMSPL]	The software received a code it did not recognize.	Check line integrity. You may be receiving junk.
Illegal Start Command	You tried to start more than one node on the same port/line.	None.
Illegal to start a specific object for IBM node..., use START NODE command. [QSRADM]	You tried to start a device such as a printer for an IBM node.	Use START NODE command.
Illegal to start termination node, only defined prototype nodes may be started [QSRADM]	Attempt to start an actual termination node.	Use START NODE command with prototype nodename.
input error [IBMSPL]	Error during file disposition of input from IBM.	Retrieve file from source if needed.
input open error... [IBMSPL]	Error during file disposition of input from IBM.	Verify that IBMSPL is running.
Internal error, LB doesn't point to valid line block [IBMSPL]	Line block pointer invalid.	You may need to restart IBMSPL.
Internal error, no memory for record buffer for device [IBMSPL]	The software has run out of working memory.	Wait for memory to become free.
Internal error, Task we are trying to create already exists [IBMSPL]	Software problem.	None.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
IO rejected [D60UNV]	Fatal error.	Try to restart IBMSPL.
Line gone away, either hung up or hardware failure [D60UNV]	Line or front end is down.	Recondition line or reload front end.
Line... on port... never came up [IBMSPL]	A line coming up has timed out.	Try to restart the line again. This may be a modem error.
Line... on port... waiting for active tasks to finish [IBMSPL]	A line cannot be shutdown gracefully while still in use.	Wait until tasks are done.
Line... on port... went away [IBMSPL]	Either the carrier has been lost or a hardware or modem failure has occurred.	Try to restart the line.
Logic error, Illegal wake up condition [IBMSPL]	Software error.	None.
Network node... is Online [QSRNET]	The node is online and can be active.	None.
Network Node... is offline [QSRNET]	The node is offline.	Start the node with a START NODE command and send/receive a signon message.
Network Node... is Active [QSRNET]	A prototype termination node is active when one of its actual nodes is Online.	None.
Next job error, Cannot find object block [IBMSPL]	An attempt to start a new job fails.	None.
No IBM remotes in system network [QSRDSP]	SHO STATUS NET gives no information. No IBM nodes have been defined.	None, or define your IBM nodes.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
No operator console for IBM Remote [QSRADM]		
No such device on the station [D60UNV]	You have made an error in your DEFINE command.	Correct the DEFINE command and try again.
No such handle exists, call D60OPN first [D60UNV]	An expected port, line, or device could not be found.	None.
No such line on the port [D60UNV]	You have made an error in your DEFINE command.	Correct the DEFINE command and try again.
No such port [D60UNV]	You have made an error in your DEFINE command.	Correct the DEFINE command and try again.
No such unit number of the specified device type [D60UNV]	The unit number given in your DEFINE command is out of range.	Correct the DEFINE command and try again.
Node... is not an IBM remote [QSRDSP]	Attempt to send a signon file failed.	Probably your nodename is wrong. Change it and try again.
Node...does not exist [QSRDSP]	Attempt to communicate with an IBM node failed.	You have not defined and started the node.
Node...is ... as station ... [QSRDSP]	Normal signon or signoff.	None.
Output open error [IBMSPL]	File disposition error.	None.
Pending shutdown cancelled [QSRADM]	Shutdown scheduled but not completed.	Cancelling done only by user running OPR.
Port n/Line m already started as node xxx	You have tried to start more than one node at a time on the same line.	None. Don't do it.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Port/line/dev/unit already in use by another process [D60UNN]	You have made an error in your DEFINE command.	Correct the DEFINE command and try again.
Port/line/device/unit already used by this process [D60UNV]	You have made an error in your DEFINE command.	Correct the DEFINE command and try again.
Port is useless to us, but it's running [D60UNV]	You have loaded the wrong software in the communica- tions front end.	Load the IBM communication software correct for the port and line available to you.
Process lacks DTE I/O privileges [D60UNV]	You do not have the right privileges to run IBMSPL.	Get system operator privileges.
Prototype node... is being shut down, Node..., trying to signon, is not defined as an IBM node. [QSRADM]	An actual termination node, placed in the prototype signon file after the prototype node was defined, has tried to signon. The prototype node is shutdown.	Give the DEFINE NODE prototype- nodename command after verifying that the signon file contains all the needed nodenames.
QUASAR shutting down inactive device [IBMSPL]	A nonexistent device is being descheduled.	None.
Rename failure, Attempting to rename file with modified extensions [IBMSPL]	Attempt to rename extension .LPT or .CDP to L00, L01,..., L99 or C00, C01,..., C99 failed. IBMSPL retries up to five times.	Rename or delete files in the holding area.
Rename failure, couldn't rename...to... [IBMSPL]	Attempt to rename extension .LPT or CDP to L00, L01,..., L99 or C00, C01,..., C99 failed.	Rename or delete files in the holding area.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Rename failure, Rename extensions exhausted [IBMSPL]	IBMSPL attempts 100 extension modifications to obtain a unique file name and rename a hold file.	Rename or delete files in the holding area.
Set for Node... Ignored, it is not defined as an IBM Remote [QSRADM]	Attempt to set an IBM-type device parameter failed.	Either you have not given a DEFINE NODE command to define your IBM-type node, or you have given the wrong nodename in your SET NODE command.
Set for Node... Ignored, it is a terminaton but not a prototype node [QSRADM]	Attempt to set a node parameter failed.	Give SET NODE commands, in termination, only for a prototype node.
Signon error--Error... opening signon file [IBMSPL] (...is "File not found")	Signon file does not exist or is not in D60.	Create or move the signon file to D60.
signon failure nodename [D60UNV]	Signon file for the station does not exist.	Create a signon file in D60.
-Signon failure Signon file..., error:... [D60JSY]	Signon file for the station does not exist.	Create a signon file in D60.
-Signon failure signon record:...did not match signon file. [D60JSY]	Signon record has no match.	Create a correct signon file in D60, or have the remote station operator correct his/her signon card.
Spool file error, Error... opening or closing hold file of console output [IBMSPL]	Error in files in D60.	Check the contents of D60.
SYSERR entry failure [D60JSY]	Attempt to record a SYSERR entry failed.	Consult the system operator in charge of SYSERR use.

