DECnet SNA Gateway for Synchronous Transport

Problem Solving (OpenVMS)

Part Number: AA-MA17E-TE

November 1993

This document explains how to solve problems that could arise in the day-to-day use of the DECnet SNA Gateway for Synchronous Transport and its related OpenVMS products. This manual also discusses diagnostic tools and describes how to report problems with the DECnet SNA Gateway products.

Revision/Update Information:	This is a revised manual.
Operating System and Version:	OpenVMS VAX V5.4 or later OpenVMS AXP V1.5
Software Version:	DECnet SNA Gateway for Synchronous Transport, V1.2

November 1993

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Preface

The DECnet SNA Gateway for Synchronous Transport (called the DECnet SNA Gateway-ST or Gateway-ST in this manual) is a hardware and software system that provides an interface between IBM and Digital Equipment Corporation networks that use SDLC lines and circuits. By handling the different communications protocols between an IBM network and a Digital network, the Gateway-ST enables certain nodes in a Digital DECnet network to communicate with one or more hosts in an IBM SNA network.

The Gateway-ST software runs on either the four-port DEC MicroServer (DEMSA) or single-port DEC MicroServer-SP (DEMSB).

Note

Throughout this manual, the hardware server box is referred to generically. Where differences occur, distinctions between the DEC MicroServer (the four-port server product) and the DEC MicroServer-SP (the single-port server product) are noted.

This manual provides information to help solve problems that could arise during the day-to-day use of the Gateway-ST software products, managed from an OpenVMS operating system. Use this manual with other Digital and IBM documentation.

The material in this guide reflects the experience of the product developers. The solutions are not necessarily the only ones that will solve a particular problem, and not every possible problem is discussed. This guide does not document problems with earlier versions of the DECnet SNA Gateway (DX24 and DECSA), nor does it include information about problems specific to individual DECnet SNA access routine products. Product-specific problem determination information can be found in the documentation set for each DECnet SNA product that you purchase.

Intended Audience

This manual is designed to assist network managers and system managers in solving problems with the Gateway-ST as managed from an OpenVMS operating system. Readers of this manual must have a working knowledge of the Digital and IBM systems they will be using.

Document Structure

This document has the following chapters:

- Chapter 1, Solving DECnet SNA Gateway for Synchronous Transport Problems

  This chapter is divided into four sections. Each section discusses a certain category of problems:

  - Section 1.1, Hardware Problems
  - Section 1.2, Initialization Problems
  - Section 1.3, DECnet Problems
  - Section 1.4, Session Problems

  Each section begins by listing the problems covered in that section. Check the list to find a problem similar to your own.

- Chapter 2, Using Loopback Tests, describes loopback tests.
- Chapter 3, Traces, describes the different types of Gateway Management and IBM traces.
- Chapter 4, Up-Line Dumps, explains the procedure that is performed to obtain an up-line dump.
- Chapter 5, Reporting Your Problems, describes how to report problems you cannot solve.
- Appendix A, Interpreting System Messages, gives information about error messages and event messages. For error messages that relate to specific DECnet SNA access routines, refer to the documentation for that access routine. For more complete information about event messages, refer to *DECnet SNA Gateway-CT and ST Management*.
- Appendix B, Log File of a Gateway Load, presents a log file of an actual Gateway-ST load.

- Appendix C, The DEC MicroServer Display Panel, describes the DEC MicroServer display values during power-up and dump sequences. It also describes the values that display when you halt the software or receive error codes.
- Appendix D, DEC MicroServer Facilities for Problem Solving, describes how to connect to the DEC MicroServer as a remote console. It also describes the remote console commands and their functions.
- Appendix E, DEC MicroServer Configuration Guidelines, contains guidelines for using the DEC MicroServer synchronous ports.
- Appendix F, Adapter Cable Pin Signals, describes the supported pin signals.

Associated Documents

The documentation for a DECnet SNA Gateway for Synchronous Transport system consists of the following sets of manuals:

- DEC MicroServer and DEC MicroServer-SP manuals
- DECnet SNA Gateway for Synchronous Transport software manuals
- Gateway Management manual
- Access routine manuals

DEC MicroServer Manuals

The following manuals document the DEC MicroServer and the DEC MicroServer-SP, the DECnet SNA Gateway for Synchronous Transport hardware units:

- *Installing the DEC Microserver*
- *DEC Microserver Systems Cystems Configuration Card*
- *Installing the DEC MicroServer-SP*
- *DEC MicroServer-SP Systems Configuration Card*

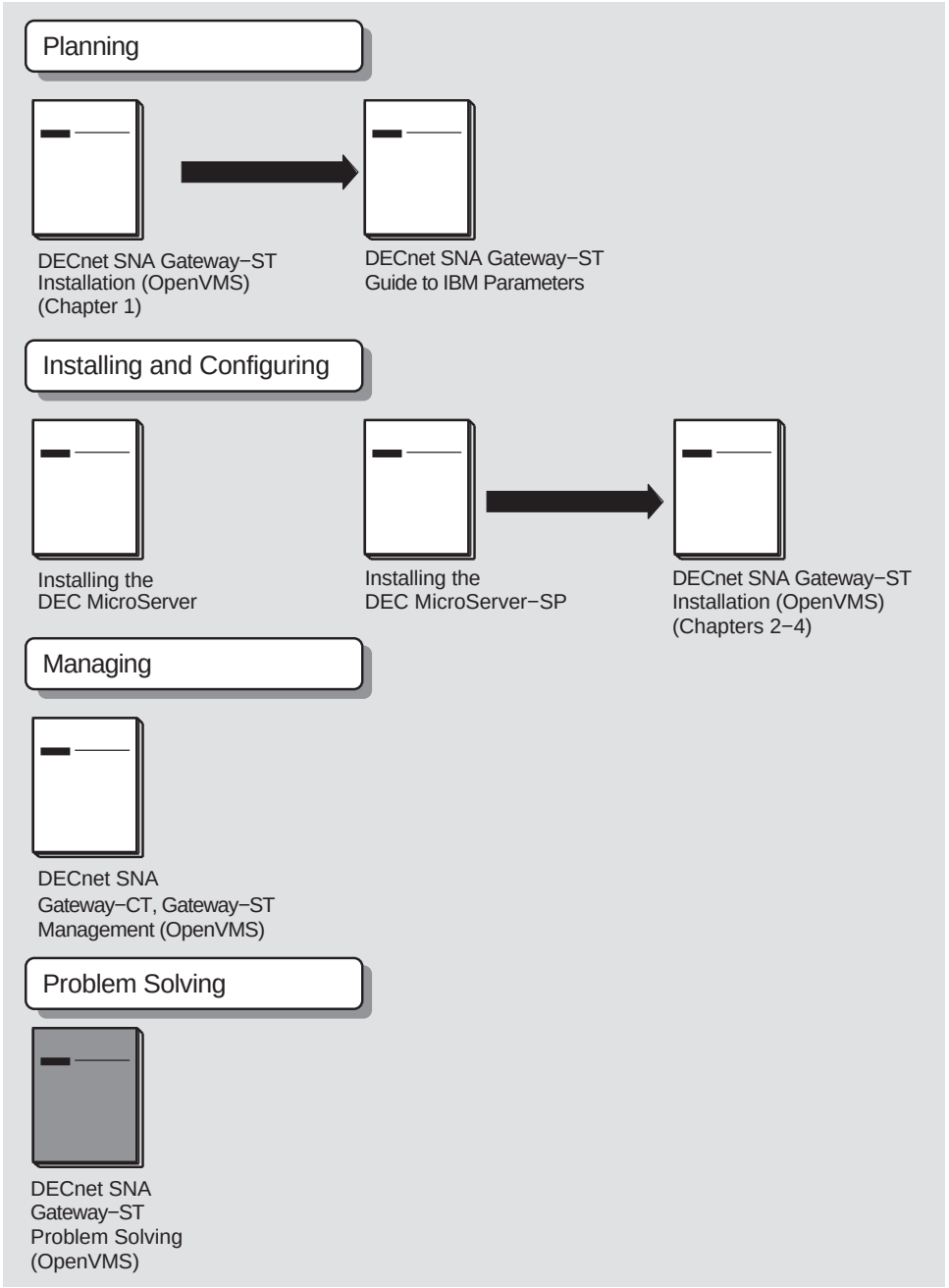
DECnet SNA Gateway for Synchronous Transport Software Manuals

The following manuals are part of the DECnet SNA Gateway for Synchronous Transport documentation kit:

- *DECnet SNA Gateway-ST Guide to IBM Parameters*
- *DECnet SNA Gateway-ST Installation*
- *DECnet SNA Gateway-ST Problem Solving*
- *DECnet SNA Gateway-ST Management*

Figure 1 lists the DECnet SNA Gateway for Synchronous Transport manuals according to the major tasks they describe. The arrows in the figure indicate the order in which you might use the books. The highlighted box indicates the manual you are currently using.

Figure 1 DECnet SNA Gateway for Synchronous Transport Manuals



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In addition to the Gateway-ST base communication systems, Digital Equipment Corporation provides the following access routine products that run on OpenVMS and can use the Gateway-ST to access IBM systems:

- **Bulk Data Transfer**
  - DECnet SNA Data Transfer Facility for OpenVMS
  - DECnet SNA Remote Job Entry for OpenVMS
  - DECnet SNA Printer Emulator for OpenVMS
- **Programming Interface**
  - DECnet SNA APPC/LU6.2 Programming Interface for OpenVMS
  - DECnet SNA 3270 Data Stream Programming Interface for OpenVMS
  - DECnet SNA Application Programming Interface for OpenVMS
- **Interactive Access**
  - DECnet SNA 3270 Terminal Emulator for OpenVMS
  - DECnet SNA VMS Distributed Host Command Facility
- **Office Information Transfer**
  - DECnet SNA VMS DDXF
  - External Document Exchange with IBM DISOSS
  - VAX Message Router/S Gateway
  - VAX Message Router/P Gateway

For a list of the documentation for the preceding products, see *DECnet SNA Gateway for Channel Transport and Gateway for Synchronous Transport Management*

You may find the following OpenVMS manuals useful:

- *OpenVMS Networking Manual*
- *OpenVMS Network Control Program Manual*
- *OpenVMS System Messages and Recovery Procedures*
- *Guide to Maintaining an OpenVMS System*
- *OpenVMS Install Utility Manual*
- *OpenVMS Run-Time Library*
- *Gude to OpenVMS System Security*

You may find the following IBM documents useful:

- *ACF/VTAM Diagnosis Reference* (IBM Order No. SC27-0621)
- *ACF/SNA System Problem Determination Guide, Vol 1* (IBM Order No. GG24-1514)
- *ACF/SNA System Problem Determination Guide, Vol 2* (IBM Order No. GG24-1523)
- *Advanced Communication Functions for VTAM, Diagnosis* (IBM Order No. ST27-0615)
- *Advanced Communication Functions for VTAM, Operations* (IBM Order No. ST27-0612)
- *CICS/OS/VS Version 1 Release 7 Data Areas* (IBM Order No. LY33-6035)
- *CICS/VS Version 1 Release 7 Diagnosis Reference* (IBM Order No. LC33-0243)
- *CICS/OS/VS Version 1 Release 7 Problem Determination Guide* (IBM Order No. SC33-0242)
- *IBM System/360 and System/370 I/O Interface Channel to Control Unit Original Equipment Manufacturers' Information* (IBM Order No. GA22-6974)
- *IBM Virtual Storage Extended Advanced Functions: Service Aids, Version 2, Release 2*, (IBM Order No. SC33-6195)
- *MVS/Extended Architecture System Programming Library: Service Aids* (IBM Order No. GC28-1159)
- *NetView Operation* (IBM Order No. SC30-3364)
- *NetView Messages* (IBM Order No. SC30-3365)
- *SNA System Problem Determination Guide* (IBM Order No. G320-6016)
- *Systems Network Architecture Formats* (IBM Order No. GA27-3136)
- *Virtual Machine/System Product: System Programmer's Guide, Release 4,* (IBM Order No. SC19-6203)
- *VTAM Version 3 Release 1 and 1.1 Diagnosis Guide* (IBM Order No. SC23-0116)

Conventions

The following conventions are used throughout this manual:

Convention	Meaning
UPPERCASE	This typeface is used in the running text for commands, options, arguments, pathnames, files, and directories.
SNACP> SET LINE *line-id*	This typeface is used for command syntax and command examples. In both command and syntax examples, uppercase letters represent text that you must enter. Lowercase letters in italics represent variables for which you must substitute specific information.
[*opt-arg*]	Square brackets enclose optional parts of a command.
Return	An enclosed key name indicates that you press that key on the keyboard.
Ctrl/*x*	An enclosed control key sequence is used to indicate that you hold down the Ctrl key while you press another key represented by *x*.

When you issue NCP, NCL, and SNANCP commands, many component names, parameters, and qualifiers require additional information. In most cases, the syntax of this additional information follows a standard set of rules. (Exceptions to these rules are noted where appropriate.) All numeric values are in decimal and range from 0 to 65,535 unless otherwise specified.

The following conventions are used for SNANCP and NCP commands:

Convention	Meaning
circuit-id	A string of characters whose exact syntax is that for a DECnet or SNA circuit identification. On DECnet nodes, circuit identification takes one of the following formats: *dev-c* *dev* A device name. *c* A decimal number (0 or a positive integer) designating the device's hardware controller. On the Gateway-ST node, the Ethernet circuit is identified by the string ETHERNET. SDLC circuits are identified by a string in the form SDLC-*n*, where *n* indicates the controller number of the line allocated to the circuit.
E-address	A string of 12 hexadecimal digits, represented by 6 bytes separated by hyphens (for example, AA-00-04-00-AB-04). The string indicates the Ethernet hardware address.
line-id	A string of characters whose exact syntax is that for a DECnet or SNA line identification. On DECnet nodes, line identification takes one of the following formats: *dev-c* *dev* A device name. *c* A decimal number (0 or a positive integer) designating the device's hardware controller. For all nonmultiplexed lines, the unit number is optional and, if specified, is always zero (0). On the Gateway-ST node, the Ethernet line is identified by the string ETHERNET. The lines from the Gateway-ST to the IBM system are identified as a string in the form SYN-*n*, where *n* indicates the number of the line.

Convention	Meaning
node-address	A numeric value in the range of 1.1 to 63.1023, composed of an area number to the left of the period followed by a node number to the right of the period. If the area number is not supplied, the area number of the executor node is used. The default area number for the executor is 1.
node-id	Either a *node-name* or a *node-address*.
node-name	A string of up to 6 alphanumeric characters containing at least 1 alphabetic character.

Abbreviations and Acronyms

This manual uses the following abbreviations and acronyms:

ACF/NCP	Advanced Communications Function with Network Control Program (also referred to as IBM NCP)
API	DECnet SNA Application Programming Interface for OpenVMS
APPC/LU6.2	DECnet SNA APPC/LU6.2 Programming Interface for OpenVMS
CICS/VS	Customer Information Control System/Virtual Storage (also referred to as CICS)
DECnet NCP	Digital's Network Control Program (also referred to as NCP)
DDXF	DECnet/SNA VMS DISOSS Document Exchange Facility
DHCF	DECnet/SNA VMS Distributed Host Command Facility
DSPRINT	MVS/TSO/VTAM Data Set Print Facility
DTF	DECnet SNA Data Transfer Facility
EDE	External Document Exchange with DISOSS
GAS	Gateway Access Server
IBM NCP	IBM's Network Control Program
IMS/VS	Information Management System/Virtual Storage (also referred to as IMS)
JES2	Job Entry Subsystem 2
JES3	Job Entry Subsystem 3
LU	Logical unit
LU1	Logical unit type 1
LU2	Logical unit type 2
LU3	Logical unit type 3

LU6.2	Logical unit type 6.2
MVS	IBM's Multiple Virtual Storage operating system
MR/S	VAX Message Router/S Gateway
MR/P	VAX Message Router/P Gateway
NCL	Network Control Language
NCP	Network Control Program. This manual uses NCP Digital product and IBM NCP to refer to the IBM product.
PLU	Primary logical unit
PrE	DECnet SNA Printer Emulator for OpenVMS
PU	Physical unit
PU2	Physical unit type 2
RH	Request/response header
RJE	DECnet SNA Remote Job Entry for OpenVMS
RU	Request/response unit
SDLC	Synchronous Data Link Control
SLU	Secondary logical unit
SNA	IBM's Systems Network Architecture
SNANCP	DECnet SNA Gateway Network Control Program
SNAP	DECnet SNA Gateway Management display utility
SNATRACE	DECnet SNA Gateway Management protocol trace utility
SSCP	System services control point
3270 DS	DECnet SNA 3270 Data Stream Programming Interface
3270 TE	DECnet SNA 3270 Terminal Emulator for OpenVMS
TH	Transmission header
TSO	IBM's Time Sharing Option
VM	IBM's Virtual Machine operating system
VSE/SP	Virtual Storage Extended/System Package
VTAM	Virtual Telecommunications Access Method

1

Solving DECnet SNA Gateway for Synchronous Transport Problems

This chapter discusses problems that might occur when you are using the DECnet SNA Gateway for Synchronous Transport and its related products. Each section begins with a list of problems; subsequent pages give possible solutions for each problem. The sections are as follows:

- Section 1.1, Hardware Problems
- Section 1.2, Initialization Problems
- Section 1.3, DECnet Problems
- Section 1.4, Session Problems

If you have trouble solving your problem, check the IBM and Digital documentation for the product you are using. Also check the release notes for the product you are using for up-to-date information on known problems.

