

Remote Job  
Emulator (RJE80)  
User's Manual (RDOS/DOS/RTOS)

# **Remote Job Emulator (RJE80) User's Manual (RDOS/DOS/RTOS)**

093-000164-02

*For the latest enhancements, cautions, documentation changes, and other information on this product, please see the Release Notice (085-series) supplied with the software.*

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Revision 02, October 1983  
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Remote Job Entry (RJE80)  
User's Manual  
(RDOS/DOS/RTOS)  
093-000164

### Revision History:

Original Release - August 1976  
First Revision - January 1979  
Second Revision - October 1983

### Effective with:

RJE80 Rev. 2.20

# Preface

This manual introduces Data General Corporation's Remote Job Entry Control Program (RJE80), a software program that supports the batch transfer of files between two computers linked by telecommunications lines.

This manual shows how to create an RJE80 communications program and how to use RJE80 features to meet your communications needs.

This manual is written for system users who operate RJE80 stations, and for system managers and programmers who design RJE80 applications.

The RJE80 program comes in three versions. Two versions are for DESKTOP GENERATION™ systems. One predefines all RJE80 hardware components and software functions. The second allows you to define your own hardware and RJE80 program configuration. The third version of the RJE80 program is for all Data General computers other than DESKTOP GENERATION systems and allows you to define your own program configuration.

We assume that system users have a working knowledge of RDOS, DOS, or RTOS. Knowledge of the Command Line Interpreter (CLI) and of file systems is especially important.

To put a pregenerated version of the RJE80 program on your system, you need a working knowledge of the following:

- CLI macro structure
- CLI commands, especially "XFER"
- Working Directory

To generate your own version of the RJE80 program for your system, you need the following in addition to the tools and concepts outlined above:

- Loading, configuring, generating, and installing a program
- RLDR utility
- MAC utility
- System generation

## Manual Organization

This manual provides information on how to operate an RJE80 program as well as on basic concepts of data communications as they relate to the RJE80 program.

Chapter 1, "Concepts and Overview," provides an introduction to RJE80 operation. After reading it, you should know what the RJE80 program does; what hardware, software, and communications link the program requires; and the data structures that the program supports.

Chapter 2, "Operating RJE80," explains how to operate an RJE80 program that is ready to run on your system. It describes the commands that start and terminate the program, monitor program operation, send and receive data, and permit program operation without operator intervention.

Chapter 3, "Overview of Program Generation," is the first of three chapters devoted to generating the RJE80 program. It introduces the three-step generation procedure and discusses the features you can choose for your version of RJE80.

Chapter 4, "Generating RJE80 on DESKTOP GENERATION Systems," describes how to put pregenerated RJE80 programs or user-generated RJE80 programs on your DESKTOP GENERATION system.

Chapter 5, "Generating RJE80 on non-DESKTOP GENERATION Systems," explains how to use the CAM and RJE80 generation programs to define a version of the RJE80 program for NOVA®, microECLIPSE® and ECLIPSE® computers.

Chapter 6, "Dictionary of Commands," describes all RJE80 commands.

The appendixes provide information on status messages and output format controls.

An index is provided to reference RJE80 terms and concepts.

## Reader, Please Note:

We use these conventions for command formats in this manual:

COMMAND required *[optional]* ...

### Where Means

COMMAND You must enter the command (or its accepted abbreviation) as shown.  
required You must enter some argument (such as a filename). Sometimes, we use:

$\left\{ \begin{array}{l} \text{required}_1 \\ \text{required}_2 \end{array} \right\}$

which means you must enter *one* of the arguments. Don't enter the braces; they only set off the choice.

*[optional]* You have the option of entering this argument. Don't enter the brackets; they only set off what's optional.

... You may repeat the preceding entry or entries. The explanation will tell you exactly what you may repeat.

Additionally, we use certain symbols in special ways:

### Symbol Means

<CR> Carriage return (CR) key on your terminal's keyboard.

□ Be sure to put a space here. (We use this only when we must; normally, you can see where to put spaces.)

All numbers are decimal unless we indicate otherwise; e.g., 35<sub>8</sub>.

Finally, in examples we use

**THIS TYPEFACE TO SHOW YOUR ENTRY!**

*THIS TYPEFACE FOR SYSTEM QUERIES AND RESPONSES.*

R is the CLI prompt.

## Contacting Data General

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- If you need additional manuals, please use the enclosed TIPS order form (USA only) or contact your Data General sales representative.

## Related Documentation

This section groups manuals related to communications, operating systems, DESKTOP GENERATION systems, programming languages, and graphics software.

### Related Communications Products

*Communications Access Manager Reference Manual* (DGC No. 093-000183)  
*Remote Job Entry Control Program (RJE80) User's Manual* (AOS) (DGC No. 093-000157)  
*MP/Communications Series: MP/RJE80 Reference* (DGC No. 069-400040)  
*Generating, Running, and Using DG/XAP* (DGC No. 093-000352)

### RDOS Manuals

*Introduction to RDOS* (DGC No. 069-400011)  
*Using DG/RDOS on DESKTOP GENERATION Systems* (DGC No. 069-000-056)  
*How to Load and Generate RDOS* (DGC No. 069-400013)  
*RDOS System Reference* (DGC No. 093-400027)

### DOS Manuals

*How to Generate Your DOS System (NOVA)* (DGC No. 092-000222)  
*DOS Reference Manual (NOVA)* (DGC No. 093-000201)

### Manuals Common to RDOS and DOS

*Learning to Use Your RDOS/DOS System* (DGC No. 069-000022)  
*RDOS/DOS Command Line Interpreter* (DGC No. 069-400015)  
*RDOS/DOS Assembly Language and Program Utilities* (DGC No. 069-400019)  
*RDOS/DOS Superedit Text Editor* (DGC No. 069-400017)  
*RDOS/DOS Backup Utilities* (DGC No. 069-400022)  
*RDOS/DOS Debugging Utilities* (DGC No. 069-400020)

### RTOS Manuals

*Introduction to RTOS (NOVA)* (DGC No. 093-000092)  
*Introduction to RTOS (ECLIPSE)* (DGC No. 093-00136)  
*RTOS Reference Manual (ECLIPSE)* (DGC No. 093-000056)  
*RTOS User's Manual (ECLIPSE)* (DGC No. 093-000135)  
*Extended Assembler User's Manual (NOVA)* (DGC No. 093-000040)  
*Extended Assembler User's Manual (ECLIPSE)* (DGC No. 093-000139)  
*Symbolic Debugger User's Manual (NOVA)* (DGC No. 093-000044)  
*Symbolic Debugger User's Manual (ECLIPSE)* (DGC No. 093-000140)

### DESKTOP GENERATION Manuals

*Installing Model 10 and Model 10/SP Systems* (DGC No. 014-000901)  
*Testing Model 10 and Model 10/SP Systems* (DGC No. 014-000902)  
*Operating Model 10 and Model 10/SP Systems* (DGC No. 014-000900)  
*Installing Model 20 and Model 30 Systems* (DGC No. 014-000904)  
*Testing Model 20 and Model 30 Systems* (DGC No. 014-000905)  
*Operating Model 20 and Model 30 Systems* (DGC No. 014-000903)

## **Programming Language Manuals**

*FORTRAN IV User's Manual* (DGC No. 093-000053)

*FORTRAN IV Runtime Library User's Manual (ECLIPSE)* (DGC No. 093-000142)

*FORTRAN 5 Reference Manual* (DGC No. 093-000085)

*FORTRAN 5 Programmer's Guide (RDOS)* (DGC No. 093-000227)

*Interactive COBOL User's Guide (RDOS)* (DGC No. 069-705014)

*Interactive COBOL Programmer's Reference* (DGC No. 093-705013)

*Interactive COBOL Utilities (RDOS/AOS)* (DGC No. 069-705020)

*IC/EDIT: Interactive COBOL Editor* (DGC No. 055-000004)

*SCREEN: Screen Format Editor* (DGC No. 055-000006)

*Extended BASIC User's Manual* (DGC No. 093-000065)

*Extended BASIC System Manager's Guide* (DGC No. 093-000119)

*Business BASIC System Management* (DGC No. 093-705007)

*Business BASIC Technical Concepts* (DGC No. 093-705004)

*Business BASIC Commands, Statements, Functions* (DGC No. 093-705005)

*Business BASIC Subroutines, Utilities, and BASIC CLI* (DGC No. 093-705006)

## **Graphics Manual**

*BusiPEN™ Graphics Charting Package User's Manual* (DGC No. 069-700007)

End of Preface

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# Chapter 1

## Concepts and Overview

Data General's Remote Job Entry Control Program (RJE80) permits the batch transfer of files to and from a computer at a remote location.

RJE80 operations emulate two industry-standard communications peripherals: the IBM 2780 and 3780 Data Communication Terminals.

The RJE80 program can transfer files across a communications link to and from a 2780 or 3780 terminal. The RJE80 program can also transfer files across a communications link to and from a computer emulating a 2780 or 3780 terminal. The computer at the remote location can run under any operating system capable of running or emulating 2780 or 3780 terminals.

The 2780 and 3780 terminals are mechanical devices using punched cards and line printers to send and receive data. The RJE80 software program supports all major 2780 and 3780 features. The RJE80 program also supports the use of terminals, line printers, disks, and diskettes.

### Features

The RJE80 program for DESKTOP GENERATION™ systems runs under RDOS. RJE80 programs for other Data General systems run under the RDOS, DOS, and RTOS. RDOS is a dual-ground operating system, allowing you to run the RJE80 program and another program at the same time. DOS and RTOS are single-ground operating systems, allowing you to run only one program at a time.

Common RJE80 operating procedure is to execute the program on your system as a background process, to use the program to send or receive as many files as you wish, and then to terminate the program, freeing your system to run other programs.

The two basic functions of the RJE80 program are to

1. Break a file into units of data, transmit the units to a remote site, and monitor the remote site to correct transmission errors.
2. Receive units of data from a remote sender; reassemble the data into its original file structure; and print, display, or store the data.

Your RJE80 program and the remote 2780 terminal, 3780 terminal, or RJE80 emulator must run complementary features. For example, when your program emulates 2780 terminal operation it cannot send files to an IBM 3780 terminal or terminal emulator. Also, how the remote site receives your data depends on the RJE80 transmission features your remote site operator uses. You must coordinate RJE80 program definition and operation with your remote site operators to ensure successful communications.

The RJE80 program

- Automatically organizes data for transmission and operates in response to simple commands.
- Allows you to choose the number of remote computers you wish to involve in data exchanges, and choose whether your computer or a remote computer controls the exchanges.
- Allows you to choose the format and a destination device or file for any message received.
- Corrects transmission errors whenever possible or signals their presence with error messages.

## Versions of RJE80

RJE80 comes in *pregenerated* and *user-generated* versions. You can run the pregenerated versions of the RJE80 program on DESKTOP GENERATION systems running RDOS. The pregenerated programs come tailored to the standard DESKTOP GENERATION hardware and the most commonly used RJE80 program features.

You can create your own version of the RJE80 program to run on a dual-diskette DESKTOP GENERATION system or any other Data General computer licensed to run RDOS, DOS, or RTOS. When you create your own RJE80 program, you choose which features your program will support.

There are two procedures for defining your own RJE80 program, one for DESKTOP GENERATION systems, and a second for other Data General systems.

## Hardware Environment

This section presents an overview of the hardware required for RJE80 operation. For more complete information, see Chapter 3 or the *Communications Access Manager Reference Manual* (DGC No. 093-000183).

In general, your RJE80 program requires the following hardware.

- A Data General computer licensed to run RDOS, DOS, or RTOS.

NOTE: You cannot load a pregenerated RJE80 program or create an RJE80 program on a single-diskette DESKTOP GENERATION system. You can, however, use a dual-diskette system to create a bootable RJE80 diskette and then use the prepared diskette on a single-diskette system.

- A synchronous-line multiplexor board: a device for connecting communications lines to your computer.

NOTE: RJE80 requires a dedicated USAM (Universal Synchronous Asynchronous Multiplexor) to run on DESKTOP GENERATION systems.

- A modem: a device for transmitting data over a telecommunications line.
- A communications link, which can be either a physical cable or telecommunications network system.
- A magnetic tape or diskette drive.

## Peripherals

The RJE80 program is compatible with all disks, diskettes, line printers, card readers, and terminals that RDOS, DOS, and RTOS support.

## Software Environment

To communicate with a computer emulating IBM 2780 or 3780 terminals, a Data General RJE80 site must run the following software.

- RDOS (Rev. 6.52 or later), DOS (Rev. 3.20 or later), or RTOS (Rev. 6.10 or later).
- Data General's RJE80 program for RDOS, DOS, and RTOS.
- Communications Access Handler (CAM) (Rev. 1.40 or later). CAM controls RJE80 access to the hardware devices that channel the flow of data across a communications line.

## Supported Protocol and Configurations

The RJE80 program uses the *Binary Synchronous Communications (BISYNC) protocol* to send data and RJE80 control information to the remote site. BISYNC is a set of procedures and predefined control characters exchanged between communications stations. It permits communication between systems emulating 2780 and 3780 terminals that have different operating systems or character coding systems.

BISYNC transmissions are *half-duplex*. Stations communicate over a link in a conversational, "I talk to you, then you talk to me" pattern. Only one station transmits at a time, and the sending station waits for acknowledgment of each unit of data sent before sending the next.

RJE80 uses the half-duplex feature of BISYNC protocol in two different configurations: point-to-point and multipoint. These configurations are illustrated in Figures 1-1 and 1-2 and described below.

### Point-to-Point Configuration

In a *point-to-point* configuration, two transmission stations exchange files over a communications line. RJE80 can operate as either a primary or secondary station in a point-to-point configuration. Should both stations attempt to transmit simultaneously (called *contention bidding*), the primary station has precedence.

### Multipoint Configuration

In a *multipoint* station configuration, two or more terminals connect to one communications line. One station is the *multipoint master station* and controls all communications within the station configuration. All other stations are multipoint slave stations.

The multipoint master station *polls* a slave station to invite it to send data. The slave station cannot send data without first receiving a poll. Slave stations cannot initiate communication or communicate with other slave stations in the configuration.

NOTE: RJE80 for DESKTOP GENERATION systems does not support multipoint configurations.

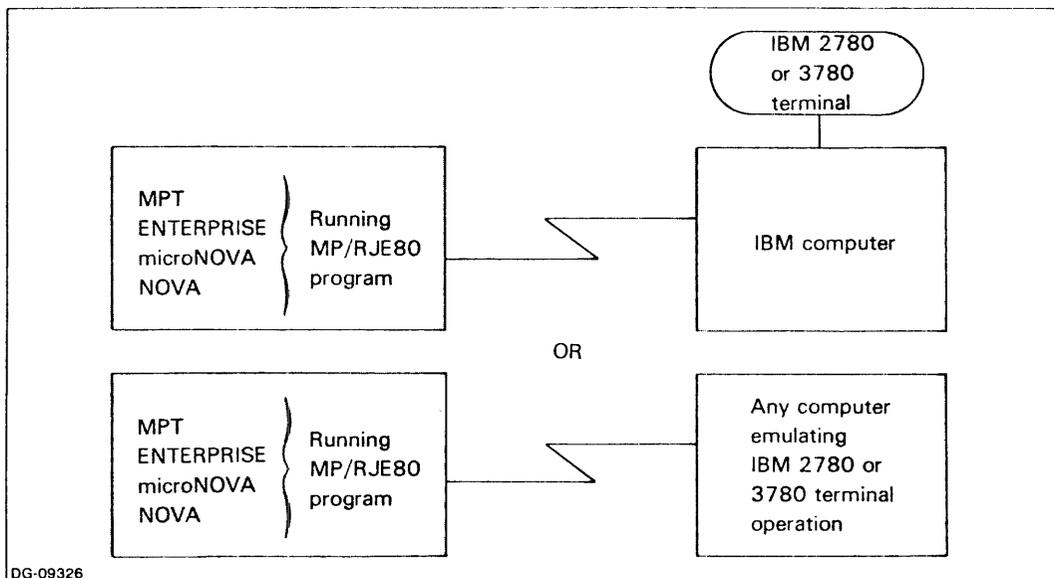
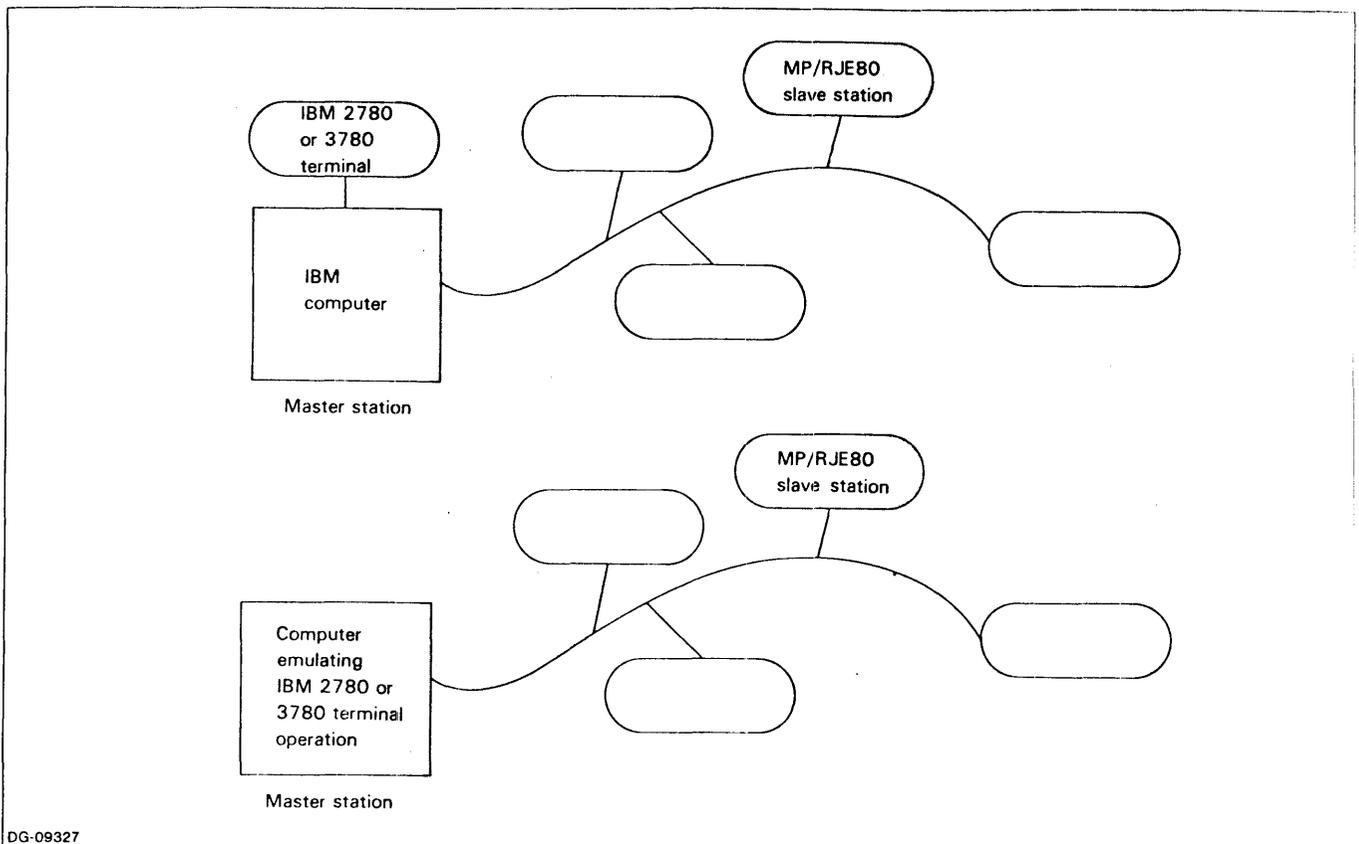


Figure 1-1. Point-to-point configuration



DG-09327

Figure 1-2. Multipoint configuration

## Communication Links

Telephone and other types of communications links cannot accept the electronic signal that computers use to encode data. Communications stations must use a *modem* to convert data to line-acceptable form before sending it. The receiving station uses another modem to convert the signal back into a form the computer accepts.

You can link your RJE80 station and remote site modems using either switched lines or dedicated lines. Multipoint stations should run on dedicated lines. Point-to-point stations can use either switched or dedicated lines.

### Switched Lines

Telecommunications companies offer *switched* networks to handle calls on demand. Using a switched network, you *dial up* the remote site modems in the same way you make a telephone call. You maintain the connection only while transmitting data. The process of making the switched line connection is called enabling the line.

### Dedicated Lines

*Dedicated lines* offer a continually open link between stations. Since the line is always enabled, modems on a dedicated line are always ready to send or receive data. Using a dedicated line, you can transmit at any time.

## Data Structure

Understanding how the RJE80 program organizes data for transmission will help you to define your version of RJE80 and operate your RJE80 station.

RJE80 groups the information you want to send into units called characters, records (also called lines), blocks, and messages. Definitions of these units follow.

**Character.** A letter, number, or other character represented by a set number of bits. The RJE80 program distinguishes two types of characters: the data characters that you want to transmit, and the BISYNC control characters that coordinate the transmission. For example, the Start of Transmission (STX) BISYNC protocol character marks the beginning of the data portion of a transmission. When the receiving station detects the STX character, it handles the transmission following it as data. (The STX character does not appear on your screen or listings.)

**Record.** A string of from 1 to 144 characters, excluding the BISYNC line control characters that frame it. The default record size is 80 characters.

RJE80 commands allow you to use either of two types of records. (See the section "Comparison of 2780 and 3780 Terminal Operation" at the end of this chapter.) *Dynamic records* contain a specific number of consecutive characters. *Data-sensitive records* contain a variable number of characters terminated by a delimiter character (carriage return, form feed, or null).

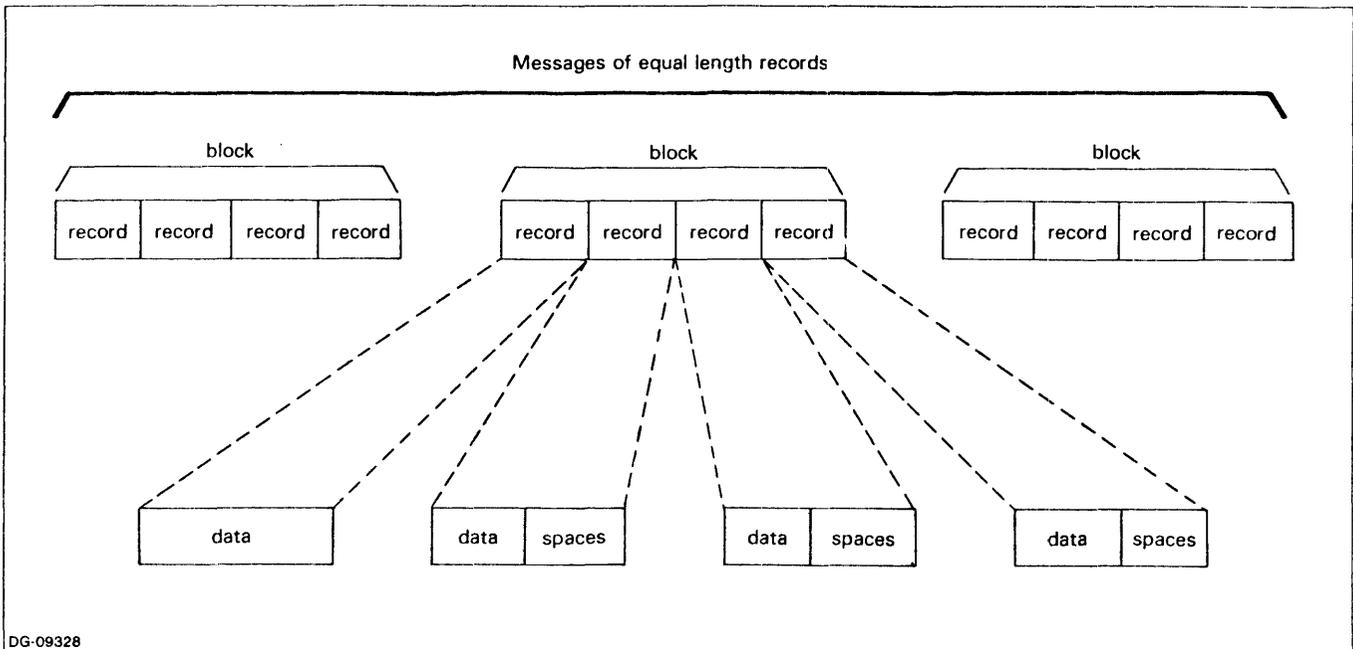
Although *line* and *record* are synonymous for RJE80 operation, we use record throughout this manual.

**Block.** A record or group of records framed by special BISYNC control characters. Block size is measured in bytes. The maximum block size for 2780 terminals or terminal emulators is 400 bytes. The maximum block size for 3780 terminals or terminal emulators is 512 bytes. You define your station's block size when you define your RJE80 application.

