Data General

SNA/RJE Operator's and User's Guide

SNA/RJE
Operator's and
User's Guide

093-000301-00

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

NOTICE

SNA/RJE
Operator's and
User's Guide
093-000301

Preface

This manual is the complete guide to running and using the SNA/RJE product. If you are an operator — by this we mean someone who controls and supervises the SNA/RJE product — we will show you how to load, configure, start, operate, and shut down SNA/RJE. If you are a user — someone who wants to send data over a Systems Network Architecture network to a Remote Job Entry subsystem — we will show you how to send files and specify destinations for the files through SNA/RJE.

We assume that you are familiar with any International Business Machine (IBM) equipment or software that you wish to use. We also assume some familiarity with Data General equipment and software. SNA/RJE operators should be familiar with the Advanced Operating System (AOS) or the Advanced Operating System/Virtual Storage (AOS/VS), the AOS or AOS/VS Command Line Interpreter (CLI), the CLI EXEC facility, AOS or AOS/VS directory structures, directory and file access control, and EXEC spoolers. SNA/RJE users should be familiar with AOS or AOS/VS directory and file structures, AOS or AOS/VS pathnames, and EXEC spoolers.

Explaining these prerequisite topics is beyond the scope of this manual. If you find that you need more information on the topics, please refer to the sources that we list below. You should then be able to use this manual.

Sources

In this section, we list sources for information that is beyond the scope of this manual. To find a source on a particular topic, first find the appropriate category — SNA, DG/SNA products, or AOS or AOS/VS. Then examine the topic summary after each source and choose the source that best fits your needs.

SNA Sources

In this manual, you will find all the information on Systems Network Architecture (SNA) that you need to operate and use SNA/RJE. But if you would like to read more about SNA, you will find the sources listed below useful.

Cypser, R.J. *Communications Architecture for Distributed Systems.* Reading, MA: Addison-Wesley, 1978. Cypser spends some time discussing networks for distributed systems, then enters a very detailed discussion of SNA.

Systems Network Architecture Format and Protocol Reference Manual: Architectural Logic. IBM #SC30-3112-1. This manual describes all the SNA formats and protocols, or the "rules of conversation" in an SNA network.

Systems Network Architecture General Information. IBM #GA27-3093. This manual provides an overview of SNA.

DG/SNA Related Sources

In this section, we list sources for the DG/SNA product and other related products.

APILU2 Reference Manual 093-000302. A guide to the DG/SNA product's high level language interface. This manual tells you how to write applications programs that use DG/SNA to send and

receive data over an SNA network. You may write the programs in COBOL, FORTRAN, PL/1, or assembly language.

DG/SNA Operator's Guide 093-000283. A guide to operating the DG/SNA product. This book tells you how to load, generate, configure, start, and control the DG/SNA product. It also tells you how to use DG/SNA utilities such as Autoproc.

DG/SNA Reference Manual 093-000282. A guide to the DG/SNA product assembly language interface. This book tells you how to write assembly language application programs that use DG/SNA to send and receive data over an SNA network.

DG/3278 User Terminal Guide 093-000284. A guide to using the 3278 terminal emulator, which is part of the SNA/3270 product. This book explains the functions, and uses, of your terminal keys when you use SNA/3270.

SNA/3270 Operator's Guide 093-000287. A guide to operating the SNA/3270 product. This book tells you how to load, generate, configure, start, and control the SNA/3270 product.

AOS Sources

In this section, we list sources for operating and using the Advanced Operating System (AOS) and for programming in assembly language under AOS.

AOS Debugger and Disk File Editor User's Manual 093-000195. Describes the AOS Debugger, the Disk File Editor (DEDIT), and their uses in testing and debugging programs (.PR files in AOS).

AOS Library File Editor User's Manual 093-000198. Describes the AOS Library File Editor.

AOS Link User's Manual 093-000254. Describes the AOS Link utility.

AOS Macroassembler Reference Manual 093-000192. Contains information about the AOS Macroassembler, its macro facility, and the pseudo-ops necessary to assemble and bind a program under AOS.

AOS Programmer's Manual 093-000120. Details process and task concepts, intertask and interprocess communications, file structures, directory structures, file and peripheral I/O, and all system calls. Describes EXEC.

Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS) 093-000122. Describes the Command Line Interpreter and its uses.

Introduction to the Advanced Operating System (AOS) 069-000016. A general introduction to AOS.

AOS/VS Sources

In this section, we list sources for operating and using the Advanced Operating System/Virtual Storage (AOS/VS) and for programming in assembly language under AOS/VS.

AOS/VS Debugger and File Editor User's Manual 093-000246. Describes the AOS/VS Debugger, the Disk File Editor (DEDIT), and their uses in testing and debugging programs (.PR files in AOS/VS).

AOS/VS Link and LFE User's Manual 093-000245. Describes the AOS/VS Link utility and the Library File Editor (LFE).

AOS/VS Macroassembler Reference Manual 093-000242. Contains information about the Macroassembler, its macro facility, and the pseudo-ops necessary to assemble and bind a program under AOS/VS.

AOS/VS Programmer's Manual 093-000241. Details process and task concepts, intertask and interprocess communications, file structure, directory structure, file and peripheral I/O, and all system calls. Describes EXEC.

Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS) 093-000122. Describes the Command Line Interpreter and its uses.

Organization of the Manual

The first two chapters describe how SNA/RJE relates to both the DG/SNA family of products and SNA. These chapters give you all the background — other than the prerequisites we mentioned earlier in the preface — that you need to use SNA/RJE. Chapters 3 and 4 concentrate on configuring and starting SNA/RJE. The fifth chapter covers using SNA/RJE and the SNA/RJE commands. The first two appendixes provide a glossary and a list of error and status messages that you can receive from SNA/RJE.

Chapter 3 provides information on optional facilities that you can configure into SNA/RJE. Much of the material covered requires a knowledge of assembly language programming. Teaching assembly language programming is beyond the scope of this book. To learn more about assembly language, please see the sources listed earlier in the preface.

If you are the SNA/RJE operator, you should read the entire manual. Be sure to read the material on optional facilities in Chapter 3 before reading Chapter 4, since you must configure the facilities into SNA/RJE if you wish to use them.

If you are an SNA/RJE user, you should read the Preface, Chapters 1 and 2, and Chapter 5 through the description of the QSNA command. You need not be concerned by any other material in the manual.

Chapter 1	Introduces the SNA/RJE product and its place in the DG/SNA family of products.
Chapter 2	Describes SNA structure and the role of an RJE subsystem. Includes such topics as: Physical Units and Logical Units, sessions, profiles, Request/Response Units, data flow for an RJE subsystem, mediums and subaddresses, data compression/expansion, data compaction, and Hollerith codes.
Chapter 3	Describes three optional facilities: the Peripheral Data Information Record (PDIR) facility, the user exit routine facility, and the facility for providing your own translation tables between EBCDIC and ASCII. Much of the material in this chapter requires a knowledge of assembly language programming. For more information on assembly language programming, see the appropriate sources listed earlier in the Preface. Appendix C contains a sample user exit routine.
Chapter 4	Describes how to load and start SNA/RJE. Includes configuring the product to your needs.
Chapter 5	Describes how to use the SNA/RJE commands and the EXEC interface. Also gives a command summary for each SNA/RJE command.
Appendix A	A glossary of SNA, RJE, DG/SNA, and SNA/RJE terms.
Appendix B	Lists messages you can receive from the system, including status and error messages.
Appendix C	Provides a copy of the sample user exit routine that appears on the SNA/RJE product tape. The sample is meant to help you understand the user exit routine description in Chapter 3.

End of Preface

Contents

Chapter 4 - How to Load, Configure, and Start SNA/RJE

Chapter 5 - SNA/RJE Commands

Appendix A - Glossary

Appendix B - SNA/RJE Messages

Appendix C - Sample User Exit Routine

093-000301-00

Tables

Illustrations

Chapter 1
Introduction to SNA/RJE

SNA/RJE allows you to submit batch work to a Remote Job Entry (RJE) subsystem from an AOS or AOS/VS operating system. SNA/RJE submits the work over a Systems Network Architecture (SNA) network. An SNA network is a method of controlling communications among computers and intelligent devices. SNA connects the computers and devices to a central computer called a host.

Information can flow over communication lines between computers on the network with the host controlling all communications. In addition, a network can connect hosts together, so that a computer or device connected to one host can communicate with a computer or device connected to another host.

SNA/RJE connects to an SNA network through products in the DG/SNA family of products.

The DG/SNA Family of Products and SNA/RJE

The DG/SNA family of products is a group of products that allows an AOS or AOS/VS operating system to communicate with an SNA network. Some of the products in the DG/SNA family provide the interface between a Data General computer and the network. Other products offer special applications for the SNA network. Please see Figure 1-1.

```
User programs
in high-level
language
```

```
APILU2        SNA/3270      SNA/RJE       User-written
Interface     Product       Product       programs
                                          using DG/SNA
```

```
DG/SNA Product
```

```
DG/SDLC Product
```

```
Physical Interface to SNA Network
```

DG-15360
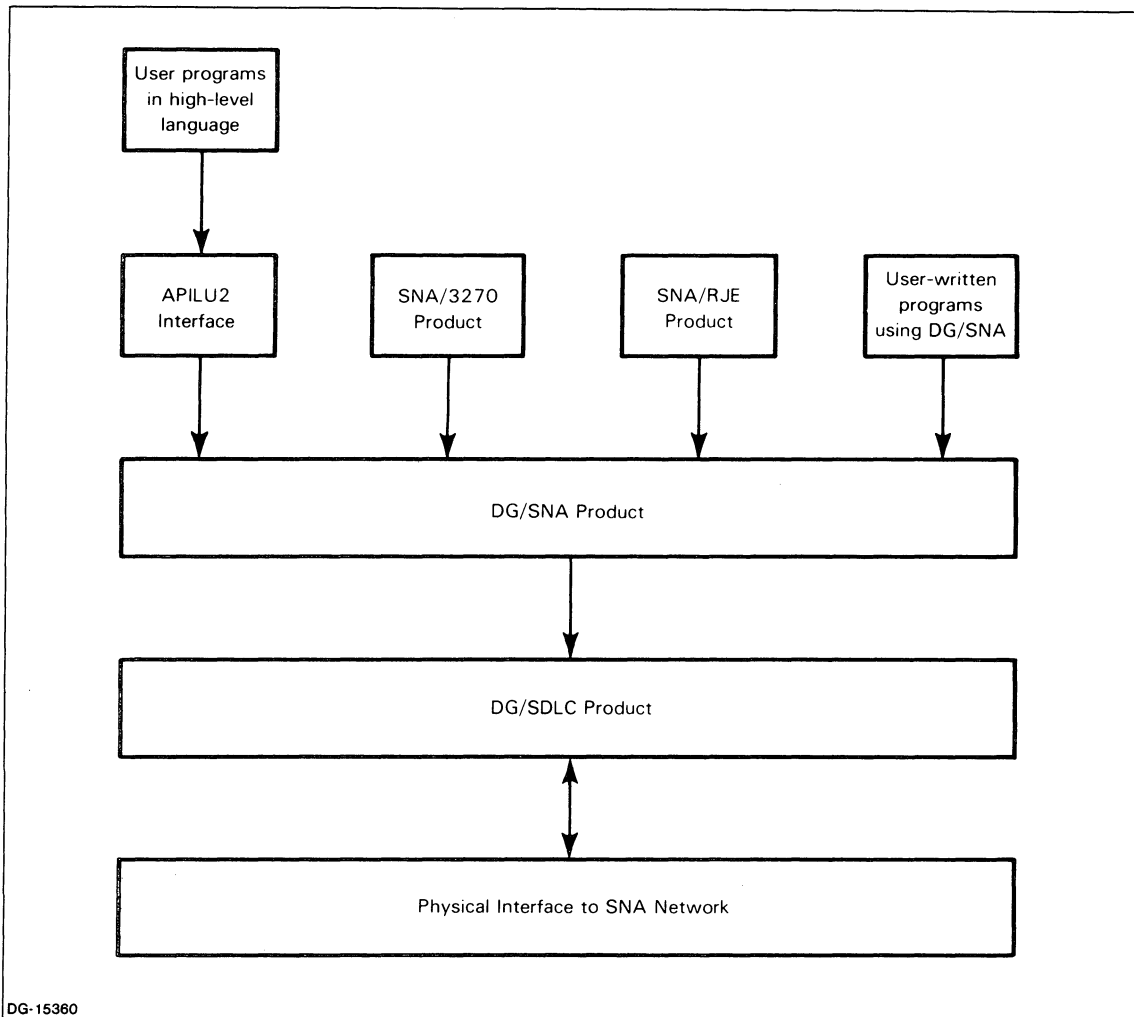
Figure 1-1. The DG/SNA Family of Products

The DG/SNA and DG/SDLC products, acting together, provide the interface between your computer and the SNA network. The DG/SNA product manages the exchange of information between the network host and application programs running under AOS or AOS/VS. DG/SDLC actually sends and receives information over the communications lines attached to your computer.

SNA/RJE and two members of the DG/SNA family of products that appear in Figure 1-1 — SNA/3270 and APILU2 — are applications packages that use the DG/SNA product. All three are concerned with the *contents* of data traveling over the network.

SNA/3270 uses your terminals and printers to emulate IBM 3278 terminals and 3289 printers. The APILU2 product is a high-level language interface to the DG/SNA product.

SNA/RJE provides an interface to a Remote Job Entry subsystem on an SNA network host.

What is SNA/RJE?

SNA/RJE lets you submit batch jobs to a Remote Job Entry (RJE) subsystem running on your network host. SNA/RJE directs data between your host and AOS or AOS/VS files or devices on your Data General computer. The data travels on up to six communication channels. We call the communication channels *streams*. A stream is a communication channel between the host and an AOS or AOS/VS file or device.

SNA/RJE submits jobs over streams for remote processing, receives output from the jobs, and directs the output to the proper device(s) (e.g., a line printer). SNA/RJE also allows you to send RJE processing commands to the host subsystem. Your AOS or AOS/VS operating system allows you to perform additional functions such as manipulating files and devices, transfering data between devices and files, and reading a message file (see the appropriate sources listed in the Preface).

SNA/RJE can also take data from different devices and files and send the data over a single stream. You provide a series of data sources to SNA/RJE, which then works through the series, attaching the beginning of the data from each source to the end of the data from the preceding source. After connecting the data from the sources, SNA/RJE sends the resulting block of data to the host.

Because the host expects EBCDIC data, SNA/RJE can translate from the ASCII format of AOS or AOS/VS files and devices to EBCDIC. SNA/RJE also accepts data from card readers, and so must translate from Hollerith code — a 12-bit code that card readers use — to EBCDIC. Because the host sends data in EBCDIC and both AOS and AOS/VS use ASCII, SNA/RJE can also translate EBCDIC data into ASCII.

SNA/RJE also accepts two special types of data from the host — compressed and compacted. SNA/RJE can handle both types of data in a way that is transparent to you, or can allow you to handle both types of data directly. For more information on compressed or compacted data, please see Chatper 2.

The host refers to files and devices by associating each with a *medium* and *subaddress*. A medium is a class of device and a subaddress refers to a certain devices in a medium. SNA/RJE recognizes the five RJE mediums: card readers, card punches, disk files, printers, and consoles. SNA/RJE also recognizes up to 16 subaddresses for any medium.

SNA/RJE performs most job processing tasks offered by a variety of IBM RJE subsystems. Although not identical to any one IBM RJE workstation, SNA/RJE offers most of the capabilities of an IBM 3776 or 3777 Multiple Logical Unit terminal. By this, we mean that SNA/RJE can manage multiple communications with the network host. SNA/RJE together with DG/SNA acts as a Physical Unit type 2 (cluster controller) that supports type 1 Logical Units (a network interface for such devices as terminals, card readers and punches, and line printers). For more information, please see Chapter 2 and the appropriate sources listed in the Preface.

The SNA/RJE product also provides functions *not* found in IBM RJE workstations, such as an EXEC interface, a user exit routine facility, the ability to run in either attended or unattended mode, the initial command file, and the message log file. We describe these features below.

SNA/RJE's EXEC Interface

The most important SNA/RJE feature is the EXEC interface. The EXEC interface allows anyone using SNA/RJE to send data to the host with a special Command Line Interpreter (CLI) command, QSNA. The QSNA command submits a transfer of data to the host as a job to an SNA queue.

The SNA/RJE EXEC interface supports the full range of EXEC commands. You can use the AOS or AOS/VS EXEC facility to control the execution of any job you submit with the QSNA command. In addition, EXEC will *queue* SNA/RJE jobs. If EXEC receives a number of SNA/RJE jobs intended for one stream, EXEC will hold the jobs in order. It processes each job in turn according to the job's queue priority, its time of scheduling, and the availability of the stream. SNA/RJE can operate under and use multiple EXEC queues.

The SNA/RJE EXEC interface also supports use of the ?EXEC program. For more information on EXEC and the ?EXEC program, see the appropriate sources listed in the Preface.

User Exit Routine Facility

The user exit routine facility allows you to intercept and modify data that the host is sending to a particular device or file. You can modify the data and direct it to an AOS or AOS/VS file. You can base the filename on the data that your intercept.

Attended/Unattended Mode

SNA/RJE can run with or without the presence of an operator. SNA/RJE can run in attended mode, notifying the operator in the case of any trouble. While an operator will provide greater flexibility in controlling data flow, SNA/RJE can respond to any situation when in unattended mode. For more information, see chapter 4.

Initial Command File

The initial command file feature lets you create a file containing SNA/RJE commands. When you start SNA/RJE, the program will execute the commands listed in the initial command file.

You can use the initial command file feature with DG/SNA's Autoproc feature (see the appropriate sources listed in the Preface). The DG/SNA operator can create a Logical Unit Group (see Chapter 2) with Autoproc. When the host activates a Logical Unit of the Logical Unit Group, or places the Logical Unit in an LU-LU session (see chapter 2 again), DG/SNA automatically starts a specific process. The process can be SNA/RJE, so that when the host activates a particular Logical Unit, DG/SNA starts SNA/RJE.

By using the initial command file feature with Autoproc, DG/SNA will start SNA/RJE which, in turn, will execute the series of commands in the initial command file. In other words, you can have SNA/RJE perform a series of instructions when the host activates a Logical Unit in a particular Logical Unit Group.

Message Log File

The message log file contains messages that the host has sent to the SNA/RJE operator console. The log file keeps only the most recent messages. When starting SNA/RJE (see Chapter 4), the operator can allow the log file to grow with the number of messages it receives or can specify a maximum size for the log file. If the log file has a maximum size, new messges displace old messages as the file becomes full. You read the file as you would any AOS or AOS/VS file. You decide whether to use the message log file utility.

End of Chapter

 093-000301-00

Chapter 2
Systems Network Architecture (SNA)
and Remote Job Entry (RJE)

SNA/RJE uses a Systems Network Architecture (SNA) network to exchange data between an AOS (or AOS/VS) operating system and an IBM Remote Job Entry (RJE) subsystem. This chapter provides the information on SNA and RJE that you need before you can use SNA/RJE.

We will examine both SNA and RJE terms and concepts in this chapter. We will also examine the SNA rules of conversation that govern how SNA/RJE and an RJE subsystem can exchange data. A complete and thorough discussion of either SNA or RJE is beyond the scope of this book. While we provide all the information you need, you can refer to the sources listed in the Preface for more information.

We will begin our discussion with some SNA concepts.

Systems Network Architecture

Systems Network Architecuture (SNA) is an IBM-developed networking method. Networking is a way of allowing computers to talk with one another. A network consists of a group of computers and a way of moving information between them. Information moves over data communication lines according to rules called protocols. SNA is one particular plan for controlling the information flow between computers over data communication lines. Because SNA provides methods of controlling communications and of connecting computers and devices, it is called an *architecture*.

You can think of an SNA network as a collection of computers, devices, communication lines, and programs. One computer is a central computer that controls the network. The other computers are local computers (these may be intelligent terminals) on which people work. The communication lines connect the computers. Programs control the data flow in the network. Every computer in the network houses a collection of these controlling programs; we call the collection of programs a *node*.

The central computer generally contains common application programs and databases. SNA allows people who might be geographically separated to use the central computer. People can work on local computers and exchange information with the central computer over the SNA network. Programs and devices can also exchange information over an SNA network. We call anyone or anything that can send or receive information over the network an *end user*.

Under SNA, end users exchange information in specially formatted packages, called *Request/Response Units*, or RUs. Request/Response Units carry either data or commands affecting data flow. In addition to the data or command, a Request/Response Unit carries other control information that can affect data flow or instruct the end user to treat the contents of the Request/Response Unit in a particular way.

End users send and receive Request/Response Units over the network through nodes. An end user does not directly send or receive information over the network. Rather, the end user directs the network software in the node to send and receive the information.

So, a network is a collection of computers and communication lines connecting the computers. End users exchange data with one another through nodes. Nodes are collections of programs that control the network. To control the network, the nodes need a way of referring to physical devices in the network, network software, end users, and other nodes. The nodes refer to these parts of the network through

network addresses. A network address is a code identifying a device, a piece of software, or an end user. Anything in the network that has a network address is called a *Network Addressable Unit*.

In the following subsections, we describe three types of Network Addressable Units: Physical Units, Logical Units, and Systems Service Control Points. We also describe sessions and profiles and how they control communications between two end users. In the final subsection, we describe Request/Response Units, the actual messages moving in an SNA network.

A node does not itself have a network address. But the node has a "doorway" into the network, called a *Physical Unit*, which does have a network address.

Physical Unit

A Physical Unit (PU) is a node's interface to the network. The node sends and receives data, packaged in Request/Response Units, through the Physical Unit. The nodes refer to other nodes by the appropriate Physical Units. So, the network recognizes Physical Units rather than nodes. Because the network refers to Physical Units, we will use the terms Physical Unit and node interchangeably. There are four different types of Physical Units in an SNA network: type 5, type 4, type 2, and type 1 PUs. There is no type 3 PU. Each node controls communications to a different extent.

A type 5 PU establishes communications between end users and monitors the network. A type 5 PU is also called a *host*. A type 4 PU is a communications controller. It provides routing and line-handling for information passing between computers. Type 4 PUs can direct messages from a less powerful PU to the message's final location on the network. Type 2 PUs, or cluster controllers, are local computers. They direct messages from the least powerful PUs to final locations. The least powerful PUs are type 1 PUs, or terminal nodes. They control terminals and printers.

The Physical Units are the parts of the network that people use. You should think of them as computers, which by coincidence can talk with one another. You will have your Physical Unit send files for batch processing to the proper location on your network host.