For information about interpreting OpenVMS and DECnet error messages, refer to the *OpenVMS System Messages and Recovery Procedures*.

1.1 Hardware Problems

Problem Number	Symptom
1	The DEC MicroServer does not power up.
2	Connecting to the remote modem fails.
3	You suspect there is a faulty synchronous port.
4	The Gateway-ST boots, but you cannot establish a connection with the host computer.
5	The line counter "Receive failures" shows errors.

Problem Number	Symptom
6	The Gateway-ST loads, but the circuit remains in the on-starting state.

Hardware Problem 1

The DEC MicroServer does not power up.

Solutions:

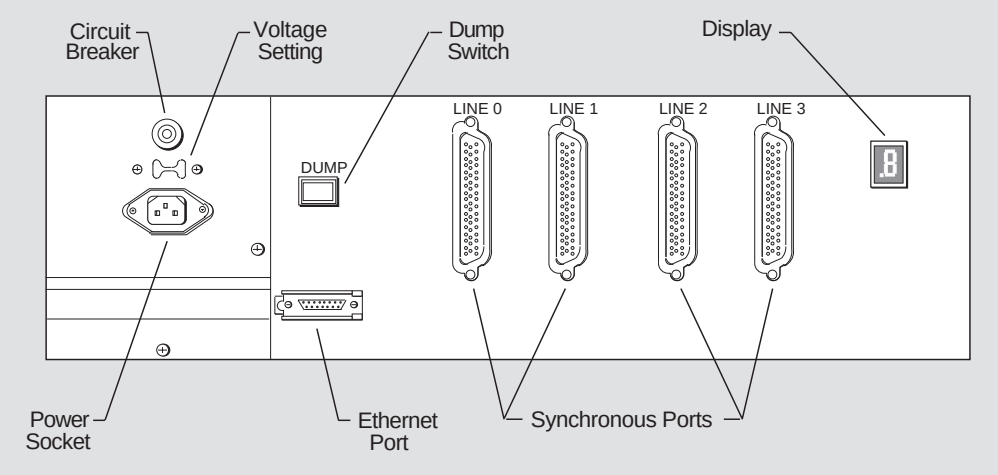
If the fans do not turn and the power indicator does not light, perform the following checks:

1. Make sure the power cord is correctly connected.
   - Check that the connector is properly inserted into the socket on the control panel of the DEC MicroServer.
   - Determine whether the plug on the end of the cord is properly inserted into the wall socket.
2. Ensure that there is power to the wall socket.
3. Determine whether the DEC MicroServer's circuit breaker has been tripped. If it has, reset the circuit breaker (shown in Figure 1–1), and power up the unit again.

NOTE

Figure 1–1 shows the control panel of the four-port DEC MicroServer.

Figure 1–1 Setting the Voltage Selector



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If the circuit breaker trips every time the unit is powered up, check the following:

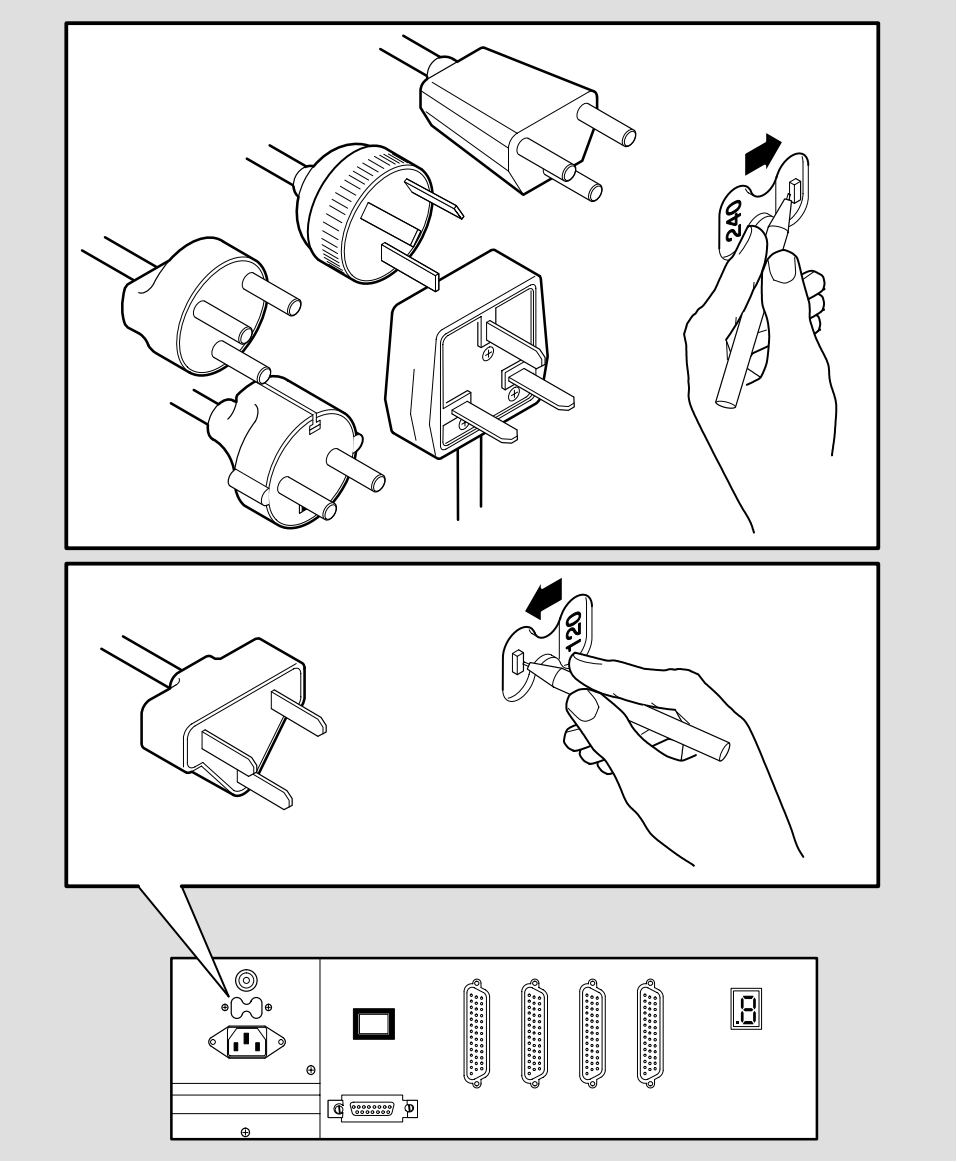
- Make sure the main voltage selector on the control panel is correctly set for your supply voltage (see Figure 1–2).

NOTE

Figure 1–2 shows the control panel of the four-port DEC MicroServer.

- If necessary, change the setting on the voltage selector, and try to power up the unit again.
- If the selector is correctly set but the breaker still trips, unplug the unit and call Digital service representative.

Figure 1–2 Checking the Voltage Selector



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4. Check the power cord.

   Use the cord on another piece of equipment (such as a terminal). If the electrical device does not work, the cord is defective. Replace the power cord, and reboot the system.

   If the power cord works, there is a problem with your DEC MicroServer. Contact Digital service representative.

5. Check the DEC MicroServer.

   If the fans do not turn (but the power indicator lights), there is a problem with the DEC MicroServer. Contact Digital service representative.

   If the power indicator does not light (but the fans turn), the power indicator might be faulty. Try to boot the system. Even if the system works, you should contact Customer Service to replace the unit as soon as possible.

   If the system does not boot, there is a problem with the DEC MicroServer. Contact Digital service representative for a replacement.

Hardware Problem 2

Connecting to the remote modem fails.

Solutions:

1. If using dialup, verify that your dialing information is correct. Make any necessary changes to the ~, and redial if necessary.
2. Check that the modems at your site and at the remote site are configured in a compatible way. If not, reconfigure either set, as necessary, and redial.
3. Check the cables:
   - Make sure all cables between the DEC MicroServer and the modem are correctly connected.
   - Use loopback tests to check the modem control lines between the DEC MicroServer and the modem. Chapter 2 describes loopback tests.
   - Replace any defective cable(s), and reload the system.

   CAUTION

   If you change an adapter cable, be careful not to accidentally press the DUMP switch.

4. Check the local modem:
   - Make sure the modem is turned on.
   - Make sure the communications line is correctly connected to the modem.
   - Test the modem using its self-test facilities (if any). The manufacturer's information tells you what facilities are available and how to use them.
   - Use modem signal loopback tests to make sure the modem is working properly.
   - Correct any faults, or replace the modem, and then reload the system, if necessary.
5. Use the remote loopback tests explained in Chapter 2 to check the communications link and the remote modem. If the modem appears to be faulty, have it repaired. If the link appears to be faulty, contact the remote site to request further fault diagnosis.

Hardware Problem 3

You suspect there is a faulty synchronous port.

Solutions:

The internal test program of the DEC MicroServer tests much of the circuitry in the unit. However, it can only test a synchronous port when a loopback connector is attached to it. If a port is faulty, the DEC MicroServer detects communication errors when trying to use that port.

If you suspect that a port is faulty, do the following:

1. Disconnect the DEC MicroServer from the power supply.
2. Remove the cables from the synchronous port you want to test, and attach the 50-way loopback connector (H3199) supplied with the DEC MicroServer hardware.
3. Power up the DEC MicroServer, and watch the display on the control panel.

With the loopback connector attached, the internal test program can check the port as well as the internal circuitry. If the display shows [d], the synchronous port might be faulty. For more information, see *Installing the DEC MicroServer*. If the test program proceeds normally, it is likely that there is no fault on that port. To perform any further fault isolation on the line, read the information on loopback testing in Chapter 2.

One faulty port on the DEC MicroServer does not necessarily prevent you from using the DECnet SNA Gateway for Synchronous Transport system. For example, if you have a DEC MicroServer and you are using two lines only at speeds less than 64K bits per second (bps), you can simply use one of the two free ports instead of the faulty one. However, one faulty port on the DEC MicroServer-SP does prevent you from using the DECnet SNA Gateway for Synchronous Transport system. Read the configuration guidelines in Appendix E to see which spare ports (if any) are available for your configuration.

Treat any reconfiguration that you make as temporary, and call Digital Customer Service to arrange for the unit's replacement.

Hardware Problem 4

The Gateway-ST boots, but you cannot establish a connection with the IBM computer.

Solutions:

1. Make sure the modems are compatible.
2. Make sure the values for the STATION ADDRESS and STATION ID parameters correspond to their IBM counterparts in *DECnet SNA Gateway-ST Guide to IBM Parameters*. If the parameters are wrong, change them by using SNANCP commands. (For information about using SNANCP, refer to *DECnet SNA Gateway-CT and ST management*.

   Use SNANCP SHOW commands to check the values specified for STATION ADDRESS and STATION ID:

   ```
   SNANCP> SHOW CIRCUIT circuit-id CHARACTERISTICS
   ```

   and for SSCP ID:

   ```
   SNANCP> SHOW PU pu-id CHARACTERISTICS
   ```

   If the SSCP ID is not shown, you have not defined it. Section 1.2, Initialization Problem 6 contains more information about these parameters. To ensure that the correct values are supplied the next time the Gateway-ST is down-line loaded, edit the SNA configuration file on the load host:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

   After you have edited the configuration file, reload the Gateway-ST.
3. Check your modems. If a modem is defective, replace it. Work through the following procedures to test your modems:
   - Check that the pairs of modems on a particular line are compatible and that you have similar strapping options on each modem.
   - Refer to the documentation that accompanies each modem, and do the following:
     - Make sure the modem is turned on.
     - Make sure the modem is installed correctly.
     - Run an internal modem test.
   - If you experience a problem on a dial-up line (for example, you get the carrier-detect signal but still cannot pass data through the modem), make sure you have similar modems in the link.

- Issue the following SNANCP command to check the line:

  ```
  SNANCP> SHOW LINE line-id COUNTERS
  ```

  If the Carrier Lost counter is high, check your modems. Counter errors might also indicate that the line is noisy or defective. Ask the leased-line provider to check the line.

4. Verify the communications path by running loopback tests for the device, cable, and modem. See Chapter 2 for information on loopback tests.
5. If you have eliminated all possible line and modem problems, check the cables between the DEC MicroServer and the local modem:
   - Make sure that all the cables between the DEC MicroServer and the modems are correctly connected. If you find any loose connections, correct them; then reload the system, if necessary.
   - Use loopback tests to check the adapter cable and any modem extension cables. Chapter 2 describes loopback tests.

     Ensure that you have the appropriate adapter cables. In particular, note that some early revisions to the RS-232 standards are incompatible with V.24 cables. See *Installing the DEC MicroServer* for information about the RS-232-C adapter.
   - Replace any defective cables, and reload the system.
6. If you cannot access the IBM system, refer to Section 1.4, Session Problems.

Hardware Problem 5

The line counter "Receive failures" shows errors.

Solutions:

The solutions outlined in this section cover possible hardware and software problems.

1. Use the following SNANCP command to determine the types of errors that might be occurring:

   ```
   SNANCP> SHOW LINE line-id COUNTERS
   ```

   If there are Receive failures, the display from this command includes the following information:

   ```
    n Receive failures, including:
      CRC error
      Receive overrun
      Frame too long
   ```

   where *n* indicates the number of errors.

2. If the counter shows CRC (Cyclic Redundancy Check) errors, there are two possible causes for the errors:

   - IBM test frames on the line can cause CRC errors. Ask your IBM system programmer to check the line for test frames.
   - There might be a problem with the line or the modem. If you have already verified that there are no IBM test frames on the line, call your Digital service representative to report the problem as a hardware problem.

3. If the counter shows Receive overrun errors, several possible hardware problems could cause this error. These hardware problems can cause the number of Receive failures in the communications device to become significantly larger than the number of data blocks received.

The following table lists some hardware problems along with possible solutions:

Problem	Solution
Noise on the line	Check the line for noise levels and, if necessary, contact your leased line/telephone service.
Fault in the modem	Check your modems as in Hardware Problem 4, and replace, if necessary.
Fault in cabling between modem and DEC MicroServer	Use loopback tests and replace cable, if necessary.
Fault in DEC MicroServer	Contact Digital service representative.

4. If the counter shows **Frame too long** error messages, change the buffer length by issuing the following SNANCP command:

   ```
   SNANCP> SET LINE line-id BUFFER SIZE n
   ```

   where *n* is the BUFFER LENGTH. This value should be the same as the value of the MAXDATA parameter in the IBM system.

The problem might be a temporary one caused by extraordinary circumstances. Monitor the problem line. Regularly clear the counters, and look at them again approximately an hour later. If the overrun is consistently high, there might be a problem in the DEC MicroServer. Contact service representative.

Hardware Problem 6

The Gateway-ST loads, but the circuit remains in the on-starting state.

Solutions:

The solutions outlined in this section cover possible hardware and software problems.

1. Use the following command to check which line is associated with the circuit:

   ```
   SNANCP> SHOW CIRCUIT SDLC-n CHARACTERISTICS
   ```

   Use the following command to check the state of the line:

   ```
   SNANCP> SHOW LINE SYN-n
   ```

   To turn the line on, use the following command:

   ```
   SNANCP> SET LINE SYN-n ON
   ```

2. Check that the IBM line and PU are active. See the IBM system manager.
3. Check that you completed Part 2 of the SNACST$CONFIGURE.COM procedure and that the following file was created:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY__*gateway-node-name*_SNA.COM

4. Check the IBM parameters against the values specified in the *DECnet SNA Gateway-ST Guide to IBM Parameters*. In particular, make sure the NRZI setting for the IBM NCP LINE macro is the same as the NRZI setting in the Gateway-ST configuration file.

   The following table equates Gateway-ST and IBM NCP NRZI settings:

Gateway-ST	IBM NCP
SIGNALLING NRZI	NRZI=YES
SIGNALLING NORMAL	NRZI=NO

5. Check the cables between the DEC MicroServer and the local modems. In particular, check the following items:

   - Make sure all cables between the DEC MicroServer and the modems are correctly connected. If you find any loose connections, reconnect the cables, and reload the system.
   - Use loopback tests to check the adapter cable and the modem extension cables. Section 2.2 describes cable loopback tests. Replace any defective cables, and reload the system.

   CAUTION

   If you change an adapter cable, be careful not to accidentally press the DUMP switch.

6. Check the DEC MicroServer synchronous ports. Hardware Problem 3 describes the steps necessary to check the synchronous ports.
7. Check the local and the remote modems on the lines that did not come up. In particular, check the following items:

   - Make sure the modems are powered on and working properly.
   - Make sure the modems have passed any self-test.
   - Use the DEC MicroServer's loopback tests to check the modems. Section 2.2 describes modem loopback tests.

1.2 Initialization Problems

Problem Number	Symptom
1	The Gateway-ST software cannot be loaded.
2	Software with an unexpected configuration is loaded.
3	You see "aborted service request" events on the load host when you try to boot the Gateway-ST.
4	NCP TRIGGER works, but LOAD does not.
5	No event messages are displayed at the load host when the Gateway-ST is booted.
6	The Gateway-ST boots, but the line counters indicate less than normal activity or no activity.
7	The Gateway-ST boots, but the circuit remains in the on-starting state.
8	The PU does not become active.
9	Errors occur in the Gateway-ST initialization process.
10	The Gateway-ST node does not recognize the DECnet node name you specify.
11	You receive an error message when you try to use a component or access name that you defined by editing the configuration file.
12	Event logging reports that the SNAINI object is unknown at the remote node.

Initialization Problem 1

The Gateway-ST software cannot be loaded.

