Burroughs Corporation

COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

B1800/B1700 HOST/RJE SYSTEM

PRODUCT SPECIFICATION

REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
E	9/12/80		Changes for Mark 10.0 Release
			3-37 Updated system input messages. Updated "All the underlined..." paragraph.
			4-12 Added "and status changes" to "The mechanism has been designed..." paragraph.
			4-13 Added "c. Any status change messages throughout the job's life." Updated "The underscore under QU..." paragraph.
			4-14 Added "h. Any status change message throughout the job's life.
			4-16 Updated "The underscore under US..." paragraph.
			4-17 Added "In general, session numbers" sentence to SESSION COMMAND.
			4-18 Added "RESTRICTIONS COMMAND."
			4-19 Added "Type = 09 - RJE status change message." Added "8. BNA node address of five characters ("00000" = local)."
			4-20 Updated "Type 02" and "Type 05" messages. Added "(syntax errors or CANCELLED)" and "5 = Death in Family" to Type 06 message.
			4-21 Added "Type 09" message.
			4-25 Updated "One SPO command was implemented..." para.
			4-26 Changed "PIN or PROTECTION" to "SEC or SECURITYTYPE" and "PIO or PROTEC.IO" to "SUS or SECURITYUSE" in "Two new file attributes..." paragraph.
			4-30 Changed "PROTECTION" to "SECURITYTYPE" and "PROTECT.IO" to "SECURITYUSE" throughout "FILE ACCESS" section.
F	2/12/81		Changes for Mark 10.0 Release
			3-37 Updated the list of system input messages.
			4-19 Added "TYPE = "99" - RJE end of BNA inquiry response." Added "9. Inquiry flag ("1" indicates response to BNA inquiry zip.)"[Changed number 9 to "10." and changed "9 characters" to "8 characters."
			4-20 Added "6 = End of compile part of Compile & Save or Compile & Go."
			4-22 Added "62 Waiting Host fn" to values list.

PRODUCT SPECIFICATION

REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
C			Continued
			3-44 Deleted "USERCODE SPECIFIED IN UC" message and renumbered remaining error messages. Added messages 16 and 17: "#WARNING: DIRECTORY NEARLY FULL" and "#WARNING: WORKFILE NEARLY FULL".
			3-53 Added "#USERCODE...LOGGED OFF, JOBS ACTIVE"; added discussion of SW1
			3-57 Deleted "UC HOST SYSTEM INPUT MESSAGE" (formerly page 3-57)
			4-1 to 4-2 Referenced "LOG ON AND OFF MESSAGES" and "ID REMOTE INPUT MESSAGE" in LOG ON procedure.
			4-3 to 4-4 Added information on entering remote card decks to a job
			4-26,4-29, 4-31 Added explanation of "PUBLIC" attribute
D	8/19/77	C Hale	Changes for Mark VII.0 Release
			All references to B1700 changed to B1800/B1700
			2-3 Added F. (Automatic CALLBACK feature)
			3-1 Added "All decks must be terminated by a ?END card" to REMOTE DECKS
			3-9 & 3-10 Added Remote Output Messages 16 through 19
			3-12 Added *PH to mnemonics of keyboard entries
			3-23 Added *PH Input Message
			3-31 Added CALLBACK to run-time remote terminal options
			3-34 Added Format 2 to *TO Input Message
			3-37 Underlined various System Input Messages to indicate these commands require a valid usercode and password
			3-43 Added System Output Error Messages 18 through 21
			4-1 Added "Each line may have only one remote satellite system..." to General Description of RJE Controller
			4-5 Added CALLBACK
			4-13 Indicated only first two characters are necessary for valid syntax of QUEUE command
			4-16 Indicated only first two characters are necessary for valid syntax of USER command
			4-22 & 4-23 Indicated two security violation conditions with attempted use of the "*" or (<usercode>) conventions
			4-25 - 4-28 Table 4-1 revised; discussion of A-N revised; further discussion (O-W) added

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REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
A	9/23/76	J Hale	Original Issue
B	11/17/76	J Hale	Updated to Mark 6.1 Release level Restructured Table of Contents 3-2 Moved BACKUP FILE HANDLING section from page 3-30 to page 3-2. 3-4 Deleted three paragraphs from explanation of RJE/CONTROLLER OUTPUT MESSAGES. 3-5 to 3-9 Added RJE SYSTEM REMOTE OUTPUT MESSAGES section. 3-11 Added *ID, *LO, *PD, *RB, *RS, *SD to list of RJE INPUT MESSAGES. 3-15 Added *ID input message explanation. 3-22 Added *PD input message explanation. 3-25 Added *RB input message explanation. 3-27 Added *RS input message explanation. 3-32 Added *SD input message explanation. 3-40 Added section of HOST SYSTEM CONSOLE MESSAGES. 3-41 to 3-45 Added section of RJE HOST SYSTEM OUTPUT ERROR MESSAGES 3-46 to 3-60 Added RJE HOST SYSTEM OPERATOR INPUT MESSAGES section 3-63 to 3-65 Added RJEA SYSTEM CONTROL MESSAGES section. 4-18 Added Type 08 to #1. Changed #7. Added #8. 4-19 Added explanation of Type 08. 5-1 to 5-5 Added section entitled GENERATING THE NETWORK CONTROLLER (RJE/NDLDCH). 3-17 Added *LO input message explanation.
C	3/21/77	J Hale	Additional 6.1 Updates 3-4 Added explanation on blank passwords 3-5 Added OUTPUT MESSAGE NO.2: "#END TRANSMISSION..' 3-6 to 3-9 Added OUTPUT MESSAGE No.3: "FILE file-name NOT PRESENT.." Renumbered remaining messages 3-16 Added second paragraph to *ID INPUT MESSAGE 3-18 Added further explanation to *LO INPUT MESSAGE 3-19 Qualified *LO INPUT MESSAGE when used with *PB INPUT MESSAGE 3-25 Added paragraph on invalid *QT INPUT MESSAGE 3-28 Qualified use of *LO INPUT MESSAGE with *RS INPUT MESSAGE 3-29 Deleted *SB options (same as *PB options); referenced *PB options 3-30 Qualified use of *LO INPUT MESSAGE with *SD INPUT MESSAGE 3-39 Message #2: Qualified method of terminating RJE system 3-40 Message #4: Same as for Message #2 3-44 Message #15: Same as for Message #2

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GENERAL DESCRIPTION

This document provides a detailed description of the remote job entry (RJE) host system for the B1800/B1700.

Remote job entry utilizes data communications lines and remote terminals to enable remote users to enter jobs for execution by a central (host) data processing system. The purpose of any RJE system is to increase the availability and convenience of using a central (host) data processing system which is located some distance from the point at which the input data is produced and the output data is required.

A typical Burroughs RJE system is shown in Figure 1.1.

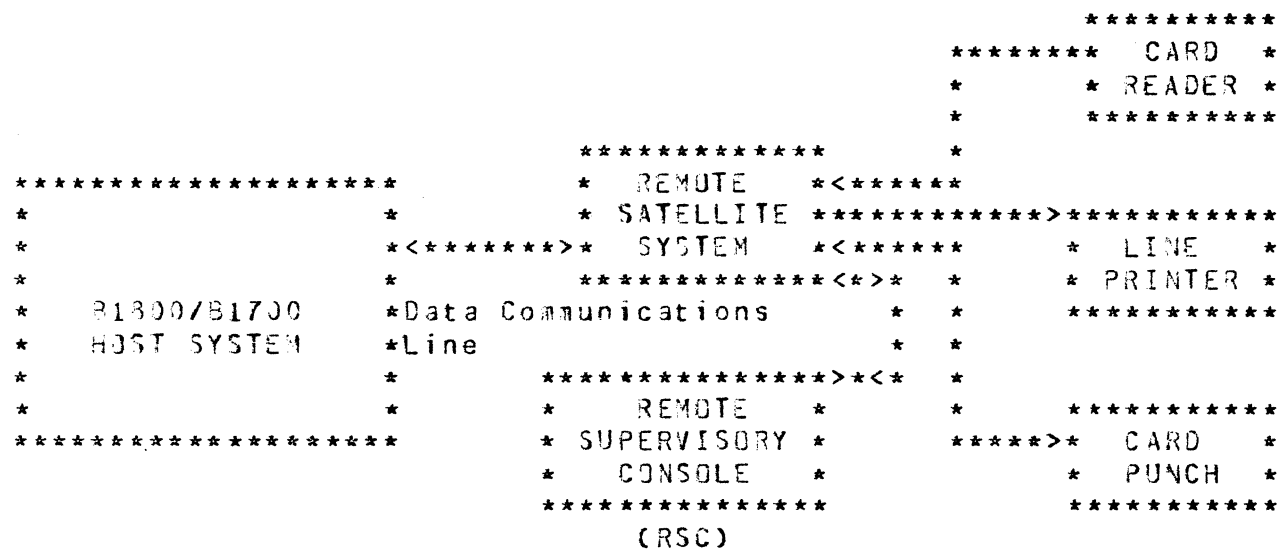

Figure 1.1 RJE System Configuration

The basic objectives of the HOST/RJE system are:

A. The introduction of programs from a remote input device for compilation and/or execution by the host system.

B. The introduction of data decks from a remote input device for processing by programs resident at the host system.

C. Dispersing of data produced by the host system to the remote devices.

D. Monitoring and controlling programs on the host system via a remote supervisory console.

RELATED DOCUMENTATION

Name	Number
NDL Library	P.S. 2212 5215
Network Definition Language	P.S. 2212 5223
Software Operational Guide	1066731

DESIGN

Figure 2.1, below, illustrates the B1800/B1700 Host RJE system in functional block form. The modules and their functional interface will be discussed in detail.

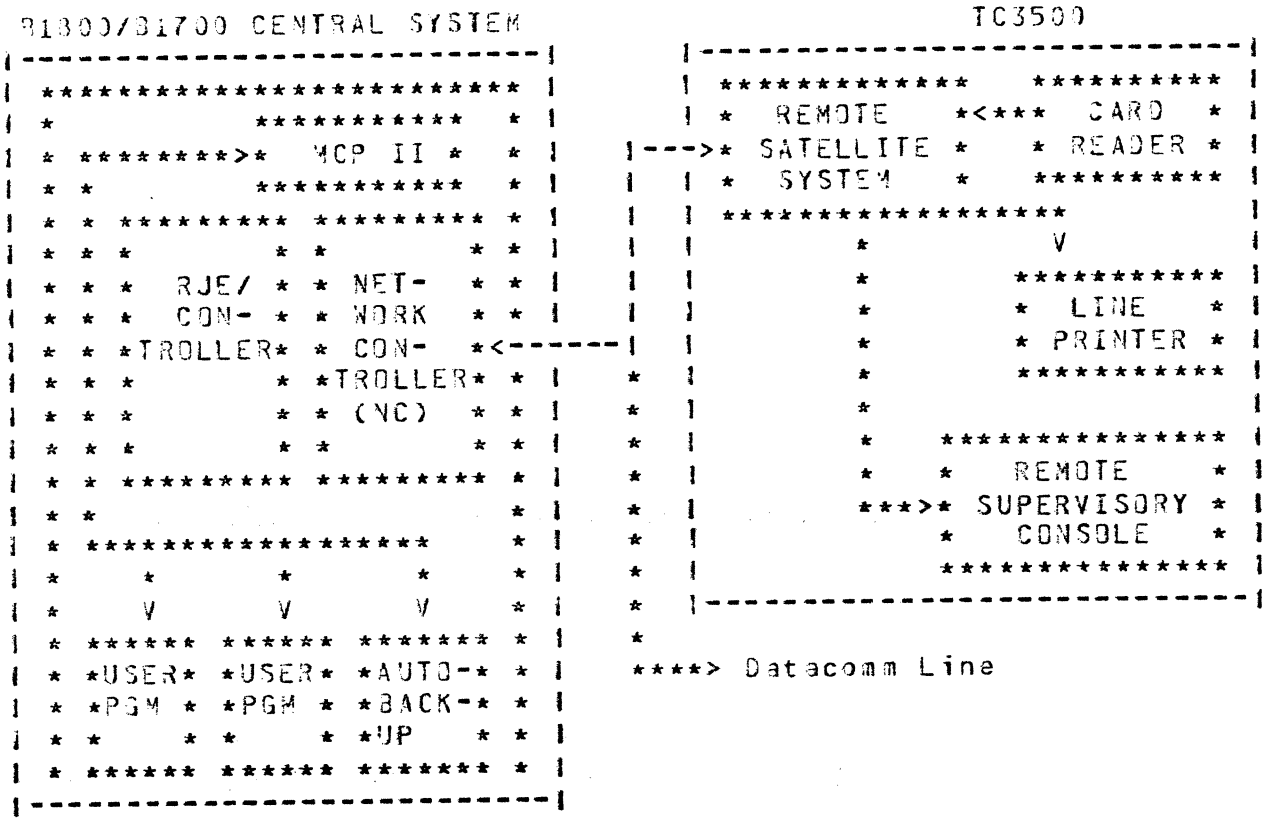

Figure 2.1 B1800/B1700 Host RJE (Functional Block Form)

DESIGN OBJECTIVES

The design of the HOST RJE system provides for the following:

A. The B1800/B1700 system is compatible with Burroughs standard data communications line discipline and message format conventions defined by the RJE-A specifications.