**Message.** A block or group of blocks that together make up a total data transmission. Usually, a message is a complete data file as organized for sending. The RJE80 program transmits the entire file, block by block, with a single command.

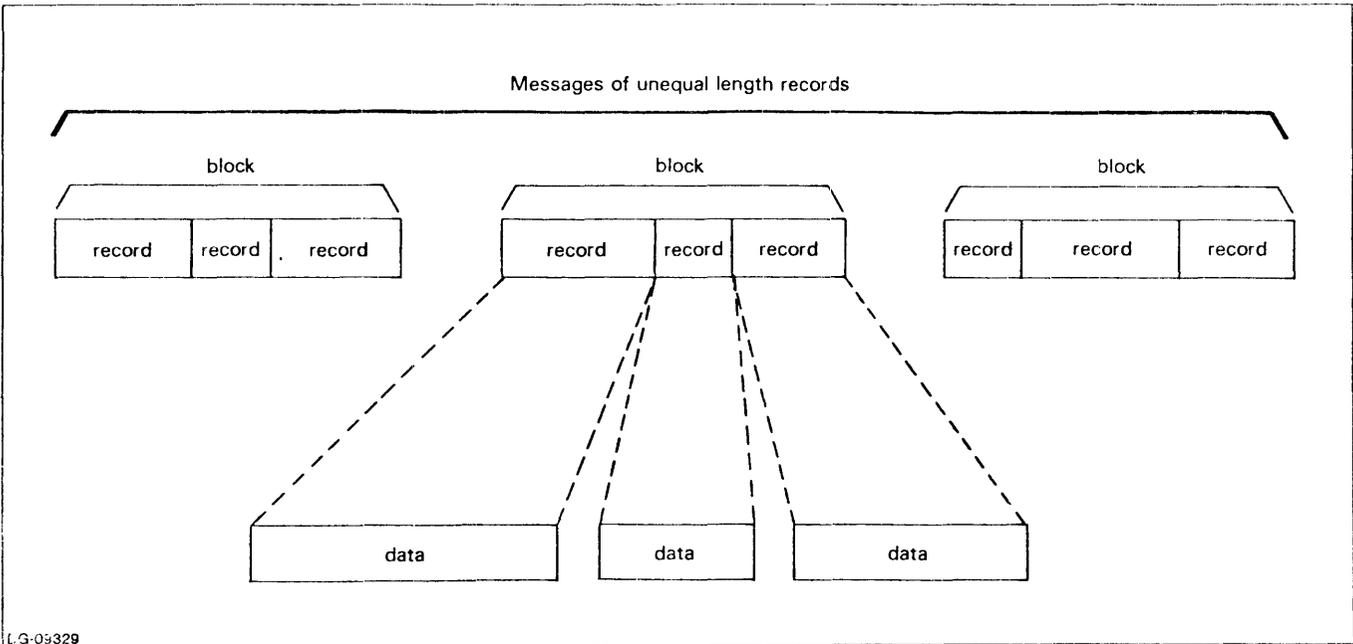
**Job.** A term used in communicating with an IBM station. A job sent by an RJE80 station communicating with an IBM site consists of job control records identifying an RJE80 site and a message. IBM systems can send multiple RJE80 messages in a single transmission.

Figures 1-3 and 1-4 show dynamic and data-sensitive RJE80 record, block, and message structures.



DG-09328

Figure 1-3. RJE80 Dynamic Record, Block, and Message Structure



LG-03329

Figure 1-4. RJE80 Data-Sensitive Record, Block, and Message Structure

## Supported Data Codes

Data General computers use ASCII code. *ASCII* stands for American Standard Code for Information Interchange, which uses 7-bit combinations to define 128 alphanumeric characters.

When transmitting to an IBM site, RJE80 must use the EBCDIC data code. *EBCDIC* stands for Extended Binary Coded Decimal Interchange Code. EBCDIC uses 8-bit binary combinations to define 256 alphanumeric characters. IBM computers and IBM's 2780 and 3780 terminals use EBCDIC.

RJE80 commonly translates the ASCII data stored at your system into EBCDIC code when transmitting and converts EBCDIC data to ASCII when receiving.

RJE80 also permits you to send EBCDIC or ASCII encoded data as a pure binary stream. This allows you to avoid problems that the RJE80 program can encounter when translating data from one code to another. (Chapter 2 provides more information on code translation and the file types that are liable to create conversion problems.)

The standard ASCII/EBCDIC conversion tables provided with your RJE80 program should be sufficient for your station's transmission needs.

RJE80 can convert Hollerith encoded data to EBCDIC for transmission. *Hollerith* is a 12-bit code used to represent data on a punch card. (You will use Hollerith encoded data only when your system or our remote system supports a cardreader.)

## Comparison of 2780 and 3780 Terminal Operation

This section describes the different features that 2780 and 3780 terminals and emulators incorporate. It explains why 3780 terminals generally transmit data at a faster rate than 2780 terminals. The features are summarized in Table 1-1.

You can choose which terminal you want your station to emulate when you design your RJE80 program application. (See Chapters 3, 4, and 5.) In general, you should select 3780 terminal emulation unless your remote station runs or emulates a 2780 terminal.

## Comparison of 2780 and 3780 Data Structures

The 2780 terminal allows block lengths of up to 400 bytes. The 3780 terminal allows block lengths of up to 512 bytes.

When an RJE80 program emulates a 2780 terminal and sends EBCDIC-encoded data, it sends dynamic records. The program adds blank spaces to "pad" short lines to equal the predefined dynamic record length. The receiving station cannot delete the added blanks. Therefore, a received message can be longer than the original file.

An RJE80 program emulating 3780 terminal operation sends data-sensitive records. When preparing data for transmission, it commonly deletes trailing blanks and does not pad records to the maximum record size. These features make 3780 transmissions faster than 2780 transmissions.

## Operations

The space compression and transparency features can affect transmission speed when you operate your RJE80 as a 3780 terminal emulator and translate data from ASCII to EBCDIC while transmitting. (The features have no effect when the RJE80 program transmits binary data.)

**Table 1-1. Summary of Features for Record Manipulation**

Mode	Pads Records up to n* Characters	Strips Trailing Blanks	Compress/Expand
2780 mode with transparency off	YES where n = record length you define for program	NO	NO
Either mode with transparency on	YES where n=80	NO	NO
3780 Mode with transparency off	NO	YES when using the SEND command	YES

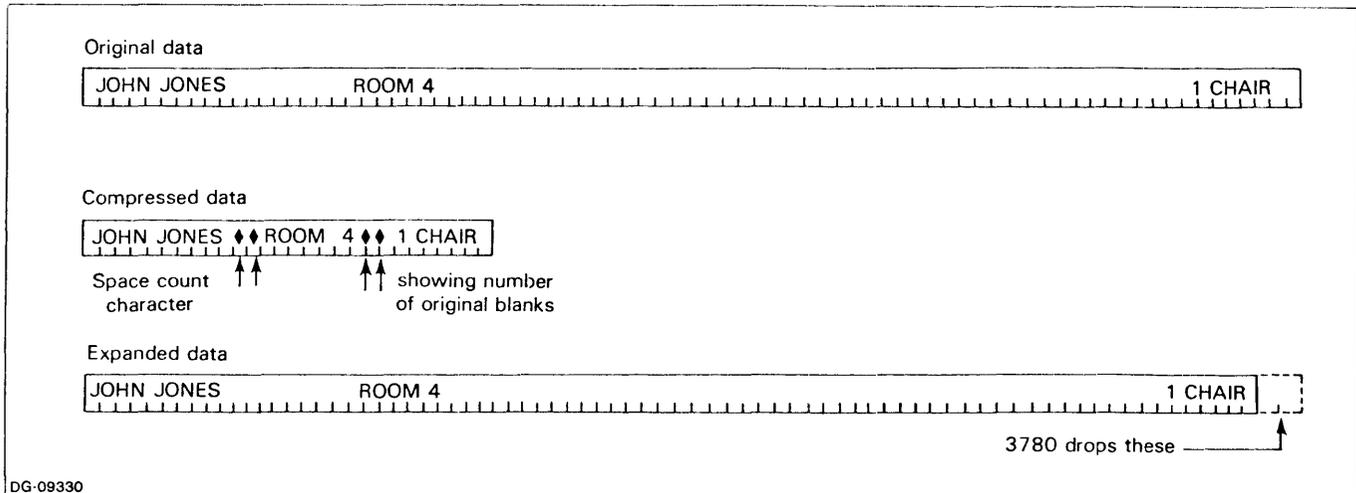
\*n is the maximum record length value you define when generating your version of RJE80. See Chapter 3.

### Compression

*Compression* allows RJE80 stations emulating 3780 terminals to increase transmission speed. Compression replaces strings of consecutive space characters within a record with a BISYNC control character and a space count character. The receiving RJE80 station, which must also emulate 3780 terminal, uses the received space count character to reinsert the original number of spaces. RJE80 programs emulating 2780 terminals cannot use the compression/expansion feature.

Figure 1-5 illustrates space compression. See Chapter 2, "Sending Exact Copies," for further information.

NOTE: When you use the compression feature explained below, 3780 terminals do not strip multiple trailing blanks from records.



*Figure 1-5. RJE80 Compression and Expansion*

## **Transparency**

*Transparency* ensures against RJE80 interpreting a string of data characters as a BISYNC control character. Transmitting files with the .SV or .RB extensions can create confusion, as these extensions can cause your transmission to fail. Transparency inserts a special BISYNC control character (DLE) before all control characters in a message. The receiving station then recognizes only those code combinations preceded by a DLE as BISYNC control characters.

Transparency is available for both 2780 and 3780 terminal emulation.

**NOTE:** Transparency causes RJE80 programs emulating 3780 terminals to send dynamic records of 80 characters. When transparency is on, programs emulating 3780 operation cannot delete trailing space from records or use compression.

End of Chapter

# Chapter 2

## Operating RJE80

This chapter explains how to operate pregenerated and user-generated versions of the RJE80 program. Reading this chapter will give you a detailed view of what RJE80 does. You cannot perform the operations described in this chapter until you have installed a version of the RJE80 program on your system as shown in Chapters 3, 4, and 5.

### Command Line Format

This chapter focuses on commands for executing and terminating the RJE80 program, setting the program environment, monitoring program operation, and sending and receiving data. This chapter presents commands in the order that you are most likely to use them. Chapter 6 presents RJE80 commands alphabetically.

A typical RJE80 command looks like this:

SA filename <CR>

SA (Send ASCII) is the command you wish to execute; filename is the name of the file you wish to send.

RJE80 executes one command at a time. It can accept commands typed ahead, but a command is not echoed until RJE80 begins its execution.

### Status Messages and Errors

RJE80 status messages and CAM status codes report on your use of the communications link and the RJE80 program, on transmission and reception errors, and on hardware and software fatal errors.

Appendix A lists these messages and codes, describes their meanings, and outlines what actions you should take.

### Executing the RJE80 Program

To bring up an RJE80 station your system must be up and running under RDOS, DOS, or RTOS. You must have an executable RJE80 program available on your system. (On a dual-diskette DESKTOP GENERATION system, you must mount a bootable diskette containing an executable RJE80 program.)

The procedure for bringing up your RJE80 station varies depending on

- Whether your communications line is switched or dedicated (See "Communications Links" in Chapter 1.)
- The operation monitoring and data transfer features you wish to use
- The requirements of non-Data General remote sites

The RJE80 execution sequence follows.

1. Enter the RDOS or DOS CLI; or bootstrap RTOS.
2. Set your system date (optional).
3. Set your system clock (optional).
4. Execute your RJE80 program.
5. Set your operating environment.
6. Call up remote site's modem (for configurations using switched line only) or receive a call from your remote site.
7. Enter the EL (Enable Link) command to enable data reception.
8. Send sign-on record (for communicating with non-Data General remote stations).

For information on how to bring up your computer, see *How to Load and Generate RDOS, Using DG/RDOS on DESKTOP GENERATION Systems, How to Generate Your DOS System, or RTOS User's Manual*.

### Setting the System Date

When you bring up your computer, the system prompts you for the date. Enter the date in the format day-month-year. For example:

```
10 14 83 <CR>
```

is October 14, 1983.

### Setting the System Clock

RJE80 displays the time at which a command is processed or a message appears on your console. When you bring up your computer, it prompts you for the correct time. Enter the time in the format as follows.

```
H:M:S <CR>
```

H stands for hours on a 24-hour clock, M for minutes, and S for seconds. You can enter zeros for minutes and seconds.

### Executing RJE80

All RJE80 programs for DESKTOP GENERATION systems operate as background processes. Although versions of RJE80 for other systems can run as foreground processes, RJE80 most commonly runs as a background process.

#### Executing RJE80 Programs on DESKTOP GENERATION Systems

To operate a pregenerated 2780 terminal emulator, enter

```
RJE27 <CR>
```

To operate a pregenerated 3780 terminal emulator, enter

```
RJE37 <CR>
```

To bring up a user-generated RJE80 program on a DESKTOP GENERATION system, enter

```
RJE80 <CR>
```

which is the default savefile name created by the BLDRJE80 generation macro.

## Executing RJE80 on Non-DESKTOP GENERATION Systems

To bring up an RJE80 program on a system running RTOS or DOS, or on a system running RDOS with RJE80 as a background process, enter the following

`savefilename`

`savefilename` is the name of the RJE80 program file you created during RJE80 generation.

To bring up your RJE80 as an RDOS foreground process having equal priority with the background process, enter the following CLI command line.

`EXFG/E savefilename`

To give your RJE80 foreground process higher priority than the background process, omit the `/E` switch.

## RJE80 Line Connection Messages

The following message appears when the RJE80 program begins operating.

*R*

*ENTER EL COMMAND TO START LINK MONITORING*

The first message means that your RJE80 program is ready to process commands. The second message means that RJE80 is ready for you to contact your remote station.

Before you complete the execution sequence for a switched or dedicated line connection you may find it useful to set your operating environment. You can operate your RJE80 program before setting environment commands (skip to the "Completing the Execution Sequence" section below).

NOTE: When you enter an environment command before enabling the link, RJE80 redisplay the READY (R) and ENTER EL COMMAND TO START LINK MONITORING messages. The status of the link, however, has no effect on RJE80's ability to process environment commands.

If you enter commands that use the link before enabling the link, RJE80 displays the messages shown above plus a third message, DATASET NOT READY indicating that the stations are not properly connected. These commands include data transfer, break link, and restart transmission commands and are discussed later in this chapter.

## Setting the Operating Environment

RJE80's environment commands define how your station

- Stores or displays received data
- Formats received data
- Tracks RJE80 run time operations

You can define or redefine your operating environment during any phase of RJE80 operation.

Table 2-1 summarizes the RJE80 environment commands you can use before enabling the link.

**Table 2-1. Environment Settings**

Action	Command	Description	Initial Environment Setting
Directory	.D	Change your working directory	Your current working directory when you executed RJE80
Initialization	.I,R	Disk or diskette initialization and release	CLI-type command
Format Select	FS	Control the vertical format of output from a data reception	VFC form F1 selected
List and Punch files	LA,LB PA,PB	User-defined destinations for received data	Closed until specified or opened to the line printer by default with the EL command
Log file	EG,DG	A file to which all operation commands and messages are written.	Disabled
Monitor	EM,DM	Signal the receipt of important messages.	Disabled
Time-of-day file support	LA,LB PA,PB	Individual files created for each transmission received at your station.	Disabled

### List and Punch Files

The RJE80 program can receive data into two files: the list file and the punch file.

NOTE: Only a non-Data General remote station can send files to an RJE80 station punch file.

You can cause RJE80 to receive the data to any storage or display device on your system. The storage file or the device you specify is your *list file* or *punch file*. Use the list file to receive data from Data General and non-Data General remote systems. Use the punch file to receive data from non-Data General systems only.

Set your list and punch files to a storage device file to keep a permanent record of received messages. When you terminate RJE80, use CLI commands to edit, break up, or transfer list and punch file data.

NOTE: RJE80 receives data to the line printer if you do not select your own list or punch file before enabling the line. The default setting can cause your system to hang if it does not support a line printer.

RDOS RJE80 defines two ways to open list and punch files. This section describes how to set list and punch files to translate received EBCDIC data to the ASCII code for storage or printing at your system. This is the most common method of transmitting data between Data General machines.

NOTE: For a complete discussion of list and punch files, see the LA, LB, PA, and PB entries in Chapter 6, "Dictionary of Commands."

To set your list or punch file, enter one or both of the following command lines:

LA filename

opens a list file.

PA filename opens a punch file.

Both commands create the file named in the filename argument. RJE80 then receives data targeted for the list or punch file you specify until you change the file or end the operating session.

### **Time-of-day File Support**

When you do not use time-of-day file support, RJE80 appends individual incoming messages to data already in the list and punch files. Time-of-day (TOD:) file support causes RJE80 to create a unique file for every message your station receives.

RJE80 gives each time-of-day file a unique filename. The name consists of the first four letters of the list or punch filename, plus six digits representing the system time at which it received the message.

Time-of-day file support causes RJE80 to append a six-digit number to the first four letters of the list or punch filename. This number represents the system time at which RJE80 received the transmission.

Time-of-day file support is a program option you can choose when generating your system. (See Chapter 4 for DESKTOP GENERATION systems and Chapter 5 for non-DESKTOP GENERATION systems.) To use time-of-day file support during an RJE80 session, enter the list or punch commands with the TOD: argument prefix as follows.

When you open a list file using the command

LA TOD:Tuesday <CR>

and receive a transmission from your remote site at five minutes past noon, RJE80 creates the list file TUES120500 and writes the message to it.

### **Setting the Log File**

The RJE80 *log* feature writes all runtime commands entered at, and all messages displayed on, your console to a designated file. You can use the information collected to track unattended operations and to determine whether your RJE80 program is functioning properly.

You can open a log file to any RJE80-supported storage or display device. You can open a new log file at any time during RJE80 operation. Finally, you can open different log files to record the information generated by different RJE80 functions.

To set a log file, enter the command line:

EG directory

The directory argument specifies the name of the file opened as the log file. The file remains the log file until you change the log filename, close the log file, or bring RJE80 down.

To close a log file enter the command line:

DG

## Monitoring Received Data

Monitoring causes RJE80 to write incoming records beginning with a specified character string to the screen as well as to the list or punch file. Use monitoring to signal the receipt of files of special interest.

To monitor received data for a file beginning *Updated Widget Maintenance Record*, enter the command line

```
EM Updated <CR>
```

EM is the Enable Monitor command.

Updated is the string that RJE80 is to monitor.

The monitor feature is case-sensitive. RJE80 cannot signal receipt of the widget file, for example, if you set the EM command to search for "updated" and receive a record beginning "Updated".

To stop RJE80 from monitoring a string, enter the command line

```
DM
```

## Changing the Working Directory

The directory in which you bring up RJE80 is the program's *working directory*. You can use the .D (Directory) command to change your working directory. For example, you may find it convenient to order list and punch files by receiving them to different directories. When you enter the command line

```
.D directory
```

the directory you name becomes your new working directory.

## Formatting Received Data

RJE80 uses *output control forms* to define the vertical and horizontal format of messages sent to its list and punch files.

Default forms released with your RJE80 program suffice for formatting most messages sent between Data General systems.

For information on how to create your own *Vertical Format Control forms*, see Appendix B. Data General's RJE80 programs do not allow you to manipulate horizontal format.

## Completing the Execution Sequence

Once you bring up the RJE80 program and define your operating environment, follow a procedure outlined below to connect to your remote station.

### Enabling a Switched Line

When you first execute the RJE80 program on a switched line, your console displays

```
R  
ENTER EL COMMAND TO START LINK MONITORING
```

Dial up your remote site modem to connect the link.

If the remote site has an automatic answer modem, you will hear a high tone as soon as it is ready to receive. When you hear the tone, put your modem into data mode and enter the EL command to enable the link.

If a person answers at the remote site, ask the person to connect the link manually. When you hear the high tone, put your modem into *data mode* and enter the EL command to enable the link.

When you enter the EL command, RJE80 becomes fully operational and displays the *R* message. RJE80 can now send and receive files across the link. RJE80 displays the *R* message after each successfully entered and processed RJE80 command.

### Enabling a Dedicated Line

When you first execute the RJE80 program on a dedicated line, your console displays

*R*  
*ENTER EL COMMAND TO ENABLE DATA RECEPTION*

This message indicates that RJE80 connects with the remote station as soon as you execute the program.

The first message states that RJE80 is ready to accept commands. The second indicates that your program cannot receive messages until you enter the EL (Enable Link) command to complete the program execution sequence.

When you enter the EL command, RJE80 becomes fully operational and displays the *R* message. RJE80 can now send and receive files across the link. RJE80 displays the *R* message after each successfully entered and processed RJE80 command.

### Communicating with Non-Data General Remote Stations

Some stations communicating with non-Data General remote stations must transmit a sign-on record to complete the program execution sequence. Ask your remote system operator to provide you with the necessary information. The remote station can reject any files you attempt to transfer before the sign-on procedure is completed.

## Runtime Commands

This section describes the runtime commands and command sequences you can use to operate your RJE80 station once you complete the program execution sequence.

### Sending Data

RJE80 supports a variety of commands and command sequences for sending and receiving files. Table 2-2 briefly describes each command used in sending and receiving files.

**Table 2-2. Commands for Sending and Receiving Data**

Action	Commands	Description
TRANSFER	XA/XB XC/XT	Copies files resident on your system to your current LIST file.
HALT COMMANDS	HC	Instructs RJE80 programs accepting commands from an input file (unattended operation) to wait until receiving a complete message sequence from the remote station before processing another command.
HALT PROGRAM	HP	Terminates RJE80
READ COMMANDS	RC	Processes commands entered from a command file rather than from the console (unattended operation).
RESTART TRANSMISSION	RT	Allows RJE80 to resume transmitting when its transmission is interrupted by a remote station Reverse Interrupt sequence.
SEND	SA/SB SI	Sends data to a remote site.

Some non-Data General remote stations can require that you include a job control record identifying your station with every message you send. Consult your remote station operator for further information.

### **The Send ASCII Command**

The SA (Send ASCII) command assumes that your files are in ASCII and translates your data into EBCDIC for transmission. To use the SA command at a point-to-point or slave station, enter the command line

SA filename

Filename is the name of the file that you wish to send to the remote site.

When the remote site accepts RJE80's bid to send, your console displays

*T OPEN*

When RJE80 has finished transmitting the file, your console displays

*T END*

### **Sending to a Master Station**

RJE80 slave stations display the *R* message when you enter send commands (SA, SB, SI) in the correct format. Your slave station must await a poll from the master station, however, before it may process your command. When the master station polls and accepts your transmission, your slave station displays the message

*T OPEN*

When the data transfer is complete, RJE80 displays the message

*T END*

You can enter environment commands when a send command pends (awaits a poll to execute), but you cannot enter another send or transfer command while a send command pends.

### **Sending to a Multipoint Slave Station**

When your RJE80 station operates as a multipoint master station, you must specify the address of the station to which you send data in the command line as follows.

SA filename [*station-address*]

The one-character station address is unique for each slave station on the line. For information on how to create slave station addresses, see the section "RPOLL.SR" in Chapter 5.

### **Sending with Compression (3780 Emulation Only)**

*Compression* is valid with 3780 emulation only. Compression saves time when you send files with numerous strings of space characters. To enable compression, enter the command line

EC

RJE80 sends a short encoded message for any string of blanks. To disable compression, enter the command line

DC

The DC command causes RJE80 to send each blank in a string of blanks. Please note that when you execute RJE80, the compression feature is disabled. For more information on compression, see "Comparison of 2780 and 3780 Terminal Operation" in Chapter 1.

**NOTE:** An RJE80 program cannot perform transparency and compression operations at the same time. Transparency, which allows RJE80 to read any code combination as data, takes precedence. When transparency is on, RJE80 ignores the compression setting. Only the sending station can set the transparency or compression feature. A receiving station can accept transparent or compressed data no matter what its environment setting.

### **Sending Exact Copies**

Because RJE80 can change a file's format when structuring it for transmission, a message sent with the SA (Send ASCII) command is not always an exact copy of the original file. Use the following procedure to send exact copies of a file.

1. To receive the exact copy, the receiving station operator must open the list file with the LB (List Binary) command.

LB filename

You can also use the SI (Send Immediate) command to signal your remote operator to prepare for your transmission. Your command line could be as follows

SI *[CTRL-G]* open list/binary to receive exact copy

The CTRL-G character directs the argument to the remote site console rather than to the remote list file. The argument to the SI command can be any text string that does not exceed the "maximum record size when transmitting" value defined for your program. (See Chapter 3.)

2. Set transparency on at the sending station (your station) using the command line

ET

The transparency feature ensures that the RJE80 station receiving the message does not read ASCII data as BISYNC characters.