FOR THE OPERATOR

Message	Meaning	Recovery/Response
Unit number specified on non-HASP station [D60UNV]	Non-HASP stations cannot be assigned unit numbers.	Either redefine your station as HASP or omit the unit number.
Unknown device type or unit [D60UNV]	The device type or unit you used is not in the normal range.	Use a type or unit that is valid.
Unknown I/O error occurred [D60UNV]	Software error.	None.
Write error... [IBMSPL]	IBMSPL encountered an error when writing a file.	Check the files in D60. If needed, have some jobs retransmitted.

GLOSSARY

The following terms are defined for the purposes of this document only:

Term	Meaning
asynchronous transmission	Data transmission in which time intervals between transmitted characters need not be of equal length. Transmission is controlled by start and stop elements at the beginning and end of each character. Asynchronous transmission is typically used between terminals and a front-end computer.
baud	The number of signal transitions per second (sometimes equal to bits per second).
binary synchronous communication protocol (bisync)	The protocol used by the IBM communications software to talk to IBM systems that also talk bisync.
BOOT11	A program that runs in the TOPS-10 host and loads the communications front end with the IBM communications software over a DL10. This program can also dump the front end, and performs the same functions as DTELDL does for the DTE20.
card image	A representation of the ASCII characters that can be placed on a punched card. The representation is typically recorded in a disk file.
carrier	A continuous signal whose frequency, amplitude or phase can be varied (modulated).
channel	A path for electromagnetic transmission between two or more points.
CDRIVE	The card reader spooler. This program must be running on any TOPS-10 host that is communicating with an IBM-type remote station. This program runs in the KI or KL processor. One copy of CDRIVE supports up to 5 local or remote card readers.