Logical Units

A Logical Unit (LU) is an end user's door into an SNA network. But an LU exists much the same way a program exists when it is running, rather than as a physical door. You cannot point to a physical part of the network and say, "This is a Logical Unit." But you can talk to your Logical Unit through your computer, which keeps track of the logical location of the LU.

The SNA network knows where your LU is; the host can send information to your LU or receive information from your LU. So when you want to exchange information with another end user on the network, you send and receive the information through your LU. You can visualize your LU as a mailbox. The postman (the SNA network) can deliver mail (information) to your mailbox (LU). You examine your mailbox for the mail. And you can leave mail in your mailbox addressed to someone else (another end user). Your postman will take the mail from your mailbox and deliver it to the other person.

When Logical Units exchange information on behalf of their end users, they must follow special conversation rules of the networks. The rules that a Logical Unit follows are the *characteristics* of the Logical Unit. We classify LUs into *types*, according to their characteristics. Under SNA/RJE, you will use only one type of Logical Unit, a Logical Unit type 1. A Logical Unit type 1 can control communications for a variety of devices, such as terminals, card readers and punches, and line printers. While the device is technically the end user, you are the ultimate source of or destination for any communications.

Under AOS or AOS/VS, you receive the use of an LU by asking DG/SNA to assign one to you. You do not, however, ask for a particular Logical Unit. The DG/SNA operator places Logical Units in Logical Unit Groups (LUGs). A Logical Unit Group is a collection of Logical Units that have identical characteristics. Logical Unit Groups can differ from each other in the characteristics of the Logical Units they contain or in their access control lists (ACLs). Using the access control list, the DG/SNA

operator may restrict use of a Logical Unit Group to particular individuals. When you ask for a Logical Unit, you are actually asking for any Logical Unit from a particular Logical Unit Group.

Systems Service Control Point

Software in the host controls all communications in the network. The Systems Service Control Point (SSCP) is a Network Addressable Unit that acts as a doorway into the network for this control software, much as Logical Units and Physical Units act as doorways for end users and nodes. The SSCP arranges for communications between two end users. One end user asks the SSCP to speak to a second end user. If the second end user agrees to communicate, the SSCP establishes a connection, called a *session*, between the two end users.

Session

When two end users exchange information over an SNA network, they do so in a session. A session is a temporary logical connection between two Network Addressable Units (NAUs). The NAUs agree to rules governing the conversation before they begin talking.

Sessions can occur between two SSCPs, between two Logical Units, between an SSCP and a Logical Unit, and between an SSCP and a Physical Unit. You will be involved only with sessions between two Logical Units and sessions between an SSCP and a Logical Unit. We refer to a session between two Logical Units as an LU-LU session. A session between an SSCP and a Logical Unit is an SSCP-LU session. You communicate to another end user in an LU-LU session. You use an SSCP-LU session to send a log on or log off request to a subsystem on the host or to exchange control information or status information.

We said that two NAUs agree to rules of conversation before a session begins. Specifically, they both agree to abide by special groups of conversation rules, called *profiles*.

Profiles

SNA governs communications between end users with groups of rules called profiles. There are two kinds of profiles. A Transmission Services (TS) profile specifies certain allowable control messages and the largest allowable message size. A Function Management (FM) profile indicates if chains and brackets (see "Request/Response Units") are allowed. The FM profile also specifies additional allowable control messages.

Many combinations of communication rules are possible. SNA recognizes only a few such combinations, or groups, as profile *types*. Different Logical Unit types require different types of profiles. A Logical Unit type 1 demands either type 1 FM and TS profiles or type 3 profiles. SNA/RJE supports type 3 profiles. As a user or operator of SNA/RJE, you do not have to understand the details of the profiles. SNA/RJE and DG/SNA control the details for you.

Systems Network Architecture can be confusing, with sessions and profiles, end users and Logical Units. But remember that the purpose of the network, no matter how complicated its structure, is to transfer information from one computer to another. And it is with moving information that we are really concerned.

Request/Response Units

Systems Network Architecture has rules for the format of messages, as well as rules governing conversation between two end users. Under SNA, end users send information in packages called Request/Response Units (RUs). Besides the end user's information, a Request/Response Unit contains control information and the destination for which the information is intended.

Going back to our earlier mail analogy, a Request/Response Unit is the equivalent of the letter that you send through your LU. The RU comes complete with a mailing address and a return address on the envelope. In the envelope is the information which you are sending.

There are two different types of Request/Response Units — data Request/Response Units and control Request/Response Units. Data RUs carry information from one end user to another. Control RUs are commands that affect either data flow in the network or the operation of a session. While there are many control RUs, you will only need to understand three control RUs: CANCEL, RSHUTD, and SIGNAL. We list these RUs in Table 2-1.

Table 2-1. Data Flow Control RUs

Acronym	Name	Function
CANCEL	Cancel	Used to abort the processing of a chain of RUs.
RSHUTD	Request SHUTDown	Used to request an LU on the host to issue an UNBIND RU immediately.
SIGNAL	Signal	Used to ask the host for permission to send data to the host.

Request/Response Units have a maximum length, agreed to by the end users when first entering a session. If you want to send more data than will fit into one Request/Response Unit, you can split the information among a number of Request/Response Units. When a group of Request/Response Units convey one message, we say that the group forms a *chain*. Under SNA, all RUs must travel in a chain, though a chain may be only one RU long. A chain with only one RU is a single-element chain. A chain with more than one RU is a multi-element chain.

Chains can form groups called *brackets*. Typically, a bracket is an exchange of chains between end users. A chain is a message; a bracket is a dialogue. You can view a bracket as a unit of work (e.g., submitting a job (transferring a file), updating a database, creating a record, verifying inventory). The chains in the bracket perform the work. An end user can group chains into brackets to suit his/her particular application. There can be, at most, only one outstanding bracket at one time during a session.

The only reason networks exist is to allow computers to communicate with one another. SNA is just one plan for allowing communications between computers. We have discussed all the basic SNA concepts you need to use the SNA/RJE product. In the next section, we will describe some of the concepts of *Remote Job Entry*.

RJE Subsystems

Through SNA, you can use applications programs and databases on your network's host computer. One sort of application program that a host can support is an *RJE subsystem*. Remote Job Entry (RJE) is a method of submitting batch jobs to a host over an SNA network for processing. The job could be a program to be compiled or data for any other applications program. A Remote Job Entry subsystem in the host receives the jobs and processes them by sending the jobs to the appropriate applications programs. JES2 is an example of an RJE subsystem.

You submit jobs for RJE processing at a Remote Job Entry workstation. An RJE workstation is a type 2 Physical Unit that accepts information from an end user and forwards the information to the RJE subsystem on the host. The information is the job. The source of the information can be a file, a stack of punch cards, or the input to a console. The workstation also receives the results of a job from the RJE subsystem and directs the results to a printer, a console, or a file.

Moving all the information between the workstations and the subsystem is the SNA network. The jobs from the workstations and the results from the subsystem travel over an LU-LU session. We refer to the LU-LU sessions carrying information in an RJE system as *streams*. Two LUs are associated with each stream, one LU at the workstation and one LU at the host. The host can specify what types of devices (i.e., line printers, card punches and readers, consoles, or files) the LUs may use. Since the host can associate the LUs with types of devices, it can effectively associate the stream with types of devices.

An SSCP-LU session is associated with each stream for control purposes (such as logging on or logging off the RJE subsystem). We still refer to the LU-LU session as the stream, however, because you submit the bulk of your work, batch jobs, to the LU-LU session. In the next sections, we describe data flow and data formats under Remote Job Entry.

Data Flow

Data under Remote Job Entry refers to many things: jobs that the workstations submit, results of the jobs that the RJE subsystems return, and messages or SNA control commands issued by either the RJE subsystem or the workstations.

Under Remote Job Entry, data moves in only two directions. Data can move from a workstation to the RJE subsystem on the host; we call this data *inbound. Outbound* data moves from the host to the workstation. Jobs, control information, and messages from the workstation to the host are all inbound data. Results of jobs, control information, and messages from the host to the workstation are all outbound data.

When sending data, the host directs the data to particular devices connected to the RJE workstation. The host specifies the device through the device's *medium* and *subaddress.*

Medium

A medium is a type of device. Remote Job Entry recognizes five mediums — card readers, card punches, exchanges (disk files), printers, and consoles. We abbreviate each medium as follows:

Abbreviation	Medium
C	card readers and punches
E	disk files (exchanges)
P	printers
K	consoles

Printers and card punches only accept data from the host. Card readers only send data to the host. Disk files and consoles can either send data to or receive data from the host.

Subaddress

A workstation can have up to 16 devices all of the same medium; for example, the workstation could have three line printers. Remote Job Entry distinguishes among devices in the same medium through subaddresses. A subaddress is a decimal number from 0 through 15 specifying a particular device within a medium. If a workstation had three line printers, we could refer to the printers as P 0, P 1, and P 2. P is the medium type, which is line printer; the number is the subaddress.

Data Formats

A Remote Job Entry subsystem sends and receives data in EBCDIC code, sometimes with special formatting control characters. Remote Job Entry also supports two special data formats: data compression and data compaction. The special formats allow an RJE subsystem to send and receive data more quickly than would be possible with only EBCDIC code, saving time and money.

In each format, special codes replace frequently occurring characters. The code may replace a string of repeated characters, as in data compression, or may replace pairs of characters, as in data compaction. The special code is shorter than the EBCDIC character or string of characters, permitting faster transmission.

When the data arrives at its destination, the RJE subsystem or workstation translates the data into its original form. Data expansion is the process of translating compressed data into EBCDIC data. Data decompaction is the process of translating compacted data into EBCDIC data. In the following sections, we describe data compression/expansion and data compaction/decompaction.

Data Compression/Expansion

In data compression, the host or the RJE workstation replaces a series of repeated characters by a shorter string of special code. The host or workstation can then send the data more quickly than if it had sent the entire string of repeated characters. By translating the code back into the repeated characters, the host or the workstation can expand the data. We call the translating of the special codes to the original character strings data expansion.

Data Compaction/Decompaction

Data compaction is a way of sending frequently occurring characters in a type of shorthand. Frequently occurring characters are called *master characters*. A *compaction table* associates master characters with shorthand codes, which take less time to transmit than the normal EBCDIC codes. Only the host may send compacted data; an RJE workstation only receives compacted data. The host replaces master characters with their shorthand codes. The RJE workstation receives a copy of the compaction table from the host and proceeds to translate compacted data into normal form. We call the translating of master characters into the original characters data decompaction.

End of Chapter

Chapter 3
Understanding Optional Facilities Before Configuring SNA/RJE

SNA/RJE offers several optional facilities that you can configure into an SNA/RJE program. They are:

the Peripheral Data Information Record facility

the user exit routine facility

the translation table facility

For each facility, you can use default procedures or you may provide your own. In this chapter we describe providing your own versions of these facilities. We describe use of the facilities and any steps you must take before configuring SNA/RJE.

The Peripheral Data Information Record (PDIR) Facility

The peripheral data information record (PDIR) facility lets you direct output sent by the host from certain jobs to particular AOS or AOS/VS files. To use the PDIR facility, you must understand IBM's job control language (JCL).

You select a job output from the host whose destination you will specify by examining the contents of the job's JCL JOBNAME statement. When you configure SNA/RJE, you can select a single JOBNAME or a group of JOBNAMEs. You associate with each such single JOBNAME or group an AOS or AOS/VS file pathname. You can include the contents of a job's JOBNAME statement in the file's pathname.

During the SNA/RJE configuration, you specify a JOBNAME with a *jobname template*. You specify AOS or AOS/VS file pathnames with *pathname templates*. The result is a list of jobname templates with corresponding pathname templates.

If you decide to use the PDIR facility, you must have your host operator configure PDIR into the host as well. (See the SNA/RJE Release Notice for information on how to configure your host subsystem.)

Notice that we use the terms JOBNAME and jobname. In this manual, JOBNAME always refers to the Job Control Language JOBNAME statement. The lowercase jobname is an SNA/RJE reference to a JCL JOBNAME or group of JCL JOBNAMEs.

After SNA/RJE receives output from a job, it examines the contents of the JOBNAME statement and tries to match them with a jobname template. SNA/RJE goes through the list of jobname templates and corresponding pathname templates, trying to match the JOBNAME with each jobname template in turn. When a jobname template matches the JOBNAME, SNA/RJE directs the job's output to the associated pathname specified by the pathname template. Once a JOBNAME matches a template, SNA/RJE stops examining the list for further matches.

A jobname template is a collection of jobname characters and/or character templates.

The jobname characters are:

A-Z   (uppercase alphabetic characters)

a-z   (lowercase alphabetic characters)

0-9   (numeric characters)

$ (dollar sign)

_   (underscore)

?   (question mark)

.   (period)

Character templates are characters that can stand for jobname characters. The character templates are:

*   Represents any single character but ".".

-      Represents any series of characters not containing a ".".

+   Represents any sequence of characters.

By using jobname characters and/or character templates, you can create jobname templates that stand for single JOBNAMEs or groups of JOBNAMEs. For example, all of the following jobname templates match the JOBNAME USR.JOB1:

USR.JOB1

USR.JOB-

USR.+

+

Notice that we have a JOBNAME USR.JOB1 and a jobname *template* USR.JOB1. To avoid confusing the two, remember that the JOBNAME appears in a job's JCL statements; a jobname template appears in the SNA/RJE configuration.

A pathname template is an AOS or AOS/VS pathname that specifies the destination of an SNA/RJE job. Pathname templates can include a *psuedofield* as part of the pathname. A pseudofield is an expression that SNA/RJE replaces with the contents of a JCL statement. The pseudofield %JOB% represents the contents of the JOBNAME statement. The following are examples of pathname templates:

:UDD:USER:JOB1:OUTPUT

:UDD:%JOB%:OUTPUT

In the first example, SNA/RJE would send data to the file :UDD:USER:JOB1:OUTPUT. In the second example, SNA/RJE would replace the %JOB% statement with the contents of the job's JOBNAME statement. If the JOBNAME was USR.JOB1, SNA/RJE would direct the job's output to :UDD:USR.JOB1:OUTPUT.

(See the SNA/RJE Release Notice for additional information about the PDIR facility and pseudofields.)

User Exit Routines

The user exit routine facility lets you tell SNA/RJE how to handle data received from the host. A user exit routine is a program you write that can intercept data from the host and modify the data. Further, the routine can redirect the data from the medium/subaddress that the host originally specified to any AOS or AOS/VS device or file.

You can write a user exit routine to modify or redirect only particular data. For example, you can modify just data sent to a particular medium/subaddress or only data sent as output from a job submitted by a particular user. The default user exit routine provided with SNA/RJE refuses all data!

Redirecting data is much like making a dynamic assignment (see Chapter 5), but with one important difference. Performing a dynamic assignment with the SNA/RJE commands requires someone to issue the commands; a user exit routine performs dynamic assignments automatically and without supervision.

When redirecting data, you can even use some contents of the data as the basis for the devicename or filename to which you will send the data.

You can write your own user exit routine or use the default user exit routine (which, as we said, effectively does nothing to the data). You can also use the sample user exit routine that we include on the product tape. We include a copy of the program in Appendix C.

The SNA/RJE process will, however, use only one user exit routine. To change the user exit routine for an SNA/RJE process, you must relink the SNA/RJE library into a new SNA/RJE program (see "Assembling, Linking, and Binding Your User Exit Routine" later in this section).

Writing a User Exit Routine

Your user exit routine is an assembly language program that SNA/RJE calls as a subroutine. Explanations of assembly language programming are beyond the scope of this book. For more information on assembly language programming, please see the appropriate sources in the Preface.

Because SNA/RJE is a 16-bit assembly language program, you must use 16-bit assembly language in writing a user exit routine. This is no problem under AOS. If you are programming under AOS/VS, use no calls from the 32-bit instruction set.

SNA/RJE can pass either *raw* or *finished* data to the user exit routine. Raw data is data as it comes from the host — possibly compacted or compressed and containing special control formatting characters. Finished data is data from the host that SNA/RJE has changed to be compatible with AOS or AOS/VS files and devices. You specify, when configuring SNA/RJE, whether the user exit routine will receive raw or finished data. To change the type of data to be received, you must reconfigure SNA/RJE.

Be aware of whether SNA/RJE passes raw or finished data to your user exit routine, so your routine will treat the data appropriately.

SNA/RJE and the user exit routine communicate through the user exit packet, which is a parameter packet. In the packet, SNA/RJE places such information as the amount of data it has received, a byte pointer to the data, and indicators of whether the data is compressed or compacted. The user exit routine uses the same packet to indicate if it will accept or redirect the data. Figure 3-1 shows the packet. (This packet may be found on the release tape, called UXPARS.SR.)

```
; The following are INPUTS to user exit routine:

.DUSR          UX.MESUB = 0                    ;Medium (left byte),
                                               ;Subaddress (right byte)
                                               ;(see medium parameters below)


.DUSR          UX.BPTR = UX.MESUB+1            ;Byte pointer to data
                                               ;(-1 if no data)


.DUSR          UX.BCNT = UX.BPTR+1             ;byte count of this portion
                                               ;of data


.DUSR          UX.TCNTH = UX.BCNT+1            ;High-order word of the
                                               ;cumulative byte count of
                                               ;data presented so far.


.DUSR          UX.TCNTL = UX.TCNTH+1           ;High-order word of the
                                               ;cumulative byte count of
                                               ;data presented so far.


.DUSR          UX.ERCL = UX.TCNT+1             ;Exchange Record Length (valid
                                               ;for PUNCH and EXCHANGE
                                               ;mediums)


.DUSR          UX.FLAGS = UX.ERCL+1            ;Flags word. Used only if RAW
                                               ;data is passed to user exit.

;BIT offsets in FLAGS word.

       .dusr UXBCMI = 0                        ;Set if data compressed
       .dusr UXBCPI = UXBCMI + 1               ;Set if data compacted

;Bit masks for FLAGS word

       .dusr UXMCMI = 1B(UXBCMI)
       .dusr UXMCPI = 1B(UXBCPI)

;The following offsets are OUTPUTS from User Exit routine:

.DUSR          UX.PNAME = UX.FLAGS+1           ;Byte pointer to AOS pathname
                                               ;to write data.  Set to 0 if
                                               ;don't want data.  Set to -1
                                               ;if want data but have no
                                               ;pathname
```

Figure 3-1. User Exit Routine Packet (continues)

093-000301-00

```
.DUSR        UX.ACL = UX.PNAME+1         ;ACL list to apply to pathname.
                                         ;Set to -1 for default, or 0
                                         ;for none.

.DUSR        UX.WCNT = UX.ACL+1          ;Number of bytes to write to
                                         ;file.

.DUSR        UX.LENGTH = UX.WCNT+1       ;Length of parameter block.

;            MEDIUM types (i.e., left byte of offset "UX.MESUB")

.DUSR        ME.PRT = 0                  ;PRINTER
.DUSR        ME.CARD = 1                 ;CARD PUNCH
.DUSR        ME.EXCH = 2                 ;EXCHANGE
```

Figure 3-1. User Exit Routine Packet (concluded)

Whenever it calls the user exit routine, SNA/RJE places a word pointer to the packet in accumulator 2 (AC2). Since the host may not be able to send all its data at once, it sometimes sends only a portion of its data to SNA/RJE at one time. SNA/RJE calls the user exit routine everytime the host sends data or a request to send data.

Notice that the packet has both input and output offsets. The input offsets contain such information as whether DG/SNA has received data from the host, the location of the data, whether the data is raw or processed, and the medium and subaddress to which the data was originally sent.

The output offsets contain such information as a byte pointer to the name of an AOS or AOS/VS pathname (if you want to redirect data), a byte pointer to an access control list (ACL), and the number of bytes of received data that you wish to redirect.

We describe in detail below the input and output offsets.

Input Offsets

UX.MESUB   When the host sends data, it directs the data to a specific medium and subaddress. UX.MESUB contains both the medium and subaddress of the intended destination for the data. The left byte of the offset contains the medium. If the medium is a printer, the value of the left byte is ME.PRT. If the medium is a card punch, the value is ME.CARD. If the medium is an exchange, the left byte will be ME.EXCH. The right byte of the parameter contains the subaddress, which is a decimal numeric value from 0 through 15.

UX.BPTR   UX.BPTR contains a byte pointer to the portion of data that SNA/RJE is passing to the user exit routine. If SNA/RJE is not passing data, UX.BPTR contains the value -1. Note that SNA/RJE usually receives a host request to send data before actually receiving the data. In this case, the first time SNA/RJE calls the user exit routine, this offset will be -1.

UX.BCNT	This offset tells you how many bytes of data are in the data portion that SNA/RJE is presently passing to you. The host sends portions of data to SNA/RJE which, in turn, passes the portions to you. If when configuring SNA/RJE you specified that a user exit routine should receive raw data, SNA/RJE will send at most 256 bytes of data to you. If SNA/RJE is processing the data (including data expansion and decompaction), it is impossible to say how much data you will receive.
UX.TCNTH	The high-order word of the total number of bytes of data that you have received from SNA/RJE appears here.
UX.TCNTL	The low-order word of the total number of bytes of data that you have received from SNA/RJE appears here. Taken together, the offsets UX.TCNTH and UX.TCNTL give you an index to where you are in the data stream that you are receiving from SNA/RJE.
UX.ERCL	If the host originally intends the data for either a card punch or exchange medium, the Exchange Record Length appears here. The ERCL is the length of a record in the data that you are receiving. The host specifies the ERCL.
UX.FLAGS	The SNA/RJE operator can configure SNA/RJE in such a way that it will pass raw data to the user exit routine. Raw data is data exactly as the host sends it, including any compaction, compression, and format control characters. If you are receiving raw data, examine two bit offsets in UX.FLAGS: UXBCMI and UXBCPI. If UXBCMI is set, the data is compressed. If UXBCPI is set, the data is compacted. Instead of offsets UXBCMI and UXBCPI, you can use the bit masks, which are respectively UXMCMI and UXMCPI.

Output Offsets

UX.PNAME	This offset performs two functions. It instructs SNA/RJE to send data or not to send data from the host to the user exit routine. It also specifies an AOS or AOS/VS pathname if you want to redirect the data. To refuse the data, set UX.PNAME to 0. Set UX.PNAME to -1 to receive data from SNA/RJE if you do not have a pathname for the final location of the data. To receive and redirect the data, place a byte pointer to the pathname in UX.PNAME. Once the user exit routine has begun receiving data and has passed a pathname, SNA/RJE ignores this offset.
UX.ACL	If SNA/RJE is redirecting the data, UX.ACL can specify an access control list for the AOS or AOS/VS pathname you provided in UX.PNAME. Use the ACL format for the ?SACL call (see the *Advanced Operating System (AOS) Programmer's Manual* or the *AOS/VS Programmer's Manual*). To use your default ACL, set UX.ACL to -1. To have no ACL for the pathname, set UX.ACL to 0.
UX.WCNT	Set UX.WCNT to the number of bytes that you want to write to the file or device specified in UX.PNAME. Set UX.WCNT to 0 to discard the data.