Solutions:

1. Check the display on the DEC MicroServer. If this shows E , run the following tests to check that the DEC MicroServer is correctly connected to the Ethernet:

   - Make sure all connections between the DEC MicroServer and the Ethernet are secure. In particular, check the connection on the DEC MicroServer. Correct any loose connections and try again to load the system.
   - Check for a damaged cable between the DEC MicroServer and the Ethernet transceiver. Replace the cable, if necessary, and try to boot the system again.

2. Run the following test to ensure that the DEC MicroServer is working properly:

   - Make sure that the power indicator is lit and the fans are turning. If the indicator is not lit or the fans do not turn, see Hardware Problem 1.
   - Turn off the DEC MicroServer, disconnect the Ethernet cable, and attach the Ethernet loopback connector (Type H4080).

   CAUTION

   If you power down the DEC MicroServer, wait at least 3 seconds before powering it up again.

   Power up the DEC MicroServer. If the display still shows an E , the Ethernet port is faulty. Contact Digital Customer Service.

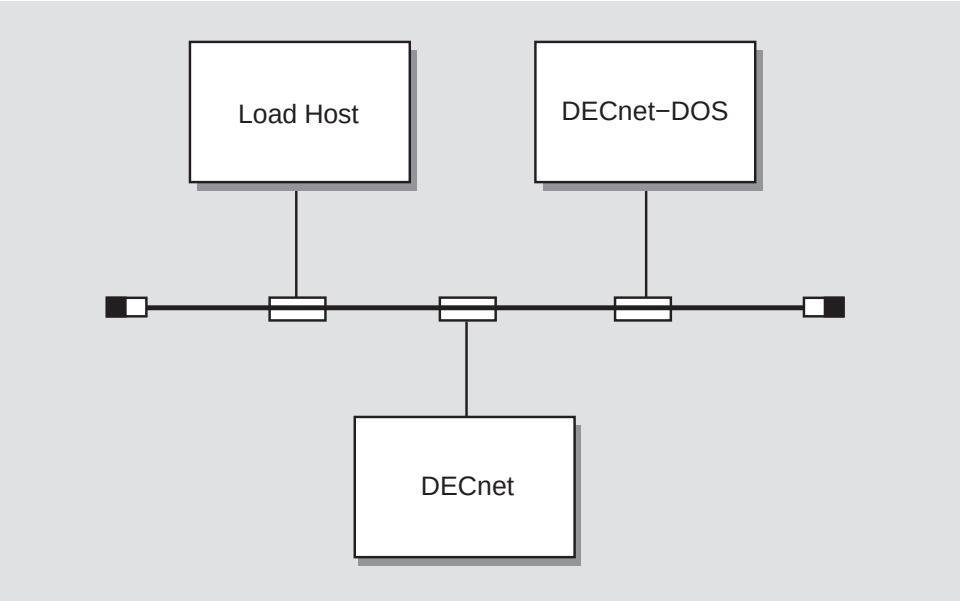
3. Reconnect the Ethernet cable. Check the Ethernet by running loopback tests on the remote nodes:

   - Log in to a load host.
   - Enter the following command:

     ```
     NCP> LOOP NODE node-name
     ```

     where *node-name* is the name of a remote node on the same Ethernet as the DEC MicroServer (see Figure 1-3).

Figure 1–3 Loop Between Nodes on Either Side of the DEC MicroServer



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- If the fault still occurs, it is likely that the Ethernet connection is at fault. Contact Digital service representative to repair the unit.

4. Make sure the DEC MicroServer has completed its self-test procedure by checking the display on the DEC MicroServer. Refer to Appendix C for DEC MicroServer display values.
5. Check that the load host is running properly. Try to load the Gateway-ST again.
6. Check that each load host has a physical connection to the same Ethernet as the DEC MicroServer.
7. Check that each load host has a database entry for the DEC MicroServer. Identify the load hosts, and perform the following actions:

   - Enter the following command (**for Phase IV**):

     `NCP TELL` *`load-host-name`* `SHOW NODE` *`gateway-node-name`* `_CHARACTERISTICS`

and **for Phase V**:

```
NCL SHOW NODE host MOP Client gateway ALL
```

If you receive the following message,

```
No information available
```

then this particular system has not been set up as a load host. Define the system as a load host following the instructions in *DECnet SNA Gateway-ST Installation*.

8. If this system is a load host, check the following items in the display information:
   - DECnet node address
   - Service circuit
   - Hardware address
   - Load file specification

   The service circuit name must match the name of the circuit on the load host to which the Gateway-ST is connected.

   The hardware address (twelve hexadecimal digits) should match the Ethernet address of the Gateway-ST node. You can find the DEC MicroServer Ethernet hardware address on the label on the back of the DEC MicroServer.

   Check that the load file specification is

   SYS$COMMON:[SNA$CSV]SNACST*nnn*.SYS

   where *nnn* is the product version number.

   Correct any errors you find. Use the DIRECTORY command to check that the Gateway-ST load file exists.

   Try to load the Gateway-ST software.

9. Check the state of the line connecting the load host to the Gateway-ST by issuing the NCP command:

   ```
   NCP> SHOW LINE line-id STATUS
   ```

   If the line state is OFF, change the state to ON with the following NCP command:

   ```
   NCP> SET LINE line-id STATE ON
   ```

   The value of the *line-id* must be the same as the value of the service circuit previously displayed.

10. Check the state of the circuit connecting the load host to the Gateway-ST by issuing the following NCP command:

    ```
    NCP> SHOW CIRCUIT circuit-id STATUS
    ```

    The value of the *circuit-id* must be the same as the value of the service circuit previously displayed.

    The state of the service circuit must be ON and the service is enabled by default. To set the state ON, issue the following NCP commands.

    CAUTION

    Setting the circuit state to OFF removes the load host from the network. Notify users that the network will be unvailable.

    ```
    NCP> SET CIRCUIT circuit-id STATE OFF
    NCP> SET CIRCUIT circuit-id SERVICE ENABLED
    NCP> SET CIRCUIT circuit-id STATE ON
    ```

11. Review the event log for details of the failure. Appendix A gives the format of event-logging and error messages. Also, check the MOM.LOG files in SYS$MANAGER for error messages from the maintenance operation module (MOM).

    Check if the proxy information is correct by looking at SYS$COMMON:[SNA$CSV]NETSERVER.LOG for the following message:

    ```
    ----------------------------------------

    Connect request received at dd-mmm-yyyy hh:mm:ss.cc
        from remote process gateway-node-name::"0=SNA$GO"
        for Object "SYS$COMMON:[SYSEXE]NML.EXE"

    ----------------------------------------
    ```

    If you do not receive this message or if NETSERVER.LOG is not located in SYS$COMMON:[SNA$CSV], set default to SYS$SYSTEM on the load host and invoke the VMS AUTHORIZE utility. Issue the following command to check the proxy:

    ```
    UAF SHOW/PROXY gateway-node-name::SNA$GO
    ```

    A message appears saying that the local proxy is SNA$CSC.

    The following message appears:

    ```
    Default proxies are flagged with (D)

    gateway-node-name::SNA$GO
                          SNA$CSV (D)
    ```

12. Verify that the Gateway-ST software has been installed correctly on the load host. Check that the software load file (SNACTS*nnn*.SYS) located in SYS$COMMON:[SNA$CSV] has the correct protection code (S:RWED, O,RWED, G, W).
13. If the configuration file has become corrupted, redo it.
14. Reload the DEC MicroServer.

Initialization Problem 2

An unexpected software configuration is loaded.

Solutions:

1. Log in to the node you think is defined as the load host, and perform the following steps:

   - Enter the following command:

     NCP> SHOW NODE *gateway-node-name* CHARACTERISTICS

   - Check the following items in the displayed information:

     DECnet node address
     Service circuit
     Hardware address
     Load file specification

   - Does the information displayed match your expectations about the configuration? If not, correct any errors that you find, and load the system again. Initialization Problem 1 provides more information about these items.

2. Use the following NCP command to check for "unknown" load hosts:

   NCP> TELL *gateway-node-name* SHOW EXECUTOR CHARACTERISTICS

   One line in this display gives the name of the node that loaded the DEC MicroServer. If you do not want that node to be a load host, you can prevent it from loading the DEC MicroServer by deleting the loading information from its DECnet database. Enter the following command to delete the information:

   NCP> CLEAR NODE *gateway-node-name* LOAD FILE

   Reload the DEC MicroServer.

Initialization Problem 3

You receive "aborted service request" DECnet events at the load host when you try to boot the Gateway-ST.

Solutions:

See the solutions for Initialization Problem 1. If you receive these event messages and your Gateway-ST is booted, the events are the result of other systems' requests for services from your load host. These messages have no bearing on the Gateway-ST.

Initialization Problem 4

NCP TRIGGER works, but LOAD does not.

Solutions:

1. Verify that you entered the following information in the LOAD command correctly:
   - Node identification of the DEC MicroServer
   - Full load file specification (if supplied) in the form of:

     device:[directory]filename
   - Hardware address of the DEC MicroServer (if supplied)
   - Service password (if necessary)
   - Line specification in LOAD VIA identifies the correct Ethernet controller

     Correct any errors, and issue the LOAD command again.
2. Verify that the node that executes the LOAD command:
   - Is a load host for the DEC MicroServer by verifying that the DECnet database has an entry for the DEC MicroServer, and that the following entries are correct:
     - DECnet node address
     - Service circuit
     - Hardware address
     - Load file specification

     To check these entries issue the following command:

     ```
     NCP> SHOW NODE gateway-node-name CHARACTERISTICS
     ```

     Check that the service circuit is enabled with the following command:

     ```
     NCP> SHOW CIRCUIT circuit-id CHARACTERISTICS
     ```

The state of the service circuit must be ON. To set the state ON and enable service on the circuit, issue the following NCP commands.

CAUTION

Setting the circuit state to OFF removes the load host from the network. Notify users that the network will be unavailable.

```
NCP> SET CIRCUIT circuit-id STATE OFF
NCP> SET CIRCUIT circuit-id SERVICE ENABLED
NCP> SET CIRCUIT circuit-id STATE ON
```

Correct any errors in the database, and reissue the command.

- Has a connection to the Ethernet used by the DEC MicroServer

Correct any errors, and issue the LOAD command again.

3. Make sure the executor node has all the necessary load files in the correct directories. Check the *DECnet SNA Gateway-ST Installation* for a list of the Gateway-ST files and their locations.

Initialization Problem 5

No event messages are displayed at the load host when the Gateway-ST is booted.

Solutions:

1. If you have more than one load host, event messages are sent to the load host that actually loaded the Gateway-ST. To find the host that loaded the Gateway-ST, issue the following command:

   ```
   NCP> TELL gateway-node-name SHOW EXECUTOR CHARACTERISTICS
   ```

2. SNAEVL or EVL might not be running. If either type of event logging is nor running, no events are logged. To check whether SNAEVL or EVL is running, enter the DCL command

   ```
   $ SHOW SYSTEM
   ```

   - If the display from this command does not list the SNAEVL process, run the following command procedure to include SNAEVL in your system:

     ```
     $ @SYS$STARTUP:SNAGM$EVL_STARTUP
     ```

     To ensure that Gateway-ST events are logged the next time the host system is booted, insert the preceding command in the system startup file. For more information about SNAEVL, refer to *DECnet SNA Gateway-CT and ST Management*.

   - If the display from this command does not list EVL, enter the following command to start DECnet event logging on your system:

     ```
     NCP> SET LOGGING MONITOR STATE ON
     ```

     For more information about DECnet event logging, refer to the *OpenVMS Networking Manual*.

3. The logging state may not be enabled. Check the SNAEVL logging state. Invoke SNANCP and enter:

   ```
   SNANCP> SHOW KNOWN LOGGING
   ```

   Check the DECnet logging state. Invoke NCP and enter:

   ```
   NCP> SHOW KNOWN LOGGING
   ```

   If this command shows that some events are being filtered, disable filtering. Invoke NCP and enter:

   ```
   NCP> SET LOGGING MONITOR KNOWN EVENTS
   ```

If the logging state for both SNAEVL and EVL is ON, you might not have enabled logging on your terminal. Use the following DCL command to enable logging:

```
$ REPLY/ENABLE=NETWORK
```

If you do not receive event messages, check whether you have set your terminal to NOBROADCAST. If you have set NOBROADCAST, you cannot receive messages. Check this setting with the following DCL command:

```
$ SHOW TERMINAL
```

If necessary, issue the following DCL command to set your terminal to broadcast mode:

```
$ SET TERMINAL/BROADCAST
```

If you still do not receive event messages, check whether you have screened out OPCOM messages with the following DCL command:

```
$ SHOW BROADCAST
```

If necessary, issue the following DCL command to set broadcasting for OPCOM messages ON:

```
$ SET BROADCASE=OPCOM
```

Initialization Problem 6

The Gateway-ST boots, but the line counters indicate less than normal or no activity.

Solutions:

1. Enter the following SNANCP command to show line status:

   ```
   SNANCP> SHOW LINE line-id
   ```

   If the SHOW command indicates that the line was not defined, go to step 2. If the line has been defined, go to step 3.

   NOTE

   It might take several minutes after booting for the Gateway-ST to correctly initialize. An event message indicates when the initialization is complete.

2. Verify that you executed Part 2 of the SNACST$CONFIGURE procedure and that the following file was created:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

   Review the contents of the above file, and check the SET LINE command in the file for the line state.

   - Ensure that the NRZI setting of the ACF/NCP LINE macro matches the SIGNALLING setting on the Gateway-ST node.
   - Check that the value set for the PU address (ADDR=) is the same as the value specified for the SDLC station address on the Gateway-ST node. Use ADDR= in ACF/NCP or ADDR= on VTAM switched node definitions for this value.
   - Verify that the SSCP ID (for all lines) and the STATION ID (for dial-up lines only) used to activate your PU matches the values specified in the SNA configuration file.

   See Hardware Problem 6, Section 1.1. For information about the correct syntax of the SNANCP SET LINE command, see the *DECnet SNA Gateway-CT and ST Management* book.

3. Check for SNAEVL event messages that indicate a problem with the configuration file.

4. If the SNANCP SHOW command shows that the line state is OFF, use the following command to set the line state ON:

   ```
   SNANCP> SET LINE line-id STATE ON
   ```

   To ensure that the Gateway-ST is initialized with the correct line state next time it is loaded, edit the SNA configuration file on the load host:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

5. Check the DEC MicroServer's synchronous port(s) by using the procedure described in Hardware Problem 3.

6. This problem might also be caused by incorrect circuit parameters. See Initialization Problem 7.

Initialization Problem 7

The Gateway-ST boots, but the circuit remains in the on-starting state.

Solutions:

1. Verify that your lines and modems are operating correctly. See Initialization Problem 6 for information about correcting line and modem problems.
2. Enter the following SNANCP commands to show circuit status:

   ```
   SNANCP> SHOW CIRCUIT circuit-id
   ```

   If the SHOW command indicates that the circuit was not defined, go to step 3. If the circuit has been defined, go to step 4.

   NOTE

   Depending on the IBM system's load, it can take several minutes for the circuits to become active after you see the "initialization complete" event.

3. Check that you executed Part 2 of the SNACST$CONFIGURE procedure and that the following file was created:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

   Review the contents of the above file and check the SET CIRCUIT command in the file. For information about the correct syntax of the SNANCP SET CIRCUIT command, see the *DECnet SNA Gateway-CT and ST Management* book.
4. Check for SNAEVL event messages that indicate a problem with the configuration file.
5. Check that the circuit is assigned to a line. Use the following command:

   ```
   SNANCP> SHOW CIRCUIT circuit-id CHARACTERISTICS
   ```

   If necessary, use the following commands to assign it.

   ```
   SNANCP> SET CIRCUIT circuit-id STATE OFF
   SNANCP> SET CIRCUIT circuit-id LINE line-id
   SNANCP> SET CIRCUIT circuit-id STATE ON
   ```

6. If the SNANCP SHOW command shows that the circuit state is OFF, use the following command to set the circuit state ON:

   ```
   SNANCP> SET CIRCUIT circuit-id STATE ON
   ```

To ensure that the Gateway-ST is initialized with the correct circuit state next time it is loaded, edit the SNA configuration file on the load host:

SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

7. Check with the IBM system programmer that both the line and the PU are in the active state.

8. Use the following command to check if there are circuit level errors:

   ```
   SNANCP> SHOW CIRCUIT circuit-id COUNTERS
   ```

   Circuit level errors often indicate a configuration problem. Check that the circuit response mode is set correctly. For more information, see the *DECnet SNA Gateway-CT and ST Management* book.

   Also, check that the PU segment size and line buffer size are the same and that these sizes match the value of the IBM NCP PU definition statement MAXDATA parameter.

Initialization Problem 8

The PU does not become active.

Solutions:

1. Check that the circuit is in the on-starting state. See Initialization Problems 6 and 7 for more information.
2. Enter the following SNANCP command to show PU status:

   ```
   SNANCP> SHOW PU pu-id
   ```

   If the SHOW command indicates that the PU was not defined, go to step 3. If the PU has been defined, go to step 4.
3. Check that you executed Part 2 of the SNACST$CONFIGURE procedure and that the following file is created:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

   Review the contents of the above file, and check the SET PU command in the file. For information about the correct syntax of the SNANCP SET PU command, see the *DECnet SNA Gateway-CT and ST Management* book.
4. Check for SNAEVL event messages that indicate a problem with the configuration file. Messages are found in:

   SYS$COMMON:[SNA$CSV]NETSERVER.LOG
5. If the SNANCP SHOW command shows that the PU state is inactive, check that:
   - The circuit is operational (see Initialization Problem 7).
   - The PU is assigned to a circuit. Use the following command:

     ```
     SNANCP> SHOW PU pu-id CHARACTERISTICS
     ```

     If the PU is not assigned to a circuit, use the following command to assign it.

