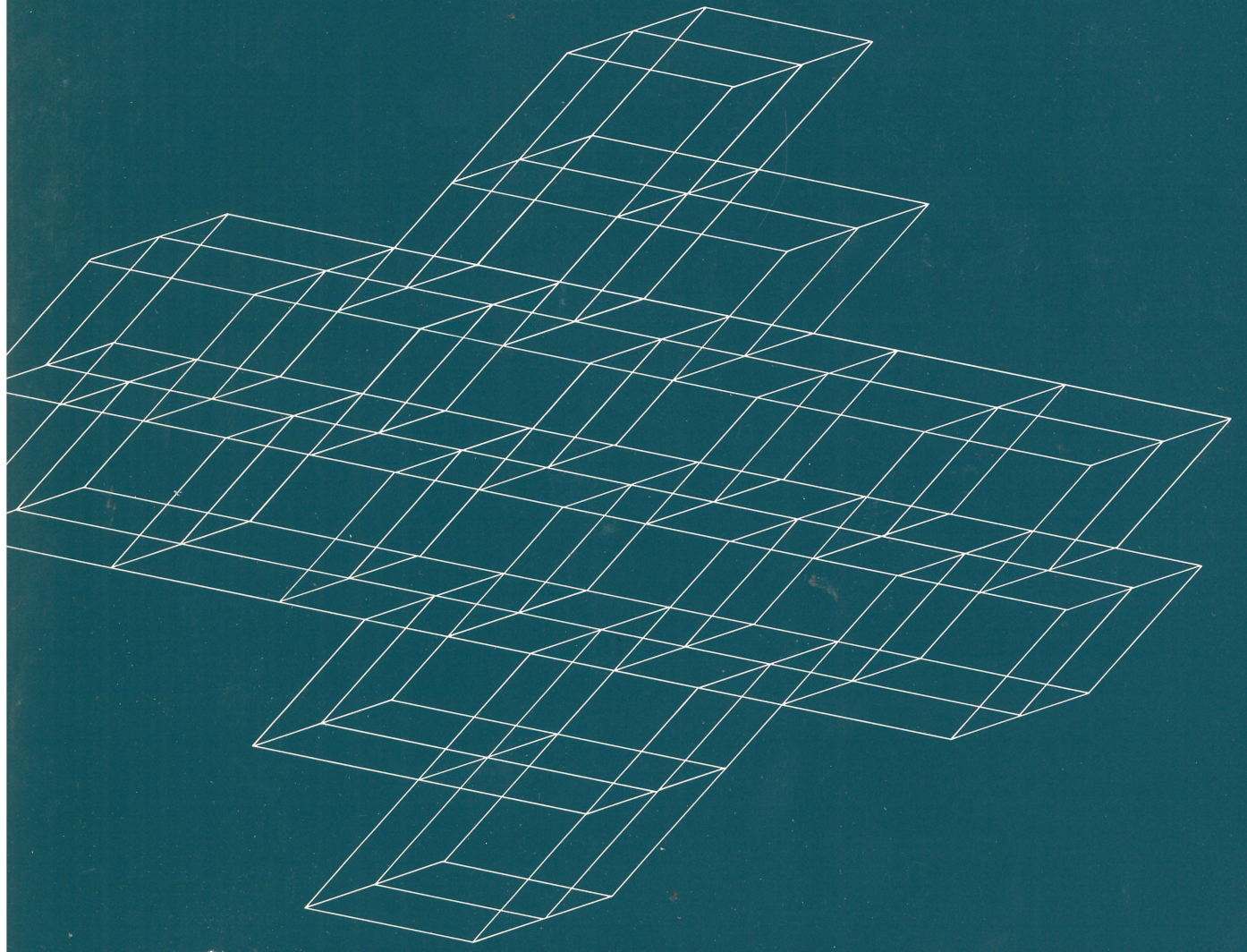
Bridge
Communications
Inc.

Configuration Guide



BRIDGE COMMUNICATIONS, INC.

CONFIGURATION GUIDE

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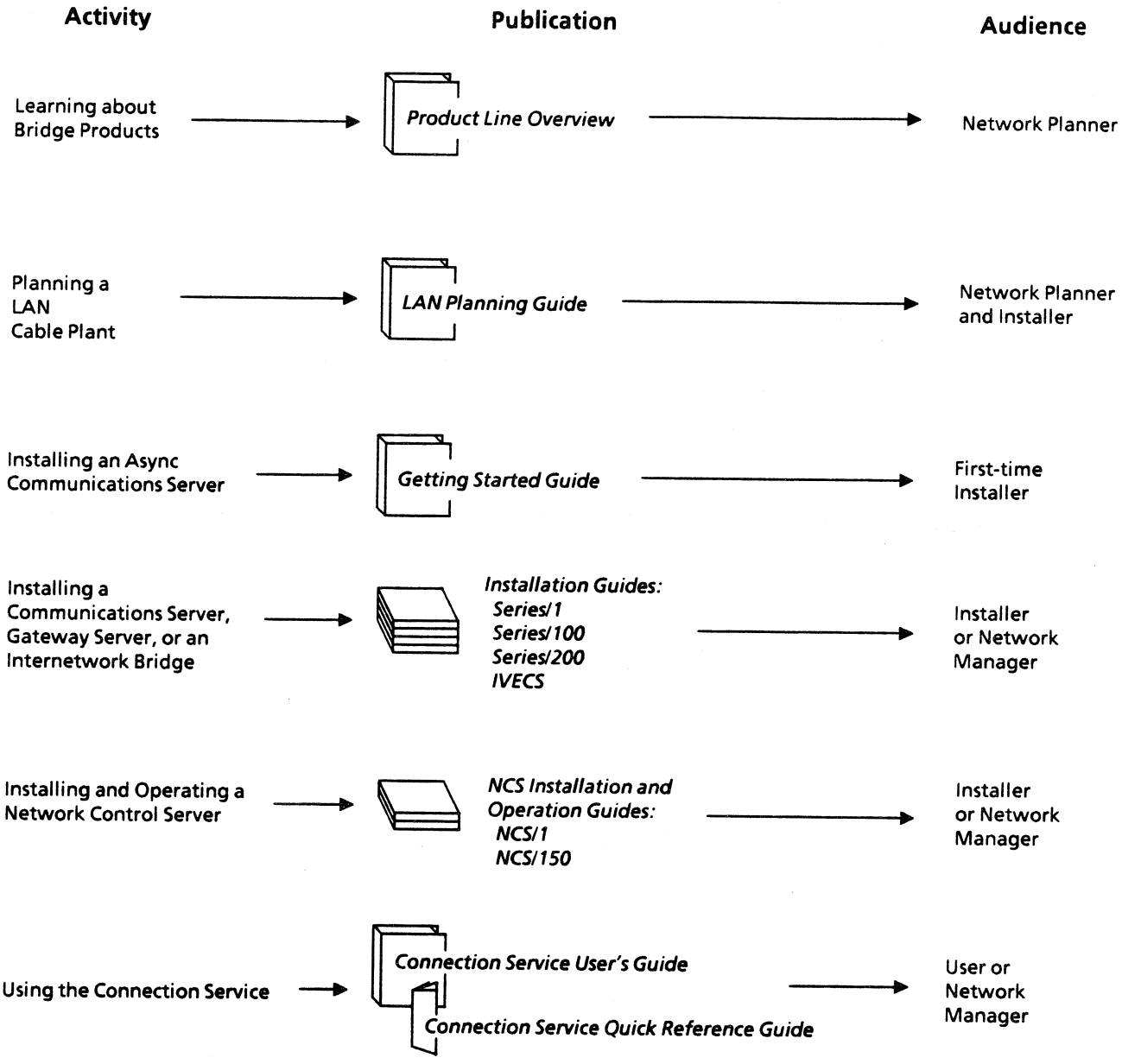

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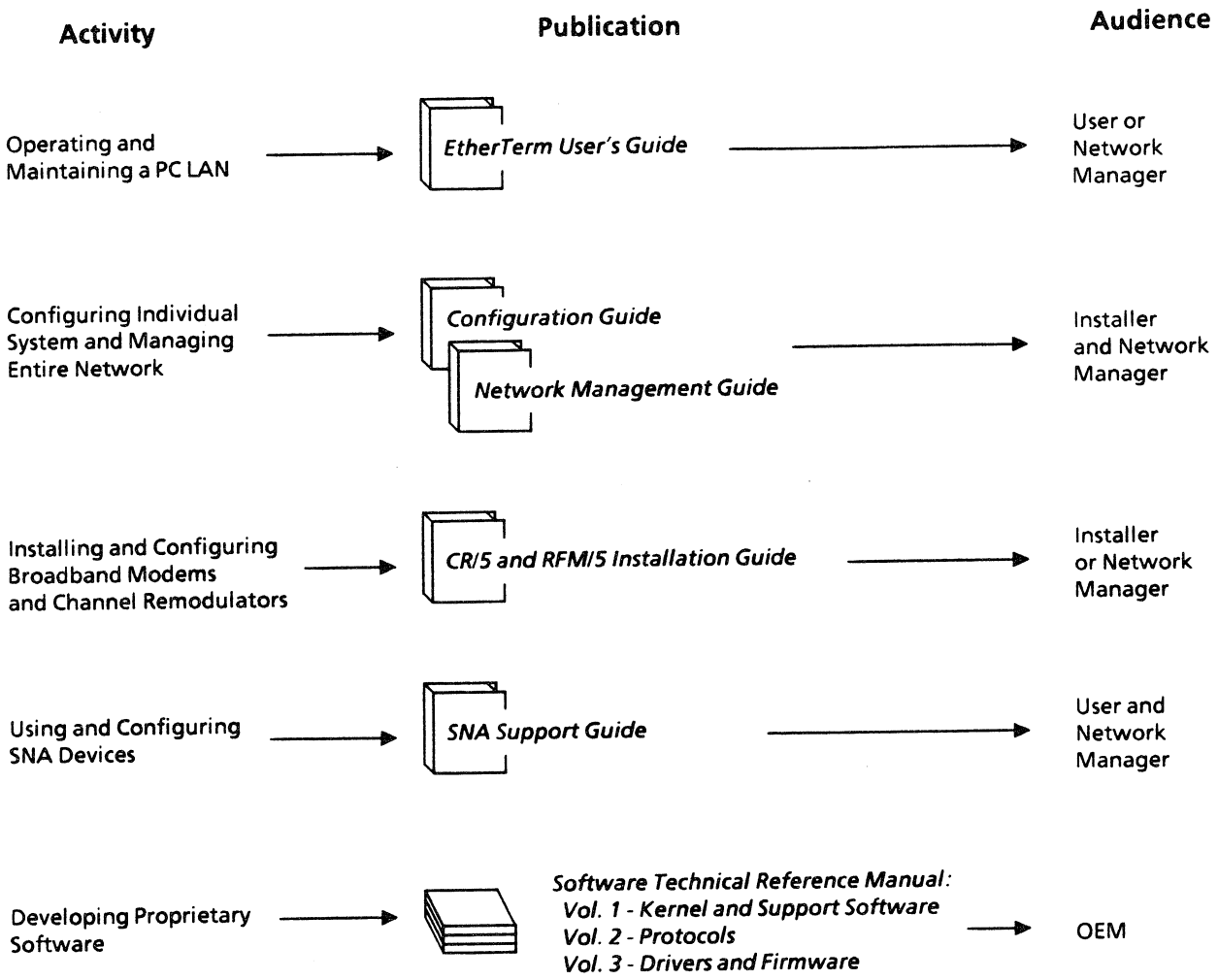

PUBLICATION CHANGE RECORD

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PREFACE

This guide provides two types of information that enables the Bridge Communications customer to configure a network: First it explains how to perform system generation for Bridge Communications Servers or Gateway Servers so that they will support installation-specific protocols and device characteristics. Then it explains how to configure port parameters for each device on the network. These port parameters include four types: parameters that apply to a single port, session parameters, editing parameters, and global parameters that apply to all ports on the server.

To configure ports, the reader should be familiar with the information provided in the *Product Line Overview* as well as the appropriate installation guides, installation and operation guides, and user's guides. If the local network interfaces a multilayered protocol such as X.25 or SNA, the reader should also be familiar with the protocol's architecture and installation-specific characteristics.

In addition, to perform system generation, the reader should be familiar with the physical and data-link layer specifications for the installation's network type (e.g., Ethernet) and with either the Xerox Network System (XNS) high-level protocols or the TCP/IP protocols.

This guide is divided into three sections:

Section 1.0 Introduction: Describes the purpose and scope of this guide.

Section 2.0 System Generation: Describes the Sysgen program, its menus and menu options.

Section 3.0 Port Configuration: Describes the port configuration parameters and provides sample configurations for various devices.