NOTE: The offset UX.LENGTH contains the length of the packet. Do not alter the value of UX.LENGTH.

Assembling, Linking and Binding the User Exit Routine

The step after writing a user exit routine is assembling the program with the Macroassembler. You must then use the Library File Link Editor to place the object file in the SNA/RJE library and the LINK utility to link the library into a new SNA/RJE program.

We now explain the process of creating the new SNA/RJE program. Notice that we do not explain the Macroassembler (MASM), Library File Link Editor (LFE), or LINK utilities, nor do we explain the switches. You can find the information in the appropriate sources listed in the Preface.

Your first step is to assemble the user exit routine with the AOS or AOS/VS Macroassembler, creating an object, or .OB, file. The name of your user exit routine program must be USEREXIT.SR. The name of the object file will be USEREXIT.OB.

To create the object file, execute MASM in the following manner:

)XEQ MASM/8 UXPARS/S USEREXIT)

where UXPARS is a parameter file supplied on the product tape.

After you have assembled the program and created an object file, replace the USEREXIT.OB section of the SNA/RJE library file SNA_RJE.LB with your USEREXIT.OB (see Chapter 4). To place your USEREXIT.OB in SNA_RJE.LB, use the Library File Link Editor in the following manner:

)XEQ LFE R SNA_RJE.LB/I NEWLIB.LB/O USEREXIT USEREXIT.OB/F)

where SNA_RJE.LB is the name of the old library and NEWLIB.LB is the name of the new library. Although we used the name NEWLIB.LB for the new library, you can choose any name that ends in .LB.

Now link the new library, NEWLIB.LB, to create a new SNA/RJE program (a .PR file). To create the new program, give the following LINK command line:

)XEQ LINK/O=SNA_RJE/TASKS=5 NEWLIB.LB)

where NEWLIB.LB is the name of the new library and SNA_RJE is the name for the .PR file. You can use a name other than SNA_RJE so that your system can have two SNA/RJE programs — one with the old user exit routine and one with the new routine.

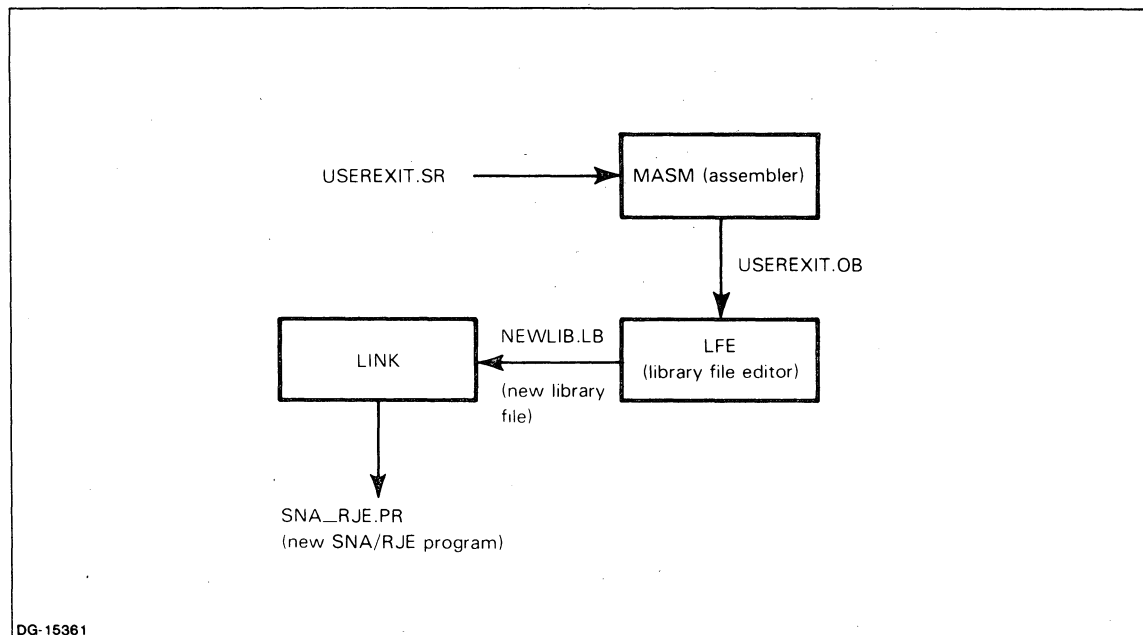Figure 3-2 shows the process of creating a new SNA_RJE.PR file with the user-written routine USEREXIT.SR.

Figure 3-2. Creating the SNA_RJE.PR File

Translation Tables

SNA/RJE translates data between EBCDIC and ASCII codes and from HOLLERITH to EBCDIC code. We provide translation tables with the SNA/RJE product tape. But you may want different translation tables. We show you how to construct your own ASCII to EBCDIC and EBCDIC to ASCII translation tables. Constructing HOLLERITH to EBCDIC translation tables is beyond the scope of this book. For more information on HOLLERITH to EBCDIC tables, see your Data General representative.

Note that to modify or create your own tables, you must use the Macroassembler (MASM), the LINK utility, and a text editor. We assume you know how to use MASM, LINK, and a text editor. If you do not, see the appropriate sources listed in the preface.

SNA/RJE translates between ASCII and EBCDIC by using two tables: A_E_TABLE and E_A_TABLE. Each table has a corresponding source file: A_E_TABLE.SR and E_A_TABLE.SR. A_E_TABLE is a translation table that converts ASCII characters to EBCDIC. E_A_TABLE translates EBCDIC characters into ASCII.

Every entry in either A_E_TABLE.SR or E_A_TABLE.SR represents both a character in EBCDIC code and a character in ASCII code. Each byte in the table represents a character in one code. For example, the 53rd byte in A_E_TABLE.SR represents the 53rd ASCII character and the 53rd byte in E_A_TABLE.SR represents the 53rd EBCDIC character. The contents of the byte represents a character in the other code. For example, if the 53rd byte in A_E_TABLE.SR contains the value 17, it represents the 17th EBCDIC character. Likewise, the contents of a byte in E_A_TABLE.SR represents an ASCII character.

The EBCDIC-to-ASCII translation table E_A_TABLE.SR is 256 bytes long. The ASCII-to-EBCDIC translation table A_E_TABLE.SR is 128 bytes long.

You can place the same value in different bytes in a table. SNA/RJE translates empty entries as nulls. Because there are more EBCDIC characters than ASCII characters, E_A_TABLE.SR cannot provide translations for all EBCDIC characters. When SNA/RJE finds no translation for an EBCDIC character, it translates the character as a null.

We will now tell you how to construct your own translation table.

Constructing a Translation Table

There are three steps to construct a translation table. First, you edit an existing translation table. Use a text editor to edit a copy of the table source file, changing values of bytes to meet your own needs.

Second, you must assemble the table with the Macroassembler, MASM, to create an object file.

Third, bind the table with the LINK utility, producing a program file which SNA/RJE can use.

Step 1 — Edit an Existing Translation Table

Copy the translation table you wish to change into another file. This allows you to edit the copy while keeping the original table.

A source file for a translation table might look like this:

```
        .MACRO E
        ^1*256.+^2
%
        .RDX 16.


        E 0,1      ;NUL,SOH
        E 2,3
        E 37,2D
           .
           .
           .
        E 24,1A
```

The sample translation table is from the A_E_TABLE.SR file. The lines beginning with E are the lines containing the translation table entries. The actual entries are the hexadecimal numbers after the E. Each entry represents a byte. We number the entries from left to right and up to down. Thus, the first line contains, in order, the first and second entries. The second line contains the third and fourth entries. The third line contains the fifth and sixth entries, and so on.

You do not need to understand the lines of assembly language code preceding the table entries. Do not change the lines of assembly language code.

After copying the table, use a text editor to change the values in the table copy.

For example, let us change the EBCDIC equivalent of the ASCII uppercase A in A_E_TABLE.SR. The ASCII A will be the 66th byte in the table, which appears on the line:

    E 7C,0C1   ;@ AND CAP A

We see that the 66th byte contains the EBCDIC code 0C1. To change the translation, we use the text editor to change 0C1 to whatever value we want. We must remember to observe the rules for source files set down by the Macroassembler MASM.

When you have finished changing values in the table, end the editing session.

Let us take an example of wanting to translate an EBCDIC uppercase A into an ASCII uppercase A in the E_A_TABLE.SR. The hexadecimal value for an EBCDIC uppercase A is 0C1(193 decimal). The hexadecimal value for an ASCII uppercase A is 41. To arrange such a translation, place the hexadecimal value for an ASCII uppercase A (i.e., 41) into the 193rd byte (EBCDIC character) of the EBCDIC-to-ASCII translation table E_A_TABLE.SR.

Step 2 — Assemble the Table with the Macroassembler

You must assemble the file after completing your edits. Use the Macroassembler (MASM) to assemble the table. You can use MASM as follows:

)XEQ MASM table-name)

MASM produces an object file with the name table-name.OB.

Step 3 — Bind the Table with the LINK Utility

You must bind the table to make a program file before you can use the new table. Give the following LINK command line:

)XEQ LINK/UDF table-name)

LINK creates a .PR program file called table-name.PR. SNA_RJEGEN uses this file. Rename the file to omit the .PR suffix, then move the file into the working directory where you run SNA_RJEGEN.

End of Chapter

Chapter 4
How to Load, Configure, and Start
SNA/RJE

This chapter tells you how to load SNA/RJE from the product tape onto your computer and how to configure, or tailor, SNA/RJE to your needs. We first describe the programs and files on the product tape. We then describe the SNA_RJEGEN program and how you use the program to configure SNA/RJE to your needs. We list all the questions that SNA_RJEGEN will ask you and describe the appropriate responses to the question. Finally, we tell you how to start SNA/RJE. We provide a checklist of what you should do before starting the program.

Note that in configuring SNA/RJE, you can decide to use some optional facilities: the PDIR facility, user exit routines, and translation tables that you supply. We describe these facilities in Chapter 3. If you want to use any of these facilities, it is very important to read Chapter 3 before reading and using this chapter.

How to Load SNA/RJE

Before you can use SNA/RJE, you must load the contents of the SNA/RJE product tape into your computer. Mount the SNA/RJE product tape on the tape drive. Next, using Superuser mode, go to the root directory and ensure that you have OWARE access to the :NET directory, and that all users have RE access to the :NET directory. To do this, type

```
)SUPERUSER ON ↲
*)DIR : ↲
*)ACL :NET OP,OWARE +,RE ↲
```

Now load the contents of the product tape into the :NET directory. If you are working under AOS, type

```
*)DIR :NET ↲
*)LOAD/V @MTAn:0 ↲
```

where n is the number of the tape drive on which you mounted the SNA/RJE product tape.

If you are working under AOS/VS, type

```
*)DIR :NET ↲
*)LOAD/V @MTBn:0 ↲
```

where n is the number of the tape drive on which you mounted the SNA/RJE product tape. Under AOS/VS, you can also use the devicename @MTCn:0.

The files on the tape are in a directory called UTIL. The tape is now loaded into :NET, but the files from the tape appear in the :NET:UTIL directory. If your system had a :NET:UTIL directory, the files from the tape are in that directory. If your system did not have a :NET:UTIL directory, loading the tape creates such a directory.

Check the contents of :NET:UTIL to ensure that the directory contains all files that we mention in the next section.

SNA/RJE Product Tape Contents

The SNA/RJE product tape contains the SNA/RJE program; the SNA_RJEGEN program, with which you configure SNA/RJE; and tables for ASCII to EBCDIC translation, EBCDIC to ASCII translation, and HOLLERITH to EBCDIC translation. The product tape also contains a sample user exit routine and the UXPARS.SR parameter packet you would use to write your own user exit routine. Finally, the product tape contains the file SNA_RJE.LB, which is a library of routines that you use to build an SNA_RJE.PR file if you want to add a user exit routine or your own translation tables. Table 4-1 describes all files that appear on the product tape.

The product tape contains the files in a directory structure. Once you load the product tape as we explained earlier, the files will appear in the directory :NET:UTIL.

Table 4-1. Contents of the SNA/RJE Product Tape

SNA_RJE.PR	SNA/RJE program
SNA_RJE.ST	Symbol table for SNA_RJE.PR
SAVE_SNA_RJE.PR	Backup copy of the SNA/RJE program
SAVE_SNA_RJE.ST	Backup copy of the symbol table for SNA_RJE.PR
RJE_ERMES	Machine readable list of error messages for SNA_RJE.PR
SNA_RJEGEN.PR	SNA_RJE GEN program
SNA_RJEGEN.ST	Symbol table for SNA_RJEGEN.PR
SAVE_SNA_RJEGEN.PR	Backup copy of the SNA_RJE GEN program
SAVE_SNA_RJEGEN.ST	Backup copy of the symbol table for SNA_RJEGEN.PR
SNA_RJE.SPEC	SNA/RJE spec file containing machine readable version of configuration; contains default configuration
SNA_RJE.SPEC.LS	Report file; user-readable version of SNA_RJE.SPEC
A_E_TABLE.SR	Source for the ASCII to EBCDIC translation table
A_E_TABLE	Assembled and bound ASCII to EBCDIC translation table
E_A_TABLE.SR	Source for the EBCDIC to ASCII translation table
E_A_TABLE	Assembled and bound EBCDIC to ASCII translation table
H_E_TABLE.SR	Source for the HOLLERITH to EBCDIC translation table
H_E_TABLE	Assembled and bound HOLLERITH to EBCDIC translation table
SNA_RJE.LB	Library containing all object files necessary to build an SNA_RJE.PR file
USEREXIT_SAMPLE.SR	Source of a sample user exit routine
UXPARS.SR	Source of user exit parameters

How to Configure SNA/RJE

You can configure certain aspects of SNA/RJE's operation to suit your particular situation. For example, you can determine the format SNA/RJE uses in sending data to a printer. You can instruct SNA/RJE to begin operating initially in either attended or unattended mode. Also possible is directing the manner in which SNA/RJE will read data from certain types of files.

You use the SNA_RJEGEN program to configure SNA/RJE. SNA_RJEGEN is an interactive program, similar to the generation program for your operating system. When you execute SNA_RJEGEN, the program asks you questions, which we call the SNA_RJEGEN *dialog*. Your answers define the configuration. SNA_RJEGEN stores your answers to the questions in a machine-readable specification file called SNA_RJE.SPEC. SNA_RJEGEN also stores the text of the answers in a report file called SNA_RJE.SPEC.LS.

The SNA_RJEGEN Specification File and Report File

SNA_RJEGEN stores your answers to its questions in two files: a specification file, or *spec file*, and a report file.

- The spec file contains a machine-readable version of all your answers to the SNA_RJEGEN dialog. As your requirements change, you can edit old spec files in whole or part by using SNA_RJEGEN. Also, if you need different configurations of SNA/RJE, you can create multiple spec files. You can start a particular configuration of SNA/RJE immediately with the spec files you have at hand, instead of running SNA_RJEGEN again to create a new spec file. The product tape provides a default spec file called SNA_RJE.SPEC.

- SNA_RJEGEN also produces a report file for each spec file. The report file contains all your answers to the SNA_RJEGEN dialog in a form that you can read. The product tape provides a default spec file called SNA_RJE.SPEC.LS. The form of the report file name is <SPEC_FILE_NAME>.LS.

You do not *need* to configure SNA/RJE. The SNA_RJE.SPEC file supplied on the product tape is a specification file that contains all the default configurations. You can run SNA/RJE without running SNA_RJEGEN.

If you want to supply your own translation tables or user exit routine, you must do so *before* you configure SNA/RJE. To supply translation tables or a user exit routine, see Chapter 3.

If you want to use the Peripheral Data Information Record (PDIR) facility, read Chapter 3 to understand PDIR templates.

If you do want to configure SNA/RJE, you can do so in any directory. To configure SNA/RJE, execute the SNA_RJEGEN program as follows:

)XEQ SNA_RJEGEN ⌡

To configure SNA/RJE with SNA_RJEGEN, all you need do is answer the questions the program asks you. You can provide your own answers to the questions or you can accept the default answers that SNA_RJEGEN provides.

SNA_RJEGEN Dialog

Each question in the SNA_RJEGEN dialog asks you for information that helps tailor SNA/RJE to meet your needs. In this section, we describe each question, the information it seeks, and possible responses. SNA_RJEGEN supplies a default answer to each question. The default answers are enclosed in square brackets at the end of the question. To choose the default answer, press the NEW LINE key after the question appears on your screen. To supply another answer, type the answer on your keyboard and press the NEW LINE key.

The format we use in describing the questions is as follows:

question number   *Text of the question in italics [default answer]*

                Information the question seeks and possible answers to the question.

NOTE: The question numbers will not appear on your screen; we provide them as a convenience to you.

The questions come in five groups. Questions 1 through 5 ask if you are editing a spec file or creating a new spec file; you must answer these questions.

Questions 6 through 6g ask if you want to change the printer configuration. You can take default answers for the entire section by answering N to question 6.

Questions 7 through 7n ask if you want to change operation mode parameters. You can take default answers for the entire section by answering N to question 7.

Questions 8 through 8b ask if you will supply your own translation tables. You can use default tables by answering N to question 8. Chapter 3 explains how to provide translation tables.

Questions 9 through 9c ask if you want to use the PDIR facility. If you answer N to question 9 or question 9a, SNA/RJE does not use the PDIR facility.

1.   *Do you want to edit an old spec file? (Y,N) [N]*

      SNA_RJEGEN asks if you have configured SNA/RJE before and would like to edit the spec file from that configuration. If you answer Y, SNA_RJEGEN asks questions 2 through 4 and skips question 5. If you answer N, SNA_RJEGEN skips questions 2 through 4 and asks question 5. If you are running SNA_RJEGEN for the first time, press the NEW LINE key to provide the default answer, which is N for no, and proceed to question 5.

      If you want to edit an old spec file, type Y and press the NEW LINE key. SNA_RJEGEN then asks

2.   *Type the name of the old spec file: (an AOS pathname) [SNA_RJE.SPEC]*

      SNA_RJEGEN is asking for the AOS or AOS/VS pathname of the spec file you want to edit. The default pathname is SNA_RJE.SPEC.

      If the file exists, SNA_RJEGEN will say *File '<filename>' already exists* and ask for the new spec file name.

3.   *Type the name of the new spec file: (an AOS pathname) [SNA_RJE.SPEC]*

      SNA_RJEGEN asks for the name of the new spec file that will contain the edited version of the old spec file. You must provide an AOS or AOS/VS pathname. If the new spec file name is the same as the old spec file name, SNA_RJEGEN asks

4.   *May I delete '<filename>'? (Y,N) [N]*

      If you answer N, SNA_RJEGEN asks question 3 again. If you answer Y, SNA_RJEGEN will delete the file and create a new spec file with the same name.

5.   *Type the name of the new spec file: (an AOS pathname) [SNA_RJE.SPEC]*

      If you are creating a new spec file rather than editing an old spec file, SNA_RJEGEN asks you for the AOS or AOS/VS pathname of the file.

6.   *Do you want to change the printer configuration? (Y,N) [N]*

      If you want to change the printer configuration, answer Y. SNA_RJEGEN then asks you questions 6a. through 6g. You may use the default answer for any or all of these questions. If you answer N to question 6, SNA_RJEGEN proceeds to question 7.

6a.   *What is the maximum presentation position? (1-256) [132]*

      The maximum presentation position is the maximum number of columns on a printed page, or the maximum number of characters per line. Type a number from 1 through 256 that fits the paper size your printers use. For 8 1/2 by 11 inch paper, the maximum presentation position is 80 characters.

6b. *What is the maximum presentation line? (1-256) [66]*

The maximum presentation line is the maximum number of printed lines per page. Type a number from 1 through 256 that fits the paper size you are using. The default of 66 is the maximum number of printed lines for 8 1/2 by 11 inch paper, with a vertical line density of 6 lines per inch (see question 6g).

6c. *What is the left margin default? (1-131) [1]*

The left margin default is the column number, counting from the leftmost column on the paper, at which the printer begins printing a line of data. The range in the question will be within the maximum presentation position you specified in question 6a. The range of 1 through 131 that appears here reflects a maximum presentation position of 132 (the default value for question 6a).

Your answer must be within the range specified by the question. If you ask for a left margin default that is too large, SNA_RJEGEN signals an error.

6d. *What is the right margin default? (2-132) [132]*

The right margin default is the column number, counting from the leftmost column on the paper, which is the end of a line of printed data. The range in the question will be within the maximum presentation position you specified in question 6a. The range of 2 through 132 that appears here reflects a maximum presentation position of 132 (the default value of question 6a) and a left margin default of 1 (the default value of question 6c).

Your answer must be within the range specified by the question; that is, within the maximum presentation position and to the right of the left margin. If you ask for a right margin default that is either too large or too small, SNA_RJEGEN signals an error.

6e. *What is the top margin default? (1-65) [1]*

The top margin default is the first line, counting from the top of a page, at which printed data can appear. The range in the question will be within the maximum presentation line. The range of 1 through 65 that appears here reflects a maximum presentation line of 66 (the default value for question 6b).

Your answer must be within the range specified by the question. Otherwise, SNA_RJEGEN signals an error.

6f. *What is the bottom margin default? (2-66) [66]*

The bottom margin default is the last line on which printed data can appear. The range in the question will be within the maximum presentation line and the top margin default (i.e., the bottom margin must be below the top margin, and both must be in the range of allowable lines). The range of 2 through 66 that appears here reflects a maximum presentation line of 66 (the default value of question 6b) and a top margin default of 1 (the default answer to question 6e).

Your answer must be within the range specified by the question. Otherwise, SNA_RJEGEN signals an error.

6g. *What is the vertical line density in lines per inch? (6 or 8) [6]*

The question asks for the number of lines per inch. All SNA_RJEGEN's default values for maximum presentation line and top and bottom margins are based on a vertical line density of 6 lines per inch.

Neither you nor the host can change the vertical line density while SNA/RJE is running. If the host tries to change the vertical line density, SNA/RJE ignores the request and proceeds.

NOTE: Set the lines-per-inch controls on your line printer to match the answer to this question.

7. *Do you want to change the operation mode parameters? (Y,N) [N]*

If you want to change the operation mode parameters, answer Y. SNA_RJEGEN then asks you questions 7a through 7n. You may use the default answer for any or all of these questions. If you answer N to question 7, SNA_RJEGEN proceeds to question 8.