     ```
     SNANCP> SET PU pu-id CIRCUIT circuit-id
     ```
6. Ask the VTAM operator to verify that your PU has been activated and is in the active state.

Initialization Problem 9

Errors occur in the Gateway-ST initialization process.

Solutions:

There are several possible reasons for this problem:

1. The Gateway-ST may not be configured. If you configured the Gateway-ST, the following files appear:

   SNAGATEWAY_*gateway-node-name*_SNA.COM
   SNAGATEWAY_*gateway-node-name*_DNA.COM

   If the files do not appear in the directory, run the following utility to configure the Gateway-ST:

   ```
   $ SYS$MANAGER:SNACST$CONFIGURE
   ```

   Refer to *DECnet SNA Gateway-ST Installation* for information on the configuration procedure.

2. When the Gateway-ST was initialized, the SNAINI object did not run. Following is a list of some of the causes for this problem:

   - The SNAINI object may not be defined. To see if it is defined, issue the NCP command (**for Phase IV**):

     ```
     NCP> SHOW OBJECT SNAINI CHARACTERISTICS
     ```

     and **for Phase V**:

     ```
     NCL> SHOW SESSION CONTROL APPL SNAINI ALL
     ```

     The display from this command should be the following:

     ```
     Object Volatile Characteristics as of dd-mmm-yyyy hh:mm:ss

     Object = snaini

     Number                          = 39
     File id                         = SYS$COMMON:[SNA$CSV]SNAINI.COM
     Proxy access                    = incoming
     ```

     If the SNAINI object is not defined, create it by executing:

     ```
     $ DEFINE_gateway-node-name_ON_load-host-node-name.COM
     ```

     If you cannot find this file, execute Part 1 of SNACST$CONFIGURE.

   - Check the proxy account created during the Gateway-ST configuration. Invoke the VMS AUTHORIZE utility, and issue the following command:

     ```
     UAF SHOW SNA$CSV
     ```

If the proxy account SNA$CSV is not defined, run Part 1 of the Gateway-ST configuration again. If SNA$CSV is defined, issue the following command:

```
UAF SHOW/PROXY gateway-node-name::SNA$GO
```

A message appears saying that the local proxy is SNA$CSV:

```
Default proxies are flagged with (D)

gateway-node-name::SNA$GO
          SNA$CSV (D)
```

If this message does not appear, run Part 1 of the Gateway-ST configuration again.

Check to determine if incoming proxies are enabled with the following command:

```
NCP> SHOW EXECUTOR CHARACTERISTICS
```

If incoming proxies are not enabled, enter the following command to enable them:

```
NCP> SET EXECUTOR INCOMING PROXY ENABLE
```

- When the Gateway-ST was initialized, the command procedure could not read or encountered errors in the SNA configuration file. Event messages from SNAINI tell you where the initialization command procedure met a problem.

Initialization Problem 10

The Gateway-ST node does not recognize the DECnet node name you specify.

Solutions:

1. If the node address is in the same area as the load host, it should be automatically copied to the Gateway-ST at load time (Phase IV only).
2. If a local node is not defined, the initialization procedure failed. Look for SNAEVL messages that provide more information about the problem.
3. For nodes outside the area, you can modify the Gateway-ST node's DECnet database while the Gateway-ST is running. Issue the following NCP commands:

   ```
   NCP> SET EXECUTOR NODE gateway-node-nameUSERusername -
   _PASSWORD password

   NCP> SET NODE node-address NAME DECnet-node-name
   ```

   To ensure that a node outside the area is defined the next time the Gateway-ST loaded, edit the node configuration file on the load host:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_DNA.COM

Initialization Problem 11

You receive an error message when you try to use a component or access name that you defined by editing the configuration file.

Solutions:

Check the following areas:

1. You might have defined the component (line, circuit, PU, LU, or server) or access name correctly but have forgotten to reboot the Gateway-ST after correcting the definitions. Check NETSERVER.LOG for errors. Reboot the Gateway-ST using the NCP TRIGGER command from a load host.

   For Phase IV, enter

   ```
   NCP> TRIGGER NODE gateway-node-name
   ```

   For Phase V, enter

   ```
   NCL> BOOT MOP CLIENT gateway
   ```

2. You might have an error in the component or access name definition in the SNA configuration file. Correct any errors.

   To ensure that the components and access names are defined next time the Gateway-ST is loaded, correct the problem by editing the following file:

   SNAGATEWAY_*gateway-node-name*_SNA.COM

Initialization Problem 12

Event logging reports that the SNAINI object is unknown at the remote node.

Solution:

You might have purged your network object database. Redefine the object **on Phase IV**, by executing:

```
$ @SYS$COMMON:[SNA$CSV]DEFINE_gateway-node-name_ON_load-host-node-name.COM
```

and **on Phase V**, by executing:

```
@SYS$STARTUP:NET$APPLICATION_STARTUP_NCL
```

1.3 DECnet Problems

Problem Number	Symptom
1	An abnormal event is logged on the DECnet load host node.
2	The Gateway-ST system is unreachable.
3	The Gateway-ST boots and comes up but does not initialize completely.

NOTE

To access the Gateway-ST, you must be licensed to use DECnet. If DECnet is not enabled, you cannot set the lines and circuits to the ON state.

DECnet Problem 1

An abnormal event is logged on the DECnet load host node.

Solutions:

1. When the system displays DECnet error messages, refer to the appropriate DECnet system manuals for information about probable causes of the error. (The DECnet manuals contain messages that are specific to DECnet products; they do not contain error messages that are specific to DECnet SNA products.)
2. If error messages suggest the problem is with your load host node, make sure all the components required for the DECnet SNA Gateway for Synchronous Transport and its products have been correctly installed, configured, and loaded.
3. If error messages suggest the problem is with the Gateway-ST node (the DEC MicroServer), refer to the problems described in Section 1.1, Hardware Problems and Section 1.2, Initialization Problems.

DECnet Problem 2

The Gateway-ST system is unreachable.

Solutions:

1. Your DECnet network might not be functioning properly. Check with your DECnet system manager.
2. There might be a problem with either your DECnet node or the Gateway-ST node.
   - Try to access your DECnet node from another node in the network. If you cannot access your DECnet node, there is a problem with it. Notify your DECnet system manager.
   - Try to access the Gateway-ST from another node in the network. If you cannot access the Gateway-ST, there is a problem with it. Check for problems with the DEC MicroServer by checking the status LED. Error and status codes are listed and explained in Appendix C.
3. Check the DEC MicroServer's physical cable connections (the Ethernet connection, the transceiver connection, and the Ethernet interface) to the DECnet network.
4. Ensure that the Gateway-ST software is installed and configured correctly.
5. Your DECnet network might not be configured correctly. For Phase V, use DNS to see that the node is known to the network.

   For Phase IV, Use the following command to check that your load host has the Gateway-ST DECnet node address defined correctly:

   ```
   ncp> SHOW NODE gateway-node-name
   ```

   Check that the node address as displayed by the NCP command matches the node address in the following configuration file:

   SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_DNA.COM

   If it does not match, reexecute Part 1 of the SNACST$CONFIGURE prodedure.
6. Run DECnet NCP loopback tests to test the communications hardware and software from the DECnet Management node to the Gateway-ST. For more information see the *DECnet SNA Gateway-CT and Gateway-ST Management* book.

DECnet Problem 3

The Gateway-ST boots and comes up but does not initialize completely.

Solution:

Wait for the end of the initialization procedure before you try to connect to the Gateway-ST again. The event message displayed during successful initialization is:

```
DECnet SNA event 266.0, Gateway initialization
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
SNA gateway management,  Severity = informational
Completed
Normal successful completion
```

Check the messages in the SYS$COMMON:[SNA$CSV]NETSERVER.LOG file and correct any problems.

1.4 Session Problems

Problem Number	Symptom
1	The Gateway-ST does not recognize the access names you specify.
2	The Gateway-ST does not recognize the PU you specify.
3	The Gateway-ST does not recognize the LU names you specify.
4	You receive error messages when you enter the first command to initiate a session.
5	Nothing happens when you try to initiate your session even after a reasonable wait for normal session establishment.
6	The session hangs while in progress.
7	Sessions terminate abnormally.
8	An excessive number of line errors occur.
9	An excessive number of circuit errors occur.
10	Response time or file transfer time increases significantly.

Session Problem 1

The Gateway-ST does not recognize the access names you specify.

Solution:

The access names you want to use might not be defined on your Gateway-ST. Use the following SNANCP command to obtain a list of access names defined on your Gateway-ST:

```
SNANCP> SHOW KNOWN ACCESS NAMES
```

For full information about access name characteristics, use the following command:

```
SNANCP> SHOW KNOWN ACCESS NAME CHARACTERISTICS
```

Use the following SNANCP command to define access names on the Gateway-ST node:

SNANCP> SET ACCESS NAME *access-name-id*

For information on using SNANCP commands to define access names, refer to the *DECnet SNA Gateway-CT and ST Management* book.

To ensure that the Gateway-ST is initialized with the correct access names next time it is loaded, edit the SNA configuration file on the load host:

SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

Session Problem 2

The Gateway-ST does not recognize the PU you specify.

Solution:

The PU you want to use might not be defined on your Gateway-ST. Use the SNANCP command SHOW KNOWN PUS to find out whether the PU you want to use is defined on the Gateway-ST node and has been activated. If the PU name is not defined, use the following SNANCP command to define it:

```
SNANCP> SET PU pu-id
```

For information on using SNANCP commands to define PUs, refer to the *DECnet SNA Gateway-CT and ST Management* book.

To ensure that the Gateway-ST is initialized with this PU next time it is loaded, edit the SNA configuration file on the load host:

SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

Session Problem 3

The Gateway-ST does not recognize the LU names you specify.

Solution:

1. Check that the PU name is defined. See Session Problem 2 for more information about specifying a PU name.
2. The LUs you want to use might not be defined on your Gateway-ST. Use the SNANCP command SHOW KNOWN LUS to find out whether the LUs you want to use are defined and are active. If the LUs are not defined, use the following SNANCP command to define them on the Gateway-ST:

   ```
   SNANCP> SET PU pu-id LU LIST lu-list
   ```

   For information on defining LUs with SNANCP commands, refer to the *DECnet SNA Gateway-CT and ST Management* book.

To ensure that the Gateway-ST is initialized with these LUs next time it is loaded, edit the SNA configuration file on the load host:

SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

Session Problem 4

You receive error messages when you enter the first command to initiate a session.

Solutions:

1. Check the product documentation for the access routine you are trying to use. Error messages that relate to a particular access routine are explained in the respective access-routine manual.
2. If the error message states that the Gateway-ST node is unknown, check whether you made any typing errors when you tried to begin a session. If you entered the command properly, use DNS to see that the node is know to the network (for Phase V), and for Phase IV, issue the following NCP command to see if the Gateway-ST node is known:

   ```
   NCP> SHOW NODE gateway-node-name
   ```

   If the Gateway-ST node is unknown, define it with the following NCP command:

   ```
   NCP> SET NODE node-address NAME gateway-node-name
   ```

   For more information see Section 1.2, Initialization Problem 10.
3. If the error message states that there is no such SNA component (line, circuit, PU, LU, access name, or server), one of the following might be the cause of the problem:
   - You specified the name of the component incorrectly.
   - The component name you specified is not defined.

   For more information see Section 1.2, Initialization Problems, and the Session Problems in this section.
4. If the error message states that access is rejected due to authorization failure, use the following SNANCP command to check the authorized users for the LU specified in the error message:

   ```
   SNANCP> SHOW LU lu-id KNOWN AUTHORIZATION
   ```

   Modify the authorization entries, if necessary. Refer to the *DECnet SNA Gateway-CT and ST Management* book for more information on LU security and authorization.
5. If you receive a message indicating that the line or circuit is not active, follow the solutions in Section 1.2, Initialization Problems 6 and 7.
6. If the lines and circuits are active, check that the PU is configured correctly and activated. See Section 1.2, Initialization Problem 8.

7. You might also receive an error message indicating that your session is not active. This message means the Gateway-ST has not received an ACTLU (activate logical unit). Use the following SNANCP command to check the state of the LU:

   ```
   SNANCP> SHOW LU lu-id
   ```

   If the LU is not active, ask your IBM system programmer to activate it.

   Check if the access name you are using corresponds to the session you intend to use. Use the following SNANCP command to see if the range of LUs for the access name corresponds to the correct LU on the IBM host:

   ```
   SNANCP> SHOW ACCESS NAME access-name CHARACTERISTICS
   ```

8. If an error message containing an IBM sense code appears, it probably indicates a session problem. Verify that your application id and session parameters are correct. (Receiving an IBM sense code indicates that the lines, circuits, PUs, and LUs are functioning normally.)

   For some sample IBM sense codes, refer to Appendix A. IBM's *Systems Network Architecture Formats* manual contains a complete list of sense codes.

Session Problem 5

Nothing happens when you try to initiate your session even after a reasonable wait for normal session establishment.

Solution:

There may be a problem with the IBM system. The IBM system may be busy, or there may be an IBM configuration problem either with VTAM or with the application with which you are trying to communicate.

Session Problem 6

The session hangs while in progress.

Solutions:

The following are potential causes for this problem:

1. The IBM system may be unreachable from the Gateway-ST (see Session Problem 5 in this section).
2. DECnet problems may be occurring between the load host and the Gateway-ST. See Section 1.3, DECnet Problems.
3. The IBM host might not be working properly or might be overloaded (see Session Problem 5 in this section).

Session Problem 7

Sessions terminate abnormally.

Solutions:

If sessions terminate abnormally, you might not have used the correct buffer size when configuring the Gateway-ST. A TE session, for example, might terminate with the following message:

```
%SNATERM-E-SESNOLACT, session no longer active
-SNA-E-ABMSESTER, session terminated abnormally
```

You must check the line and circuit counters.

Check the line counters with the following command:

```
SNANCP> SHOW KNOWN LINE COUNTERS
```

If the display includes the following message, change the line buffer size to reflect the value of MAXDATA specified in the IBM system:

```
1  Receive failures, including:
     Frame too long
```

Ensure that the PU segment size matches the line buffer size.

Check the circuit counters with the following command:

```
SNANCP> SHOW KNOWN CIRCUITS COUNTERS
```

If the display includes the following message, change the buffer size to reflect the value of MAXDATA specified in the IBM system:

```
1  Remote station errors, including:
     FRMR sent, I-frame too long

1  Data errors inbound, including:
     Frame too long
```

To change the buffer size, use the SNANCP SET LINE command. See the *DECnet SNA Gateway-CT and ST Management* book for information on using this command. To ensure that the correct buffer size is used next time the Gateway-ST is loaded, edit the SNA configuration file on the load host:

SYS$COMMON:[SNA$CSV]SNAGATEWAY_*gateway-node-name*_SNA.COM

Session Problem 8

An excessive number of line errors occur.

Solutions:

Do not ignore line errors. Use the following SNANCP command to check the rate of line errors.

```
SNANCP> SHOW KNOWN LINE COUNTERS
```

Refer to the *DECnet SNA Gateway-CT and ST Management* book for a description of each line counter.

Line errors are usually caused by either the cables or the modem. Use the SNANCP LOOP LINE command to test the communications line. This command helps you trace the line problem to the controller, cable, or modem.

If line errors occur on only one circuit, try moving the line to one of the other ports, if available. If the problem remains, replace the cable.

For additional information on line problems, refer to Hardware Problem 6.

Session Problem 9

An excessive number of circuit errors occur.

Solutions:

Do not ignore circuit errors. Use the following SNANCP command to check the rate of circuit errors.

```
SNANCP> SHOW KNOWN CIRCUIT COUNTERS
```

Refer to the *DECnet SNA Gateway-CT and ST Management* book for a description of each circuit counter.

Circuit errors are usually caused by an incorrectly configured system. Use the appropriate SNANCP commands to show line, circuit, and PU characteristics.

Some errors that can occur because your system is incorrectly configured follow:

- A **FRMR sent, I-frame too long** error message is often caused by an insufficient line buffer size.
- A **Reject received** error message is often caused by setting the PU segment size larger than the IBM MAXDATA parameter size.
- Transmit and receive errors can be caused by incorrectly setting the circuit duplex parameter to FULL when the IBM parameter is set to HALF

In addition, **Frame retransmits** error messages can occur because of problems in the communications equipment or because of a noisy line. See Section 1.1, Hardware Problem 5 for a description of how to solve these problems.

Session Problem 10

Response time or file transfer time increases significantly.

Solutions:

1. Use SNANCP SHOW commands to check the following:
   - Number of sessions active

     ```
     SNANCP> SHOW ACTIVE LUS
     ```

     In general, the more LUs that are in session, the slower the performance.
   - Possible line retransmissions

     ```
     SNANCP> SHOW CIRCUIT circuit-id COUNTERS
     ```

     Look at the line and circuit counters for abnormally high error rates.
   - Number of transmission errors

     ```
     SNANCP> SHOW LINE line-id COUNTERS
     ```

     Look at the number of transmission errors. Excessive retransmissions and CRC errors are a sign of noisy lines. Report the problem to your operations manager.
2. Use SNANCP commands to check the following:
   - The MODEM parameter (this should be *normal* if you are not using IBM diagnostic modems)

     ```
     SNANCP> SHOW LINE line-id CHARACTERISTICS
     ```

     Do not specify a modem type of *diagnostic* unless you are using diagnostic modems.
   - Check the adequacy of your host system resources. Probable causes of slowed response time at a DECnet node are the following:
     - Number of users
     - Number of communication lines
     - SNATRACE circuit-level trace being run
     - Line speed of DECnet lines to Gateway-ST
     - Decrease in IBM response time due to system load or a program's priority (for example, heavy RJE activity). (See Session Problem 5.)

