ECLIPSE®-LINE

Remote Job Entry

Control Program

(RJE80)

User's Manual

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NOTICE

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Preface

Read this manual to understand how to establish and use the Remote Job Entry Control Program (RJE80) as a communications link between a Data General ECLIPSE computer (with its associated peripheral devices) and either an IBM 360/370 computer or another RJE80-equipped ECLIPSE and/or NOVA computer. Organized for fast access, the manual serves as a reference guide during program generation or operation.

Although the systems programmer who generates RJE80 should read the entire book, the first three chapters provide sufficient information for system operation from the console. The remaining chapters describe program generation procedures and system configurations.

You should have a working knowledge of RDOS/RTOS. Also, the following Data General publications can assist you:

093-000184   *ECLIPSE-line Communications Access Manager*

093-000135   *RTOS Reference Manual*

093-000129   *RDOS Reference Manual*

093-000132   *Introduction to RDOS*

093-000189   *How to Load and Generate Your RDOS System*

093-000136   *Introduction to RTOS*

093-000130   *Extended Relocatable Loaders*

017-000020   *Buffered Input/Output Package in RDOS/RTOS*

End of Preface

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Chapter 1
Introduction to RJE80

The Remote Job Entry Control Program (RJE80) allows communications between a computer (with its associated peripheral devices) and either an IBM 360/370 system or another RJE80-equipped NOVA or ECLIPSE computer.

The program emulates an IBM Model 2780 or 3780 Remote Job Entry Terminal and operates in compliance with IBM's Binary Synchronous Communications discipline. Moreover, it provides such extended capabilities as the use of a command console, and disk and tape storage.

RJE80 permits jobs to be run without supervision of an attendant operator. Remote jobs can run unattended under either the RDOS BATCH Monitor or the Command Line Interpreter (CLI - the console interface to RDOS).

The system operates in the environment of either Data General's core-based Real-Time Operating System (RTOS), or disk-based Real-Time Disk Operating System (RDOS). Data General's Communications Access Manager (CAM) handles communications functions for you. CAM establishes and maintains communications with other functionally equivalent systems, thereby permitting RJE80 to operate without regard for the details of BSC protocol.

RJE80 performs the following functions:

- Inputs jobs (job control language, program source, and program data) through a system input device (card reader, disk, magnetic tape, etc.).

- Receives transmission blocks from a remote computer, formats input records, and outputs the records to a system output device (line printer, disk, magnetic tape, etc.).

- Provides operator console functions necessary for you to control system operation.

- Allows card-to-printer and other peripheral-to-peripheral operations (i.e., card-to-disk, disk-to-printer, etc.).

RJE80 supports the following standard features:

- Printer horizontal and vertical format control

- Multiple-record transmission and reception

- Transparency

- Transmission checking

- Automatic Turnaround

- 80- or 132-character line printer operation

- Off-line and on-line file listing capability

- Two-wire or four-wire operation

- Extended retry

- Unattended operation

- Space compression

- Multi-drop communications

Printer Horizontal Format Control

This feature provides a tab simulation function for the line printer similar to the tab function on a typewriter. It can greatly increase throughput by eliminating the need to transmit spaces within the text to format a record. When you use this feature, the format record which precedes all others in a transmission is retained in storage until a new format record is received.

The horizontal tabulation character (HT) is used in three ways:

1. When the HT character follows the ESC character at the beginning of a record, the remainder of the record becomes a printer horizontal format control record, and is stored in the program.

2. When the HT character appears within a printer horizontal format control record, it indicates a tab stop to the control program. Each HT character within the horizontal format control record sets up a tab stop, thereby establishing the horizontal format control for printing subsequent records.

3. When the HT character appears within subsequent records, the data following the HT character is printed starting at the next tab stop that was set by the preceding horizontal format control record.

Printer Vertical Format Control

The program checks for an (ESC-character) (control-character) sequence at the beginning of each print line. If this sequence appears, the remaining characters in the line are printed according to the action specified by the control-character (otherwise, the result is a single line feed).

You can create one or more software carriage control tapes using the following table:

ESC \	Single space
ESC S	Double space
ESC T	Triple space
ESC A	Skip to channel 1
ESC B	Skip to channel 2
ESC C	Skip to channel 3
ESC D	Skip to channel 4
ESC E	Skip to channel 5
ESC F	Skip to channel 6
ESC G	Skip to channel 7
ESC H	Skip to channel 8
ESC I	Skip to channel 9
ESC J	Skip to channel 10
ESC K	Skip to channel 11
ESC L	Skip to channel 12

A vertical tab (VT) causes a skip to channel 2; a Form Feed causes to skip to channel 1. See Chapter 3 for further information concerning this option.