B. The B1800/B1700 system maintains RJE command language compatibility with Burroughs large and medium systems RJE.

C. The B1800/B1700 RJE system is transparent to the user (i.e., remote control cards and MCP commands are a subset of the B1800/B1700 host control card and commands.)

D. A B6700 compatible file security system is provided.

E. The RJE system supports up to sixteen concurrent users.

NETWORK CONTROLLER (NC)

The Network Controller (NC) is a Network Definition Language (NDL) generated program whose prime function is to process and supervise the flow of messages between the Central System and Remote Satellite Systems. It performs the data communications line discipline. The Network Controller handles the initiation and completion of data communication I/O and services exception conditions. Typically, B1800/B1700 message flow is handled in the following manner:

A. Upon receiving an error free message from a remote satellite system, the NC will queue the message (via a "queue file") for RJE/CONTROLLER.

B. RJE/CONTROLLER will read the message from the queue and process it.

C. On the output side, RJE/CONTROLLER queues MCP messages, output data, etc., for the NC.

D. Upon receiving the message from RJE/CONTROLLER, NC will initiate the appropriate procedures to transmit the message to the designated remote satellite system.

RJE/CONTROLLER

RJE/CONTROLLER is an MCS and is the heart of the B1800/B1700 host RJE system. It can be thought of as the functional software interface between the B1800/B1700 operating system and the remote satellite systems, in that all input and output information passes through it. Some of the more significant functions of RJE/CONTROLLER are:

A. Log on and log off functions.

B. Receive jobs from remote satellite systems and schedule them for eventual execution by the MCP.

C. Schedule the transfer of print and punch backup files to the remote satellite systems.

D. Handle system commands from remote satellite systems, either passing them on to the MCP, or processing them directly in RJE/CONTROLLER.

E. Handle the transfer of output messages from the MCP to the appropriate remote satellite systems.

F. Invoke the automatic CALLBACK feature after a remote user has LOGGED OFF with jobs still running. This allows another remote user to LOG ON and use the host processor while the jobs for the former remote user are completed. As soon as the jobs for the former remote user are completed, and a dial out line becomes available, the former user is automatically CALLED BACK and his output is transmitted to him.

USER INTERFACE

SECURITY CONVENTIONS

A remote user has the ability to select names for files without having to be aware of names used by other remote users and at the same time has the ability to address host system site files. However, for the host system to perform library maintenance on all types of files, all file names must be unique.

To allow remote users to be isolated from each other so far as file name selection is concerned, and at the same time maintain a system of unique names to the central system, user identification can be assigned by the data processing manager to each user of the system. RJE/CONTROLLER obtains this user identification either by remote satellite log-on or by a special control card.

The activation of a remote satellite system is known as the "log-on" procedure. This "log-on" is accomplished by supplying RJE/CONTROLLER with a valid usercode and password combination. The user is referred to the section entitled "LOG-ON AND LOG-OFF MESSAGES" for information on the manner in which the user identification must be supplied.

The usercode, if any, obtained from the "log-on" procedure is the default usercode associated with job decks which are read from the remote reader and with such keyboard entries as "PD" entered from the Remote Supervisory Console (RSC). Any USER control cards contained in the job decks override this default usercode for the programs involved.

REMOTE DECKS

Decks acceptable from the remote card reader are the same as decks acceptable at the central site with the exception that binary card decks are not allowed. Programs cannot read cards directly from the remote reader. All card decks are spooled on disk before a program can read them. All decks must be terminated by a "?END" card.

For documentation of the card decks that are acceptable, the user is referred to the Systems Software Operational Guide, Form Number 1068731.

BACKUP FILE HANDLING

Backup files generated by RJE-initiated jobs are placed in a special directory maintained by RJE/CONTROLLER.

The names of the backup files are:

<usercode> / # <integer> | # <usercode> / % <integer>

A "#" is used to indicate a printer backup file. The "%" signifies a punch backup file.

REMOTE SUPERVISORY CONSOLE (RSC)

A remote operator/system interface is provided to enable the operator to control the jobs submitted from the remote system. This feature is provided through output and input messages via the remote supervisory console (RSC).

CONTROL AND ERROR MESSAGES

OUTPUT MESSAGES

There are four basic types of RSC output messages: local, log-on and log-off, RJE, and system messages. The following paragraphs discuss these message types.

LOCAL MESSAGES

Local messages are messages generated by the remote computer pertaining to its own control and error handling. These include "reader hopper empty", "printer out of paper", "modem transmission error", and other such messages. The format of these messages is dependent upon the type of RJE satellite used

and is described in the documentation for the satellite system.

LOG-ON AND LOG-OFF MESSAGES

To employ RJE in a secured-terminal environment (i.e., one in which every user of an RJE terminal is required to supply the controller with acceptable usercodes and passwords) the following procedure must be followed.

After establishing contact between the RJE terminal and the B1800/B1700 (by dialing-in, etc.), RJE/CONTROLLER will respond with the following message for the RSC:

#***** B1800/B1700 RJE HOST <time> <date> #USERCODE.

The RJE operator must then enter a valid usercode at the RSC or a valid usercode password combination (separated by blanks or a slash). If only a usercode has been entered, RJE/CONTROLLER will respond with:

#AND YOUR PASSWORD.

The correct response to this is a valid password entered at the RSC. Blank passwords are accepted by the RJE system either by entering a valid usercode followed by a slash and no password, or by entering a null message at the RSC when a password is requested. The usercode and password are checked for validity. If they are invalid, then RJE/CONTROLLER will respond with the RSC message:

#SECURITY ERROR, ENTER USERCODE.

and the usercode must be re-entered. If the user identification entered is found to be valid, RJE/CONTROLLER will respond with the following RSC message:

#<remote station name> LOGGED ON AT <time> <date>.
#SESSION <session number>.

The remote satellite system may now proceed with job introduction and RSC activity.

To terminate the session at an RJE terminal, the remote operator must enter:

"*BYE"

as discussed in the section on "RJE INPUT MESSAGES".

If a "BYE" command is not entered, then when RJE/CONTROLLER receives the notification from the network controller of the remote site terminating the connection, the RJE/CONTROLLER will clear the user from the system, saving all files and allowing all jobs to complete.

RJE/CONTROLLER OUTPUT MESSAGES

The RSC messages issued by RJE/CONTROLLER in response to RJE keyboard entries are discussed in the section entitled "RJE INPUT MESSAGES".

RJE SYSTEM REMOTE OUTPUT MESSAGES

The meaning of most of the RSC output messages sent by RJE host is either self-evident or explained elsewhere in this document. However, some unsolicited messages are an indication of an error caused by the remote satellite system or of a process being initiated at the host which will affect the remote satellite system. These messages and their definitions are discussed in the following paragraphs.

1. "#DATA RECEIVED FROM NON VALID STATION."

   Originator: RJE/CONTROLLER

   RJE/CONTROLLER will accept remote satellite system input from three of the four stations required for each remote user. Whenever a buffer is received from the fourth station, which must be output only, this message is sent to the remote satellite system and the buffer is discarded. RJE/CONTROLLER will continue.

2. "#END TRANSMISSION PRINT FILE <file-name>,

PUNCH

FILE - SAVED "
PURGED

Originator: RJE/AUTOBACKUP

This message is sent whenever the transmission of a backup file to the remote site is terminated abnormally, such as through a "*QT" message or if the remote device receiving the file goes down.

3. "#FILE <file-name> NOT PRESENT, NOT SENT."

Originator: RJE/AUTOBACKUP

If a copy of RJE/AUTOBACKUP is requested to send a backup file which is not present on the system to a remote satellite system, then this message will be sent to the RSC. The most likely reason for this condition would be because the file resides on a pack which is not on line at the host at the time the request is issued. The remote satellite system may request (via a SPO message to the host SPO) that the pack be mounted and readied after which the file may be transmitted to the remote satellite system.

4. "#FILE <file-name> - EOF REACHED NO RECORDS PROCESSED."

Originator: RJE/AUTOBACKUP

The KEY and RECORD options of the PB (PRINTER/PUNCH BACKUP) and SB (SITE BACKUP) remote input messages cause RJE/AUTOBACKUP to search a backup file according to the parameters supplied in these options. Should RJE/AUTOBACKUP scan an entire file without finding a match for the parameters (i.e., the range of records requested does not exist in the file named), then this message will be transmitted to the RSC. The file will be saved at the host system.

5. "FILE <file-name> LOCKED AS A DISK FILE."

Originator: RJE/CONTROLLER

This message is sent to the RSC whenever a remote card deck has been locked on the host system as a disk file. Any remote card deck not directly associated with a remote job will be locked as a disk file at the host computer.

6. "#FLUSHING CARD READER."

Originator: RJE/CONTROLLER

Several error conditions may initiate this message. All incoming card decks to RJE/CONTROLLER must begin with control cards. If the deck does not begin with control cards or there is an error in the deck itself, RJE/CONTROLLER sends this message. If a remote satellite system attempts to send card images before log on is complete, RJE/CONTROLLER sends this message to the RSC. All card images are discarded until the remote satellite system is fully logged on.

7. "#INVALID CONTROL MESSAGE RECEIVED."

Originator: RJE/CONTROLLER

The control messages referred to in this error message are Burroughs RJEA system control messages explained later in this section. Should a message be received which is not defined for the system, the above message will be sent to the RSC. Also, the type 9 control message may only be sent immediately after log on and prior to any other input to the host. If it is sent at any other time, this message will be sent to the RSC.

8. "#INV KEYIN"

Originator: RJE/CONTROLLER

All RJE input messages have a specific format, i.e., an asterisk as the first non-blank character and an appropriate control string. If a message is received by RJE/HOST which does not conform to the defined format, #INV KEYIN is transmitted to the RSC. The incorrectly formatted message is discarded and the operator must re-enter it, correcting the error.

9. "#LOG OFF IN PROCESS READER PURGED."

Originator: RJE/CONTROLLER

If a remote operator logs off while receiving output, remote satellite system will remain on line until completion of the transmission. At this time, however, no program input will be permitted. Should the operator attempt to send a remote card deck, it will be discarded and this message sent to the RSC. An *LO message will return the remote satellite system to its prior state, enabling the operator to enter jobs.

10. "#PACK <pack name> REQUIRED FOR USER <usercode>, RSN <RSN>."

Originator: RJE/CONTROLLER

It is possible to set up a usercode to automatically require a specific pack when log on occurs. If RJE/CONTROLLER determines that the necessary pack is not on line, the above message is sent to the RSC. The remote satellite system operator must then converse with the host system operator (via the RSC) to decide if the pack should be loaded. Once the pack is on line, work may begin. If, however, the host operator decides to override the pack request, the following message will be sent to the RSC.

"#PACK REQUESTED HAS BEEN OVERRIDDEN TO SYSTEM DISK"

11. "#PB OR SB INVALID SYNTAX."

Originator: RJE/AUTOBACKUP

The text portion of an *PB or *SB message is not scanned by RJE/CONTROLLER but passed to and scanned by RJE/AUTOBACKUP. Should this text prove to be in error, then the above message is sent to the RSC and the *PB or *SB discarded. The operator at the remote satellite system must then correct the error and re-enter the message.

12. "#QT IN PROCESS."

Originator: RJE/CONTROLLER

A QT entered by the host operator will cause the RJE system to log off every active user. All output is saved and all jobs which have been executed are allowed to complete. Immediately after the QT message has been entered, a "#QT IN PROCESS" is sent to all active users before their log off process begins.

13. "#SAVE IN PROCESS."

Originator: RJE/CONTROLLER

An SV entered by the host operator will cause the user specified in the SV to be logged off. All output is saved and all jobs are allowed to complete. Immediately after the SV has been entered, the above message will be sent to the RSC and the user logged off.

14. "#STOP IN PROCESS."

Originator: RJE/CONTROLLER

An ST message entered by the host operator will cause the RJE system to immediately terminate. All remote jobs and their backup files will be lost. Prior to terminating, RJE/CONTROLLER will send the "#ST IN PROCESS" message to every RSC and log every user off the system.

15. "#SYSTEM FULL LOG ON NOT POSSIBLE."

Originator: RJE/CONTROLLER

The RJE system is capable of supporting only 16 remote users. Should a new user enter the RJE system when 16 users are active, then this message will be displayed and further input from the remote ignored until space is available. The primary reason for this situation is that a job may continue to run under a usercode after that remote user has logged off. The host system views that user as active until the job completes. The line may be free for some time before space is available within RJE for another user.

16. "#TO BE CALLED BACK"

Originator: RJE/CONTROLLER

This indicates that the CALLBACK option has been set and a phone number entered. The remote user will automatically be called back when his job is completed in order to transmit the output.

17. "#BYE ABORTED, NEED PHONE NUMBER"

Originator: RJE/CONTROLLER

The CALLBACK OPTION was set but no phone number for the automatic callback was entered (via the #PH command).

18. "#CALLBACK ABORTED, NO JOBS ACTIVE"

Originator: RJE/CONTROLLER

No automatic callback will occur since there will be no output to transmit.

19. "#BYE ABORTED, NO DIALOUT LINE AVAILABLE"

Originator: RJE/CONTROLLER

No DIALOUT LINE is available - the hardware is not present.

SYSTEM OUTPUT MESSAGES

All other messages displayed at the RSC are generated by the MCP. These messages have formats identical to those at the main system and include replies generated in response to system input messages entered at the RSC. (See section entitled "SYSTEM INPUT MESSAGES".)

INPUT MESSAGES

There are two basic types of RSC input messages: RJE input messages and system input messages. The following paragraphs discuss these message types.