- Slow response time could also be caused by an intermittent fault in the communications device connecting the Gateway-ST node to the SNA network. See Section 1.1, Problems 5 and 6 for more information. If the problem persists, ask your Digital service representative to check this device.

2
Using Loopback Tests

Loopback tests send test messages over a particular communications path and then loop them back to the originating node. This operation checks the communications links and helps you isolate the cause of any faults. If the originating node successfully receives the test messages, you can assume all components along the test path are working properly. Tests along different paths help you isolate problems in specific areas of a DECnet SNA network.

Loopback tests for the Gateway-ST fall into two main categories:

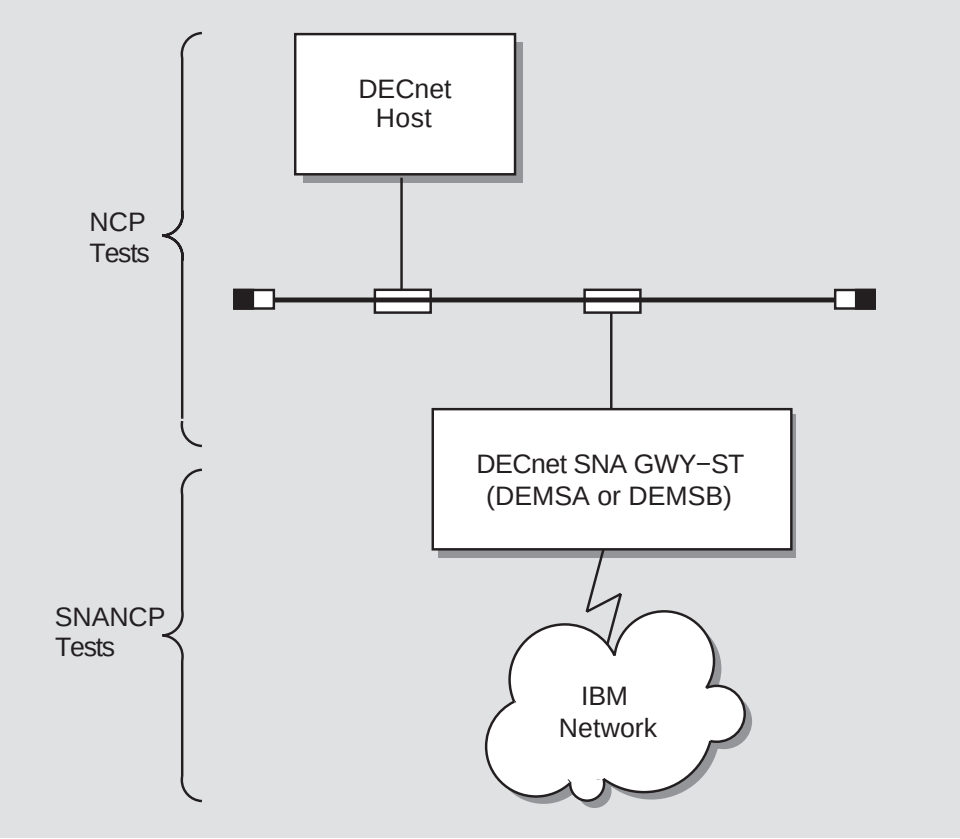
- **DECnet NCP loopback tests.** These tests check the communications software and hardware from the DECnet Management node to the Gateway-ST node. If you have been receiving DECnet error messages, you should run these tests. The tests are described in Section 2.1.
- **SNANCP loopback tests.** These tests check the communications hardware from the Gateway-ST to the modem at the IBM site. You should run SNANCP loopback tests in either of the following cases:
  - If you have been receiving SNANCP error messages or SNA-related event messages.
  - If the SNANCP command SHOW LINE *line-id* COUNTERS indicates excessive error counters on the line.

  The SNANCP loopback tests are described in Section 2.2. For more details on the SNANCP commands, refer to the *DECnet SNA Gateway-CT and ST Management* book.

In addition to NCP and SNANCP loopback tests, DEC MicroServer loopback tests are available. Section 2.3 describes the DEC MicroServer loopback tests. Use these tests when you cannot use the test facilities offered by the DECnet SNA Gateway for Synchronous Transport software.

Figure 2–1 shows which parts of the network the loopback tests check.

Figure 2–1 Loopback Tests



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Figures 2–2 and 2–3 show the suggested order to run loopback tests to isolate a problem. Start with the loopback tests shown in Figure 2–2. If the first set of tests are successful, run the tests shown in Figure 2–3. Run the tests in the order shown in the figures unless you know that the problem is in a particular area. If the first test you run does not isolate the problem, continue testing in the order shown until you find the problem.

Figure 2–2 Running ncp Tests

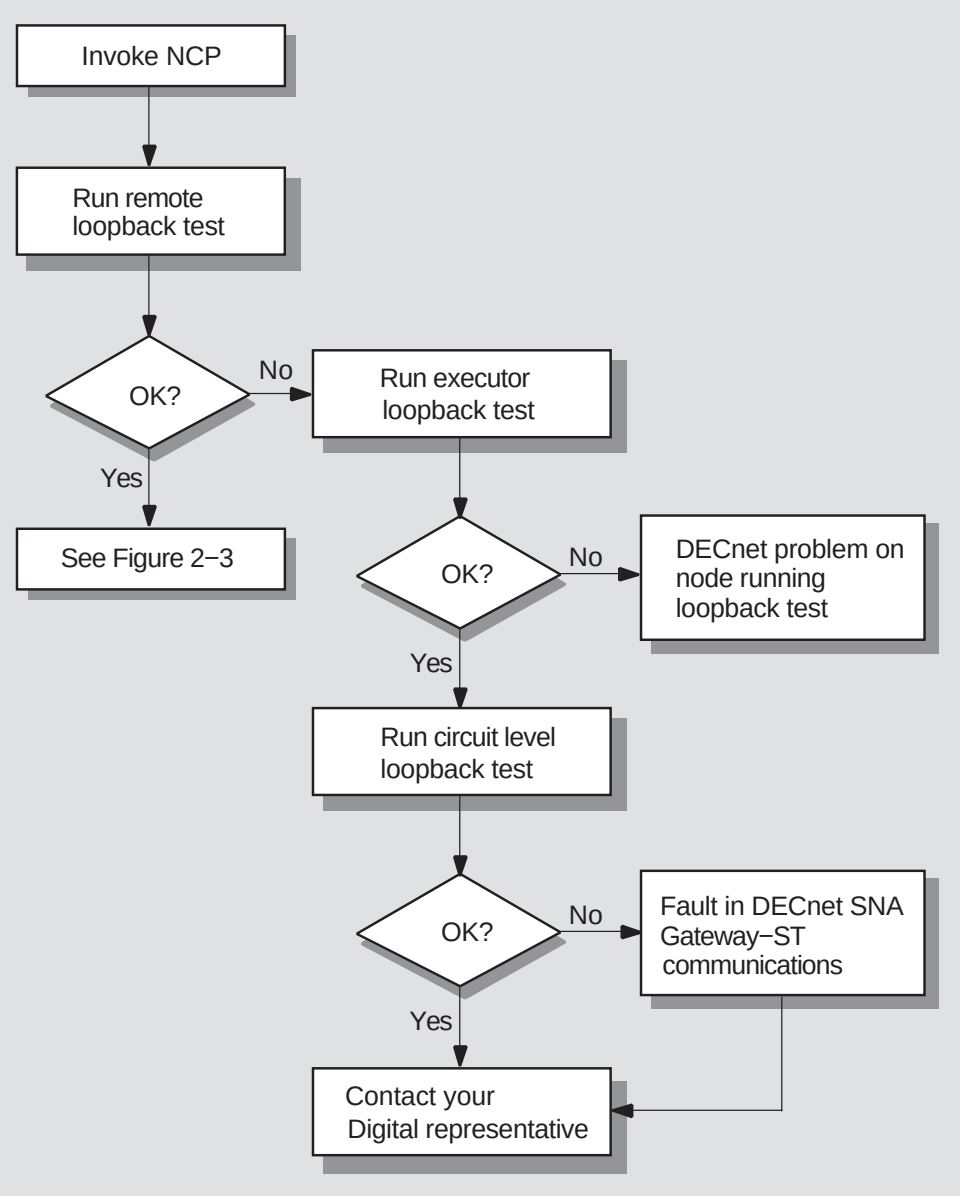

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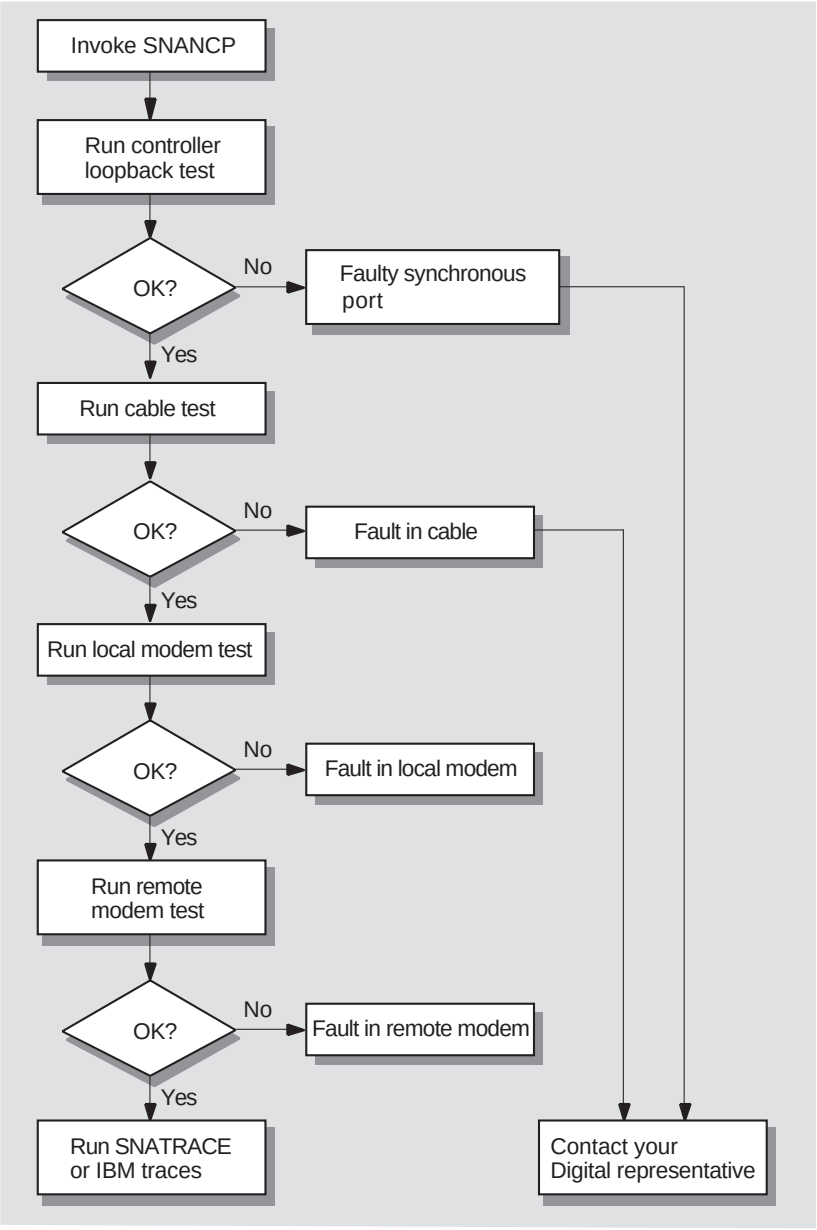
Figure 2–3 Running snancp Tests



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2.1 NCP Loopback Tests

Before running the NCP loopback tests, verify that the Gateway-ST node is on the same DECnet network as the node from which you want to run the tests. Then invoke NCP with the following command:

```
$ NCP
```

Once you have invoked the Network Control Program (NCP), you can use the loopback tests to check the software and the hardware between the Gateway-ST and any DECnet node on the same network.

The tests described in this section are:

- **Remote loopback test**.

  This loopback test checks the DECnet software and logical link between the local DECnet node and the Gateway-ST, regardless of the circuit (see Section 2.1.1).

- **Executor loopback test**.

  This loopback test checks the DECnet software in the local node (see Section 2.1.2).

- **Circuit level loopback test**.

  This loopback test checks the service circuit and the communications device on the Gateway-ST node (see Section 2.1.3).

For details about using these loopback tests on a particular system, refer to the *OpenVMS Networking Manual*.

2.1.1 Remote Loopback Test

The remote loopback test checks the ability to create logical links between the DECnet host and the Gateway-ST regardless of the physical route taken by the test data. Start with this test if you are unsure of the location of the problem.

To run the remote loopback test, you must know the Gateway-ST privileged username and password. At the NCP prompt enter the following command:

```
NCP> LOOP NODE gateway-node-name USER username PASSWORD password [...]
```

For example,

```
NCP> LOOP NODE GWY USER MARSHALL PASSWORD WILDERNESS COUNT 10
```

However, in earlier versions of OpenVMS, DECnet NCP might not pass the supplied access control information to the Gateway-ST; therefore, the LOOP NODE command fails with the following error message:

```
%NCP-I-NMLRSP, listener response - mirror connect
               failed, access control rejected
```

To work around this problem, you can establish default outgoing access control at your DECnet node. Then issue the LOOP NODE command:

```
NCP> SET NODE gateway-node-name NONPRIVILEGED USER username-
_PASSWORD password
NCP> LOOP NODE gateway-node-name [...]
NCP> CLEAR NODE gateway-node-name NONPRIVILEGED USER PASSWORD
```

Note that all connections issued from your DECnet node to the specified Gateway-ST can potentially use the default access control you have established. Therefore, be sure to leave the default access control set up for the duration of the loopback test only.

If this test runs successfully, you can assume it is possible to create logical links between your local DECnet node and the Gateway-ST. Use the SNANCP loopback tests to check the link from the Gateway-ST to the IBM network.

If you get an error with this test, run the executor loopback test to further isolate your problem.

2.1.2 Executor Loopback Test

The executor loopback test checks the DECnet software in the node you are using; it does so by setting up and sending test data through an internal logical link. If this test is successful, the local DECnet software is not causing your problem.

To run the executor loopback test, enter the following command at the NCP prompt:

```
NCP> LOOP EXECUTOR [parameter] [...])
```

For example,

```
NCP> LOOP EXECUTOR
```

If this test fails, there is a problem with the DECnet software in your local node. Ask the DECnet system manager to verify that DECnet is correctly installed and currently active.

If this test is successful, run the circuit level loopback test to further isolate your problem.

2.1.3 Circuit Level Loopback Test

Use this test to check the communications device on the DECnet side of the Gateway-ST node.

To run the circuit level loopback test, you need OPER privileges. If the circuit is in the ON state for DECnet, then by default service is enabled. If you want to verify that service is enabled, issue the following command:

```
NCP> SHOW CIRCUIT circuit-id CHARACTERISTICS
```

If the service is not enabled, enter the following commands:

```
NCP> SET CIRCUIT circuit-id OFF
NCP> SET CIRCUIT circuit-id SERVICE ENABLED
```

If the service is enabled, enter the following command:

```
NCP> LOOP CIRCUIT circuit-id NODE gateway-node-name
```

For example, enter the following command:

```
NCP> LOOP CIRCUIT UNA-0 NODE GWY
```

If this test fails, ask your Digital Customer Service representative to run diagnostics on the device to ensure that it is properly installed.

2.2 SNANCP Loopback Tests

The SNANCP loopback tests check the link from the Gateway-ST to the SNA network. The tests described in this section are:

- **Controller loopback test**:

  Checks the communications device on the Gateway-ST.

- **Cable loopback test**:

Checks the cable from the Gateway-ST to the local modem.

- **Modem loopback tests**:

  Check the communications link either to the modem at the Gateway-ST end or to the modem at the IBM end. Use a digital loopback test on the local modem and an analog loopback test on the remote modem.

Use the SNANCP loopback tests in either of the following cases:

- You have been receiving Gateway-ST error messages.
- You have not been able to locate a problem by using the NCP loopback tests.

For all SNANCP tests, ensure that the line state is OFF. Use the following command to verify the state of the line:

```
SNANCP> SHOW LINE line-id STATUS
```

If the line state is not OFF, issue the following SNANCP command:

```
SNANCP> SET LINE line-id STATE OFF
```

Refer to the *DECnet SNA Gateway-CT and ST Management* book for information on SNANCP commands.

2.2.1 Controller Loopback Test

Use this loopback test to check the communications device on the Gateway-ST. To use the controller loopback test, enter the following command:

```
SNANCP> LOOP LINE line-id AT CONTROLLER
```

If this test fails, there is a fault with the communications device. Ask your Digital Customer Service representative to check the device.

If this test is successful, run the cable loopback test to further isolate the problem.

2.2.2 Cable Loopback Test

This loopback test checks the cable from the Gateway-ST to the local modem. Before you use the cable loopback test, make sure that a cable loopback connector (or equivalent) is installed at the end of the cable between the Gateway-ST node and the local modem. To run the cable loopback test, perform the following steps:

```
SNANCP> LOOP LINE line-id AT CABLE
```

If this test fails, there is a fault with the cable. Have the cable replaced.