7a. *Enter time-out period for operator intervention in secs. [300]*

The host may try to send data to a medium/subaddress to which the SNA/RJE operator has not assigned a device or file. If SNA/RJE is running in attended mode, SNA/RJE asks the operator to assign a device or file to the medium/subaddress. The time-out period is the amount of time, in seconds, that the SNA/RJE operator has to assign a device or file to the medium/subaddress. If the operator fails to make an assignment within the time-out period, SNA/RJE rejects the data.

If SNA/RJE is running in unattended mode, it immediately rejects the data from the host. Please see the descriptions of the OUTPUT and ASSIGN commands in Chapter 5.

7b. *Enter time-out 'reminder' interval in secs. [60]*

If the host is trying to send data to an unassigned medium/subaddress, as in question 7a, SNA/RJE sends periodic messages asking the operator to make an assignment.

7c. *Should SNA/RJE time/date stamp messages? [N]*

SNA/RJE can prefix each message it sends to the operator console or a log file with the current time and date. Answer either Y for yes or N for no (the default value).

7d. *Should SNA/RJE use the append option when writing to files? [N]*

When SNA/RJE sends data to a file, it can either overwrite data present in the file, or it can append the new data to the end of the file. If SNA/RJE does not append data to a file, it begins overwriting the file from the beginning of the file. If the amount of new data is less than the present length of the file, some of the old data remains. You would answer Y and use the append option if you wanted to keep all the information sent to a file. If you were not interested in old information in files and wanted to save disk space (by not having files grow), you could answer N to the question.

You can override this part of the configuration through the OUTPUT and ASSIGN commands described in Chapter 5.

7e. *Should SNA/RJE initially come up in Attended (A) or Unattended (U) mode? [A]*

SNA/RJE can initially start running in either attended or unattended mode Indicate attended mode with A and unattended mode with U. You can change the mode while SNA/RJE is running with the SET command (see Chapter 5).

7f.   *Should SNA/RJE send raw data (R) or finished data (F) to user exit routine? [F]*

The user exit routine is a user-written assembly language program that can intercept data from the host, edit the data, and redirect the data to another location. SNA/RJE can send either raw data or finished data to the user exit routine. Raw data is data as it comes from the host — untranslated into ASCII, possibly compacted, with special control characters. Finished data is data from the host that SNA/RJE has changed to be compatable with AOS or AOS/VS files and devices. If you are not writing your own user exit routine and are not using the sample user exit routine, you must answer **F** to this question.

7g.   *How many Signals should SNA/RJE send to host? (1 or 2) [2]*

If you want to send data on a stream that is presently receiving data, or if the SNA/RJE operator issues a SIGNAL command, SNA/RJE sends a SIGNAL Request/Response Unit to the host. The SIGNAL Request/Response Unit requests the host to stop sending data and to receive data from SNA/RJE.

Certain hosts require two SIGNAL Request/Response Units before they stop sending data and receive data instead. If your host requires two SIGNAL Request/Response Units, answer 2 to the question or use the default answer. If your host only requires one, answer 1.

7h.   *Enter the maximum number of RU's per chain that SNA/RJE will send to host (0 = no max) [0]*

Your IBM system programmer may want to limit the number of Request/Response Units per data chain coming from a card reader. Ask for the limit, if there is one, and enter the number here.

7i.   *Should SNA/RJE verify origin of operator commands? [N]*

You can configure SNA/RJE to either restrict the use of operator commands to privileged users or to allow any user to issue operator commands. Privileged users are any whose process is the father process of SNA/RJE or whose username is identical to the username of the SNA/RJE process.

You choose to restrict the use of operator commands having SNA/RJE verify the origin of the commands. If SNA/RJE does not verify the origin of operator commands (the default condition), then any user can issue operator commands. If SNA/RJE verifies the origin of operator commands, only privileged users can issue the commands. To ensure verification, answer **Y** for yes.

7j.   *Enter the default record length (in bytes) for LINE type files [80]*

When SNA/RJE sends data from LINE type files to the host, it performs data sensitive reads. The answer to this question sets the maximum length of a LINE type file. The default record length is 80 bytes. The record length does not include the record delimiter. See the TRANSFER command in Chapter 5.

7k.   *Enter the record length (in bytes) for SEQUENTIAL and EBCDIC type files [80]*

If a file is SEQUENTIAL, or if the data in the file is in EBCDIC, SNA/RJE performs dynamic reads in sending the data from the file to the host. The answer to this question determines the number of characters that SNA/RJE will read as a single record. See the TRANSFER command in Chapter 5.

Notice that the only difference between SEQUENTIAL and EBCDIC type files is that the data in a SEQUENTIAL file is in ASCII while the data in the EBCDIC file is in EBCDIC. You specify file types with operator commands (see Chapter 5).

7l.   *Enter the maximum host log file size, in bytes (0 = no max.) [0]*

SNA/RJE can send messges from the host to a log file if you decide to use the log facility. Your answer to this question sets the maximum size of the log file. If the text of the messages exceeds the maximum log file size, SNA/RJE begins overwriting the log file, starting from the beginning of the file. By answering 0 to the question, SNA/RJE will not set a maximum size to the file, and so will never overwrite any of the messages in the file. The default answer is 0.

7m.   *Type the process name of SNA/RJE's default DG/SNA server [SNAPU1]*

SNA/RJE uses the DG/SNA product to send and receive data over the SNA network. You must provide the name of the DG/SNA process in answering this question. The default process name is SNAPU1.

7n.   *Type in SNA/RJE's working directory [:UDD:OP]*

The answer to this question is the AOS or AOS/VS pathname of the working directory of SNA/RJE. The default working directory is :UDD:OP.

8.   *Will you supply your own translation tables? (Y,N) [N]*

SNA/RJE uses EBCDIC to ASCII, ASCII to EBCDIC, and HOLLERITH to EBCDIC translation tables in exchanging data with the host. You can use the translation tables supplied on the SNA/RJE product tape or you can supply your own. To construct your own tables, please see Chapter 3. If you answer Y, SNA_RJEGEN will ask you questions 8a and 8b. If you answer N, SNA_RJEGEN will proceed to question 9.

8a.   *Type the pathname of the EBCDIC to ASCII translation table: [E_A_TABLE]*

You must provide the pathname to the assembled and bound translation table. The translation table is a PRG type file. The default answer to the question is the name of the default table, as supplied on the product tape. You can supply any file name that you want. You can also name your new translation table E_A_TABLE as we explain in Chapter 3.

8b.   *Type the pathname of the ASCII to EBCDIC translation table: [A_E_TABLE]*

You must provide the pathname to the assembled and bound translation table. The translation table is a PRG type file. The default answer to the question is the name of the default table, as supplied on the product tape. You can supply any file name that you want. You can, however, name your translation table A_E_TABLE as we explain in Chapter 3.

9.   *Do you want to change the PDIR configuration? (Y,N) [N]*

If you want to change the PDIR configuration, answer Y. Depending on further answers, SNA_RJEGEN asks questions 9a through 9c. If you answer N, SNA_RJEGEN ends and you are finished.

9a.   *Should SNA/RJE accept the PDIR request from host [N]*

In this question, you indicate whether SNA/RJE should accept the PDIR request from the host. If you answer N, SNA/RJE processes data from the host without the PDIR facility. SNA_RJEGEN ends after such an answer and you are finished. If you answer Y, SNA/RJE uses the PDIR facility and SNA_RJEGEN proceeds to the next question.

9b.   *Do you want to delete the PDIR templates (Y,N) [N]*

In this question, you indicate if you want to edit old PDIR templates, edit new templates that have default values available, or create new templates without default values. We explain templates in Chapter 3. If you answer Y and delete the PDIR templates, you create new templates without default values. If you answer N and you are creating a new spec file, you create new templates with default values available. If you answer N and are editing an old spec file, you edit the existing templates. Either answer leads to the next question.

093-000301-00

9c.   *Do you want to reconfigure the templates? (Y,N) [N]*

In this question, SNA_RJEGEN asks you if you actually want to change the templates. If you answer N, SNA_RJEGEN ends and you are finished. In this case, if you answered N to 9b, SNA_RJEGEN uses the old template or the default template. If you answered Y to 9b, SNA_RJEGEN does not use PDIR templates.

If you answer Y, SNA_RJEGEN requests JOBNAME templates and associated pathname templates in the following form:

Enter a JOBNAME template: []

Enter the corresponding AOS template: []

If you answered Y to question 9b, the brackets following the question are empty and you must provide all information.

If you answered N to question 9b, an answer to a request appears within the brackets. If you are editing old templates, the old values appear in the brackets. You can add new templates after the old template values.

If you are editing new templates with default values, SNA_RJEGEN displays two additional requests:

Enter a JOBNAME template: [+]

Enter the corresponding AOS template: [:UDD:%JOB%:JES.OUTPUT]

All following requests have nothing within the brackets. We explain the pseudofield %JOB% in Chapter 3. You can add templates after the initial default templates.

If you respond to the request *Enter a JOBNAME template: []* with a carriage return or new line, the SNA_RJEGEN dialog ends.

Starting and Stopping SNA/RJE

Once you have loaded the SNA/RJE product tape into the :NET directory and completed any configuration work, you are ready to start SNA/RJE. To be sure that you will be successful, please verify the points in the following checklist.

1.   You need certain privileges to run SNA/RJE. You must have Interprocess Communications (IPC) privileges in your AOS or AOS/VS user profile. SNA/RJE uses the IPC facility to receive commands from the SNA/RJE operator and from the EXEC facility. Use the PREDITOR utility to give yourself IPC privileges. For more information on IPCs and PREDITOR, please see the *Advanced Operating System (AOS) System Manager's Guide* or *Managing AOS/VS*.

You must also have either write access to SNA/RJE's initial directory (the directory in which the SNA/RJE process started) or the Superuser privilege to create IPC ports and files.

SNA/RJE first tries to create IPC ports and files in Superuser mode. If you do not have Superuser privileges, SNA/RJE must then have access to the initial directory if it is to create the ports and files. If you have neither Superuser privileges nor access to the initial directory, you cannot start SNA/RJE.

2.   Ensure that your default spec file is in SNA/RJE's initial directory or that the file's pathname is in SNA/RJE's search list.

3.   The working directory specified in the spec file must exist. You can read the report file to find the spec file name. SNA/RJE must also have write access to the working directory.

4. The RJE_ERMES, which you loaded from the product tape into :NET:UTIL, must be either in SNA/RJE's working directory or in SNA/RJE's searchlist. SNA/RJE must have read access to RJE_ERMES.

You use the CLI PROCESS command to start SNA/RJE.

)PROCESS/DEF*[/DIR=<INITIAL_DIRECTORY>][/USER=<NAME>]&*
)*[/NAME=<IPC_PORT_NAME>]* &

)SNA_RJE*[/SERVER=<SERVER_NAME>][/SPEC=<SPEC_FILENAME>]&*
)*[/COMMANDS=<FILENAME>]* &

)<LUG_NAME>*[/N=n][/NOINPUT]*

where

/DIR=<INITIAL_DIRECTORY>	is an optional switch that specifies the initial working directory of SNA/RJE. If you want to use the QSNA command and the EXEC interface, you must set /DIR= to :PER.
/USER=<NAME>	is an optional switch that sets the user name of the SNA/RJE process. You must use this switch if you have SNA/RJE validate the source of operator commands.
/NAME=<IPC_PORT_NAME>	is the basis for the names of the IPC ports; the port for OP commands has the name <IPC_PORT_NAME> and the port for commands to EXEC has the name <IPC_PORT_NAME>_EXEC.
/SERVER=<SERVER_NAME>	is an optional switch that specifies the name of the DG/SNA server process that you want SNA/RJE to use. If you do not use this switch, SNA/RJE will use the server process that you specified when configuring SNA/RJE.
/SPEC=<SPEC_FILENAME>	is an optional switch giving the name of the spec file with filename <SPEC_FILENAME>; you must give the machine-readable spec file, not the report file; it is best to give a full pathname for the spec file. If you do not use this switch, SNA/RJE will use the spec file that you specified when configuring SNA/RJE.
/COMMANDS=<FILENAME>	is an optional switch that specifies the name of an initial command file. An initial command file contains SNA/RJE commands that SNA/RJE executes when it starts. For more information on the initial command file facility, see the "Initial Command File" section later in this chapter.
<LUG_NAME>*[/N=n][/NOINPUT]*	is the name of a Logical Unit Group containing the Logical Unit type that you want; if you want more than one LU from an LUG, use the /N=n switch, where n is the number of LUs that you want. You cannot open more than six LUs (for six streams). If you use the /NOINPUT switch, SNA/RJE will refuse any TRANSFER commands specifying a stream using a Logical Unit from the Logical Unit Group. See the *DG/SNA Operator's Guide* for information on configuring LUGs.

093-000301-00

Following is an example of a start-up line:

```
PROC/DEF/DIR=@/USER=OP/NAME=SNA_RJE   SNA_RJE/&
SPEC=:NET:UTIL:SNA_RJE.SPEC/COMMANDS=RJE.COMMANDS   RJE.LUG/N=6
```

After SNA/RJE is running, you can log on to the host by issuing the SSCPMSG command described in Chapter 5.

Initial Command File

The initial command file allows you to pass a command file containing SNA/RJE commands to SNA/RJE when you start the program. SNA/RJE executes the commands in the file after starting. You pass the name of the command file to SNA/RJE with the /COMMANDS=<FILENAME> switch when you start SNA/RJE with the CLI PROCESS command. When entering commands into the command file, use the command syntax of each command as described in the command descriptions of Chapter 5; do not use the CLI CONTROL command as described in the beginning of Chapter 5. Below is an example of the contents of an initial command file, SNA_RJE.COMMANDS.

```
SET/LOG=HOST.LOG
ASSIGN P 0 @LPT
ASSIGN C 0 @CPA
SSCPMSG "LOGON1 APPLID(JES2)"
```

The directory name you provide with the /DIR switch is the one in which SNA/RJE creates the necessary IPC ports to receive operator commands and EXEC commands (i.e., QSNA). After creating the ports, SNA/RJE immediately moves to the initial working directory that you specified when configuring SNA/RJE.

You can change SNA/RJE's working directory with the DIR command (see Chapter 5).

Creating EXEC Queues for SNA/RJE

To create and open an EXEC queue that will receive TRANSFER requests submitted through the QSNA command, type the following:

```
CONTROL @EXEC CREATE SNA <QUEUE_NAME>
CONTROL @EXEC OPEN <QUEUE_NAME>
```

where <QUEUE_NAME> is the name of the SNA queue that you choose. Typically, <QUEUE_NAME> is SNQ.

SNA/RJE must be running to activate the queue. To activate the queue, type the following:

```
CONTROL @EXEC START <QUEUE_NAME> @<SNA_PROCESS_NAME>_EXEC
CONTROL @EXEC CONTINUE @<SNA_PROCESS_NAME>_EXEC
```

where <SNA_PROCESS_NAME> is the SNA/RJE process name that you specified with the CLI PROCESS command and the /NAME= switch when starting SNA/RJE.

After you issue the START command, SNA/RJE will send you the message *AN EXEC SNA JOB QUEUE HAS BEEN STARTED.*

To pause and stop an SNA queue, type the following:

```
CONTROL @EXEC PAUSE @<SNA_PROCESS_NAME>_EXEC
CONTROL @EXEC STOP @<SNA_PROCESS_NAME>_EXEC
```

You close the SNA queue by typing the following:

```
CONTROL @EXEC CLOSE <QUEUE_NAME>
```

You can also use the EXEC commands CONTINUE, DELETE, HOLD, UNHOLD, CANCEL, and FLUSH. For more information on EXEC, see the appropriate sources listed in the preface.

End of Chapter

Chapter 5
SNA/RJE Commands

The SNA/RJE commands allow you to operate the SNA/RJE program and manage data flow between the program and the host. Most of the commands are for control purposes.

Every SNA/RJE command is an operator command. It is possible to configure SNA/RJE so that only privileged users can issue operator commands (you are a privileged user if your process is the father process of SNA/RJE or if your username is the same as that of the SNA/RJE process).

Three commands — TRANSFER, ASSIGN, and OUTPUT — control the most important functions of SNA/RJE, sending and receiving data. They are the most important SNA/RJE commands.

The TRANSFER command sends files of data to the host. The host will return data to you on its own. By using the ASSIGN and OUTPUT commands, you can direct the data from the host to devices or files on your AOS or AOS/VS system.

The ASSIGN and OUTPUT commands create an association, called an *assignment*, between a medium/subaddress and an AOS or AOS/VS device or file. Each command makes a different type of assignment. The ASSIGN command creates *static* assignments; the association between the medium/subaddress and the device or file lasts until you change it. The OUTPUT command creates *dynamic* assignments that last only while the medium/subaddress receives data from the host.

You only use the OUTPUT command when the host sends data to an unassigned medium/subaddress and SNA/RJE asks you to assign a device or file to the medium/subaddress. You can use the ASSIGN command at any time.

Because sending data files to the host is the main function of SNA/RJE, any user, privileged or not, can effectively issue the TRANSFER command through the QSNA command (see "SNA/RJE and the EXEC Facility"). We describe all the commands, listed in alphabetical order, later in this chapter.

Issuing SNA/RJE Commands

You issue an SNA/RJE command through the CLI CONTROL command. You issue an SNA/RJE command as follows:

CONTROL <SNA/RJE PROCESS NAME> <SNA/RJE COMMAND>

where <SNA/RJE PROCESS NAME> is the name of your SNA/RJE process (see Chapter 4) and <SNA/RJE COMMAND> is the command you are issuing. You may abbreviate the name of an SNA/RJE operator command (see "Abbreviations" later in this chapter).

You may the /I switch or the /M switch with the CONTROL command. The /I switch instructs the CLI to take the following lines as the input to the command. The CONTROL/I switch causes the CLI to treat each line you type on your console as a command to be sent to SNA/RJE. You end input to the command by typing a single right parenthesis and a NEW LINE after a prompt. You must use the /I switch if you are issuing either the HOSTMSG or the SSCPMSG command; /I causes the CLI not to interpret commas as spaces in the control line.

We give an example below of using the /I switch with the HOSTMSG command, which sends a message to the host.

```
)CONTROL/I SNA_RJE )
))HOSTMSG "$DJ1-9999" )
))) )
```

By typing these lines, you send the message $DJ1-9999 to the host.

If you place the CONTROL command in a macro, the /M switch applies the CONTROL command to every line in the macro that follows it. The last line of the macro must be a single right parenthesis. In the next example, we will send a file to the RJE subsystem and send a message to the host with the following macro that we named SEND.CLI:

```
CONTROL/M SNA_RJE
TRANSFER/STREAM=3 JOB1
HOSTMSG "$DJ1-9999"
)
```

SEND.CLI uses TRANSFER to send the file JOB1 on STREAM 3. The macro then sends the message $DJ1-9999 to the host on STREAM 1 (a default value).

Although unprivileged users cannot issue TRANSFER with the CONTROL CLI command, they can issue TRANSFER through the EXEC facility.

SNA/RJE and the EXEC Facility

Any SNA/RJE user can effectively issue the TRANSFER command through the EXEC facility. You issue a TRANSFER command through EXEC by submitting the data transfer as a batch job to the SNA queue with the CLI command QSNA. The format of the QSNA command is

QSNA*[/SWITCHES]* <filename or devicename>

where *[/SWITCHES]* are optional command switches that we describe below. The argument <filename or devicename> is the source of the data that you want to send to the host. You can abbreviate the QSNA switches as you can abbreviate the SNA/RJE commands (see "Abbreviations" later in this chapter).

When issuing a QSNA command, you can set the /MEDIUM= switch equal to the medium type of <filename or devicename>. The possible values for /MEDIUM= are CONSOLE, CARD, and EXCHANGE. The PRINTER medium only accepts data from the host and cannot act as a data source for the TRANSFER command. The default value of the /MEDIUM= switch is CARD.

You can also set the /SUBADDRESS= switch to the subaddress of <filename or devicename>. The possible values for /SUBADDRESS= are the hexadecimal numbers 0 through E. The default value for /SUBADDRESS= is 0.

Switches

/1 = { IGNORE / WARNING / ERROR / ABORT }   The /1= switch instructs the CLI to handle class1 exceptions to the QSNA command in a particular way. You can set /1= equal to IGNORE, WARNING, ERROR, or ABORT.

         093-000301-00

/2 = { IGNORE, WARNING, ERROR, ABORT }	The /2= switch instructs the CLI to handle class2 exceptions to the QSNA command in a particular way. You can set /2= equal to IGNORE, WARNING, ERROR, or ABORT.
/AFTER=	You can instruct EXEC to delay processing your request until after a specified date and time. The format of the switch is /AFTER=DATE:TIME. The date format is DD-MM-YY (for example 04-07-99); the time format is HH:MM:SS in 24-hour time (for example, 14:30:00 for 2:30 pm). You must specify all parts of the date, but you can abbreviate the time by expressing only the hours and minutes, or just the hours. The default value for the date is the current date; the default value for the time is midnight. You cannot use a default value for both the time and the date; you must explicitly set either the time or the date or both.
/DELETE	If you submit a filename to the QSNA command, EXEC deletes the file after completing the TRANSFER command. Do not use the /DELETE switch if you wish to transfer data from a device to the host. Only use /DELETE if the filename is not a devicename (i.e., filename is not of the form @<name>). .
/ERCL=	You can use the /ERCL= switch when the medium is E. The value of /ERCL= sets the record length that SNA/RJE uses in reading data from the file. The /ERCL= switch overrides the record length specified in configuring SNA/RJE. SNA/RJE also passes the record length value to the host. You can still use the /TYPE= switch with the /ERCL= switch.
/HOLD	When you use the /HOLD switch, EXEC will place your request in the queue, but will prevent execution of the request until you issue a QUNHOLD command.
/L[=]	EXEC may send messages to your console when using QSNA. The /L switch redirects the messages to a file. If you use the format /L, the messages appears in the current listfile. If you use the format /L=XXX, where XXX is a filename, EXEC directs its messages to filename. The /L switch does not effect the destination of the data that you are sending to the host.
/MEDIUM=	You set the /MEDIUM= switch to the medium type of the device or file whose data you are submitting to the SNA queue. If you do not use the /MEDIUM= switch, EXEC will assume the card reader medium C.
/NORESTART	The /NORESTART switch instructs EXEC not to restart the QSNA job if a system failure interrupts the job.
/NOTIFY	If you use the /NOTIFY switch, EXEC informs you when your request is complete.
/OPERATOR	When you use the /OPERATOR switch, EXEC does not process your request until the system operator is logged onto the system.
/Q	If you use /Q on the QSNA command, the CLI will replace all sequences of tabs and spaces by single spaces in any text the CLI displays on your console screen.