3. Send the file using the SB (Send Binary) command. (The SB (Send Binary) command sends data without ASCII to EBCDIC translation and without compression.)

SB filename

The filename is the name of the file you are sending.

4. When RJE80 completes the transmission, use the DT (Disable Transparency) command to set transparency to off.

DT

The receiving station operator can then close the current list file (by opening a new list file) and examine the received data.

### **Sending Punched Card Data**

Punched card readers (device name \$CDR) use the 12-bit Hollerith code. RJE80 cannot send or receive Hollerith-encoded data. When your system supports a punched card reader, you must translate the \$CDR data to EBCDIC before transmitting. Enter the command line

XC filename

The filename is the name of the file that receives the translated EBCDIC data. (Because the XC command always reads from the \$CDR file, it takes only one argument.)

**NOTE:** You cannot use the SA (Send ASCII) command to transmit the translated \$CDR data. Follow the procedure for sending exact copies shown above to complete the transmission.

## Receiving Data

The following sections describe how RJE80 can format, process, and store received data.

### Output Format Controls

The RJE80 program uses output format forms to define a message's vertical and horizontal tab format. Your RJE80 program includes release format forms that should be sufficient for your communications needs.

**Vertical formats.** The station receiving a message determines vertical formats. Appendix B provides information on defining your own vertical format controls.

**Horizontal tab formats.** The station sending a message determines horizontal tab formats. Data General's RJE80 programs do not allow you to manipulate horizontal format.

### Manipulating Data Received

In a standard data reception, your station receives EBCDIC-encoded data, translates it to ASCII, and writes it to a list file opened with the PA command or to a punch file opened with the PA command.

When you open your list or punch files with the LB or PB commands as shown in the section "Sending Exact Copies" above, RJE80 does not translate received data. The following steps show how to translate received EBCDIC data with RJE80 commands.

Set your list or punch file to a new file by typing the command line:

LA new filename

Use the XT (Copy/Translate) command to convert the file data to ASCII:

XT original list or punch filename

In this command line, filename names the list or punch file containing the EBCDIC data.

NOTE: The RJE80 transfer commands XA, XB, and XT accept only one argument, the name of the file to be copied. The transfer commands copy data to the currently opened list file.

### Reviewing File Contents

The RJE80 program has no CLI-style TYPE command. You can, however, review the contents of a file received to the list file without terminating RJE80 program execution.

Set your list file to your screen:

LA \$TTO

Use the XA (Transfer ASCII) command to print the desired files to the new list file:

XA filename

You can review the contents of the file as RJE80 sends it to the screen.

NOTE: You can also set the list file to the line printer (\$LPT) to print out the contents of the file.

## Unattended Operation

The RJE80 program accepts commands from the terminal by default. It can also accept input from a file called an input command file. Like CLI macro files, input command files contain previously defined commands, freeing you from entering a series of commands one by one. Use unattended operation to perform repetitive and time-consuming tasks such as sending lengthy messages, or to transfer files during off-peak hours. Input command files are commonly used to transfer files overnight.

Create the input command file using a text editor such as Speed. Figures 2-1 and 2-2 show sample command input files for unattended sending and receiving operations.

Figure 2-1 provides an example of an input command file for a sending station. The example assumes a Data General-to-Data General station configuration.

The two last commands in the example cause RJE80 to disable the line and reinvoke the input command file itself. Use this format to communicate with several point-to-point receiving stations. (The receiving stations must dial into the sending station one at a time.)

To communicate with a single receiving station during an unattended operation session, replace the RC command line with the HP (Halt Program) command.

<b>Command Input File Contents</b>	<b>Meaning</b>
EL	Enables data reception
HC	Waits for remote site to declare itself ready
SA SIGNON_FILE	Transmits a file
HC	Waits for remote site to open a new list file and declare that it has received the file
SA DITOCCL_FILE	Transmits a file
HC	Waits for remote site to declare that it has received the file
DL	Disables the communications link
RC SEND_FILES	Reinvokes the command file (to begin sending files to another station)

*Figure 2-1. Sample Command Input File for Sending Station*

Figure 2-2 provides an example of an input command file for a receiving station. This example also assumes a Data General-to-Data General station configuration.

The SI command line sends messages to the console of the remote station where the messages can be read by the remote site operator. (See "Sending Exact Copies" above or the SI entry in the Chapter 6 command dictionary.)

<b>Command Input File Contents</b>	<b>Meaning</b>
LA SIGNON	Sets the list file
EL	Enables data reception
SI CTRL-G SEND SIGNON FILE	Sends a record-length message to the remote site terminal
HC	Coordinates setting a new list file before receiving new transmissions
SI CTRL-G SEE YOU LATER	Sends a record-length message to the remote terminal
DL	Disables the communications link
HP	Terminates RJE80 operation

*Figure 2-2. Sample Command Input File for Receiving Station*

**NOTE:** The input command file must be in your current directory or linked to your current directory to invoke correctly.

To begin unattended operation, enter the command line

RC filename

The filename argument names the input command file containing the RJE80 command series you wish your station to process.

Unattended operation ends when the program:

- Encounters an RC (Read Commands) command. (The command line RC @TTI returns program control to a terminal in the background. The command line RC \$TTI returns program control to a terminal in the foreground.)
- Encounters a HP (Halt Program) command in the command input file.
- Processes a manually-entered emergency termination control sequence (See "Controlling the Communications Link" later in this chapter.)

When the RJE80 program runs unattended and encounters an irrecoverable error, it closes the current input file and returns control to the console. When RJE80 encounters a communications error, it attempts recovery. (See "Status Messages and Errors" above.)

## Reverse Interrupt Command Sequences

A non-Data General remote station can interrupt any RJE80 transmission by sending a reverse interrupt (RVI) sequence. The RJE80 station stops transmitting, and the remote station sends its own transmission. The transmission is commonly an operator-to-operator message explaining the reason for the interruption. It can, however, be a data transmission without accompanying explanation.

When the remote station completes the RVI transmission, pregenerated RJE80 programs automatically resume transmission of the interrupted message. When you operate a user-generated RJE80 program, however, you can control the way your station resumes operation. When you use the *automatic restart* feature, RJE80 automatically resumes the interrupted communication. When you use the *manual restart* feature, RJE80 lets you decide whether to complete or abort the interrupted communication. The two features are further described in Chapter 3.

Figures 2-3 and 2-4 show two examples of reverse interrupt operating sequences using manual restart.

In Figure 2-3, a remote non-Data General station responds with an RVI and a message when an RJE80 operator submits an incorrect job control card. Resubmitting the uncorrected message would result in another transmission failure. The operator whose transmission was interrupted therefore uses manual restart to send other, acceptable jobs before resubmitting the original message. He or she then brings down RJE80, corrects the unacceptable job with a text editor, re-executes RJE80, and resubmits the edited job to the remote site.

In Figure 2-4, an RJE80 station currently transmitting files receives an RVI from a non-Data General, non-IBM station.

In Figure 2-4, the remote station interrupts a viable RJE80 message to send data of its own. When the remote station finishes its RVI transmission, the local RJE80 operator whose message was interrupted manually enters an RT (Restart Transmission) command to resume the transmission.

**NOTE:** When you select the automatic restart response to a reverse interrupt during RJE80 generation, RJE80 follows the sequence of operations shown in Figure 2-4.

<b>Commands and Messages</b>	<b>Meaning</b>
EL	Operator enables communications link to remote IBM host
SA sign-on	RJE80 operator sends IBM sign-on card
<i>T OPEN</i>	RJE80 signals sending of sign-on card
<i>T END</i>	RJE80 completes transmission of sign-on card
<i>R Open</i>	RJE80 receives message reception of sign-on card
<i>R END</i>	RJE80 signals end of IBM message
SA JOB1	RJE80 submits a job to IBM host
<i>T OPEN</i>	RJE80 signals sending of JOB1
<i>REVERSE INTERRUPT RECEIVED</i>	RJE80 receives complete RVI message from remote host
<i>T END</i>	RJE80 suspends transmission of JOB1 in acknowledgment of RVI (this message appears in 3780 emulation only)
<i>R OPEN</i>	RJE80 receives message from IBM host
<i>R END</i>	RJE80 signals end of IBM message
SA JOB2	RJE80 sends another job rather than use manual restart to continue transmitting JOB1
<i>T OPEN</i>	RJE80 signals sending of JOB2
<i>T END</i>	RJE80 completes transmission of JOB2
HP	Operator terminates RJE80 operation to correct JOB1
execute RJE80	Operator brings up RJE80 after correcting JOB1 with an editor
<i>READY ENTER EL...</i>	RJE80 signals connection to remote site
EL	Operator enables communication link to remote IBM host
SA SIGN-ON	Operator sends sign-on card
<i>T OPEN</i>	RJE80 signals sending of sign-on card
<i>T END</i>	RJE80 completes transmission of sign-on card
<i>R Open</i>	RJE80 receives IBM message
<i>R END</i>	RJE80 signals end of IBM message
SA JOB1	RJE80 resubmits a job to IBM host
<i>T OPEN</i>	RJE80 signals transmitting of JOB1
<i>T END</i>	RJE80 successfully completes transmission of JOB1

Figure 2-3. RVI Command Sequence (IBM Host to RJE80)

**Commands and Meaning  
Messages**

EL	Operator enables communication link
SB sign-on	RJE80 operator sends sign-on card
<i>T OPEN</i>	RJE80 signals sending of sign-on card
<i>T END</i>	RJE80 completes transmission of sign-on card
<i>R Open</i>	RJE80 receives message reception of sign-on card
<i>R END</i>	RJE80 signals end of IBM message
SB FILE1	RJE80 transmits a file to the remote station
<i>T OPEN</i>	RJE80 signals sending of JOB1
<i>RVI</i>	RJE80 receives RVI from the remote station
<i>T END</i>	RJE80 suspends transmission of FILE1 in acknowledgment of RVI
<i>R OPEN</i>	RJE80 receives message from IBM host
<i>R END</i>	RJE80 signals end of IBM message
RT	RJE80 operator uses manual restart to resume operation of interrupted transmission
<i>T OPEN</i>	RJE80 sends the rest of FILE1
<i>T END</i>	RJE80 transmission of FILE1 completed
SB FILE2	Operator sends new file to remote site, invokes any other RJE80 operation, or terminates RJE80

*Figure 2-4. RVI Command Sequence (RJE80 and 2760/3780 Emulator)*

## **Controlling the Communications Link**

You can use the BL (Break Link) and DL (Disable Link) commands to alter RJE80 access to the communications link.

### **Break Link**

Used when you are communicating over a switched link, the BL (Break Link) command disconnects the switched link and instructs your modem to wait for an incoming call to enable the link. (You can re-enable the link yourself by dialing up the remote site modem as described earlier in this chapter.)

Use the BL command to communicate with more than one remote station during an RJE80 session. When you finish communicating with one station, break the connection and dial up and enable a line to another station.

### **Disabling and Enabling the Link**

The DL (Disable Link) command gives you control over the communications line without actually disconnecting it. It allows your station to ignore transmissions from the remote station.

You can disable or enable (with the EL, Enable Link, command) reception at any time. It is important, however, to determine how your remote station operators plan to respond before using this command. The remote RJE80 program can disconnect a switched line, ignore your future transmissions, or suspend its own transmissions.

## **Terminating the RJE80 Program**

This section describes two procedures for terminating RJE80 operation. The HP (Halt Program) command is the standard procedure. The emergency procedure can be useful, however, when your station is in unattended operation and cannot accept commands from the console.

### **Standard Termination**

To terminate RJE80, use the HP (Halt Program) command. The RJE80 program then finishes execution by closing any currently open files and disabling the communications hardware. The program that was operating before you invoked RJE80 (in RDOS operation, normally the CLI) resumes operation.

### **Emergency Termination**

As a last resort, press CTRL-C to interrupt execution of the RJE80 program and return to the program that was running before RJE80. Avoid emergency termination when possible: it does not properly disconnect your station's hardware. It can, for example, terminate RJE80 operation without disabling the link. In addition, CTRL-C does not signal your RJE80 termination at the remote site.

End of Chapter

# Chapter 3

## Overview of Program Generation

You can choose between three generation procedures to put RJE80 on your system. Each procedure supports different program features. This chapter presents the information you need to choose a generation procedure and program features.

This is the first of three chapters devoted to the RJE80 program generation process. Chapter 4 shows how to establish RJE80 programs on your DESKTOP GENERATION system. Chapter 5 shows how to generate a version of the RJE80 program for non-DESKTOP GENERATION systems.

### Pregenerated and User-Generated RJE80 Programs

DESKTOP GENERATION systems can run a pregenerated version of the RJE80 program. The pregenerated programs assume that you use a standard DESKTOP GENERATION hardware configuration. Pregenerated RJE80 programs incorporate the most commonly used RJE80 features.

Use the "Pregenerated RJE80 Configurations" and "RJE80 Options" sections below to determine whether your station hardware, your remote station's configuration, and your communications needs permit you to use a predefined version of the RJE80 program.

When you operate a DESKTOP GENERATION system and wish to take advantage of RJE80 features not available with the pregenerated RJE80 programs, follow the DESKTOP GENERATION procedure to create your own version of RJE80.

To operate an RJE80 station on a Data General NOVA®, microNOVA® or ECLIPSE® system you must generate your own versions of the CAM and RJE80 programs. The generation procedure allows you to customize the RJE80 program to your system's hardware and to select among file transfer options. The "RJE80 Options" section below defines the range of RJE80 configurations available.

### Pregenerated RJE80 Program Configurations

The 2780.SV pregenerated program file defines a RJE80 program emulating an IBM 2780 Data Communication Terminal. The 3780.SV pregenerated program file emulates an IBM 3780 Data Communication Terminal.

Table 3-1 shows the hardware configurations and file transfer options that the pregenerated RJE80 programs incorporate. Read the "Options" section below for a definition of each option.

Note also that pregenerated RJE80 programs do not support multipoint configurations. Pregenerated RJE80 programs do not support the "wrong number protection", "time-of-day file support", or "insert carriage return in punch file data" options.

**Table 3-1. Pregenerated RJE80 Programs**

Option Type	2780 or 3780 Terminal Emulation	
	Option	Pregen Setting
Hardware Configuration	Multiplexor	USAM
	Device Code	54
	Physical Line Number	0
Operating System	Type	RDOS
	Ground	background
	Buffers	1
	Stacks	2
CAM and RJE80 Features	Station Configuration	point-to-point
	Station Type	primary
	Line Protocol	half duplex
	Error Protection	Software CRC
	Timeout	3 seconds
	Block Format	standard
	Reverse Interrupt	automatic
	Maximum Line Length	132 characters
	Error Shut Down	no

### RJE80 Options

The following sections define the range of configurations and options that RJE80 supports.

If you operate a DESKTOP GENERATION system, use these sections to determine whether the pregenerated RJE80 program configurations meet your needs.

When you cannot or prefer not to use the pregenerated versions of RJE80, use these sections to define your program configuration in preparation for running the CAM and RJE80 generation programs.

Your station configuration and the configuration of your remote site must be complementary. Your remote site program configuration influences whether you can use a pregenerated RJE80 program. Your remote station configuration influences your choice of options if you define your own version of RJE80.

**NOTE:** The following sections group related options together. They do not reflect the order in which the generation dialogs present choices.

### Naming and Modifying

The procedure for naming or modifying the name of your RJE80 program is different for pregenerated and user-generated versions of the RJE80 program.

#### Renaming RJE80 for DESKTOP GENERATION Systems

Data General has assigned default program names for pregenerated and user-generated RJE80 programs for DESKTOP GENERATION systems. You can modify a default name after you re-establish the program on your system. Use CLI commands to modify the program name.

## Naming RJE80 Programs for Non-DESKTOP GENERATION Systems

The RJE80 generation program allows you to name the RJE80 program yourself. Each RJE80 program you generate must have a unique name.

NOTE: When you generate a new program and give it the name of a previously-generated program, RJE80 deletes the old program file and uses the program name for the newly created files.

You can regenerate your CAM and RJE80 files at any time to change your communications line or file transfer configuration.

NOTE: When you change your CAM configuration, you must regenerate RJE80 to bind your new CAM files with your RJE80 files.

## Hardware

You must select and install communications hardware before generating a version of RJE80 for your system. This section describes where to find general hardware installation information, and describes issues specific to hardware installation for RJE80 programs.

DESKTOP GENERATION systems support the USAM-1 and USAM-4 multiplexors only. You must dedicate a USAM multiplexor for your RJE80 program.

For information on how to install and jumper the communications multiplexor, physical lines and modems on DESKTOP GENERATION systems, see *Installing Model 10 or Model 10/SP Systems and Installing Model 20 and Model 30 Systems*.

For information on how to install communications hardware on non-DESKTOP GENERATION systems, consult your Data General representative.

NOTE: When your communications link is modem controlled, jumper your communications device to support an external (modem) clock. When your communications link is a direct, modemless connection to another machine, or is a loopback cable, jumper your communications device to use the internal, operating system clock.

## DESKTOP GENERATION Systems

Check your system's hardware against the Table 3-1 list of pregenerated values for RJE80 station hardware.

## Non-DESKTOP GENERATION Systems

Before executing the CAM and RJE80 generation programs, gather the information listed below.

- Filenames for your CAM table and RJE80 program files.
- The communications device (multiplexor board type or DCU) your system uses.
- The device code of your communications device.
- The lines on the communications device already in use, and whether they support asynchronous or synchronous communications.
- The line on your communications device over which RJE80 is to transmit data.

## Operating Systems

This section outlines RJE80 configuration options that are related to operating systems. These options are shown in Figure 3-1.

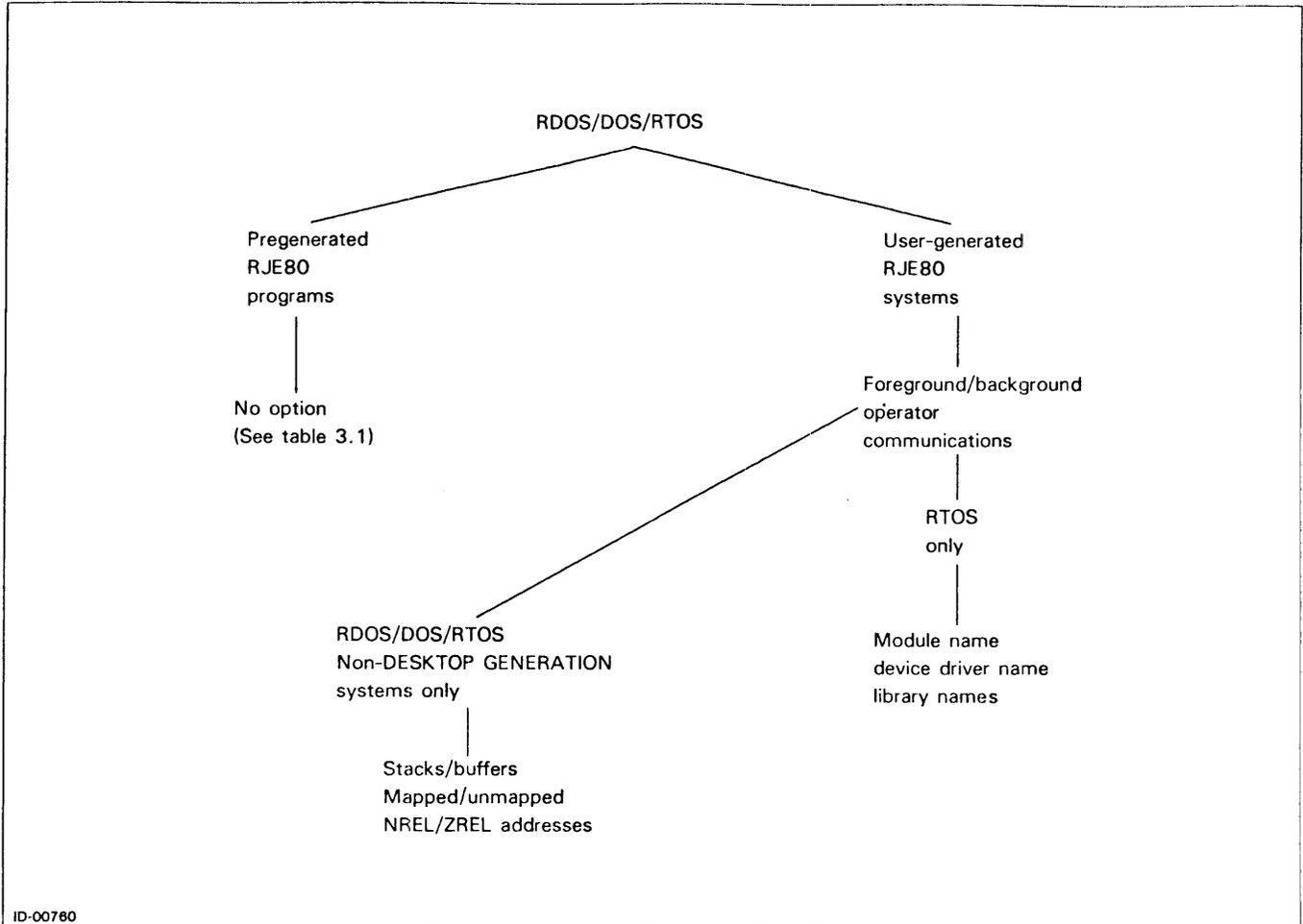


Figure 3-1. Operating System Options

DESKTOP GENERATION systems support RDOS only. Other systems support RDOS, DOS, and RTOS.

### Stacks and Buffers

Pregenerated RJE80 programs allocate 1 buffer and 2 stacks. This is good for most RJE80 applications.

User-generated RJE80 programs for DESKTOP GENERATION and non-DESKTOP GENERATION systems allow you to select buffer and stack values. The default values (1 stack and 2 buffers) should be sufficient for your needs.

## Foreground/Background Processes

This is an option for non-DESKTOP GENERATION systems only. RJE80 for DESKTOP GENERATION systems runs in the background only.

RJE80 for non-DESKTOP GENERATION systems can run as a foreground or background process. It is common to run RJE80 as a background process. Pregenerated RJE80 programs run as background processes. Depending on your needs, however, you can run RJE80 as a foreground process. In this manner you can give RJE80 priority over a process running simultaneously in the background.

## Operator Communications

This is an option for RJE80 on user-generated DESKTOP GENERATION and non-DESKTOP GENERATION systems only. When you operate RJE80 in the foreground and have no foreground terminal, you can instruct RJE80 to accept commands from and send messages to the background terminal.

## Mapped System/Addresses

This is an option for RJE80 on non-DESKTOP GENERATION systems only. When you define your own version of RJE80, you must define your operating system as mapped or unmapped. (DESKTOP GENERATION computers run unmapped operating systems.)

## NREL and ZREL Addresses

This is an option for RJE80 on non-DESKTOP GENERATION systems only. All RDOS, DOS, and RTOS operating systems automatically assign memory space to RJE80 programs that are run as background processes. To run RJE80 as a foreground process on an unmapped operating system, you must assign memory space yourself. The generation dialog requires that you specify normal relocatable memory (NREL) and page zero relocatable memory (ZREL) addresses.

The address locations you choose depend on the NREL and ZREL addresses of the programs you plan to run in the background concurrent to RJE80 operation. For more information, see the *RDOS System Reference Manual* (DGC No. 093-400027).

## RTOS-Specific Information

These options are for RJE80 on non-DESKTOP GENERATION systems only. To run a version of RJE80 under RTOS, you must specify the following:

- The name of your RTOS system (the .RB file that RTOSGEN creates).
- The names of all user-written device drivers used with your RTOS system (as opposed to standard device drivers contained in the RTOS libraries).
- The name of all RTOS libraries (for example, MRTOS1.LB and MRTOS2.LB; NRTOS1.LB and NRTOS2.LB; or ERTOS1.LB and ERTOS2.LB).

## Station Configuration

Pregenerated RJE80 programs for DESKTOP GENERATION systems support point-to-point configurations.

User-generated RJE80 programs for DESKTOP GENERATION and non-DESKTOP GENERATION systems can run in point-to-point or multipoint configurations. Point-to-point and multipoint configurations support different program features, as outlined below.

## Point-to-Point Station Configuration

Use the program features summarized in Figure 3-2 and described below to configure a RJE80 point-to-point station.