CONTENTS

TABLES

FIGURES

REFERENCES

The following publications describe Ethernet, the Xerox Network System products, and other related specifications:

[1] *The Ethernet, A Local Area Network: Data Link Layer and Physical Layer Specifications*, Version 1.0 (Digital Equipment Corporation, Intel Corporation, and Xerox Corporation, 1980)

[2] *The Ethernet, A Local Area Network: Data Link Layer and Physical Layer Specifications*, Version 2.0 (Digital Equipment Corporation, Intel Corporation, and Xerox Corporation, 1982)

[3] *IEEE Standard 802.3 CSMA/CD Access Method and Physical Layer Specifications,* Draft Document (The Institute of Electrical and Electronics Engineers, Inc., 1985)

[4] *IEEE Standard 802.5 Token Ring Access Method,* Draft Document (The Institute of Electrical and Electronics Engineers, Inc., 1985)

[5] *Internet Transport Protocols*, XSIS 028112 (Xerox Corporation, 1981)

[6] *Courier: The Remote Procedure Call Protocol*, XSIS 038112 (Xerox Corporation, 1981)

[7] *Clearinghouse Protocol Specification*, Version 1.0, 596P85150 (Xerox Corporation, 1981)

The following publications describe the TCP/IP protocols:

[8] *Ethernet Address Resolution Protocol*, RFC-826 (SRI International, 1982)

[9] *Internet Protocol*, RFC-791 (SRI International, 1982)

[10] *Internet Control Message Protocol*, RFC-792 (SRI International, 1982)

[11] *User Datagram Protocol*, RFC-768 (SRI International, 1982)

[12] *Assigned Numbers*, RFC-960 (SRI International, 1985)

[13] *Transmission Control Protocol*, RFC-793 (SRI International, 1981)

The following publications describe the X.25 protocols:

[14] *CCITT Recommendation X.25*, Vol. VIII.2 (CCITT Study Group VII, 1980)

[15] *CCITT Recommendation X.3*, Vol. VIII.2 (CCITT Study Group VII, 1980)

[16] *CCITT Recommendation X.28*, Vol. VIII.2 (CCITT Study Group VII, 1980)

[17] *CCITT Recommendation X.29*, Vol. VIII.2 (CCITT Study Group VII, 1980)

[18] *Telenet X.25 Documentation Service*, PE-xx.001.04B (GTE Telenet Communication Corporation, 1979)

1.0 INTRODUCTION

The *Configuration Guide* provides the information a customer needs to perform system generation and port configuration on a Bridge network. It is intended primarily for the network manager who is responsible for configuring a typical network and secondarily for the system programmer who may want to modify the system generation parameters to accommodate a custom network.

1.1 How to Use This Guide

Communications Servers are shipped with software that is preconfigured to run in a typical installation. However, some software configuration may be necessary. This guide provides information about all system generation parameters, regardless of whether they must be modified, may be modified, or should not be modified under any circumstance. The text indicates whether or not a parameter should be modified.

For Broadband and Token Ring implementations, system generation parameters are the same as those for the Ethernet version of the product.

Bridge servers have two sets of software-controlled parameters: system generation parameters and port configuration parameters.

1.2 System Generation

System generation parameters apply to an entire Bridge server. These parameters typically need to be changed only once for a given installation. The parameters are modified through the Sysgen program, described in Section 2.0.

Before performing system generation, copy the original system software diskette. Use the copy to perform system generation. The original system software contains factory-set default values, which are designed to work for most installations. If Sysgen parameter values are changed and the system performance is adversely affected, reboot the server with its original software.

System generation is used to adjust Communications Server and Gateway Server system generation parameters to meet the needs of a specific installation. In most cases, it is used only to make modifications for custom software or nonstandard installations, or on TCP/IP servers, to specify the server's Internet address. Unless specifically required, avoid using different system generation parameters on different servers of the same type. The results of the system generation are recorded on the system diskette, which should be backed up afterward.

Whether system generation is required or optional depends on the type of server, the type of software, and whether or not the server boots from an NCS. Restrictions and requirements are summarized in Table 1-1 and described below.

1.2.1 Communications Servers

For Communications Servers, system generation may not be necessary. The following list outlines restrictions and requirements:

- The CS/1 and CS/100 running XNS protocols are shipped with default parameters designed for standard software. System generation is required only on a system with custom software or special installation-dependent requirements; refer to Section 2.2.
- The CS/1 and CS/100 running TCP/IP protocols are shipped with default parameters designed for standard software. For servers that boot from an internal disk drive, system generation is required to specify the server's Internet address. Refer to Section 2.3.
- A CS/1 or CS/100 that boots from an NCS/1 does not require system generation in standard installations. If system generation is required for custom software or a non-standard installation, the procedure must be performed on the NCS/1. The configured software is used by all CS/1s or CS/100s that boot from that NCS/1.
- A CS/1 or CS/100 that boots from an NCS/150 does not require system generation in standard installations. If system generation is required for custom software or a non-standard installation, the procedure must be performed on a CS/1 or CS/100 with an internal disk drive, and the changes must be copied onto the NCS/150 diskette (the *NCS/150 Installation and Operation Guide* describes copying to the NCS/150 diskette). The configured software is used by all CS/1s or CS/100s supported by the NCS/150, not just by the CS/1 or CS/100 on which Sysgen was run.
- The CS/1-HSM is shipped with default parameters for one multiplexed line to a DEC host. System generation is always required; refer to Section 2.4.
- The CS/200 is shipped with a set of default parameters designed for the standard software on a 10-port system. System generation is optional and can be performed only from an NCS/1.
- The IVECS is shipped with default parameters for one UNIBUS™ interface to a VAX™ host. System generation is optional and can be performed only from an NCS/1.
- The CS/1-SNA is shipped with default parameters for one line to an SNA communications processor. System generation is always required; refer to Section 2.7.
- The CS/1-X.25 is shipped with default parameters for one X.25 line. System generation is always required; refer to Section 2.8.

1.2.2 Gateway Servers

All Gateway Servers require system generation as follows:

- For the GS/1, to specify the network address of the Ethernet to which the GS/1 is attached, the addresses and characteristics of the lines attaching the GS/1 to the X.25 networks, and the network addresses and access line addresses of the remote networks. Refer to Section 2.9.
- For the GS/3 and GS/300, to specify the network address of the Ethernet to which the server is attached and the network addresses and characteristics of the lines attached to the server. Refer to Sections 2.10, 2.11, and 2.12.

- For the GS/4, to specify the local and remote network addresses. Refer to Section 2.13.

**** NOTE ****

Once a diskette is configured for a particular Gateway Server, do not use the diskette in any other server. The address information on the diskette applies only to a single Gateway Server.

Table 1-1 System Generation Requirements

Server	*System Generation*
CS/1 with async, BSC, and SDLC interfaces and XNS	Not required *
CS/1 that boots from an NCS	Not required *
CS/1 with TCP/IP	Required
CS/1-HSM	Required
CS/1-SNA	Required
CS/1-X.25	Required
CS/100 with async and BSC interfaces and XNS	Not required *
CS/100 that boots from an NCS	Not required *
CS/100 with async interfaces and TCP/IP	Required
CS/200	Not required *
Gateway Servers (all types)	Required
IVECS	Not required *

* System generation may be required for custom software or a nonstandard installation.

1.3 Port Configuration

After the network manager runs the Sysgen program, default values for the port configuration parameters should be adjusted to reflect local requirements. Port configuration parameters apply to individual ports and may need to be changed more frequently than system generation parameters. Port configuration parameters can be changed dynamically using the ReaD, SET, SETDefault, and REMoteSET commands. Section 3.0 describes port configuration parameters.

Create and maintain backups for each server after it has been fully configured.

An efficient way to configure a large network is to define a few generic default parameter files, with one file for every major port type used throughout the network (e.g., VT100 terminals, dial-out modems, and so on). These generic files may then be used to configure the majority of ports on the network, thereby limiting the proliferation of varied configurations on similar devices.

Keep accurate, current records of the configuration of each server. Keeping these records on-line on an NCS/1 or on a host computer connected to a Communications Server allows network configuration and other network management operations to be automated.

2.0 SYSTEM GENERATION

This section describes Communications Server and Gateway Server system generation.

System generation is executed either from a terminal attached to the server (the "system console") or from the Network Control Server (NCS) console. Because the menus and procedures on the NCS are similar to those on the system console, only system generation on the system console is described in detail in this guide. For information on executing system generation on the NCS, refer to the appropriate NCS installation and operation guide.

System generation adjusts parameters to meet the needs of a specific installation. Parameters typically need to be set only once for each server. The results of the system generation are recorded on the system disk, which should be backed up afterward.

2.1 Running the Sysgen Program

The Sysgen program is a simple, menu-based utility for displaying and altering the system generation parameters and saving the changes.

The Sysgen program runs only on a server with an internal disk drive or on an NCS/1. On a Communications or Gateway Server, Sysgen can run only immediately after a power-on or reset; the program does not execute properly if communications software has just been running. The system diskette must be in the disk drive when Sysgen is executed.

**** NOTE ****

> Before performing system generation, follow the release memo instructions for copying the system software. Then store the distribution diskette in a safe place and use the copy to run the Sysgen program. This precaution ensures that the factory-set parameter values can be restored to the system.

For all Series/1 products, Sysgen is run from the Main CPU (MCPU) monitor on the system console terminal. Insert the system diskette, reset the server, and enter the Sysgen command:

```
gn
```

To run Sysgen on an NCS/1, use the NCS/1 Sysgen utility; follow the instructions in the *NCS/1 Installation and Operation Guide.*

For Series/100 products, first boot the utilities diskette; then press the return key, a period, and the return key again. When an angle-bracket prompt (>) appears on the terminal attached to port 0, enter the Sysgen command:

```
gn
```

When prompted, press the return key. Then remove the utilities diskette from the disk drive, replace it with the system diskette, and press return again.

**** NOTE ****

On a CS/100 with byte-synchronous interfaces, make sure that an asynchronous terminal is attached to port 0.

After the appropriate software is loaded, the server displays the main Sysgen menu shown in Figure 2-1. To begin system generation, type 1 and press the return key.

```
                Sysgen Utility

1.  View/Alter Module Parameters

2.  Save Parameters

3.  Exit to Monitor









Enter selection:
```

Figure 2-1 Sysgen Program Main Menu

System generation parameters are divided into seven or eight groups, depending on the server type. When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the program displays the Module Select Menu. This menu displays a list of all parameter groups, also called modules. Figure 2-2 shows the Module Select Menu for the CS/1 and CS/100. For servers running other than standard software, the menu may differ.

Most system generation parameters are set to default values appropriate for standard installations and need not be altered. However, all possible parameters appear in the Sysgen menus in order to allow alterations necessary in custom installations and during software development.

**** NOTE ****

Sysgen parameters should be altered only by someone with a thorough understanding of the system software.

```
                Module Select Menu

1.  Kernel Parameters

2.  Data Link Parameters

3.  IDP Parameters

4.  SPP Parameters

5.  User Interface Parameters

6.  Virtual Terminal Parameters

7.  Statistics Monitoring Parameters

8.  Clearinghouse Parameters


(ESC to return to main menu)
Select Module:
```

Figure 2-2 Module Select Menu for the CS/1 and CS/100 with XNS

To display a parameter module, enter the number of the module as it appears on the Module Select Menu; then press the return key. Depending on the module chosen, the program displays either a list of parameters or a list of both parameters and submenus from which to choose. Parameter values are expressed in decimal or hexadecimal notation. Hexadecimal values appear in the following form, where "<n>" represents a numeral:

```
0x<n>
```

The "0x" indicates that the numeral following is in hexadecimal notation.

To change a parameter value, locate the menu that lists that parameter value and then enter the number of the parameter. The resulting prompt lists the limits that apply to the parameter value. To enter a new value, respond to the prompt by typing the new value; then press the return key. To leave the value unchanged, simply press the return key.

While using the Sysgen program, press the escape key at any time to return to the menu at the next higher level.

**** NOTE ****

On terminals that do not have an escape key, use <CTRL-[> to send an escape character to the program.

After system generation is complete, and before the modified system generation parameters can take effect, the values must be saved on the system diskette or in the appropriate NCS/1 system file. Then the system must be booted from the updated software. To save the new values, first press the escape key as many times as necessary to return to the main Sysgen menu. Then select option 2, Save Parameters, from the main menu.

The Sysgen program requests confirmation before writing over the old system configuration parameters. First verify that the diskette is in place in the disk drive. Then respond to the confirmation prompt with a lowercase "y" to save the new values or a lowercase "n" to return to the menu without writing to the disk.

Use the Site Management forms in the *Network Management Guide* to keep a written record of changed parameters.

The following sections discuss system generation parameters for Communications Servers and for Gateway Servers. This guide recommends which parameters should be changed, or left unchanged, for typical installations. However, all parameters are described.

A map of Sysgen menus appears in each section and corresponds to the Sysgen version for the server being discussed. The map shows how menus branch to other menus, depending on which menu option is chosen. Individual menus are also shown.