If the test is successful, run the modem loopback tests to further isolate the problem.

2.2.3 Modem Loopback Tests

There are two modems between the Gateway-ST node and the SNA network. You can test either modem with the SNANCP command:

```
SNANCP> LOOP LINE line-id AT MODEM
```

First, test the modem at the Gateway-ST end of the communications path by physically setting it to loopback mode (see the manufacturer's instructions). If the test fails, have the modem repaired.

If the test is successful, run a similar test on the remote modem to further isolate the problem. For this test, the local modem should be set for normal communications, and the remote modem should be set to loopback mode (see the manufacturer's instructions).

If the test on the remote modem is successful but you still have a problem, you might need to have loopback tests run on the IBM equipment. Speak to your IBM systems programmer to arrange for such tests.

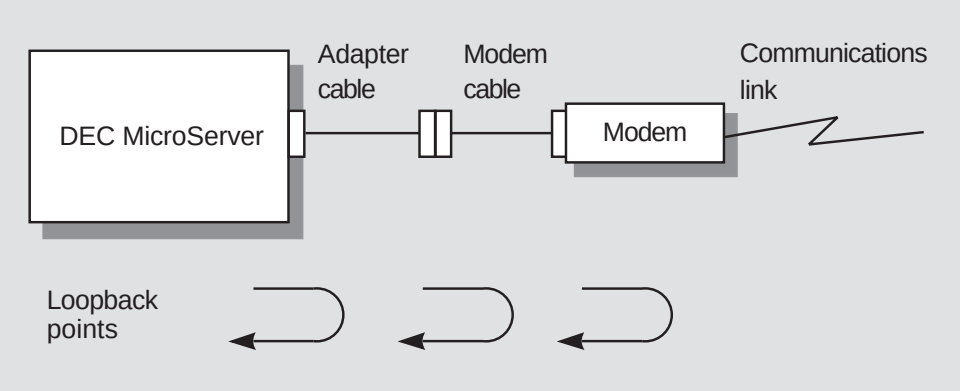
2.3 DEC MicroServer Loopback Tests

There might be times when you cannot use the test facilities offered by the DECnet SNA Gateway for Synchronous Transport software. In these cases, you can use the loopback facilities that the DEC MicroServer hardware offers. The following sections describe available tests and tell you how to use them.

2.3.1 Loopback Points

A DEC MicroServer synchronous link has a number of components, as Figure 2–4 shows. The communication connections between different DEC MicroServer components are used as loopback points.

Figure 2–4 Parts of a Synchronous Communications Link



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Loopback connectors can be attached to any of the following loopback points:

- To the socket on the DEC MicroServer
- At the end of the adapter cable
- At the end of the modem cable (if any)

Some modems provide loopback functions at the following loopback points:

- On the communications link side of the modem
- At the remote modem

By doing a series of tests, each using a different loopback point, you can find out which part of the line is faulty.

2.3.2 General Test Procedure

Test one line at a time, starting from the synchronous port on the DEC MicroServer and working towards the remote modem. Use the tests in the following order:

1. Synchronous port on the DEC MicroServer or the DEC MicroServer–SP
2. Adapter cable
3. Modem cable
4. Local modem
5. Remote modem

The first test to fail shows where the communications link is faulty. For example, if the tests on the DEC MicroServer port and the adapter cable succeed but the test on the modem cable fails, it is likely that the modem cable is faulty.

2.3.3 The test Command

To do the testing, use the DEC MicroServer's remote console facilities. (See Appendix D for information on the DEC MicroServer's remote console facility and commands.) Use the TEST command to perform each loopback test. Each time you use the TEST command to perform a loopback test, it displays one of the following messages:

- If the test is successful:

  `Successful Data Loopback on Channel` *n*

- If the test fails:

  `Data Loopback Test Failed on Channel` *n*

In both messages, the appropriate port number appears in place of *n*.

2.3.4 Sample Test Procedure

The following sections describe how to test a DEC MicroServer communications link with the loopback test.

2.3.4.1 Connect to the DEC MicroServer

First, attach your terminal as a remote console by performing the following steps:

1. Log in to a host system. This system must be on the same Ethernet as the DEC MicroServer.
2. Use the commands in Appendix D to create a logical connection between your terminal and the DEC MicroServer.

When the connection is made, the following prompt appears on your terminal:

```
>>>
```

2.3.4.2 Stop the System Software

The loopback tests need exclusive use of the synchronous port(s), so you must stop the DECnet SNA Gateway for Synchronous Transport software before you start the tests. Enter the following remote console command:

```
HALT
```

Once the DEC MicroServer has been halted, the only way to restore normal Gateway-ST operations is to load the Gateway. See Section 2.3.4.7 for information about using the console BOOT command.

2.3.4.3 DEC MicroServer I/O Port Testing

Test the 50-way port on the DEC MicroServer by doing the following:

1. Remove the adapter cable from the 50-way port.
2. Attach the 50-way loopback connector (Type H3199).
3. Enter the following command at the console:

   ```
   TEST DATA_LOOPBACK/CHn
   ```

   Replace *n* with the number of the port (0, 1, 2, or 3).

If the test fails, go to Section 2.3.5. If this test succeeds, reconnect the adapter cable, and go on to the next section.

Caution

When removing the adapter cable, attaching the loopback connector, or reattaching the adapter cable, be careful not to press the DUMP switch.

2.3.4.4 Adapter Cable and Modem Cable Testing

The adapter cable and modem cable loopback test use the same remote console command (TEST) on different loopback points. Run the adapter cable loopback test first. To run the test, perform the following steps:

1. Detach the adapter cable from the modem (or modem cable).
2. Put the appropriate loopback connector on the end of the adapter cable. ~ contains a list of loopback connectors.
3. Enter the following command at the console:

   `TEST DATA_LOOPBACK/CH`*n*

   Replace *n* with the number of the synchronous line (0, 1, 2, or 3).

If this test fails, go to Section 2.3.5. If this test succeeds, run the modem cable test (if there is a modem cable) by performing the following steps:

1. Reattach the modem cable to the adapter cable.
2. Detach the modem cable from the modem.
3. Put the appropriate loopback connector on the end of the modem cable.
4. Enter the following command at the console:

   `TEST DATA_LOOPBACK/CH`*n*

   As before, replace *n* by the number of the synchronous port.

If this fails, go to Section 2.3.5. If this test succeeds, reconnect the cable to the modem, and test the local modem.

2.3.4.5 Local Modem Testing

A modem control signal sent to the modem from the DEC MicroServer can put the modem into a loopback mode. However, not all modems recognize this signal, and some need to be set to loopback manually. The modem manufacturer's literature should tell you what loopback facilities are available.

The TEST command you use depends on whether the modem recognizes the loopback signal from the DEC MicroServer.

- If your modem recognizes the loopback signal, read Section 2.3.4.5.1.
- If your modem does not recognize the signal, read Section 2.3.4.5.2.
- If your modem has no test facilities at all, read Section 2.3.4.5.3.

2.3.4.5.1 Modems That Recognize Local Loop If your modem recognizes the loopback signal, perform the following steps:

```
TEST DATA_LOOPBACK/CHn/LOCAL
```

Replace *n* with the number of the port (0, 1, 2, or 3). If the test fails, go to Section 2.3.5. If this test succeeds, reset the modem and then test the remote link.

NOTE

Some modems have more than one test facility. You can use these additional tests to run more extensive tests on the modem. Refer to the manufacturer's instructions for information on any further test facilities.

2.3.4.5.2 Manually Controlled Modems If the modem has a manual test facility, perform the following steps:

1. Switch the modem so that it loops data back (refer to the manufacturer's instructions).
2. Enter the command:

   ```
   TEST DATA_LOOPBACK/CHn/MANUAL
   ```

   Replace *n* with the number of the port (0, 1, 2, or 3).

If the test fails, go to Section 2.3.5. If this test succeeds, reset the modem and then test the remote link.

2.3.4.5.3 Modems with No Test Facilities If your modem does not have built-in test facilities, perform the following steps:

1. Detach the communications link from the modem.
2. Attach a suitable loopback connector to the modem.
3. Enter the following command at the console:

   ```
   TEST DATA_LOOPBACK/CHn
   ```

   Replace *n* with the number of the port (0, 1, 2, or 3).

If the test fails, go to Section 2.3.5. If this test succeeds, reconnect the communications link and test the remote link.

2.3.4.6 Remote Modem Testing

Remote modem tests check both the communications link and the remote modem. Before running this test, contact the remote site to check that it is convenient to do the test. Then, run the remote modem test by performing the following steps:

1. Make sure the remote modem is set up for the test (the remote site might have to switch the modem into a loopback mode)
2. Enter the following command at the console:

   ```
   TEST DATA_LOOPBACK/CHn/REMOTE
   ```

   Replace *n* with the number of the port (0, 1, 2, or 3).

2.3.4.7 Start the System Software

When you are finished testing, reboot the DEC MicroServer:

```
>>>BOOT
```

Booting the DEC MicroServer takes a few minutes because the system performs its self-tests and then loads the Gateway-ST image. During this time remote console commands are not accepted and control is returned to the DECnet NCP utility.

2.3.5 Additional Procedures

If one of the previously described tests has failed use Table 2–1 to find the cause of the problem and suggested solutions.

Table 2–1 Faults Indicated by Loopback Testing

Test that failed	What to do
DEC MicroServer I/O port	Do one of the following: 1. If available, use one of the other ports on the DEC MicroServer. 2. Call Digital Customer Service to correct the problem with the DEC MicroServer.
Adapter cable	Replace the adapter cable.
Modem cable	Replace the modem cable.

(continued on next page)

Table 2–1 (Cont.) Faults Indicated by Loopback Testing

Test that failed	What to do
Local modem	Call the modem's supplier to service the unit, or replace the modem.
Remote modem	Either the remote modem or the intervening communications link is faulty. To isolate the problem, ask the remote site to test the modem. If the modem is working properly, contact the provider of the communications link to report the error. If the modem is not working, ask the remote site to correct the fault on their modem.

If all the tests complete successfully and you still have trouble on the link, check the DEC MicroServer's configuration (including data speeds). Also, allow for intermittent faults by repeating the tests two or more times. Some conditions (such as electrical storms) may cause errors even though all the equipment is working properly. Repeat the test sequence at a later time to check that the error is not caused by temporary conditions. You might have to do this more than once to locate the source of an intermittent problem.

3
Traces

Two types of traces can isolate a DECnet SNA Gateway for Synchronous Transport problem:

- Gateway Management traces
- IBM traces

  Section 3.1 describes the Gateway Management traces and Section 3.2 describes the IBM traces. Each section lists documents that provide additional information about a particular type of trace.

3.1 Gateway Management Traces

The gateway management software provides a protocol trace utility called SNATRACE (for Phase IV), and Netrace (for Phase V). This utility shows the SNA protocol exchange between a Gateway-ST node and an IBM node. You can use SNATRACE (or Netrace) to isolate problems associated with the Gateway-ST and its access routines. For information about using SNATRACE, refer to the
DECnet SNA Gateway-CT and ST Management book.

3.1.1 Types of Traces

You can use three types of Gateway Management traces to isolate problems in the DECnet SNA environment.

- Circuit level trace
- Physical unit level trace
- Session level trace

  Choose the type of trace according to the type of problem you have. If you do not know which trace level is appropriate for a problem, run a circuit level trace (it is the lowest level trace and collects the most data).

3.1.1.1 Circuit Level Traces

The Gateway Management software provides an SDLC circuit level trace.

Run an SDLC circuit level trace if any of the following symptoms occur:

- You suspect that a line is not being polled.
- The line to IBM does not initialize properly.
- You receive duplicate messages.
- You suspect that messages are being lost.
- You suspect data corruption.

3.1.1.2 Physical Unit Level Traces

Run a physical unit level trace if any of the following symptoms occur:

- You cannot establish a connection between the Gateway-ST and IBM.
- You establish a connection between the Gateway-ST and IBM, but it fails repeatedly.
- You receive a message indicating a protocol problem on the physical unit level.
- You are unsure of the specific LU on which you want to run a PU trace.

3.1.1.3 Session Level Traces

Run a session level trace if you perceive a protocol problem with a particular session. Any of the symptoms listed in previous sections can indicate the need for a session level trace.

3.2 IBM Traces

Gateway-ST users might need data from IBM traces to isolate problems in the Gateway-ST environment. You use trace data to show protocol sequences on the line level, on the channel level, on the physical level, and on the logical level. Obtain IBM traces from your IBM systems programmer.

You can also request a VTAM internal trace and use the results to determine which control blocks VTAM used when it established a session. Do not ask your IBM system programmer to do a VTAM internal trace except as a last resort.

For detailed information about IBM traces, see the following manuals:

- *VTAM Version 3 Release 1 and 1.1 Diagnosis Guide*
- *MVS/Extended Architecture System Programming Library: Service Aids*

- *Virtual Machine/System Product: System Programmer's Guide, Release 4*

3.2.1 Types of Traces

Six types of IBM traces can be useful for isolating problems in the DECnet SNA network:

- VTAM buffer contents trace
- VTAM I/O trace
- Generalized PIU trace
- VTAM line trace
- SDAID trace
- VTAM internal trace

Choose the type of trace according to the type of problem you have.

3.2.1.1 VTAM Buffer Contents Trace

A VTAM buffer contents trace (TYPE=BUF) shows the contents of inbound and outbound message buffers. A buffer contents trace helps you determine whether a problem is in the host (VTAM or an application program) or in the network. It traces all the messages that are sent to or received from a VTAM application. Request a buffer contents trace to trace path information units (PIUs) being sent to and received from a VTAM application program.

3.2.1.2 VTAM I/O Trace

The VTAM I/O trace (TYPE=RNIO) records the order in which PIUs flow between network nodes and VTAM. You might use this trace to determine whether the Gateway-ST software receives all the responses that it should and whether VTAM forwards all the requests issued by the Gateway-ST.

The content of the I/O trace is similar to that of the buffer trace except that the I/O trace records less user data. Use the PRDMP (print dump) service aid to edit and print the I/O trace records.

3.2.1.3 Generalized PIU Trace

The generalized PIU trace (TYPE=GPT) collects PIU trace data obtained by IBM's NCP. LUs associated with the PU are automatically traced when traffic flows over them. Request a generalized trace of all NCP buffers in the following situations:

- To determine whether NCP has received or sent PIU data.

- When the line between the Gateway-ST and IBM can be activated but the PU (Gateway-ST) cannot be activated. Request a trace of all messages that reach the Gateway-ST through VTAM buffers.
- When the circuit from the Gateway-ST to IBM is active but you are not sure whether you are communicating with the IBM host. Request a trace of all messages that reach the Gateway-ST LUs through VTAM.

3.2.1.4 VTAM Line Trace

A line trace (TYPE=LINE), a joint function of VTAM and the IBM NCP, records the status of a line each time the NCP receives data from or sends data to that line. A line trace provides you with a record of the sequence of messages that travel over a specific line between the Gateway-ST and ACF/NCP in the 37*xx* communications controller. Request a line trace in the following situations:

- When you suspect a problem with a device attached to the IBM 37*xx* communications controller.
- When you receive the error message "Circuit is not active." This message indicates that you cannot activate the line between the Gateway-ST and IBM.
- When the line to IBM from the Gateway-ST does not activate.

Note

Before using a line trace, you should use a generalized PIU trace to verify whether the problem is in VTAM or with the application program. Expect a very extensive trace listing when you ask for a VTAM line trace. Do not ask for a VTAM line trace unless you are trying to solve a line-related problem.

3.2.1.5 SDAID Trace Program

You can use the following SDAID traces to trace VSE events,

- VTAMBU (VTAM buffer) trace provides a record of events when VTAM uses a buffer in its buffer pool.
- VTAMIO traces SVCs, SIO or SIOF instructions, and I/O interrupts.

For information about using the SDAID trace program, refer to the *IBM Virtual Storage Extended Advanced Functions: Service Aids, Version 2, Release 2*.

3.2.1.6 VTAM Internal Trace

A VTAM internal trace (TYPE=VTAM) provides a record of events within VTAM when VTAM is setting up a session. This trace can help determine the flow of commands when you establish and terminate a session.

When you ask the system programmer for a VTAM internal trace, you have the choice of three options:

- OPTION=API traces the IBM application program interface calls.
- OPTION=PIU traces all messages originating from VTAM or intended for processing by VTAM. Like the buffer contents trace, it helps you isolate problems with the hardware, NCP, or VTAM.
- OPTION=SSCP traces session initiation and session termination. It helps isolate VTAM problems to a specific VTAM module or component. For example, you can use the SSCP option to trace the sequence of messages (from the VTAM point of view) caused by entering the SET HOST/SNA command.

4

Up-Line Dumps

If you report a problem to Digital Equipment Corporation (see Chapter 5) you could be asked to include an up-line dump or crash dump file. If a Gateway-ST node crashes, it writes the contents of its memory into a dump file on any available load host. The procedure of writing the contents of memory to a load host is called an up-line memory dump or a crash dump. After an up-line (or crash) dump, the Gateway-ST node automatically tries to reload the Gateway-ST software.

If a Gateway-ST system "hangs" (stops working part way through the execution of a program), you can force a crash dump by pressing the dump button on the back of the DEC MicroServer (see Figure 1–1).