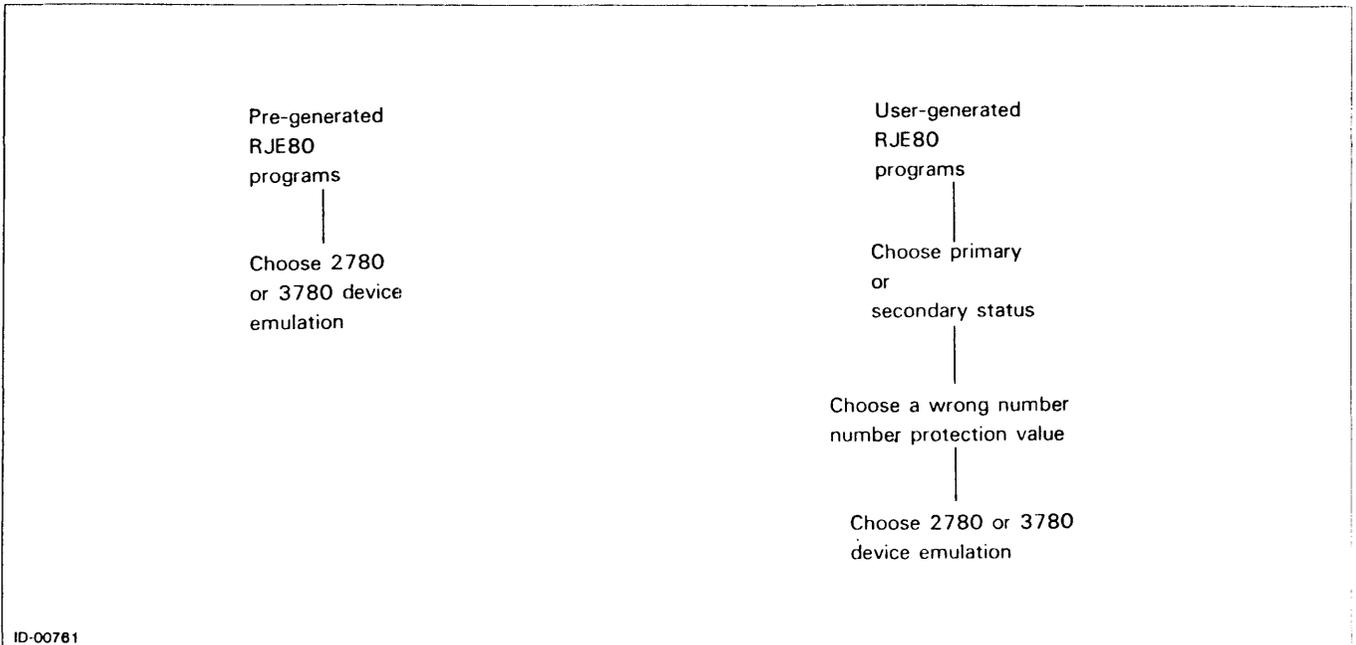


Figure 3-2. Point-to-Point Station Configuration Options

**Primary or Secondary Station.** (Pregenerated RJE80 programs are primary stations.) Your RJE80 station can have primary or secondary status in bidding for a line. A primary station wins control of the line when two stations bid for the line at the same time. (This is called contention bidding.) The primary station rebids without delay while the secondary station waits three seconds before rebidding. In this manner, two stations cannot tie up the line by continually requesting to transmit.

User-defined point-to-point stations should run in the setting opposite that of the remote station.

Pregenerated RJE80 programs define primary stations. It is not worthwhile to reject using a pregenerated RJE80 program to gain the primary/secondary station option. Contention bidding situations rarely occur.

**Wrong Number Protection.** This option is not available for pregenerated RJE80 programs. On user-generated RJE80 programs for DESKTOP GENERATION and non-DESKTOP GENERATION systems you can choose how many seconds your station waits for data after you enable your switched line. Without this feature, anyone dialing your modem number by mistake and failing to hang up can tie up your station indefinitely. Wrong number protection disconnects the line, re-enables it, and instructs RJE80 to wait for another call.

**NOTE:** It is not worthwhile to reject using a pregenerated RJE80 program to gain use of the wrong number protection feature. The line problem that the feature corrects rarely occurs.

**Device Emulation.** Both pregenerated RJE80 programs and user-generated RJE80 programs for DESKTOP GENERATION and non-DESKTOP GENERATION systems allow you to choose between 2780 and 3780 device emulation.

You should choose the faster, more efficient 3780-emulation whenever possible. You can use 3780 emulation when your remote station runs or emulates a 3780 terminal, or accepts 3780-type records. Your station must emulate a 2780 terminal when your remote station uses or emulates a 2780 terminal.

### Multipoint Station Configuration

Use the features summarized in Figure 3-3 and described below to configure your program as a multipoint master station or multipoint slave station.

NOTE: Pregenerated RJE80 programs for DESKTOP GENERATION systems do not support multipoint configurations.

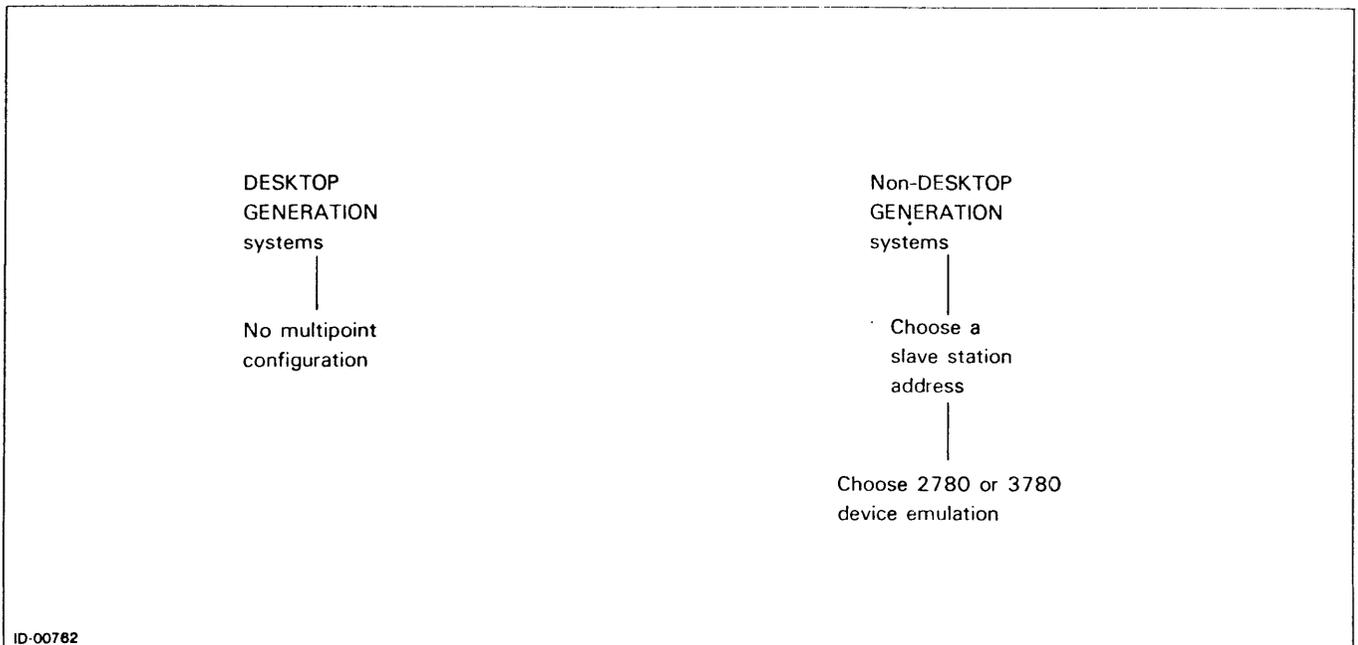


Figure 3-3. Multipoint Slave Station Configuration Options

**Multipoint Master/Multipoint Slave Station.** The multipoint master station controls all other RJE80 stations on the link. Only the master station can initiate a transmission. Slave stations transmit at the invitation of the master station.

RJE80 slave station programs must run on a dedicated line.

**Slave Station Address.** Each slave station has a one-letter address that distinguishes it from other slave stations on the line. The master station uses an address to poll (invite a slave station to transmit data) or select (command a slave station to receive data). Only the slave station addressed responds to the master station.

**Device Emulation.** You should choose the faster, more efficient 3780 operation whenever possible. You can use 3780 emulation when your remote station runs or emulates a 3780 terminal, or accepts 3780-type records. Your station must emulate a 2780 terminal when your remote station uses or emulates a 2780 terminal.

## Transmission Configuration

During program generation, you must define the features your program uses to protect transmissions from line errors, and to send and receive data. Transmission configuration features include:

- Line protocol (full-duplex or half-duplex)
- Error protection
- Settings for sending data
- Settings for receiving data

### Line Protocol

RJE80 uses half-duplex protocol. Pregenerated RJE80 programs support half-duplex protocol. You cannot use the pregenerated RJE80 programs when your remote station is configured for full-duplex communications.

You can configure your line as full-duplex when you define your own RJE80 program for a DESKTOP GENERATION or non-DESKTOP GENERATION system and have full-duplex hardware. Communicating stations must run the same line protocol. Operating RJE80 on a full-duplex line can cut down the amount of time it takes RJE80 to complete a transmission. Please note that no more than one slave station can run on a full-duplex line.

### Error Protection

Use the program features summarized in Figure 3-4 and described below to establish how your RJE80 program reacts to line errors.

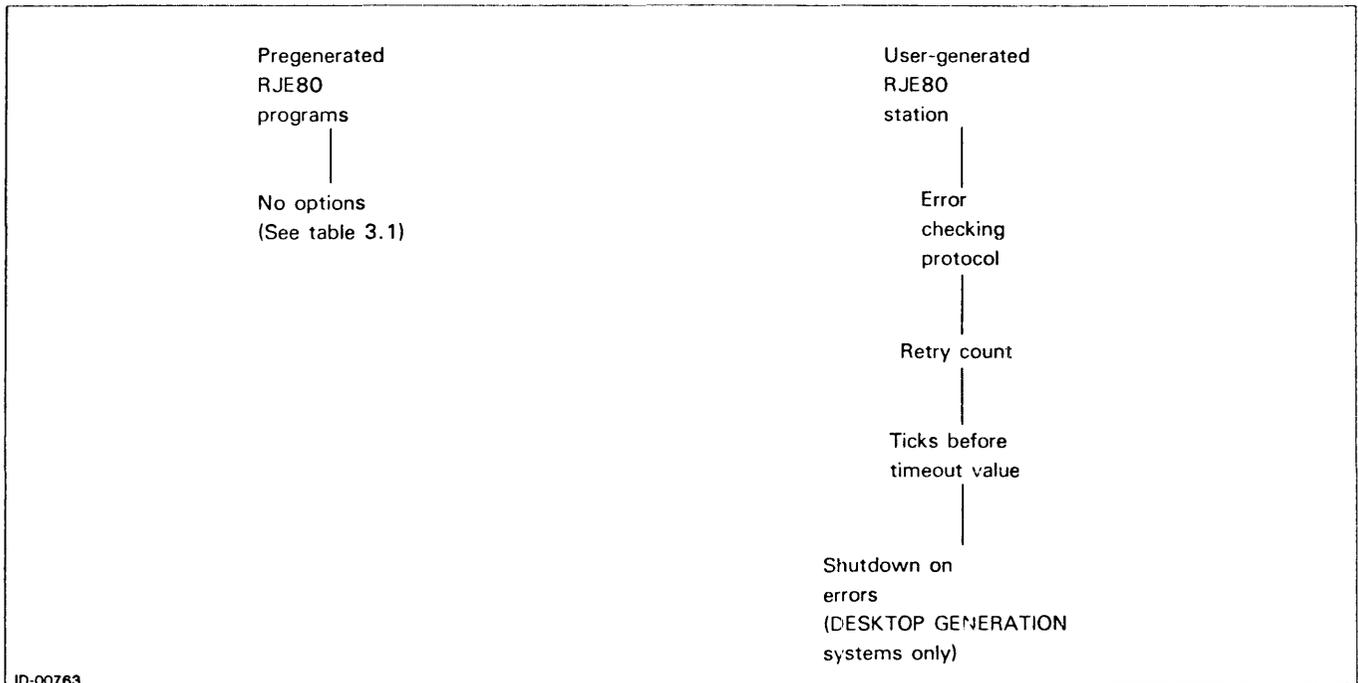


Figure 3-4. Error Protection Configuration Options

**Error Checking.** Pregenerated RJE80 programs use software CRC16 error checking to detect when a communications link problem garbles a data block in transit.

User-generated RJE80 for DESKTOP GENERATION and non-DESKTOP GENERATION systems offers two methods of error checking: CRC16, commonly used in North America, and CCITT16, commonly used in Europe and South America.

Many Data General multiplexors offer software and hardware error protection. Use hardware error checking wherever possible: it is more efficient than software error checking.

Your station and the remote station must use the same error checking method. Data General uses CRC16 for hardware error checking.

**Retry Count.** This option establishes how many times your RJE80 station can unsuccessfully retransmit a message before aborting the transmission. Transmissions commonly fail when data is garbled as it crosses the communications link. The condition that causes the destruction of data may not reoccur upon retransmission.

Pregen RJE80 programs transmit a block of data up to three times. User-generated programs for DESKTOP GENERATION and non-DESKTOP GENERATION systems can retry up to 10 times. When you define your own RJE80 program, you can establish a retry count by trial and error.

**Ticks Before Timeout.** This option is available on all RJE80 programs. The remote site must acknowledge each data block or user-transparent control character your station transmits before your station can transmit again. Transmission errors can keep the remote site from acknowledging a block. (Transmission errors can occur due to poor quality lines, hardware errors, or the remote site operator disabling the communications line.)

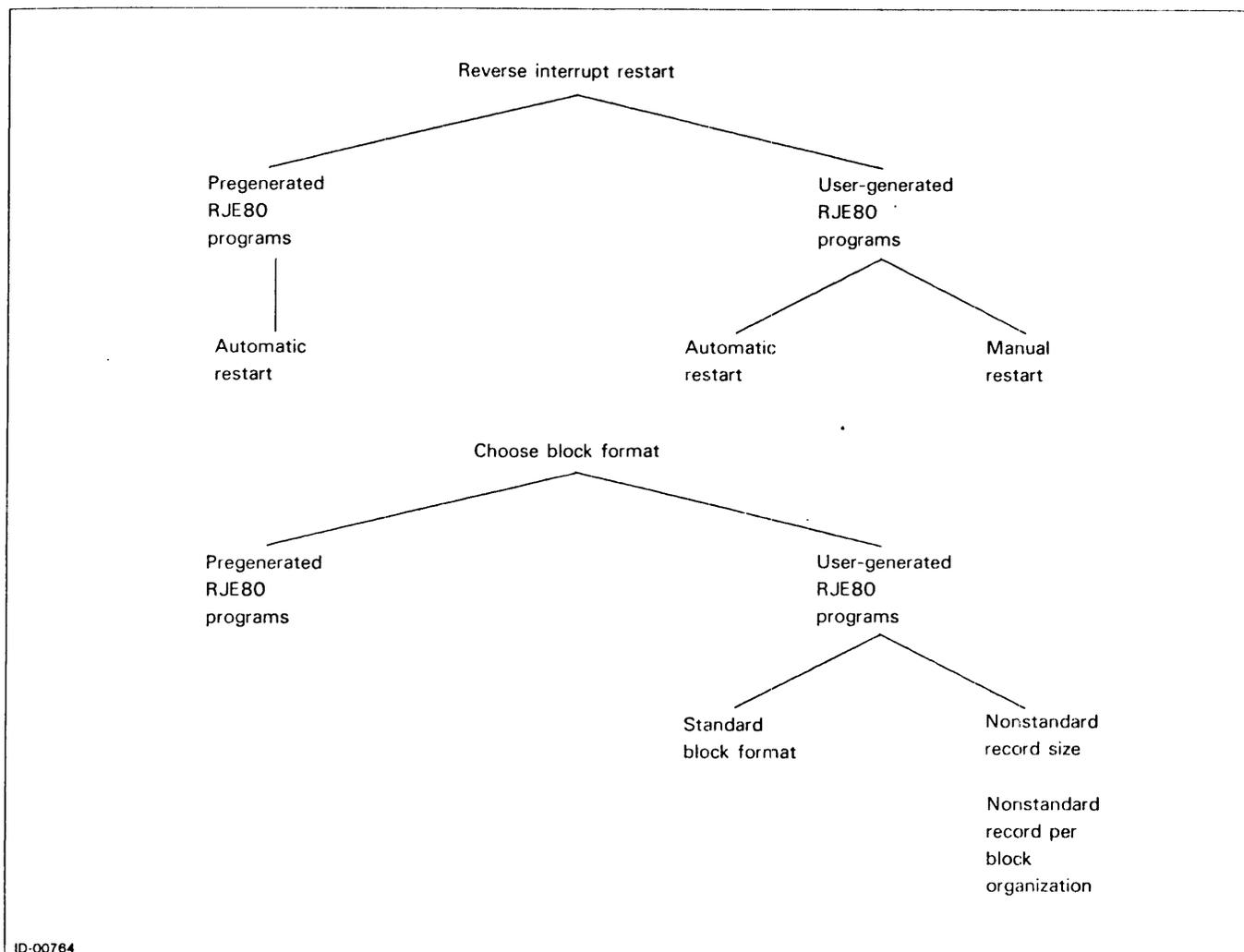
The *ticks before timeout* feature allows you to define how many half-second "ticks" CAM waits for a response from the remote site before retransmitting the data block or control character. (See "Retry Count," above.) For example, pregenerated RJE80 programs allow 6 ticks (3 seconds) for the remote site to respond.

**Shutdown on Errors.** This option is available on DESKTOP GENERATION systems only. *Shutdown on errors* allows you to control how RJE80 reacts when an error condition interrupts an unattended transmission.

The default setting (used in pregenerated RJE80 programs) causes RJE80 to reopen the input command file and rerun the unattended operation session from the beginning. You can define your user-generated RJE80 programs, however, to stop processing commands from the input command file and return control to the CLI.

## Sending Data

Figure 3-5 summarizes the options that define how your RJE80 program sends data.



ID-00764

Figure 3-5. Data Transmission Configuration Options

Pregenerated RJE80 programs use standard block format. An RJE80 program using the standard block format creates records of up to 80 data characters each and packs as many records as a transmission block will hold. When you specify the standard block format, RJE80 aborts transmission when it encounters a line containing more than 80 characters. Since most text files have a maximum line length of 80 characters, the default setting is sufficient for most RJE80 programs.

**NOTE:** With the transparency feature on, RJE80 always transmits records with a fixed record size, regardless of whether you choose a standard or non-standard block format.

User-generated RJE80 programs for DESKTOP GENERATION and non-DESKTOP GENERATION systems offer standard block format. They also allow you to define your own block format, consisting of a “nonstandard record size” and “nonstandard records per block” (defined below). To choose the best format for your station, study the format of the data that you plan to transmit with your station.

**Nonstandard Record Size.** This option is not available on pregenerated RJE80 programs. You can specify a length for the records that RJE80 creates when transmitting. Set the record length according to the line length of the files that you plan to transmit. RJE80 can abort transmission upon encountering records that exceed the value you define.

An RJE80 program emulating a 2780 terminal fixes the length of records for transmission at the record size you specify. An RJE80 program emulating a 3780 terminal uses the value you specify as a maximum record length when transmitting with the SA command. (See the SA command listing in Chapter 6 and in "Comparison of 2780 and 3780 Terminal Operation" in Chapter 1.)

**Nonstandard Records per Block.** This option is not available on pregenerated RJE80 programs. You can specify that RJE80 pack a variable number of records (as many as can fit) into a transmission block. You can also specify that RJE80 pack a fixed number of records (either one or two) into a transmission block.

The variable setting is more efficient than a fixed record setting; it fits more records in a transmission block. Select the variable setting unless you communicate with a non-Data General remote station that requires a fixed-record setting.

### Receiving Data

Define the program features summarized in Figure 3-6 to establish how your station receives data.

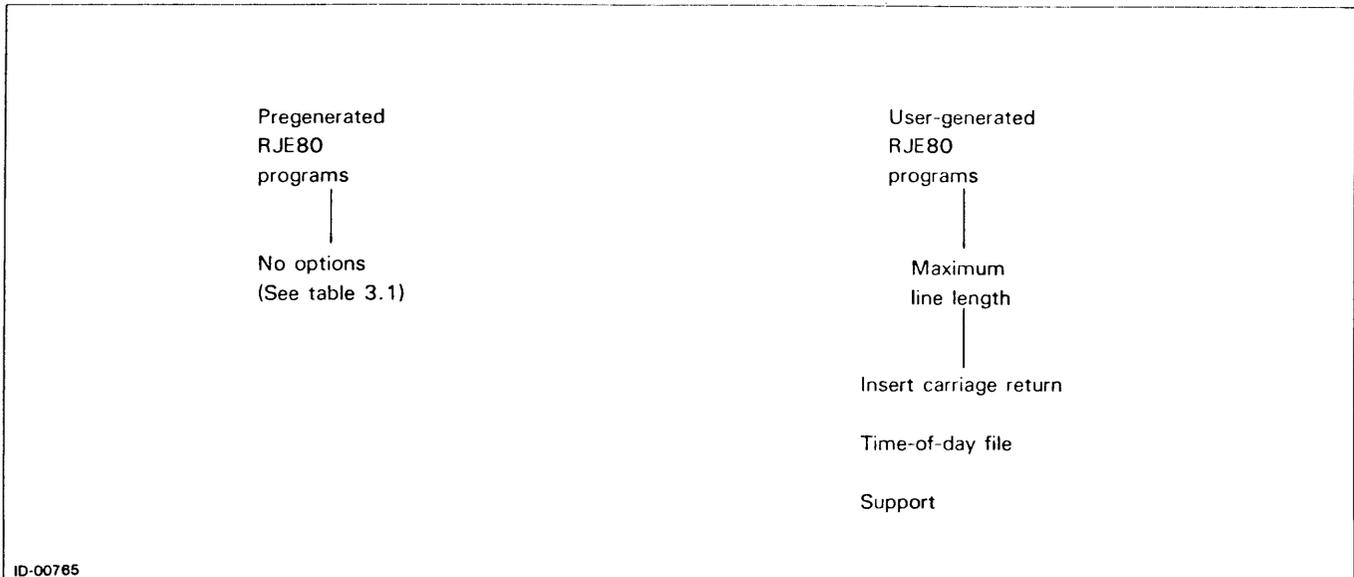


Figure 3-6. Data Reception Configuration Options

**Reverse Interrupt Procedure.** RJE80 offers two options for responding to a completed reverse interrupt sequence from the remote site. (See Chapter 2 for information on reverse interrupts.)

You may choose *manual restart* or *automatic restart*. (Pregenerated RJE80 programs support automatic restart.) With manual restart, your station waits for you to enter commands to resume or abort the interrupted transmission. With automatic restart, your station resumes transmission without your intervention. Your choice should reflect how remote station operators plan to use the Reverse Interrupt feature.

Use manual restart if the remote site RVIs interrupt transmissions sent with unacceptable formats. (Examples of incorrect formats include incorrect job control records or record lengths.) Manual restart allows you to correct an unacceptable file before retransmitting it.

Use automatic restart if remote site RVIs interrupt viable transmissions. (For example, the remote site might wish to send important files without delay.) Automatic restart allows you to resume an interrupted transmission without delay.

**Maximum Line Length.** The maximum line length determines the size of the buffer RJE80 uses to receive records. Pregenerated RJE80 programs support a maximum line length of 132 characters, which is adequate for most applications. You can specify your own line length when you generate your own RJE80 program for DESKTOP GENERATION and non-DESKTOP GENERATION systems.

NOTE: RJE80 uses the maximum line value when you open your list or punch files with the LA or PA commands. It breaks all received data into 80-character lines when you open the list or punch file with the LB or PB commands.

Consult with your remote station operator to determine the length of the records your station will receive.

An RJE80 station emulating a 2780 terminal attempts to abort transmissions containing records longer than the *maximum line length* value you specify.

An RJE80 station emulating 3780 terminal operation breaks receives records that exceed the maximum line length you specify into multiple records.

**Insert Carriage Return in Each Record of Punch File Data.** This option is not available on pregenerated RJE80 programs.

Use this option when you communicate with a non-Data General remote station and receive data to a punch file opened with the PA command. (This feature is not applicable to pregenerated RJE80 programs.)

Records sent to a punch file do not include the delimiter characters that control the line breaks. Unless your RJE80 program inserts a carriage return character after each punch-file formatted record, your station receives the data without line breaks between records.

NOTE: RJE80 cannot insert carriage returns when you open the punch file with the PB command, or when the sending station uses transparency.

**Temporary File Support.** When you use this optional feature, RJE80 opens a new list or punch file for every transmission received. (See "Temporary File Support" in Chapter 2.)

**Shutdown on Errors.** This option is available on RJE80 for DESKTOP GENERATION systems only. This feature allows you to establish how RJE80 reacts to an error condition encountered during unattended operation. RJE80 can return control to the CLI, or can repeat the unattended operation session from the beginning by rerunning the input command file.

Pregenerated RJE80 programs rerun the input command file on encountering errors.

End of Chapter

# Chapter 4

## Generating RJE80 on DESKTOP GENERATION Systems

This chapter describes how to prepare pregenerated RJE80 programs for use on your DESKTOP GENERATION system. It also shows how to use the BLDRJE80 macro to create your own RJE80 configuration for your DESKTOP GENERATION system.