2.2 CS/1 and CS/100 Running XNS Protocols

The CS/1 offers interface variations that support asynchronous, byte-synchronous, and bit-synchronous communications devices; the CS/100 offers asynchronous or byte-synchronous interfaces. These interfaces are supported on servers running XNS protocols. The asynchronous version is also supported on servers running TCP/IP protocols. For the purpose of system generation, the server protocol is significant; the network manager uses slightly different versions of the Sysgen program depending on whether the server runs the XNS or TCP/IP protocols. However, both Sysgen versions display the same main Sysgen menu, illustrated in Figure 2-1.

This section describes the Sysgen menus and parameters that are used to configure the CS/1 and CS/100 running XNS protocols.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-3 shows the paths of the Sysgen menus for the CS/1 and CS/100 running XNS protocols.

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. This menu appears in Figure 2-2. In most installations, unless special installation-dependent requirements exist, no system generation parameters should be changed except User Interface Parameters and Clearinghouse Parameters. These options are described in more detail in their respective sections.

The menus branching from the Module Select Menu are detailed below, as are their individual options and submenus.

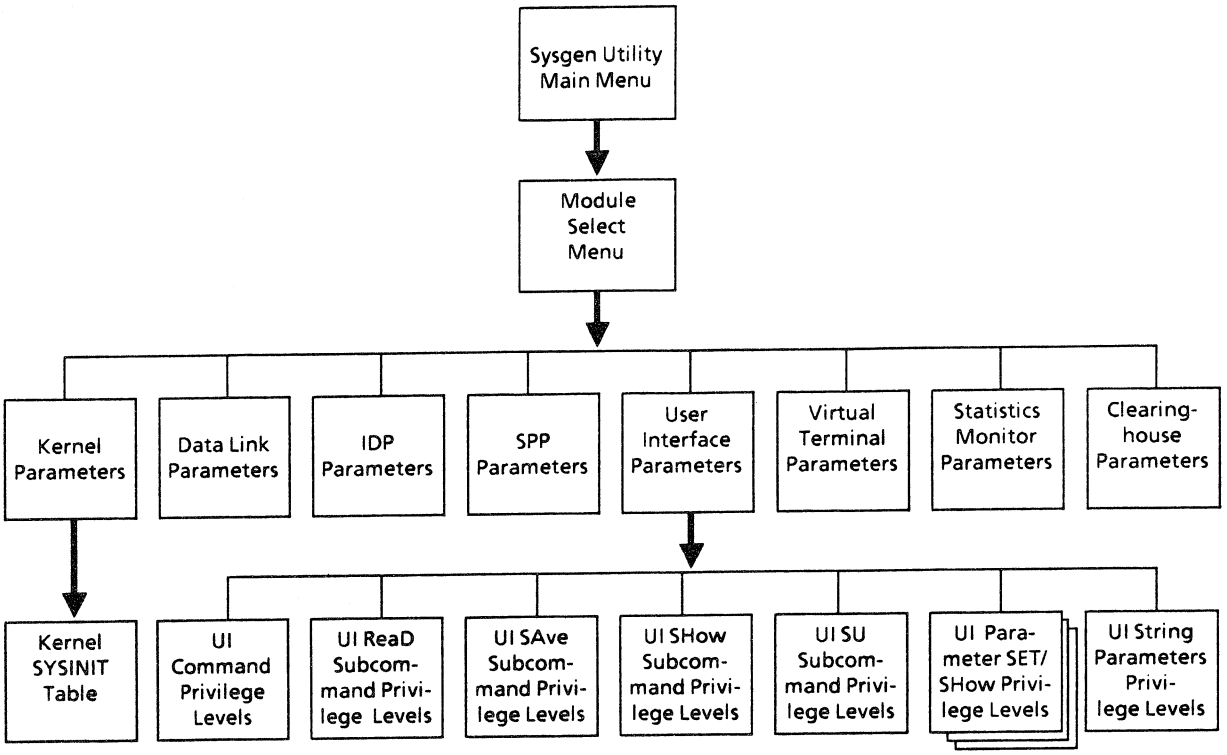


Figure 2-3 Sysgen Menus for the CS/1 and CS/100 with XNS

2.2.1 XNS Kernel Parameters

The kernel provides resource management services for the server software. These services are detailed in the *Software Technical Reference Manual, Volume One.*

Figure 2-4 shows the Kernel Parameters menu for the CS/1 and CS/100 running XNS protocols.

```
                Kernel Parameters

     Parameters                    Current Value

1. Max. no. of ports                    0x40
2. Buffer size                          0x52
3. Buffer load factor                   0x46
4. Number of macro buffers              0xC

    Kernel Submenus

5. View/Modify SYSINIT Table




(ESC to return to previous menu)
Enter selection:
```

Figure 2-4 Kernel Parameters Menu for the CS/1 and CS/100 with XNS

The kernel parameters are explained below:

1. **Max. no. of ports.** This parameter specifies the maximum number of physical ports the server supports. Hexadecimal values 0 through 40 are permitted on the CS/1. Hexadecimal values 1 through E are permitted on the CS/100. Ordinarily, the value should never be less than the number of physical ports present on the server. Reducing this parameter value may be useful when the number of physical ports exceeds the number of users on the server: the lower the value of this parameter, the more sessions are created by the server.

2. **Buffer size.** This parameter specifies the standard buffer size as a hexadecimal number of bytes. Values of 2A through 400 are permitted. The number does not include space for protocol headers in front of the data portion of the buffer. The server automatically allocates space for protocol information. The buffer-size parameter value should not be changed unless an application requires a specific system buffer size.

3. **Buffer load factor.** This parameter specifies a load factor to control the number of buffers the server allocates to its buffer pool. This number is a percentage of the maximum possible number of buffers. The higher the load factor, the more buffers the server assigns. Hexadecimal values A through 64 are permitted.

   This parameter controls the use of shared memory. The higher the specified value, the more memory is allocated to each port and session. As a result, the server allows fewer sessions. The lower the specified value, the greater the number of available sessions and the greater the likelihood that the server will run out of memory.

4. **Number of macro buffers.** This parameter specifies the number of buffers that hold custom macros for simultaneous execution. For example, if this parameter is set to 0x40 (hexadecimal), 64 users can execute macros simultaneously. Hexadecimal values 0 through 40 are permitted. Increasing the number of macro buffers may reduce the number of sessions the server can accommodate.

5. **View/Modify SYSINIT Table.** This option branches to the Kernel SYSINIT Table submenu, which allows the system programmer to view processes in the SYSINIT table. The SYSINIT table lists all processes that the kernel must create during system initialization.

**** CAUTION ****

Do not try to use the Kernel SYSINIT Table submenu to add or change processes.

2.2.2 Data Link Parameters

The Data Link module broadcasts information about the server on which it resides to other servers on the network. This information includes the server's network address, the kind of software it is running, and the software version number. The interval at which it broadcasts this information is configurable.

Figure 2-5 shows the Data Link Parameters menu. This menu is the same for the CS/1 and CS/100 running either XNS or TCP/IP protocols.

The single Data Link parameter specifies the interval at which information about the server is broadcast through the network. Hexadecimal values 0 through 258 are permitted. A large value is useful on a network where frequent broadcasts slow network performance.

To disable broadcasts, specify 0. If the broadcast interval is set to 0, the server can still receive broadcasts from other servers. However, it does not drop obsolete entries from its network map. Therefore, its network map does not show current information about all other servers. Other servers perceive this server as dead if they do not receive a broadcast from it within approximately 5 minutes.

```
                    Data Link Parameters

     Parameter                      Current Value

1. Broadcast interval (seconds)        0x2D




(ESC to return to previous menu)
Enter selection:
```

Figure 2-5 Data Link Parameters Menu

2.2.3 IDP Parameters

The Internetwork Datagram Protocol (IDP) is used to send datagrams to an addressable destination, which may be on another network. This section describes the IDP parameters that can be adjusted during system generation. Figure 2-6 shows the IDP Parameters menu for the CS/1 and CS/100 running XNS protocols. The IDP parameters are explained below:

1. **Mailbox depth level 0.** At system initialization, IDP creates two mailboxes: a data mailbox for receipt of incoming packets (Level 0) and a data mailbox for receipt of outgoing packets (Level 2). This parameter specifies the depth of the mailbox in which IDP receives data from the network. The default value of 20 is the only value permitted.

2. **Mailbox depth level 2.** This parameter specifies the depth of the mailbox in which IDP receives data from its Level 2 client. Hexadecimal values 8 through C are permitted.

3. **Software packet checksum on/off.** The setting of the checksum option determines whether or not IDP generates a checksum on each IDP packet transmitted to a Level 0 protocol. Specify 1 to include a checksum, 0 not to include it. Regardless of the setting of this parameter, IDP verifies the checksum (if any) on IDP packets received from a Level 0 protocol.

4. **Use PEP (0) / BTP (1).** The Packet Exchange Protocol (PEP or PXP) and Bridge Transaction Protocol (BTP) specify how requests for clearinghouse names and certain filenames are sent and how the responses are received. BTP allows more efficient data transfer; PEP is part of the original XNS protocol. This parameter is provided for compatibility with systems that do not support the BTP protocol. Specify 1 for BTP; 0 for PEP.

```
                    IDP Parameters

     Parameter                        Current Value

1. Mailbox depth level 0                   0x20
2. Mailbox depth level 2                   0xC
3. Software packet checksum on/off         0x0
4. Use PEP (0) / BTP (1)                   0x1









(ESC to return to previous menu)
Enter selection:
```

Figure 2-6 IDP Parameters Menu for the CS/1 and CS/100 with XNS

2.2.4 SPP Parameters

This section describes the system generation parameters that apply to the Sequenced Packet Protocol Service (SPP). Figure 2-7 shows the SPP Parameters menu for the CS/1. The CS/100 displays the same menu with different default values.

The default minimum and maximum receive window sizes are optimized for terminal-to-host applications and can be adjusted to increase throughput for other applications (e.g., host-to-host file transfer). However, if window size is increased, the system requires more buffers. See the *Software Technical Reference Manual, Volume One,* for information on allocating buffers.

The SPP parameters are explained below:

1. **Min. rec. window.** This parameter specifies the minimum size of the receive window. The window determines the number of unacknowledged packets that the other end of a connection can send. Hexadecimal values 2 through 4 are permitted.

2. **Max. rec. window.** This parameter specifies the maximum size of the receive window. Hexadecimal values 2 through 16 are permitted.

3. **Max. no. retransmits.** This parameter specifies the maximum number of times SPP retransmits a packet to the destination socket. When the maximum number is reached, SPP assumes the other socket is no longer operational and aborts the session. Hexadecimal values 2 through A are permitted.

4. **Max. no. probes.** This parameter specifies the maximum number of times SPP sends a probe to the destination socket without receiving an acknowledgement. Probes are system packets with the Send Acknowledgement bit set. When the maximum number is reached, SPP assumes the other socket is no longer operational and aborts the session. Hexadecimal values 2 through A are permitted.

5. **User to SPP data mailbox.** This parameter specifies the depth of the data mailbox used to receive data from the user. Hexadecimal values 1 through A are permitted.

6. **IDP to SPP data mailbox.** This parameter specifies the depth of the data mailbox used to receive data from IDP. Hexadecimal values 1 through A are permitted.

7. **Min. retransmit timeout.** This parameter specifies the minimum number of milliseconds between attempts to retransmit the oldest unacknowledged packet in the retransmit queue. Hexadecimal values 1F4 through 1388 are permitted.

8. **Max. retransmit timeout.** This parameter specifies the maximum number of milliseconds between attempts to retransmit the oldest unacknowledged packet in the retransmit queue. Hexadecimal values 1388 through 4E20 are permitted.

9. **Probe timeout.** This parameter specifies the number of milliseconds between probes. Hexadecimal values BB8 through 2710 are permitted.

```
                    SPP Parameters

     Parameter                    Current Value

1. Min. rec. window                    0x2
2. Max. rec. window                    0x2
3. Max. no. retransmits                0x6
4. Max. no. probes                     0x5
5. User to SPP data mailbox            0x1
6. IDP to SPP data mailbox             0x3
7. Min. retransmit timeout             0x3E8
8. Max. retransmit timeout             0x3A98
9. Probe timeout                       0x1388
A. Init. connection timeout            0x3E8
B. Mailbox limit init. connection      0x5
C. Acknowledge timeout                 0x63




(ESC to return to previous menu)
Enter selection:
```

Figure 2-7 SPP Parameters Menu for the CS/1 with XNS

A. **Init. connection timeout.** This parameter specifies the number of milliseconds between probes sent to establish a connection. Hexadecimal values 3E8 through 2710 are permitted.

B. **Mailbox limit init. connection.** This parameter specifies the depth of the mailbox used to receive a connection request from a user process or from the network. Hexadecimal values 3 through 6 are permitted.

C. **Acknowledge timeout.** This parameter specifies the number of milliseconds SPP waits before sending an acknowledgement in response to a Send Acknowledgement request. Rather than immediately creating a special packet for the acknowledgement, SPP waits for the specified interval to determine if the acknowledgement can be piggybacked on another packet destined for the requesting socket. Hexadecimal values 31 through 64 are permitted.