Multiple Record Transmission and Reception

The system operates in multiple-record mode. The size of the synchronous communications buffer (specified during CAM program generation) controls the maximum number of records which can be transmitted in a block before a line turnaround occurs. The default buffer size allows up to four 80-byte records. For example, a 400-byte buffer allows four 80-byte records to be transmitted in each block (note that in addition to the data, some control characters are also stored in the buffer).

Transparency

The terminal operates in either normal or transparent mode. In normal mode the software responds to certain codes as control characters. In transparent mode, all 256 codes can be transferred as data, i.e., transparency permits unrestricted use of all bit patterns. The operator may select transparency mode from the console.

Transparent text mode must be used to transmit binary data, such as object program information.

Transmission Checking

RJE80 checks the validity of all data received or transmitted by the terminal.

The program appends a block check character to each transmitted data block. It also generates a block check character for each received data block. It compares the send block check character with the received block check character to determine the validity of the received message. If the check character comparisons don't agree, an error occurs and the data block is retransmitted.

Automatic Turnaround

This feature enables the terminal to automatically switch to receive mode after completing a transmission, without operator intervention.

Two-wire/Four-wire Operation

This feature allows the synchronous line adapter to transmit and receive data using synchronous data sets interfaced for four-wire as well as two-wire operation.

Extended Retry

You can specify the number of retry operations after a transmission error is detected. This option is selectable during CAM program generation.

Unattended Operation

Commands can be stored on a disk or tape file, and executed sequentially without intervention. Additionally, these command streams can suspend further command processing until some event occurs (such as receipt of end-of-transmission (EOT), or data-set-ready (DSR)). If such an event occurs, sequential command processing resumes.

If a transmission error occurs while processing commands from a tape or disk file, the message

TTI READY

or

$TTI1 READY   (if running in foreground)

appears on the console indicating the return to the console control mode and the tape or disk file is immediately closed.

RJE80 can run in either foreground or background under RDOS. Additionally, a configuration option allows console READ and WRITE commands to the same console from both the foreground and background.

Note that .RDOP and .WROP system calls implement this ability. The option can be selected during RJE80 program generation. If this option is selected, the ready message follows either !!B or !!F which signify the background or foreground, respectively.

Space Compression

You can specify space compression with a console command. If this option is selected, three or more consecutive spaces are compressed into a two-character sequence when you transmit data to another RJE80 station configured as a 3780 or an IBM 360/370, supporting a 3780. Select this option only during program operation.

End of Chapter

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Chapter 2
Operating Procedures

The RJE80 Control Program provides the means for sending data from an RJE80-equipped computer to a host IBM 360/370 or RJE80-equipped computer, and for receiving and directing output from the host computer to the RJE80 station.

The system console device allows you to select and control terminal operations. A log of system messages output to the console device indicates the status of the program and communications facilities.

Under RDOS, you start the program by entering one of the following CLI commands:

Case 1 - RJE80)
          EXFG RJE80) (foreground)

Case 2 - RJE80 *filename*)
          EXFG RJE80 *filename*)   (foreground)

Where the symbol) indicates a carriage return, and *filename* is the name of the file you supply.

Case 1 illustrates the operator's procedure for RJE80 operation when either $TTI or $TTI1 is the console device.

Case 2 illustrates the procedure when RJE80 reads the console commands from the file specified by *filename*. This presupposes that *filename* is a file you previously created using the text editor or similar program. Typically, the last command in the file returns control to the console (the method for accomplishing this is described later in this manual).

NOTE: If RJE80 runs under RTOS, the execution procedures remain the same as for any other RTOS program. See Appendix B of the RTOS Reference Manual for a description of these procedures.

After the control program is loaded and started, one of the following messages appears on the console:

READY

or

DATASET NOT READY

The READY state is the resting or idling state of the program. It implies all of the following:

1. The modem is ready for service.

2. The line is being monitored for any incoming messages. The operator need not intervene to place the terminal in receive mode.

3. The program is ready to accept and attempt processing console commands.

If the hardware is not properly initialized, the message

INITIALIZATION ERROR

appears on the console.