/QOUTPUT=	The /QOUTPUT= switch sets the output file of the batch process to a specified pathname. If you do not use the /QOUTPUT= switch, SNA/RJE creates the file :UDD:<USER>:RJE.OUTPUT.N, where N is the EXEC assigned sequence number. The following status information appears in the output file:

USER:	name of user issuing QSNA command
STREAM NUMBER:	stream over which SNA/RJE sends data
SOURCE FILE:	name of file or device providing data
TYPE:	file type (line, sequential, EBCDIC, or Hollerith)
SEQUENCE NO.:	value of the EXEC assigned sequence number
MEDIUM:	medium type of the data source file
SUBADDRESS:	subaddress of the data source file
ERCL:	value of the /ERCL switch, if used (if not, is 0)
TRANSPARENCY:	ON or OFF, indicating if SNA/RJE is sending transparent data

/QPRIORITY=	You can set the request priority of the QSNA command with this switch. Set /QPRIORITY= to a number greater than 0 but less than 256.
/QUEUE=	A system can have more than one SNA queue. To submit a request to a particular queue, set /QUEUE= to the queue name.
/STREAM=	Use the /STREAM= command to transfer the data over a particular stream. You can set /STREAM= equal to a stream number from 1 through 6; you can also set /STREAM= to 0 to let EXEC choose any stream. The default value of /STREAM= is 1.
/SUBADDRESS=	Set the /SUBADDRESS= switch equal to the subaddress of the device or file whose data you are submitting to the SNA queue. If you do not use the /SUBADDRESS= switch, SNA/RJE assumes the subaddress 0.
/TRANSPARENT	The /TRANSPARENT switch instructs SNA/RJE to send the data as transparent data. The host does not interpret transparent data.
/TYPE=	The /TYPE= switch directs SNA/RJE to read data from the device or file in a certain way. Setting the switch to LINE instructs SNA/RJE to perform data sensitive reads. You set the maximum record length for line data files when configuring SNA/RJE. Setting the switch to SEQUENTIAL instructs SNA/RJE to perform dynamic reads, by counting a certain number of characters as a record. You set the record length for sequential data when configuring SNA/RJE. Setting the switch to EBCDIC instructs SNA/RJE not to translate the data into ASCII and to read the data dynamically. Setting the switch to HOLLERITH instructs SNA/RJE to translate data from Hollerith to ASCII and to perform dynamic reads. Setting /TYPE= to HOLLERITH is valid only if the device you specify is a card reader.
/V	The /V switch instructs EXEC to send a message to indicate that it has queued the device or file.

You can use EXEC commands such as QHOLD, QUNHOLD, QCANCEL, and FLUSH on an SNA queue.

Abbreviations

You can abbreviate an SNA/RJE command by typing only part of the command, as though you began typing the command name, but stopped. SNA/RJE will recognize any abbreviation of an SNA/RJE command so long as it can stand for only one command. An abbreviation must be long enough to differ from the abbreviation of any other command. For example,

A   is sufficient for   ASSIGN,

but S is insufficient for SESSTAT, because SET, SIGNAL, and SSCPMSG also begin with S. We can, however, abreviate SESSTAT, SET, SIGNAL, and SSCPMSG as follows:

SES	is sufficient for	SESSTAT
SET	is sufficient for	SET
SI	is sufficient for	SIGNAL
SS	is sufficient for	SSCPMSG

You can also abbreviate SNA/RJE command switch names and QSNA switch names.

Command Summary

In this section, we will give short summaries for each of the SNA/RJE commands. Full descriptions of each command follow this section.

ASSIGN	Assign a medium/subaddress to an AOS or AOS/VS physical device or file.
CANCEL	Stop the operation currently associated with a device or medium/subaddress.
CLOSE	Close an LU.
DEASSIGN	Deassign a medium/subaddress from an AOS or AOS/VS physical device or file.
DEVSTAT	Display devicenames or filenames associated with medium/subaddress assignments
DIR	Display or change the working directory of SNA/RJE.
HALT	Halt the SNA/RJE program.
HOSTMSG	Send a short message to the host processor.
OPEN	Open an LU.
OUTPUT	Temporarily assign a medium/subaddress to an AOS or AOS/VS device or file.
RSHUTD	Send an Request Shutdown RU to the host.
SESSTAT	Display various status information for a given session.
SET	Set SNA/RJE output, mode, or log functions.
SIGNAL	Send a Signal RU to the host.
SSCPMSG	Send a message to the Systems Service Control Point.
STATUS	Display status information on the SNA/RJE process.
TRANSFER	Transfer data to the RJE subsystem on the host.

ASSIGN
Assign a medium/subaddress to an AOS or AOS/VS physical device or file.

Syntax

ASSIGN*[/A][/NOAPP]* <*medium*> <*subaddress*> <*devicename or filename*>

medium	is a one letter code for the medium type: C, E, or P.
subaddress	is the subaddress code and may range from 0 through 15, decimal.
devicename or filename	is the name of the device or file to which you are assigning the medium and subaddress.

Switches

/A	causes SNA/RJE to write data to a file or device using the append option.
/NOAPP	causes SNA/RJE to write data to a file or device without the append option.

Description

ASSIGN instructs SNA/RJE to associate a file or device with a particular medium and subaddress. By using this command, you are telling SNA/RJE where to write data. You associate the device or file with a particular medium and subaddress. You can use ASSIGN at two different times. One time is when the host tries to send data to a medium/subaddress, but the medium/subaddress is not associated with any device or file. SNA/RJE will then prompt you to assign the medium/subaddress to a device or file. ASSIGN makes static assignments. A static assignment is one that lasts after SNA/RJE sends data to the medium/subaddress that you assigned. You can change such an assignment by using ASSIGN again or by using DEASSIGN.

There are three assignable mediums: card punches (C), files (E), and printers (P). You can assign subaddress 0 through 15 decimal.

You can use one of two optional switches with ASSIGN, /A and /NOAPP. If you specify the /A switch, SNA/RJE appends data from the host to the end of the data already in the file or device. If you assign a medium/subaddress to a magnetic tape file, SNA/RJE increments the file number whenever it writes new data to the file. If you assign any other type of file, SNA/RJE appends new data to the end of data already present in the file.

If you specify the /NOAPP switch, SNA/RJE doesn't append data from the host to that already in a file or device. Instead, SNA/RJE creates a new file in the form of <filename>_HH.MM.SS, where <filename> is the name of the original file and HH.MM.SS is the time at which SNA/RJE wrote the data to the file. If you assign a magnetic tape file, SNA/RJE increments the file number whenever it writes new data to the file.

If you use neither the /A or the /NOAPP switch, SNA/RJE will write with whatever option you specified when configuring SNA/RJE. If you answered Y to the question, "Should SNA/RJE use the append option when writing to files? [N]", SNA/RJE will use the append option, in the absence of the switches. If you answered N, SNA/RJE will not use the append option.

Examples

Assign the lineprinter @LPT to the medium P, subaddress 11.

CONTROL SNA_RJE ASSIGN P 11 @LPT

CANCEL
Stops the operation currently associated with a device or medium/subaddress.

Syntax

CANCEL $\left\{ \begin{array}{l} <\text{devicename or filename}> \\ [/STREAM=n][/INBOUND][/OUTBOUND] <\text{medium}> <\text{subaddress}> \end{array} \right\}$

<devicename or filename>	is the name of an AOS or AOS/VS device or file.
medium	is C, E, P (outbound data only), or K (inbound data only).
subaddress	is a decimal number from 0 through 15.

Switches

/STREAM=n	specifies the stream; n is a decimal number 1 through 6 or the word ALL.
/INBOUND	cancels only inbound data on a stream. You must specify a medium and a subaddress with this switch.
/OUTBOUND	cancels only outbound data on a stream. You must specify a medium and a subaddress with this switch.
No Switch	you must specify a device or file name.

Description

Note that there are two formats for the CANCEL command: one if you use no switch and another if you specify switches. With no switch, you must specify a devicename or filename.

CANCEL stops the flow of data associated with a specific device or stream. If outbound data is going to a device, the CANCEL command will tell the host to stop sending data; if you use a switch with CANCEL, SNA/RJE will also end any association between the device and any medium/subaddress.

SNA/RJE examines the CANCEL command first for a /STREAM switch. If there is no /STREAM switch, SNA/RJE then examines the command for a /OUTBOUND switch. If there is neither a /STREAM or a /OUTBOUND switch, SNA/RJE looks for a /INBOUND switch. SNA/RJE acts on only one switch. In other words, SNA/RJE gives preference first to stopping all data flow on a stream, second to stopping only outbound data flow, and last to stopping only inbound data flow. If you use CANCEL with a switch and you stop outbound data flow to a device, you end the association between that device and any medium/subaddress combination.

NOTE: If you use the CANCEL command on an OUTBOUND stream, you may have to issue a special command to the host subsystem with the HOSTMSG command to restart the logical device.

Examples

We will end all outbound data flow to the line printer @LPT.

CONTROL @SNA_RJE CANCEL @LPT

To end inbound data from the file associated with the medium/subaddress E 11, we do the following:

CONTROL @SNA_RJE CANCEL/INBOUND E 11

If we use both the /STREAM= switch and the /INBOUND switches as follows,

CONTROL @SNA_RJE CANCEL/STREAM=2/INBOUND E 11

SNA/RJE will end all data flow on stream 2 and will ignore the /INBOUND switch.

CLOSE
Close an LU.

Syntax

CLOSE[/STREAM=n]

Switches

/STREAM=n   specifies the stream whose LU you want to close. You can set the switch to a decimal stream number from 1 through 6 or to ALL, which instructs SNA/RJE to close the LUs of all streams. The default value is stream 1.

Description

CLOSE ends a stream's SSCP-LU and LU-LU sessions immediately and frees the Logical Unit for use by another user. A CLOSE command interrupts and ends any data traffic on the stream's sessions. You would issue a CLOSE command to free a Logical Unit for a user or if you want to change the characteristics of the stream by assigning it a Logical Unit from a different Logical Unit Group or by using the /NOINPUT switch on the OPEN command.

Examples

If you have three streams with active sessions and you want to end all the sessions, you would type the following:

CONTROL @SNA_RJE CLOSE/STREAM=ALL

SNA/RJE would return the following message:

STREAM NO. 1
STREAM HAS BEEN CLOSED
STREAM NO. 2
STREAM HAS BEEN CLOSED
STREAM NO. 3
STREAM HAS BEEN CLOSED

     093-000301-00

DEASSIGN

Deassign a medium/subaddress from an AOS or AOS/VS physical device or file.

Syntax

DEASSIGN $\left\{ \begin{array}{l} \text{<devicename or filename>} \\ \text{<medium> <subaddress>} \end{array} \right\}$

<devicename or filename>	is the name of the device or file associated with the medium/subaddress that you want to deassign.
<medium>	is the medium of the medium/subaddress you want to deassign (C, E, or P).
<subaddress>	is the subaddress of the medium/subaddress you want to deassign.

Switches

None.

Description

DEASSIGN instructs SNA/RJE to end any association between a particular medium/subaddress and any file or device. By using this command, you are telling SNA/RJE to inform you if the host sends any data to the medium/subaddress.

You can specify a medium and a subaddress. The mediums you can deassign are: card punches (C), files (E), and printers (P). You can deassign subaddress 0 through 15 decimal.

You can also specify the name of the file or device that is associated with the medium and subaddress that you want to deassign.

Examples

We will deassign the medium P, subaddress 11 from the line printer @LPT.

CONTROL @SNA_RJE DEASSIGN P 11

We can also deassign the medium/subaddress by specifying the line printer.

CONTROL @SNA_RJE DEASSIGN @LPT

DEVSTAT

Displays devicenames or filenames associated with medium/subaddress assignments.

Syntax

DEVSTAT

Switches

None.

Description

When you issue DEVSTAT, SNA/RJE returns status information on any file or device which you have associated with a medium/subaddress through the ASSIGN command.

For every such device or file, you will receive the following information: the medium, the subaddress, the append option and the devicename or filename.

Examples

Line printer @LPT is assigned to medium/subaddress P 0, file PRINT.1 is assigned to medium/subaddress P 1, and file JOB3 is assigned to medium/subaddress E 3. In addition, file PRINT.1 will have data appended to it, and files @LPT and JOB3 will not have data appended to them. To receive status information on all devices and files, you would type the following:

CONTROL @SNA_RJE DEVSTAT

SNA/RJE would return the following status information:

MED	SUB	APND	AOS filename
P	0	N	@LPT
P	1	Y	PRINT.1
E	3	N	JOB3

093-000301-00

DIR
Display or change the working directory of SNA/RJE.

Syntax

DIR *[DIRECTORY_NAME]*

Switches

None.

Description

DIR displays or changes the current working directory of SNA/RJE. Note that the working directory can be different from the initial working directory specified when configuring SNA/RJE. To display SNA/RJE's working directory, issue DIR without an argument. To change the working directory, specify a directory name as an argument to the DIR command.

When you start SNA/RJE, you use the /DIR switch to specify the initial working directory. It is important to remember that the /DIR switch is different from the DIR command. The /DIR switch lets you specify the initial working directory. The DIR command lets you change the working directory while SNA/RJE is running.

Examples

To find the working directory, we type

CONTROL @SNA_RJE DIR

SNA/RJE will return

:UDD:OP

To change the working directory to :UDD:WIN, we type

CONTROL @SNA_RJE DIR :UDD:WIN

HALT
Halt the SNA/RJE program.

Syntax

HALT*[/I][/C]*

Switches

/C   causes SNA/RJE to halt after completing any ongoing activity. This is a complete halt.

/I   issues an immediate halt. An immediate halt is the default.

Description

HALT stops the operation of the SNA/RJE program. Only the SNA/RJE operator may use this command. You may request an immediate halt or a complete halt.

Under a complete halt, SNA/RJE sends an RSHUTD command to all streams that have LU-LU sessions. When all the streams are shut down, SNA/RJE terminates and sends the message *SNA/RJE is terminating* to the operator console. SNA/RJE also deletes its own temporary files.

Under an immediate halt, SNA/RJE sends CLOSE commands to all streams that have LU-LU sessions. After all such streams are closed, SNA/RJE terminates and sends the message *SNA/RJE is terminating* to the operator console. SNA/RJE also deletes its own temporary files.

Examples

We want to issue CLOSE commands to all streams that have active LU-LU sessions and terminate SNA/RJE, so we type the following:

CONTROL @SNA_RJE HALT/I

         093-000301-00

HOSTMSG
Send a short message to the host processor.

Syntax

HOSTMSG*//STREAM=n]*#Text of message#

\#   is any character that is not in the text of your message. The maximum message length is 256 characters.

Switches

/STREAM=n   specifies the stream to send your message on; *n* can be a decimal number from 1 through 6, or the word ALL which sends the message on all streams. If you do not use /STREAM=, SNA/RJE sends the message on stream 1.

Description

You use HOSTMSG to send a message to your host, requesting status information from the RJE subsystem. The host receives the message as coming from the RJE console. You can send the message on any one stream, or on all of them. You indicate the stream with the /STREAM switch on the HOSTMSG command. Your message may be no longer than 256 characters.

You must use the /I switch with the CLI CONTROL command when you issue HOSTMSG. You type CONTROL/I, then a NEW LINE. The CLI returns a double parenthesis prompt. You then type HOSTMSG *[/STREAM=n]*, where *n* is a stream number (1 through 6 decimal) or ALL (for all streams). Type your message. First, choose a character to delimit the message. You can choose any non-blank character. You cannot use this character within your message.

When you have entered your message and the delimiting character, type another NEW LINE. When the CLI returns the double prompt, type a right parenthesis and a NEW LINE. You have issued HOSTMSG and your message.

Examples

To send the message "$R637.PR1" to the host on the third session, do as follows:

)CONTROL / I @SNA_RJE)
))HOSTMSG / STREAM = 3 #$SR637.PR1#)
))))

You could also send the message this way:

)CONTROL / I @SNA_RJE)
))HOSTMSG / STREAM = 3 "$SR637.PR1")
))))

To send the same message to the host on all sessions, do as follows:

CONTROL / I @SNA_RJE)
HOSTMSG / STREAM = ALL "$SR637.PR1")

To send the message on STREAM 1, you may use the default STREAM value.

CONTROL / I @SNA_RJE)
HOSTMSG %$SR637.PR1%)

OPEN
Open an LU.

Syntax

CONTROL <SNA_RJE_PROCESS_NAME> OPEN <LUG_NAME>*[/NOINPUT]*

where:

<SNA/RJE_PROCESS_NAME>   is the name of your SNA/RJE process.

<LUG_NAME>   is the name of a Logical Unit Group.

Switches

/NOINPUT   appears after the LUG name. Forbids issuing a TRANSFER command that would use a LU from the specified LUG to send data to the host.

Description

The OPEN command assigns a Logical Unit from a specified Logical Unit Group to the first stream that has no Logical Unit. Using the OPEN command gives you an *activated* stream, or a stream whose Logical Unit has an active SSCP-LU session.

OPEN only activates the stream — you must still logon to the RJE subsystem before the stream's LU-LU session can carry data traffic. You logon to the RJE subsystem with the SSCPMSG command.

Examples

We want to initialize two streams with Logical Units from the Logical Unit Group RJE.LUG. We want to ensure that no one can issue a TRANSFER or QSNA command to the second stream. The name of the process is SNA_RJE.

CONTROL @SNA_RJE OPEN RJE.LUG

CONTROL @SNA_RJE OPEN RJE.LUG/NOINPUT

     093-000301-00

OUTPUT

Temporarily assign a medium/subaddress to an AOS or AOS/VS device or file.

Syntax

OUTPUT*[/STREAM=n][/A][/NOAPP]* <devicename or filename>

<devicename or filename>   is the name of an AOS or AOS/VS device or file that you are assigning.

Switches

/A	causes SNA/RJE to write data to a file or device using the append option.
/NOAPP	causes SNA/RJE to write data to a file or device without the append option.
/STREAM=n	indicates the stream whose output you wish to direct to the specified devicename. You may set *n* equal to a decimal number from 1 through 6. If you do not use this switch, SNA/RJE issues the command to stream 1.

Description

OUTPUT instructs SNA/RJE to temporarily assign the given devicename or filename to the specified medium and subaddress. The assignment is valid until the host stops sending data to the device or file. The OUPUT command is like an ASSIGN command that works only until after the device or file in question receives something from the host. Use the OUTPUT command only when SNA/RJE requests you to assign a file or device to a particular medium/subaddress. We call an assignment made at the request of SNA/RJE a dynamic assignment.

Unlike the ASSIGN command, the OUTPUT command takes a stream number and an AOS (or AOS/VS) filename or devicename as arguments. You may specify a stream number from 1 through 6. If you do not specify a stream, SNA/RJE sends the OUTPUT command to stream 1. SNA/RJE directs output from the specified stream(s) to the specified file or device.

You can use two other switches with OUTPUT, /A and /NOAPP. The /A switch causes SNA/RJE to write data to a file or device in append mode. In append mode, SNA/RJE will append data from the host to the end of the data already in the file or device. If you assign a medium/subaddress to a magnetic tape file, SNA/RJE increments the file number whenever it writes new data to the file. If you assign any other type of file, SNA/RJE appends new data to the end of data already present in the file. If you specify a nonexistent file, SNA/RJE will create the file.

The /NOAPP switch causes.SNA/RJE to write data to a file or device without the append option. If you assign a magnetic tape file, SNA/RJE writes the data to file 0. If you assign any other type of file, SNA/RJE writes the data to the file, overwriting the data already in the file. If you specify a nonexistent file, SNA/RJE will create the file.

If you use neither the /A or the /NOAPP switch, SNA/RJE writes with whatever option you specified when configuring SNA/RJE. If you answered Y to the question, *Should SNA/RJE use the append option when writing to files? [N]*, SNA/RJE will use the append option, in the absence of the switches. If you answered N, SNA/RJE will not use the append option.

Examples

We want to receive the next output from stream 3 at line printer @LPT1.

CONTROL @SNA_RJE OUTPUT/STREAM=3 @LPT1

RSHUTD
Send an Request Shutdown (RSHUTD) RU to the host.

Syntax

RSHUTD*[/STREAM=n]*

Switches

/STREAM=n   *n* is a stream number (1 through 6) or ALL (for all streams) indicating which stream is to be shutdown. The default is stream 1.

Description

RSHUTD asks your host stop data traffic and end the LU-LU session on a specified stream. The host's reaction to the RSHUTD varies with the RJE subsystem. See sources on your RJE subsystem for further information.

The HALT/C command automatically issues RSHUTD commands for all streams.

Examples

We will ask the host to shutdown the LU-LU session on the fifth stream.

CONTROL @SNA_RJE RSHUTD/STREAM=5

Licensed Material-Property of Data General Corporation   093-000301-00

SESSTAT

Displays various status information for a given session.

Syntax

SESSTAT*[/DATA][/H][/STREAM=n]*

Switches

/DATA   returns the data from the initial BIND RU (if any) in hexadecimal and displays the compaction table (if any) with ASCII character entries.

/H   is used with the /DATA switch and displays the compaction table (if any) with hexadecimal entries.

/STREAM=n   indicates for which stream you want status information. You can specify a stream number from 1 through 6 or ALL, indicating that you want status information for all streams. The default stream is 1.

Description

You issue SESSTAT to obtain status information on any session or group of sessions running under the control of SNA/RJE. To identify a session, you specify the stream with which it is associated. Since only one LU-LU session is associated with a stream, the stream number is the only identification you need.

The SESSTAT command accepts two other switches: the /DATA switch and the /H switch. If you don't specify the /DATA switch, SNA/RJE returns status information in the following order:

- STREAM NO. (1-6): This indicates the stream number for which SNA/RJE is displaying information.

- SNA STATE: The SNA state displays status information on the LU-LU session on the given stream. The SNA state may be: NOT OPEN, OPEN, OPEN/ACTIVATED, BOUND, READY, or SHUT DOWN. NOT OPEN means that the stream does not have the use of an LU, i.e., either no user has issued an OPEN command for the stream or a user has issued a CLOSE command for the stream. An OPEN stream is one that has the use of a Logical Unit, i.e. someone issued an OPEN command to an LUG for the stream. An OPEN/ACTIVATED stream is one that has an active SSCP-LU session. A BOUND stream has active SSCP-LU and LU-LU sessions. A READY stream has data traffic ready on the LU-LU session. A SHUT DOWN stream is one that received a SHUTD Request/Response Unit from the host, followed by SNA/RJE sending a SHUTC RU (an acknowledgement of the SHUTD RU) to the host.

- INPUT INHIBIT STATUS: This tells if an OPEN command with the /NOINPUT switch was used to provide an LU to the stream. You cannot issue a TRANSFER command for a stream that has an active input inhibit status.