2.2.5 User Interface Parameters and Submenus

The User Interface Parameters menu includes one parameter and pointers to several submenus. Figure 2-8 shows the User Interface Parameters menu. This menu is the same for the CS/1 and CS/100 on both XNS and TCP/IP networks. The single parameter allows the network manager to specify whether or not the server prompt displays the port number of the attached device:

```
Prompt with port no.
```

Specify 1 to display the port number; specify 0 to exclude it.

The User Interface (UI) submenus list Connection Service commands and subcommands. These commands and subcommands can be entered either as whole words or in abbreviated forms. Therefore, the menus show parts of the commands in uppercase letters to indicate the abbreviation recognized by the system software.

Connection Service commands are detailed in the *Connection Service User's Guide*

On the UI submenus, the privilege levels required to execute the Connection Service commands can be modified. When the command number is entered, the Sysgen program displays the following prompt:

```
new privilege level:
```

Enter one of the following privilege levels:

- **User** allows all users to execute the specified command.
- **LNM** allows only users with Local Network Manager privilege to execute the command.
- **GNM** allows only users with Global Network Manager privilege to execute the command.

Although one privilege level might be set for a UI command, a higher level can be specified for some forms of the command. For example, the SHow command has User as its default privilege level. However, the network manager can specify LNM or GNM for the Show subcommands, which are listed on the UI Show Subcommand Privilege Levels menu.

Figure 2-9 shows an example of the UI Command Privilege Levels submenu. This menu differs slightly between the XNS and TCP/IP protocols.

```
                    User Interface Parameters

     Parameter                      Current Value

1. Prompt with port no.                  0x0

     UI Submenus

2. UI Main Command Privileges
3. UI ReaD Subcommand Privileges
4. UI SAve Subcommand Privileges
5. UI SHow Subcommand Privileges
6. UI SU Subcommand Privileges
7. UI Parameter SET/SHow Privileges
8. UI String Parameters




(ESC to return to previous menu)
Enter selection:
```

Figure 2-8 User Interface Parameters Menu

```
                    UI Command Privilege Levels

     Command          Privilege          Command          Privilege

 1. BRoadcast           LNM       2. Connect              User
 3. DEFine              LNM       4. DEQueue              User
 5. DisConnect          User      6. DO                   User
 7. Echo                User      8. Listen               User
 9. Name                LNM       A. Pause                User
 B. ReaD                LNM       C. REMOTE               GNM
 D. REMoteSET           User      E. REMoteSHow           User
 F. RESume              User     10. ROtary               LNM
11. SAve                LNM      12. SET                  User
13. SETDefault          LNM      14. SHow                 User
15. SU                  GNM      16. SWitch               User
17. Transmit            User     18. UNDefine             LNM
19. UNName              LNM      1A. UNSave               LNM
1B. ZeroStats           LNM


(ESC to return to previous menu)
Enter selection:
```

Figure 2-9 UI Command Privilege Levels Menu

The *Connection Service User's Guide* describes the commands on this menu in detail, enabling the network manager to modify privilege levels based on command usage. However, the default values are optimal for most networks and need not be modified.

**** NOTE ****

Do not establish any privilege level other than User for the SET command. Otherwise, no one can access higher privilege levels, which can be done only through the SET command.

Bridge does not recommend giving a User privilege level to commands that can change stored names, macros, rotaries, or default configurations (e.g., Name, UNDefine, ROtary, SETDefault).

2.2.6 XNS Virtual Terminal Parameters

The Virtual Terminal Service supports TTY-like terminals and TTY hosts. This service is described in the *Software Technical Reference Manual, Volume Two.*

This section describes the Virtual Terminal parameters that can be adjusted during system generation. Figure 2-10 shows the Virtual Terminal Parameters menu for the CS/1 and CS/100 running XNS protocols.

```
                Virtual Terminal Parameters

     Parameters                      Current Value

1. Mailbox depth to SPP                   0x1
2. Mailbox depth to agent                 0x1
3. Skip dead(DTR low) ports               0x1
4. Autolisten timer(min)                  0xF
5. Disconnect timer(sec)                  0x6









(ESC to return to previous menu)
Enter selection:
```

Figure 2-10 Virtual Terminal Parameters Menu for the CS/1 and CS/100 with XNS

The Virtual Terminal parameters are explained below:

1. **Mailbox depth to SPP.** This parameter specifies the depth of the mailbox the Virtual Terminal Monitor (TM) process uses to receive messages from each SPP process. Hexadecimal values 1 through 3 are permitted.

2. **Mailbox depth to agent.** This parameter specifies the depth of the mailbox the Virtual Terminal Monitor (TM) process uses to receive messages from the SIO agent process. Hexadecimal values 1 through 3 are permitted.

3. **Skip dead(DTR low) ports.** This parameter specifies that a connection request to a rotary port succeeds as long as one rotary port is enabled. The host enables a port by keeping the Data Terminal Ready (DTR) signal raised. If a connection request to a rotary port encounters a port with DTR low, the server repeats the request until an enabled port is found or all rotary ports have been tried. Specify 1 to disregard disabled ports; specify 0 to have a connection request fail upon encountering a disabled port.

4. **Autolisten timer(min).** This parameter specifies the number of minutes after which an unconnected port changes from Command Mode to Listening Mode. This interval begins at the time the attached device is reset or powered on, or at the time of the most recent data transfer to or from the device. Hexadecimal values 0 through 3E80 are permitted. Specifying 0 disables the timer. This parameter is not applicable to the program interface.

5. **Disconnect timer(sec).** This parameter specifies the number of seconds the server waits for all data queued in the network to flush at disconnection time. Specify a large value for the disconnect timer if an attached device sends large amounts of data to a slow device on the network. A high disconnect-timer value allows the slower device to receive the data before the server breaks down the connection. Specify a hexadecimal value between 6 and 20.

2.2.7 Statistics Monitor Parameters

The Statistics Monitor (SM) module collects network performance statistics. It does this in two ways: (1) by sampling processes running on the server's MCPU board and (2) by sampling statistics gathered by the network interface and SIO agent processes. The interval during which the Statistics Monitor samples network performance statistics is configurable.

Figure 2-11 shows the Statistics Monitor Parameters menu. This menu is the same for all communications servers and gateway servers.

The single Statistics Monitor parameter specifies the interval during which the monitor samples network performance statistics. The monitor then creates statistics reports, which can be viewed by issuing the SHow STATistics command (described in the *Connection Service User's Guide).* Hexadecimal values 2 through A are permitted.

Raising the sampling-frequency value produces statistics gathered over a longer period of time. Lowering the sampling-frequency value can provide useful debugging information on an active network.

```
                Statistics Monitor Parameters

     Parameter                          Current Value

1. Sampling frequency (secs/sample)     0x4









(ESC to return to previous menu)
Enter selection:
```

Figure 2-11 Statistics Monitor Parameters Menu

2.2.8 Clearinghouse Parameters

The Clearinghouse Service creates, searches, and modifies a local database of name-to-address mappings; it requests searches of remote databases and responds to their search requests. This service is described in the *Software Technical Reference Manual, Volume Two*. Figure 2-12 shows the Clearinghouse Parameters menu for most servers running XNS protocols.

The single parameter in the Clearinghouse Parameters menu specifies whether or not the Communications Server distinguishes between lowercase and uppercase in clearinghouse names. Specify 0 to distinguish between lowercase and uppercase; specify 1 to ignore the distinction.

```
                Clearinghouse Parameters

     Parameter                          Current Value

1. Clearinghouse names all one case     0x1









(ESC to return to previous menu)
Enter selection:
```

Figure 2-12 Clearinghouse Parameters Menu

2.3 CS/1 and CS/100 Running TCP/IP Protocols

The CS/1 and the CS/100 with asynchronous interfaces run either XNS or TCP/IP protocols. For the purpose of system generation, the server protocol is significant; the network manager uses slightly different versions of the Sysgen program depending on whether the server runs the XNS or TCP/IP protocols. However, both Sysgen versions display the same main Sysgen menu, illustrated in Figure 2-1.

This section describes the Sysgen menus and parameters that are used to configure the CS/1 and CS/100 running TCP/IP protocols. The only TCP/IP parameter that must be changed at system generation is the server's Internet address and it need not be changed if the server boots from an NCS. This parameter is on the IP Parameters menu described in Section 2.3.3.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-13 shows the paths of the Sysgen menus for the CS/1 and CS/100 running TCP/IP protocols.

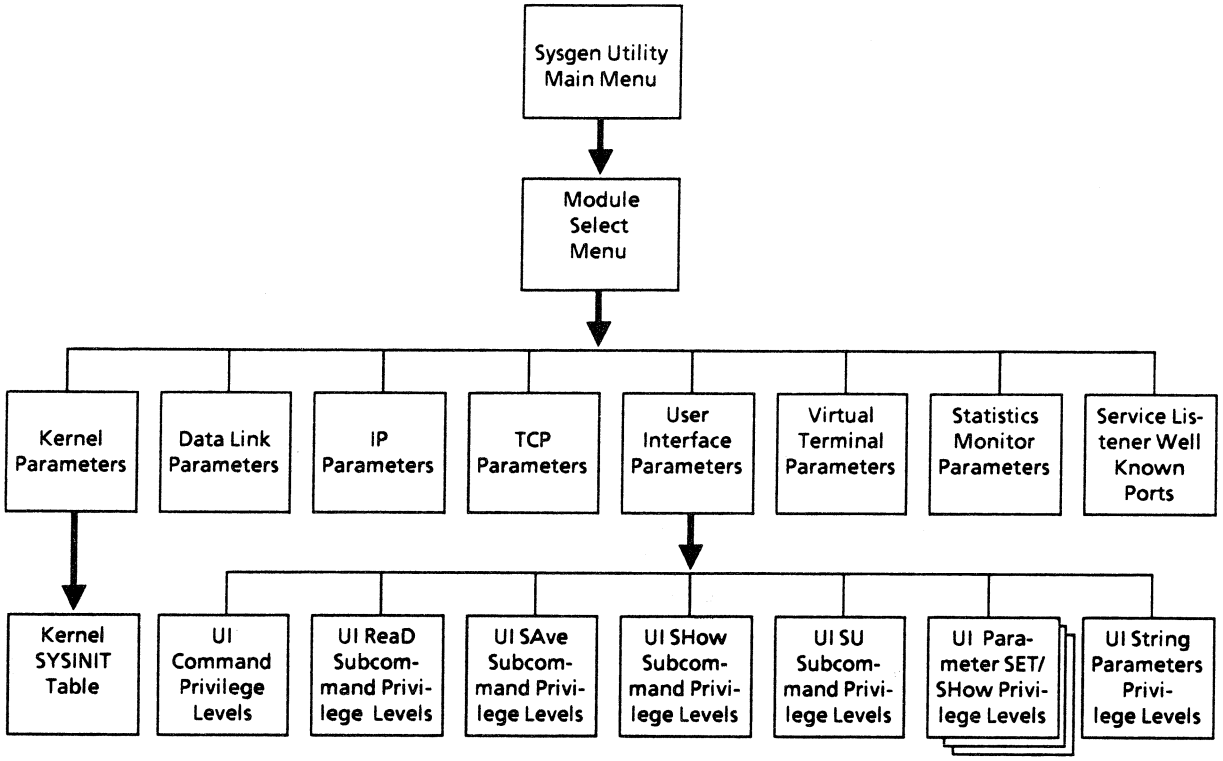


Figure 2-13 Sysgen Menus for the CS/1 and CS/100 with TCP/IP

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. This menu appears in Figure 2-14.

```
                Module Select Menu

1.  Kernel Parameters

2.  Data Link Parameters

3.  IP Parameters

4.  TCP Parameters

5.  User Interface Parameters

6.  Virtual Terminal Parameters

7.  Statistics Monitoring Parameters

8.  Service Listener Port List


(ESC to return to main menu)
Select Module:
```

Figure 2-14 Module Select Menu for the CS/1 with TCP/IP

Most options on the CS/1 and CS/100 Sysgen menus are the same for both XNS and TCP/IP. However, some differences exist. Menus with significant differences are discussed in the following sections.

2.3.1 TCP/IP Kernel Parameters

The kernel provides resource management services for the server software. These services are detailed in the *Software Technical Reference Manual, Volume One.*

The Kernel Parameters menu for the CS/1 running TCP/IP protocols is the same menu as for the CS/1 running XNS protocols. Default values may differ slightly. Refer to Section 2.2.1 for a menu description.

Figure 2-15 shows the Kernel Parameters menu for the CS/100 running TCP/IP protocols.

```
                Kernel Parameters

     Parameters                    Current Value

1. Max. no. of ports                    0xE
2. Max. no. of sessions                 0x11
3. Buffer size                          0x34
4. Buffer load factor                   0x40

    Kernel Submenus

5. View/Modify SYSINIT Table




(ESC to return to previous menu)
Enter selection:
```

Figure 2-15 Kernel Parameters Menu for the CS/100 with TCP/IP

The kernel parameters are explained below:

1. **Max. no. of ports.** This parameter specifies the maximum number of physical ports the server supports. Hexadecimal values 2 through E are permitted on the CS/100. Ordinarily, the value should never be less than the number of physical ports present on the server. Reducing this parameter value may be useful when the number of physical ports exceeds the number of users on the server: the lower the value of this parameter, the more sessions are created by the server.