The DATASET NOT READY message appears whenever the dataset ready signal is off. Completing the connection to the remote CPU puts the program into the ready state. In the DATASET NOT READY state, only immediate action console commands (described below) can be processed. RJE80 does not service any command requesting data transmission until the READY state appears.

If the remote CPU bids for control of the line, and the program accepts the bid, the message

R OPEN

appears on the console. The message indicates that the receiver is open and active. This message is also printed in multi-drop mode when the RJE80 slave station has been selected. If the RJE80 is acting as a master station, the message (address) STATION ADDRESS is printed (where address is the address of the remote station that is transmitting the data). The console signals the end of reception.

When a error occurs during reception, the control program types

LINE FAILED DURING RECEIVE

indicating that the data just received is probably incomplete.

Console Commands

You have a variety of console commands available for your use. The following comments apply to the available commands:

1. You enter a command by typing the command code letter, the filename (if required), the select address (if required), and a carriage return. If you make an error while keying, use the RUBOUT key to delete one or more previously typed characters; the backslash (SHIFT L) erases the entire command line.

2. The program types ?? if the command is not understood, and FILE ERROR if the filename is illegal. FILE ERROR appears whenever the control program encounters trouble when using an input or output file. If the RJE80 station is configured as a multi-drop master station, the error message SELECT ADDRESS ERROR appears when the receiving station address doesn't appear in the polling list.

3. Certain commands (described below) result in immediate action. Only immediate action commands receive service when the console displays DATASET NOT READY (when the terminal is in off-line mode).

4. You can key in commands ahead of time for future use by the console command processor. Consequently, you can type in several file transfers or file transmissions at once, and these commands will be sequentially processed.

5. Standard filenames for the common peripheral devices are:

$LPT/$LPT1	(line printer)
$CDR/$CDR1	(card reader)
$PTR/$PTR1	(paper tape reader)
$PTP/$PTP1	(paper tape punch)
MTO:0/MTO:1/...	(magnetic tape files)
CTO:0/CTO:1/...	(cassette tape files)
$PLT/$PLT1	(digital plotter)
filename	(disk file)

There are four major RJE80 command groups:

1. Terminal initialization and deactivation commands.

2. File transmission commands (peripheral to communications line).

3. File transfer commands (peripheral to peripheral).

4. Optional commands.

Terminal Initialization and Deactivation Commands

These commands are:

T   SET MODE TO TRANSPARENT TRANS-MISSION.

N   SET MODE TO NON-TRANSPARENT TRANSMISSION. You must ensure that no data link control characters (ETX, STX, etc.), are in the transmitted data. This is the transmission default mode.

H   RETURN TO OPERATING SYSTEM (disk-based systems only). This command causes an immediate halt to any transmission or reception. The synchronous hardware is reset, and control passes to the command line interpreter (CLI).

G   SET SPACE COMPRESSION MODE. Any occurrence of three or more consecutive spaces in transmitted data is compressed into a two-character sequence.

F   CLEAR SPACE COMPRESSION.

O   filename [station address]

> CLOSE OLD OUTPUT FILE AND MAKE NEW OUTPUT FILE CALLED *filename.* Initially, the output file is $LPT (line printer). All data received over the communications line, and the output from the L and X commands (see below), transfer to the output file. The O command is intended primarily for redirecting data to tape or disk. It can also be used to load a disk or tape file with card images in conjunction with the L or X command. IF RJE80 is operating in multi-drop mode as a master station, the O command can be used to direct data received from a slave station by including a station address. Initially, all data received from all slave stations is directed to $LPT. All information from the D, L, and X commands will still be directed to the file specified by the O command when used without the station address. This is an immediate command.

V filename [station address]

> CLOSE THE CURRENT OUTPUT FILE AND OPEN AN OUTPUT FILE IN SEQUENTIAL MODE. All communications data subsequently received is output to filename via a .WRS command. This permits transfer of binary data between DGC COMPUTERS. enter an O command to return to ASCII code. To open a new sequential file, enter another V command. The command closes the current output file prior to opening a new file.

File Transfer and Transmission

Two types of files are used in file transfer and transmission:

1.   ASCII files are variable length files handled with read-line (.RDL), and write-line (.WRL) system processing.

2.   EBCDIC files are fixed-length (80-bytes), binary sequential files handled via the read-sequential (.RDS), and write-sequential (.WRS) processing modes.