The Gateway-ST produces an up-line dump in the following sequence:

1. The Gateway-ST node detects a fatal error.
2. The Gateway-ST sends out a message on the Ethernet calling for any node on the Ethernet to receive an up-line memory dump.
3. Entries in the DECnet configuration database of each node on the Ethernet determine whether that node recognizes the Gateway-ST and whether the necessary service is enabled. Any node that can accept a dump sends a message back to the Gateway-ST.
4. The Gateway-ST then dumps its memory onto the node that responds first. The node that receives the dump data simultaneously creates the dump file. If the node has insufficient disk space for the dump file, the Gateway-ST attempts to dump its memory a number of times. Whether or not the Gateway-ST successfully dumps its memory, it proceeds with the process described in step 5.
5. Once the up-line dump is completed (dumping will take several minutes), the Gateway-ST automatically attempts to load the Gateway-ST software again. The process is as follows:
   - The Gateway-ST node sends out a message on the Ethernet calling for any node on the Ethernet to load the Gateway-ST system image.

- Entries in the DECnet configuration database of each node on the Ethernet determine whether that node recognizes the Gateway-ST and whether the necessary service is enabled. Any node that can perform the load sends a message back to the Gateway-ST.
- The Gateway-ST then loads from the node that responds first.
- If no node responds to the Gateway-ST node's request to load the system image, the Gateway-ST node repeats the process in step 5.

5
Reporting Your Problems

To report a problem, you must complete a Digital Software Performance Report (SPR). You can report a problem to Digital Equipment Corporation on an SPR form if your company has purchased support services for the Gateway-ST products or if the Gateway-ST products are still under warranty. Your operations manager can tell you if you have this service.

Section 5.1 describes the information you should include with a problem report. Section 5.2 provides more information about SPRs.

5.1 Gathering Information

Table 5–1 lists the documentation that you should collect while trying to isolate a problem. Entries in separate columns in the table indicate which type of information can help you or Digital Equipment Corporation to isolate problems in a particular area of the system. Where possible, include the relevant information with your SPR.

The following legend explains the symbols used in Table 5–1 :

Symbol	Meaning
A	*Always* send this documentation, if your problem is in the indicated area.
R	Send this documentation only if it is *relevant*.
O	Send *one* item of documentation that is relevant.

Table 5–1 Documenting a Problem

Documentation	Gateway-ST	Gateway Management	DEC host	IBM host
A crash dump file image	A		A	
A listing of the SNAEVL.LOG from SYS$MANAGER	R	A		
A PU trace using SNATRACE	O			O
A circuit trace using SNATRACE	O			O
A session trace using SNATRACE	O			O
Listing of your SNA configuration file—SNAGATEWAY_*gnn*_SNA.COM	A	A	A	A
Listing of your DECnet configuration file—sNAGATEWAY_*gnn*_DNA.COM	A	A	A	
A description or map of your DNA network, showing operating system versions	A	A	A	
A description of your SNA environment	A			A
A hard copy of events logged at the DECnet host node	A	A	A	A
A list of reported error messages	A	A	A	A
A detailed description of the operation or procedure that caused the fatal error	A	A	A	A

(continued on next page)

Table 5–1 (Cont.) Documenting a Problem

Documentation	Gateway-ST	Gateway Management	DEC host	IBM host
A description of your system's activity before the fatal error	A	A	A	
An IBM VTAM buffer contents trace	O			
An IBM generalized PIU trace	O			
An IBM VTAM line trace	O			
An IBM VTAM internal trace	R			
An IBM VTAM I/O trace	O			
An SDAID trace				
Listing of VTAM definitions	R			R
Listing of VTAM application node definitions	R			R
Logon mode table for this GROUP/LINE/PU/LU	R			R
Listing of CICS terminal control table definitions	R			R
Listing of IMS control block definitions	R			R
.LOG files from the workstation, the job, and NETSERVER	R		R	
Listing of JES2/JES3 startup parameter definitions				R

Note

For RJE and DHCF problems, please supply both the Gateway-ST software version number and the access routine version number. Please indicate the type of media from which you installed the software.

5.2 Reporting Problems to Digital Equipment Corporation

After you have isolated your Gateway-ST problem, report it to Digital Equipment Corporation. (For information on known problems, refer to the release notes for the specific product.)

Your software distribution kit includes an SPR form. Use this form to report a software problem. If you have purchased support services, you should complete one of these forms when you are unable to solve a critical problem. Your local area office can provide you with additional forms.

Each SPR form has attached instructions to follow when completing the form. In addition to the data requested on the form, include any other information on the problem, as described in Section 3.1 of the SPR form.

When your SPR form is complete, submit the form and other information to the SPR center nearest you. (The addresses are listed on the reverse side of the SPR instructions.)

A

Interpreting System Messages

Gateway-ST events are logged by the Gateway-ST event logger. They are defined according to class and type. The class identifies the layer or resource to which the event applies. The type describes an event within a particular class.

Event classes are defined in Section A.1.1, and event types are defined in Section A.1.2.

To receive event messages at a terminal, you must do the following:

1. Verify that you have OPER privilege.
2. Set the required terminal as an operator's terminal.
3. Ensure that event logging is running.

A system program called OPCOM logs events. When you have decided at which terminal you want OPCOM to dispay the messages (the terminal can be a console), enter the following command from that terminal to set it as an operator's terminal:

```
$ REPLY/ENABLE=NETWORK
```

You will receive all Gateway-ST event messages and DECnet network messages at that teminal. Section A.1 describes the format and meaning of event messages.

NOTE

OPCOM logs both DECnet and Gateway-ST events. DECnet events are documented in the *OpenVMS Network Control Program Manual*; a detailed explanation of Gateway-ST events is provided in *DECnet SNA Gateway-CT and ST Management*.

In addition to event messages, you may receive OpenVMS, DECnet or Gateway-ST error messages.

You may also receive IBM sense codes. Most of the error messages are in the standard OpenVMS message format. Section A.2 describes the format of the error messages and refers you to documentation where the meaning of the error messages is provided.

A.1 Interpreting Event Messages

Event messages logged by OPCOM have the following format:

```
DECnet SNA event nnn.nn event-text
From node node-address (node-name), dd-mmm-yyyy hh:mm:ss.cc
component component-id, Severity = level
message1_text
message2_text
```

where

nnn.nn	Is the DECnet event code. All Gateway-ST event messages have a code greater than 255.
event-text	Is the text that always appears with the event class and type.
node-address (node-name)	Is the Gateway-ST node address and node name.
dd-mmm-yyyy	Is the date when the event occurred.
hh:mm:ss.cc	Is the time when the event occurred.
component component-id	Is the name and ID of the Gateway-ST component sending the event messages.
level	Is the severity level of the event.
message1_text ***message2_text***	Are messages giving you the details of the event. The second of these messages can be a VAX or AXP system message. For information about VAX or AXP system messages, refer to *OpenVMS System Messages and Recovery Procedures*. If the text contains SNANCP error messages, refer to the *DECnet SNA Gateway-CT and ST Management* book.

A.1.1 Event Classes

Gateway-ST event messages specify a class and a type (see Section A.1.2) for an event. The class code number identifies the location where the Gateway-ST event occurred. Table A–1 lists the event classes and their location.

Table A–1 Event Classes and Location

Event Class	Location of Event
256	Line
257	Circuit
258	Physical Unit
259	Session
265	Counters
266	Gateway management – Initialization – Logging
268	DHCF/GAS
269	RJE

A.1.2 Event Types

Event types are categorized according to the class of events to which they belong. This section lists and explains all event types. The text that follows the type and describes the event is not displayed on the Gateway-ST node. However, the text is documented here because it might be displayed at the DECnet sink node.

The Gateway-ST logs the following event types:

- Line
  - Line state change
  - Device or driver error
- Circuit
  - Circuit state change
- PU
  - PU state change
- Session
  - LU state change
  - Session protocol error
  - Access denied
- Counter
  - Automatic counters
  - Counters zeroed
  - Counter overflow
- Initialization
  - Gateway initialization
  - Initialization failure
  - Initialization message
- Logging
  - Logging sink state change
  - Event logging sink failure
- Server
  - Gateway Access server message
  - RJE server message
  - DHCF server message

A.2 Interpreting Error Messages

Most of the error messages you receive are in the standard format for OpenVMS messages. The format is as follows:

FACILITY-L-IDENT, TEXT

where

FACILITY Is the name of the program that generates the message.

L Is a severity indicator with one or more of the following values:

Code	Meaning
S	Success
I	Information
W	Warning
E	Error
F	Fatal, or severe error

IDENT Is the identification of the message text.

TEXT Is one or more lines of information.

A.2.1 Interpreting OpenVMS and DECnet Error Messages

OpenVMS System Messages and Recovery Procedures lists and explains both the OpenVMS and DECnet error messages.

A.2.2 Interpreting Gateway Utility Error Messages

DECnet SNA Gateway-CT and ST Management lists and explains error messages you may receive from the Gateway-ST or DECnet SNA gateway management software, such as SNATRACE messages, SNANCP messages, SNAP messages, and SNAEVL messages.

If you receive a Gateway-ST error message that is not described in *DECnet SNA Gateway-CT and ST Management*, refer to the documentation for the access routine you are using. The individual documentation set lists the error messages that can appear when you are using a specific DECnet SNA product through a Gateway-ST.

A.2.3 Interpreting IBM SNA Sense Codes

The IBM SNA sense codes are four-digit hexadecimal numbers that appear on the screen when an error (exception condition) occurs. In some cases, the Gateway-ST reports the IBM SNA sense codes to the user as part of a Gateway-ST-related error message. In other cases, the IBM host reports these sense codes to the Gateway-ST user without a Gateway-ST-related error message.

The IBM manual *System Network Architecture Formats* contains a key to these sense codes.

Table A–2 contains information about some of the common IBM SNA sense codes.

Table A–2 Sample IBM Sense Codes

IBM SNA Sense Code	Code Meaning	Gateway Meaning
X'08*xx*'	Request reject	You are unable to connect to IBM for some reason.
X'0801'	Request reject, resource unavailable	The IBM application or host is not available.
X'0806'	Request reject, resource unknown	VTAM does not recognize the application name you entered, or the VTAM-interpret table does not translate your application name correctly.
X'0821'	Request reject, invalid session parameters	You might have specified an unknown or invalid logon mode name.

B

Log File of a Gateway Load

The LOAD command down-line loads software to the DEC MicroServer. The Gateway-ST uses the specified circuit or the circuit obtained from the DECnet database on the host.

During a software load to the DEC MicroServer, the load host's console displays the following event messages:

```
%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 266.10, Logging sink state change
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
Logging sink type = monitor,  Severity = informational
Sink node = sink nodename
New state = on, old state = off

%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 266.0, Gateway initialization
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
SNA gateway management,  Severity = informational
Started, DECnet SNA Gateway-ST V1.1

%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 266.0, Gateway initialization
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
SNA gateway management,  Severity = informational
Default node database loaded

%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 266.0, Gateway initialization
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
SNA gateway management,  Severity = informational
Setting gateway DECnet configuration
```

```
%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 266.0, Gateway initialization
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
SNA gateway management,  Severity = informational
Setting gateway SNA configuration

%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 256.0, Line state change
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
Line SYN-n,  Severity = informational
New state = on, old state = off
```

After you load and initialize the software without error, you will see the following display:

```
%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 266.0, Gateway initialization
From node aa.ssss (nodename), dd-mmm-yyyy hh:mm:ss.cc
SNA gateway management,  Severity = informational
Complete, status = success
```

When the IBM system responds to the Gateway-ST, you see the following display:

```
%%%%%%%%%%  OPCOM  dd-mmm-yyyy hh:mm:ss.cc  %%%%%%%%%%
Message from user SYSTEM on nodename
DECnet SNA event 257.0, Circuit state change
From node aa.sss (nodename), dd-mmm-yyyy hh:mm:ss.cc
Circuit SDLC-n,  Severity = informational
New state = on, old state = on-starting
```

C

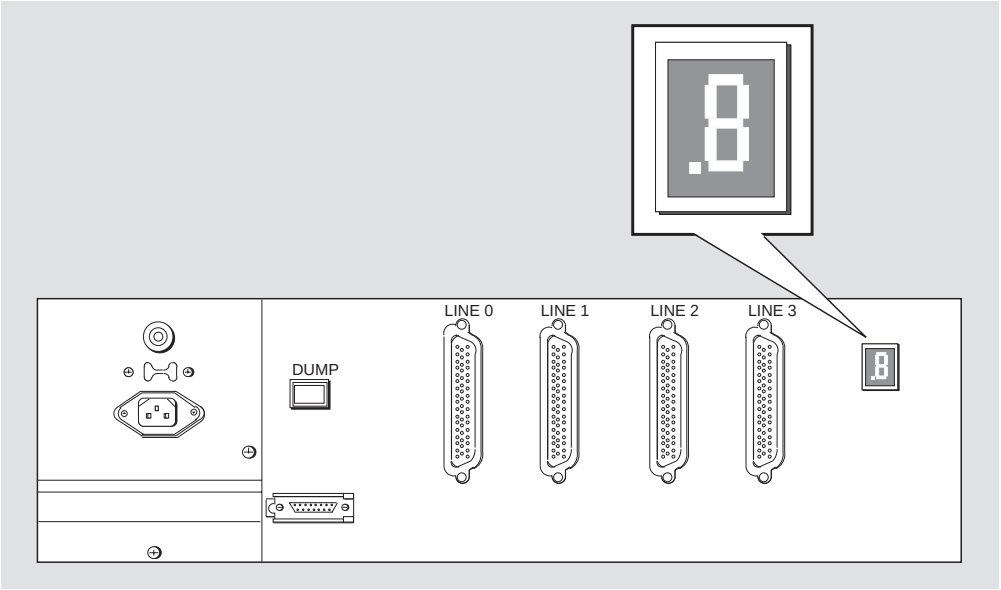
The DEC MicroServer Display Panel

Each time you power up the DEC MicroServer, it runs an internal test and then loads the Gateway-ST software. The unit uses a seven-segment display on the control panel to show how this test and load sequence is progressing. The DEC MicroServer also uses this display to:

- Show that the unit is connected to the electrical supply.
- Report any errors that the internal test detects.
- Indicate the progress of a dump sequence.

Figure C–1 shows the location of the display on the control panel of the DEC Microserver. The following sections describe the DEC MicroServer display.

Figure C–1 DEC MicroServer Display Panel



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C.1 Power-Up Sequence

On power up, the DEC MicroServer performs the following actions:

- Lights the decimal point of the display.
- Tests the display.
- Tests the internal circuitry.
- Asks for software to be loaded.
- Receives the software.
- Runs the software.

The DEC MicroServer displays different values on the LED to show these actions. Table C–1 explains the values that can appear during the power-up sequence.

Table C–1 Power-Up Display Values

Display Value	Meaning
[.]	Power applied; tests are beginning.
Ripple pattern (one segment lights at a time)	Display being tested.
[1]	Waiting to load software. At this point, the DEC MicroServer has asked a host to provide it with software and is waiting for the host to respond.
[2]	Loading software. Once a host has responded, the software is loaded across the Ethernet. This value shows that the load is taking place.
[3]	The load has failed because no load host responded. The DEC MicroServer will wait before sending the message again.
Circling pattern (two segments light at a time)	Software running normally.

C.1.1 Normal Power-Up Sequence Without Retry

In a normal load sequence, the display shows one of the following values:

[1] or [2]

C.1.2 Power-Up Sequence Including Retry

If the DEC MicroServer has to retry the load, the display shows a different sequence of values:

[1] ▷ [3] or [3] ▷ [1]

The display alternates between [1] and [3] until the DEC MicroServer is able to use the Ethernet.

The display then continues with these values:

[1] ▷ [2]

C.2 Dump Sequence

During a dump sequence, the DEC MicroServer:

1. Sends a dump request on the Ethernet and waits for a host node to reply.
2. Sends the contents of memory (including the internal error log) to the host node that answers the dump request.
3. Runs its internal test and reboots when the dump is complete.

Table C–2 shows the values that can appear on the display during a dump.

Table C–2 Dump Display Values

Display Value	Meaning
5	Waiting to dump. At this point, the DEC MicroServer has asked for a host to accept the dump and is waiting for a host to respond.
6	Dump in progress. Once a host has responded, the DEC MicroServer dumps the system's contents across the Ethernet to the host.

As with the power-up sequence, the DEC MicroServer might have to retry sending its request for a host to receive the dump. This is reflected in the values that appear on the display.

C.2.1 Normal Dump Sequence Without Retry

In a normal dump sequence, the display shows the following:

5 ▷ 6

The display then continues with a power-up sequence (with or without retry, as necessary).

C.2.2 Dump Sequence with Retry

If no host responds to the dump request, the DEC MicroServer abandons the dump attempt. The display shows the following:

5

The DEC MicroServer then retries sending the dump request. During the retry, the display shows the following:

5

Once the dump request has been sent, the display continues as follows:

5 ▷ 6

The display continues to show a power-up sequence (with or without retry, as necessary).

C.3 Halt Codes

To use some remote console commands, the DEC MicroServer software has to be halted. If the software is halted, the display panel shows the value:

8

C.4 Error Codes

The self-test uses the display to report any detected errors. Table C–3 shows the values that can appear and briefly describes each value. For detailed information about resolving the problems indicated by each of these codes, refer to the DECnet SNA Gateway for Synchronous Transport problem-solving information in Chapter 1.

Table C–3 Error Code Values

Display Value	Meaning
F	Fault detected in the DEC MicroServer. Contact Digital Customer Service.
E	Ethernet connection fault, either within the DEC MicroServer box or between the DEC MicroServer and the Ethernet.
d	Synchronous I/O fault.
C	The memory used as the system's internal error log has failed. Contact Digital Customer Service.