RJE INPUT MESSAGES

RJE/CONTROLLER has been designed as an interface between the remote satellite system and the MCP which services its RSC keyboard entries. Complete transparency of this interface is impossible since many RSC keyboard entries must be provided to communicate directly with the RJE/CONTROLLER. Therefore, any RSC input message beginning with the character "*" is handled directly by RJE/CONTROLLER.

These RJE input messages provide control over the following areas of RJE/CONTROLLER activity: session log-off, debugging aids, Autobackup routine activity, states of RJE terminal run-time options, datacomm reconfiguration, inter-terminal communication, and environment interrogation.

The available RJE input messages are discussed in the following paragraphs. The mnemonics of these keyboard entries are as follows:

*BYE
*CL
*FM
*ID
*LC
*LO
*PB
*PD
*PH
*QT
*RB
*RD
*RS
*SB
*SD
*SF
*SO
*SS
*TF
*TO
*US
*WM

* BYE INPUT MESSAGE (LOG-OFF)

Format: *BYE

The *BYE input message causes the current session to be terminated. Any active jobs initiated by the satellite system are left active. If the satellite system is receiving a data stream, the stream will be allowed to complete. If the satellite system is sending a job deck, the card reader is cleared and the deck is discarded. When transmitting over switched lines the satellite system is disconnected.

Example:

```
*BYE
```

*CL INPUT MESSAGE (CLEAR UNIT)

Format: *CL or *CLEAR

The *CL input message allows the remote operator to clear the remote card reader. The host system will purge any program currently being received from the satellite system and will respond with the message "#CR CLEAR".

Example:

```
*CL
*CLEAR
```

*FM INPUT MESSAGE (RESPONSE TO SPECIAL FORMS)

Format: *FM <unit mnemonic>

The *FM input message is a response to the "SPECIAL FORMS REQUIRED" message. The unit-mnemonic designates which unit is to be assigned to the file. The message:

"#SPECIAL FORMS REQUIRED ON PRINT FILE - <file name>"
PUNCH

is disolayed on the remote console printer and requires that an *FM message be submitted by the remote operator before the file can be transmitted.

Example:

*FM LP
*F1 CP

*ID INPUT MESSAGE (REMOTE SITE IDENTIFIER)

Format: *ID = <id message>

The *ID input message is to permit satellite systems to supply a satellite system identifier to the host system. Some satellite RJE implementations can send this message via a special control message and will not need this message while some implementations (e.g., DC1000) must use this command. The ID message may be up to 17 non-blank characters in length.

This command will be accepted only after log on, and before any action by the host for the user. It may be entered any number of times if no other actions have occurred. If entered incorrectly, an error message will be sent and the command must be re-entered, providing the original error did not produce an error condition that has to be remedied first.

Example:

```
*ID = 012345678
```

*LC INPUT MESSAGE (LOG COMMENT)

Format: *LC <text>

The *LC input message allows the remote operator to enter given text in the system's SPO log as an RJE/CONTROLLER message entry associated with the current session number. The text is also displayed on the host console printer. The RJE/CONTROLLER responds by displaying "#" on the remote console printer.

Example:

```
*LC MESSAGE SYSTEMS SPO LOG
```

*LO INPUT MESSAGE (LOG-ON)

Format: *LO

The *LO input message allows the remote operator to bypass the LOG-ON requirement. The *LO message does not assign a usercode or password to the satellite system. Therefore, each job entered from the satellite system must have a usercode and/or password control card. This message is only valid at log-on time. If a user logs on with this message, then input messages which require knowledge of a remote site's usercode will be disabled. (i.e., *PB, *SB, *PD, *SD, *RB, *RS).

Example:

```
*LO
```

*PB INPUT MESSAGE (PRINTER/PUNCH BACKUP)

Format 1) *PB J <job number> <option-1 [option-2]...>

2) *PB S <session number> <option-1 [option-2]...>

3) *PB <backup number> <option-1 [option-2]...>

4) *PB = <option-1 [option-2]...>

The *PB input message allows the satellite system operator to initiate the transmission of a print or punch disk file to the satellite system. Format 1 transmits all backup files that were created under the specified job number. Format 2 transmits all backup files that were created under the specified session number. Format 3 transmits the backup file specified by the backup number. Format 4 transmits all backup files that were created under the usercode with which the satellite system LOGGED-ON. If a satellite system has bypassed the LOG-ON procedure by using the *LO input message, the *PB will not be accepted since the *PB will apply only to files created under the remote operator's usercode.

OPTION	FUNCTION
COPIES integer	Causes RJE/AUTOBACKUP to produce integer copies of the specified backup file. One copy is the default if this option is not specified.
DOUBLE	Causes RJE/AUTOBACKUP to double-space the entire printer listing, overriding any carriage control specified in the backup file.
KEY	Allows specification of a range of records to be printed or punched. A detailed description of the syntax is given below. All records in the file will be printed or punched if this option is omitted.
LABEL(S)	Allows the remote operator the ability to request the labels of all backup files to be printed on the remote printer. This option is the only option that cannot have any other

option associated with it.

RECORD range — Allows specification of a range of records to be printed or punched. Output will begin with the physical record specified by integer-1 (the first record in the backup file is record number 1) and continues until the physical record specified by integer-2. If integer-2 is omitted, end-of-file is assumed as the terminator. All records in the file are printed or punched if this option is omitted.

SAVE — Causes RJE/AUTOBACKUP to leave the backup file on disk when the file is closed. The file will be removed from disk if this option is omitted.

SINGLE — Causes RJE/AUTOBACKUP to single-space the entire printer listing, overriding any carriage control specified in the backup file.

The complete syntax for the KEY option is:

```
*****************************************************************
*             compiler-name             RANGE string-1 string-2 *
*    KEY                                                        *
*             integer-1 integer-2       EQUAL string-3          *
*****************************************************************
```

Use of the KEY option allows specification of a range of records to be printed or punched according to information within the records themselves (e.g. a sequence number). The portion of each record to be compared may be specified, as well as the information that will start and stop the output.

Integer-1 specifies the column number of the subfield to be used for the compare argument, and integer-2 specifies the length. Integer-2 must be greater than zero and less than ten. The compiler-name option causes automatic generation of the proper column number and length pair that corresponds to the sequence field of the output listing produced by the specified compiler. The permissible compiler-names that can be used are BASIC, COBOL, FORTRAN, MIL, NDL, RPG, SDL, DASDL and UPL.

The RANGE and EQUAL parameters specify the argument to which the subfield in each record is to be compared, and the action to be taken when a "true" comparison is detected. The strings can be either an integer or an alphanumeric literal enclosed within quote marks. When the comparison arguments are of different lengths, an integer string is left-truncated or left zero-filled to the same length as the subfield; an alphanumeric literal is right-truncated or right space-filled to the same length as the subfield.

If EQUAL is specified, printing and punching will begin when an exact comparison has been made between the subfield and string-3, and will continue until end-of-file is reached.

If RANGE is specified, printing or punching will begin when an exact comparison has been made between the subfield and string-1. The printing and punching continues until an exact comparison is made between the subfield and string-2, or until end-of-file is reached, whichever occurs first.

If string-1 is equal to string-2, the entire backup file will be searched. Every record in which the designated subfield matches string-1 is printed or punched.

Since the specified comparisons require an exact match between the string and the subfield, no sequential ordering of the backup file is necessary.

NOTE: If both the RECORD option and the KEY option are specified in the same statement, the comparisons specified by the KEY option will be made only within the range of records specified by the RECORD option.

Examples:

```
*PB J 125
*PB S 17
*PB 4 RECORD 5
*PB = COPIES 4 RECORD 5
*PB 3 KEY COBOL RANGE 123 567
*PB 2 KEY 7 6 EQUAL "ABC"
*PB 53 RECORD 1 100 DOUBLE SAVE
*PB = LABELS
```

*PD INPUT MESSAGE (PRINT DIRECTORY)

Format 1) *PD J <job number>

2) *PD S <session number>

3) *PD <backup number>

The *PD input message allows the satellite system operator to interrogate the host system's output file directory for files entered under the usercode with which he logged on. If no files are found to match the PD as entered, the following message is displayed at the RSC.

"#FILE(S) NOT ON DISK"

This message is also displayed if the satellite system operator bypassed the log on procedure by using the *LO input message. For every file that is found, the message

"#PD = <file name>

is displayed at the RSC and at the end of the listing of files the message below is displayed.

"#END PD"

Example:

*PD J 495

*PH INPUT MESSAGE (CURRENT PHONE NUMBER)

Format: *PH

This command will inform the operator of the current phone number.

Example:

```
*PH
PHONE NUMBER IS 964-3719
```

Format: *PH = <phone-number>

This command allows the phone number to be entered or changed. The phone number is requested when the CALLBACK option is set and is used for automatically re-establishing connection to a remote user after he has logged off in order to transmit his output. A <phone-number> can be up to 20 characters including dashes ("-") for time separators (c.f. NDL "PHONE = <TEXT>"). The phone number entered will be echoed back for verification.

Example:

```
*PH = 1-805-964-6881-412
PHONE NUMBER IS 1-805-964-6881-412
```

*QT INPUT MESSAGE (QUIT TRANSMITTING)

Format: *QT <unit-mnemonic> <option>

The *QT input message allows the remote operator to control printing and punching of backup files. The <unit-mnemonic> must be a line printer (LP) or card punch (CP). Options can be used to control the output and action taken by AUTOBACKUP. A detailed description of these options follows:

Option	Function
+ <integer>	Causes RJE/AUTOBACKUP to skip forward the number of records specified by the integer and continue transmission of the print or punch file.
- <integer>	Causes RJE/AUTOBACKUP to skip backward the number of records specified by the integer and continue transmission of the print or punch file.
COPIES	Causes RJE/AUTOBACKUP to interrogate the number of copies left to be transmitted and displays the message on the remote console printer.
PURGE	Causes RJE/AUTOBACKUP to stop transmitting the current backup file and remove the backup file from disk.
SINGLE	Causes RJE/AUTOBACKUP to override any carriage control information in the backup file and replace the carriage control information with a single space carriage control character.
WHERE	Causes RJE/AUTOBACKUP to display on the remote console the number of records transmitted so far.

If no copy of RJE/AUTOBACKUP is active when this command is entered, an error message will be generated informing the user that the command is invalid in that context.

*RB INPUT MESSAGE (REMOVE REMOTE BACKUP ENTRY)

Format 1) *RB J <job number>

2) *RB S <session number>

3) *RB <backup number>

The *RB input message allows the satellite system operator to interrogate the host system's output file directory and remove entries from both the directory and the system. If no files are found under the format entered or if the satellite system operator logged on via the *LO input message, then the following message is displayed is the RSC.

"#FILE <file name> NOT ON DISK#

For every file that is found and removed the following message is displayed at the RSC.

"#FILE <file name> REMOVED"

Example:

*RB S 1001

*RO INPUT MESSAGE (RESET OPTION)

Format: *RO <option-name>

The *RO input message allows the remote operator to reset the options used by RJE/CONTROLLER. RJE/CONTROLLER replies with the verification that the option has been reset after each *RO message. The reply format is:

<option-name>=0

If the option name specified is illegal, RJE/CONTROLLER responds with:

#INV KEYIN.

Refer to the documentation on *SO for a description of the <option name>.

Example:

```
*RO CALLBACK
    CALLBACK=0
```

*RS INPUT MESSAGE (REMOVE SITE BACKUP ENTRY)

Format 1) *RS J <job number>

2) *RS S <session number>

3) *RS <backup number>

4) *RS <(usercode)>

The *RS input message allows the satellite system operator to interrogate the host system's output file directory and to remove files from both the directory and the system. The first search is for the USERCODE, PASSWORD and SITE ID of the satellite system. When a match has been found for all three of these, the search will then be initiated for the specification entered by the *RS message. If no site id was entered at log on by the satellite system operator, or if a *LO was used to log on, or if no files were found matching the parameters given, the following message is sent to the RSC.

"#FILE(S) NOT ON DISK"

For every file that is found and removed the message below is displayed at the RSC.

"#FILE <file name> REMOVED"

Example:

*RS (USER)

*SB INPUT MESSAGE (SITE BACKUP)

Format 1) *SB J <job number> <option-1 [option-2]...>

2) *SB S <session number> <option-1 [option-2]...>

3) *SB <backup number> <option-1 [option-2]...>

4) *SB <(usercode)> <option-1 [option-2]...>

5) *SB = <option-1 [option-2]...>

The *SB input message allows the remote operator to print or punch files at the satellite system site. This command can initiate the printing of any file entered under the usercode, password and site-id of the remote user regardless of which actual usercode created the file.

Format 1 Prints or punches all backup files that were created under the specified job number.

Format 2 Prints or punches all backup files that were created under the specified session number.

Format 3 Prints or punches the backup files specified by the backup number.

Format 4 Prints or punches all backup files created under the specified usercode; the parentheses are required.

Format 5 Prints or punches all backup files created by RJE/CONTROLLER.

Options:

Various options allowed by the *SB INPUT MESSAGE are the same as the *PB options. See *PB INPUT MESSAGE (PRINTER/PUNCH BACKUP), Section 3.

*SD INPUT MESSAGE (PRINT SITE DIRECTORY)

Format 1) *SD J <job number>

2) *SD S <session number>

3) *SD <backup number>

4) *SD <(usercode)>

The *SD input message allows the satellite system operator to interrogate the host system's output file directory for files which were entered under the usercode, password and site id specified and which match one of the above formats. If no usercode or site id was entered at log on, or if a *LO was used to log on, or if no files were found in the directory, the message below is displayed at the RSC.