- S/R STATE: If the stream is carrying inbound data, the word SEND appears here. If the stream is carrying outbound data, the word REC appears here. If the stream is carrying no traffic, the word CONT appears here.

- ACTIVE MEDIUM: If the stream is carrying data to or from an AOS or AOS/VS file or device, the medium of the file or device appears here.

- ACTIVE SUBADDRESS: If the stream is carrying data to or from an AOS or AOS/VS file or device, the subaddress of the file or device appears here.

SESSTAT (continued)

- ACTIVE INPUT DEVICE NAME: If the stream is carrying inbound traffic, the name of the device or file providing the data appears here. If there is no inbound traffic, this section does not appear.
- ACTIVE OUTPUT DEVICE NAME: If the stream is carrying outbound traffic, the name of the device or file providing the data appears here. If there is no outbound traffic, this section does not appear.
- BRACKET STATE: The session's bracket status appears here. *IN BRACKETS* indicates that the session is in a bracket. *BETWEEN BRACKETS* indicates that the session is between brackets.
- TRANSFER STATE: The transfer state is an octal number which is unimportant unless there are problems with the session, in which case you should contact your Data General representative.
- PENDING OP ASSIGN STATUS: If the host is waiting for the operator to assign a device to a particular medium/subaddress so the host can send data, the words *PENDING OP ASSIGN* appear here. Otherwise, this section does not appear.
- INPUT INTERRUPT STATUS: If the host interrupts a transmission of an inbound job, the words *Input interrupted* appear here. Otherwise, this section does not appear.

The /DATA switch instructs SNA/RJE to return a different set of status information than that listed above. The /H switch can only be used with the /DATA switch; it instructs SNA/RJE to print the compaction table in hexadecimal.

- BIND DATA: The data in the initial BIND RU that the host uses to start the LU-LU session appears here in hexadecimal.
- COMPACTION TABLE: If the host is sending compacted data, the compaction table appears here as a 16 by 16 array. Numbering of the array runs from 0 through F hexadecimal, from left to right and from top to bottom. If you do not use the /H switch in addition, entries in the table will be ASCII characters. Any unprintable ASCII characters will appear as "00". If you use the /H switch, entries in the table will be ASCII codes in hexadecimal.

Examples

Stream 2 is receiving outbound data and is sending it to line printer @LPT. The session is in brackets.

To receive session status information, we issue the following:

CONTROL @SNA_RJE SESSTAT/STREAM=2

SNA/RJE will return the following:

STREAM NUMBER:	*2*
SNA STATE: READY	
S/R STATE: REC	
MEDIUM:	*PRINTER*
SUBADDRESS:	*6*
AOS FILE NAME (OUTPUT):	*@LPT*
BRACKET STATE:	*IN BRACKETS*
TRANSFER STATE:	*0*

093-000301-00

If we used the /DATA switch as follows,

CONTROL @SNA_RJE SESSTAT/DATA/STREAM=2

we might receive the following:

STREAM NUMBER: 2
BIND DATA:

31010303B3A37080000385850600011040009100C000000100400008E5D1C5E2F0F0F0

COMPACTION TABLE:

```
00  00  00  00  00  00  00  00  00  00  00  00  00  v   w   y
00  00  00  00  00  00  00  00  00  00  00  00  00  s   t   u
00  00  00  00  00  00  00  00  00  00  00  00  00  o   p   r
00  00  00  00  00  00  00  00  00  00  00  00  00  l   m   n
00  00  00  00  00  00  00  00  00  00  00  00  00  i   j   k
00  00  00  00  00  00  00  00  00  00  00  00  00  f   g   h
00  00  00  00  00  00  00  00  00  00  00  00  00  c   d   e
00  00  00  00  00  00  00  00  00  00  00  00  00  9   a   b
00  00  00  00  00  00  00  00  00  00  00  00  00  6   7   8
00  00  00  00  00  00  00  00  00  00  00  00  00  3   4   5
00  00  00  00  00  00  00  00  00  00  00  00  00  0   1   2
00  00  00  00  00  00  00  00  00  00  00  00  00  X   Y   Z
00  00  00  00  00  00  00  00  00  00  00  00  00  00  V   W
00  :   #   @   '   =   ""  B   C   F   H   J   K   M   P   Q
(   +   &   1E  $   *   )   ;   0C  -   /   ,   %   _   >   ?
    A   D   E   G   I   L   N   O   R   S   T   U   0A  .   <
```

By using the /DATA and /H switches as follows,

CONTROL @SNA_RJE SESSTAT/DATA/H/STREAM=2

we might receive the following:

STREAM NUMBER: 2
  BIND DATA:

31010303B3A37080000385850600011040009100C000000100400008E5D1C5E2F0F0F0

  COMPACTION TABLE:

```
00  00  00  00  00  00  00  00  00  00  00  00  00  A5  A6  A8
00  00  00  00  00  00  00  00  00  00  00  00  00  A2  A3  A4
00  00  00  00  00  00  00  00  00  00  00  00  00  96  97  99
00  00  00  00  00  00  00  00  00  00  00  00  00  93  94  95
00  00  00  00  00  00  00  00  00  00  00  00  00  89  91  92
00  00  00  00  00  00  00  00  00  00  00  00  00  86  87  88
00  00  00  00  00  00  00  00  00  00  00  00  00  83  84  85
00  00  00  00  00  00  00  00  00  00  00  00  00  F9  81  82
00  00  00  00  00  00  00  00  00  00  00  00  00  F6  F7  F8
00  00  00  00  00  00  00  00  00  00  00  00  00  F3  F4  F5
00  00  00  00  00  00  00  00  00  00  00  00  00  F0  F1  F2
00  00  00  00  00  00  00  00  00  00  00  00  00  E7  E8  E9
00  00  00  00  00  00  00  00  00  00  00  00  00  04  E5  E6
79  7A  7B  7C  7D  7E  7F  C2  C3  C6  C8  D1  D2  D4  D7  D8
4D  4E  50  1E  5B  5C  5D  5E  0C  60  61  6B  6C  6D  6E  6F
40  C1  C4  C5  C7  C9  D3  D5  D6  D9  E2  E3  E4  15  4B  4C
```

093-000301-00

SET
Set SNA/RJE output, mode, or log function.

Syntax

SET[/OUTPUT=n][/MODE=m][/LOG=filename][/NOLOG]

Switches

/OUTPUT=n	instructs SNA/RJE to direct all messages to a specific console, file, or Process ID (PID). If you direct messages to a console, n takes the form @CONx or @VCONx, where x is a valid console number. If directing messages to a file, n is an AOS or AOS/VS filename. If directing messages to a PID, n is the PID number. If you omit n, SNA/RJE directs all messages to SNA/RJE's first father process with a console.
/MODE=m	instructs SNA/RJE to work in attended or unattended mode. The switch takes the value of A for attended or U for unattended.
/LOG=filename	instructs SNA/RJE to create a log file with the given AOS or AOS/VS pathname.
/NOLOG	instructs SNA/RJE to stop sending copies of messages from the host to a log file.

NOTE: You can use only one switch each time you issue the SET command.

Description

The SET command controls certain functions of SNA/RJE. SET can direct all messages, including error messages, to a particular console or virtual console, AOS or AOS/VS file, or Process ID (PID). You direct the messages through the /OUTPUT= switch. SNA/RJE initially sends all messages to its first father process with a console. The /OUTPUT switch (without the =) is equivalent to setting the /OUTPUT= switch to the original output console.

SET can also determine if SNA/RJE runs in either attended or unattended mode. In attended mode, SNA/RJE notifies the operator if the host is trying to send data to a medium/subaddress that is not associated with a particular device. The operator then has time to assign a device to the medium/subaddress. If the operator does not make the assignment, SNA/RJE refuses the data. Further actions by the host vary with the RJE subsystem. See the appropriate sources for information on your RJE subsystem. In unattended mode, such an assignment problem causes SNA/RJE to immediately refuse the data.

You can send a copy of all messages from the host to a log file with the /LOG= switch. If you want to stop logging, use the /NOLOG switch.

You can use SET on only one function at a time (i.e., you can use only one switch on SET).

SET (continued)

Examples

We want to direct all messages from SNA/RJE, the host, and the SSCP, to a file called MSGS.

CONTROL @SNA_RJE SET/OUTPUT=MSGS

If we want to direct the messages to console 4, we do the following:

CONTROL @SNA_RJE SET/OUTPUT=@CON4

If we want SNA/RJE to run in attended mode type:

CONTROL <SNA_RJE_PROCESS_NAME> SET/MODE=A

You can direct all messages from the host to the file HOST.LOG.

CONTROL <SNA_RJE_PROCESS_NAME> SET/LOG=HOST.LOG

 093-000301-00

SIGNAL
Send a Signal (SIGNAL) RU to the host.

Syntax

CONTROL <SNA_RJE_PROCESS_NAME> SIGNAL*[/STREAM=n]*

Switches

/STREAM=n   indicates on which stream you are asking the host for permission to transmit; *n* may be 1 through 6 or to ALL which indicates all streams. The default value of /STREAM= is 1.

Description

The SIGNAL command instructs SNA/RJE to send SIGNAL RU to the host. By issuing the SIGNAL command, you request the host to stop sending data so that you may send data. Use SIGNAL if a HOSTMSG command fails and you receive the message *STREAM BUSY RECEIVING OUTBOUND_DATA*.

Examples

We will ask for permission to send data to the host on stream 3.

CONTROL @SNA_RJE SIGNAL / STREAM = 3

SSCPMSG
Send a message to the Systems Service Control Point.

Syntax

SSCPMSG//*STREAM*=n] #Text of message#

\#   is any character not appearing in the text of your message.

Switches

/*STREAM*=n   where *n* is the stream on which you want to send the message; *n* may be 1 through 6 or to ALL, which indicates all streams. The default value of /STREAM= is 1.

Description

You use SSCPMSG to send a message to your SSCP to logon to or logoff of the RJE subsystem. You can send the message on any one stream, or on all of them. You indicate the stream with the /STREAM= switch on the SSCPMSG command. The message may be no longer than 256 characters.

You must use the /I switch with the CLI CONTROL command when you issue SSCPMSG. You type CONTROL/I, then NEW LINE. The CLI returns a double parenthesis as a prompt. You then type SSCPMSG/STREAM= and your message. You must begin and end your message with a character that does not appear in the text of your message. You can choose any non-blank character, but you must type it at the beginning and end of the message.

When you have entered your message and the delimiting character, type another NEW LINE. You have issued SSCPMSG and your message. When the CLI returns the double parenthesis prompt, type a right parenthesis and a NEW LINE.

Examples

To send the message "LOGON APPLID(VJES0002)" to the host on the third session, type the following:

```
)CONTROL/I @SNA_RJE ↲
))SSCPMSG/STREAM=3 "LOGON APPLID(VJES0002)" ↲
)) ↲
```

You could also send the same message as follows:

```
)CONTROL/I @SNA_RJE ↲
))SSCPMSG/STREAM=3 @LOGON APPLID(VJES0002)@ ↲
)) ↲
```

NOTE: Although you may use the SSCPMSG command to logoff from the RJE subsystem, you should ask the subsystem operator for proper logoff instructions.

       093-000301-00

STATUS
Display status information on the SNA/RJE process.

Syntax

STATUS

Switches

None.

Description

The STATUS command indicates the mode of the SNA/RJE process (either attended or unattended), the name of the log file (if any), and the SNA/RJE process's working directory.

Examples

CONTROL @SNA_RJE STATUS

You will receive the following information:

MODE: *ATTENDED*

LOGFILE: *:UDD:RJE:HOST.LOG*

DIRECTORY: *:UDD:RJE*

TRANSFER

Transfer data to the RJE subsystem on the host.

Syntax

TRANSFER*[/STREAM=n][/MEDIUM=m][/SUBADDRESS=s][/TRANSPARENT]*
    [/TYPE=t][/ECRL][/CONCATENATE] <filename>

<filename>	is the name of the file or device supplying data to the TRANSFER command. If you use the /CONCAT switch, <filename> indicates a file containing the names of your data sources.

Switches

/STREAM=n	indicates the stream on which you want to send the data. You can specify a stream number by setting *n* to be a decimal number from 1 through 6. If you omit the switch, SNA/RJE sends the data on any available stream.
/MEDIUM=m	indicates the medium type of the file or device providing the data; *m* may be CARD, CONSOLE, or EXCHANGE. The default value is CARD.
/SUBADDRESS=s	indicates the subaddress of the file; *s* is a decimal number from 0 through 15. The default value is 0.
/TRANSPARENT	causes SNA/RJE to send the data as transparent, instructing the host not to interpret any of the data. Without this switch, SNA/RJE will treat the data as not transparent.
/TYPE=t	indicates the file type by setting *t* equal to LINE for line data, SEQUEN-TIAL for sequential data, EBCDIC for EBCDIC data, or HOLLERITH for Hollerith data. If you do not specify a data type, SNA/RJE expects line data.
/ERCL=	instructs SNA/RJE to use the exchange record length you supply in reading the file. You can still use the /TYPE= switch when you use the /ERCL= switch. You can abbreviate this switch.
/CONCATENATE	indicates that the file contains a list of data sources. Each data source has the format <source_name>*[/TRAN][/TYPE=t][/ERCL]* where *t* is the file type and <source_name> is the name of the data source.

Description

TRANSFER allows you to send data to the host. The data can have only one destination in the host (i.e., only one medium/subaddress at the host).

Indicate the way SNA/RJE should read the data source file with the /TYPE= switch. There are four types: L (for line), S (for sequential), E (for EBCDIC), and H (for Hollerith). Line data is data sensitive; certain characters delimit the end of a record. You can find a list of AOS and AOS/VS delimiters in the *Advanced Operating System (AOS) Programmer's Manual* or the *AOS/VS Programmer's Manual*.

When sending sequential data, SNA/RJE defines a record as a fixed number of characters. You set the record length for sequential data when starting SNA/RJE. SNA/RJE translates the contents of the file into EBCDIC.

SNA/RJE usually translates ASCII data into EBCDIC before sending the data to the host. If your file is already in EBCDIC, indicate the type as E. SNA/RJE treats the file as sequential but will not translate the data. You can also read Hollerith data from a card reader by setting the type to H. SNA/RJE translates the Hollerith into EBCDIC before sending the data.

093-000301-00

To send data from more than one source, place the source names in a file, each source name on a separate line. You then use the TRANSFER command with the /CONCAT switch and the file of source names as the argument. You can use the /TRAN, /TYPE=, and /ECRL= switches with each source name in the file. The switches are the same as those used on the TRANSFER command itself. SNA/RJE will send the data as though it all came from the file containing the names of the data sources. When you use the /CONCAT switch, SNA/RJE sends the data from each of the files as a chain.

Examples

We want to send the file JOB1, which contains a program that we want the host to compile. The file medium is E; the subaddress is 7. JOB1 contains ASCII characters, and we want SNA/RJE to read the file with an exchange record length of 100 characters. We issue the TRANSFER command as follows:

CONTROL @SNA_RJE TRANSFER/MED=E/SUB=7/ERCL=100/TYPE=S JOB1

We will now send the data from a card reader, @CRA, to the host. The medium and subaddress of @CRD2 are C and 2. We will send the file over the LU-LU session of stream 3. The TRANSFER command now looks like this:

CONTROL @SNA_RJE TRANSFER/STREAM=3/MED=C/SUB=2/TYPE=H @CRA

Let us send data from five sources to the host. The first source is a file that contains Job Control Language (JCL) statements. The second source is a file containing a program. Sources three through five are files on magnetic tapes that contain data. The JCL statements instruct the host to run the program first with the data in from the third data source, then the data from the fourth data source, and finally the data from data source five. The first file is JCLFILE. The file containing the program is PROGFILE. The three data files are @MTA0:0, @MTA0:1, and @MTA1:0. We place the filenames in the file JOB. The TRANSFER command is

CONTROL @SNA_RJE TRANSFER/STREAM=1/MED=E/SUB=9/TYPE=L/CONCAT JOB

where JOB is medium E, subaddress 9. The data type is line because the file JOB is a line type file. We indicate the data type of each source within JOB itself. We will now show the contents of JOB:

JCLFILE

PROGFILE

@MTA0:0

@MTA0:1

@MTA1:0

If we wished to send the data files as transparent data and also wanted SNA/RJE to perform sequential reads, we would change the contents of JOB as follows:

JCLFILE

PROGFILE

@MTA0:0/TRAN/TYPE=S

@MTA0:1/TRAN/TYPE=S

@MTA1:0/TRAN/TYPE=S

End of Chapter

Appendix A
Glossary

AOS	the Advanced Operating System
AOS/VS	the Advanced Operating System/Virtual Storage
ASCII	a seven-bit code used in information transfer; Data General computers use this code
attended mode	running SNA/RJE with an operator supervising the program
bracket	a group of chains; typically an exchange of chains between end users; also a job
chain	a group of Request/Response Units that carries a single message
compaction	a method of sending frequently occurring characters in a type of shorthand; used by the host, at its discretion, when sending data to speed data transmission
compression	a method of replacing a series of repeated characters by a shorter character string; used by the host and workstations, at their discretion, to speed data transmission
DG/SDLC	an interface between a Data General computer and an SNA network
DG/SNA	an interface allowing a Data General end user to access an SNA network
EBCDIC	an eight-bit code used in information transfer; the host uses this code
end user	anyone or anything that uses as SNA network
Hollerith	a 12-bit code used to represent data in a card reader
inbound	the direction in which data moves when traveling from an RJE workstation to the host
initial command file	a file containing a series of SNA/RJE commands that SNA/RJE executes upon being started
Logical Unit (LU)	a logical doorway into the network for end users
Logical Unit Group (LUG)	a collection of logical units with identical characteristics
LU	see Logical Unit
LUG	see Logical Unit Group
medium	a class of device; there are five medium types — card readers (C), card punches (C), disk files or exchanges (E), consoles (K), and printers (P)
message log file	an SNA/RJE file that receives messages from the host
NAU	see Network Addressable Unit

network	a method of controlling communications between computers
network address	a code identifying a device, an applications program, or end user in an SNA network
Network Addressable Unit (NAU)	any part of an SNA network that has a network address
node	a collection of programs that helps control an SNA network
outbound	the direction in which data moves when traveling from the host to an SNA workstation
PDIR	see Peripheral Data Information Record
Peripheral Data Information Record	a special block of data that contains information about a user's job; a method of associating a JOBNAME in a JCL statement with an AOS or AOS/VS file and directing output from the job to the file
PU	see Physical Unit
Physical Unit	a node's logical interface to the network
profile	a group of rules governing communications between computers
QSNA	a CLI command that submits a transfer of data over an SNA network as an EXEC job
Remote Job Entry (RJE)	a method of submitting batch jobs from a workstation to the host over an SNA network
Request/Response Unit (RU)	the form of a message sent through an SNA network; contains data, control information, and the data's destination
RJE	see Remote Job Entry
RU	see Request/Response Unit
session	a temporary logical connection between two end users
SNA	see Systems Network Architecture
SNA/RJE	a Data General product that provides an interface between an AOS or AOS/VS system and an RJE subsystem on an SNA network
SSCP	see Systems Service Control Point
stream	an SNA communications channel carrying data in an RJE subsystem
subaddress	a number from 0 through 15 indicating a particular device in a medium device class
Systems Network Architecture (SNA)	an IBM method of controlling communications among computers
Systems Service Control Point (SSCP)	an end user in an SNA network that controls all network communications
translation tables	assembly language tables that specify translation from one type of character code to another
unattended mode	running SNA/RJE with no one supervising
user exit routine	an assembly language program that can intercept, modify, and redirect information from the host

End of Appendix

Appendix B
SNA/RJE Messages

This appendix contains SNA/RJE status and error messages that you may see. Accompanying each message is an explanation of the message and recommended action, if necessary.

AN EXEC SNA JOB QUEUE HAS BEEN STARTED

Someone has issued a START command on an EXEC queue to the SNA/RJE process.

CANNOT FIND DG/SNA PROCESS

You provide the name of a DG/SNA process to SNA/RJE through either the configuration or a switch on the CLI PROCESS command when you start SNA/RJE. If you start SNA/RJE and it cannot find the DG/SNA process that you specified, you receive this error message. SNA/RJE terminates. You must ensure that you provided a valid DG/SNA process name. If the name is invalid, correct the name and start SNA/RJE again. If the name is valid, you must start the appropriate DG/SNA process.

CANNOT INITIALIZE REQUESTED STREAM

You receive this error message if you try to initialize more than six streams. The message means that you have issued an OPEN command or start-up command to gain the use of more than six Logical Units.

CANNOT SEND MESSAGE TO THE SSCP

The stream over which you were going to issue the SSCPMSG command is busy receiving data from the host.

CARD READER PICK OR CARD CODE ERROR

You receive this message when you issue a TRANSFER command from a physical card reader, but the card reader registers an error. See your Data General representative.

COMMAND NOT VALID FOR CURRENT STATE OF STREAM

The command is not appropriate for the stream (e.g., issuing the TRANSFER command for a stream with no LU-LU session).

DG/SNA HAS TERMINATED. PLEASE TERMINATE THIS CUSTOMER OF DG/SNA

The DG/SNA process has terminated and you must terminate SNA/RJE. For more information on DG/SNA, please see the appropriate sources in the Preface.

ERROR: ARGUMENT NOT FOUND

You receive this error message if you failed to supply an argument with a command.

ERROR: NO OUTPUT FILE HAS BEEN DEFINED FOR DATA

If SNA/RJE cannot match a JOBNAME to a JOBNAME template, you receive this message. SNA/RJE has no place to write the data, so it will throw out the data.

ERROR: RECORD LENGTH TOO LARGE FOR RU. UNABLE TO SPAN RECORD

Your record length is too long to send in an RU. See your Data General representative.

ERROR: STREAM IS NOT PENDING AN 'OUTPUT' COMMAND

You receive this error if you use the OUTPUT command on a stream that is not receiving data.

ERROR: SWITCH NAME NOT UNIQUE.

This message indicates that you used a nonunique abbreviation for a switch.

ERROR: UNKNOWN SWITCH NAME.

You receive this message when you specify a switch name that SNA/RJE does not recognize.

ERROR IN OPENING USER SOURCE FILE

You receive this error if you submit a job with the TRANSFER command and SNA/RJE cannot open the data source file that you specified. You will receive an additional AOS or AOS/VS message.

EXEC HAS TERMINATED

The EXEC facility of either AOS or AOS/VS has terminated. See the appropriate sources in the Preface for more information.

EXEC SNA JOB QUEUE(S) HAS BEEN STOPPED

Someone has issued a STOP command on an EXEC cue to the SNA/RJE process.

HOST ABORTED INBOUND DATA STREAM

The host has ended data flow from SNA/RJE to the host on a stream. This is usually the result of a host operator command.