2. **Max. no. of sessions.** This parameter specifies the maximum number of simultaneous sessions the server can support. Hexadecimal values 2 through 2A are permitted in the CS/100. Setting this parameter has no effect on software version 12010 or later.

3. **Buffer size.** This parameter specifies the standard buffer size as a hexadecimal number of bytes. Values of 2A through 400 are permitted. The number does not include space for protocol headers in front of the data portion of the buffer. The server automatically allocates space for protocol information. The buffer-size parameter value should not be changed unless an application requires a specific system buffer size.

4. **Buffer load factor.** This parameter specifies a load factor to control the number of buffers the server allocates to its buffer pool. This number is a percentage of the maximum possible number of buffers. The higher the load factor, the more buffers the server assigns. Hexadecimal values A through 64 are permitted.

   This parameter controls the use of shared memory. The higher the specified value, the more memory is allocated to each port and session. As a result, the server allows fewer sessions. The lower the specified value, the greater the number of available sessions and the greater the likelihood that the server will run out of memory.

5. **View/Modify SYSINIT Table.** This option branches to the Kernel SYSINIT Table submenu, which allows the system programmer to view processes in the SYSINIT table. The SYSINIT table lists all processes that the kernel must create during system initialization.

   **** CAUTION ****

   Do not try to use the Kernel SYSINIT Table submenu to add or change processes.

2.3.2 TCP/IP Data Link Parameters

The Data Link Parameters menu for the CS/1 and CS/100 running TCP/IP protocols is identical to the XNS version. See Section 2.2.2 for details.

2.3.3 IP Parameters

The Internetwork Protocol (IP) is an internetwork datagram protocol that delivers packets to and from an attached network. This section describes the IP parameters that can be adjusted during system generation. Figure 2-16 shows the IP Parameters menu for the CS/1 running TCP/IP protocols. The CS/100 displays slightly different default values.

```
                    IP Parameters

     Parameter                    Current Value

1. Network to IP mailbox                0x20
2. Client to IP mailbox                 0xC
3. Server internet address         000.000.000.000
4. Server subnet mask              not a subnet

(ESC to return to previous menu)
Enter selection:
```

Figure 2-16 IP Parameters Menu for the CS/1 with TCP/IP

The IP parameters are explained below:

1. **Network to IP mailbox.** This parameter determines the depth of the mailbox in which IP receives data from the network. The mailbox depth is the number of packets the server can buffer between schedules of the IP processes. Hexadecimal values 1 through 20 are permitted on the CS/1, and 1 through C are permitted on the CS/100.

2. **Client to IP mailbox.** This parameter determines the depth of the mailbox in which IP receives data from its Level 2 clients. Hexadecimal values 1 through C are permitted.

3. **Server internet address.** This parameter assigns an address to the local Communications Server. The initial value of the Internet address is 000.000.000.000. Modify this parameter at system generation if the server boots from an internal disk drive. It need not be changed if the server boots from an NCS. Enter "x" to clear a previously specified Internet address.

   An Internet address consists of 32 bits divided into four 8-bit subfields. Normally these fields are divided between the network and host fields. The network portion of the Internet address must be the same for all TCP/IP servers on the same network, except when the network has subnets. The host portion of the address must be unique for each TCP/IP server on the network. Refer to *Assigned Numbers* (reference [12]) for details about Internet addresses.

4. **Server subnet mask.** Some TCP/IP networks extend the network field with an additional field called the subnet field, which indicates a particular physical segment. When this parameter is selected, the server prompts for the subnet mask. Enter a new subnet mask or "x" to clear a previously specified subnet mask.

   Do not assign subnet masks unless the network uses them. For the subnet addressing to be meaningful, all servers on the same private network must be configured with identical subnet masks.

   The subnet mask is formed by taking the leading bits from the host field. The entire address still has 32 bits. The subnet mask is a 32-bit number; each bit of the mask that coincides with the network field must be set. For example, 126.000.000.000 is a class A Internet address. To extend this network number by a subnet field that would provide for up to 16 subnets requires a 4-bit subnet field. The binary representation of this subnet mask is as follows:

   (11111111).(11110000).(00000000).(00000000)

   The first field (11111111) masks the network field of the Internet address, and the second field (11110000) extends the network field by four bits. The decimal representation of this binary number is as follows:

   255.240.000.000

   Determine the binary representation of the subnet mask necessary to provide the desired number of subnets and convert it to decimal. When prompted, enter the decimal representation of the subnet mask and press the return key.

2.3.4 TCP Parameters

The Transmission Control Protocol (TCP) module provides the connection-oriented transport protocol. Figure 2-17 shows the TCP Parameters menu for the CS/1 and CS/100 running TCP/IP protocols.

The TCP parameters are explained below:

1. **Maximum number of retransmissions.** This parameter specifies the maximum number of times TCP retransmits an unacknowledged packet before terminating the connection. Hexadecimal values 6 through 64 are permitted.
2. **User to TCP data mailbox.** This parameter specifies the depth of the mailbox used to receive data from the user. Hexadecimal values 1 and 2 are permitted.
3. **IP to TCP data mailbox.** This parameter specifies the depth of the mailbox used to receive data from IP. Hexadecimal values 1 and 2 are permitted.

```
                    TCP Parameters

     Parameter                        Current Value

1. Maximum number of retransmissions  0x1E
2. User to TCP data mailbox           0x1
3. IP to TCP data mailbox             0x2









(ESC to return to previous menu)
Enter selection:
```

Figure 2-17 TCP Parameters Menu for the CS/1 and CS/100 with TCP/IP

2.3.5 TCP/IP User Interface Parameters

The User Interface Parameters menu for the CS/1 and CS/100 running TCP/IP protocols is identical to the XNS version. See Section 2.2.5 for explanations of this menu and how to alter privilege levels on User Interface submenus.

2.3.6 TCP/IP Virtual Terminal Parameters

The Virtual Terminal Service supports TTY-like terminals and TTY hosts. This service is described in the *Software Technical Reference Manual, Volume Two.*

This section describes the Virtual Terminal parameters that can be adjusted during system generation on a TCP/IP network. Figure 2-18 shows the Virtual Terminal Parameters menu for the CS/1 and CS/100 running TCP/IP protocols.

The Virtual Terminal parameters are explained below:

1. **Mailbox depth to TCP.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and each Telnet (TN) process. Hexadecimal values 1 through 3 are permitted. However, 1 is the only recommended value and should not be changed.

2. **Mailbox depth to agent.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and the SIO agent process. Hexadecimal values 1 through 3 are permitted.

3. **Autolisten timer(min).** This parameter specifies the number of minutes after which an unconnected terminal port changes from Command Mode to Listening Mode. This interval begins at the time the attached device is reset or powered on, or at the time of the most recent data transfer to or from the device. Hexadecimal values 0 through 3E80 are permitted. Specifying 0 disables the timer. This parameter is not applicable to the program interface.

```
                Virtual Terminal Parameters

     Parameters                      Current Value

1. Mailbox depth to TCP                   0x1
2. Mailbox depth to agent                 0x1
3. Autolisten timer(min)                  0xF




(ESC to return to previous menu)
Enter selection:
```

Figure 2-18 Virtual Terminal Parameters Menu for the CS/1 and CS/100 with TCP/IP

2.3.7 Statistics Monitor Parameters

The Statistics Monitor menu for the CS/1 and CS/100 running TCP/IP protocols is identical to the XNS version. See Section 2.2.7 for details.

2.3.8 Service Listener Well Known Ports

The Service Listener Well Known Ports menu enables the network manager to add user-defined service ports to the TCP/IP interface. Figure 2-19 shows this menu for the CS/1 and CS/100.

Option 1 is the Telnet service listener port, and option 2 is the Rlogin service listener port. These port numbers are provided by default and cannot be changed. The last option can be used to add or delete user-defined services as necessary. The assigned service listener ports can be found in *Assigned Numbers* (reference [12]).

Up to eight service ports, in addition to Telnet and Rlogin, are allowed on this menu. These service ports can be used to export the TCP interface to a serial line. The host can bind a process to that line to accept incoming data units from the active side of the particular service and generate appropriate responses for the service protocol.

Service ports are available only on the passive end of a connection. The remote service cannot be selected when making a connection from a terminal attached to a CS/1; only the Telnet service is available.

```
        Service Listener Well Known Ports

1.     23(  17)
2.    513( 201)
3.   (Add new service here)









(ESC to return to previous menu)
Enter selection:
```

Figure 2-19 Service Listener Well Known Ports Menu

2.4 CS/1-HSM

The CS/1-HSM provides up to 64 virtual ports to a DEC™ host with UNIBUS™ interfaces over one or two high-speed, multiplexed lines. The CS/1-HSM runs XNS protocols and is similar to the CS/1 with XNS described in Section 2.2.

System generation for the CS/1-HSM includes both mandatory and optional parameters. This section describes the Sysgen menus and parameters that are used to configure the CS/1-HSM and indicates parameters that the network manager must configure.

After performing the system generation procedures described below, the network manager must also run the host installation program for each Host Adaptor Card (HAC) installed. Refer to the *Series/1 Installation Guide* for a description of the host installation program.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-20 shows the paths of the Sysgen menus for the CS/1-HSM.

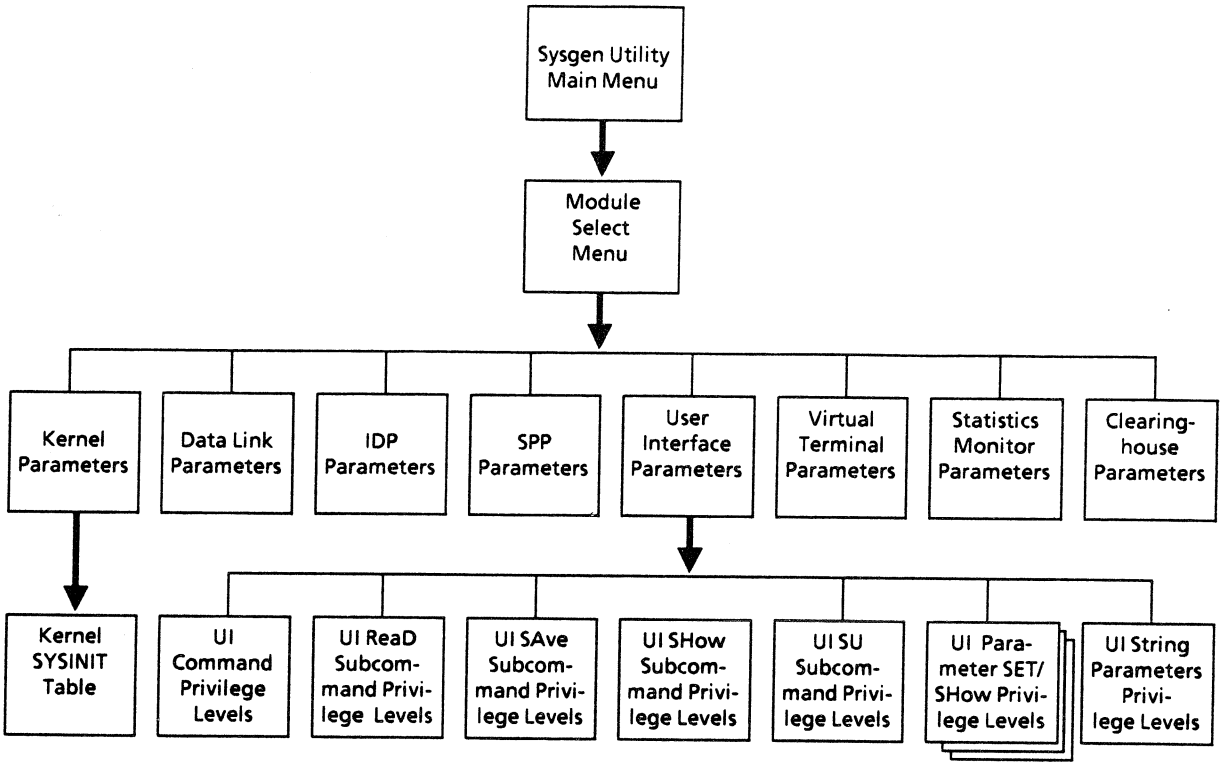


Figure 2-20 CS/1-HSM Sysgen Menus

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. The Module Select Menu for the CS/1-HSM is the same as for the CS/1 described in Section 2.2. This menu appears in Figure 2-2.

In most installations, unless special installation-dependent requirements exist, no system generation parameters should be changed except the User Interface Parameters and Clearinghouse Parameters. These parameters are described in detail in sections 2.2.5 and 2.2.8.