### Choosing a Generation Procedure

Before performing the procedures outlined in this chapter, read the "RJE80 Options" and following sections in Chapter 3 to decide whether to use a pregenerated RJE80 program or to create your own version of the RJE80 program.

### Preparing to Run a Pregenerated RJE80 Program

This section outlines how to create a bootable diskette containing an RJE80 pregenerated program. Each step is presented in detail later in this chapter.

- Make a copy of your system diskette.
- Load a pregenerated RJE80 program onto your copy of the system diskette.
- Delete all RJE80 files from your system diskette except the pregenerated program file you plan to use.
- Delete all system files from the system/RJE80 diskette except for the files you need to boot the diskette.

Before putting a pregenerated version of RJE80 on your system, gather

- An ADES diskette containing the TBFU utility.
- A blank, hardware- and software-formatted diskette.

NOTE: For information on formatting diskettes see *Using DG/RDOS on DESKTOP GENERATION Systems*.

### Preparing to Create Your Own RJE80 Program

This section outlines how to create a bootable diskette containing your own version of the RJE80 program. Each step is presented in detail later in this chapter.

NOTE: You must have the RDOS development package to generate your own version of RJE80.

- Make a copy of your RJE80 release diskette for safekeeping.
- Tailor a version of your operating system to contain only the files you need to run RJE80.
- Put the MAC and RLDR utilities on your system.
- Load release media contents onto your system diskette.
- Run the RJE80 generation dialog program.

- Delete all RJE80 files from your system diskette except the program file you created with BLDRJE80 and the generation log file.

Before running BLDRJE80, gather:

- An ADES diskette containing the TBFU utility.
- Utility diskettes containing the MAC and RLDR utilities and SYS.LB.
- At least two blank hardware- and software-formatted diskettes.

NOTE: For information on formatting diskettes see Using DG/RDOS on DESKTOP GENERATION Systems.

## Copying Release and System Diskettes

This section describes how to make a copy of your system diskette in preparation for putting a pregenerated RJE80 program on your system. It shows how to make a copy of both your system and RJE80 release diskette in preparation for putting your own version of the RJE80 program on your system.

When creating your own version of the RJE80 program, store the back-up copy of your RJE80 release diskette for safekeeping.

1. Load the ADES diskette into DJ0 and type 20H at your console.

!20H

2. ADES then displays the following questions and messages. Respond as shown below.

*Filename [ADES]? <CR>*

*CPU is (ADES displays your CPU type)*

*Memory size is (ADES displays your CPU memory size)*

*Run Autosizer [Y,N]? Y <CR>*

*Reporting level (?..0,1) [0] ? <CR>*

3. ADES will now display a series of warning messages. When the ADES prompt, ADES-CLI>, appears, enter the name of the TBFU utility.

*ADES-CLI> TBFU <CR>*

The TBFU menu then appears as shown below. Select option 4.

1. *Format diskette*
2. *Format and verify diskette*
3. *Clean drive heads*
4. *Diskette copy program*
5. *Return to main menu*

*Select option (1..5) 4 <CR>*

4. ADES now displays the message:

*Remove system diskette from drive to prevent system loss*

*System diskette refers to the ADES diskette. Remove the ADES diskette from DJ0.*

5. Insert your RDOS system diskette in DJ0 and a blank, formatted diskette in DJ1.

**NOTE:** *If you repeat this procedure to make a back-up copy of your RJE80 release diskette, insert the RJE80 release diskette in DJ0.*

6. ADES now requires that you select a method of sector formatting for your diskette  
*Select DG (9 sector) or IBM (8 sector) format DG <CR>*
7. Ignore the next two ADES prompts:  
*Insert original diskette into drive 0*  
*Insert blank formatted diskette in drive 1*  
(You have already inserted your original diskette—your system diskette or RJE80 release diskette—in DJ0 and a blank, formatted diskette in DJ1.)
8. Press the carriage return to continue. TBFU now copies the contents of your system diskette to the blank diskette.
9. TBFU now queries whether you wish to repeat the copy procedure.  
When you
  - plan to load a pregenerated RJE80 program onto your system diskette, or
  - plan to create your own version of the RJE80 program, and have already repeated the copy procedure to duplicate your RJE80 release mediaAnswer NO to the query by pressing <CR>.  
*Another copy? (Y,N) <CR>*  
Skip the rest of step 9 and continue on to step 10.  
When you plan to create your own version of the RJE80 program, and have not yet made a copy of your RJE80 release media, answer YES.  
*Another copy? (Y,N) Y <CR>*  
Repeat the copying procedure with a second blank, formatted diskette and your RJE80 release media.
10. When you complete the copying procedure for your system diskette and, if applicable, your RJE80 release media, and answer NO to Another copy?, ADES redisplay the TBFU utility menu. Select option 5.
  1. *Format diskette*
  2. *Format and verify diskette*
  3. *Clean drive heads*
  4. *Diskette copy program*
  5. *Return to main menu**Select option (1..5) 5 <CR>*
11. ADES then displays the message  
*RELOAD SYSTEM DISKETTE IN DRIVE*  
*Hit any key to continue.*  
Remove your system diskette or RJE80 release diskette from DJ0 and your back-up copy from DJ1. Insert the ADES diskette in DJ0.

12. ADES then displays

*Press CR to continue.*

When you press the carriage return key, the ADES prompt reappears. Type BYE to terminate ADES.

*ADES CLI> BYE <CR>*

Your system then shuts down.

This completes the copying procedure. To prepare a pregenerated RJE80 program, read the "Loading a Pregenerated RJE80 Program" section below. To create your own version of the RJE80 program, skip to the "Generating Your Own RJE80 Program" section below.

## Loading a Pregenerated RJE80 Program

This section shows how to load pregenerated RJE80 program files onto your system diskette. You can delete all other files, as they will unnecessarily take up diskette space. The files you need differ depending on whether you operate your RJE80 station as a 2780 or a 3780 terminal emulator.

1. Insert the backed-up system diskette in DJ0 and boot it by entering:

*!20H*

The screen then displays the message

*FILENAME?*

If you are using a default RJE80 system, press NEW LINE. If you are using your own RDOS system, enter your system's name and then press NEW LINE.

Enter the correct date and time in response to the RDOS prompts.

2. Insert the RJE80 release diskette in DJ1, initialize DJ1, and make DJ1 your working directory.

*DIR DJ1 <CR>*

3. To load the pregenerated 2780 emulator program, use the CLI MOVE command to move the RJE27.SV file to the system diskette.

*MOVE/V DJ0 2780.SV <CR>*

To load the pregenerated RJE80 3780 emulator program, use the CLI MOVE command to move the RJE37.SV file to the system diskette.

*MOVE/V DJ0 3780.SV <CR>*

4. Make the backed-up copy of the system diskette the working directory.

```
DIR DJ0 <CR>
RELEASE DJ1 <CR>
```

Use the CLI DELETE command to delete all RDOS files with the following root names from the system diskette: DDUMP, DKINIT, DLOAD, FLOAD, and FDUMP. (Your DELETE command lines will vary depending on which of the files named above you have on your system diskette.)

```
DELETE DDUMP.SV DKINIT.SV DLOAD.SV FLOAD.SV FDUMP.SV <CR>
DELETE DDUMP.OL DDUMP.OL DDUMP.ER <CR>
```

**NOTE:** *Be sure to leave the CLI.OL and CLI.SV files on your system diskette.*

You now have a bootable diskette containing an executable RJE80 program. This completes the "Loading a Pregenerated RJE80 Program" procedure.

If you plan to operate your RJE80 program at this time, proceed to steps 5 and 6.

5. (Optional) Initialize a blank diskette in the lower diskette drive. You can open your list or punch file to this diskette during program operation, giving you more room to receive data than is available on the system diskette.

```
INIT DJ1 <CR>
```

6. Follow the instructions in "Executing RJE80" in Chapter 2 for information on how to start and operate pregenerated RJE80 programs.

## Generating Your Own RJE80 Program

Your RJE80 release diskette contains a macro, BLDRJE80, that invokes the CAM and RJE80 generation dialogs, creates the RJE80 configuration file that contains your dialog responses, and binds the configuration file with CAM and RJE80 library files to form a running communications station.

**NOTE:** The BLDRJE80 macro performs all procedures for CAM and RJE80 program generation in one operation.

### Preparing to Invoke BLDRJE80

Before you can run BLDRJE80, you must put the MAC and RLDR utilities and the SYS.LB library file on your working diskette. The working diskette will be the copy of your RJE80 release diskette you make in following this procedure. You will build your executable RJE80 program on this back-up copy of your RJE80 release diskette because of system diskette space restrictions.

1. Insert the backed-up system diskette in DJ0 and boot it by entering:

```
!20H
```

The screen then displays the message

```
FILENAME?
```

If you are using a default RJE80 system, press NEW LINE. If you are using your own RDOS system, enter your system's name and then press NEW LINE.

Enter the correct date and time in response to the RDOS prompts.

2. To conserve diskette space, use the CLI DELETE command to delete all RDOS files with the following root filenames: DDUMP, DKINIT, DLOAD, FLOAD, and FDUMP. (Your DELETE command lines will vary depending on which of the files named above you have on your system diskette.)

```
DELETE DDUMP.SV DKINIT.SV DLOAD.SV FLOAD.SV FDUMP.SV <CR>
DELETE DDUMP.OL DDUMP.OL DDUMP.ER <CR>
```

**NOTE:** *Be sure to delete these files from your copy of the system diskette only. Be sure to leave the CLI.OL and CLI.SV files on your copy of the system diskette.*

3. Insert the RDOS utility diskette in DJ1 and make DJ1 your working directory.

```
DIR DJ1 <CR>
```

4. Move the RLDR and SYS.LB files from the utility diskette to the system diskette. Make the system diskette your working diskette and release the utility diskette.

```
MOVE/V DJ0 RLDR.SV RLDR.OL SYS.LB <CR>
DIR DJ0 <CR>
RELEASE DJ1 <CR>
```

5. Remove the utility diskette from DJ1 and insert the RJE80 release diskette. Move the RLDR and SYS.LB files to the RJE80 release diskette.

```
INIT DJ1 <CR>
MOVE/V DJ1 RLDR.SV RLDR.OL SYS.LB <CR>
```

6. Delete the RLDR and SYS.LB files from your system diskette.

```
DELETE RLDR.SV RLDR.OL SYS.LB <CR>
```

7. Release the RJE80 diskette and remove it from DJ1.

```
RELEASE DJ1 <CR>
```

Reinsert the utility diskette in DJ1.

You need file MAC.PS to run the BLDR.JE80 generation macro.

If you have previously built MAC.PS and a copy of it remains on your utility diskette, make DJ1 your working directory and proceed to step 7.

```
DIR DJ1 <CR>
```

To create MAC.PS, enter the following command lines:

```
DIR DJ1 <CR>
MAC/S NBID OSID PARU PARS <CR>
```

8. Move the following files to the system diskette and then make DJ0 your working directory.

```
MOVE/V DJ0 MAC.PS MAC.SV MACXR.SV <CR>
DIR DJ0 <CR>
```

9. Remove the utility diskette from DJ1. Insert the RJE80 release diskette in DJ1. Move the MAC files to the RJE80 release diskette.

```
INIT DJ1 <CR>
MOVE/V DJ1 MAC.PS MAC.SV MACXR.SV <CR>
```

10. Delete the MAC and MACXR files from the system diskette.

```
DELETE MAC.PS MAC.SV MACXR.SV <CR>
```

11. Make DJ1 your working directory.

```
DIR DJ1 <CR>
```

If your system does not have a line printer, create a file called \$LPT.

```
CREATE $LPT <CR>
```

The \$LPT file will store error messages from the BUILDRJE program, should error conditions occur.

This completes the procedure for preparing to invoke BLDRJE80.

## The BLDRJE80 Macro

BLDRJE80 prompts for information on how to configure your version of the RJE80 program. See Chapter 3 for a complete discussion of the RJE80 options that BLDRJE80 presents.

This section presents the dialog questions and defines possible responses.

Many questions supply default answers. The default answers follow immediately after the question they correspond to and are enclosed in brackets. BLDRJE80 uses the default value when you type a carriage return in response to a question.

The text accompanying the questions shows the range of non-default responses. Enter non-default responses to the right of the corresponding question before entering a carriage return.

When you enter a response which is not within a question's acceptable range of values, BLDRJE80 repeats the question until you enter a valid response.

Numbers terminated with a decimal point(.) are decimal. Numbers with no decimal points are octal values.

### Starting the Dialog

To run the RJE80 generation program, enter the command line:

```
@BLDRJE80@ LISTFILE <CR>
```

BLDRJE80 is the name of the macro that calls the RJE80 generation program. The generation program creates an executable RJE80 program file.

LISTFILE is an optional argument. When you enter the LISTFILE argument, BLDRJE80 records dialog questions and responses in a file called RJE80. Use the RJE80 listfile as a record of your RJE80 configuration. Should you experience difficulty when operating your RJE80 program, use the listfile to locate possible generation errors.

The first time you invoke BLDRJE80, the system will display the message FILE DOES NOT EXIST: RJE80.LM. Ignore this message.

Each time you invoke BLDRJE80, the system displays

*COMMUNICATIONS GENERATOR*

BLDRJE80 then asks the first dialog question:

```
MULTIPLEXOR DEVICE CODE ? DEFAULT=34
```

Enter 54, the device code of the USAM multiplexor you must install to operate RJE80.

```
EMULATING A 3780 (1=YES) ? DEFAULT=1
```

Press CR to have RJE80 emulate a 3780 IBM terminal. Type 0 to have RJE80 emulate a 2780 terminal. Base your answer on what your remote station operators expect your station to emulate.

*CRC TYPE (0=SOFTWARE 1=HARDWARE) ? Default=0*

When your system supports the USAM-1 multiplexor, press CR to select software CRC. When your system supports the USAM-4 multiplexor, you can select hardware CRC unless your remote system uses CCITT16 error checking.

*RETRY COUNT ? DEFAULT=3.*

Your answer specifies how many times CAM attempts to establish communications with a remote station before aborting a transmission. Do not enter a value less than 3. Do not enter a value greater than 10. Your answer must be decimal (followed by a period).

*TICKS BEFORE TIMEOUT ? DEFAULT=6.*

CAM, the program that controls the communications line for RJE80, measures how long it waits for a response from the remote station in half-second ticks. Your answer specifies how many ticks can elapse before CAM retries the transmission. (Your answer to the RETRY COUNT question above determines how many times CAM can repeat the timeout procedure.)

Enter a value between 0 and 20. The default answer (6 ticks, or 3 seconds) is suitable for most stations. Your answer must be decimal (followed by a period).

*WRONG NUMBER PROTECTION (1=YES) ? DEFAULT=0*

This question appears when you configure your application in a point-to-point configuration. Answer 1 (YES) to have RJE80 disconnect a switched line after you connect the line and receive no data from the remote site.

*OPERATOR COMMUNICATIONS (1=YES) ? DEFAULT=0*

This question applies to RDOS RJE80 operation only. When you answer 1 (YES), an RJE80 station operating in the foreground allows a program operating in the background to send output to the terminal.

*MAXIMUM LINE LENGTH ? DEFAULT=132*

Specify how many characters per record your station can accept when receiving list or punch files opened with the LA or PA commands. Your answer should correspond to the line length of the files you expect to receive. Your answer must be decimal (followed by a period).

*STANDARD BLOCK FORMAT (1=YES) ? DEFAULT=1*

If you press CR to accept the standard block format, BLDRJE80 supplies the default answers to the next two questions (MAXIMUM RECORD SIZE WHEN TRANSMITTING? and RECORDS PER BLOCK).

If you type 0 (NO) to STANDARD BLOCK FORMAT, you must specifically answer the MAXIMUM RECORD SIZE WHEN TRANSMITTING? and RECORDS PER BLOCK questions.

*MAXIMUM RECORD SIZE WHEN TRANSMITTING? DEFAULT=80*

Enter a value between 1 and 144 based on the line length of the files you plan to transmit.

*RECORDS PER BLOCK (0=STANDARD) ? DEFAULT=0*

Your answer determines the number of records that RJE80 packs into each transmission block. When you accept the default setting (0), RJE80 packs as many records as each transmission block can accommodate.

Alternatively, you can enter 1 or 2. When you enter 1, RJE80 packs 1 record into each transmission block. When you enter 2, RJE80 packs 2 records into each transmission block.

*INSERT CR IN PUNCH ASCII OUTPUT (1=YES) ? DEFAULT=1*

Your answer determines whether your RJE80 station inserts a carriage return after each record received to a punch file opened with the PA command. The default value is good for most RJE80 applications.

*TIME-OF-DAY (TOD) FILE SUPPORT (1= YES) ? DEFAULT=1*

Enter 1 (YES) if you want the option of using the TOD: argument prefix on files opened with the list and punch commands.

*SHUT DOWN RJE80 ON LINE ERROR (1= YES) ? DEFAULT=0*

Enter 1 (YES) to have RJE80 return control of your system to the CLI when it encounters a line error condition that disconnects the link. Press CR to have RJE80 resume transmissions interrupted by a line error condition.

After you answer the SHUT DOWN RJE80 ON LINE ERROR question, BLDRJE80 displays

*TITLE CAMCON; COMMUNICATIONS CONFIGURATION MODULE*

*.TITL REBOP*

*.TITL R POLL*

indicating that BLDRJE80 is creating the CAM and RJE80 files necessary to create an executable RJE80 program.

### **Completing the BLDRJE80 Generation Procedure**

To complete the BLDRJE80 generation procedure you must move the executable RJE80 program you have created on the RJE80 release diskette to your copy of the system diskette.

Save your original RJE80 release diskette as your master release copy. Save the backed-up copy of the RJE80 release diskette with the RDOS utilities on it in case you generate a new version of the RJE80 program.

1. To move the RJE80 program file to the system diskette, enter the command line:

`MOVE /V DJ0 RJE80.SV <CR>`

Remove the backed-up copy of the RJE80 release diskette from DJ1 and release DJ1.

`RELEASE DJ1 <CR>`

If you plan to run your RJE80 program now, continue to step 2.

2. (Optional) Initialize a blank diskette in the lower diskette drive. You can open your list or punch file to this diskette during program operation, giving you more room to receive data than is available on the system diskette.

`INIT DJ1 <CR>`

3. Follow the instructions in "Executing RJE80" in Chapter 2 for information on how to start and operate pregenerated RJE80 programs.

End of Chapter

# Chapter 5

## Generating RJE80 Programs for Systems Other than DESKTOP GENERATION Systems

This chapter shows how to create CAM and RJE80 programs for systems other than DESKTOP GENERATION systems. RJE80 uses CAM to handle the flow of data across the communications link. The RJE80 program itself organizes data before transmitting it and upon receiving it.

### Overview of CAM and RJE80 Generation

Defining your own version of the RJE80 program for non-DESKTOP GENERATION systems involves the following steps.

1. Read the "RJE80 Options" and following sections in Chapter 3 to decide which CAM and RJE80 options to select for your version of the RJE80 program.
2. Load CAM and RJE80 release media into memory.
3. Run CGEN, the CAM generation program.
4. Edit an RPOLL.SR macro to define your program as a multipoint master or slave station.
5. Run the RJE80 generation program to define which of the RJE80 features your station will support.

### Loading CAM and RJE80 Release Files

The following shows how to load your release files onto any system supporting RJE80 other than a DESKTOP GENERATION system.

Create a directory to hold your CAM and RJE80 release files using the following command line format:

```
CDIR destination-directory
```

To load CAM and RDOS release media onto your system, follow the procedure outlined below that is applicable to your type of release media.

#### Loading Diskettes onto RDOS and DOS Systems

To load CAM from its release diskette onto an RDOS or DOS system, insert the diskette into the diskette drive (drive DPD0 in this example) and enter:

```
INIT DP0 <CR>
```

Copy the release files to your current working directory:

```
DIR DJLO <CR>
```

```
MOVE/V/R destination_directory -.- <CR>
```

Release the release diskette using the command line:

```
RELEASE DP0 <CR>
```

and remove it from the diskette drive. Repeat this procedure for your RJE80 release diskette.

Now you are ready to start the CAM generation program.

## Loading Tape onto RDOS or DOS Systems

To load your CAM release files onto an RDOS or DOS system, mount the magnetic tape on an available tape drive (drive MT0 in this example). Enter the following command line to move release files to your current working directory:

```
INIT MT0 <CR>
```

```
LOAD/V/R MT0:0 -.- <CR>
```

Remove the tape from the tape drive using the command line:

```
RELEASE MT0 <CR>
```

Repeat the procedure for your RJE80 release media.

## Linking Libraries and Utility Files

Before starting the CAM generation program, create links in the directory containing your CAM and RJE80 release media to each of MAC and RLDR files.

## CAM Generation

CGEN is an interactive generation program that prompts you for information on your system's hardware, your operating system, and the line control characteristics you wish to incorporate into your RJE80 program. You choose among configuration variables by typing your responses at a terminal. You can run the system generation programs on RDOS or DOS.

BLDRJE80 prompts for information on how to configure your version of the RJE80 program.

This section presents the dialog questions and defines possible responses. See Chapter 3 for a complete discussion of the options that CGEN presents.

Many questions supply default answers. The default answers follow immediately after the question they correspond to and are enclosed in brackets. BLDRJE80 uses the default value when you type a carriage return in response to a question.

The text accompanying the questions shows the range of non-default responses. Enter non-default responses to the right of the corresponding question before entering a carriage return.

When you enter a response which is not within a question's acceptable range of values, CGEN repeats the question until you enter a valid response.

Numbers terminated with a decimal point (.) are decimal. Numbers with no decimal points are octal values.

## Starting the CAM Generation Program

To start the CAM generation program, enter the command line:

```
CGEN CAMCON [FILENAME]
```

In this command line:

CGEN is the generation program that asks dialog questions, stores your responses in file CONF.SR, and uses your responses to assemble the CAM file (default name TABLE) used with RJE80 files to create an executable RJE80 program.

CAMCON is the file that contains the CAM generation dialog questions displayed by the CGEN program.

*FILENAME* is the name you select for the optional CAM log file.

The optional log file allows you to record generation program questions and your responses. The log file is useful for reviewing details of your configuration or locating generation errors that keep your program from functioning correctly.

When the logfile name you specify is that of a file already in your working directory, CAM deletes the file (unless it is a permanent file, for example, \$LPT), and creates a new file with the same name.

## The CAM Generation Dialog

NOTE: When you run the RJE80 generation program for the first time, CGEN displays the message FILE DOES NOT EXIST. Ignore this message.

When the CGEN generation program starts, your system displays the message:

*;COMMUNICATIONS GENERATOR*

and the first dialog question appears.

*HIGHEST LOGICAL LINE NUMBER ? DEFAULT=0*

CAM controls a single communications line, called *logical line 0* for RJE80 operation. Press CR to accept the default value.

*MULTIPLEXOR DEVICE CODE ? DEFAULT=34*

Enter the device code appropriate for the communication device that your system uses. Legal answers are 34, 44 (if another device is already using device code 34) and 74 (ASLM only).

*COMMUNICATION STACKS ? DEFAULT=1*

CAM operation requires 2 stacks. Enter 2.

*NUMBER OF SYNCHRONOUS COMMUNICATION BUFFERS ? DEFAULT=0*

CAM requires a single synchronous communication buffer for RJE80 operation. Enter 1.

*SIZE OF SYNC COMM BUFFERS ? DEFAULT=400*

To create an RJE80 program that emulates a 2780 terminal, enter 200. (decimal). Enter 256. to create an RJE80 program that emulates a 3780 terminal. Your answer must be decimal (followed by a period).

*CRC TYPE (0=SOFTWARE 1=HARDWARE) ? Default=0*

Hardware CRC error protection is more efficient than software CRC error protection. All multiplexors for systems other than DESKTOP GENERATION systems support hardware CRC. Press CR to accept the default value, software.

*NUMBER OF ASYNCHRONOUS COMMUNICATION BUFFERS ? DEFAULT=0*

CAM can run as a synchronous or asynchronous communications product. RJE80 is a synchronous communications product. To handle the communications line for RJE80, CAM must also operate as a synchronous product. Press CR to accept the default, 0.

*NUMBER OF DCU'S IN SYSTEM ? DEFAULT=1*

Enter 0 when your system is not configured for a DCU. Enter 1 when your system is configured for one or more DCUs. (RJE80 supports only one line, so specify only one DCU for RJE80 use.)

When your system is configured for DCU(s), CGEN asks:

*DCU-001 DEVICE CODE ? DEFAULT=40*

Specify the device code of the DCU controlling the line your RJE80 program is to use. Use 40 unless your system is configured for another DCU, in which case you should enter 41.

*TOTAL NUMBER OF COMMUNICATIONS LINES ? DEFAULT=1*

SLM-1 communications devices support only one line. When your system is configured for one of these devices, press CR to accept the default value.