ASCII data is converted to EBCDIC for transmission and converted to ASCII when printing.

The following notations indicate file type:

CDR-E   a card file punched in Hollerith 029. All rows punched in column 1 indicate end-of-file. All 256 card code punches are legal. The system performs the required Hollerith to EBCDIC translation.

CDR-A   a card file punched in ASCII card code. All rows punched in column 1 indicate end-of-file. All 128 card code punches are legal.

DISK-E   a disk or tape file containing 80-byte binary records (typically EBCDIC card images).

DISK-A   a disk or tape file containing variable-length records.

OUTPUT-A   The control program output file (always ASCII). It sets to $LPT by default.

File Transmission Commands

You can enter one of the following commands whenever the program is in the ready state:

C   (Transmit EBCDIC cards)

E *filename*   (Transmit EBCDIC file filename)

S *filename*   (Transmit ASCII file filename)

Take the typical case of sending EBCDIC cards. You would enter the following:

C

or

E $CDR

If you are operating as the master station on a multi-drop line, an additional argument (one character) specifies the receiving station address. For example:

S *filename* A

transmits ASCII file to station A.

The most recent setting of the transparency option (T or N command) determines the transmission mode (whether transparent or not). In point-to-point mode, as soon as you enter the command, the control program attempts to bid for control of the link.

If the bid succeeds,

T OPEN

appears on the console, indicating that the communications line is open. If the remote CPU doesn't respond, or doesn't accept the bid,

LINE NOT OPEN

appears.

If you are operating as a multi-drop slave station, any of the transmit commands will open the transmit file. The RJE80 station will then type

READY

and await the reception of its address from the master station before beginning transmission. Once the polling address is recognized, the message

T OPEN

appears on the console and transmission begins. If another transmission command or a file transfer command is entered at the console while the RJE80 station is awaiting its polling address, the command is rejected and the message

AWAITING POLL

appears on the console.

The control program always informs you of the success or failure of a given request. The maximum time between a failure and the appearance of a message equals three times the number of retries in seconds (where the number of retries is specified during CAM program generation). The default number of retries is three, and any line failure is noted within nine seconds. If you are operating as the master station on a multi-drop line, and if the poll is successful, the message T OPEN is printed on the console. After the last record is sent, it is acknowledged and the line closed. Then

T END

and

READY

appear on the console. Should any failure occur during transmission, the message

TRANSMISSION FAILURE

informs you that the file must be retransmitted.

When you enter either the C or E command, EBCDIC data is taken from the peripheral unit and transmitted without any code conversion. Since transparent transmission legally allows all 256 codes, you can send object decks, binary data, special codes, etc., on the line. If you use the S command, ASCII to EBCDIC conversion occurs.

If the current command file is not $TTI or $TTI1, and any of the C, D, or S commands terminate abnormally, control immediately returns to $TTI or $TTI1.

File Transfer Commands

Use file transfer commands when the terminal is off-line or on-line.

D *filename*   (Output EBCDIC cards to disk)

L *filename*   (Output EBCDIC file to filename)

X *filename*   (Output ASCII file to filename)

Use the L and X commands for obtaining listings of EBCDIC or ASCII files.

Use the D command for loading EBCDIC cards onto a disk file for future transmission.

The X command stores card images on a disk or tape file. The following sequence illustrates this procedure:

O MYFILE (Open a new file)

X$CDR   (Transfer cards from card reader)

O $LPT   (Close MYFILE, open $LPT)

Note that under RDOS the XFER command serves the same function, and is easier to use.

On successful completion of a file transfer command, an asterisk (*) appears on the console.

Reverse Interrupt Processing

If the remote receiving CPU is unwilling to accept any more data, it can send a reverse interrupt to the terminal control program. This event is indicated by the

RVI

message typed on the console. There are two ways of handling this situation:

1. COMPULSORY OPERATOR INTERVEN-TION. Transmission immediately ceases and you must type R on the console to resume sending the rest of the interrupted file. This option can be selected at program generation time.

2. AUTOMATIC RESTART. The control program waits for the receipt of the reverse interrupt message and then automatically continues transmitting the rest of the file. This is the program's default response.

Optional Commands

The following commands can be selected during RJE80 program generation:

B   The B command initiates a disconnect by transmitting a DLE-EOT followed by a reset of DATA TERMINAL READY (DTR). A B command should not be used when RJE80 is configured in multi-drop mode.