Almost all CS/1-HSM Sysgen menus are the same as those for the CS/1 running XNS protocols, although the HSM menus may display different defaults and permit slightly different ranges of values to be specified. For menus that are similar, Table 2-1 refers to the appropriate manual sections. The only menu with significant differences is the Virtual Terminal Parameters menu, discussed following the table.

Table 2-1 Locating HSM Sysgen Menu Descriptions

CS/1-HSM Menu	*Similar to*	*Where Described*
Kernel Parameters	CS/1 TCP/IP	2.3.1
Data Link Parameters	CS/1 XNS	2.2.2
IDP Parameters	CS/1 XNS	2.2.3
SPP Parameters	CS/1 XNS	2.2.4
User Interface Parameters	CS/1 XNS	2.2.5
Virtual Terminal Parameters	—	2.4
Statistics Monitor Parameters	CS/1 XNS	2.2.7
Clearinghouse Parameters	CS/1 XNS	2.2.8

CS/1-HSM Virtual Terminal Parameters

The Virtual Terminal Service supports TTY-like terminals and TTY hosts. This service is described in the *Software Technical Reference Manual, Volume Two.*

This section describes the Virtual Terminal parameters that can be adjusted during system generation. Figure 2-21 shows the Virtual Terminal Parameters menu for the CS/1-HSM.

```
                Virtual Terminal Parameters

     Parameter                          Current Value

 1. Mailbox depth to SPP                    0x1
 2. Mailbox depth to agent                  0x1
 3. HSM 1, Base port ID                     0x20
 4. HSM 1, Number of ports                  0x40
 5. HSM 1, Break character 0=Spaceline      0x0
 6. HSM 2, Base port ID                     0x0
 7. HSM 2, Number of ports                  0x0
 8. HSM 2, Break character 0=Spaceline      0x0
 9. Autolisten timer(min)                   0xF




(ESC to return to previous menu)
Enter selection:
```

Figure 2-21 CS/1-HSM Virtual Terminal Parameters Menu

This menu displays several parameters that are unique to the HSM configuration. These parameters appear twice, once for each possible HSM board in the unit. The CS/1-HSM Virtual Terminal parameters are explained below:

1. **Mailbox depth to SPP.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and each SPP process. Hexadecimal values 1 through 3 are permitted.

2. **Mailbox depth to agent.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and the SIO agent process. Hexadecimal values 1 through 3 are permitted.

3. **HSM 1, Base port ID.** These parameters (menu options 3 and 6) specify the lowest number in the range of virtual port numbers accessed through each board. Hexadecimal values 20 through 5F are permitted. If two HSM boards are present, a base port ID must be specified for each board; if only one HSM board is present, the base port ID must be specified for that board, and the second base port ID and number of ports must be set to zero.

4. **HSM 1, Number of ports.** These parameters (menu options 4 and 7) specify how many virtual ports are assigned to each board. Hexadecimal values 0 through 40 are permitted.

   By default, all 64 (decimal) virtual ports are assigned to the first HSM board. If the server contains two HSM boards, this parameter must be configured: the number of ports specified for each board must correspond to the number of ports specified for the Host Adapter Cards (HACs) when they were installed. HAC ports are specified in units, 1 unit representing 8 ports. For example, if 6 units were specified for the first HAC and 2 units were specified for the second HAC, then 48 ports must be specified for the first HSM board and 16 ports must be specified for the second HSM. See the *Series/1 Installation Guide* for a description of HAC board installation.

5. **HSM 1, Break character 0=Spaceline.** These parameters (menu options 5 and 8) determine how breaks are sent to the host. Hexadecimal values 0 through FF are permitted. The values 1 through FF correspond to the ASCII character set. If this parameter is set to 0, the CS/1-HSM sends the host a null character with a framing error when a break signal is received from the terminal. If this parameter is set to a hexadecimal value within the range 1 through FF, the CS/1-HSM sends the host the specified ASCII character when a break signal is received from the terminal.

   If the CS/1-HSM is connected to a VAX™ running VMS™, this parameter should be set to 0x19 (the <CTRL-Y> character).

6. **HSM 2, Base port ID.** See option 3 above.

7. **HSM 2, Number of ports.** See option 4 above.

8. **HSM 2, Break character 0=Spaceline.** See option 5 above.

9. **Autolisten timer(min).** This parameter specifies the number of minutes after which a port changes from Command Mode to Listening Mode. This interval begins at the time the attached device is reset or powered on, or at the time of the most recent data transfer to or from the device. Hexadecimal values 0 through 3E80 are permitted. Specifying 0 disables the timer. This parameter is not applicable to the program interface.

2.5 CS/200

The CS/200 running XNS protocols offers interface variations that support asynchronous, byte-synchronous, and bit-synchronous communications devices; the CS/200 running TCP/IP protocols offers asynchronous and bisynchronous interfaces.

The CS/200 running XNS protocols boots from an NCS. System generation is only possible on the NCS/1. The CS/200 is shipped with defaults that are appropriate for any standard installation; system generation should not be necessary.

**** NOTE ****

System generation is not available for the CS/200 running TCP/IP protocols.

The Sysgen parameters and default values for the CS/200 running XNS protocols are the same as for the CS/1 running XNS protocols. To perform CS/200 system generation, refer to Section 2.2, which describes CS/1 system generation.

2.6 IVECS

The Integrated VAX Ethernet Communications Server (IVECS) boots from an NCS. System generation is only possible on the NCS/1 and only for the IVECS running XNS protocols. The IVECS is shipped with defaults that are appropriate for any standard installation; system generation should not be necessary.

The Sysgen parameters and default values for the IVECS running XNS protocols are the same as for the CS/1 running XNS protocols. To perform IVECS system generation, refer to Section 2.2, which describes CS/1 system generation.

2.7 CS/1-SNA Running XNS or TCP/IP Protocols

The CS/1-SNA provides an interface to an SNA host. It enables asynchronous devices, communicating across the network, to appear to the host as 3278/3287-type devices. Actual 3278/3287-type devices and terminal emulators (e.g., PCs running EtherTerm) can also communicate with the host through the CS/1-SNA. This section describes the Sysgen menus and parameters used to configure the CS/1-SNA running either XNS or TCP/IP protocols.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software and the SNA protocol requirements.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-22 shows the paths of the Sysgen menus unique to the CS/1-SNA.

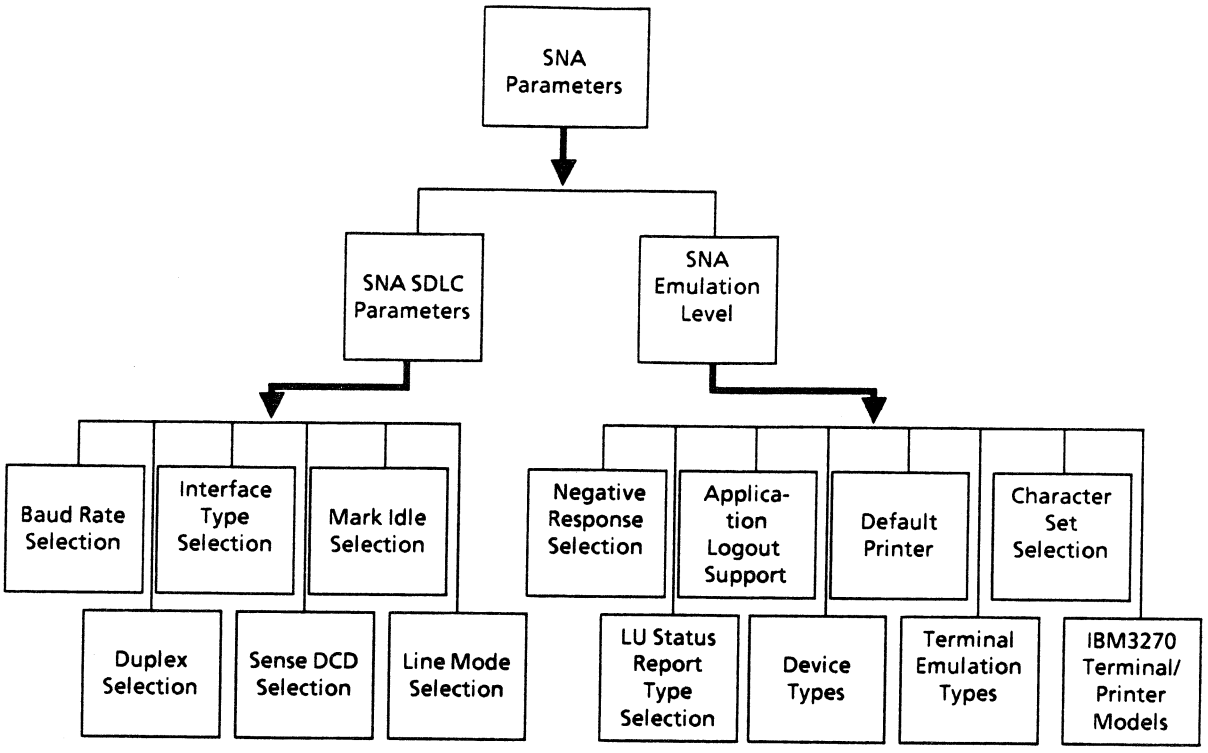


Figure 2-22 CS/1-SNA Sysgen Menus

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. The first eight menus listed on the CS/1-SNA Module Select Menu are the same as those for the CS/1 running the same protocols (XNS or TCP/IP). For information about the parameters and default values on the first eight menus, refer to sections 2.2 and 2.3, which describe CS/1 system generation.

When option 9 is selected on the Module Select Menu, the Sysgen program displays the SNA Parameters menu, which is unique to CS/1-SNA system generation. The SNA Parameters menu and its submenus are discussed in detail below.

2.7.1 SNA Parameters

The SNA Parameters menu and submenus are used to define the interface between the CS/1-SNA and the host's communications processor.

The default values of many parameters are factory set and need not be specified unless a different value is required; other parameter values must be specified.

The network manager or host system administrator must also run the host system generation procedure to specify appropriate values on the host side. For further information on SNA host system generation, see the *SNA Support Guide*.

The SNA Parameters menu displays the following options:

```
1. SDLC level Parameters
2. SNA emulation level Parameters
```

Each of these options branches to a series of submenus. These submenus are described in the following sections.

2.7.2 SNA SDLC Level Parameters

This section describes the SNA Synchronous Data Link Control (SDLC) parameters and submenus for both the XNS and TCP/IP versions of the CS/1-SNA. These parameters define the link-level characteristics of the interface. Figure 2-23 shows the SNA SDLC Parameters menu. The SNA SDLC parameters are explained below:

1. **Station Address.** This parameter specifies the SDLC station address of each link between the CS/1-SNA and the host communications processor. The parameter value must be a hexadecimal number in the range 0 through FE and must match the address specified by the host communications processor. The default is C1.

2. **SDLC Window size.** This parameter specifies the maximum permitted number of outstanding unacknowledged SDLC frames. This value must match the window size specified by the host. Hexadecimal values 1 through 7 are permitted. The default is 7.

3. **Maximum SDLC Frame size.** This parameter specifies the maximum size, in bytes, of an SDLC frame. The size includes the SDLC header, the transmission header (TH), the request/response header (RH), and the request/response unit (RU). The value must match the maximum frame size specified by the host. It is factory set to 10B, which is appropriate for most applications. If this value needs to be altered, call Bridge Communications or an authorized representative.

```
                    SNA SDLC Parameters

      Parameter                    Current Value

 1. Station Address                    0xC1
 2. SDLC Window size                   0x7
 3. Maximum SDLC Frame size            0x10B
 4. Number of Devices                  0x10
 5. Exchange ID                        0x92976
 6. Baud rate                          4800
 7. Duplex selection                   Half Duplex
 8. Interface type selection           DTE
 9. Sense DCD selection                ON
 A. Mark idle selection                ON
 B. Line mode selection                Switched Line




(ESC to return to previous menu)
Enter selection:
```

Figure 2-23 SNA SDLC Parameters Menu

4. **Number of Devices.** This parameter specifies the maximum number of Logical Units (LUs) supported by the CS/1-SNA. (In this sense, "devices" can also mean sessions.) The specified value determines the number of virtual ports available for the CS/1-SNA. The value must be equal to or less than the maximum number of LUs specified by the host. Hexadecimal values 1 through 18 are permitted.

   For servers supporting IBM 3278 terminal emulation, the Number of Devices parameter has certain hardware dependencies. The number of devices (LUs) available for regular- and wide-screen 3278-type terminal emulation is determined by the server's EC board type and the amount of onboard memory. These dependencies are summarized below:

   - For a CS/1-SNA either with an EC/1 or with an EC/2 that provides 256 kbytes of memory, the maximum number of LUs for IBM 3278 model-5 (wide screen) emulation is 12 (decimal). The maximum number of LUs for IBM 3278 model-2 (regular screen) emulation is 24 (decimal).
   - For a CS/1-SNA with an EC/2 that provides 512 kbytes of memory, the maximum number of LUs for both model-5 and model-2 emulation is 24 decimal. (The MCPU board must have M1MMON PROMs Revision 01K or later, and the EC/2 board must have MOEDL2 PROMs Revision 01A or later.)