Many communications devices support more than one line. Enter a value equaling the total number of lines (synchronous and asynchronous) present on the device. When your system is configured with more than one multiplexor, enter a value equaling the total number of lines on all multiplexors.

The next series of questions requires that you specify the method of transmission (synchronous, asynchronous, or "not used") for each line of your communications device or devices.

*LINE 000 - TYPE (0=NOT USED 1=SYNC 2=ASYNC) ? DEFAULT=0*

The first question in the series requires that you define the method of transmission used for physical line 0 of your communications device.

NOTE: The first line on a multiplexor is called physical line 0. For example, the four lines of the ASLM multiplexor are numbered 0-3.

The SLM-1, 4226/4227/4228 device set, and the ULM-1 support only one line. When your system is configured for one of these devices, enter 1 (SYNC) for the line. The CGEN dialog then skips to the LINE CONNECTION TYPE question.

Many communications devices support more than one line. Which line RJE80 uses depends on how you configure the communications device on your system. Enter 1 (SYNC) when RJE80 is to use physical line 0 on your device. Enter 0 (NOT USED) when RJE80 is not to use physical line 0 on your device.

CGEN then requires that you define the remaining lines on your communications device or devices:

*LINE 001 - SAME AS LAST LINE CONFIGURED*

Answer this question in conjunction with the LINE 000 - TYPE question above to define the use of physical line 1 on your communications device. CGEN repeats the LINE nnn - SAME AS LAST LINE CONFIGURED question until you define the use of each physical line of your communications device or devices.

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

Enter CR to accept the default response and communicate with a remote station over a point-to-point configuration. Enter 1 to communicate in a multipoint configuration.

*RETRY COUNT ? DEFAULT=3.*

Your answer specifies how many times CAM attempts to establish communications with a remote station before aborting the transmission. Do not enter a value less than 3. Do not enter a value greater than 10. Your answer must be decimal (followed by a period).

*TICKS BEFORE TIMEOUT ? DEFAULT=6.*

CAM measures the time it waits for a response from your remote station in half-second ticks. Your answer specifies how many ticks can elapse before CAM retries the transmission. (Your answer to the RETRY COUNT question above determines how many times CAM can repeat the procedure.)

Enter a value between 0 and 20. The default answer (6 ticks, or 3 seconds) is suitable for most stations. Your answer must be decimal (followed by a period).

*CRC TYPE 0=CRC16 1=CCITT16) ? DEFAULT=0*

Enter the value corresponding to the type of error checking you selected when jumpering your communications device. The value you enter must also correspond with the CRC type that your remote station uses.

*SEPARATOR CHARACTER (DEFAULT IS EBCDIC ITB) ? DEFAULT=37*

Your response to this question is important only when you plan to operate RJE80 as a 2780 terminal. The 2780 and the 3780 use the separator character in different ways. However, your answer will be the same whether you are operating RJE80 as a 2780 or a 3780.

When you plan to operate RJE80 as a 2780 terminal, press CR to accept the default value (the EBCDIC ITB character). All 2780 terminals require the ITB character to perform error checking on a block-by-block basis.

An RJE80 program operating as a 3780 terminal does not need a special character to enable record-by-record error checking. When you plan to operate RJE80 as a 3780 terminal, press CR to accept the default value.

*LINE HALF(0) OR FULL(1) DUPLEX ? DEFAULT=0*

RJE80 uses half-duplex protocol. Operating RJE80 on a full-duplex line, however, can increase transmission efficiency. You can configure your line as full-duplex when you have full-duplex hardware. Communicating stations must use the same protocol. No more than one slave station can run on a full-duplex, multipoint line.

*MODEM CONTROLLED (0=NO 1=YES) ? DEFAULT=0*

You must enter 1 (YES) even if you do not use a modem. Answering YES causes RJE80 to send a Request to Send EIA signal when you bring up the program, and to await a Clear to Send EIA signal in response from the remote site. RJE80 cannot operate without this exchange of signals.

*AUTO ANSWER MODEM (0=YES 1=NO) ? DEFAULT=0*

In almost all cases, answer 0 (YES) even if you do not have an automatic-answer modem. Answering YES causes RJE80 to raise the Data Terminal Ready (DTR) signal when first brought up. This allows RJE80 to accept incoming calls.

When you answer 1 (NO), RJE80 raises the DTR signal only when it receives the ring indicator signal from a remote station. RJE80 cannot initiate a transmission without first raising the DTR signal. When you do not use the AUTO ANSWER MODEM setting, RJE80 may not be able to accept incoming calls.

*LOGICAL LINE NUMBER ? DEFAULT=0*

This question specifies the logical line number of the physical line that RJE80 is to use. CAM controls only one line for RJE80 operation, called *logical line 0*. Press CR to accept the default.

*MODULE NAME ?DEFAULT=TABLE*

The name you enter becomes the root filename for the CAM configuration files built by CGEN. When you press CR rather than specify a module name, CGEN selects the default module name TABLE.

After you answer the MODULE NAME question, CGEN begins to assemble the CAM configuration module. During assembly the MAC utility outputs the message

*.TITLE CAMCON ;COMMUNICATIONS CONFIGURATION MODULE*

The RDOS/DOS prompt returns when CGEN finishes the CAM generation procedure.

## RJE80 Generation

Once you have read Chapter 3 and decided on an RJE80 program configuration and have run the CGEN program, you should define your RJE80 station configuration.

### Defining Your RJE80 Station Configuration

The RPOLL.SR assembly language module provided with your RJE80 release media defines the station configuration of your version of the RJE80 program. You can choose either a point-to-point, multipoint slave, or multipoint master station configuration. The module consists of three assembly-language macros, one for each station type.

You must select a station configuration before running the RJE80 generation dialog. To do this you simply choose which RPOLL.SR macro to use, and enter it with the arguments it requires. The RJE80 generation program uses RPOLL information along with your answers to the generation dialog to create your version of the RJE80 program.

You need modify an RPOLL.SR module defined for your station only when you wish to change your station configuration; for example, when you add a station to a two-station line, which requires changing from a point-to-point to a multipoint configuration.)

#### Point-to-Point Station Configuration

The POINT macro defines a point-to-point configuration. The RPOLL.SR module defines your configuration as point-to-point by default. When you operate a pregenerated version of RJE80 or a user-generated, point-to-point version of RJE80, you do not need to modify the RPOLL.SR module.

Use the POINT macro if you regenerate your version of the RJE80 program to change from a multipoint to a point-to-point configuration. Enter the macro in the format:

POINT

The POINT macro takes no arguments.

#### Multipoint Slave Station Configuration

Use the SLAVE macro to create a multipoint slave station. Enter the macro in the format

SLAVE address

The address is a single alphabetic character that becomes your station's address. The master station uses this address to distinguish your station from other stations on the line.

A master station emulating 2780 operation reads the upper- and lowercase version of a letter as distinct addresses. (For example, "a" and "A" address different 2780 stations.) A 3780 master station does not use case to distinguish addresses. When you define a slave station emulating a 3780 terminal, you must enter an uppercase alphabetic address.

#### Multipoint Master Station Configuration

To operate your master station as a 2780 terminal emulator, enter the MSTER macro in the format

MSTER address address ...

Address is a single alphabetic character addressing one slave station on the line. You must enter an address for each slave station you wish to communicate with.

See the "Multipoint Slave Station Configuration" information above to decide whether your station addresses can be lowercase or must be uppercase.

## Communicating with Non-Data General Machines

The master station adds information to the address you enter with the `MSTER` macro to specify whether it polls or selects a slave station. In most situations, you can safely ignore this information. Non-Data General RJE80 stations, however, may require the complete address formats as shown in Table 5-1.

**Table 5-1. Complete Slave Station Addresses**

Terminal Emulation	Poll	Select (Printer)
2780	A6	A3
3780	AA0	aaDC1*

\*"DC1" represents a single character.

The address format is different for 2780 and 3780 terminals and for polling and selecting. When RJE80 emulates a 2780 terminal, the single character represented as "A" can be uppercase or lowercase. RJE80 adds the numbers 6 and 3 to the address you enter to differentiate between polls and selects. When RJE80 emulates a 3780 terminal, RJE80 uses an uppercase letter combination to indicate a poll and a lowercase combination to indicate a select. An RJE80 program emulating a 3780 terminal also adds a 0 and the control character "DC1" to further differentiate between polls and selects.

The master station "select" addresses the slave station printer (which can be opened as a device or file). When you communicate with a Data General machine, however, your master station transmits to the list file, which you can open as a file or as the line printer. When you transfer data to a non-Data General machine, your master station transmits data to the remote station's printer.

## The RJE80 Generation Dialog

The RJE80 generation dialog prompts for information on how to configure your version of the RJE80 program. See Chapter 3 for a complete discussion of the RJE80 options that the program presents.

This section presents the dialog questions and defines possible responses.

Many questions supply default answers. The default answers follow immediately after the question they correspond to and are enclosed in brackets. The program uses the default value when you type a carriage return `<CR>` in response to a question.

The text accompanying the questions shows the range of non-default responses. Enter non-default responses to the right of the corresponding question before entering a carriage return.

When you enter a response which is not within a question's acceptable range of values, the program repeats the question until you enter a valid response.

Numbers terminated with a decimal point(.) are decimal. Numbers with no decimal points are octal values.

If you make a typing error when entering your response, you can abort the session by typing `CTRL-C`. You can abort the generation session at any time, including while the generation program is assembling and binding configuration files. Regenerating RJE80 deletes the partially-completed configuration files from the aborted session.

## Starting the RJE80 Generation Program

NOTE: Before invoking the RJE80 generation program, make sure that your working directory is the directory containing your CAM and RJE80 files.

To run the RJE80 generation program, enter the command line

*CGEN RECON [FILENAME]*

*CGEN* is the generation program that asks dialog questions, and assembles and loads your CAM and RJE80 files into an executable RJE80 program.

*RECON* is the file that contains the RJE80 generation dialog questions displayed by the *CGEN* program.

*FILENAME* is the name you select for your RJE80 log file.

The log file is an optional feature that records generation program questions and your responses. You can use the log file contents to review configuration details later or to locate generation errors that keep your program from functioning correctly.

When you enter the *CGEN* command line, your terminal displays the message

*COMMUNICATIONS GENERATOR*

NOTE: When you run the RJE80 generation program for the first time, *CGEN* displays the message *FILE DOES NOT EXIST*. Ignore this message.

*CGEN* then displays the first dialog question.

*POINT TO POINT LINE(1= YES) ? DEFAULT=1*

Press CR to communicate with a remote station in a point-to-point configuration. Enter 0 (NO) to communicate in a multipoint configuration.

When you specify a point-to-point configuration, *CGEN* skips to the *WRONG NUMBER QUESTION* below. When you specify a multipoint configuration, *CGEN* asks the following question.

*SLAVE STATION (1= YES) ? DEFAULT=1*

To run in a multipoint environment, specify whether you wish your station to be a slave station or master station. Press CR (YES) for slave station and 0 (NO) for master station.

Whether you specify a master or slave station, *CGEN* skips to the *OPERATOR COMMUNICATION* question below.

*WRONG NUMBER PROTECTION (1= YES) ? DEFAULT=0*

This question appears when you specify a point-to-point configuration in the *POINT-TO-POINT LINE* question above. Type 1 (YES) when you want your RJE80 application to disconnect a switched line after the line is connected and no data is received.

*PRIMARY STATION (1= YES) ? DEFAULT=1*

Your point-to-point station must run in the setting opposite from your remote station. Remote station operators can tell you what their setting is.

*OPERATOR COMMUNICATIONS (1= YES) ? DEFAULT=0*

This question applies to RDOS RJE80 programs running in the foreground on systems that do not have a foreground console. When you answer 1 (YES), you can operate the foreground RJE80 station from the background console.

*MAXIMUM LINE LENGTH ? DEFAULT=132*

Specify how many characters per record your station can accept when receiving list or punch files opened with the LA or PA commands. Your answer must be decimal (followed by a period).

*STANDARD BLOCK FORMAT (1=YES) ? DEFAULT=1*

If you press CR to accept the *standard block format*, BLDRJE80 supplies the default answers to the next two questions (MAXIMUM RECORD SIZE WHEN TRANSMITTING? and RECORDS PER BLOCK).

If you answer 0 (NO) to STANDARD BLOCK FORMAT, you must specifically answer the MAXIMUM RECORD SIZE WHEN TRANSMITTING? and RECORDS PER BLOCK questions.

*MAXIMUM RECORD SIZE WHEN TRANSMITTING ? DEFAULT=80.*

Enter a value between 1 and 144 based on the line length of the files you plan to transmit.

*RECORDS PER BLOCK (0=STANDARD) ? DEFAULT=0*

Your answer determines the number of records that RJE80 packs into each transmission block. When you accept default setting (0), RJE80 packs as many records as each transmission block can accommodate.

Alternatively, you can answer with a 1 or 2. When you enter 1, RJE80 packs 1 record into each transmission block. When you enter 2, RJE80 packs 2 records into each transmission block.

*INSERT CR IN PUNCH ASCII OUTPUT (1=YES) ? DEFAULT=1*

Your answer determines whether your RJE80 station inserts a carriage return character after each record received to a punch file opened with the PA command. The default value is good for most RJE80 applications.

*OPERATOR INTERVENTION AFTER REVERSE INTERRUPT(1=YES) ? DEFAULT=0)*

This question defines the action that RJE80 takes when reception of the remote site Reverse Interrupt (RVI) is complete.

Enter 1 (YES) to set your application to manual restart. RJE80 will resume transmissions interrupted by the RVI only when you enter the RESTART command before entering another SEND command.

Accept the default (NO) to set your application to automatic restart. RJE80 will resume transmission of interrupted messages without your intervention.

*TIME-OF-DAY (TOD) FILE SUPPORT (1=YES) ? DEFAULT=1*

Press CR and accept the default (YES) to have RJE80 receive transmissions to unique files.

Enter 0 (NO) to have RJE80 receive all transmissions to a single list or punch file.

*EMULATING A 3780 (1=YES) ? DEFAULT=1*

Press CR to accept the default (YES) and have RJE80 emulate a 3780 terminal. Enter 0 (NO) to have RJE80 emulate a 2780 terminal. Base your answer on what your remote station operators expect your station to emulate.

*OPERATING SYSTEM (0=RDOS 1=RTOS 2=DOS) ? DEFAULT=0*

Enter the value corresponding to the operating system you wish to run your RJE80 program under.

When you specify RDOS or DOS, CGEN skips to the LINE DCU ASSISTED question below.

When you specify RTOS, CGEN asks

*NUMBER OF BUFFERS FOR BKPKG ? DEFAULT=2*

Accept the default value to allow RTOS to read and write lines to and from magnetic tape. RTOS normally reads and writes entire tape blocks only. RTOS RJE80 cannot function without this feature.

*LINE DCU ASSISTED (1= YES) ? DEFAULT=0*

Answer 1 (YES) when your system is configured with a DCU. When you answer YES, make sure that your version of CAM also specifies DCU support. Accept the default (NO) when your system is not configured for a DCU.

If your RJE80 program is to run under RTOS, CGEN skips to the SAVE FILE NAME question below.

If your RJE80 program is to run under RDOS, CGEN asks

*LINKING FOR FOREGROUND (1= YES) ? DEFAULT=0*

Your answer determines whether your version of RJE80 runs as an RDOS background or foreground process. Press CR to accept the default (NO) to run RJE80 in the background. Enter 1 (YES) to run RJE80 in the foreground.

If you enter 0 (NO) and specify a background process, CGEN skips to the SAVE FILE NAME question below.

If you answer 1 (YES) and specify a foreground process, CGEN asks

*MAPPED SYSTEM (1= YES) ? DEFAULT=0*

Enter 1 (NO) when your operating system is mapped.  
Enter 0 (YES) when your operating system is not mapped.

If you enter 0 (NO), CGEN skips to the SAVE FILE NAME question below.

If you enter 1 (YES), CGEN asks

*NREL START ADDRESS ? DEFAULT=1016*

Enter an octal address between 1016 and 7777. The address corresponds to the location at which the Relocatable Loader (RLDR) begins to read the RJE80 program into memory.

NOTE: The address must be larger than the NMAX of the program you plan to run in the background while RJE80 runs in the foreground. (As of this writing, the NMAX of the RDOS CLI example is 13000 octal. To run the CLI as the background process, the RJE80 NREL start address must be greater than 13000.)

When you specify the NREL START ADDRESS, CGEN asks

*ZREL START ADDRESS? ? DEFAULT= 50*

Enter an octal address between 50 and 377 corresponding to the beginning of the foreground page zero.

NOTE: The address you specify must be greater than the ZMAX of the program you wish to run in the background while RJE80 is in the foreground.

*SAVE FILE NAME(.SV) ? DEFAULT=RJE80*

Your answer becomes the name given to the executable RJE80 program file that the RJE80 generation program creates when you finish this dialog session. Enter a name using the RDOS, DOS, or RTOS filename conventions. Do not enter a filename extension.

When you enter the default response, RJE80 names the program file RJE80.SV.

*LOAD MAP FILE NAME (.LM) ? DEFAULT=RJE80*

The name that you enter becomes the root filename for your version of the RJE80 program. For example, the default name, RJE80, becomes the load map file RJE80.LM.

If you specify an RJE80 program to run under RDOS or DOS, CGEN skips to the TABLE NAME FROM CAM GEN question below.

If you specify an RJE80 program to run under RTOS, CGEN asks the following 2 questions.

*RTOS MODULE NAME (INCLUDING EXTENSION IF ANY) ? DEFAULT=RTOS.RB*

Enter the name of your RTOS system created by RTOSGEN. Include the filename extension, if applicable.

When you do not specify an RTOS system name, CGEN defines a default name of RTOS.RB.

*ENTER DEVICE DRIVER NAMES-END WITH CR ? DEFAULT=NO-DEFAULT*

Supply the name of each user-written device driver in your RTOS system. For example, when your RTOS system is configured for a magnetic tape drive, enter

MTADR.LB

or whatever device name you assigned to it.

When you plan to run RJE80 on a mapped RTOS system, supply the mapped library name for a device after you enter the device driver name. (CGEN does not prompt for this information.)

When you plan to run RJE80 on an unmapped RTOS system and do not need to specify additional device drivers, enter the default answer. To take the default, enter a space character followed by a carriage return.

*TABLE NAME FROM CAM GEN. ? DEFAULT=TABLE*

Answer this question with the module name you chose in response to the CAM generation question, MODULE NAME. The RJE80 generation program needs this name to locate the CAM configuration files it binds with your RJE80 files to create an executable RJE80 station.

When you specify an RJE80 program to run under RDOS or DOS, the TABLE NAME FROM CAM GEN question is the last RJE80 dialog question.

When you specify an RJE80 program to run under RDOs or RTOS, CGEN asks

*ENTER LIBRARY NAMES ? DEFAULT=NO-DEFAULT*

Enter the names of the libraries that your RTOS operating system will use.

### **Completing the RJE80 Generation Program**

CGEN calls the MAC utility to assemble the RJE80 configuration files and the RPOLL.SR module. CGEN displays the messages

*.TITL REBOP*

*.TITL RPOLL*

and uses the RLDR utility to build an executable RJE80 program using your dialog responses. The operating system prompt returns when CGEN finishes the RJE80 generation procedure.

For informatin on how to operate your RJE80 program, see Chapter 2 and Chapter 6.

End of Chapter

# Chapter 6

## Dictionary of Commands

This dictionary describes all RJE80 commands and their respective formats, switches, and arguments. In the command formats, the two-letter command itself appears in capital letters. Command switches and arguments appear in lowercase letters. We use italics and brackets to indicate optional arguments and switches.

---

## **BL (Break Link)**

### **Disconnect the switched link**

---

#### **BL**

Use the BL (Break Link) command to disconnect the communications link. To terminate RJE80, use the HP (Halt Process) command, not the BL command. When RJE80 processes the BL command and disconnects the line, it displays the message DATA SET NOT READY. RJE80 then waits for an incoming call to reconnect the communications line.

The BL command is valid only for point-to-point stations using a switched line. When you enter the BL command at a multipoint master or slave station, RJE80 displays the message ILLEGAL COMMAND.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

HP (Halt Process).

---

## **.D (Directory)**

### **Change the working directory**

---

.D directory\_name

This command functions like the RDOS and DOS CLI DIR commands. It changes the current working directory to the directory named.

#### **Switches**

None.

#### **Argument**

The argument specifies the directory that RJE80 takes as the new current working directory.

#### **Related Commands**

None.

---

## **DC (Disable Compression)**

### **Stop RJE80 from shortening records for transmission**

---

#### **DC**

The DC command turns compression off.

Compression is available for RJE80 programs emulating 3780 terminal operation only. When compression is on, a transmitting RJE80 station replaces any string from 2 to 63 spaces with a two-character compression code. (See the EC command.) The code indicates how many spaces RJE80 deletes from a record. RJE80 transmits the compression code as data. The RJE80 station receiving the compressed transmission reads the compression code for the correct number of spaces to reinsert into the record.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

EC (Enable Compression).

---

## **DG (Disable Logging)**

### **Close a log file**

---

#### **DG**

Use the DG (Disable Logging) command to close a log file opened with the EG (Enable Logging) command. When you use the logging feature, RJE80 writes all commands and messages that appear on your screen to a log file. When you enter the DG command, RJE80 stops writing to the log file.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

EG (Enable Logging).

---

## **DL (Disable Link)**

### **Ignore transmissions from the remote site**

---

#### **DL**

This command allows your station to ignore transmissions from the remote site. The DL command gives you control over the communications link without actually disconnecting it. You can disable (using the DL command) or enable (using the EL command) RJE80's ability to receive transmissions at any time that RJE80 is not actively sending or receiving data.

A remote site receives no response when it attempts to transmit to an RJE80 station that has disabled the link. When a remote site receives no response, the remote site operator can:

- Disconnect the line if it is switched.
- Ignore future transmissions from your station.
- Suspend transmission attempts until you initiate a transmission yourself, indicating that you have re-enabled the link.

To ensure that such responses do not affect your station adversely, check with remote site operators to determine how they plan to react.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

EL (Enable Link).

---

## **DM (Disable Monitor)**

### **Disable monitoring of received records**

---

#### **DM**

The DM (Disable Monitor) command turns monitoring off.

When the monitoring feature is on, RJE80 searches incoming data for a message from the operator at the remote site. See the EM (Enable Monitor) command in this dictionary for further information.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

EM (Enable Monitor).

---

## **DT (Disable Transparency)**

### **Disable RJE80's Transparency Feature**

---

DT

The DT (Disable Transparency) command turns transparency off.

When you transmit data with transparency disabled, RJE80 translates the ASCII-encoded data resident in your system to the EBCDIC character code before transmitting it over the line. See the ET (Enable Transparency) entry in this dictionary and the discussion of transparency in the "Sending Exact Copies" section of Chapter 2 for more information.

Note that when you enter the ET command, RJE80 ignores the current compression setting (enabled or disabled). When you enter the DT (Disable Transparency) command, RJE80 respects the current compression setting.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

ET (Enable Transparency).

---

## **EC (Enable Compression)**

### **Shorten records for transmission**

---

#### **EC**

RJE80 accepts the EC (Enable Compression) command only when emulating 3780 device operation. When the compression feature is on, a transmitting RJE80 station replaces any string of two or more spaces with a two-character compression code. The code indicates how many spaces RJE80 deletes. RJE80 transmits the compression code as data. The RJE80 station receiving the compressed transmission reads the compression code for the number of spaces to reinsert into the data.

The two-character compression code can represent up to 63 spaces. When strings contain more than 63 spaces, RJE80 uses additional two-character compression codes. An RJE station accepts and processes character compression codes in received data whether its own compression feature is on or off.

Normally, RJE80 programs emulating 3780 operation delete strings of two or more blanks at the end of a line. When compression is on, RJE80 replaces any string of trailing blanks with two-character compression codes. In this manner, RJE80 does not delete trailing blanks when compression is on.

Transparency takes precedence over compression. RJE80 cannot transmit compressed data when the transparency feature is on. (See the ET, Enable Transparency, command.) When you turn transparency off, however, RJE80 can perform the compression procedure on data for transmission.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

DC (Disable Compression).  
ET (Enable Transparency).

---

## **EG (Enable Logging)**

### **Open a file or device as the log file**

---

#### **EG filename**

The EG command creates the file specified by the filename when it does not already exist, and opens the file as the current log file. RJE80 then writes all commands entered at, and all messages displayed on, your terminal to the log file. When the file you open as the log file already exists, RJE80 appends log data to the file's contents.

#### **Switches**

None.

#### **Arguments**

Filename specifies the file that RJE80 opens as the log file. RJE80 creates the file (when it does not already exist) and opens it in a single operation.

#### **Related Commands**

DG (Disable Logging).

---

## **EL (Enable Link)**

### **Respond to transmissions from the remote site**

---

#### **EL**

Use the EL (Enable Link) command to instruct RJE80 to monitor the link for transmissions from the remote site. RJE80 executes with the link disabled. RJE80 cannot respond to any transmission from the remote site until you issue the EL command. You can enable the link (using the EL command) or disable the link (using the DL command) at any time during an operation session except when RJE80 is actively sending or receiving data.