"#FILE(S) NOT ON DISK"

For every file that is found matching the specifications, the following message is displayed at the RSC.

"#SD = <file name>

At the end of the listing of files, a final message is printed.

"#END SD"

Example:

*SD J 512

*SF INPUT MESSAGE (SET FACTOR)

Format: *SF <integer>

The *SF input message allows the remote operator to specify the max numbers of characters per transmission block. The initial default buffer size is 402 (number of characters between STX and ETX). The integer must fall between 135 and 402 inclusive.

Example:

```
*SF 200
BLOCKING FACTOR=200
```

*SO INPUT MESSAGE (SET OPTION)

Format: *SO <option-name>

The *SO input message allows the remote operator to set the options used by RJE/CONTROLLER. RJE/CONTROLLER replies with the verification that the option has been set after each *SO message. The reply format is:

<option-name>=1

If the option name specified is illegal, RJE/CONTROLLER responds with

#INV KEYIN.

The three run-time remote terminal options are as follows:

Option	Function
AUTOPRINT	When this option is set, all print files are automatically transmitted to the satellite system as soon as the job has been completed, without intervention by the remote operator.
AUTOPUNCH	When this option is set, all punch files are automatically transmitted to the satellite system as soon as the job has been completed, without intervention by the remote operator.
CALLBACK	When this option is set, and a remote user logs off with jobs active, connection is automatically re-established upon completion of these jobs using the phone number supplied by the *PH message. Output is then transmitted to the remote user. The line is available for other users during the time between the log off and the reconnection.

Example:

```
*SO AUTOPRINT
   AUTOPRINT=1
```

*SS INPUT MESSAGE (SEND SPO MESSAGE)

Format 1) *SS <text>

2) *(USERCODE) SS <text>

3) *<RSN>SS <text>

The *SS input message allows the remote operator to send console printer messages to the host system or to another satellite system that is logged-on. Format 1 results in the text portion of the message being displayed on the host console printer. Format 2 results in the text portion of the message being displayed on any satellite system console printer that corresponds to the given usercode. Format 3 results in the text portion of the message being displayed on the satellite system console printer that corresponds to the given Remote Station Number (RSN).

NOTE: RSN is calculated from the LSN received from NDL Handler. The calculation is LSN/4+1.

If the satellite system is not currently logged-on, RJE/CONTROLLER will respond with the following message:

#INV KEYIN.

Successful communication is indicated when RJE/CONTROLLER responds with "#". When using format 2, the parentheses are required.

Example:

```
*SS WHAT TIME IS IT
 #
*(A) SS WHO ARE YOU
 #
*16 SS WHO ARE YOU
 #
```

*TF INPUT MESSAGE (TEST BLOCKING FACTOR)

Format: *TF

The *TF input message allows the remote operator to interrogate the current setting of the blocking factor. (See "*SF".)

Example:

```
*TF
BLOCKING FACTOR=402
```

*TO INPUT MESSAGE (DISPLAY OPTIONS)

Format 1) *TO

2) *TO <option-name>

The *TO input message allows the remote operator to interrogate the status of its remote options. Option 2 will only interrogate the status of <option-name> [c.f. *SO], thus selectively reducing the typed output.

Example:

```
*TO
 AUTOPRINT=1
 AUTOPUNCH=0
 CALLBACK=1

*TO CALLBACK
 CALLBACK=0
```

*US INPUT MESSAGE (USERS ON-LINE)

Format: *US

The *US input message allows the remote operator to obtain a list of every remote satellite system in the network by Remote Station Number (RSN).

Example:

```
*US
```

*WM INPUT MESSAGE (DISPLAY CURRENT RJE/CONTROLLER)

Format: *WM

The *WM input message allows the remote operator to request the compile date and time of RJE/CONTROLLER.

Example:

```
*WM
RJE/CONTROLLER COMPILED ON 28 JUL 80 AT 17:12:59.4
```

SYSTEM INPUT MESSAGES

All RSC input messages that are not prefixed with an "*" are sent to the MCP in the manner in which they are keyed-in. The MCP then generates appropriate responses which are sent to the RSC. Every attempt has been made to make the RSC as similar as possible to the central system SPO; however, security restrictions have imposed certain constraints on RSC keyboard entries. Also, certain keyboard entries such as those which alter central system options or purge or clear central system peripherals have been disallowed when entered at an RSC. The legal system input messages are indicated below:

ADD	AP	AT	AX	BF	CD	CH	CO	CP	CU	DA	DJ	DF
---			--	--		--	--			--		--
DM	DP	DS	DY	END	EX	FN	FR	FS	FW	GO	GT	HN
--	--	--	--		--		--	--	--	--	--	
HS	HW	IL	LD	LO	LP	LS	MH	MO	MP	MR	MX	NT
--	--	--	--	--	--		--	--	--	--		--
OF	OK	OL	OU	PD	PM	PP	PR	PS	PV	QF	QP	QU
--	--		--	--	--	--	--		--	--		
RB	RE	RF	RM	RS	RX	SP	ST	SW	SZ	TD	TI	TS
--	--	--	--	--	--	--	--	--				
UL	US	WD	WM	WS	WT	WY	ZQ					
--												

All the underlined SPO commands require a valid usercode and password. It is possible for a remote user to copy or backup his files using SYSTEM/COPY constructs; i.e., COPY, ADD, COMPARE.

Job related system input messages may refer only to jobs initiated by the terminal where the keyboard entry is entered.

HOST SYSTEM CONSOLE MESSAGES

To assist the host B1800/B1700 RJE operator, RJE Host provides console input and output messages. With these, the operator has the ability to interrogate and control the B1800/B1700 Host RJE package. The current Host RJE output and input messages are discussed in the following sections.

RJE HOST SYSTEM OUTPUT ERROR MESSAGES

The meaning of most of the host system console output messages displayed by RJE Host is either self-evident or explained elsewhere in this document. However, some unsolicited messages are indicative of an error within the RJE system which may either require some intervention by the host system operator or inform the operator of some minor malfunction within the RJE Host system. These messages and their definitions are discussed in the following paragraphs.

1. "#CONTROL RECORD OUT OF RANGE."

   Originator: RJE/AUTOBACKUP

   This message generally does not occur within a normal operating environment. It indicates the receipt by RJE/AUTOBACKUP of an incorrectly formatted message from RJE/CONTROLLER. This error is not serious; the programs will continue.

2. "#END TASK RECORD OUT OF SEQUENCE."

   Originator: RJE/AUTOBACKUP

   This message should not be encountered within a normal operating environment. It is displayed when RJE/AUTOBACKUP receives a message from RJE/CONTROLLER out of proper sequence. The programs will recover, however, should this or any other error message be received with great frequency, the RJE system should be terminated (e.g., by the QT or ST local SPO messages, or by <mix>DS or <mix>DP).

3. "#ERROR OCCURRED WHILE ATTEMPTING TO INITIALIZE USERCODE FILE."

   Originator: RJE/CONTROLLER

   After execution, RJE/CONTROLLER initializes the system's usercode/password file via a communicate with the MCP. If an error is encountered during this procedure,

RJE/CONTROLLER displays this message and terminates. The error must be corrected before the program can be executed again.

4. "#FILE RECORD OUT OF SEQUENCE."

Originator: RJE/AUTOBACKUP

This message should not be encountered under normal running conditions. It indicates that RJE/AUTOBACKUP received a message from RJE/CONTROLLER that was out of proper sequence. All programs will continue. No operator intervention is necessary unless RJE/AUTOBACKUP generates error messages frequently. If this occurs, the RJE system should be terminated (e.g., by the QT or ST local messages, or by <mix>DS or <mix>DP).

5. "#FILE "RJE/MESSAGES" NOT FOUND."

Originator: RJE/CONTROLLER

After execution, RJE/CONTROLLER opens a random disk file named "RJE/MESSAGES" which contains all output messages for RJE/CONTROLLER. If this file cannot be found, this message is displayed and RJE/CONTROLLER terminates. If RJE/CONTROLLER resides on a user pack instead of system disk, RJE/MESSAGES must also reside on the user pack.

6. "#INVALID MESSAGE RECEIVED".

Originator: RJE/AUTOBACKUP

As with all other error messages from RJE/AUTOBACKUP, this message should not be encountered. It indicates that RJE/AUTOBACKUP has received an unrecognizable message from RJE/CONTROLLER. The programs will recover.

7. "#INV KEYIN".

Originator: RJE/CONTROLLER or RJE/AUTOBACKUP

This message is displayed by either program in response to

the entry of an invalid operator input message.

8. "#LOSS OF DATA SET READY ON LINE <line number>".

Originator: NETWORK CONTROLLER

This message is caused by a hardware malfunction. It notifies the host system operator that the data set on the line specified has dropped data set ready. This condition is not fatal to the user currently logged on that line as no output will be lost. All files will be saved and all jobs will complete. The data set should be checked before the user logs on again.

9. "#MESSAGE RECEIVED FOR NON ACTIVE STATION".

Originator: RJE/CONTROLLER

This message is displayed by RJE/CONTROLLER when a message is received from the MCP where the session number of the message does not match any session number currently active in the system. The message is discarded and RJE/CONTROLLER continues.

10. "#PACK <pack name> REQUIRED FOR USER <(usercode)>, RSN <RSN>".

Originator: RJE/CONTROLLER

Following the successful log on of a user whose usercode requires a pack, this message is displayed at the host system. The host system operator should converse with the remote satellite system operator to determine if the pack named should be loaded on the system. If it is decided to use system disk instead of the user pack, an OV should be entered at the host system. This overrides the pack request and sends all jobs to system disk. If a job is entered before the user pack is on line or the OV entered, that job will go to system disk automatically.

11. "#PB OR SB INVALID SYNTAX"

Originator: RJE/AUTOBACKUP

This message is displayed by RJE/AUTOBACKUP when an RT local input message entered by RJE/CONTROLLER contains erroneous text. When this error occurs, no files are transmitted to the remote satellite system. The host system operator should correct and re-enter the message.

12. "#RECORD RECEIVED FOR NON ACTIVE JOB"

Originator: RJE/CONTROLLER

RJE/CONTROLLER receives MCP messages which reference both users and jobs. If a message is received where the user referenced is active but the job specified is not currently running under that user, this message is displayed. The MCP message is discarded and RJE/CONTROLLER continues.

13. "#RETRIES UP ON LINE <line number>"

Originator: NETWORK CONTROLLER

This message is displayed by the Network Controller when the message it is trying to send on the line specified is not being acknowledged and the retry count is exhausted. The host system operator may let the Network Controller continue to send to the remote satellite system or it may instruct the Network Controller to discard the message via an RE local input message.

14. "#TASK RECORD OUT OF SEQUENCE"

Originator: RJE/AUTOBACKUP

This message should not be encountered under normal running conditions. It indicates that the message received by RJE/AUTOBACKUP from RJE/CONTROLLER is out of proper sequence. The programs will continue to run. No operator intervention is necessary unless this message is frequently displayed.

15. "#USER RECORD OUT OF SEQUENCE"

Originator: RJE/AUTOBACKUP

This is another of the RJE/AUTOBACKUP messages which should not be encountered in a normal running environment. It indicates that RJE/CONTROLLER has sent RJE/AUTOBACKUP a message which is out of proper sequence. The programs continue and the operator should intervene only if this or some other RJE/AUTOBACKUP message is frequent enough to warrant terminating the RJE system (e.g., by the QT or ST local SPO messages, or by <mix>QS or <mix>QP).

16. "#WARNING: DIRECTORY NEARLY FULL"

Originator: RJE/CONTROLLER

The output file directory used by the RJE/CONTROLLER is a large disk file (10,000 records) which, under even the most extreme conditions, should never be filled. Should the file ever be nearly full (less than 50 records remaining), then the above message is displayed whenever a record is added to the file. If this situation occurs, the directory should be purged of entries which are not needed.

17. "#WARNING: WORKFILE NEARLY FULL"

Originator: RJE/CONTROLLER

The workfile used by the RJE/CONTROLLER is a large disk file (10,000 records) which, under even the most extreme conditions, should never be filled. If the file is close to being filled, then the above message will be displayed whenever a record is added to the file. If this situation occurs, active users should be logged off until the workfile stabilizes with the completion of their remote jobs.

18. "WARNING: CONTROL CARD FIELD TRUNCATION"

Originator: RJE/CONTROLLER

Columns 73-80 of the control cards from a remote station are blacked out, comments (starting with "%") are removed and trailing blanks are ignored. The remaining data is then packed into a 2000 byte area. If this 2000 byte area is filled all further control information is ignored and RJE/CONTROLLER sends the above message to the remote station.

19. "#INVALID LSN FROM STATION STATUS"

20. "#ILLEGAL TERMINAL TYPE"

21. "#INCONSISTENCY BETWEEN LSN'S OF RSN"

These three messages (19, 20, and 21) are originated by RJE/CONTROLLER and indicate possible hardware malfunction. An automatic DUMP is produced to assist in locating the problem.

RJE HOST SYSTEM OPERATOR INPUT MESSAGES

The host system operator may interrogate and control RJE/CONTROLLER via host system input messages. These messages are free form with no embedded blanks allowed within tokens. They are defined by a unique two character mnemonic which must be the first non-blank series of characters in the message.

RJE/CONTROLLER always acknowledges host system input messages. If the message was entered correctly, a pound sign "#" will be disolayed or a detailed response to the command. If an invalid message is entered the following is disolayed.