The IBM 3278 emulation types are configured with the IBM3270 Terminal/Printer Model parameter, discussed later in this section.

5. **Exchange ID.** This parameter specifies the value of the third field of the CS/1-SNA's Exchange ID (XID). It must comprise 5 hexadecimal digits.

   An XID is a 12-digit hexadecimal number that identifies the terminal cluster to the host. The XID consists of three fields; only the third field can be specified. The first field (4 digits) identifies the physical unit type; PU type 2 (0x0200) is the only value currently supported. The second field (3 digits) specifies that the CS/1-SNA emulates a 3274 cluster controller (0x017). The third field (5 digits) is a unique ID assigned to this CS/1-SNA. The entire Exchange ID must match the XID specified for the CS/1-SNA by the host's Network Control Program (NCP). Therefore, the network manager must coordinate XID assignment with the person responsible for NCP system generation.

   This parameter need not be specified if the CS/1-SNA is directly connected to the 3705 or 3725; it applies only to switched or leased lines.

6. **Baud rate.** This parameter determines the speed of the link between the CS/1-SNA and the host. It branches to the Baud Rate Selection menu, shown in Figure 2-24. To change the baud rate, select the option number corresponding to the desired rate on the Baud Rate Selection menu. This parameter applies only if the receive clock and transmit clock are set to internal on the CS/1-SNA.

7. **Duplex selection.** This parameter determines whether the link is full duplex or half duplex. It branches to the Duplex Selection menu, which lists the following options:

   ```
   0. Full Duplex

   1. Half Duplex
   ```

   For a Bell 212-type interface, set duplex to full; for a Bell 208-type interface, set duplex to half.

   This parameter can be changed by setting the Line Mode parameter as shown in Table 2-2. The default is half duplex for switched lines and full duplex for leased lines and direct connections. To override the default combination, first set Line Mode appropriately and then set the duplex parameter to the desired value.

```
                        Baud Rate Selection


0. 110 baud       1. 134.5 baud     2. 150 baud       3. 200 baud

4. 300 baud       5. 600 baud       6. 1200 baud      7. 1800 baud

8. 2400 baud      9. 3600 baud      A. 4800 baud      B. 7200 baud

C. 9600 baud      D. 19.2 kbaud     E. 38  kbaud     F. 56  kbaud




(ESC to return to previous menu)
Enter selection:
```

Figure 2-24 CS/1-SNA Baud Rate Selection Menu

8. **Interface type selection.** This parameter determines whether the CS/1-SNA functions as Data Terminal Equipment (DTE) or as Data Communications Equipment (DCE). It branches to the Interface Type Selection menu, which displays the following options:

   0. DTE

   1. DCE

   This parameter can be changed by setting the Line Mode parameter as shown in Table 2-2. The default value is DTE for switched or leased lines and DCE for direct connection. If the parameter is set to DCE, the connector cable must be a synchronous host cable rather than the standard synchronous modem cable. To override the default combination, first set Line Mode appropriately and then set Interface Type to the desired value. This parameter does not change the electrical interface but instead changes the way that the software operates with the electrical interface.

9. **Sense DCD selection.** This parameter determines the function of the Data Carrier Detect (DCD) line (pin 8) on the RS-232 interface. It branches to the Sense DCD Selection menu, which displays the following options:

```
0. OFF

1. ON
```

Select 1 to enable DCD; 0 to disable it. The parameter value can be changed by the setting of the Line Mode parameter as shown in Table 2-2, and the parameter function is affected by the settings of the Duplex and Interface Type parameters as shown in Table 2-3.

The default value of the Sense DCD parameter is ON for switched lines and OFF for direct connections and leased lines. To override the default combination, first set Line Mode appropriately and then set Sense DCD to the desired value.

A. **Mark idle selection.** This parameter determines whether an idle line is in mark state or sync state. It branches to the Mark Idle Selection menu, which displays the following options:

```
0. OFF

1. ON
```

Select 1 (ON) for mark state; 0 (OFF) for sync state. This parameter can be changed by the setting of the Line Mode parameter as shown in Table 2-2. The default value is ON for switched lines, leased lines, and direct connections. To override the default combination, first set Line Mode appropriately and then set Mark Idle to OFF.

B. **Line mode selection.** This parameter specifies whether the line is a switched line, a leased line, or a direct connection. It branches to the Line Mode Selection menu, which displays the following options:

```
0. Direct Connect

1. Leased Line

2. Switched Line
```

The default value is switched line. Changing the value of this parameter automatically changes the values of the Duplex, Interface Type, Sense DCD, and Mark Idle parameters. Table 2-2 illustrates the effect of Line Mode on these other parameters.

Table 2-3 summarizes the interaction among three SNA SDLC parameters: sense DCD, duplexing, and interface type.

Table 2-2 Effect of Line Mode on Other Parameters

	Switched Line	*Leased Line*	*Direct Connect*
Duplex	Half	Full	Full
Interface Type	DTE *	DTE *	DCE **
Sense DCD	ON	OFF	OFF
Mark Idle	ON	ON	ON

* Requires use of synchronous modem cable (CBL-SM-25).
** Requires use of synchronous host cable (CBL-SH-25).

Table 2-3 Interaction Among Sense DCD, Duplex, and Interface Type Parameters

Case	*Sense DCD*	*Duplex*	*Interface Type*	*Result*
1	ON	Full	DTE	The SIO firmware uses DCD to place the receiver in and out of hunt phase. DCD is on pin 8 on an SIO-SM board and on pin 20 on an SIO-ST board or a CS/100.
2	ON	Full	DCE	The SIO firmware uses RTS to place the receiver in and out of hunt phase. RTS is on pin 5 on an SIO-SM board and on pin 4 on an SIO-ST board or a CS/100.
3	ON	Half	DTE	The SIO firmware uses DCD to place the receiver in and out of hunt phase. DCD is also used to condition transmission; when DCD is true, transmission is inhibited. In this configuration, the DCE device must toggle DCD. DCD is on pin 8 on an SIO-SM board and on pin 20 on an SIO-ST board or a CS/100.
4	ON	Half	DCE	The SIO firmware uses RTS to place the receiver in and out of hunt phase. RTS is also used to condition transmission; when RTS is true, transmission is inhibited. In this configuration, the DCE device must toggle RTS. RTS is on pin 5 on an SIO-SM board and on pin 4 on an SIO-ST board or a CS/100.
5	OFF	Full	DTE	The SIO firmware ignores DCD. DCD is on pin 8 on an SIO-SM board and on pin 20 on an SIO-ST board or a CS/100.
6	OFF	Full	DCE	The SIO firmware ignores RTS. CTS is constant. RTS is on pin 5 on an SIO-SM board and on pin 4 on an SIO-ST board or a CS/100. CTS is on pin 4 on an SIO-SM board and on pin 5 on an SIO-ST board or a CS/100.
7	OFF	Half	DTE	RTS is toggled by the SIO firmware at line turnaround points and transmission waits for CTS. RTS is on pin 4 on an SIO-SM board and on pin 5 on an SIO-ST board or a CS/100.
8	OFF	Half	DCE	DCD is toggled by the SIO firmware at line turnaround points. RTS is on pin 20 on an SIO-SM board and on pin 8 on an SIO-ST board or a CS/100.

2.7.3 SNA Emulation Level Parameters

This section describes the SNA Emulation Level parameters and submenus for both the XNS and TCP/IP versions of the CS/1-SNA. Figure 2-25 shows the SNA Emulation Level menu.

```
                    SNA Emulation Level Menu


1. Negative Response selection          No Response

2. LU status Report type selection      LUSTAT

3. Host application logout support      SUPPORT

4. Device Types

5. Default printers

6. Terminal emulation type

7. CS1-SNA banner message

8. Character Set Selection

9. IBM3270 Terminal/Printer Model

Enter selection:
```

Figure 2-25 SNA Emulation Level Menu

The SNA protocol interface is defined by the following three parameters:

1. **Negative Response selection.** This parameter specifies how the CS/1-SNA responds negatively to an activate message from the host. The host may expect no response or may expect a negative response plus sense code 8004 (illegal destination address field).

   This parameter branches to the Negative Response Selection menu, which displays the following options:

   ```
   0. No Response

   1. 8004
   ```

   Specify the negative response expected by the host.

2. **LU status report type selection.** This parameter specifies which data-flow control request is sent by the CS/1-SNA, LUSTAT or NOTIFY. This parameter branches to the LU Status Report Type Selection menu, which displays the following:

   ```
   0. LUSTAT

   1. NOTIFY
   ```

   Select 0 to send LUSTAT to the host or 1 to send NOTIFY to the host when the terminal is up during the SSCP-LU session. This parameter should be set to comply with the host application.

3. **Host application logout support.** This parameter specifies whether or not the CS/1 performs the application logout for the terminal port when the port is disconnected before the terminal user logs out of the host. It branches to the Application Logout Support Selection menu, which displays the following options:

   ```
   0. NOSUPPORT

   1. SUPPORT
   ```

   Select 0 to depend on the host's timeout mechanism to terminate the session; select 1 to have the server log out.

4. **Device Types.** This parameter specifies the device type (terminal or printer) of each logical unit (LU) included in the Number of Devices parameter value. It branches to the Device Types menu, shown in Figure 2-26.

   To change a device type, first specify its number. Specifying the number of a device designated as Disabled displays an error message. Specifying any other device number displays the following prompt:

   ```
   Enter device type: (0: SCREEN 1: PRINTER)
   ```

   Enter 0 to specify Screen or 1 to specify Printer. The new device type displays on the menu next to the device number.

By default, devices 2 and 3 are Printer LUs and the remainder are Screen LUs (terminals). The menu has 24 fields; if fewer than 24 devices are specified by the Number of Devices parameter, the program automatically sets the device type of any LU not present to Disabled.

```
                              Device Types

 0. SCREEN        1. SCREEN        2. PRINTER       3. PRINTER
 4. SCREEN        5. SCREEN        6. SCREEN        7. SCREEN
 8. SCREEN        9. SCREEN       10. SCREEN       11. SCREEN
12. SCREEN       13. SCREEN       14. SCREEN       15. SCREEN
16. DISABLED     17. DISABLED     18. DISABLED     19. DISABLED
20. DISABLED     21. DISABLED     22. DISABLED     23. DISABLED




(ESC to return to previous menu)
Enter device number (in decimal):
```

Figure 2-26 SNA Device Types Menu

5. **Default printers.** This parameter associates a Printer LU with one or more Screen LUs (terminals). When a terminal user sends a "Print Screen", the output goes to the associated printer. This menu branches to the Default Printer menu, shown in Figure 2-27.

   If some printers were specified for the Device Types parameter, they appear as N/A on this menu. If fewer than 24 devices were specified, DISABLED appears opposite the unused port numbers. Devices designated N/A and Disabled cannot be assigned a default Printer. For each Screen defined on the Device Types menu, the user can specify an associated Printer. A single Printer can be associated with more than one Screen.

   To associate a Printer with a Screen device type, first enter the device number that appears on the Default Printer menu; then enter the decimal number of the Printer. By default, Printer 2 is associated with Screen 0, and Printer 3 is associated with Screen 1.