HOST ABORTED OUTBOUND DATA STREAM

The host has ended data flow to SNA/RJE on a stream. This is usually the result of a host operator command.

HOST HAS SHUTDOWN STREAM

The host has shutdown a stream, rendering it unavailable for data transfer.

Action: Any solution depends on the particular RJE subsystem.

ILLEGAL FILE TYPE SPECIFIED

You receive this message if you specify an unrecognized file type in either the ASSIGN command or in the /LOG or /OUTPUT switches of the SET command. You can also receive this message if SNA/RJE could not access the file which you listed as the third argument in the ASSIGN command.

ILLEGAL STREAM SPECIFIED

This message indicates that you have not specified a stream number from 1 through 6 or the word ALL.

INVALID COMMAND FORMAT

You issued an invalid command.

INVALID 'ERCL' VALUE SPECIFIED. MUST BE DECIMAL NUMBER FROM 0 THROUGH 255

An ERCL value must be in the range of 0 through 255.

INVALID FILE TYPE SPECIFIED. MUST BE "LINE", "SEQUENTIAL", "EBCDIC", OR "HOLLERITH"

You have specified an unrecognized file type in a TRANSFER or QSNA command.

INVALID MEDIUM SPECIFIED. MUST BE "CARD", "CONSOLE", OR "EXCHANGE"

You have specified an unrecognized medium type in a TRANSFER command.

INVALID MEDIUM SPECIFIED. VALID MEDIUMS ARE "C", "E", OR "P"

You have specified an unrecognized medium type when using the ASSIGN command.

INVALID MODE OF OPERATION SPECIFIED

In using the SET command with the /MODE switch, you specified a mode other than ATTENDED or UNATTENDED.

INVALID RJE OPERATOR COMMAND

You have issued an unrecognized SNA/RJE operator command.

INVALID SUBADDRESS SPECIFIED. SPECIFY A DECIMAL NUMBER FROM 0 THROUGH 15.

You have specified an unrecognized subaddress when using the ASSIGN command.

INVALID SWITCH FORMAT

The format of a switch on that command is incorrect.

JOB CANCELLED BY USER

A user used the CLI QCANCEL command to end a QSNA job.

JOB FLUSHED BY OPERATOR

The SNA/RJE operator ended a QSNA job with the CONTROL @EXEC FLUSH command.

JOB RACE ERROR - RESTARTING JOB

You receive this message if you issue a QSNA command without a /NORESTART switch which must compete with a TRANSFER job on the same stream. SNA/RJE tries to restart the QSNA command. See your Data General representative.

JOB RESTART ERROR - ABORTING JOBS.

You receive this message if you issue a QSNA command with a /NORESTART switch which must compete with a TRANSFER job on the same stream. SNA/RJE aborts the QSNA job. See your Data General representative.

JOB STREAM ERROR - RESTARTING JOB

You receive this message if EXEC chooses a stream for a QSNA command but SNA/RJE cannot use the stream for some reason. SNA/RJE attempts to restart the job.

MESSAGE IS TOO LONG. MAXIMUM LENGTH IS 256 CHARACTERS

This error message indicates that you issued HOSTMSG or SSCPMSG with a message longer than 256 characters.

NO DEVICE AVAILABLE FOR DATA STREAM FROM HOST - DATA REJECTED

You receive this message if SNA/RJE is running in unattended mode and the host has sent data to an unassigned medium/subaddress. You also receive this message if you issue a CANCEL command for a stream before you assign a device or file to the medium/subaddress specified by the host.

NON-UNIQUE ABBREVIATION OF ATTENDED OR UNATTENDED

In using the SET command with the /MODE switch, you used an abbreviation for ATTENDED or UNATTENDED that was not unique.

OPERATOR COMMAND ABBREVIATION IS NOT UNIQUE

You have used an abbreviation for an operator command that can stand for more than one command.

OUTPUT STREAM ENDED

You receive this status message when the host ends sending data to a particular medium/subaddress.

OUTPUT STREAM STARTED

You receive this status message when the host begins sending data to a particular medium/subaddress.

OUTPUT SUSPENDED TO ALLOW SNA/RJE INPUT TO HOST

This is a status message. The host stopped sending data over a stream to let you issue a TRANSFER command over the same stream.

PLEASE BEGIN AND END YOUR MESSAGE WITH THE SAME CHARACTER

When using either HOSTMSG or SSCPMSG, you receive this message if you do not begin and end your message with the same character.

RECEIVED NEGATIVE RESPONSE FROM HOST

The meaning of this status message depends on your host. You should receive 8 digits (or 4 bytes) of sense data that explains the response. Ask your host system programmer for the meaning of the sense data. If you receive a sense data block of 08250000, you have tried to send too many jobs to the host simultaneously.

RECEIVED NEGATIVE RESPONSE FROM SSCP

The meaning of this status message depends on your host. You should receive 8 digits (or 4 bytes) of sense data that explains the response. Ask your host system programmer for the meaning of the sense data. If you receive a sense data block of 08250000, you have tried to send too many jobs to the host simultaneously. This message is typically followed by a text message explaining the reason for the negative response. For more information on the reason for the response, you can use the DG/SNA trace facility. See the appropriate sources in the Preface for more information on the trace facility.

SESSION ACTIVATED

You receive this status message every time SNA/RJE successfully opens a Logical Unit.

SESSION HAS BEEN RESET

If you receive this error message, you have lost the SSCP-LU session on a stream or the host has reactivated the session. Issue a SESSTAT command for stream that lost the SSCP-LU session. If the SNA state is OPEN/ACTIVATED, you must use the SSCPMSG command to send a logon request to the RJE subsystem.

SESSION HAS BEEN UNBOUND

If you issue an RSHUTD SNA/RJE command or send a log off command to the RJE subsystem through the SSCPMSG command, you receive this message. You might also receive this message if SNA/RJE rejects data from the host. Receiving this message indicates that you have lost the LU-LU session on a particular stream. SNA/RJE informs you on which stream you lost the session.

SNA/RJE HAS REJECTED BID FROM HOST

This message indicates that SNA/RJE rejected a host request to send data over a stream because SNA/RJE was sending data over the same stream.

SNA/RJE HAS REJECTED BIND

You receive this message if SNA/RJE receives a BIND RU from the host with incompatible parameters, or if SNA/RJE receives the wrong type of BIND from the host. You may have issued an OPEN command to a Logical Unit Group with the incorrect LU type. Examine the LU type of the Logical Units you are using. Also use the DG/SNA trace facility. For more information on the trace facility, see the *DG/SNA Operator's Guide.*

SNA/RJE HAS SENT A NEGATIVE LU/LU RESPONSE

If you are running SNA/RJE in unattended mode with no device or file to accept data, you receive this message. An 8 digit (4 byte) sense code follows.

SNA/RJE IS RUNNING

This status message indicates that you have successfully started SNA/RJE. The revision number of SNA/RJE follows the message.

SNA/RJE IS TERMINATING

This is a status message that indicates a successful HALT command.

SNA/RJE IS UNABLE TO FIND SUITABLE STREAM FOR TRANSFER JOB.

SNA/RJE cannot find a stream on which to submit a TRANSFER command. This can be due to all streams being busy, to no streams being in the READY state, or to all streams having been started with /NOINPUT switches.

SSCP-LU SESSION DOES NOT EXIST

You are trying to issue an SSCPMSG command on a stream that is not open or activated. First, ensure that the stream is activated. Second, issue the OPEN command for the stream. Third, you can issue the SSCPMSG command over a different stream.

STREAM ALREADY CLOSED

This is a status message indicating that someone issued a CLOSE command for the stream you specified.

STREAM BUSY RECEIVING DATA FROM HOST

If you issue the HOSTMSG command over a stream that is receiving data from the host, you receive this message.

STREAM BUSY RECEIVING OUTBOUND DATA

You receive this message if you are trying to issue an SSCPMSG or HOSTMSG over a stream but the stream is carrying data from SNA/RJE to the host.

STREAM BUSY SENDING DATA TO HOST

You receive this message if you try to issue a HOSTMSG or SSCPMSG command over a stream that is sending data to the host. Wait until the stream stops sending data or issue the command over another stream.

STREAM HAS BEEN CLOSED

This is a status message confirming successful completion of the CLOSE and HALT commands.

STREAM NOT OPEN AND ACTIVATED

You have tried to send data over a stream whose LU-LU session is neither bound or activated by the host. First ensure that the host has activated the LU-LU session. If the host has activated the LU-LU session, issue the OPEN command for the session.

STREAM NOT READY FOR DATA TRAFFIC

You receive this message if you try to issue a TRANSFER or HOSTMSG command over a stream that is not active and ready.

STREAM READY...

This is a status message, indicating that the RJE subsystem has successfully issued a BIND RU to the stream. The stream is now ready for data traffic.

THE DEVICE SPECIFIED IS NOT ACTIVE

You receive this message if you issue a CANCEL command and the medium/subaddress is not active.

TRANSFER JOB ABORTED

You receive this error message when the SNA/RJE operator issues a CANCEL command for a stream sending data to the host. You can also receive the message if the host rejects data for any reason.

TRANSFER JOB REQUEST COMPLETED

You receive this status message when the TRANSFER command successfully transfers data to the host.

TRANSFER JOB REQUEST STARTED

If you successfully issue a TRANSFER command and the host gives SNA/RJE permission to send data, you receive this status message.

UNABLE TO TURN ON SUPERUSER. INITIALIZATION WILL CONTINUE.

You do not have superuser privileges, but SNA/RJE will contine to try creating the necessary files and IPC ports for it to run.

End of Appendix

Appendix C
Sample User Exit Routine

In this appendix, we list and describe the sample user exit routine, USEREXIT_SAMPLE.SR. The routine intercepts all data sent by the host to a printer, takes a username from the seventh line of the data, and directs the data to the file :UDD:USERNAME:JES.OUTPUT.

Read Chapter 3, "Understanding Optional Facilities Before Configuring SNA/RJE", before reading this appendix so you will understand the sample user exit routine.

Figure C-1 shows a flow chart of the routine.
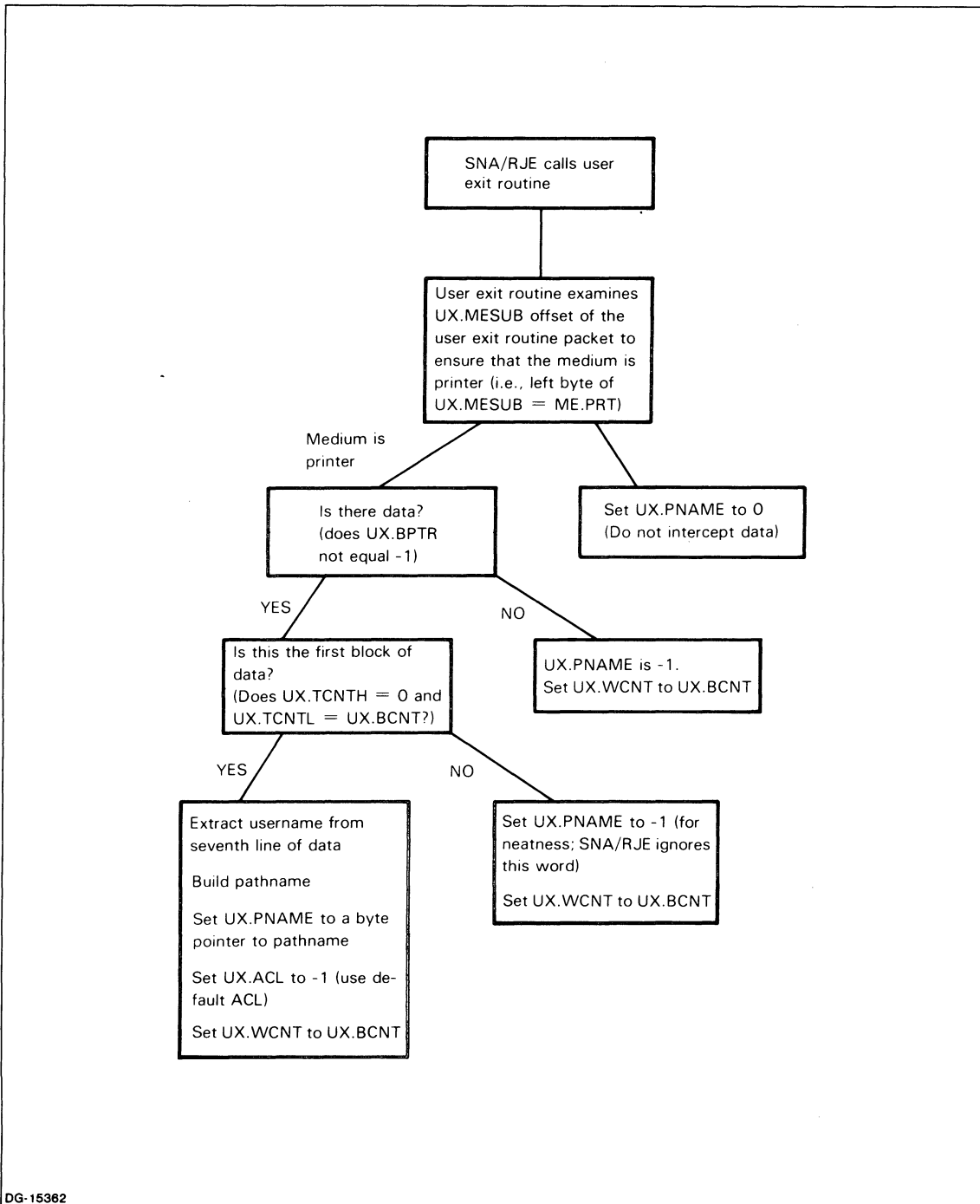
Figure C-1. Flow Chart of the Sample User Exit Routine

The routine first checks to ensure that the medium type is printer. If the medium is not printer, the routine sets the offset UX.PNAME to 0, thus refusing the data.

       093-000301-00

If the medium is printer, the routine checks if UX.BPTR equals -1. If it does, there is no data, the routine sets UX.PNAME, byte pointer to an AOS or AOS/VS pathname, to -1, indicating that the routine is not providing a pathname. The routine also sets UX.WCNT to UX.BCNT.

If there is data, the routine examines if the data is the first block of data. If UX.TCNTH = 0 and UX.TCNTL = UX.BCNT, then the data is the first block. The routine then takes the username and builds a pathname. It sets UX.PNAME to a byte pointer to the pathname and sets UX.ACL to -1, indicating a default ACL. Finally, the routine sets UX.WCNT to UX.BCNT.

If the data is not the first block of data, the routine sets UX.PNAME to -1 (unimportant because SNA/RJE does not examine UX.PNAME in this case) and sets UX.WCNT to UX.BCNT.

We now list the sample user exit routine.

```
  0001 USEREXIT AOS ASSEMBLER REV 01.60          10:36:40 09/09/82
01
02                  ; COPYRIGHT (C) DATA GENERAL CORPORATION 1981
03                  ; ALL RIGHTS RESERVED.
04                  ; LICENSED MATERIAL - PROPERTY OF DATA GENERAL CORPORATION
05
06                  ;:::DOC_START
07
08                  ;****************************************************************
09                  ;                          USEREXIT
10                  ;****************************************************************
11
12                  ;FUNCTIONAL DESCRIPTION: THIS IS A SAMPLE USER EXIT ROUTINE.
13                  ; WHEN CALLED WITH MEDIUM = PRINTER, SUBADDRESS = (ANYTHING),
14                  ; IT WILL ACKNOWLEDGE THAT IT WOULD LIKE TO RECEIVE DATA FOR
15                  ; THE PRINTER.  IT BUILDS A FILENAME FOR SNA/RJE TO ?WRITE TO
16                  ; BY EXTRACTING THE USER NAME FROM THE 1ST LINE OF DATA
17                  ; RECEIVED.  IT KNOWS THAT THE JES2 USER NAME IS ALWAYS THE
18                  ; 7TH WORD ON LINE 1 OF THE PRINTER OUTPUT, AND BUILDS THE
19                  ; AOS PATH NAME ":UDD:(USERNAME):JES.OUTPUT" FROM IT.
20
21                  ;AC0 IN: (UNUSED)
22                  ;AC1 IN: (UNUSED)
23                  ;AC2 IN: POINTER TO USER EXIT PARAMETER BLOCK
24                  ;AC3 IN: (UNUSED)
25
26                  ;CALLING CONVENTIONS:   EJSR    USEREXIT
27                  ;                               (ERROR RETURN)
28                  ;                               (NORMAL RETURN)
29
30                  ;AC0 OUT: (HI ORDER SNA SENSE CODE, IF BAD RETURN IS TAKEN
31                  ;           ELSE, UNCHANGED)
32                  ;AC1 OUT: (LO ORDER SNA SENSE CODE, IF BAD RETURN IS TAKEN,
33                  ;           ELSE, UNCHANGED)
34                  ;AC2 OUT: (UNCHANGED)
35                  ;AC3 OUT: (UNCHANGED)
```

```
36
37
                    .TITL   USEREXIT
39                  .ENT    USEREXIT
40                  .EXTN   GARG
41
42      000001      .NREL   1
43
44
45          ;======================================================
46          ;  STACK OFFSETS
47
48      000001 COUNTER = 1
49      000001 STKTMPS = COUNTER
50
51      177776 UXBLOCK = ?0AC2          ;POINTER TO USER EXIT PARAM. BLOCK
52
53      000001 LINENUM = 1      ;LINE NUMBER TO FIND NAME ON
54      000007 WORDNUM = 7      ;WORD NUMBER ON LINE WHERE USER NAME IS FOUND
55          ;======================================================
56
57
58          USEREXIT:
59 00000!163710      SAVE    STKTMPS
60      000001


   0002  USEREXIT
01
02          ; SEE IF MEDIUM = PRINTER.
03
04 00002!021000      LDA     0,UX.MESUB,2    ;MEDIUM (LEFT BYTE), SUBADDRESS
05                                           ;(RIGHT BYTE)
06 00003!121510      HXR     2,0             ;MEDIUM TO RIGHT BYTE
07 00004!064000      LEF     1,ME.PRT
08 00005!106434      USEQ    0,1             ;SKIP IF MEDIUM = PRINTER
09 00006!000470      JMP     IGNORE
10
11          ; SEE IF THERE IS ANY DATA PRESENT.
12
13 00007!021001      LDA     0,UX.BPTR,2
14                   SGTZ    0               ;SKIP IF DATA PRESENT
15 00011!000472      JMP     NODATA
16
17          ; SEE IF THIS IS THE VERY 1ST BLOCK OF DATA.
18
19 00012!021003      LDA     0,UX.TCNTH,2
20                   SEQZ    0               ;skip if hi order count = 0
```

```
21 00014!000476        JMP    NOTFIRST        ;not first block
22 00015!021002        LDA    0,UX.BCNT,2     ;# BYTES IN THIS BLOCK
23 00016!025004        LDA    1,UX.TCNTL,2    ;CUMULATIVE BYTE COUNT (LO order)
24 00017!106434        USEQ   0,1             ;SKIP IF THIS IS 1ST BLOCK
25 00020!000472        JMP    NOTFIRST
26
27              ; CALL ROUTINE TO EXTRACT THE USER NAME FROM THE DATA
28
29 00021!021001        LDA    0,UX.BPTR,2     ;GET BPTR TO DATA
30 00022!025002        LDA    1,UX.BCNT,2     ;# BYTES IN THIS BLOCK
31 00023!070001        LEF    2,LINENUM       ;LINE # TO EXTRACT FROM
32 00024!151300        MOVS   2,2             ;TO LEFT BYTE
33 00025!113770        IORI   WORDNUM,2       ;WORD # TO RIGHT BYTE
34     000007
35 00027!106470        EJSR   GETNAME
36     000071
37 00031!000452        JMP    NODATA          ;UNABLE TO EXTRACT NAME
38
39              ; AC0 CONTAINS BPTR TO USER NAME, AC1 CONTAINS LENGTH OF NAME.
40              ; NOW APPEND THE NAME TO ":UDD:OP"
41
42 00032!045401        STA    1,COUNTER,3     ;SAVE LENGTH OF USERNAME
43 00033!172070        ELEF   2,PTHNAME
44     000006'
45 00035!151120        MOVZL  2,2             ;BPTR TO ":UDD:"
46 00036!173770        ADDI   5,2             ;BPTR TO WHERE TO PUT USER NAME
47     000005
48 00040!106710 ALOOP: LDB    0,1             ;GET A BYTE
49 00041!147010        STB    2,1             ;APPEND TO DIRECTORY NAME
50 00042!100010        ADI    1,0             ;BUMP BPTR'S
51 00043!110010        ADI    1,2
52 00044!015401        DSZ    COUNTER,3       ;SKIP WHEN DONE
53 00045!000773        JMP    ALOOP
54
55              ; HAVE BUILT ":UDD:(USERNAME)".  NOW APPEND ":JES.OUTPUT"
56
57 00046!060014        LEF    0,SUFFLEN       ;LENGTH OF SUFFIX
58 00047!041401        STA    0;COUNTER,3
59 00050!162070        ELEF   0,SUFFTXT
60     000000'
```

```
 0003  USEREXIT
01 00052!101120         MOVZL   0,0             ;BPTR TO ":JES.OUTPUT"
02
03 00053!106710 BLOOP:  LDB     0,1
04 00054!147010         STB     2,1
05 00055!100010         ADI     1,0
06 00056!110010         ADI     1,2
07 00057!015401         DSZ     COUNTER,3       ;SKIP WHEN DONE
08 00060!000773         JMP     BLOOP
09
10              ; TERMINATE PATHNAME WITH A NULL.
11
12 00061!126400         SUB     1,1
13 00062!147010         STB     2,1
14
15
16              ; AOS PATH NAME HAS BEEN BUILT.  NOW RETURN BPTR TO IT IN THE
17              ; PARAMETER PACKET.
18
19 00063!031776         LDA     2,UXBLOCK,3
20 00064!162070         ELEF    0,PTHNAME
21      000006'
22 00066!101120         MOVZL   0,0             ;BPTR TO PATH NAME
23 00067!041007         STA     0,UX.PNAME,2
24
25              ; SPECIFY THAT THE DEFAULT ACL BE PUT ON IT.
26
27 00070!102000         ADC     0,0             ;-1
28 00071!041010         STA     0,UX.ACL,2
29
30              ; SPECIFY THAT ALL BYTES ARE TO BE WRITTEN TO THE FILE.
31
32 00072!021002         LDA     0,UX.BCNT,2
33 00073!041011  .      STA     0,UX.WCNT,2
34
35 00074!011400         ISZ     ?ORTN,3         ;TAKE 2ND RETURN
36 00075!127710         RTN                     ;DONE

!0004  USEREXIT
01              ; MEDIUM IS NOT 'PRINTER'.  SPECIFY THAT WE DON'T WANT
02              ; THE DATA.
03
04 00076!031776 IGNORE: LDA     2,UXBLOCK,3     ;POINTER TO PARAMETER BLOCK
05 00077!102400         SUB     0,0
06 00100!041007         STA     0,UX.PNAME,2    ;0 MEANS DON'T WANT DATA
```