Term	Meaning
chunk	The smallest amount of contiguous memory in the front end that the IBM communications software can allocate and free. Chunk space is used for holding messages on their way between the TOPS-10 and IBM systems.
D60SPD	A test program used to verify and change the status of the IBM communications software. This program runs in the KI or KL processor. (See the appendix, "Using D60SPD".)
DL10	A Data Link hardware interface between a KI or KL and a PDP-11.
DTE20	A 10/11 interface unit that permits a KL to communicate with a PDP-11.
D6xyza.BIN	The IBM communications binary file containing the executable program that runs in the communications front end. Several versions of this file exist, each tailored to a specific configuration (see Chapter 3, "IBM Communications Software Installation Procedures" for a description of these files).
DTELDR	A program that runs in the TOPS-10 host and loads the communications front end over a DTE20. It can also be used to dump the communications front end, and performs the same function as BOOT11 does for the DL10.
DUP11	A single-line, program-controlled, double-buffered communications device that connects a PDP-11 processor to a serial synchronous line.
DQ11	A high-speed, double-buffered communications device that connects a PDP-11 processor to a serial synchronous line.
duplex (full)	Transmission simultaneously in two directions.
emulation	The use of a software/hardware combination that enables a TOPS-10 host to communicate with an IBM host. TOPS-10 is seen by the IBM host as an IBM-type remote station.
four-wire	A channel consisting of two pairs of wires. Such a channel can be made to operate in full-duplex mode by using one pair for each direction.

Term	Meaning
front end	A programmable minicomputer that handles non-compute-bound tasks such as data communications.
GALAXY	The batch system, a part of the TOPS-10 system software, that runs unattended jobs concurrently with timesharing jobs. The GALAXY system contains the programs QUASAR (system scheduler and queue manager); BATCON (batch controller); LPTSP (output spooler); CDRIVE (card reader spooler); SPRINT (card reader interpreter); OPR (operator command language), and ORION (operator controller).
half-duplex	Transmission in two directions, but only one at a time.
HASP	The IBM spooling system which implemented the multileaving protocol that allows simulated full-duplex communications on a half-duplex line.
host	A complete computer facility with processor, mass storage, and peripheral devices.
IBMSPL	The IBM communications spooler for communicating with an IBM host (360 or 370). This program runs in the KI or KL processor.
JCL	IBM host Job Control Language. Control card images sent to the IBM host must be in the formats acceptable to JCL. These card images identify a job to the IBM host and direct its execution.
KMC11	An auxiliary processor, with memory, that interfaces with the PDP-11 UNIBUS. The KMC11 controls I/O operations such as data communications. With IBM communications software, a KMC11 controls up to four DUPl1s, relieving the front end of some associated overhead.
log file	A file where the TOPS-10 batch system makes a record of all activities that occur between a running batch job and TOPS-10. This file can be printed automatically as the final step in a batch job.

Term	Meaning
loopback procedure	The process of systematically testing a link by sending a signal down the link and returning it. Both ends of the link are connected in some fashion so that the sent and returned signals can be compared. This method is used to verify the operation of devices and software along a communications link.
LPTSPL	The spooler for printed output. This program must be running on any TOPS-10 host that is to print output at an IBM-type remote station. One copy of LPTSPL supports up to 5 local and remote printers. This program runs in the KI or KL processor.
modem	A device that modulates and demodulates signals transmitted over communications facilities. It translates signals between the digital form used by terminals and computer interfaces, and the analog form used for transmission over long wires.
multileaving	The protocol used by the IBM communications software that allows messages transmitted both to and from remote sites to be interleaved on the line.
multiple record feature	A feature of certain IBM 2780 remote stations; it allows transmission of several records in each message.
node	A processor in a network, either at a host or remote site.
OPR	The program that accepts all commands from the operator to control system resources.
ORION	The program that processes all commands from OPR. OPR and ORION comprise the software interface that the operator uses to control the system resources.
primary timeout category	One of two BSC timeout categories; each of two communicating systems must be assigned to different timeout categories (see secondary timeout category). For example, IBM 2780s and 3780s are usually hard-wired in the PRIMARY timeout category. The timeout category establishes the time elapsed between bids for the line. The time elapsed in the primary timeout category is 74 (octal) jiffies, or close to 1 second at 60 Hertz. The time elapsed is slightly longer at 50 Hertz.