I   The I commamd causes further console command processing to stop until it receives an end-of-transmission (EOT).

M   The M (text) command monitors each received record for matching (text) at the beginning of that record. If the program receives an escape (octal 33 in ASCII), as the first received character, it skips both the escape character and the following character. If a match occurs, the received record appears on $TTO or $TTO1. An M (Carriage Return) deselects monitoring.

P   The P filename command assigns filename as the current input command file. This permits you to create a disk or tape file containing commands to be processed. For example: P DISKFILE makes DISKFILE assume console input functions. DISKFILE serves as a pseudo-console and can contain any command sequence. For example:

Q TTO   (Log processed commands)

O FILE3   (Create output file)

I   (Wait for EOT before continuing)

O $LPT   (Direct data to new output file)

S FILE3   (Send file)

P $TTI   (Redirect command processor)

Q   Use the Q filename command to log commands on filename (must either be $TTO or $TTO1). If you omit filename, logging stops.

W   The W (text) command transmits the text stream. In DGC system/DGC system mode, the text outputs to the current output file. If, however, you want the received text output on the DGC computer's TTO, the first character of text must be a control G. This feature permits a console-to-console conversation between different Data General computer systems.

DGC System 1- You enter: W CTRL-G
PICK UP PHONE.

DGC System 2- Receiving console receives
PICK UP PHONE.

Command Summary

The following tables summarize the standard console commands.

Terminal Initialization and Deactivation Command Summary

Command	Use	Example	Immediate Action
F	Set space compression mode	F)	No
G	Set clear space compression mode	G)	No
H	Return to system	H)	Yes
T	Set transparent mode	T)	No
N	Set non-transparent mode	N)	No
R	Resume after RVI	R)	No
O	Direct received data to new output file	O *filename*)	Yes
	Direct received data to standard output file	O $LPT)	Yes
V	Open new binary output file	V *filename*)	Yes

File Transfer and Transmission Command Summary

Command	Source	Destination	Example	Immediate Action
C	CDR-E	Line	C)(same as E $CDR)	No
D	CDR-E	Disk-E	D *filename*)	Yes
E	CDR-E	Line	E $CDR)	No
	DISK-E	Line	E *filename*)	No
L	CDR-E	Output-A	L $CDR)	Yes
	DISK-E	Output-A	L *filename*)	Yes
S	CDR-A	Line	S $CDR)	No
	DISK-A	Line	S *filename*)	No
X	CDR-A	Output-A	X $CDR)	Yes
	DISK-A	Output-A	X *filename*)	Yes

NOTES: 1. The output file (Output-A) is $LPT unless changed by an O command.

2. -E denotes EBCDIC; -A denotes ASCII file structure.

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Optional Command Summary

Command	Use	Example	Immediate Action
B	Send DLE-EOT; reset DTR	B ⟩	No
I	Wait for EOT	I ⟩	No
M	Monitor for matching text	M ⟩ (resets monitor function)	No
P	Define pseudo console	P *filename* ⟩	No
Q	Log commands	Q $TTO ⟩	
		Q ⟩ (resets log function)	No
W	Transmit text	W SEND PAYROL ⟩	
		W Ctrl G ⟩	
		SEND PAYROL ⟩	No

End of Chapter

Command Summary

Chapter 3
Program Generation Questions

Before using RJE80, you must generate two modules - the Communications Access Manager, and RJE80. Configure both modules with the Communications Generator Program (CGEN). CGEN operates an an interactive program that asks you a series of questions. Based on your responses to these questions, CGEN custom-builds both RJE80 and CAM to provide efficient executives for the specific remote site configuration and its system operation requirements.

As the console displays each CGEN question, you must respond with either a valid answer followed by a carriage return, or an immediate carriage return. If you answer a question with just a carriage return, the program default response is used. Except for the last question, answer all questions with a numeric value. If your answer contains an alphabetic character, or does not fall within the allowable range, the question repeats until you give a valid response.

All numeric responses are octal values unless a period immediatey follows the response, in which case the program translates the numeric value to decimal.

Configuring the Communications Access Manager

To configure CAM, enter the following command:

CGEN CAMCON)

The CAMCON file contains the CAM program generation questions. After you enter the above command, CGEN responds with

COMMUNICATIONS GENERATOR

on the system console, followed by the first CAM program generation question.

MAPPED SYSTEM (0 = NO;1 = YES)?

Specify whether you system is mapped or unmpapped.