"#INV KEYIN"

The current RJE host input messages are discussed in the following section.

AP HOST SYSTEM INPUT MESSAGE (AUTOPRINTS RUNNING)

Format: AP <number>
AP

The AP inout message permits the host system operator to control the number of copies of RJE/AUTOBACKUP which may run simultaneously. The number supplied must be between 1 and 16 inclusive. If the number entered is greater than the current setting, RJE/CONTROLLER will search for a user which might need a copy of RJE/AUTOBACKUP and execute a copy for that user. RJE/CONTROLLER will respond with the following message.

"#NUMBER OF COPIES SET TO "<number>"

If no number is supplied, RJE/CONTROLLER will display the current number of autoprints which may run at one time.

Example:

AP 5

OV HOST SYSTEM INPUT MESSAGE (OVERRIDE PACK)

Format: OV <RSN>

Following the successful log on of a remote user who requires a pack or cartridge not currently on line, the following message is displayed at both the RSC and the host system SPO.

"#PACK <pack name> REQUIRED FOR USER <(usercode)>, RSN <RSN>"

Should it not be convenient or desirable to put the user pack on line, the host system operator may enter an OV message. This will force all jobs for that user to run on system disk. If a job requiring an absent pack is executed, the MCP will automatically send that job to system disk. If the host system operator overrides the pack request, the following message is sent to the RSC.

"#PACK REQUESTED HAS BEEN OVERRIDEN TO SYSTEM DISK"

QT HOST SYSTEM INPUT MESSAGE (QUIT RUNNING)

Format: QT

This input message allows the host system operator to halt the RJE system in an orderly manner. All remote satellite systems which are logged on but have no active jobs and are receiving no output will immediately be logged off. All other users will continue until the current output task has been completed. These users will then be logged off. All remote jobs will be allowed to complete before RJE/CONTROLLER goes to EOJ.

The QT message must be entered twice. After the first entry, the following message is displayed.

"#PLEASE RE-ENTER "QT" MESSAGE"

The actual QT begins after the operator enters the second QT.

Example:

```
QT
```

RE HOST SYSTEM INPUT MESSAGE (RETRY)

Format: RE <line #>

This input message is directed to the Network Controller. If the Network Controller exhausts the retry count for a message on a certain line, it will display the following message.

"#RETRIES UP ON LINE <line number>"

The Network Controller continues to transmit the message until the host system operator enters "RE <line #> " to RJE/CONTROLLER. RJE/CONTROLLER queues a message for the Network Controller causing it to discard the message when retries are up.

Example:

RE 1

RT HOSTS SYSTEM INPUT MESSAGE (ROUTE FILE)

Format 1) RT ALL <file name> [<text>]

2) RT <RSN> <file name> [<text>]

3) RT <(usercode)> <file name> [<text>]

The RT input message allows the host system operator to route backup files to specific remote satellite systems. The "ALL" format will route a copy of the specified file to every user currently logged on. The <RSN> format will route the file to the RSN specified if a valid user is logged on at that RSN. The <(usercode)> format will cause the host system to send the file to all users logged on under the given usercode.

To send a file, a copy of RJE/AUTOBACKUP must be available for every user or RJE/CONTROLLER will try to schedule a copy of RJE/AUTOBACKUP for the user and disolay the following message.

"#PLEASE RE-ENTER "RT" MESSAGE FOR RSN "<RSN>" AT A LATER TIME"

The file name entered must conform to RJE backup file naming conventions for the message to be valid. An example is shown:

[<pack id>]/<multi-file-id>/<"#" or "%"><backup number>

The <multi-file-id> need not be a usercode, but may be any character field of ten characters or less.

The file will always be saved at the host system regardless of the format used to enter the message. The text field in the above formats is identical to the text field in the "*PB" and "*SB" remote input messages. If a copy of RJE/AUTOBACKUP is available, the RT will be queued for the remote satellite system user and the following message sent the the user's RSC.

"#PB SCHEDULED BY LOCAL OPERATOR"

Example:

RT (USERA) PACK/(USERA)/#645 COPIES 2 SINGLE

RY HOST SYSTEM INPUT MESSAGE (READY LINE)

Format: RY <RSN>

The command causes the RJE system to ready the RSN specified in the statement. The command negates the action of the SV message.

Example:

```
RY 1
```

SE HOST SYSTEM INPUT MESSAGE (SET LOCAL LOG ON OPTION)

Format: SE

The SE input message will cause a message to be displayed at the host system console whenever a new user logs on or off the system.

"#USERCODE "<usercode>" LOGGED ON AT RSN "<RSN>",
SESSION "<session>"

"#USERCODE "<usercode>" LOGGED OFF AT RSN "<RSN>",
SESSION "<session>"

"#USERCODE "<usercode>", RSN "<RSN>", SESSION "<session>",
LOGGED OFF JOBS ACTIVE"

This option is either set or reset when SE is entered, depending on the current setting of the option within RJE/CONTROLLER. This option may be set permanently by modifying SW1 to a non-zero value or by setting "SW1=1" either at execution time or whenever RJE/CONTROLLER is executed. The SE command may still be used as usual.

Example:

SE

SS HOST SYSTEM INPUT MESSAGE (SEND SPO MESSAGE)

Format 1) SS <text>

2) <(usercode)> SS <text>

3) <RSN> SS <text>

The SS inout message is used to route messages from the host system console to the remote RSC. Format 1 will route the text of the message to all users which are currently logged on. Format 2 will route the message to all users currertly logged on under the specified usercode. The third format will only route the message to the user at the specified RSN.

Example:

(USERA) SS HELLO FROM SPO

ST HOST SYSTEM INPUT MESSAGE (STOP RUNNING)

Format: ST

The ST host system input message will bring the entire RJE system to an immediate halt. All programs running at the time will halt and all output will be lost.

The ST message must be entered twice. The system responds to the first entry with this message:

"#PLEASE RE-ENTER "ST" MESSAGE"

The actual ST begins only after the second consecutive ST is entered.

Example:

ST

SV HOST SYSTEM INPUT MESSAGE (SAVE RSN)

Format: SV <RSN>

The SV message allows the host system operator to save the RSN specified, (i.e., to log off the current user). The command is valid only if the RSN is active. All jobs will complete and all output will be saved. This message has the same effect as a "BYE" entered from the user's RSC.

Example:

```
SV 1
```

WH HOST SYSTEM INPUT MESSAGE (WHERE ARE USERS)

Format 1) WH

2) WH <RSN>

With this message, the host system operator can obtain a list of every remote satellite system in the network by usercode and remote station number (RSN). If the first format is used, the following message is displayed for every user currently logged on.

"#USERCODE "<(usercode)>" AT RSN <RSN>"

When the second format is used, the above message is displayed only for the active user currently logged on at that RSN. If no users are found, RJE/CONTROLLER displays the following:

"#NO USERS LOGGED ON"

Example:

WH

WM HOST SYSTEM INPUT MESSAGE (DISPLAY CURRENT RJE/CONTROLLER)

Format: WM

The WM message allows the host system operator to request the compile date and time of RJE/CONTROLLER. The response is shown below:

"RJE/CONTROLLER COMPILED ON <date> AT <time>"

Example:

WM

RJE/AUTOBACKUP HOST SYSTEM OPERATOR INPUT MESSAGES

The following two messages may be entered to RJE/AUTOBACKUP. If an invalid message is received by RJE/AUTOBACKUP, the response is as shown below:

"#INV KEYIN"

STATUS HOST SYSTEM INPUT MESSAGE

Format: STATUS

This messages allows the host system operator to request the current status of RJE/AUTOBACKUP. It will respond with the following:

"#USERCODE = <usercode>"
"#RSN = <RSN>"
"#LSN = <LSN>"
"#SESSION = <session>"

STOP HOST SYSTEM INPUT MESSAGE

Format: STOP

The purpose of this message is to halt RJE/AUTOBACKUP. It must be entered twice to achieve this. The first entry causes this response from RJE/AUTOBACKUP.

"#PLEASE RE-ENTER "STOP" MESSAGE"

Following the re-entry of the STOP message, RJE/AUTOBACKUP will terminate.

RJEA SYSTEM CONTROL MESSAGES

In addition to the standard datacomm control interface, systems in an RJE environment need to communicate certain information via system messages to insure orderly operation. System control messages are sent only to the first of the four stations declared for every remote user. The station address equals "00" (See Network Controller documentation below). These messages are sent without operator intervention by the systems themselves. They are not obvious to the operator (i.e., they do not appear as a SPO message at the host system or the remote satellite system).

RJE system control messages are two character decimal codes, sometimes followed by additional data.

CODE	DEFINITION	EXPLANATION
01	Logged on	Sent by the host system operator to the remote user to inform him that his terminal has been logged on and that the host system will now accept user messages and input data.
02dddd	Buffer size	Sent from either system, requesting a change in the length of messages being assembled for transmission. "dddd" is a variable length field (3 characters minimum) containing the requested message length in decimal notation.
03	Logged off	Sent from the host system to the remote terminal to indicate that the terminal is no longer logged on. Operator messages and input data will no longer be accepted.
04dddd	Buffer size reply	Sent from either system as a reply to Buffer size request (02) message.

05	D A 1	D A 2	Device not ready Suspend	Sent from either system instructing the other to suspend transmitting messages for DA1 and DA2. Indicates a temporary condition at a device, such as a line printer out of paper.
06	D A 1	D A 2	Device not ready Abort	Sent from either system informing the other that an uncorrectable condition exists preventing the processing of additional transmissions for DA1, DA2.
07	D A 1	D A 2	Device Ready	Sent from either system: 1. After a device not ready (05 or 06) system message to indicate that the condition has been corrected and the device is again ready to receive data. 2. Whenever a formerly unavailable device becomes ready to receive data. 3. Immediately after a logged on (01) system message to indicate each device that is ready and available to receive data.
08	D A 1	D A 2	Output comolete	Sent from the host system informing the remote terminal that all current output from the job to the device is complete. A response by the remote terminal to the host system is not required.
09ddsss			Station - id	Sent from the remote terminal to the host system prior to being logged on to provide the host with a positive means of identification independent of any security function.

The following chart of systems messages depicts the requirements for implementation of these message for both the host system the the remote satellite system.

MESSAGE CODE	HOST SYSTEM		TERMINAL SYSTEM	
	RECV	SEND	RECV	SEND
01	NOT REQUIRED	MANDATORY	MANDATORY	NOT REQUIRED
02	MANDATORY	MANDATORY	MANDATORY	OPTIONAL
03	NOT REQUIRED	MANDATORY	MANDATORY	NOT REQUIRED
04	MANDATORY	MANDATORY	MANDATORY	MANDATORY
05-07	MANDATORY	OPTIONAL	MANDATORY	OPTIONAL
08	OPTIONAL	MANDATORY	MANDATORY	OPTIONAL
09	OPTIONAL	NOT REQUIRED	NOT REQUIRED	OPTIONAL

B1800/B1700 HOST RJE IMPLEMENTATION

RJE CONTROLLER

GENERAL DESCRIPTION

The RJE Controller is a general purpose B1800/B1700 program which handles the interface between the B1800/B1700 remote user and the B1800/B1700 MCP. The RJE Controller runs with a general though properly configured Network Controller. Each line may have only one remote satellite system (since Burroughs RJE is a point-to-point discipline). Each remote satellite is represented as four stations in the NDL station section. The four stations correspond to the SPO, reader/punch, printer and a station for control messages. For further information on NDL generation refer to the section on "GENERATING THE NETWORK CONTROLLER".

OPERATION

LOG ON

The network controller notifies the RJE Controller whenever a new user enters the system (this is done whenever a new user has established a new connection by the exchange of an ENQ-ACK sequence on the line) or whenever a current user re-establishes his connection with the host. The RJE/CONTROLLER will send messages for the particular remote satellite system identifying the host system and requesting the user to enter his usercode and password. (See section titled "LOG ON AND LOG OFF MESSAGES").

LOG ON is not mandatory. If an "*LO" is sent from the remote SPO following the LOG ON request then the user will be connected without requiring a usercode or password. An "*LO" requires that a valid usercode be supplied with every program executed from the remote satellite system. The format of the usercode control card placed at the start of each deck or execute SPO message is "USER XXX/ZZZ" or "US XXX/YYY". Regardless of the method of logging, after a user is logged on, a session number is assigned to the user and a message with this session number is sent to its RSC. This session number identifies the user and all jobs sent to the host and backup files created by the user while logged on.

If a user wishes to supply a remote site ID to the host, it must be sent either just prior to or just after being logged on at the host system. (See *ID REMOTE INPUT MESSAGE). It will be discarded if sent at any other time. Until a a user has successfully logged on, any card input from the remote reader will be discarded. Also, if a remote user were to re-establish his connection with the host, he will, in effect, log himself off, and must re-LOG ON. If the same usercode and password are supplied as before, the same session number will be assigned.

PROGRAM ENTRY

Once logged on, a user may enter or run a job at any time (unless the host has sent a message to the remote satellite system disabling or suspending its card reader). All incoming decks must start with control cards and the input stream will be flushed until a control card is found. All the control cards for a job will be stripped off the incoming stream to be passed to the MCP via a zip communicate. The communicate will be done immediately after all the control cards for the job have been received. The RJE/CONTROLLER places usercode, session number, and queue information in the zip communicate. The MCP will respond through a special queue and supply job numbers and usercodes of all jobs scheduled by the communicate. The name of the input card file is also returned by the MCP.