Term	Meaning
protocol	A set of rules governing the format and relative timing of message exchange.
queue	A set of data structures that must be operated on in some order. For example, queued files destined for the line printer are printed. A queue is sometimes called a list.
remote station	Data processing equipment used to communicate with a host from a geographically distant location. A remote station typically has a card reader for input and a line printer for output. A multileaving remote station can have an operator's console.
secondary timeout category	One of two BSC timeout categories; each of two communicating systems must be assigned to different timeout categories (see primary timeout category). IBM 360's and 370's running HASP are always in the SECONDARY timeout category; an IBM host running ASP may be in the PRIMARY timeout category. The timeout category establishes the time elapsed between bids for the line. The time elapsed in the secondary timeout category is 264 (octal) jiffies, or close to 3 seconds at 60 Hertz. The time elapsed is slightly longer at 50 Hertz.
spooling	The mechanism that TOPS-10 uses to handle data destined for slow speed devices; it places the data on disk for later transfer to the device.
SPRINT	The card interpreter spooler. This program must be running on your TOPS-10 system for communications with an IBM-type remote station.
synchronous transmission	Data transmission in which time intervals between transmitted characters are of equal length. Synchronous transmission is often used between communicating computers.
termination (of a remote station)	The use of a software/hardware combination that enables a TOPS-10 host to communicate with an IBM-type remote station. TOPS-10 is seen by the IBM-type remote station as an IBM host.
two-wire	A channel consisting of one pair of wires. Such a channel can be made to operate in full-duplex mode with added multiplexing.

INDEX

<p>201C modem, A-11</p> <p>208A/B modem, A-11</p> <p>209A modem, A-11</p> <p>2780/3780 emulation test, A-30</p> <p>2780/3780 ET, 1-4</p> <p>2780/3780 HASP, 1-4</p> <p>2780/3780 termination test, A-29</p> <p>ABORT command, A-15, A-16, B-11, B-13</p> <p>/ACCOU switch, 2-6, 2-7</p> <p>ALIGN command, B-11, B-14</p> <p>ASCII file transfer, 2-9</p> <p>AUTO command, A-15</p> <p>BACKSPACE command, B-11, B-15</p> <p>Batch system, 2-1</p> <p>BATCON failure, 3-31</p> <p>BATCON program, 2-2</p> <p>BISYNC, B-58</p> <p>BOOT11, 3-1, 3-21, 4-3, B-58</p> <p>BPM, 3-12</p> <p>Building process (diagram), Monitor, A-9</p> <p>CAL11. error codes, A-28</p> <p>CANCEL command, B-11, B-16</p> <p>CDRIVE failure, 3-31</p> <p>CDRIVE program, 2-2, B-58</p> <p>CHK60 error messages, A-13</p> <p>CHK60 program, 3-1, 3-22, A-12</p> <p>Command, ABORT, A-15, A-16, B-11,</p>	<p>Command (Cont.) B-13</p> <p>ALIGN, B-11, B-14</p> <p>AUTO, A-15</p> <p>BACKSPACE, B-11, B-15</p> <p>CANCEL, B-11, B-16</p> <p>CONTINUE, B-11, B-17</p> <p>D60SPD, A-15</p> <p>DDT, A-15</p> <p>DEFINE, B-3</p> <p>DISABLE, B-11, B-18</p> <p>ENABLE, B-11, B-20</p> <p>EOF, A-15</p> <p>EXIT, A-15, B-11, B-22</p> <p>FORWARDSpace, B-11, B-23</p> <p>HELP, A-15, B-11, B-24</p> <p>HOLD, B-12, B-25</p> <p>INPUT, A-15, A-17</p> <p>MODIFY, B-12, B-26</p> <p>NOTYPEAHEAD, A-15</p> <p>OUTPUT, A-15, A-18</p> <p>PARAM, A-15</p> <p>RELEASE, B-12, B-27</p> <p>REPORT, B-12, B-28</p> <p>REQUEUE, B-12, B-29</p> <p>RESPOND, B-12, B-30</p> <p>RESTART, A-15</p> <p>ROUTE, B-12</p> <p>SEND, B-12, B-31</p> <p>SET, A-15, A-18, B-12, B-32</p> <p>SET DEVICE, A-18</p> <p>SET LINE, A-20</p> <p>SET NODE, B-3</p> <p>SET SIMULATE, A-21</p> <p>SET STATUS, A-22</p> <p>SET SUPPORT/PORT, A-22</p> <p>SHOW, B-12, B-34</p> <p>SHOW MESSAGES, B-35</p> <p>SHOW OPERATORS, B-36</p> <p>SHOW PARAMETERS, B-37</p> <p>SHOW QUEUES, B-38</p> <p>SHOW STATUS, B-5, B-39</p> <p>SHOW TIME, B-41</p> <p>SHUTDOWN, B-6, B-12, B-42</p> <p>START, B-6, B-43</p> <p>STATUS, A-15</p> <p>STOP, B-12, B-44</p> <p>SUPPRESS, B-12, B-45</p> <p>TOPS-10 host OPR, B-3</p> <p>TYPEAHEAD, A-15</p> <p>WHAT, A-15</p> <p>Communication front end, Loading, 4-3</p> <p>Communication paths, 4-14</p>
--	--