0 = Unmapped

1 = Mapped

Default: 0

Range: 0-1

HIGHEST LOGICAL LINE NUMBER?

0 = Required response for RJE80.

MULTIPLEXOR DEVICE CODE?

Specify the device code assigned to the synchronous multiplexor. The multiplexor device code is the same in both DCU-assisted and stand-alone systems.

Default: 34

Range: 34-44

NUMBER OF COMMUNICATIONS STACKS?

1 = Required response for RJE80.

NUMBER OF SYNCHRONOUS COMMUNICATIONS BUFFERS?

1 = Required response for RJE80.

SIZE OF SYNCHRONOUS COMMUNICATIONS BUFFERS?

The size of the synchronous communications buffers defines the maximum number of characters that you can send or receive. Specify the size of the buffers in full words (two-characters per word).

Default: 400

Range: 1-2000

CRC TYPE (0=SOFTWARE;1=HARDWARE)?

Select hardware or software computed CRC according to the available hardware.

Default: 0

Range: 0-1

NUMBER OF ASYNCHRONOUS COMMUNICATIONS BUFFERS?

0=Required response for RJE80.

NUMBER OF DCU'S IN SYSTEM?

Specify the number of DCU's in the system. If there are none, respond with 0, otherwise, respond with 1.

Default: 1

Range: 0-1

DCU-001 DEVICE CODE?

Specify the device code for DCU-001. (NOTE: this question is skipped if you responded with 0 for the previous question).

Default: 34

Range: 0-75

TOTAL NUMBER OF COMMUNICATIONS LINES?

1=Required response for RJE80.

LINE CONNECTION TYPE (0=POINT-TO-POINT; 1=MULTIDROP)?

Specify whether the line is point-to-point or multi-drop.

LINE000-TYPE   (0=NOT   USED;   1=SYNC; 2=ASYNC)?

1=Required response for RJE80.

RETRY COUNT?

Specify the number of times to retry an unsuccessful transmission before transmission terminates. Note that RJE80 requires at least three.

Default: 3

Range: 1-10

CRC TYPE (0=CRC16;1=CCITT16)?

0=Required response for RJE80.

SEPARATOR CHARACTER (DEFAULT IS EBCDIC ITB)?

Specify the record separator character. The send and receive calls use this character in line mode. You must respond with the octal value for the EBCDIC character.

RJE80 requirements:

2780 Emulator: 37 (ITB)

3780 Emulator: 36 (IRS)

Default: 37 (ITB)

Range: 0-377

LINE HALF (0) OR FULL (1) DUPLEX?

Specify whether the line is full of half-duplex.

0=Half-duplex

1=Full-duplex

Default: 0

Range: 0-1

MODEM CONTROLLED (0=NO;1=YES)?

Specify whether or not a modem controls the line.

0=No

1=Yes

Default: 0

Range: 0-1

AUTO-ANSWER MODEM?

0=Modem does not have auto-answer.

1=Modem has auto-answer.

NOTE: CGEN skips this question if you answered 0 to the previous question.

Default: 0

Range: 0-1

LOGICAL LINE NUMBER?

0=Required response for RJE80.

MODULE NAME?

After you have answered all CGEN questions, CGEN assembles the source file and generates a relocatable binary file and the data structures needed by CAM.

At this time you can supply the name of the relocatable binary file. If you answer this question with a carriage return, the relocatable binary file is named TABLE.RB.

Default: TABLE.RB

Range: Any legal filename.

Configuring RJE80

After generating CAM, you must now generate RJE80.

If you are configuring a multidrop line, be sure to supply a polling list or poll address before proceeding any further. You accomplish this by editing the file RPOLL.SR. This procedure is described further in this chapter. If you are configuring a point-to-point system, this extra procedure is not required since RPOLL.RB has been initially configured and supplied for point-to-point mode.

Enter the following command:

CGEN RECON)

The RECON file contains the RJE80 program generation questions. After you enter the above command, the following message appears:

COMMUNICATIONS GENERATOR

The following pages explain the RJE80 program generation questions.

RJE80 Generation Questions

These questions apply to optional console commands. If you select these commands, you can use them from the console when running RJE80; i.e., your choices will specify certain capabilities as part of the program.

B COMMAND?

Select the B command to send DLE-EOT and reset data terminal ready. The module requires approximately 35 octal words.

0 = No

1 = Yes

Default: 0

Range: 0-1

I COMMAND?