A remote card deck can have only a 10 character file name. Names of the form A/B are not allowed. The RJE/CONTROLLER will change the names of incoming card files to a standard format which will identify the disk file as a remote card deck. The standard deck name format will use the user supplied file name as the file-ID and use a standard name for Multi-File-ID in which the job number of the particular job has been embedded. When an "?END" control card or a control card starting another job is scanned, RJE/CONTROLLER will close and lock the data file or files entered for that job and dispatch the job by zipping a special command to the MCP which will force the job out of the waiting schedule and attach the session number of the user which created the job to it. Thus, the job will be processed only after all the data decks for the job have been spooled to disk. With this final communicate, the B1800/B1700 MCP is then in control of the job.

It is possible to enter jobs under a usercode which is different from the one under which the remote operator logged-on. The control card "?USER " or "?US " followed by one's usercode and password (i.e., "?USER ABC/XYZ") as the first card in the deck will override the remote site's usercode for that one program only. The usercode and password entered this way will be verified and must therefore be valid or the job stream will be discarded and an error message sent to the remote site.

A ?END or a ?DATA control card must be included in a string of control cards before the cards are zipped to the MCP by RJE/CONTROLLER. If a job is to be executed from a remote card reader which does not have any remote card decks (and therefore no ?DATA control cards) associated with it, then a ?END control card is necessary for that job to be zipped when the string is received.

A remote card deck entered by the remote which is not associated with a job (control cards for the job having been entered immediately prior to the ?DATA control card for the deck) will be spooled as a disk file at the host system.

A usercode control card immediately preceding the ?DATA control card will cause the disk file to be named under the usercode supplied by the OS control card.

Multiple data decks are also possible. If instead of encountering a ?END control card another ?DATA control card is seen, the next deck will also be spooled to disk and named according to the same usercode as the previous deck.

(NOTE: Multiple data decks are really to enable a user to spool a number of decks to the host system under a usercode different from that used by the remote operator to log on, although it is permissible to do so with the default usercode).

PROGRAM EXECUTION

RJE/CONTROLLER will be notified via a special message from the MCP when a remote program entered through RJE/CONTROLLER has either gone to BOJ, gone to EOJ, or closed an output backup file. Upon BOJ of a remote job, RJE/CONTROLLER will upgrade the entry for that job in its active job file to show it as executing. Upon EOJ, in addition to changing the entry for that job in its

active job file to indicate that its output is waiting to be transmitted to the remote site, the controller will also send a zip to the MCP to remove all remote card decks which may have been entered for that job.

When notification of a backup file is received by RJE/CONTROLLER, an entry for that file is made in its output-file. After a program goes to EOJ, all backup files created by the program are queued for output if the autoprint option has been set. If required, a copy of a program named RJE/AUTOBACKUP is executed. RJE/AUTOBACKUP will then transmit the file to the remote satellite system and notify RJE/CONTROLLER when it is done.

The remote user will be able to control his jobs just as if he were at the B1800/B1700 SPO. All relevant messages concerning his jobs which would normally appear on the B1800/B1700 console will also appear on his remote console and likewise any messages sent from his remote SPO concerning his jobs will be passed to the MCP. All communication between RJE/CONTROLLER and the MCP in regards to messages to and from a remote console will have session number and usercode included so that the MCP will know the originator of the messages and RJE/CONTROLLER will know the final destination of the messages.

PROGRAM OUTPUT

If a user has the autoprint and autopunch options set for his remote site (the default value for these options will be true and false, respectively), all print and punch output from any job will be automatically sent to the remote terminal in the order in which the backup files were opened. A user may have any number of jobs running at a given time, all of which may be creating any number of backup files. In order to maintain the correct logical order of these files, output for a given job created under a particular usercode, session number, and job number will not be transmitted to the remote site until that job has gone to EOJ. If the autoprint option is set, all output for a job that has gone to EOJ will be transmitted to the remote site in the order in which the files were created (lowest backup file number first). Only when all output for a given job has been transmitted will the entry for that job be deleted from the active job file. If the autoprint option is not set, that job will remain in RJE/CONTROLLER's active job file until the user logs off. At this time, the host system will delete all entries for the job.

OUTPUT RETRIEVAL

When a user logs on, all backup files which were created under a previous session number will not be automatically sent to the remote user, but must be explicitly requested. In order to accomplish these requests, local commands have been implemented in RJE/CONTROLLER to enable users to determine the names of backup files, and to have them transmitted in any sequence. It is possible to request files by session number, job number, usercode, or backup file number.

If a backup file is created under a certain usercode, then that user may log on from any remote satellite system and claim all the output created under that usercode. A number of jobs may be entered from one site under different usercodes. The operator at the remote satellite system may request all the backup files created by these program to be transmitted to the remote satellite system, as long as the usercode, password and remote satellite system ID of the operator match those under which the system was logged on.

CALLBACK

In order to obtain a more efficient utilization of a remote terminal and its datacomm line, the automatic callback feature has been implemented for VII.0. A remote user logs off with the callback option set before his job(s) have been completed. The remote terminal is then made available for other users. Upon completion of the original user's jobs, RJE/CONTROLLER will find an available dialout line and automatically re-establish connection with him at the phone number previously supplied. His output will then be sent to him automatically without any operator intervention.

JOB SUMMARY INFORMATION

Job summary files have been implemented. For any remote program, a job summary file is a print file of all SPO messages and control cards sent and received by RJE/CONTROLLER for that job. Until that job goes to EOJ, all these messages are stored in RJE/CONTROLLER's job summary file as a list (the initial entry is pointed to by the entry for that job in RJE/CONTROLLER's active job file). Upon EOJ of the job, if the autoprint option is set, this print file will be transmitted as the first file for that

job. If the autoprint option is not set, then upon EOJ, the controller will dump all the job summary information for that job to a unique disk file and an entry for that file will be made in RJE/CONTROLLER's output-file. This disk file will then be treated as any other backup file and may be accessed by any RJE/CONTROLLER command which would normally access backup files listed in RJE/CONTROLLER's output-file.

BURROUGHS RJEA DESIGN CONSIDERATIONS

The initial release of RJE/CONTROLLER fully supports the Burroughs RJEA RJE system. This includes all nine local system control messages (station address "00", message types "01" through "09", which give the user the ability to control peripherals and change transmission buffer size). See Burroughs RJEA specifications for a detailed explanation. The RJE/CONTROLLER supports card and SPO input only and only SPO, printer and punch output.

PROGRAM STRUCTURE

EXTERNAL PERMANENT FILES

RJE OUTPUT-FILE FILE

Whenever RJE/CONTROLLER receives notification of the creation of a backup file for a remote user, an entry describing the file is made into this file. When a backup file has been transmitted to the remote site, the entry for this file will be deleted from the OUTPUT-FILE. Through this file, the remote user may claim output when the files were not initially sent to the remote site but retained at the host system. Each entry in the OUTPUT-FILE file will have five fields.

BACKUP FILE NUMBER
JOB NUMBER WHICH CREATED THE FILE
SESSION NUMBER UNDER WHICH THE FILE WAS CREATED
USERCODE WHICH CREATED THE FILE
USERCODE, PASSWORD, AND SITE ID AT INITIAL LOG ON

When a user logs back on the host system, he may request his backup files under any of the above entries. In this way, a user may log on from a site and enter a job or jobs and then he or another user with the same usercode may log on from a different site at a later time and claim all output created under that usercode. Output may be claimed by job number or session number as long as usercodes match. For large shop operations, when a large number of jobs may be entered at one time under a number of different usercodes, output may be claimed via the last field in this file. If one's usercode, password, and site ID match those in the last field, then he may claim all output for that site regardless of which usercode created the file.

EXTERNAL TEMPORARY FILES

ACTIVE JOB FILE

All jobs initiated by RJE/CONTROLLER are stored in this file under job number, usercode, and session number. This aids the controller in message routing and in allowing the remote user to control jobs running under his usercode when he logs back on the host system with jobs still running under his usercode.

OUTPUT CARD FILES

One output file for each of sixteen users is maintained. By manipulation of these files, all incoming card files from the remote sites are formed into logically separate data files on the host system.

INPUT/OUTPUT REMOTE FILE

Only one remote file is declared in RJE/CONTROLLER for communication with the network controller. One queue exists for each station in the network controller. Each line (and therefore each user) will have four stations. These queues will be for communication between the network controller and RJE/CONTROLLER.

MCP QUEUE FILE

One queue is specified for the reception of SPO messages from the MCP destined for the remote user. The session number specified in the message from the MCP will indicate the final destination of the message.

MCP RESPONSE QUEUE

A queue is used for communication of the results of zips done by RJE/CONTROLLER. The name of the queue will be passed in the zip and the MCP will place the results of the communicate in this queue immediately after the communicate.

JOB SUMMARY FILE

The controller forms a job summary file of all SPO messages and control cards sent and received for any remote program. Until a job has gone to EOJ, all messages for that job, and all other remote jobs, which are to be printed in their job summary file will be stored in this disk file as lists. The start of a list for a particular job is stored in the entry for that job in RJE/CONTROLLER's active job file.

REMOTE USER STATUS FILE

The status of each user is maintained in this table. It will include in addition to the usercode, password, and site ID, the status of the peripherals at the remote site, the current settings of the options under which the user is running and the current state of his session within the host system.

INTERNAL TABLES

LSN/SESSION NUMBER TABLE

All users are identified in the MCP by their usercode and session number. Since the network controller is governed by LSN, the LSN table is maintained so that messages may be routed properly.

RJE/AUTOBACKUP TABLE

The status of each of the RJE/AUTOBACKUP programs which may be running at one time is maintained in this table. Status includes which user the program is currently servicing, the file it is sending, and the remote file number of the remote file of the RJE/AUTOBACKUP program.

RJE/AUTOBACKUP

The transmission of backup files is done by RJE/AUTOBACKUP. RJE/CONTROLLER has direct control over the executions and terminations of this program.

As the need arises, RJE/CONTROLLER zip executes a copy of RJE/AUTOBACKUP. RJE/AUTOBACKUP opens a remote file belonging to the controller. The open will be passed to the controller for approval. The resident code option for the file should be set to disk. To determine the name and destination of the next backup file, RJE/AUTOBACKUP will issue a read of its remote file. RJE/CONTROLLER has three options available at this time.

1. Let the program wait (rolled out to disk) by taking no action. This saves SOJ time when output becomes ready to send.

2. Send this copy of RJE/AUTOBACKUP to SOJ.

3. Tell it what file and where to send it.

These options are also available to the host operator through communication with RJE/CONTROLLER.

JOB SPAWNING AND CONTROL

The ability to spawn and control jobs is essential for implementing host RJE. RJE/CONTROLLER receives jobs submitted from remote terminals. It then executes and controls these programs. The MCP extensions required to do this function are described in this section.

GENERAL OVERVIEW

Job spawning can be generally defined as the ability to programmatically execute jobs and maintain an adequate level of control over these jobs during their execution. The ability to execute jobs has been present for some time in the MCP via the "ZIP" command; however, the ability to control a job which had been "ZIP" executed has not existed until now. The mechanism developed to spawn and control jobs in the MCP can be broken down into several distinct areas.

1. Extensions to the "ZIP" function to propogate control information when a "spawned" job spawns another job.

2. New control card commands to associate the necessary control information with "spawned" jobs.

3. Specific changes in the general MCP functioning to recognize and apply the control information to such areas as job scheduling, message routing, file naming, etc.

The mechanism has been designed to give the user some flexibility in selecting the level of control he may desire over a "spawned" job. The user may select a mode of operation where he is only informed of the birth, death, and status changes of a "spawned" job, or he may select a mode where the controlling job essentially becomes the "spawned" job's SPO and receives all communication normally associated with the local SPO.

QUEUE COMMAND

Syntax: QUEUE <name1> [/ <name2>]
--

Description:

The QUEUE command allows the user to designate a previously opened queue file as a control queue. The control queue provides a mechanism whereby the MCP can communicate to a controlling job on behalf of a spawned job, or in response to other control card commands which the controlling job may wish to receive. For example, the control string "QU X/Y EX DMPALL" will cause the MCP to insert into queue X/Y the following messages:

a. A special schedule record message.

b. A special BOJ message.

c. Any status change messages throughout the job's life.

d. And, eventually, a special EOJ message.

The format of these messages is explained in a later section. The QU command may also be used to obtain MCP responses to normal SPO input messages. For example, the string "QU X/Y WY" would cause the standard output from the WY command to appear in queue X/Y.

The underscore under QU implies that only the first two characters are necessary (e.g., QU and QUEUE are both valid syntax).

LOG SPO COMMAND

Syntax: LS

Description:

The LS command causes a boolean to be set and carried with a control string and eventually a job. The function of the LS boolean is to cause all control messages (both input and output) to be inserted in the control queue (note: a QU command is required in the control string prior to the LS command). In addition, the LS boolean has the effect of bypassing the local SPO except for error messages which require operator intervention, or if the RMSG option in the MCP is set. For example, the control string "QU X/Y LS EX DMPALL" would cause the following messages to be inserted into the control queue X/Y:

a. The special schedule record message.

b. A message containing the actual control string.

c. The special BOJ message.

d. The actual SPO BOJ message.

e. The normal DMPALL display to the SPO.

f. The ACCEPT message from DMPALL.

g. Any input to DMPALL, and subsequent ACCEPTs from DMPALL.

h. Any status change message throughout the job's life.

i. The special EOJ message.

j. The actual SPO EOJ message.