INDEX (CONT.)

- Communication procedures, 4-14
- Configurations,
 - IBM, 1-1
 - TOPS-10, 1-2
- Connecting remote host, 3-33
- Connecting synchronous lines, 3-25
- Connecting to IBM host, 3-10, 3-18
- Connecting to termination station, 3-18
- Connecting TOPS-10 host to IBM host, 4-12
- Connecting TOPS-10 host to remote stations, 4-13
- CONTINUE command, B-11, B-17
- CSD, 3-12

- D60SPD, 3-1, B-59
- D60SPD command, A-15
- D60SPD error messages, A-23
- D60SPD test, A-29
- D60UNV module, A-8
- DDT command, A-15
- DEFINE command, B-3
- Defining IBM nodes, 4-4
- /DEST switch, 2-6, 2-7
- Destination node, 2-3
- Dialing remote sites, 4-10
- DISABLE command, B-11, B-18
- Distribution tape, A-1
 - Mounting, 3-16
 - removing, 3-17
- DL10, B-59
 - Loading, 3-32
- DN20, 1-4
- DN87, 1-4
- DN87S, 1-4
- DQ11, B-59
- DTE20, B-59
 - Loading, 3-32
- DTEHDR, 3-1, 4-3, B-59
- DUP11, B-59

- Editing system files, 3-4, 3-31
- Eliminator,
 - modem, A-12
- Emulation, B-59
- Emulation (diagram), 1-3
- Emulation mode, 4-2
- Emulation node, 2-3

- Emulation procedures, 2-5
- Emulation test, 2780/3780, A-30
 - HASP, A-30
- Emulation verification, 3-3
- ENABLE command, B-11, B-20
- Enabling modems, 3-28
- Ending jobs, 4-16
- /ENDLI switch, 2-6, 2-7
- EOF command, A-15
- Error codes,
 - CAL11., A-28
- Error messages, B-46
 - CHK60, A-13
 - D60SPD, A-23
 - IBMSPL, 4-11
- EXIT command, A-15, B-11, B-22

- Failure,
 - BATCON, 3-31
 - CDRIVE, 3-31
 - GALAXY, 3-31
 - IBMSPL, 3-30
 - LPTSPL, 3-31
 - ORION, 3-31
 - PULSAR, 3-31
 - QUASAR, 3-31
 - SPRINT, 3-31
 - SPROUT, 3-31
 - startup, 3-29
- File transfer,
 - ASCII, 2-9
- Files,
 - TOPS-10 2780/3780, A-2
 - TOPS-10 2780/3780/HASP, A-3
- FORWARDSpace command, B-11, B-23
- Front-end translate table, A-3

- GALAXY, 2-2
- GALAXY building process (diagram), A-10
- GALAXY failure, 3-31
- GALAXY system, B-60
- GALAXY system emulation mode (diagram), 2-2
- GALAXY system termination mode (diagram), 2-2
- GLXMAC module, A-8

INDEX (CONT.)