Select the I console command when you will want to wait for an EOT. The module occupies approximately 15 octal words.

0 = No

1 = Yes

Default: 0

Range: 0-1

M COMMAND?

Select the M console command to monitor for matching text. This module requires approximately 175 octal words.

0 = No

1 = Yes

Default: 0

Range: 0-1

Q COMMAND?

Select this command to log all console commands. The module requires approximately 200 octal words.

0 = No

1 = Yes

Default: 0

Range: 0-1

P COMMAND?

Select this command when you want to read RJE80 commands from a file instead of the console. This module occupies approximately 250 octal words.

0 = No

1 = Yes

Default: 0

Range: 0-1

W COMMAND?

Select this command to send text from the console. This module occupies approximately 75 octal words.

0 = No

1 = Yes

Default: 0

Range: 0-1

EMULATING AN IBM 3780?

Select 1 (Yes) is you are emulating an IBM 3780. Select 0 (No) if you are emulating an IBM 2780.

Default: 0

Range: 0-1

POINT TO POINT LINE?

Select 0 (No) if you are operating on a multi-drop line. Select 1 (Yes) if you are operating point-to-point.

Default: 1

Range: 0-1

SLAVE STATION?

Select 1 (Yes) if you are going to operate as a slave station on a multi-drop line. Select 0 (No) if you are a master station on a multi-drop line. Note that this questions is skipped if you answered 1 to the previous question.

Default: 1

Range: 0-1

.RDOP AND .WROP FUNCTIONS FOR .WRL AND .RDL?

Select 1 (Yes) to replace .RDL and .WRL with .RDOP and .WROP functions. This action permits foreground and background programs to simultaneously communicate with the same command console.

To enter an RJE80 command with .RDOP/.WROP functions, you must first enter a CNTRL-E followed either by a B (background), or F (foreground). The notation !!F preceeds console data directed to the foreground, while !!B preceeds console data directed to the background

Default: 0

Range: 0-1

MAXIMUM LINE LENGTH?

Select the maximum printer line length.

Default: 132-characters

Range: 1-132.

OPERATING UNDER RTOS?

Select 1 (Yes) if you will operate under RTOS. Answer 0 (No) if you will operate under RODS.

Default: 0

Range: 0-1

NUMBER OF BUFFERS FOR BFPKG?

Select the number of buffers allocated to the buffered I/O package. This number must be at least two in order to allow double buffering to peripheral devices. Note that this questions is skipped if you answered 0 to the previous question.

Default: 2

Range: 2-20

OPERATOR INTERVENTION AFTER REVERSE INTERRUPT?

Select this option if you want operator intervention after a reverse interrupt message. If you don't choose this option, the program automatically transmits the rest of the data that was not sent prior to the RVI. When you use this option, complete data transmission requires the R command.

0 = Do not select this option.

1 = Select this option.

Default: 0

Range: 0-1

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SOFTWARE DOCUMENTATION

Building the RJE80 System

After RJE80 and CAM generations, you must build an executable file using the RLDR utility program.

In RDOS, enter the following command when configuring a DCU-assisted system running in an unmapped environment:

```
RLDR RJE80/S REBCD REB REBRD REBOP ↑
REBHA REBIT REBBY CTAB RPOLL REOPT.LB ↑
CAM.LB TABLE DCU.LB DCMT.LB DMON.RB )
```

To configure a DCU-assisted system running in a mapped environment:

```
RLDR RJE80/S REBCD REB REBRD ↑
REBOP REBHA REBIT REBBY CTAB ↑
RPOLL REOPT.LB TABLE DMON.RB DCU.LB ↑
CAM.LB DCMT.LB DCU.LB CAM.LB )
```

To configure a stand-alone system in either a mapped or unmapped environment, enter the following:

```
RLDR RJE80/S REBCD REB REBRD REBOP ↑
REBHA REBIT REBBY CTAB RPOLL REOPT.LB ↑
CAM.LB TABLE SALP.RB MUX.LB SCMT.LB )
```

To configure RTOS with a DCU-assisted system, enter the following:

```
RLDR/C RJE80/S RTOS-GEN-MODULE REBCT ↑
REB REBRD REBOP REBHA REBIT REBBY ↑
CTAB RPOLL REBOPT.LB BFPKG RTOS1.LB ↑
RTOS2.LB CAM.LB TABLE DCU.LB ↑
DCMT.LB DMON.RB )
```

To configure RTOS in a stand-alone environment:

```
RLDR/C RJE80/S RTOS-GEN-MODULE REBCT ↑
REB REBRD REBOP REBHA REBIT REBBY ↑
CTAB RPOLL REBOPT.LB BFPKG RTOS1.LB ↑
RTOS2.LB CAM.LB TABLE SALP.RB ↑
MUX.LB SCMT.LB )
```

TABLE stands for the module name specified in CAM system generation.