NOTE: A job which has been spawned and has its LS boolean set may not spawn a job with the LS command.

ZIP QUEUE COMMAND

Syntax: ZQ <name1> [/<name2>]

Description:

The ZQ command is similar to the QUEUE command with the exception that the queue specified is used exclusively for schedule messages and data card messages. Where the control queue may contain many messages concerning jobs, MCP responses to SPO commands, etc., the zip queue will only contain schedule records of jobs zip executed by the controlling program, and the data card label message if a DATA control card was encountered in the zip string.

This effectively allows the controlling program to be immediately aware of the fact that a job has been scheduled without having to scan through the general control queue for pertinent messages. In general, the control queue is designed for general communication, while the zip queue is specifically to be used for job spawning control.

USER COMMAND

Syntax: USER <usercode> [/<password>]

Description:

The USER command provides a way of invoking the file security mechanism and the associated naming convention. The USER command causes the MCP to verify the usercode, and/or password, against the system usercode/password file. The usercode is carried with the control string and is used to obtain the information to apply the RJE naming convention to any subsequent file name reference. For example, the string "US AL PD =/=" would generate a name in the PD of "<PACK-ID>/(AL)/=", where the pack-id and the usercode "(AL)" were obtained from the system usercode file. In addition, the usercode index is stored in the Run Structure Nucleus of jobs zip executed with a USER command and is used to apply the RJE naming convention to any files the job may open during execution. A detailed description of file security is provided in a later section.

The underscore under US implies that the first two characters are necessary and the rest are optional (e.g., US and USER are both valid).

SESSION COMMAND

Syntax: SZ <integer>

Description:

This is mainly an RJE control card. It would not be invoked in the course of simple job spawning. The session number generated by an SZ command is carried with a "zioped" control string and applied to a job or mix of jobs depending on what other commands are in the control string. The primary function of the session number is to associate independent jobs into logically related groups. For example, HOST RJE assigns a session number to a physical site at log-on time and all jobs submitted from that site will contain identical session numbers, thus relating them to the originating remote site. In general, session numbers are routing control numbers that the spawning job can assign to executes or other zip strings, and the returned messages in the spawning queue will have the same session numbers.

RESTRICTIONS COMMAND

Syntax: RR <integer>

Description:

The RR command assigns a RESTRICTIONS value to a job. The value may be 0, 1, 2, or 3; the default value is 0. The restrictions concern whether a job will be allowed to access printer and cards directly and whether a usercode is required with certain control input commands.

Jobs and zips with an RR value of 0 can access printers directly, can access card devices directly, and do not require usercodes (unless they reference jobs that were started with a usercode, in which case the same usercode/password is required).

Jobs and zips with an RR value of 1 cannot access printers directly, can access card devices directly, and do require usercodes on some commands. (See the section on "SYSTEM INPUT MESSAGES" to determine exactly which commands require usercodes/passwords.)

Jobs and zips with an RR value of 2 cannot access printers directly, can access card devices directly, and do not require usercodes (unless they reference jobs that were started with a usercode).

Jobs and zips with an RR value of 3 cannot access printers directly, cannot access card devices directly, and do require usercodes on a subset of system input commands (see the "SYSTEM INPUT MESSAGES" section).

CONTROL QUEUE MESSAGE FORMATS

Messages received in a control queue have a standardized 50-character header as follows:

1. Message type of 2 characters.

   Type = "01" - RJE data card label message
   Type = "02" - RJE special schedule message
   Type = "03" - RJE SPO input message
   Type = "04" - RJE SPO output message
   Type = "05" - RJE special BOJ message
   Type = "06" - RJE special EOJ message
   Type = "07" - RJE backup ready message
   Type = "08" - RJE zip message from program
   TYPE = "09" - RJE status change message
   TYPE = "99" - RJE end of BNA inquiry response

2. Job number of 5 characters.

3. Usercode of 10 characters.

4. Session number of 5 characters.

5. Time stamp of 6 characters.

6. Actual size of following textual message of 4 characters.

7. Usercode index of four characters.

8. BNA node address of five characters ("00000" = local).

9. Inquiry flag ("1" indicates response to BNA inquiry zip).

10. Reserved space for use of 8 characters.

The textual portion of the messages varies according to the type of message. In general, the kind of text that can be expected for the individual messages is as follows:

Type 01 The first 10 characters contain the actual label detected by the MCP on a DATA card (e.g., "CARDS"). Note: This message only appears in the "zip"queue.

Type 02 The first 10 characters will contain the user's pack-id, if the next character = "1", then an FN command is needed, and the next five characters contain the summary backup number. (See note below.) The additional information beyond the header is:

user's pack-id	CHARACTER (10)
FN needed (="1")	CHARACTER (1)
Summary backup number	CHARACTER (5)
BNA hostname where message originated	CHARACTER (17)
Non-native flag (="1"): cooperating BNA host is not a B1000 system	CHARACTER (1)

Type 03 Standard SPO input text (e.g., "1AX------").

Type 04 Standard output text which would normally appear on the SPO.

Type 05 (None.)

Type 06 First 2 characters indicate the termination type, and the next 4 characters contain the compiler error count, if any. Termination type value indicate the following:

0 = normal EOJ
1 = DS or DP
2 = Error condition in program (syntax errors or CANCELLED)
3 = Aborted
4 = RS-ed
5 = Death in Family
6 = End of compile part of Compile & Save or Compile & Go

Type 07 The first character indicates what type of backup file was created ("#" = print, "%" = punch). The next five characters are the backup number used in naming the file. The last ten characters are the pack-id. For example, the string "#3" indicates a print backup file which has an actual RJE backup file name of "<user pack-id>/<usercode>/#3". The backup number is stored left justified in the five character field.

Type 03 If a job which has a parent queue with the LS option set does a ZIP, this message and the text portion of the ZIP are placed in the queue.

Type 09 If a job's status changes so that the job needs operator intervention to continue running, or if a job is resumed following such a condition, an encoded status change message is written to the job spawning queue. Its format beyond the header is:

encoded status value	CHARACTER (3)
text, which may be file names, the DS message, or null, depending on the status	CHARACTER (360)

The reported status values, their meanings, and the additional text that is reported with them are as follows, where "fn" in the "text" column means "40-character internal and external file names", "dbn" means database name, "tnm" means "translate file-id", and "pn" means "program name."

Value	Meaning	Text
0	executing ("resumed")	
1	no file	fn
2	no user disk	fn
3	duplicate file on disk	fn
4	duplicate input files	fn
5	possible duplicate multipack file	fn
6	waiting for hardware	fn
7	program stopped	
11	waiting keyboard input	
13	waiting operator action	
15	waiting DS or DP	DS message
16	no multipack file pack	fn
17	no file on disk	fn
18	waiting for locked file	fn
35	no network controller	fn
36	no output pack	fn
37	missing sort intrinsic	pn
38	no sort input file	fn
41	waiting recovery	dbn
46	waiting forms on printer	fn
47	no translate file	fn + tnm
49	no dms file	fn

50	no dms dictionary	dbn
51	waiting dms reorganization	dbn
52	waiting inactive data base	fn
53	security error	fn
60	missing called program	on
61	BNA not present	fn
62	waiting host	fn

Note: Jobs requiring card files are put into the waiting schedule. This prevents the JOJ from occurring before the card file is actually present. It then becomes RJE/CONTROLLER's responsibility to move this job from the waiting schedule to the active schedule when the remote card file is present. This is done with the FW (FORCE WAITING) command.

NEW RUN STRUCTURE NUCLEUS FIELDS

Five new fields have been added to the Run Structure Nucleus which contain the necessary information for job spawning control. The fields are the following:

1. RS.USERCODE (10 bits) Contains the index into the system usercode file obtained from the US command.

2. RS.SESSION (16 bits) Contains the binary representation of the session number from the SZ command.

3. RS.LOG.SPO (1 bit) Boolean set as a result of the LS command.

4. RS.PARENT.QUEUE (24 bits) Contains the actual address of the control queue of the parent job which was obtained through the JU command.

5. RS.PARENT.JOB.NR (24 bits) Contains the job number of the parent program.

DISK-FILE AND SYSTEM-ACCESS SECURITY

The B1800/B1700 system provides a mechanism for identifying system users, limiting system access to valid users, and restricting disk-file operations by securing disk files against operations by users other than the owners of the files.

Each individual user of the system is identified by a unique usercode, which is normally assigned by installation management. One or more passwords may be associated with each usercode to prevent unauthorized use of the usercode. System access control is achieved by requiring a user to specify usercode/password before any useful processing is performed. Basic file security is achieved by associating a given user's files with his usercode. By default, a user is restricted to accessing his own files. Mechanisms are available for a user to access a system-global library of files, and files in another user's library, subject to constraints placed by the owners of those files.

Installations not desiring to use file security may ignore it and then run without any changes to their existing systems.

USERCODES AND PASSWORDS

Usercodes and passwords are identifiers. A usercode may be up to eight characters in length and a password may have from 1-10 characters.

The usercode is defined by its appearance in a file called (SYSTEM)/USERCODE, which is maintained by installation management to keep information about system users. Facilities to create and maintain this file are described in the product specification on the SYSTEM/MAKEUSER program.

SYSTEM ACCESS

Initial access to the system is achieved by entering a job through a card reader (or operator console) or by entering information from a terminal via the Datacomm system. In the former case, the access is controlled by the MCP; in the latter case, a Message Control System (MCS) program is involved.

A usercode may be associated with a job by including a USER statement preceding the job statements. This job will have the specified usercode. The user statement has the form:

USER usercode[/password]

The [/password] is omitted if no password is associated with the usercode. A USER card entered at a card reader remains in effect until the end of the job.

Individual control programs may accept or require usercode specifications. CANDE requires all users to log on with a usercode. The USER statement is used in RJE jobs as it is in MCP jobs. In addition, RJE has the capability of running each job with a default usercode, i.e., the one with which the terminal was logged on.

FILE-NAMING CONVENTIONS

Disk files created by a program running with a usercode are associated with that usercode. In normal situations, the user supplies an arbitrary file name (consisting of 1 to 10 characters); the directory structure prevents confusion of that file with any other user's file of the same name. All the files in a given usercode library "belong" to that user. A user may not create a new file that does not "belong" to him but may, however, legitimately require access to general system files and those of other users. To facilitate this access, the following conventions have been adopted:

a. An asterisk of a multi-file ID indicates that the file will be found among the general system files. For example:

```
FILE F (NAME="*SYSTEM"/"CARDLINE");      % SDL file
                                         %  declaration
```

The actual name of the file in the MCP's file directory will be SYSTEM/CARDLINE.

b. Parentheses around the multi-file ID of a file name indicate that the identifier is a usercode and that the file, the title of which consists of the FILE.ID will be found among the files belonging to that user.

```
FILE F(NAME = "(HISUSER)"/"HISDATA");      % SDL syntax
```

The actual name of the file in the MCP's file directory will be (HISUSER)/HISDATA.

c. In the normal case, when neither of the above conventions is used, then the search will begin with files belonging to the user. If the file is not found, the search will continue among the general system files.

Attempted use of the "*" or (<usercode>) conventions to create a new permanent file is a security violation under the following conditions:

1. If the program is not running under a usercode,

2. If the program is running under a non-privileged usercode and its usercode is not the same as the usercode of the file being created.

The following examples are syntactically correct.

RUN CARD EXAMPLE: EX (HISUSER)/HISPROGRAM;

LABEL EQUATION EXAMPLE: FILE ZZZ NAME = *SYSTEMFIL;

FILE SECURITY IMPLEMENTATION

Two fields were added to the disk file header to support file security.

DFH.PROTECTION BIT (2)

0 - PUBLIC
1 - PRIVATE
2 - GUARD (not implemented)

DFH.PROTECTION.IO BIT (2)

0 - INPUT OUTPUT
1 - INPUT ONLY
2 - OUTPUT ONLY

One SPO command was implemented to change these fields.

```
MH <FILE-IDENTIFIER> SEC PUBLIC
                         PRIVATE
                     SUS INPUT
                         OUTPUT
                         I.O
```

Two fields were added to the FPB. These are used to set the fields in the disk file header.

FPB.PROTECTION BIT (2)

0 - DEFAULT
1 - PUBLIC
2 - PRIVATE
3 - GUARD (not implemented)

FPB.PROTECTION.IO BIT (2)

0 - INPUT OUTPUT
1 - INPUT ONLY
2 - OUTPUT ONLY

Two new file attributes can set these FPB fields.

SEC or SECURITYTYPE	DEFAULT PUBLIC PRIVATE GUARD	SUS or SECURITYUSE	I.O INPUT OUTPUT

Upon locking a new disk file into the directory the MCP will set DFH.PROTECTION.IO to FPB.PROTECTION.IO then look at FPB.PROTECTION. If it is zero (DEFAULT), then DFH.PROTECTION is set to PUBLIC if the MULTI.FILE.ID does not contain a USERCODE. However, if the MULTI.FILE.ID does contain a USERCODE, FPB.PROTECTION will be set to the security attribute of the usercode, i.e., PUBLIC or PRIVATE. If FPB.PROTECTION is not equal to zero, DFH.PROTECTION is set to FPB.PROTECTION less one.

USERCODE naming conventions and FILE SECURITY is enforced at open time based upon the following decision table. This table does not reflect PUBLIC or PRIVILEGED USERCODES.