When you first enable the line, RJE80 determines whether list and punch files are open. When you have not previously opened list and punch files, RJE80 assumes that all incoming data is ASCII encoded, and sends it to the line printer. Your station cannot follow this default procedure of opening the list and punch files to the line printer when:

- your system is not configured for a line printer or
- the other ground is using the line printer.

When RJE80 cannot open a list or punch file, it aborts operation. You can avoid this situation by opening list and punch files to a storage device or to your terminal screen prior to entering the EL command.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

DL (Disable Link).

---

## **EM (Enable Monitor)**

### **Monitor the received records for a specified string**

---

#### **EM string**

The EM (Enable Monitoring) command instructs RJE80 to search incoming data for a specific record from the remote site. RJE80 compares the initial characters of records received to your station with a character string entered as the argument to the EM command. RJE80 displays those records that match the monitored string at your terminal. RJE80 also sends monitored records to the list file.

RJE80 monitors records sent without transparency and destined to a list file opened with the LA (List ASCII) command. The RJE80 monitoring feature ignores peripheral device selection and printer format controls sent at the beginning of a record.

#### **Switches**

None.

#### **Arguments**

String can contain up to 39 characters. The string cannot contain blanks or delimiters. RJE80 compares this string to the initial characters of all records it receives.

#### **Related Commands**

DM (Disable Monitor).

---

## **ET (Enable Transparency)**

### **Send transparent data to the remote site**

---

#### **ET**

The transparency feature ensures against reading a string of data characters as BISYNC control characters. When you enter the ET (Enable Transparency) command, RJE80 inserts a special control character, DLE, before each control character in a message. The receiving station recognizes only those code combinations preceded by a DLE as BISYNC control characters.

Use the ET command when you transmit data that might contain character code combinations that RJE80 can interpret as line control characters. Examples of files that RJE80 can misinterpret include files of binary data sent with the SB command and files with the .SV or .RB extension. (See "Sending Exact Copies" in Chapter 2 and the SA and SB entries in this dictionary.)

When you enable transparency, RJE80 modifies SA and SB commands and sends 80-character records. When transmitting using the SA (Send ASCII) command, RJE80 adds space characters to lines that contain less than 80 characters.

RJE80 ignores the device selection codes in data received with transparency indicated.

Transparency takes precedence over compression in 3780 operation. The 3780-emulating RJE80 station can compress data only when you disable transparency.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

DT (Disable Transparency).  
EC (Enable Compression).  
SA (Send ASCII).  
SB (Send Binary).

---

## **FS (Form Select)**

### **Select vertical format control form**

---

#### **FS form\_ID**

Use the FS (Form Select) command to change the current Vertical Format Control (VFC) form. The VFC form controls how many unprinted lines RJE80 leaves between text lines and text blocks when writing data to the list file.

For information on the standard Data General vertical format and on how to define nonstandard vertical formats, see Appendix B.

#### **Switches**

None.

#### **Arguments**

Form\_ID consists of two alphanumeric characters identifying a new VFC form.

#### **Related Commands**

None.

---

## **HC (Halt Command Processing)**

### **Stop processing commands from the input file**

---

HC

The HC (Halt Command Processing) command coordinates the transmission and reception of messages. You can use the command any time during program operation. The command is commonly inserted into the command input files that control unattended operation. The HC command causes RJE80 to stop processing commands until receipt of a full message sequence from the remote site.

When RJE80 does not successfully receive a complete message, the HC command keeps program operation from resuming. This can occur when a transmission fails or when RJE80 does not receive the BISYNC protocol characters signaling successful transmission.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

RC (Read Commands).

---

## **HP (Halt Process)**

### **Terminate the RJE80 program**

---

HP

The HP (Halt Process) command terminates RJE80 program operation. It does this only after RJE80 processes all previously entered commands. The HP command returns control to the process from which RJE80 was invoked, usually the CLI.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

None.

---

## **.I (Initialize)**

### **Initialize a device or directory**

---

**.I[/F]**    { devicename }  
             { directoryname }

The RJE80 .I command and the RDOS and DOS CLI INIT commands are identical. Use the command to initialize a device or directory not currently in use.

The .I command performs only a partial initialization. The .I/F command and switch combination performs a full initialization.

### **Switches**

*/F* instructs RJE80 to perform a full initialization.

### **Arguments**

Devicename or directoryname is the name of the device or directory you wish RJE80 to initialize.

### **Related Commands**

.R (Release a device or directory).

---

## LA (List ASCII)

### Open a new ASCII list file

---

LA *//A* [*TOD:*]            { filename }  
                                  { devicename }

You can set the list file to any file or device supported by RDOS, DOS, or RTOS. The list file receives data directed to it from your remote station.

Use the LA (List ASCII) command to receive data sent from a remote site using the SA (Send ASCII) command.

The LA (List ASCII) command translates data received in EBCDIC code to ASCII code. The LA command instructs RJE80 to append a carriage return character to each received record. RJE80 then writes the records to the list file as data-sensitive lines.

When you enter the LA (List ASCII) command, RJE80 uses the horizontal tab format record to interpret horizontal tab characters in received data. RJE80 uses either the horizontal format record currently in memory or a horizontal tab format record sent by the remote station. RJE80 processes vertical format characters received using the current vertical format control table form in memory (see Appendix B).

RJE80 restricts the length of the EBCDIC records that it can receive. In 2780 emulation, RJE80 can accept records up to 144 characters long. In 3780 emulation, RJE80 can accept records up to the maximum length you defined during program generation. When received data contains records that are too long, an RJE80 program running as a 2780 terminal aborts the transmission and an RJE80 program running as a 3780 terminal splits the record into multiple lines.

You can change your list file at any time, but the original list file remains open until RJE80 completes the reception in progress. When you type or print the contents of a list file currently in use, any data received to your station since you opened the list file does not appear in the listing.

The *TOD:* (Time-of-Day) argument prefix instructs RJE80 to open a unique list file for each message received. *TOD:* list files differ from other list files in several respects:

- RJE80 determines the *TOD:* list filename at the time it receives a transmission. Therefore, RJE80 can open a *TOD:* list file only when it receives a transmission. A list file already open when you enter LA *TOD:*filename remains open until your station receives a transmission.
- When you use the *TOD:* argument prefix without specifying a filename, RJE80 names the file according to the time of day at which it receives the transmission. For example, when you enter the command line:

LA TOD

and receive a file at 7:30 a.m., RJE80 names the file created 073000.

- When the filename entered contains less than 4 characters, RJE80 uses only those characters plus the 6 *TOD:* digits. When you enter the command line:

LA TOD ZZ

and receive a file at 7:30 a.m., RJE80 names the file created ZZ073000.

- When the filename entered contains more than 4 characters, RJE80 truncates the name to the first 4 characters and adds the 6 TOD: digits. When you enter the command line:

LA TOD: BALANCE

and receive a file at 7:30 a.m., RJE80 names the file created BALA073000.

### **Switches**

*/A* appends new data to the existing list file.

### **Arguments**

Filename or devicename specifies the name of the file or device that RJE80 opens as the current list file. RJE80 creates the file when it does not already exist.

*TOD:* appends a 6-digit number representing the time of day at which the file was received to the first 4 characters of the filename typed in the command line. The digits specify the hour, minutes, and seconds.

### **Related Commands**

LB (List Binary).

XA (Transfer ASCII).

XB (Transfer Binary).

XT (Transfer/Translate).

---

## LB (List Binary)

### Open a new binary list file

---

LA *[/A] [TOD:]*      { filename }  
                                  { devicename }

You can set the list file to any file or device supported by RDOS, DOS, or RTOS. The list file receives data directed to it from your remote station.

Use the LB (List Binary) command to receive an exact copy of a file as transmitted by the remote site, without character code translation and without assuming the presence of ASCII strings or delimiters. The file you open with the LB (List Binary) command accepts data irrespective of its code. (For further information see the "Sending Exact Copies" section of Chapter 2.)

You can change your list file at any time, but the original list file remains open until RJE80 completes the reception in progress. When you type or print the contents of a list file currently in use, any data received to your station since you opened the list file does not appear in the listing.

The *TOD:* (Time-of-Day) argument prefix instructs RJE80 to open a unique list file for each message received. *TOD:* files differ from other list files in several respects:

- RJE80 determines the *TOD:* list filename at the time it receives a transmission. Therefore, RJE80 can open a *TOD:* list file only when it receives a transmission. The list file that is open when you enter `LA TOD:filename` remains open until your station receives a transmission.
- When you use the *TOD:* argument prefix without specifying a filename, RJE80 names the file according to the time of day at which it receives the transmission. For example, when you enter the command line:

LB TOD

and receive a file at 7:30 a.m., RJE80 names the file created 073000.

- When the filename entered contains less than 4 characters, RJE80 uses only those characters plus the 6 *TOD:* digits. When you enter the command line:

LB TOD ZZ

and receive a file at 7:30 a.m., RJE80 names the file created ZZ073000.

- When the filename entered contains more than 4 characters, RJE80 truncates the name to the first 4 characters and adds the 6 *TOD:* digits. When you enter the command line:

LB TOD:BALANCE

and receive a file at 7:30 a.m., RJE80 names the file created BALA073000.

## Switches

*/A* appends new data to the existing binary list file.

## Arguments

Filename or devicename specifies the name of the file or device that RJE80 opens as the current list file. RJE80 creates the file when it does not already exist.

*TOD*: appends a 6-digit number representing the time of day at which the file was received to the first 4 characters of the filename typed in the command line. The digits specify the hour, minutes, and seconds.

## Related Commands

LA (List ASCII).

XA (Transfer ASCII).

XB (Transfer Binary).

XT (Transfer/Translate).

---

## PA (Punch ASCII)

### Open a new ASCII punch file

---

PA *[/A]* *[TOD:]*      { filename }  
                                  { devicename }

You can set the punch file to any file or device supported by RDOS, DOS, or RTOS. The punch file receives data directed to it from your remote station.

The PA (Punch ASCII) command translates data received in EBCDIC code to ASCII code. Depending on how you generate your RJE80 program, the PA command can instruct RJE80 to append a carriage return character to each received record. (See the generation dialog question INSERT CR IN PUNCH ASCII OUTPUT). RJE80 then writes received records to the punch file as data-sensitive lines.

RJE80 restricts the length of the EBCDIC records that it can receive. In 2780 emulation RJE80 can except records up to 144 characters long. In 3780 emulation, RJE80 can accept records up to the maximum length you defined during program generation. When received data contains records that are too long, an RJE80 program running as a 2780 terminal emulator aborts the transmission and an RJE80 program running as a 3780 terminal emulator splits the record into multiple lines.

You can change your punch file at any time, but the original punch file remains open until RJE80 completes a transmission in progress. When you type or print the contents of a punch file presently in use, any data received to your station since you opened the file does not appear in the listing.

RJE80 does not format data destined for the punch file. It ignores all vertical format control forms.

The *TOD:* (Time-of-Day) argument prefix instructs RJE80 to open a unique punch file for each message received. *TOD:* files differ from other punch files in several respects:

- RJE80 determines the punch filename at the time it receives a transmission. Therefore, RJE80 can open a *TOD:* punch file only when it receives a transmission. The punch file that is open when you enter PA *TOD:*filename remains open until your station receives a transmission.
- When you use the *TOD:* argument prefix without specifying a filename, RJE80 names the file according to the time of day at which it receives the transmission. For example, when you enter the command line:

PA *TOD*

and receive a file at 7:30 a.m., RJE80 names the file created 073000.

- When the filename entered contains less than 4 characters, RJE80 uses only those characters plus the 6 *TOD:* digits. When you enter the command line:

PA *TOD ZZ*

and receive a file at 7:30 a.m., RJE80 names the file created ZZ073000.

- When the filename entered contains more than 4 characters, RJE80 truncates the name to the first 4 characters and adds the 6 *TOD:* digits. When you enter the command line:

PA *TOD:BALANCE*

and receive a file at 7:30 a.m., RJE80 names the file created BALA073000.

## **Switches**

*/A* appends new punch file data to the existing ASCII punch file.

## **Arguments**

Filename or devicename specifies the name of the file or device that RJE80 opens as the current punch file. RJE80 creates the file when it does not already exist.

*TOD*: appends a six-digit number representing the time of day at which the file was received to the first 4 characters of the filename typed in the command line. The digits specify the hour, minutes, and seconds.

## **Related Commands**

PB (Punch ASCII).



## **Switches**

*/A* appends new data to the existing binary punch file.

## **Arguments**

*Filename* or *devicename* specifies the name of the file or device that RJE80 opens as the current punch file. RJE80 creates the file when it does not already exist.

*TOD* appends a 6-digit number representing the time of day at which the file was received to the first 4 characters of the filename typed in the command line. The digits specify the hour, minutes, and seconds.

## **Related Commands**

PA (Punch ASCII).

---

## **.R (Release)**

### **Release a device or directory**

---

```
.R {devicename }  
   {directoryname }
```

The RJE80 .R command and the RDOS and DOS CLI RELEASE commands are identical. Use the command to release a device or directory not currently in use.

The .R command can release a disk, tape, or directory within a disk.

NOTE: Do not release the master directory while running RJE80.

### **Switches**

None.

### **Argument**

Devicename or directoryname specifies the device or directory for RJE80 to release.

### **Related Commands**

.I (Initialize device or directory).

---

## RC (Read Commands)

### Read commands from a specified source

---

RC {filename }  
    {devicename}

This command directs RJE80 to read commands from the file or device specified in the command line rather than from the current input device (normally the keyboard) or the input command file. Use the RC command to run RJE80 without operator intervention or to return a station running under unattended operation to manual control.

End your command input files with the command RC \$TTI to return control to the terminal. (Enter RC \$TTI1 when RJE80 is the foreground process and you are at a second system terminal.)

When RJE80 is running with input from the terminal keyboard, the command line

```
RC CMDFILE1
```

tells RJE80 that the current source for RJE80 commands is the file CMDFILE1.

The RC command is not the only way to indicate a source for RJE80 commands. You can specify a devicename or command filename for unattended operation in the CLI command line that brings up RJE80. For example, in the CLI command line:

```
RJE80 CMDFILE1
```

RJE80 is the name of your RJE80 application save file (RJE80.SV) and CMDFILE1 is the name of a file containing RJE80 commands.

### Switches

None.

### Argument

Filename or devicename specifies the RJE80 input command file or device from which you want RJE80 to accept commands.

### Related Commands

HC (Halt Command Processing).

---

## **RT (Restart Transmission)**

### **Restart an interrupted transmission**

---

#### **RT**

When your RJE80 station transmits to a remote site, it normally receives a BISYNC character as acknowledgment for every block successfully received at the remote location. Operators of a non-Data General remote site can interrupt your transmission by sending a Reverse Interrupt (RVI) character instead of the expected acknowledgment. When RJE80 receives an RVI, it temporarily suspends transmission and prepares to receive a message from the remote site.

Operators can use the RVI to interrupt the transmission of faulty or unnecessary data. Operators can also use the RVI to interrupt transmissions when they wish to send data of their own.

When entered correctly, the RT command re-enables your SEND command and the data transmission interrupted by receipt of an RVI.

The RT command is valid:

- Only if you answered YES to the RJE80 generation dialog question, OPERATOR INTERVENTION AFTER REVERSE INTERRUPT.
- After receiving a complete Reverse Interrupt (RVI) and message reception sequence from the remote site.
- Before entering any subsequent SEND commands.

RJE80 stations generated for manual restart resume transmission only when you enter the RT (Restart Transmission) command. You can delay resumption of the transmission by not immediately entering the RT command, and can abort the transmission by not entering the RT command at all.

When the RVI message reception is completed, those RJE80 stations generated for automatic restart complete the interrupted message from where they left off. When you generate your RJE80 program for automatic restart, you do not need the RT command.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

SA (Send ASCII).  
SB (Send Binary).

---

## SA (SEND ASCII)

### Translate and transmit ASCII file data as EBCDIC data

---

SA filename [*/slave\_address*]

Use the SA (Send ASCII) command to transmit text files, stored on your computer in ASCII code, to your remote station.

Enter the name of the file you wish to transmit as the argument to the SA command. RJE80 performs line-by-line (data-sensitive) reads of the contents of the file, and translates the file data from ASCII to EBCDIC before transmitting it. When your remote station is a Data General machine, your remote operator must open the list file with the LA (List ASCII) command to receive your data. The receiving station then translates the data transmitted in EBCDIC back to ASCII before writing to the output file.

When your RJE80 station is a multipoint master station, you must specify the address of the slave station to which RJE80 is to send data. For example, enter the command line:

SA INFO A

to send the file INFO to tributary station A.

Slave station messages have only one possible destination: the master station. When you operate a multipoint slave station, do not include an address in the command line. Because slave stations transmit at the invitation of the master station, there can be a delay between your entering an SA command and RJE80 processing the command. RJE80 cannot process send commands when a previously entered send command is outstanding.

When you transmit nontext data (for example, program files) with the SA command, RJE80 could abort when it encounters data character sequences that appear to be BISYNC line control characters. To avoid this problem, enable the transparency feature and send data with the SB (Send Binary) command. (See the SB and ET commands in this dictionary and "Sending Exact Copies" in Chapter 2.)

RJE80 uses the current compression and transparency settings when you enter the SA command. When you send data in transparent mode, RJE80 ignores the compression setting.

Note that the files you send must have maximum line lengths (exclusive of the delimiter) less than or equal to the maximum record length specified at system generation. RJE80 truncates any lines that exceed maximum record length before transmitting a file. (For details on how the RJE80 program creates records for transmission when emulating 2780 or 3780 terminal operation, see "Comparison of 2780 and 3780 Terminal Operation" in Chapter 1.)

### Switches

None.

### Arguments

Filename names the files you transmit to the remote site.

*Slave\_address* names the slave station(s) in a multipoint configuration that the master station is transmitting to.

### Related Commands

SB (Send Binary).

SI (Send Immediate).

ET (Enable Transparency).

RT (Restart Transmission).

---

## **SB (Send BINARY)**

**Send the contents of a binary file to the remote site**

---

SB filename [*slave\_address*]

The SB (Send Binary) command instructs RJE80 to transmit a file to your remote station without translating the contents of the file from ASCII to EBCDIC.

When you enter the SB command, RJE80 reads a file for transmission in sequential mode. Each read accepts a number of bytes equal to the maximum record length defined for your RJE80 program. RJE80 transmits the file data with no translation from ASCII to EBCDIC.

When you transmit with the SB command, RJE80 can read data character sequences that appear to be BISYNC line control characters without aborting. (See the ET (Enable Transparency) command in this dictionary and "Sending Exact Copies" in Chapter 2.)

When your RJE80 station is a multipoint master station, you must specify the address of the slave station to which RJE80 is to send data. For example, enter the command line

SB INFO A

to send the file INFO to slave station A.

Slave station messages have only one possible destination: the master station. When you operate a multipoint slave station, do not include an address in the command line. Because slave stations transmit at the invitation of the master station, there can be a delay between your entering an SB command and RJE80 processing the command. RJE80 cannot process send commands when a previously entered send command is outstanding.

RJE80 uses the current compression and transparency settings when you enter the SB command.

The length of the records in a message sent with the SB command is equal to the maximum RJE80 record length for your station. (You can set this length if you generate your own version of RJE80.)

### **Switches**

None.

### **Arguments**

Filename names the files you wish to transmit to the remote site.

*Slave\_address* names the slave station(s) in a multipoint configuration that the master station is transmitting to.

### **Related Commands**

SA (Send ASCII).

ET (Enable Transparency).

SI (Send Immediate).

RT (Restart Transmission).

---

## **SI (Send Immediate)**

### **Send an 80-character message to the remote site**

---

#### **SI /CTRL-G/message**

Use the SI command to transmit a short message to the operator of your remote site. The message consists of the text string you enter as the argument to the SI command.

The message must be no longer than 80 characters. RJE80 truncates any additional message characters. The record can contain any combination of alphanumeric characters and blanks.

When you enter the SI command in the format:

#### **SI message**

RJE80 sends the message to the remote site's list file. When you enter the SI command in the format:

#### **SI /CTRL-G/message**

RJE80 sends the message to the remote site terminal rather than the list file.

If you have enabled transparency (see the ET command), RJE80 sends the SI message in transparent mode. RJE80 does not compress SI messages.

Note that an RJE80 station functioning as a multipoint master or slave station does not process an SI command. When using the SI command at a multipoint master or slave station, RJE80 displays the message ILLEGAL COMMAND.

### **Switches**

None.

### **Argument**

Message is a message to be sent as a one-record file to the remote site. The message can contain blank characters.

### **Related Commands**

SA (Send ASCII).

SB (Send Binary).

---

## **XA (Transfer ASCII)**

### **Locally transfer an ASCII file to the list file**

---

#### **XA filename**

The XA (Transfer ASCII) command allows you to copy files resident on your system to a list file opened with the LA (List ASCII) or LB (List Binary) commands. Use the XA command to transfer ASCII-encoded data only.

The XA command instructs RJE80 to copy files in data-sensitive mode. RJE80 reads and writes character strings bounded by the standard RDOS, DOS and RTOS delimiters (line feed, form feed, carriage return, and null). If RJE80 reads 133 characters for transfer without encountering a delimiter character, the operating system aborts the transfer. The operating system restriction should not be a problem when transferring ASCII file data. It can, however, cause transfers of .SV file data to abort, as .SV files place no restrictions on line length. To avoid this problem use the XB command to send .SV file data.

#### **Switches**

None.

#### **Arguments**

Filename names the file you wish to copy.

#### **Related Commands**

LA (List ASCII).  
LB (List Binary).  
XB (Transfer Binary).

---

## **XB (Transfer Binary)**

### **Locally transfer a binary file to the list file**

---

#### **XB filename**

The **XB** (Transfer Binary) command allows you to copy files resident on your system to a list file opened with the **LA** (List ASCII) or **LB** (List Binary) commands. You can use the **XB** command to transfer ASCII files, EBCDIC files, .SV files, or Hollerith files. The **XB** command allows you to transfer any form of data regardless of its code.

When you enter the **XB** command, RJE80 copies files sequentially. Each read and write accepts a number of bytes equal to the maximum transmission record length defined for your RJE80 program.

#### **Switches**

None.

#### **Argument**

Filename names the file you wish to transfer.

#### **Related Commands**

**XA** (Transfer ASCII).

**LA** (List ASCII).

**LB** (List Binary).

---

## **XC (Transfer \$CDR file)**

**Locally transfer a \$CDR (Hollerith encoded) file to any local file.**

---

### **XC filename**

The XC (Transfer \$CDR) command allows you to copy data in the \$CDR file. The \$CDR file usually contains Hollerith-encoded data for cardpunch operation. Use the XC command to transfer the \$CDR file contents to any file on your system.

The XC command causes RJE80 to translate \$CDR file data to EBCDIC. RJE80 then performs sequential writes, copying the \$CDR file data to the file specified as an argument to the XC command.

When the file destination is a previously created disk file, RJE80 deletes the file, creates a new file with the same name, translates the data to EBCDIC, and transfers it to the file you specify in the command line.

### **Switches**

None.

### **Argument**

Filename names the file you wish to copy \$CDR file data to.

### **Related Commands**

XA (Transfer ASCII).

XB (Transfer Binary).

---

## **XT (Transfer/Translate)**

**Translate local file data from EBCDIC to ASCII and transfer the file to the list file**

---

### **XT filename**

The XT (Transfer/Translate) command allows you to transfer EBCDIC files resident on your system to a list file opened with the LA (List ASCII) or LB (List Binary) commands. To make the transfer possible, the XT command instructs RJE80 to translate EBCDIC data to ASCII while reading it to the list file.

RJE80 reads the file sequentially, reading and writing a number of bytes equal to the maximum transmission record length defined for the RJE80 program. RJE80 translates the data from EBCDIC to ASCII and appends a carriage return to each record. RJE80 then writes the data to the list file as data-sensitive records.

When the file you specify as the argument to the XT command is a \$CDR (CARDREADER) file, RJE80 translates the file data from Hollerith to EBCDIC code, and then from EBCDIC to ASCII code.

RJE80 translates any EBCDIC characters that do not have ASCII equivalents as blanks.

### **Switches**

None.

### **Argument**

Filename names the file you wish to transfer/translate.

### **Related Commands**

LA (List ASCII).

LB (List Binary).

---

## **CTRL-A**

### **Terminates current transmission or reception**

---

#### **CTRL-A**

CTRL-A causes RJE80 to abort any transmission or reception in progress.

Entering CTRL-A at an RJE80 station that is sending or receiving data causes RJE80 to close the file it was transmitting and abort the transmission. RJE80 then waits for you to enter another command.

Entering CTRL-A at a station that is not sending or receiving has no effect on RJE80 operation. The CTRL-A command does not return RJE80 to the CLI.