- HASP emulation test, A-30
- HASP termination test, A-30
- HELP command, A-15, B-11, B-24
- HOLD command, B-12, B-25
- Host,
 - IBM, 2-11
- Host implementations (diagram), 2-8

- IBM configurations, 1-1
- IBM host, 2-11
 - Connecting to, 3-10, 3-18
 - Connecting TOPS-10 host to, 4-12
- IBM host operator, 4-17
- IBM node shutdown, 4-9
- IBM nodes,
 - Defining, 4-4
 - Starting, 4-7
- IBM stop codes, B-1
- IBM verification, 3-20
- IBMMAC module, A-8
- IBMPAT module, A-8
- IBMSPL, 3-1, B-60
- IBMSPL assembly/link
 - modules diagram, A-8
- IBMSPL error messages, 4-11
- IBMSPL failure, 3-30
- IBMSPL module, A-8
- IBMSPL program, 2-2
- IBMSPL switches, 2-7
- IBMUSR module, A-8
- ICC COMLINK II modem, A-11
- INPUT command, A-15, A-17
- Installation,
 - Software, 3-3, 3-14
- Installation preparation, 3-2, 3-5
- Installation procedures, 3-1
- Installation summary, 3-2
- Installation worksheet, 3-13

- JCL, B-60
- JCL file (example), 2-8, 2-9
- Job deck (diagram), 2-11
- Jobs,
 - Ending, 4-16
 - Starting, 4-16

- KMC11, B-60
 - /LDISP switch, 2-6, 2-7
 - /LFORM switch, 2-6, 2-7
 - /LNAME switch, 2-6, 2-7
- Loading communication front end, 4-3
- Loading DL10, 3-32
- Loading DTE20, 3-32
- Loopback procedure, B-61
- LPTSPL failure, 3-31
- LPTSPL program, 2-2, B-61
- /LSTR switch, 2-6, 2-7

- M7818 switch settings, A-14
- Mode,
 - Emulation, 4-2
 - Termination, 4-3
- Modem,
 - 201C, A-11
 - 208A/B, A-11
 - 209A, A-11
 - ICC COMLINK II, A-11
 - null, A-11
 - synchronous, A-11
- Modem eliminator, A-12
- Modems, A-11
 - Enabling, 3-28
- MODIFY command, B-12, B-26
- Module,
 - D60UNV, A-8
 - GLXMAC, A-8
 - IBMMAC, A-8
 - IBMPAT, A-8
 - IBMSPL, A-8
 - IBMUSR, A-8
 - ORNMAC, A-8
 - QSRMAC, A-8
- Modules diagram,
 - IBMSPL assembly/link, A-8
- Monitor Building process (diagram), A-9
- Mounting distribution tape, 3-16

- Network node status, 4-6
- Node,
 - Destination, 2-3
 - Emulation, 2-3
 - Termination, 2-3

INDEX (CONT.)

Node names, 3-6
 Node parameters, 3-11
 Setting, 4-5
 Node shutdown,
 IBM, 4-9
 Node status, B-5
 Network, 4-6
 Nodeids, 3-7
 Nodenum, 2-3, 3-6
 Nodes,
 Prototype, 3-5
 NOTYPEAHEAD command, A-15
 Null modem, A-11

 Operator,
 IBM host, 4-17
 Termination station, 4-14
 TOPS-10, 4-3
 Operator procedures, 4-1
 OPR,
 Running, 3-32
 OPR commands,
 Using, 4-17
 OPR commands for
 termination station,
 B-8
 OPR HELP facility, B-7
 OPSER test, A-29
 ORION failure, 3-31
 ORNMAC module, A-8
 OUTPUT command, A-15, A-18

 PARAM command, A-15
 Parameters,
 Node, 3-11
 /PNAME switch, 2-6, 2-7
 PRINT switches, 2-6
 Program,
 BATCON, 2-2
 CDRIVE, 2-2
 CHK60, A-12
 IBMSPL, 2-2
 LPTSPL, 2-2
 QUASAR, 2-2, 4-3
 SPRINT, 2-2
 Prototype nodes, 3-5
 PULSAR failure, 3-31

 QSRMAC module, A-8
 QUASAR failure, 3-31
 QUASAR program, 2-2, 4-3

 RELEASE command, B-12, B-27
 Remote host,
 Connecting, 3-33
 Remote sites,
 Dialing, 4-10
 Remote station, 2-10
 Removing distribution tape,
 3-17
 REPORT command, B-12, B-28
 REQUEUE command, B-12, B-29
 RESPOND command, B-12, B-30
 Restart,
 System, 3-34
 RESTART command, A-15
 Restoring files, 3-16
 ROUTE command, B-12
 RPM, 3-12
 Running OPR, 3-32