D

DEC MicroServer Facilities for Problem Solving

The DEC MicroServer does not have a port dedicated to a console. Instead, it accepts connections over the DECnet console carrier. This means that a terminal connected to a load host can communicate with the DEC MicroServer as if it were a console terminal.

With your terminal acting as the DEC MicroServer console terminal, you can use remote console commands to:

- Control the operation of the system.
- Get information.
- Test the communications line(s).

Section D.1 provides a summary of the remote console commands. Section D.2 describes how to logically connect a terminal as a remote console. Sections D.4 through D.10 describe the remote console's features and commands.

D.1 Command Summary

Table D–1 shows the format of the remote console commands.

Table D–1 Summary of Remote Console Commands

Command	Parameter	Qualifier
BOOT	None	None
DUMP	None	None
HALT	None	None
HELP	None	None

(continued on next page)

Table D–1 (Cont.) Summary of Remote Console Commands

Command	Parameter	Qualifier
HELP TEST	None	None
SET PASSWORD	hex-password	None
SHOW STATE	None	None
TEST CABLE_TYPE DATA_LOOPBACK MODEM_SIGNAL	None	/ALL /CH*n* /INTERNAL /LOCAL /MANUAL /REMOTE
TEST CONTINUOUS	None	None

D.2 Connecting to the DEC MicroServer

Before you can use the remote console commands for problem solving, you must create the logical connection between your terminal and the DEC MicroServer. To connect from a load host that runs OpenVMS, perform the following steps:

1. Log in.
2. Issue the following command to invoke NCP:

   ```
   $ RUN SYS$SYSTEM:NCP
   ```

3. Enter the remote console command CONNECT.

   ```
   NCP> CONNECT NODE node-name
   ```

   Replace *node-name* with the node name of the DEC Microserver.

   If there is a service password to protect the console, use the following form of the CONNECT command:

   ```
   NCP> CONNECT NODE node-name SERVICE PASSWORD password
   ```

   Replace *node-name* with the node name of the DEC Microserver and *password* with the appropriate password.

   Once the connection is complete, the following prompt appears on your terminal:

   ```
   >>>
   ```

D.3 Detaching the Console

After you finish using the remote console, press Ctrl/D to detach the console. The NCP prompt appears on your terminal:

```
NCP>
```

D.4 Halting the Software

The remote console HALT command stops the communications software. HALT can also be used to stop a software load or a system dump. The format of the command is:

```
>>>HALT
```

Use this command before you issue any of the following remote console commands:

- BOOT
- DUMP
- TEST

D.5 Testing the DEC MicroServer

The remote console TEST command has two formats that you can use to test the DEC MicroServer:

- The first format lets you test the synchronous communications ports, their modem control lines, and the adapter cables.
- The second format allows you to run continuous tests of the DEC MicroServer.

The first format of the remote console TEST command is:

TEST) *type channel/qualifier*

where:

type Determines the type of test you want to perform. Specify one of the following test types:

DATA_LOOPBACK
MODEM_SIGNAL
CABLE_TYPE

channel Defines the synchronous lines on which the test should run. You can use one or more of the following to test the DEC MicroServer:

/CH0
/CH1
/CH2
/CH3
/ALL

Note that you can only use /CH0 with the DEC MicroServer-SP.

/qualifier Specifies the type of test you want to perform. The following qualifiers can be used with the TEST DATA_LOOPBACK command:

/INTERNAL
/MANUAL
/LOCAL
/REMOTE

The second format of the remote console TEST command is:

TEST CONTINUOUS

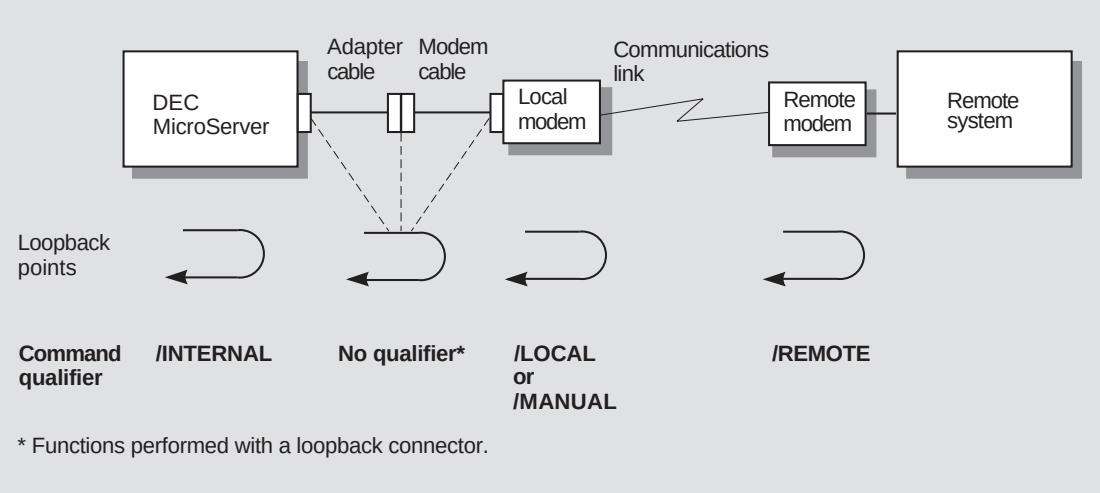
The following sections describe each test and give examples of their use.

D.5.1 Data Loopback Tests

The data loopback tests use a connector in the communications path. This loopback connector joins the transmit and receive paths and enables all information sent to be returned. The tests send data along the line and wait for the looped data to return. The returned data is then compared with the transmitted data. Differences between the two versions of the data indicate where an error on the path is corrupting the data.

Figure D–1 shows the points where information can be looped back. You use different forms of the TEST DATA_LOOPBACK command for each point, as the figure indicates.

Figure D–1 Loopback Point Command Qualifiers



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For example, to loop back through the local modem on channel 1, you use either:

```
TEST DATA_LOOPBACK/CH1/LOCAL
```

or

```
TEST DATA_LOOPBACK/CH1/MANUAL
```

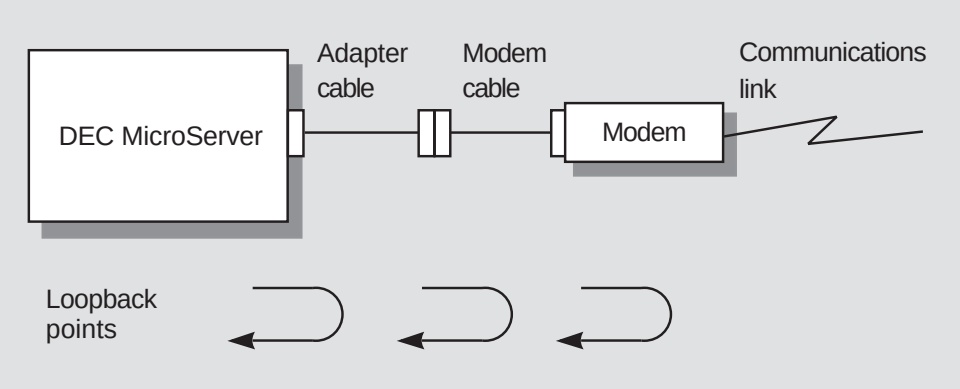
Use the first command if your modem recognizes the local loop modem signal. Use the second if you have to manually set the modem to loopback mode (for example, by pressing a switch on the modem).

Chapter 2 provides more information on using these commands to test a communications line.

D.5.2 Modem Signal Tests

The modem signal tests check the modem signals between the DEC MicroServer and the local modem. The signals can be looped back either at the DEC MicroServer's synchronous port or at the end of the adapter cable, as shown in Figure D–2.

Figure D–2 Loopback Points for the Modem Signal Test



LKG–4912–93R

To use a modem signal test, perform the following steps:

1. Attach a loopback connector to one of the loop points.
2. Enter the following command:

   ```
   >>>TEST MODEM_SIGNAL/CHn
   ```

   Replace *n* with the number of the line on the DEC MicroServer you want to test (0, 1, 2, or 3). Replace *n* with a value of 0 if you have a DEC MicroServer-SP.
3. If the test is successful, the following message appears on your terminal:

   ```
   Successful Modem Signal Loopback on Channel n
   ```

   If the test fails, the following message appears on your terminal:

   ```
   Modem Signal Loopback Failed on Channel n
   ```

Modem signal tests can be used to isolate a faulty adapter cable. For example, you can attach the 50-way loopback connector to the DEC MicroServer's synchronous port and run the modem signal test. Run the test again, but this time use the correct loopback connector on the end of the adapter cable. If there is a faulty adapter cable, the first test passes but the second test fails.

D.5.3 Cable Type Tests

A range of adapter cables available for the DEC MicroServer provide easy connection to various interface standards. Each type of cable contains a unique identifier.

To determine which cable is attached to a particular line, verify that there is no loopback connector on the port, and then issue the following command:

```
TEST CABLE_TYPE/CHn
```

To determine which cables are attached to the DEC MicroServer, verify that there are no loopback connectors on any port, and then issue the following command:

```
TEST CABLE_TYPE/ALL
```

For each cable, the test displays the following message:

type `Cable on Channel` *n*

If, however, any port has a 50-way loopback connector attached to it, the test displays the message:

`H3199 Loopback on Channel` *n*

If the test cannot determine the type of cable, it displays the following message:

`Unsupported Cable on Channel` *n*`, Cable Code` *xxxx*

If this message appears for a supported cable, check that the cable is correctly connected to the socket, and then retry the test. If the message appears again, the adapter cable is probably faulty.

D.5.4 Soak Testing the DEC MicroServer

The DEC MicroServer's internal tests are usually run during power up or when the system is being reloaded. You can, however, run internal tests continuously to "soak test" a DEC MicroServer unit. To run a soak test, perform the following steps:

1. Attach the appropriate loopback connectors to the DEC MicroServer's synchronous ports.
2. Enter the following command:

   ```
   >>>TEST CONTINUOUS
   ```

The DEC MicroServer now runs the internal test program continuously. To reload the system, power down the DEC MicroServer, wait 3 seconds, and power up the DEC MicroServer.

D.6 Monitoring the DEC MicroServer Status

The DEC MicroServer retains some internal information on its own status. You can display this information by using the SHOW command. The command has the following format:

SHOW *topic*

The *topic* parameter can be one of the following:

PASSWORD Displays the current service password as a 16-digit hexadecimal number.

STATE Displays the current system state. This system state can be one of the following:

Halted
Requesting Boot
Booting
Deferring Boot
Requesting Dump
Dumping
Deferring
Running

The following is an example of the display the SHOW PASSWORD command produces:

```
>>>SHOW PASSWORD
Service Password:    FEFEFEFEFEFEFEFE
```

The following is an example of the display the SHOW STATE command produces:

```
>>>SHOW STATE
Processor State:  *HALTED*
```

D.7 Reloading the System

Use the remote console command BOOT to reload the system. The BOOT command instructs the system to initiate the following actions:

1. Execute the internal test to check the major components in the DEC MicroServer.
2. Issue a load request on the Ethernet.
3. Accept the image from the load host.
4. Read any configuration information from the load host.
5. Start operation.

NOTE

If you need a record of the system's current state, use the DUMP command before using BOOT.

D.8 Dumping the Contents of Memory

Occasionally, you might need to dump the contents of the system. Although you would usually use the DEC MicroServer's DUMP switch to perform a system dump, you can also use the remote console command DUMP.

The DUMP command causes the DEC MicroServer to:

1. Send a dump request on the Ethernet and wait for a host node to reply.
2. Send the contents of memory (including the internal error log) to the host node that answers the request.
3. Run its internal test and reboot when the dump is complete.

D.9 Console Password

Several of the remote console commands can greatly affect the operation of the DEC MicroServer (for example, BOOT and DUMP). To help prevent misuse of these commands, you can set up a password for the remote console facility. If you define a password, users must specify the password in order to attach a terminal as a remote console.

D.9.1 Setting a Password

A service password is a hexadecimal number that users must specify to perform the following:

- Use the NCP CONNECT command to attach a terminal as a remote console.
- Use the NCP TRIGGER or LOAD command to down-line load the Gateway-ST software from a load host.

When you first install a DEC MicroServer, no password is defined. This allows you to perform the initial startup of the hardware and load your software system without having to know a preset password.

When you see the prompt for the remote console (>>>), use the SET PASSWORD command to define a service password. The command syntax is as follows:

```
>>> SET PASSWORD password
```

Replace *password* with up to 16 hexadecimal digits.

For example:

```
>>> SET PASSWORD FEFEFEFEFEFEFEFE
```

The SET PASSWORD command also has a prompting mode. If you do not enter a password after the command but simply press Ret, the system prompts you for a password. The system does not echo the password you enter. The system then prompts you for verification. Enter the password again.

As with all passwords, you should change the service password regularly. This helps to maintain security. To change the password, simply use the SET PASSWORD command again.

To show the password, use the following command:

```
>>> SHOW PASSWORD
```

D.9.2 Clearing the Service Password

Once you have defined a service password for the DEC MicroServer, you must use that password each time you want to attach a terminal as a remote console or down-line load the Gateway-ST software from a load host with the TRIGGER or LOAD commands. If you forget the password, you can clear it by unplugging the DEC MicroServer and then powering it up in the following way:

1. Hold in the DUMP switch.

2. Insert the power cord.
3. Release the DUMP switch when the display shows the following value:

Once you have performed these three steps, you can set a new password by using the SET PASSWORD remote console command.

D.10 Getting Help

To get a listing of the commands and their formats, use the HELP command:

```
>>>HELP
```

This command produces a display similar to the following:

```
Available Commands -

B[oot]
DU[mp]
HA[lt]
H[elp] [More,Test]
SE[t] PASSWORD
SH[ow] {PASSWORD,STATE}
TE[st] keyword [/keyword_qualifiers...]
UPPERCASE - required letters, lowercase - optional letters
[...] - Optional, {...} - Select One
```

The remote console recognizes additional commands, but these are for use by Digital support people only.

E

DEC MicroServer Configuration Guidelines

The number of DEC MicroServer ports available for use depends on the maximum data speed you want to run on any line. However, if you have the DEC MicroServer-SP, you have only one port to use. The following sections contain guidelines for using the synchronous ports.

E.1 Allocation of the Synchronous Ports

The line interface that connects the DEC MicroServer-SP to the IBM SNA network has one port for one synchronous communication link. The DEC MicroServer-SP can support data communications speeds up to 19.2K bits per second. Table E–1 shows the only configuration available with the DEC MicroServer-SP.

Table E–1 The DEC MicroServer-SP Port

Data Speed (in bits per second)	Number of Lines	Port
Up to 19.2K bps	1	0

The DEC MicroServer can support data communication speeds up to 256K bps. The range of speeds is split into three bands. In each band specific synchronous ports are available for use.

Table E–2 shows the three speed bands and the number of ports available in each band and specifies which port to use.

Table E–2 DEC MicroServer Ports

Maximum Data Speed Band (in bits per second)	Number of Lines	Port(s)
From 2.4K up to 64K	4	0, 1, 2, 3
Above 64K up to 128K	2	0 and 1
Above 128K up to 256K	1	0 only

Use the information in Table E–2 in the following way:

1. Determine the maximum speed of the line(s) you want to use.
2. Locate the band for that speed in the table.
3. Determine how many lines you can use.
4. Use only the ports listed for your speed band.

For example, you might want to use one DEC MicroServer line at 64K bps and another at 128K bps. In this case, the maximum data speed is in the middle band. Only two ports (0 and 1) can be used.

E.2 Other Configurations

The configurations listed in Table E–2 are the only ones supported by Digital Equipment Corporation. Other configurations might seem to work, but Digital Equipment Corporation does not guarantee their performance or recommend their use.

F

Adapter Cable Pin Signals

This appendix describes the pin signals used with the following adapter cables:

- V.35 adapter cable
- V.24/RS-232-D adapter cable
- V.24/RS-232-C adapter

Tables F–1 through F–3 list the signal names. (A) or (B) after a signal name refers to wires A and B of a twisted pair. The description of the V.24/RS-232-C adapter connector includes both the male and the female connectors.

Table F–1 V.35 34-Way Square Connector (Male)

Pin	Signal Name	Pin	Signal Name
a	TX CLOCK (B)	r	RX DATA (A)
b	DTE GROUND	s	TX DATA (B)
c	RTS	t	RX DATA (B)
d	CTS	u	AUX CLOCK (A)
e	DSR (A)	v	RX CLOCK (A)
f	DCD/I (A)	w	AUX CLOCK (B)
h	DTR	x	RX CLOCK (B)
j	RI	y	TX CLOCK (A)
p	TX DATA (A)		

Table F–2 V.24/RS-232-D 25-Way D-Type Adapter Cable (Male)

Pin	Signal Name	Pin	Signal Name
2	TX DATA	17	RX CLOCK
3	RX DATA	18	LOCAL LOOP
4	RTS	20	DTR
5	CTS	21	REM.LOOP
6	DSR	22	RI
7	GROUND	23	SPEED SELECT
8	DCD	24	CLOCK
15	TX CLOCK	25	TEST INDICATE

Table F–3 V.24/RS-232-C 25-Way D-Type Adapter (Male and Female)

Pin	Signal Name	Pin	Signal Name
2	TX DATA	15	TX CLOCK
3	RX DATA	17	RX CLOCK
4	RTS	20	DTR
5	CTS	22	RI
6	DSR	24	CLOCK
7	GROUND	25	TEST INDICATE
8	DCD		

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