Several undefined variables of the form xCMND can result from the RLDR. Don't be concerned, since these will result from optional commands which may not have been selected during CGEN.

Operating System Configuration

When running under RDOS, you must allocate a sufficient number of stacks to run the RJE80 package. The optimal number of stacks is four. For further details on selection of the number of stacks, consult *How to Load and Generate Your RDOS System*.

In an RTOS environment, you must first perform a system generation to obtain the RTOS-GEN-MODULE. You should specify at least five tasks and six channels in the system in addition to the peripherals. If RJE80 is configured as a master station on a multi-drop line, you must add one channel for each tributary station.

Supplying Multi-drop Information

If you are configuring a multi-drop line, you must supply a polling list for a master station, or a polling address for a slave station. Do so by editing the RPOLL.SR file. Three macros are provided to assist you.

If you are the master station, supply the polling list information by using the MSTER macro. It has the following format:

MSTER (first station address),(second), ... (last)

Each argument is one character; up to 9 arguments are permitted. For example:

MSTER A,B,C,D,E,F)

If you are a slave station, supply the polling address using the SLAVE macro:

SLAVE (poll address)

The poll address is one character. For example:

SLAVE A

If you are running point-to-point, you should use a third marco called POINT. It has no arguments. For example:

POINT

RPOLL.RB is supplied to you when running point-to-point.

Vertical Forms Control Table

RJE80 can simulate a carriage control tape through a vertical forms control table. The program furnishes a vertical forms control table by default. The program uses this table unless you replace it with one of your own.

The default table has 66 lines. The table sets channels one and two on line one. This setting causes a form feed when RJE80 receives data indicating either a SKIP TO CHANNEL ONE (form feed) or SKIP TO CHANNEL 2 (vertical tab).

RJE80 contains the file CTAB.SR, from which the table in CTAB.RB derives. If you want to replace this table, edit it to your specifications.

The CTAB.SR module includes the CCTAB macro to generate a vertical forms control tablde. The CCTAB macro sets one or more channels on a particular line of the form.

The format is as follows:

CCTAB (line no.) (channel no.) ... (channel no.)

You can include from one to twelve (Channel No.) values. Setting channel twelve marks the end of the

form (enter all arguments in decimal). For example:

CCTAB 10 1 3 4 12

specifies that channels 1, 3, 4, and 12 are set for line 10.

The CCTAB macros must be ordered by ascending line number. The sequence

CCTAB 10 1 2
CCTAB 3 1 2

causes an error when assembled, since the line 3 definition occurs after the line 10 definition.

The following shows a sample form specification:

CCTAB 6 10
CCTAB 10 1 5
CCTAB 20 1 6
CCTAB 50 4 3

The file CTAB.SR must then be assembled using the macro assembler. This creates CTAB.RB. The table is assembled using the following CLI command:

MAC CTAB.SR $LPT/L)

which generates CTAB.RB.

End of Chapter

Chapter 4
System Configurations

RJE80 operates with the Real-Time Disk Operating System (RDOS), or its compatible subset, the Real-Time Operating System (RTOS).

Hardware Required/Supported

The minimum hardware configuration needed to support RJE80 follows:

RDOS

ECLIPSE computer
Real-Time clock
256K words of disk storage
Console terminal
SLM-1
Communications Chassis

RTOS

ECLIPSE computer
Real-Time clock
Card reader
Line printer
Console terminal
SLM-1
Communications Chassis

Additional hardware supported by the operating systems includes:

DCU/50
Additional fixed or moving head disks
Magnetic tapes
Cassette tapes
High speed paper tape reader and punch
Plotters

Required Software

The following lists the required software when using RJE80:

Real-Time Disk Operating System (RDOS), or Real-Time Operating System (RTOS).

Communications Access Manager

Customer Supplied Components

You must supply all transmission facilities, including modems, leased private communications lines (or access to a switched network), and termination of the transmission facility to the appropriate IBM hardware/software interface.

End of Chapter

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