 SEND command, B-12, B-31
 SET command, A-15, A-18,
 B-12, B-32
 SET DEVICE command, A-18
 SET LINE command, A-20
 SET NODE command, B-3
 SET PORT, A-21
 SET SIMULATE command, A-21
 SET STATUS command, A-22
 SET SUPPORT/PORT command,
 A-22
 Setting node parameters,
 4-5
 SHOW command, B-12, B-34
 SHOW MESSAGES command, B-35
 SHOW OPERATORS command,
 B-36
 SHOW PARAMETERS command,
 B-37
 SHOW QUEUES command, B-38
 SHOW STATUS command, B-5,
 B-39
 SHOW TIME command, B-41
 Shutdown,
 System, 3-34
 SHUTDOWN command, B-6, B-12,
 B-42
 SIGNON, 3-12
 SIGNON card, 4-14
 SIGNON (diagram), 3-7
 SIGNON file, 3-18
 Software installation, 3-3,
 3-14
 Software verification, 3-3,
 3-20
 Spooling system, 2-1

INDEX (CONT.)

SPRINT failure, 3-31
 SPRINT program, 2-2
 SPROUT failure, 3-31
 START command, B-6, B-43
 Starting IBM nodes, 4-7
 Starting jobs, 4-16
 Startup failure, 3-29
 Startup verification, 3-4
 Station,
 Remote, 2-10
 STATUS command, A-15
 Stop codes,
 IBM, B-1
 STOP command, B-12, B-44
 SUPPRESS command, B-12,
 B-45
 Switch,
 /ACCOU, 2-6, 2-7
 /DEST, 2-6, 2-7
 /ENDLI, 2-6, 2-7
 /LDISP, 2-6, 2-7
 /LFORM, 2-6, 2-7
 /LNAME, 2-6, 2-7
 /LSTR, 2-6, 2-7
 /PNAME, 2-6, 2-7
 Switch settings,
 M7818, A-14
 Switches,
 IBMSPL, 2-7
 PRINT, 2-6
 Synchronous lines,
 Connecting, 3-25
 Synchronous modem, A-11
 System,
 Batch, 2-1
 GALAXY, B-60
 Spooling, 2-1
 System files,
 Editing, 3-4, 3-31
 System restart, 3-34
 System shutdown, 3-34

 Termination mode, 4-3
 Termination node, 2-3
 Termination procedures, 2-3
 Termination signon
 (diagram), 3-8
 Termination station,
 Connecting to, 3-18

 Termination station
 operator, 4-14
 Termination test,
 2780/3780, A-29
 HASP, A-30
 Termination verification,
 3-4
 Test,
 D60SPD, A-29
 HASP termination, A-30
 OPSER, A-29
 TIMEOUT, 3-12
 TOPS-10 2780/3780 files,
 A-2
 TOPS-10 2780/3780/HASP
 files, A-3
 TOPS-10 configurations, 1-2
 TOPS-10 host OPR command,
 B-3
 TOPS-10 host to IBM host,
 Connecting, 4-12
 TOPS-10 host to remote
 stations,
 Connecting, 4-13
 TOPS-10 operator, 4-3
 TRANS, 3-12
 Translate table,
 Front-end, A-3
 Translate table
 modifications, A-5
 Transparency, 3-12
 TYPEAHEAD command, A-15

 Using OPR commands, 4-17

 Verification,
 Emulation, 3-3
 IBM, 3-20
 Software, 3-3, 3-20
 startup, 3-4
 termination, 3-4

 WHAT command, A-15
 Worksheet,
 Installation, 3-13

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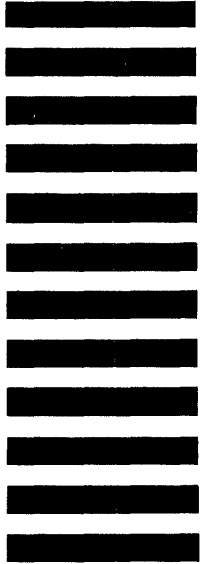
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