MULTI.FILE.ID	PACK.ID	JOB RUNNING WITH A USERCODE: NEW FILE	JOB RUNNING WITH A USERCODE: OLD FILE	JOB RUNNING WITHOUT A USERCODE: NEW FILE	JOB RUNNING WITHOUT A USERCODE: OLD FILE
BLANK	BLANK	A	B	OPEN	C
	PRESENT	G	K	OPEN	C
USERCODE	BLANK	D	I	D	E
	PRESENT	F	H	W	C
ASTERISK IN FIRST POSITION	BLANK	L	M	J	N
	PRESENT	L	M	J	N
PRESENT	BLANK	P	C	OPEN	C
	PRESENT	P	C	OPEN	C

Table 4.1 Decision Table

Where:

A. 1. Set PACK.ID from the USERCODE table using the USERCODE under which the program is running.
2. Set the MULTI.FILE.ID with the USERCODE under which the program is running.
3. Allow OPEN to proceed.

B. 1. Set the PACK.ID from the USERCODE table using the USERCODE under which the program is running.
2. Set the MULTI.FILE.ID with the USERCODE under which the program is running.
3. Search directory.
4. If the file is present allow the OPEN to proceed.
5. Clear the PACK.ID and the MULTI.FILE.ID.
6. Proceed in step C.

C. 1. Search the directory.
2. If the file is not present then hang the program NO FILE.
3. Proceed to step R.

D. 1. If the USERCODE in the MULTI.FILE.ID is not the same as the USERCODE under which the program is running, then the job is DS-ed.
2. Set the PACK.ID from the USERCODE table using the USERCODE in the MULTI.FILE.ID.
3. Allow the OPEN to proceed.

E. 1. Set the PACK.ID from the USERCODE file table using the USERCODE in the MULTI.FILE.ID.
2. Search the directory.
3. If the file is present then proceed to step R.
4. Clear the PACK.ID.
5. Proceed to step C.

F. 1. If the USERCODE in the MULTI.FILE.ID is not the same as the USERCODE under which the program is running, then the job is DS-ed.
2. Allow the OPEN to proceed.

G. 1. Set the MULTI.FILE.ID with the USERCODE under which the program is running.
2. Allow the OPEN to proceed.

H. 1. If the USERCODE in the MULTI.FILE.ID is not the same as the USERCODE under which the program is running, proceed to step C.
2. Search the directory.
3. If the file is not present hang the program NO FILE.
4. Allow the OPEN to proceed.

I. 1. Set the PACK.ID from the USERCODE table using the USERCODE in the MULTI.FILE.ID.
2. Search the directory.
3. If the file is present proceed to step S.
4. Clear the PACK.ID.
5. Proceed to step H.

J. 1. Remove the asterisk and shift the name left one position.
2. Allow the OPEN to proceed.
3. At CLOSE time proceed to step T.

K. 1. Set the MULTI.FILE.ID with the USERCODE under which the program is running.
2. Search the directory.
3. If the file is present, allow the OPEN to proceed.
4. Clear the MULTI.FILE.ID.
5. Proceed to step C.

L. 1. Remove the asterisk and shift the name left one position.
2. If the resultant name is a USERCODE, proceed to step F.
3. Allow the OPEN to proceed.
4. At CLOSE time proceed to step U.

M. 1. Remove the asterisk and shift the name left one position.
2. If the resultant name is a USERCODE, proceed to step H.
3. Proceed to step C.

N. 1. Remove the asterisk and shift the name left one position.
2. Proceed to step C.

O. 1. Set the PACK.ID from the USERCODE table using the USERCODE in the MULTI.FILE.ID.
2. Proceed to step N.

P. 1. Allow the OPEN to proceed.
2. At CLOSE time proceed to step U.

Q. 1. Display security error message.
2. Hang program NO FILE.

R. 1. If the OPEN violates file security, proceed to step Q.
2. Allow OPEN to proceed.

S. 1. If the USERCODE in the MULTI.FILE.ID is the same as the USERCODE under which the program is running, then allow the OPEN to proceed.
2. Proceed to step R.

T. 1. If the program is attempting to lock the file into the directory and the MULTI.FILE.ID contains a USERCODE, then proceed to step V.
2. Allow the CLOSE to proceed.

U. 1. If the MULTI.FILE.ID does not contain the USERCODE under which this program is running and the program is attempting to lock this file into the directory, proceed to step V.
2. Allow the CLOSE to proceed.

V. 1. Display an error message.
2. Discard the file.

W. 1. Allow the OPEN to proceed.
2. At CLOSE time proceed to step T.

FILE ACCESS

Access to a given disk file is controlled by two attributes of the file: SECURITYTYPE and SECURITYUSE.

The SECURITYTYPE attribute specifies who, apart from the owner, may access the file. The attribute values are "PRIVATE", "PUBLIC" or "GUARD". "PRIVATE" means that only the owner may access the file. "PUBLIC" means that anyone who knows the usercode and title may access it, using the "(usercode)/title" form of file name. "GUARD" indicates that the file is "guarded". The default value of SECURITYTYPE is PRIVATE for files created by programs run under a usercode with a PRIVATE security attribute or PUBLIC otherwise.

Note: The "GUARD" attribute is not implemented.

The use which may be made of a file is further controlled by the SECURITYUSE attribute, which may have the values IN, OUT, and IO, indicating respectively that the file may be read only, written only, read or written. The default value is IO.

If a program running under a usercode attempts to access a file in that usercode library, SECURITYTYPE and SECURITYUSE are ignored. If a file in some other usercode library is accessed, three cases arise.

1. If SECURITYTYPE is PRIVATE, a security violation exists.

2. If SECURITYTYPE is PUBLIC, usage is determined by SECURITYUSE.

3. A SECURITY error is caused if some action contrary to the allowed usage is attempted.

Execution of a code file by a non-owner is permitted for a PUBLIC file independent of SECURITYUSE. If a code file is PUBLIC, READ ONLY, it cannot be opened by any one except the owner.

The security attributes for a file may be specified by the security file attributes or programmatically, or by the SPO. Only a job/task running under the usercode for the file may alter the security attributes.

FILE CREATION

A program running under a usercode cannot create and lock into the file directory a file with a different usercode, nor can it create a system file (i.e. a file name which begins with an asterisk). A program may open a new system file for temporary usage but it will not be allowed to close that file with lock.

PRIVILEGED USERCODES

A job running with a PRIVILEGED USERCODE has a special status. If the names of the disk files that are opened contain only a FILE.ID, the RJE naming conventions will be exercised. However, the program may also supply the PACK.ID and MULTI.FILE.ID and never violate RJE naming conventions or file security.

PUBLIC USERCODES

If a usercode is given the "PUBLIC" attribute (c.f. P.S. 2219 0102, SYSTEM/MAKEUSER) then all files created (i.e., locked into the disk directory) will have the default DFH.PROTECTION set to PUBLIC. Thus if the DFH.PROTECTION is not explicitly set to PRIVATE (or GUARD) full access to this new file is allowed to any other program, whether running under a usercode or not.

GENERATING THE NETWORK CONTROLLER

RJE/NDLDCH, which is the network controller for RJE, requires the user to write NDL specifications to generate the specific network controller. The following list of guidelines is intended to aid the user in generating the correct NDL. Please refer to B1800/B1700 NDL Manual, for extended specifications and definitions.

1. Program Name

   The network controller and "NIF" file are here defined as RJE/NDLDCH and RJE/NDLDCHNIF. It is not necessary for them to be so named.

2. Declaration Section

   The only required entry is the specification for the NIF file name:

   NIF = "RJE"/"NDLDCHNIF". MAX FILES = 2. MAX BUFFERS = 2. MAX MESSAGES = 20. MAX MESSAGE SIZE = 411.

3. Request Section

   The required request section is contained in the NDL Library. It is named "RJEHOST".

   $LIBRARY RJEHOST

4. Control Section

   The required control section is contained in the NDL Library. It is named "RJECTL".

   $LIBRARY RJECTL

5. Terminal section

   Only one terminal entry in the terminal section is required. Any other values may be used for the remaining statements possible within the terminal section ("TYPE" and the name specified for the terminal).

   Note: Unless a user written MCS is supplied, the "TERMINAL DIAGNOSTIC REQUEST" statement cannot be utilized.

Required terminal section statements.

```
BUFFERSIZE = 620.
ADDRESS = 2.
REQUEST = RJEHOST:RECEIVE, RJE:TRANSMIT.
TRANSMISSION = 1.
```

Note: The RJE request section is used both for transmitting and receiving.

6. Station section

Four stations are used with RJEHOST for each line to be used, each of which references the one terminal section defined above. It is recommended that the retry limit be set at 25 and that the input and output frequencies be set to identical values.

The "MYUSE" statements must be set as follows:

```
MYUSE=INPUT,OUTPUT.
```

The addresses for the four stations must have the following values:

"00" FOR STATION 1
"01" FOR STATION 2
"02" FOR STATION 3
"03" FOR STATION 4

A maximum of 64 RJEHOST stations is possible. Each series of four stations must have the addresses specified above in the order listed above. RJEHOST stations may only be defined in blocks of four at a time, as each series of four stations defines one remote user on one line.

The RJEHOST stations in the network controller must be the first stations defined. If other stations are to be defined in the network controller, it is absolutely necessary that they follow all RJEHOST station definitions.

7. Line section

The address of the adapter of the line to be used is specified in the line section. This address will vary from system to system. The station statement must reference the four stations defined above.

The following is a list of required statements in the line section:

```
ADDRESS = P:C:A.  (Where P = Port #,
                        C = Channel #,
                        A = Adapter #)
STATION = STATION LIST.
CONTROL = RJECTL.
```

A maximum of 16 RJEHOST lines is permitted.

8. File section

One remote file is required. It is necessary that the following file section be used:

```
FILE MCSQUEUE;
FAMILY = S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,.....
```

9. Sample NDL RJE declaration:

The following is a sample NDL RJEHOST declaration for a network controller servicing three remote sites.

```
?CO RJE/NDLDCH NDL
?DATA CARDS
DECLARATION:
     NIF="RJE"/"NDLDCHNIF".
     MAX FILES = 2.
     MAX BUFFERS = 2.
     MAX MESSAGES = 20.
     MAX MESSAGE SIZE = 411.
$LIBRARY RJEHOST
$LIBRARY RJECTL
TERMINAL B1700:
     TYPE=62.          % B1700
     ADDRESS=2.
     BUFFERSIZE=320.
     TRANSMISSION=1.
     REQUEST=RJE:RECEIVE, RJE:TRANSMIT.

STATION DEFAULT DF:
     TERMINAL=B1700.
     RETRY=25.
     FREQUENCY=255,255.
     MYUSE=INPUT, OUTPUT.

%
%  PHONE = "<phone.number>"
%  THIS STATEMENT IS NOT USED IN THE CURRENT
%  IMPLEMENTATION OF CALLBACK
%

STATION S1:
     DEFAULT=DF.
     ADDRESS="00".
STATION S2:
     DEFAULT=DF.
     ADDRESS="01".
STATION S3:
     DEFAULT=DF.
     ADDRESS="02".
STATION S4:
     DEFAULT=DF.
     ADDRESS="03".

STATION S5:
```

```
            DEFAULT=DF.
            ADDRESS="00".
      STATION S6:
            DEFAULT=DF.
            ADDRESS="01".
      STATION S7:
            DEFAULT=DF.
            ADDRESS="02".
      STATION S8:
            DEFAULT=DF.
            ADDRESS="03".

      STATION S9:
            DEFAULT=DF.
            ADDRESS="00".
      STATION S10:
            DEFAULT=DF.
            ADDRESS="01".
      STATION S11:
            DEFAULT=DF.
            ADDRESS="02".
      STATION S12:
            DEFAULT=DF.
            ADDRESS="03".

      LINE L1:
            ADDRESS=7:12:0.
            CONTROL=RJECTL.
            STATION=S1, S2, S3, S4.
      LINE L2:
            ADDRESS=1:0:6.
            CONTROL=RJECTL.
            STATION=S5, S6, S7, S8.
      LINE L3:
            ADDRESS=1:0:0.
            CONTROL=RJECTL.
            STATION=S9, S10, S11, S12.

      FILE RJEQUEUE
            FAMILY=S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12.
      FINI
      ?END
```

PAGES	CHANGES FOR MARK VII.0 RELEASE (D)
	All references to B1700 changed to B1800/B1700
2-3	Added F. (Automatic CALLBACK feature)
3-1	Added "All decks must be termirated by a "?END" card" to REMOTE DECKS
3-9 & 3-10	Added Remote Outout Messages 16 through 19
3-12	Added *PH to mnemonics of keyboard entries
3-23	Added *PH Input Message
3-31	Added CALLBACK to run-time remote terminal options
3-34	Added Format 2 (*TO <option name>) to *TO Input Message
3-37	Underlined System Input Messages BF, CH, CO, DF, EX, MH, MO, QF, RB, and RE to indicate these commands require a valid usercode and password
3-43	Added RJE Host System Output Error Messages 18 through 21
4-1	Added "Each line may have only one remote satellite system..." to General Description of RJE Controller
4-5	Added CALLBACK
4-13	Indicated only first two characters are necessary for valid syntax of QUEUE command
4-16	Indicated only first two characters are necessary for valid syntax of USER command
4-22 & 4-23	Indicated two security violation conditions with attempted use of the "*" or (<usercode>) conventions
4-25 - 4-28	Table 4-1 revised; discussion of A-N revised; furtha discussion (O-W) added

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