#### **Switches**

None.

#### **Arguments**

None.

#### **Related Commands**

None.

End of Chapter

# Appendix A

## Status Messages and Descriptions

The first section of this appendix alphabetically lists RJE80 status messages as they appear at your terminal.

The second section of this appendix lists the CAM condition codes most likely to appear during RJE80 operation. CAM messages appear as a numeric code. Several CAM messages are accompanied by RJE80 messages. The CAM status message section lists the codes in ascending order.

Both sections explain the conditions that can cause the messages to appear. When applicable, the explanation outlines the actions that RJE80 takes, or that you should take, to correct an error condition.

### RJE80 Status Messages

#### *AWAITING ENABLE LINK COMMAND (EL) -- COMMAND IGNORED*

**SIGNIFICANCE.** RJE80 displays this message when the link is disabled and you enter a HC (Halt Command Processing) command. RJE80 ignores the HC command because you cannot receive a message from the remote site.

**ACTION.** Enter the EL command to enable the link before re-entering the HC command.

#### *CONTENTION ERROR*

**Significance.** User-defined, point-to-point RJE80 station with secondary status display this message when both stations on the link attempt to transmit at the same time.

**ACTION.** When your secondary station finishes receiving the transmission, retry your transmission.

#### *DATASET NOT READY*

**SIGNIFICANCE.** This message concerns the status of the communications link. RJE80 displays this message when you attempt to enable the line and your modem does not indicate that a connection has been made. When you operate on a switched line, this commonly means that your station has not established connection with your remote station. When you operate on leased lines, this commonly means that the remote station is not active.

#### *DEACTIVATION ERROR*

**SIGNIFICANCE.** This message appears when RJE80 detects an error condition while attempting to disable the communications line. RJE80 terminates operation and creates a break file.

**ACTION.** Re-execute RJE80 to resume operation. Repetition of the message can indicate a hardware problem. Contact your systems engineer.

#### *ENTER EL COMMAND TO START LINK MONITORING*

**SIGNIFICANCE.** RJE80 displays this message along with the READY message when the link is disabled. This condition occurs when you first bring up your RJE80 program and after you enter a DL (Disable Link) command.

**ACTION.** Enter the EL (Enable Link) command when you are ready to receive.

### *FILE ERROR*

**SIGNIFICANCE.** RJE80 displays this message when it encounters an error condition while attempting to create, write, close, or delete a file. This message is preceded by an RDOS, DOS, or RTOS error code.

**ACTION.** When a file error occurs RJE80 terminates the current operation and returns to an idle state. Re-execute the RJE80 command. If the same error condition occurs, consult your operating system documentation.

### *ILLEGAL CARD CODE*

**SIGNIFICANCE.** RJE80 displays this message when you attempt to send or locally transfer a \$CDR file containing an invalid Hollerith code combination.

**ACTION.** Check that the cards used to input Hollerith data to your system are not damaged.

### *ILLEGAL COMMAND*

**SIGNIFICANCE.** RJE80 displays this message when you enter a command that your pregenerated or user-defined RJE80 program does not support. For example, you cannot open a list file with TOD support on a pregenerated RJE80 program or a user-defined program not generated for TOD support.

**ACTION.** If you wish to use the feature that your station presently cannot accept, you must generate or regenerate your own version of the RJE80 program.

### *INITIALIZATION ERROR*

**SIGNIFICANCE.** This message appears when a line error condition occurs while RJE80 attempts to enable or re-enable the communications link. RJE80 terminates operation and creates a break file.

**ACTION.** Re-execute RJE80 to resume operation. Repetition of the message can indicate a hardware problem.

### *IRREVOCABLE COMMUNICATIONS ERROR*

**SIGNIFICANCE.** RJE80 displays this message when it encounters a communications-related problem that keeps it from functioning properly and that it cannot correct.

**ACTION.** Check all hardware.

### *LINE DISCONNECTED*

**SIGNIFICANCE.** RJE80 displays this message when your remote station is no longer on line. RJE80 returns to an idle state until you or the remote station operator reconnects the line or the remote station resumes RJE80 program operation.

**ACTION.** Check with your remote station operator to make sure that the remote station is not active. If the remote station is active, check that both modems function properly. If you have diagnostic equipment, the DSR (Data Set Ready) signal should be low when there is no modem-to-modem connection and high when you establish connection.

### *NEW LIST FILE IS -----*

**SIGNIFICANCE.** RJE80 displays this message when it receives data destined for a list file opened with the time-of-day (TOD:) option. The message includes the name of the TOD list file opened when your station receives a transmission.

### *NEW PUNCH FILE IS \_\_\_\_\_*

**SIGNIFICANCE.** RJE80 displays this message when it receives data destined for a punch file opened with the time-of-day (TOD:) option. The message includes the name of the TOD punch file opened when your station receives a transmission.

*NO DATA FROM CALLER -- LINE DISCONNECTED*

**SIGNIFICANCE.** This message pertains to point-to-point stations generated with the **WRONG NUMBER PROTECTION** feature. RJE80 displays this message when you enable or re-enable the link and it receives no data from the remote within the 30 seconds following connection.

**ACTION.** When RJE80 receives no data within 30 seconds, it aborts any transmission in progress, disconnects the communications line, and re-enables the communications equipment to wait for a new connection. Call the remote site to re-establish line connection or wait for the remote site to call your station.

*R END*

**SIGNIFICANCE.** RJE80 status. RJE80 displays this message when it completes a message reception.

*R OPEN*

**SIGNIFICANCE.** RJE80 status. RJE80 displays this message when your RJE80 station first receives a message transmission.

*READY*

**SIGNIFICANCE.** Status of the communications link. RJE80 displays this message when it finishes processing all the commands you have entered and is ready to process another command.

*RECEIVER ABORTED TRANSMISSION*

**SIGNIFICANCE.** RJE80 displays this message at the sending station when the receiving station operator terminates a reception by entering CTRL-A.

**ACTION.** Contact the remote station operator to determine why the operator aborted the transmission. If appropriate, retry the transmission.

*RECEIVER DISCONNECTED LINE*

**SIGNIFICANCE.** RJE80 displays this message at the sending station when the receiving station operator disconnects a switched communications line. When the line is disconnected, RJE80 deactivates and reinitializes the communications equipment.

**ACTION.** RJE80 waits for you or the remote station operator to reconnect the line. (See "Executing the RJE80 Program" in Chapter 2.) RJE80 accepts no commands for data transmission command while the line is disconnected.

*RETRY COUNT EXHAUSTED*

**SIGNIFICANCE.** RJE80 displays this message when RJE80 is unable to process a command. RJE80 retries an operation as many times as the CAM program allows (see the CAM generation dialog question **RETRY COUNT**) before aborting the attempt. RJE80 then returns to an idle state.

**ACTION.** Try the transmission again. If the transmission fails repeatedly, contact your remote site operator to determine whether the remote RJE80 program is functioning properly.

*REVERSE INTERRUPT RECEIVED*

**SIGNIFICANCE.** RJE80 status. Your RJE80 station displays this message when a non-Data General remote station interrupts your station's transmission to send data of its own. When your RJE80 station receives a Reverse Interrupt (RVI), RJE80 stops its current transmission and prepares to receive the incoming message.

**ACTION.** Once the remote site's RVI transmission is complete, your station can automatically resume transmission or wait for you to enter new commands. A user-defined RJE80 program's response to an RVI depends on how you answer the **OPERATOR INTERVENTION AFTER REVERSE INTERRUPT** generation question. Pregenerated RJE80 programs restart transmissions automatically after an RVI.

### *SENDER ABORTED TRANSMISSION*

**SIGNIFICANCE.** RJE80 displays this message at the receiving station when it receives a BISYNC character signaling the end of a transmission (EOT) instead of the end of a data block. The transmission abort returns RJE80 to idle state. When RJE80 aborts a transmission, the receiving file is left in an indeterminate state depending on how much of the message sequence the receiving station processed before the abort.

**ACTION.** Contact the remote station operator to determine why the operator aborted the transmission.

### *SENDER DISCONNECTED LINE*

**SIGNIFICANCE.** RJE80 displays this message at the receiving station when the sending station disconnects the line instead of continuing a transmission sequence. The line disconnect returns RJE80 to an idle state.

**ACTION.** To communicate with the remote station you or the remote station operator must dial up the other station to reconnect the line.

### *SENDER FAILED TO CONTINUE TRANSMISSION*

**SIGNIFICANCE.** RJE80 displays this message when your CAM program interprets an interruption in a remote station transmission as a transmission error. RJE80 then returns to an idle state. Pregenerated RJE80 programs interpret a 9-second delay as an error condition. User-defined CAM programs interpret a delay of  $1/2tn$  seconds as an error condition.

t = the CAM retry value in half-second ticks (selected during CAM generation)

n = the CAM retry count (selected during CAM generation)

### *STATION NOT SELECTED*

**SIGNIFICANCE.** RJE80 displays this message when you attempt to transmit without awaiting a "select" (authorization for transmission) from the master station.

**ACTION.** This message commonly appears when you generate your RJE80 program as a point-to-point station and attempt to transmit to a multipoint station. Edit the RPOLL.SR file to define your station as a multipoint slave station.

### *SYSTEM ERROR*

**SIGNIFICANCE.** RJE80 displays this message when it encounters problems related to the operating system that keeps RJE80 from functioning properly and that RJE80 cannot correct.

**ACTION.** If the problem reoccurs, consult documentation for your operating system.

### *T END*

**SIGNIFICANCE.** RJE80 status. RJE80 displays this message when it completes a message transmission.

### *T OPEN*

**SIGNIFICANCE.** RJE80 status. RJE80 displays this message when it begins a message transmission.

### *TRANSMISSION ABORTED BY OPERATOR*

**SIGNIFICANCE.** RJE80 displays this message to acknowledge a properly entered CTRL-A. The CTRL-A causes RJE80 to terminate a transmission in progress.

### *\$TTI READY*

**SIGNIFICANCE.** Status of the communications link. RJE80 displays this message when it is ready to accept commands from the console.

## CAM Condition Codes

Please note that the following is not an exhaustive list of CAM conditions codes. It includes only those codes most likely to appear when you use CAM and RJE80. For an exhaustive listing of CAM error codes, see the *Communications Access Manager's Reference Manual*.

**2000**

**SIGNIFICANCE.** CAM displays this code when you enter an invalid device code for the DCU or multiplexor during CAM generation.

**ACTION.** You must regenerate the CAM program and enter a valid device code.

**2001**

**SIGNIFICANCE.** CAM displays this code when the DCU or multiplexor CAM attempts to use to make a call is already in use.

**ACTION.** CAM attempts to use the physical device corresponding to the device code you entered during CAM generation. If the device is not available, and cannot be made available, you should regenerate CAM to use another device.

**2003**

**SIGNIFICANCE.** CAM displays this code when it attempts to access a line that had no logical line number assigned to it during CAM generation. (RJE80 requires that CAM use logical line 0.)

**ACTION.** Regenerate CAM according to the instructions in Chapter 5 and specify logical line 0.

**2006**

**SIGNIFICANCE.** CAM displays this code when it attempts to make a call and the [remote] modem is not receiving (if the Data Set Ready signal indicating connection is low).

**ACTION.** CAM cannot establish contact with the remote station until you or the remote operator connects the line.

**2011**

**SIGNIFICANCE.** CAM commonly displays this code when it encounters a possible DCU hardware or software failure.

**2012**

**SIGNIFICANCE.** CAM displays this code when communications buffers, which it needs to read data to or write data from, are not available.

**ACTION.** Regenerate CAM according to the instructions in Chapter 5. In answering the NUMBER OF SYNCHRONOUS COMMUNICATIONS BUFFERS question, specify a greater number of buffers for CAM use than previously allocated.

**2013**

**SIGNIFICANCE.** CAM displays this code when you specified an incorrect number of buffers for CAM use during CAM generation, or when the blocks of data sent by the remote site are too large.

**ACTION.** Refer to your generation log file to determine how many buffers you allocated for CAM operation. Regenerate CAM and specify a greater number of buffers than previously allocated.

2014

**SIGNIFICANCE.** CAM displays this code when it is unsuccessful in establishing communications with the remote site. The code appears only after CAM retries the communication the number of times you specified as your answer to the CAM generation question **RETRY COUNT**. Trouble with the communications link or with the remote station itself can cause a transmission to fail.

**ACTION.** When repeated attempts to communicate fail, regenerate your RJE80 program to select a larger "retry count". If the larger retry count does not correct the condition, check the communications link and the remote station for hardware problems.

2022

**SIGNIFICANCE.** CAM displays this code when there is no stack space available for CAM use.

**ACTION.** Regenerate CAM according to the instructions in Chapter 5. You must specify at least two stacks for RJE80 operation.

2023

**SIGNIFICANCE.** CAM displays this code when your remote site operator requests that you disconnect the link.

**ACTION.** If this condition occurs without operator intervention check for software and hardware failures.

End of Appendix

# Appendix B

## Output Format Controls

RJE80 uses output format records to define a message's vertical and horizontal tab format. The output format records included with your RJE80 release media are good for most RJE80 applications.

This appendix defines the standard Data General vertical and horizontal output control format records and shows you how to define nonstandard vertical formats.

### Horizontal Format Control

You cannot control how your RJE80 station formats horizontal tabs in received records. Your station uses a horizontal tab format record included with your RJE80 release media unless the remote station sends a horizontal tab format record as part of its transmission.

When the RJE80 receiving station reads a tab stop, it moves to the next tab position as defined in the horizontal tab format record before writing more data to the list or punch file. For example, when the sending station uses the default horizontal tab format record, the receiving station skips up to 8 spaces after it reads a tab stop character. (The default record defines tabs at 8-space intervals for lines up to 80-characters long.) The default horizontal format record stays in effect until RJE80 receives a new horizontal tab format record inserted in a received file.

### Vertical Format Control

You can control how your RJE80 application controls the vertical formatting when it receives records.

On IBM 2780 and 3780 devices, a carriage control tape mechanically regulates vertical formatting. The tape is divided into 12 columns, called channels. Each channel has a hole punched in it corresponding to the location of a vertical tab stop. When the printer encounters a vertical tab command, it performs a channel skip by moving to the page form location corresponding to the proper hole in the carriage control tape before writing more data.

RJE80 stations set vertical formats for received records using vertical format control (VFC) tables. The tables define channel locations in memory. When RJE80 reads a vertical tab character, it moves to the form location defined in the vertical format control table currently in memory.

Figure B-1 shows the channel locations of RJE80's default VFC table, Table F1. Table F1 is located in the source unit CTAB.SR. The F1 vertical format settings serve most DG-to-DG communications needs.

Channel:	contains a "hole" on line:
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	63

DG-0342

Figure B-1. Data General default values for vertical forms control

## Defining Vertical Format Control Tables

Use the RJE80 assembly language macros CCTIT and CCTAB to supplement the default VFC table with one or more of your own.

The first step in defining your own VFC table involves editing in the CCTIT macro using the following format:

CCTIT form-ID form-length print-length

For the first argument, form-ID, enter any two alphanumeric characters. The macro uses these characters as the name of your VFC table.

For the second argument, form-length, specify the total number of printable lines on a form, which is the total number of lines on the form minus the lines at the top and bottom of the form that are not printed on. (See Figure B-2.)

For the third argument, print-length, specify your line printer form size in printable lines. Print length includes the total number of printable lines on the form plus any lines above and below the form that are not printed on. (You do not need to enter this value when using the Data General standard page form described below.)

Figure B-2 shows a standard Data General line printer page form. It has a form length of 63 lines. Three lines at the bottom of the page are not printed on. This means that the form length is the total number of lines (66) minus three nonprintable lines, or 63 printable lines.

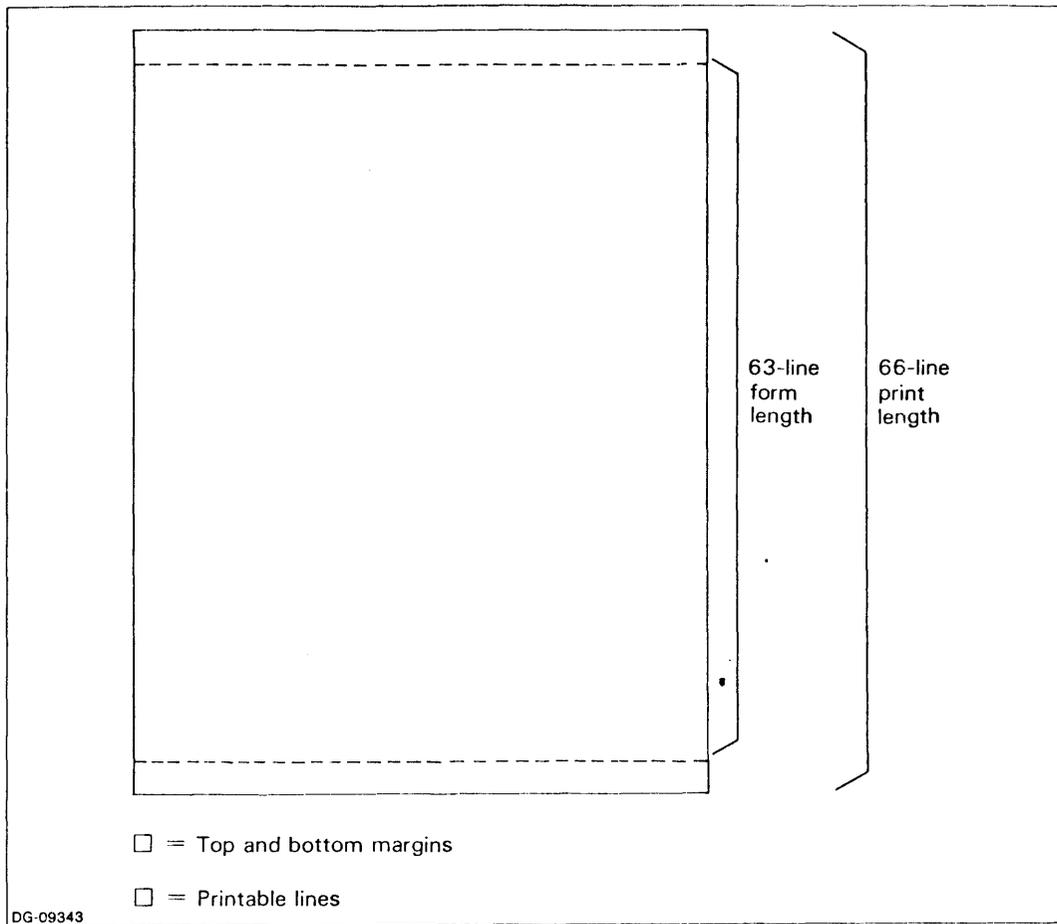


Figure B-2. Standard Data General form and page lengths

When you finish entering the CCTIT line to define the name and format parameters of your form, enter the CCTAB lines that define the contents of your form. CCTAB defines each of the 12 channel locations on your form.

Channel 1 defines the top of form, which is the first printable line on a form. Channel 12 defines the bottom of form, which is the last printable line on the form. When the printer finishes printing on the line defined as channel 12, it performs a form feed and advances to channel 1 (the top-of-form location) on the next page. Channels 2 through 11 define vertical tabs on the form.

To define a channel skip or channel skips for a line location, enter a CCTAB line using the format:

CCTAB line-number [channel-number(s)]

The first number is the line location on a page (for example, 10 lines down on the 63-line standard Data General form) and the second and optional following arguments are the channel numbers you assign to that argument's line location.

You can define less than 12 vertical tab stops by assigning some lines to more than one channel. The total number of assigned channels, however, must equal 12.

The command line

```
CCTAB 10 3 4 5
```

means that the tenth line on the form is the location of the third, fourth and fifth vertical tabs. Enter the CTAB line as many times as you need to assign line locations to all 12 channel stops.

When you specify line locations for all 12 channel stops on a form, you can enter the CCTIT macro without arguments to close the VFC table, or you can enter any additional VFC tables you need. When you define multiple tables, enter a single CCTIT line without arguments at the end of the text file to close all tables at once.

Figure B-3 shows the CCTIT and CCTAB lines used to define multiple VFC tables. (The first example is a copy of the VFC Table F1 released with RJE80 media.)

The first CCTIT line names Table F1, the Data General release VFC table. It defines a form length of 63 printable lines and a print length (a default value not entered as an argument) of 63 lines. The CCTAB macro specifies 11 vertical tab locations spaced at one-line intervals and a twelfth tab location, specifying the bottom of the page, at line 63.

The second CCTIT line names the second table F2 and defines a nonstandard form having a form length of 9 lines and a print length of 31 total lines. The file specifies only 4 tab locations: the top and bottom of the page (channel skips 1 and 12) and 2 tab locations within the page, at lines 3 and 5.

The third CCTIT line closes both VFC tables.

The edited forms table or tables must be assembled and bound into a new RJE80 application. Enter the command line:

```
MAC CTAB <CR>
```

When the MAC utility signals the presence of errors in the construction of your table(s), re-edit and reassemble the file following the procedure outlined above. When your system successfully completes the MAC process, it returns control to the CLI. Generate a new RJE80 application to include your new vertical output format line. (Use the log file created when you originally generated your application to review your program configuration before regenerating.)

## Changing Vertical Format during RJE80 Operation

To change the vertical format of data received to your station, enter the command line:

```
FS argument
```

Argument is the name of the Vertical Format Control form you create following the instructions in this appendix.

**Defining Table F1**

CCTIT F1 63

CCTAB 1 1

CCTAB 2 2

CCTAB 3 3

CCTAB 4 4

CCTAB 5 5

CCTAB 6 6

CCTAB 7 7

CCTAB 8 8

CCTAB 9 9

CCTAB 10 10

CCTAB 11 11

CCTAB 63 12

**Defining Table F2**

CCTIT F2 9 31

CCTAB 1 1

CCTAB 3 2

CCTAB 5 3 4 5 6 7 8 9 10 11

CCTAB 9 12

CCTIT

DG-26123

*Figure B-3. Defining vertical format tables*

End of Appendix

# Index

Within this index, "f" or "ff" after a page number means "and the following page" (or "pages"). Commands, calls, and acronyms are in uppercase letters (e.g., CREATE); all others are lowercase.

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# Data General Users group

## Installation Membership Form

Name \_\_\_\_\_ Position \_\_\_\_\_ Date \_\_\_\_\_

Company, Organization or School \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone: Area Code \_\_\_\_\_ No. \_\_\_\_\_ Ext. \_\_\_\_\_

### 1. Account Category

- OEM  
 End User  
 System House  
 Government

### 5. Mode of Operation

- Batch (Central)  
 Batch (Via RJE)  
 On-Line Interactive

### 2. Hardware

	Qty. Installed	Qty. On Order
M/600	_____	_____
MV/Series ECLIPSE*	_____	_____
Commercial ECLIPSE	_____	_____
Scientific ECLIPSE	_____	_____
Array Processors	_____	_____
CS Series	_____	_____
NOVA* 4 Family	_____	_____
Other NOVAs	_____	_____
microNOVA* Family	_____	_____
MPT Family	_____	_____

Other \_\_\_\_\_  
 (Specify) \_\_\_\_\_

### 6. Communication

- HASP       X.25  
 HASP II     SAM  
 RJE80       CAM  
 RCX 70      XODIAC™  
 RSTCP       DG/SNA  
 4025        3270  
 Other

Specify \_\_\_\_\_

### 3. Software

- AOS           RDOS  
 AOS/VS       DOS  
 AOS/RT32    RTOS  
 MP/OS        Other  
 MP/AOS

Specify \_\_\_\_\_

### 7. Application Description

○ \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### 4. Languages

- ALGOL       BASIC  
 DG/L        Assembler  
 COBOL      FORTRAN 77  
 Interactive  FORTRAN 5  
                    COBOL     RPG II  
 PASCAL     PL/1  
 Business    APL  
                    BASIC     Other

Specify \_\_\_\_\_

### 8. Purchase

From whom was your machine(s) purchased?

Data General Corp.

Other

Specify \_\_\_\_\_

### 9. Users Group

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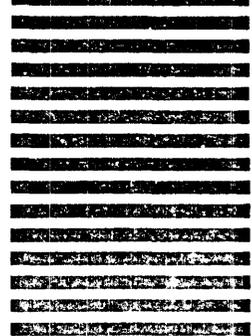
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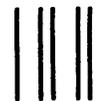
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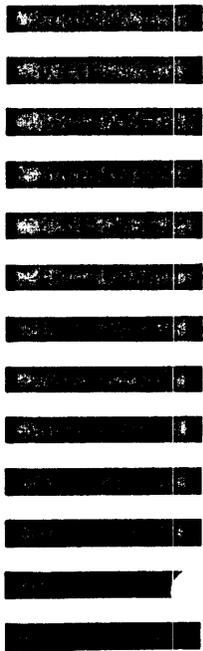
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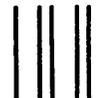
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