                                   093-000301-00

```
07 00101!011400        ISZ     ?ORTN,3         ;TAKE NORMAL RETURN
08 00102!127710        RTN
09
10
11                 ; NO DATA PRESENT.
12                 ; SPECIFY THAT WE WANT THE DATA PASSED TO USEREXIT, BUT DON'T
13                 ; SPECIFY AN AOS PATHNAME TO WRITE TO, YET.
14
15 00103!031776 NODATA: LDA    2,UXBLOCK,3      ;POINTER TO PARAMETER BLOCK
16 00104!102000        ADC     0,0
17 00105!041007        STA     0,UX.PNAME,2    ;NILL BPTR TO PATHNAME
18 00106!021002        LDA     0,UX.BCNT,2     ;WRITE ALL DATA (IF ANY)
19 00107!041011        STA     0,UX.WCNT,2
20 00110!011400        ISZ     ?ORTN,3         ;TAKE NORMAL RETURN
21 00111!127710        RTN
22
23                 ; THIS IS NOT THE 1ST BLOCK OF DATA.  NO NEED TO EXTRACT
24                 ; USERNAME.  JUST SPECIFY THAT WE WANT ALL THE DATA TO BE
25                 ; WRITTEN.
26
27             NOTFIRST:
28 00112!031776        LDA     2,UXBLOCK,3      ;POINTER TO PARAM. BLOCK
29 00113!021002        LDA     0,UX.BCNT,2
30 00114!041011        STA     0,UX.WCNT,2
31 00115!102000        ADC     0,0
32 00116!041007        STA     0,UX.PNAME,2    ;NO PATHNAME (WOULD BE IGNORED
33                                             ;BY SNA/RJE, ANYWAY)
34 00117!011400        ISZ     ?ORTN,3
35 00120!127710        RTN                     ;TAKE NORMAL RETURN

!0005  USEREXIT
01             ;****************************************************************
02             ;                        GETNAME
03             ;****************************************************************
04
05             ; GETNAME:  EXTRACTS A USER NAME FROM A PRINT FILE.
06
07             ; CALLING CONVENTION:
08
09             ;AC0 IN: BPTR TO DATA
10             ;AC1 IN: BYTE LENGTH OF DATA
11             ;AC2 IN: LINE NUMBER (LEFT BYTE) ! WORD NUMBER (RIGHT BYTE)
12
13             ; THE LINE # AND WORD # SPECIFY WHERE TO FIND THE USER NAME.
14
```

```
15                    ;              EJSR    GETNAME
16                    ;              (ERROR RETURN)
17                    ;              (NORMAL RETURN)
18
19                    ; ERROR RETURN:  UNABLE TO EXTRACT NAME FROM DATA BECAUSE OF
20                    ; A) INSUFFICIENT AMOUNT OF DATA FOR LINE/WORD NOS. SUPPLIED,
21                    ; B) NO SUCH WORD NO. ON GIVEN LINE.
22                    ;ACO OUT: BPTR TO USER NAME
23                    ;AC1 OUT: BYTE LENGTH OF USER NAME
24                    ;AC2 OUT: (UNCHANGED)
25
26
27                    ;-----------------------------------------------------------
28                    ; STACK TEMPS:
29
30    000001 WORDN   = 1              ;WORD NUMBER
31    000002 LINEN   = WORDN+1        ;LINE NUMBER
32    000002 NTMPS   = LINEN
33
34    177774 DATABPTR = ?0ACO
35    177775 DATABLEN  = ?0AC1
36    177776 LINEWORD = ?0AC2
37
38    000012 ASCNL   = 12             ;ASCII 'NEW LINE'
39                    ;-----------------------------------------------------------
40
41
42              GETNAME:
43 00121!163710       SAVE    NTMPS
44       000002
45
46                    ; GET/SAVE LINE # AND WORD #.
47
48 00123!145000       MOV     2,1             ;COPY LINE!WORD
49 00124!147770       ANDI    377,1           ;ISOLATE WORD NO.
50       000377
51 00126!045401       STA     1,WORDN,3
52 00127!131510       HXR     2,2             ;ISOLATE LINE NO.
53 00130!051402       STA     2,LINEN,3
54
55                    ; IF LINE # = 1, START LOOKING FOR PROPER WORD.
56                    ; ELSE BUMP DOWN TO PROPER LINE
57
58 00131!021774       LDA     0,DATABPTR,3    ;BPTR TO DATA
59 00132!110110       SBI     1,2
60                    SNEZ    2               ;SKIP IF NOT LINE #1
```

```
  0006  USEREXIT
01 00134!000417          JMP     LINE1
02 00135!051402          STA     2,LINEN,3      ;SAVE LINE NO., 0-RELATIVE
03
04               ; NEED TO GO TO ANOTHER LINE. SEARCH FOR 'NEW LINES' UNTIL
05               ; PROPER LINE NUMBER IS REACHED.
06
07 00136!021774          LDA     0,DATABPTR,3
08 00137!106710 NLLOOP:  LDB     0,1
09 00140!070012          LEF     2,ASCNL
10 00141!132434          USEQ    1,2            ;SKIP IF GOT NEW LINE
11 00142!000404          JMP     CONT
12 00143!015402          DSZ     LINEN,3        ;SKIP IF AT PROPER LINE
13 00144!000402          JMP     CONT
14 00145!000405          JMP     ATLINE
15 00146!100010 CONT:    ADI     1,0
16 00147!015775          DSZ     DATABLEN,3     ;SKIP IF NO MORE DATA
17 00150!000767          JMP     NLLOOP
18 00151!000416          JMP     OUTOFDATA
19
20 00152!100010 ATLINE:  ADI     1,0            ;BUMP PAST NEW LINE CHARACTER
21
22
23               ; AC0 HAS BPTR TO PROPER LINE TO LOOK FOR NAME
24
25 00153!064007 LINE1:   LEF     1,WORDNUM      ;GET WORD NO.
26 00154!104110          SBI     1,1            ;MAKE IT 0-RELATIVE FOR 'GARG'
27 00155!172070          ELEF    2,USERNM       ;BUFFER TO CONTAIN USER NAME
28       000025'
29 00157!151120          MOVZL   2,2
30 00160!106470          EJSR    GARG
31       000161$
32 00162!000405          JMP     OUTOFDATA
33
34               ; AC2 HAS BPTR TO USER NAME, AC0 HAS BYTE LENGTH OF IT
35
36 00163!051774          STA     2,?0AC0,3      ;PASS BACK IN AC0
37 00164!041775          STA     0,?0AC1,3      ;PASS BACK LENGTH
38 00165!011400          ISZ     ?0RTN,3        ;TAKE NORMAL RETURN
39 00166!127710          RTN
40
41
42               ; UNABLE TO EXTRACT USER NAME FROM DATA.  TAKE BAD RETURN.
43
44               OUTOFDATA:
45 00167!127710          RTN
```

```
!0007  USEREXIT
01        000000           .NREL   0
02
03        000012 MAXNAME = 10.              ;MAXIMUM USER NAME LENGTH (BYTES)
04
05               ; AOS PATHNAME SUFFIX:
06
07 00000'035112 SUFFTXT:          .TXT    %:JES.OUTPUT%
08        042523
09        027117
10        052524
11        050125
12        052000
13        000014 SUFFLEN = (.-SUFFTXT*2)                ;LENGTH OF SUFFIX
14
15               ; AOS PATHNAME TO ?WRITE TO. (FILENAME TO BE APPENDED)
16
17 00006'035125 PTHNAME:          .TXT    %:UDD:%         ;PREFIX
18        042104
19        035000
20 00011'000014                   .BLK    (MAXNAME/2)+(SUFFLEN/2)+1
21                                                 ;LEAVE SPACE FOR
22                                                 ;"USERNAME:JES.OUTPUT"
23
24               ; BUFFER TO CONTAIN USER NAME.
25
26 00025'000005 USERNM:           .BLK    (MAXNAME+1)/2


**00000 TOTAL ERRORS, 00000 FIRST PASS ERRORS


     0008 USERE


ADC       102000      3/27    4/16    4/31
ADD       103000      2/15
ADDI      163770      2/46
ADI       100010      2/50    2/51    3/05    3/06    6/15    6/20
ALOOP     000040!     2/48#   2/53
ANDI      143770      5/49
ASCNL     000012      5/38#   6/09
ATLINE    000152!     6/14    6/20#
BLOOP     000053!     3/03#   3/08
CONT      000146!     6/11    6/13    6/15#
COUNTER   000001      1/48#   1/49    2/42    2/52    2/58    3/07
DATABLEN  177775      5/35#   6/16
DATABPTR  177774      5/34#   5/58    6/07
DSZ       014000      2/52    3/07    6/12    6/16
EJSR      106070      2/35    6/30
```

```
ELEF      162070        2/43    2/59    3/20    6/27
GARG      000001  XN    1/40    6/30
GETNAME   000121!       2/35    5/42#
HXR       101510        2/06    5/52
IGNORE    000076!       2/09    4/04#
IORI      103770        2/33
ISZ       010000        3/35    4/07    4/20    4/34    6/38
JMP       000000        2/09    2/15    2/21    2/25    2/37    2/53    3/08
                        6/01    6/11    6/13    6/14    6/17    6/18    6/32
LDA       020000        2/04    2/13    2/19    2/22    2/23    2/29    2/30
                        3/19    3/32    4/04    4/15    4/18    4/28    4/29
                        5/58    6/07
LDB       102710        2/48    3/03    6/08
LEF       060000        2/07    2/31    2/57    6/09    6/25
LINE1     000153!       6/01    6/25#
LINEN     000002        5/31#   5/32    5/53    6/02    6/12
LINENUM   000001        1/53#   2/31
LINEWORD  177776        5/36#
MAXNAME   000012        7/03#   7/20    7/26
ME.PRT    000000        2/07
MOV       101000        2/21    2/32    2/45    3/01    3/22    5/48    6/01
                        6/29
NLLOOP    000137!       6/08#   6/17
NODATA    000103!       2/15    2/37    4/15#
NOTFIRST  000112!       2/21    2/25    4/27#
NTMPS     000002        5/32#   5/43
OUTOFDAT  000167!       6/18    6/32    6/44#
PTHNAME   000006'       2/43    3/20    7/17#
RTN       127710        3/36    4/08    4/21    4/35    6/39    6/45
SAVE      163710        1/59    5/43
SBI       100110        5/59    6/26
SBN       000007        2/15
SEQZ      000000! MC    2/20
SGTZ      000017! MC    2/14
SNEZ      000005! MC    5/60
SNR       000005        6/01
STA       040000        2/42    2/58    3/23    3/28    3/33    4/06    4/17
                        4/19    4/30    4/32    5/51    5/53    6/02    6/36
                        6/37
STB       103010        2/49    3/04    3/13
STKTMPS   000001        1/49#
SUB       102400        3/12    4/05
SUFFLEN   000014        2/57    7/13#   7/20
SUFFTXT   000000'       2/59    7/07#   7/13


     0009 USERE


SZR       000004        2/21
USEQ      102434        2/08    2/24    6/10
```

```
USEREXIT 000000! EN    1/39    1/58#
USERNM   000025'       6/27    7/26#
UXBLOCK  177776        1/51#   3/19    4/04    4/15    4/28
UX.ACL   000010        3/28
UX.BCNT  000002        2/22    2/30    3/32    4/18    4/29
UX.BPTR  000001        2/13    2/29
UX.MESUB 000000        2/04
UX.PNAME 000007        3/23    4/06    4/17    4/32
UX.TCNTH 000003        2/19
UX.TCNTL 000004        2/23
UX.WCNT  000011        3/33    4/19    4/30
WORDN    000001        5/30#   5/31    5/51
WORDNUM  000007        1/54#   2/33    6/25
?0AC0    177774        5/34    6/36
?0AC1    177775        5/35    6/37
?0AC2    177776        1/51    5/36
?0RTN    000000        3/35    4/07    4/20    4/34    6/38
```

End of Appendix

093-000301-00

Index

Within this index, "f" or "ff" after a page number means "and the following page" (or "pages"). In addition, primary page references for each topic are listed first. Commands, calls, and acronyms are in uppercase letters (e.g., CREATE); all others are lowercase.

M

/M switch 5-1
Macroassembler (MASM) utility 3-6ff
margin
   bottom default 4-5
   left default 4-5
   right default 4-5
   top default 4-5
mask
   UXMCMI bit 3-6
   UXMCPI bit 3-6
MASM, see Macroassembler (MASM) utility
maximum presentation
   line 4-5
   position 4-4
maximum, host log file size 4-8
ME.CARD, left byte value of UX.MESUB input offset
   3-5
ME.EXCH, left byte value of UX.MESUB input offset
   3-5
ME.PRT, left byte value of UX.MESUB input offset 3-5
/MED= switch, TRANSFER command 5-26f
medium 1-3, 2-5, 5-3ff
   card punch 1-3, 2-5
   card reader 1-3, 2-5, 5-4
   consoles 1-3, 2-5
   disk files 1-3, 2-5
   exchange 2-5
   printers 1-3, 2-5
   subaddresses for 1-3, 2-5
   type C 2-5, 5-3ff
   type E 2-5, 5-3ff
   type K 2-5, 5-7ff
   type P 2-5, 5-6ff
/MEDIUM= switch, QSNA CLI command 5-2f
message log file 1-4
messages, SNA/RJE B-1ff, 5-13
mode
   attended 4-6, 1-4, 5-21, 5-25
   unattended 4-6, 1-4, 5-21, 5-25
/MODE= switch, SET command 5-21f

N

/NAME= switch, PROCESS CLI command 4-10
NAU, see Network Addressable Unit
:NET directory 4-1
:NET:UTIL directory 4-1
network 1-1, 2-1
network address 2-2
Network Addressable Unit (NAU) 2-2f
   Logical Unit (LU) 2-2
   Physical Unit (PU) 2-2
   Systems Service Control Point (SSCP) 2-3
network architecture 2-1
network, Systems Network Architecture (SNA)
NEWLIB.LB library 3-7

/NOAPP switch
   ASSIGN command 5-6
   OUTPUT command 5-15
node 2-1
   see also Physical Unit (PU)
/NOINPUT switch
   OPEN command 5-14
   PROCESS CLI command 4-10
/NOLOG switch, SET command 5-21f
/NORESTART switch, QSNA CLI command 5-3
/NOTIFY switch, QSNA CLI command 5-3

O

offset
   input
      UX.BCNT 3-6
      UX.BPTR 3-5
      UX.ERCL 3-6
      UX.FLAGS 3-6
      UX.MESUB 3-5
      UX.TCNTH 3-6
      UX.TCNTL 3-6
   output
      UX.ACL 3-6
      UX.LENGTH 3-6
      UX.PNAME 3-6
      UX.WCNT 3-6
/1 switch 5-2
OPEN command 5-14
   /NOINPUT switch 5-14
OPEN EXEC command
operation mode parameters 4-6
operator commands, see SNA/RJE commands
/OPERATOR switch, QSNA CLI command 5-3
operator, SNA/RJE
option, append 4-6
outbound data 2-5
   control information 2-5
   messages from host to workstation 2-5
   results of jobs 2-5
/OUTBOUND switch 5-7
OUTPUT command 5-15, 5-1
   /A switch 5-15
   /NOAPP switch 5-15
   /STREAM= switch 5-15
output offset 3-6
   UX.ACL 3-6
   UX.LENGTH 3-6
   .UX.PNAME 3-6
   UX.WCNT 3-6
/OUTPUT switch, SET command 5-21f
/OUTPUT= switch, SET command 5-21f

093-000301-00

⬤ DataGeneral

TP_____

TIPS ORDER FORM
Technical Information & Publications Service

BILL TO:

COMPANY NAME_____

ADDRESS _____

CITY_____

STATE_____ ZIP _____

ATTN: _____

SHIP TO: (if different)

COMPANY NAME_____

ADDRESS _____

CITY_____

STATE_____ ZIP _____

ATTN: _____

QTY	MODEL #	DESCRIPTION	UNIT PRICE	LINE DISC	TOTAL PRICE

(Additional items can be included on second order form)

[Minimum order is $50.00]

Tax Exempt #_____
or Sales Tax (if applicable)

TOTAL	
Sales Tax	
Shipping	
TOTAL	

METHOD OF PAYMENT —————————————— **SHIP VIA** ———

☐ Check or money order enclosed
For orders less than $100.00

☐ Charge my ☐ Visa ☐ MasterCard
Acc't No._____ Expiration Date_____

☐ Purchase Order Number:_____

☐ DGC will select best way (U.P.S or Postal)

☐ Other:
　☐ U.P.S. Blue Label
　☐ Air Freight
　☐ Other _____

_____

——— NOTE: ORDERS LESS THAN $100, INCLUDE $5.00 FOR SHIPPING AND HANDLING. ———

Person to contact about this order _____ Phone _____ Extension _____

Mail Orders to:

Data General Corporation
Attn: Educational Services/TIPS F019
4400 Computer Drive
Westboro, MA 01580
Tel. (617) 366-8911 ext. 4032

Buyer's Authorized Signature
(agrees to terms & conditions on reverse side)

Date

Title

DGC Sales Representative (If Known)

Badge #

**DISCOUNTS APPLY TO
MAIL ORDERS ONLY**

educational services

012-1780

CUT ALONG DOTTED LINE

DATA GENERAL CORPORATION
TECHNICAL INFORMATION AND PUBLICATIONS SERVICE
TERMS AND CONDITIONS

Data General Corporation ("DGC") provides its Technical Information and Publications Service (TIPS) solely in accordance with the following terms and conditions and more specifically to the Customer signing the Educational Services TIPS Order Form shown on the reverse hereof which is accepted by DGC.

1. PRICES
Prices for DGC publications will be as stated in the Educational Services Literature Catalog in effect at the time DGC accepts Buyer's order or as specified on an authorized DGC quotation in force at the time of receipt by DGC of the Order Form shown on the reverse hereof. Prices are exclusive of all excise, sales, use or similar taxes and, therefore are subject to an increase equal in amount to any tax DGC may be required to collect or pay on the sale, license or delivery of the materials provided hereunder.

2. PAYMENT
Terms are net cash on or prior to delivery except where satisfactory open account credit is established, in which case terms are net thirty (30) days from date of invoice.

3. SHIPMENT
Shipment will be made F.O.B. Point of Origin. DGC normally ships either by UPS or U.S. Mail or other appropriate method depending upon weight, unless Customer designates a specific method and/or carrier on the Order Form. In any case, DGC assumes no liability with regard to loss, damage or delay during shipment.

4. TERM
Upon execution by Buyer and acceptance by DGC, this agreement shall continue to remain in effect until terminated by either party upon thirty (30) days prior written notice. It is the intent of the parties to leave this Agreement in effect so that all subsequent orders for DGC publications will be governed by the terms and conditions of this Agreement.

5. CUSTOMER CERTIFICATION
Customer hereby certifies that it is the owner or lessee of the DGC equipment and/or licensee/sub-licensee of the software which is the subject matter of the publication(s) ordered hereunder.

6. DATA AND PROPRIETARY RIGHTS
Portions of the publications and materials supplied under this Agreement are proprietary and will be so marked. Customer shall abide by such markings. DGC retains for itself exclusively all proprietary rights (including manufacturing rights) in and to all designs, engineering details and other data pertaining to the products described in such publication. Licensed software materials are provided pursuant to the terms and conditions of the Program License Agreement (PLA) between the Customer and DGC and such PLA is made a part of and incorporated into this Agreement by reference. A copyright notice on any data by itself does not constitute or evidence a publication or public disclosure.

7. DISCLAIMER OF WARRANTY
DGC MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANT-ABILITY AND FITNESS FOR PARTICULAR PURPOSE ON ANY OF THE PUBLICATIONS SUPPLIED HEREUNDER.

8. LIMITATIONS OF LIABILITY
IN NO EVENT SHALL DGC BE LIABLE FOR (I) ANY COSTS, DAMAGES OR EXPENSES ARISING OUT OF OR IN CONNEC-TION WITH ANY CLAIM BY ANY PERSON THAT USE OF THE PUBLICATION OF INFORMATION CONTAINED THEREIN INFRINGES ANY COPYRIGHT OR TRADE SECRET RIGHT OR (II) ANY INCIDENTIAL, SPECIAL, DIRECT OR CONSEQUEN-TIAL DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOSS OF DATA, PROGRAMS OR LOST PROFITS.

9. GENERAL
A valid contract binding upon DGC will come into being only at the time of DGC's acceptance of the referenced Educational Services Order Form. Such contract is governed by the laws of the Commonwealth of Massachusetts. Such contract is not assignable. These terms and conditions constitute the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior oral or written communications, agreements and understandings. These terms and conditions shall prevail notwithstanding any different, conflicting or additional terms and conditions which may appear on any order submitted by Customer.

DISCOUNT SCHEDULES

DISCOUNTS APPLY TO MAIL ORDERS ONLY.

LINE ITEM DISCOUNT

5-14 manuals of the same part number - 20%
15 or more manuals of the same part number - 30%

DISCOUNTS APPLY TO PRICES SHOWN IN THE CURRENT TIPS CATALOG ONLY.

◀▶ DataGeneral

TIPS ORDERING PROCEDURE:

Technical literature may be ordered through the Customer Education Service's Technical Information and Publications Service (TIPS).

1. Turn to the TIPS Order Form.

2. Fill in the requested information. If you need more space to list the items you are ordering, use an additional form. Transfer the subtotal from any additional sheet to the space marked "subtotal" on the form.

3. Do not forget to include your MAIL ORDER ONLY discount. (See discount schedules on the back of the TIPS Order Form.)

4. Total your order. (MINIMUM ORDER/CHARGE after discounts of $50.00.)

    If your order totals less than 100.00, enclose a certified check or money order for the total (include sales tax, or your tax exempt number, if applicable) plus $5.00 for shipping and handling.

5. Please indicate on the Order Form if you have any special shipping requirements. Unless specified, orders are normally shipped U.P.S.

6. Read carefully the terms and conditions of the TIPS program on the reverse side of the Order Form.

7. Sign on the line provided on the form and enclose with payment. Mail to:

    TIPS
    Educational Services – M.S. F019
    Data General Corporation
    4400 Computer Drive
    Westboro, MA 01580

8. We'll take care of the rest!

educational services

Data General Corporation, Westboro, MA 01580

093-000301-00