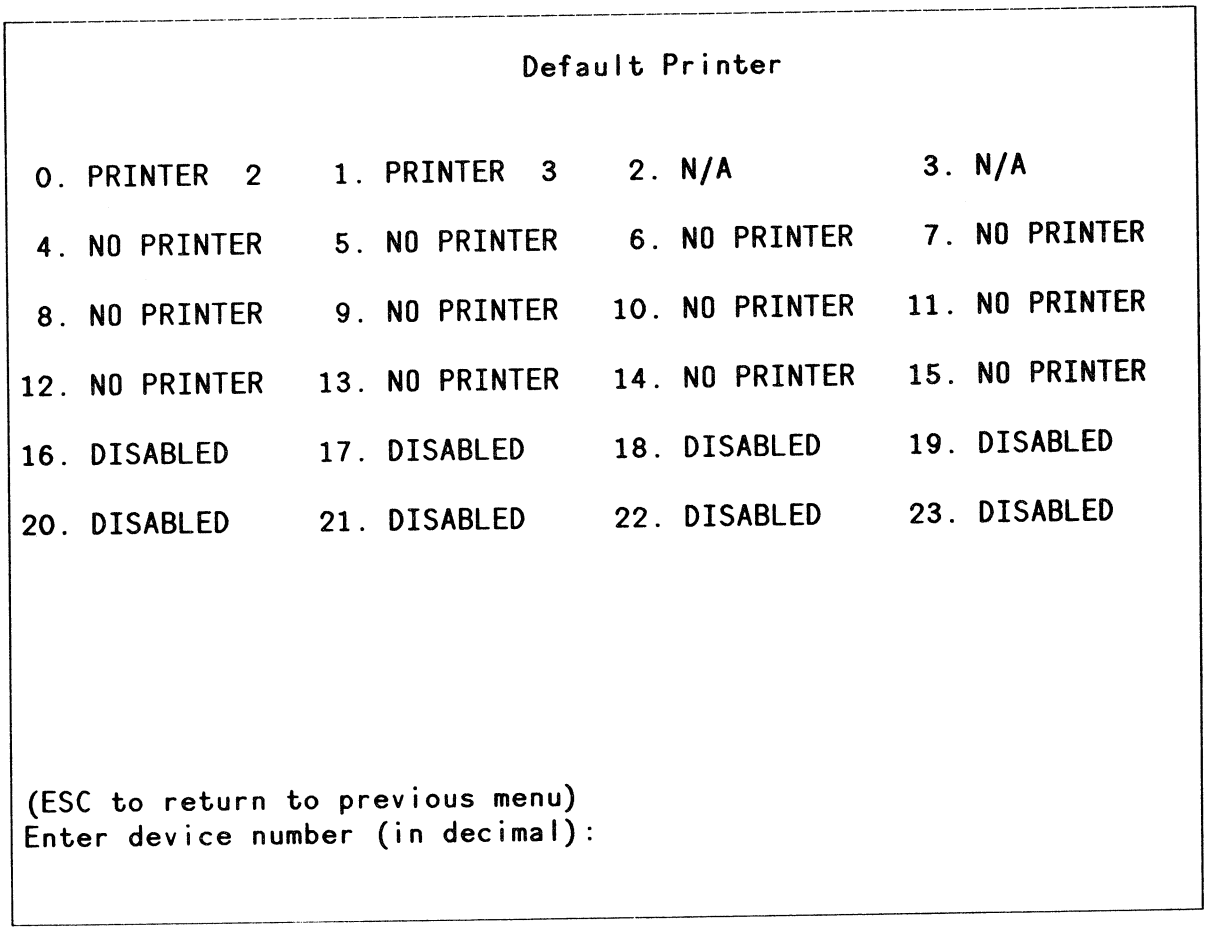


Figure 2-27 Default Printer Menu

6. **Terminal emulation type.** This parameter specifies the type of terminal used on a port. It branches to the Terminal Emulation Types menu. The 24 options on this menu correspond to the maximum number of ports supported by the CS/1. If some printers were specified for the Device Types parameter, they appear as N/A on this menu. If fewer than 24 devices were specified, DISABLED appears opposite the unused port numbers. The message NODEFAULT indicates terminal ports, which can be configured with this menu.

   To specify a terminal type, enter the port number. A list of supported terminal types (and the message NODEFAULT) appears on the screen. Select the number opposite the appropriate terminal type for the port.

7. **CS1-SNA banner message.** This parameter allows the network manager to change the default CS/1 banner to an installation-unique message. The banner message can be up to 45 characters.

8. **Character Set Selection.** This parameter specifies the character set the CS/1 supports. It branches to the Character Set Selection menu, which displays the following options:

   ```
   0. U.S.A. Character Set

   1. Swedish Character Set

   2. Hebrew Character Set

   3. Japanese Character Set
   ```

   Only U.S.A. and Swedish are currently supported. When a character set is selected, the CS/1-SNA is configured to recognize that character set, although no message appears to indicate the selection.

9. **IBM3270 Terminal/Printer Model.** This parameter specifies whether a regular-screen terminal, a wide-screen terminal, or a printer is associated with each CS/1-SNA virtual port. To specify regular screen, enter IBM3278M2; to specify wide-screen, enter IBM3278M5; to specify a printer, enter IBM3278M1.

   Choosing all regular-screen or all wide-screen terminals affects session (LU) availability for some servers, depending on the amount of onboard memory. For a summary of hardware dependencies, refer to the description of the Number of Devices parameter in this section.

2.8 CS/1-X.25

The CS/1-X.25 provides an interface to an X.25 host, multiplexing up to 48 virtual circuits on a single, high-speed line. It enables both asynchronous devices and other X.25 hosts to access the host through an XNS network. This section describes the Sysgen menus and parameters used to configure the CS/1-X.25.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software and the X.25 protocol requirements.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-28 shows the paths of the Sysgen menus for the CS/1-X.25.

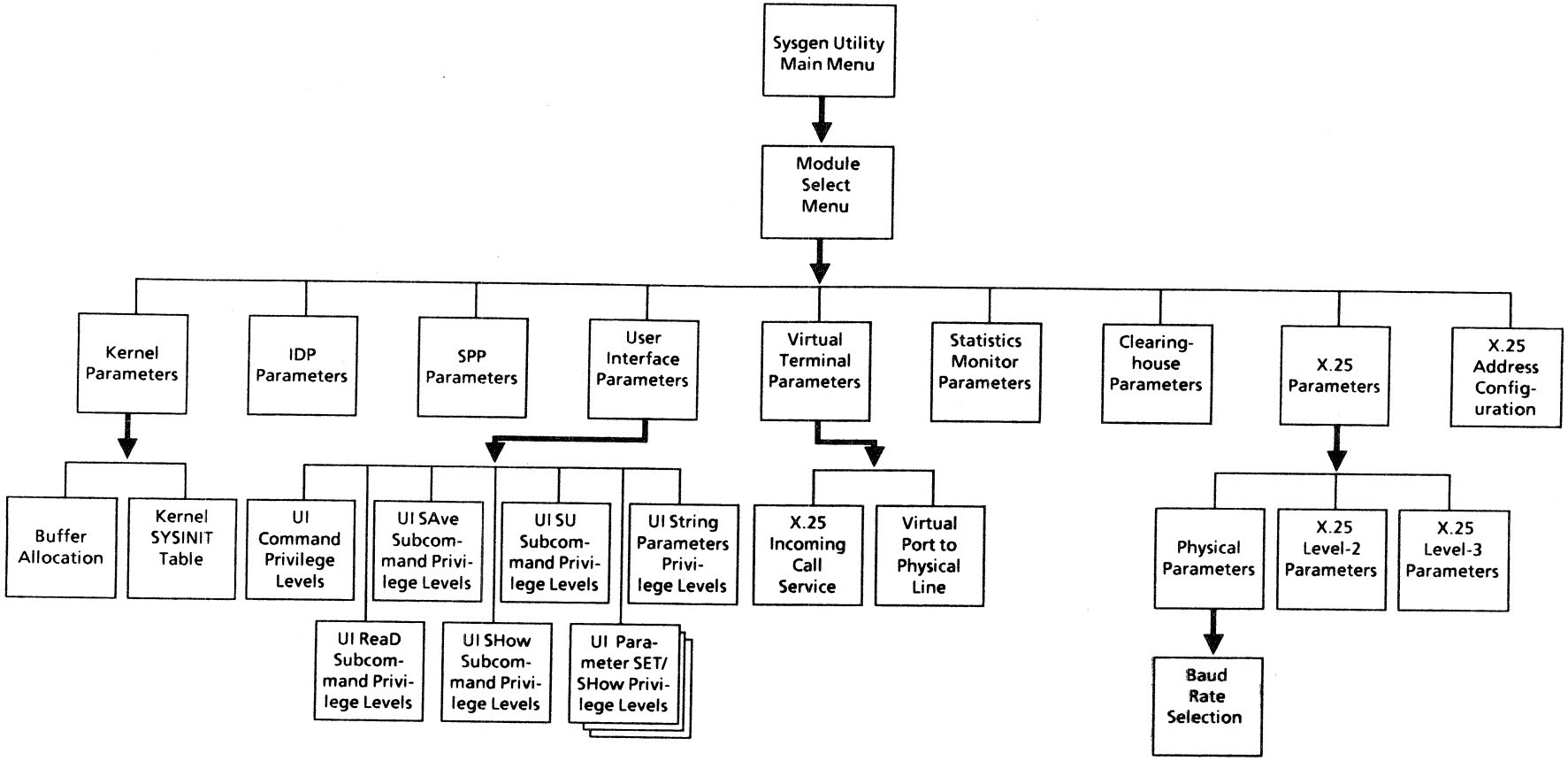


Figure 2-28 CS/1-X.25 Sysgen Menus

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. Figure 2-29 shows the Module Select Menu for the CS/1-X.25.

```
                    Module Select Menu

1. Kernel Parameters

2. IDP Parameters

3. SPP Parameters

4. User Interface Parameters

5. Virtual Terminal Parameters

6. Statistics Monitoring Parameters

7. Clearinghouse Parameters

8. X.25 Parameters

9. X.25 Address Configuration


(ESC to return to main menu)
Select module:
```

Figure 2-29 CS/1-X.25 Module Select Menu

Some CS/1-X.25 Sysgen menus are the same as those for the CS/1 with XNS. Where menus are the same, the following sections refer to the sections of this guide that describe the menus. Parameters and menus that are unique to the CS/1-X.25 are described in detail.

2.8.1 CS/1-X.25 Kernel Parameters

The kernel provides resource management services for the server software. These services are detailed in the *Software Technical Reference Manual, Volume One.*

Figure 2-30 shows the Kernel Parameters menu for the CS/1-X.25.

```
                    Kernel Parameters

     Parameter                      Current Value

1. Max. no. of processes                0x89
2. Max. no. of mailboxes                0x1AB
3. End of text & data memory            0x40592

    Kernel Submenus

4. View/Modify Buffer Allocation
5. View/Modify SYSINIT Table




(ESC to return to previous menu)
Enter selection:
```

Figure 2-30 CS/1-X.25 Kernel Parameters Menu

**** CAUTION ****

Do not modify any of the kernel parameters.

The Kernel parameters are described below.

1. **Max. no. of processes.** This parameter specifies the maximum number of kernel processes that can be created at any one time.
2. **Max. no. of mailboxes.** This parameter specifies the maximum number of mailboxes that can be created at any one time.

3. **End of text & data memory.** This parameter specifies the last byte in memory occupied by the system software.

4. **View/Modify Buffer Allocation.** This option branches to a submenu listing buffers in private and shared memory. This submenu allows the system programmer to view the quantity and sizes of buffers in memory. The buffer allocation submenu is shown in Figure 2-31.

5. **View/Modify SYSINIT Table.** This option branches to the Kernel SYSINIT Table submenu, which allows the system programmer to view processes in the SYSINIT table. The SYSINIT table lists all processes that the kernel must create during system initialization.

**** CAUTION ****

Do not try to use the Kernel SYSINIT Table submenu to add or change processes.

```
    Buffers in Private and Shared Memory

In Private Memory
 1. There are 0x12C     0x1C  byte buffers
 2. There are 0x177     0x30  byte buffers
 3. There are 0xA       0x3E  byte buffers
 4. There are 0x34      0x60  byte buffers
 5. There are 0x30      0x8C  byte buffers
 6. There are 0x31      0xA8  byte buffers
 7. There are 0x9       0x15E byte buffers
 8. There are 0x13      0x2BC byte buffers
 9. There are 0x5       0xF60 byte buffers

In Shared Memory
 A. There are 0x241     0x28  byte buffers
 B. There are 0x190     0xC0  byte buffers
 C. There are 0x6       0x202 byte buffers
 D. There are 0x4       0x250 byte buffers
 E. There are 0x4       0xF60 byte buffers

(ESC to return to previous menu)
Enter selection:
```

Figure 2-31 CS/1-X.25 Buffer Allocation Menu

2.8.2 CS/1-X.25 IDP/XDG Parameters

The Internetwork Datagram Protocol (IDP) transmits datagrams to an addressable destination, which can be another network. This section describes the IDP and X.25 Datagram Translator (XDG) parameters that can be adjusted during system generation. Figure 2-32 shows the IDP/XDG Parameters menu for the CS/1-X.25.

The IDP and XDG parameters are explained below. All values are expressed in hexadecimal.

1. **Mailbox depth level 0.** At system initialization, IDP creates two mailboxes: a data mailbox for receipt of incoming packets (level 0) and a data mailbox for receipt of outgoing packets (level 2). This parameter specifies the depth of the mailbox in which IDP receives data from the network. Hexadecimal values 8 through C are permitted.

2. **Mailbox depth level 2.** This parameter specifies the depth of the mailbox in which IDP receives data from its level 2 client. Hexadecimal values 8 through C are permitted.

3. **Max. no. sockets.** This parameter specifies the maximum number of sockets that can be established at the request of client processes. Hexadecimal values C through 38 are permitted.

4. **Software packet checksum on/off.** The setting of the checksum option determines whether or not IDP generates a checksum on each IDP packet transmitted to a Level-0 protocol. Specify 1 to include a checksum; 0 not to include it. Regardless of the setting of this parameter, IDP verifies the checksum (if any) on IDP packets received from a Level-0 protocol.

5. **XDG timeout timer(min).** This parameter does not affect the CS/1-X.25.

```
                    IDP/XDG Parameters

     Parameter                      Current Value

 1. Mailbox depth level 0                0xC
 2. Mailbox depth level 2                0xC
 3. Max. no. sockets                     0x38
 4. Software packet checksum on/off      0x0
 5. XDG timeout timer(min)               0x5









(ESC to return to previous menu)
Enter selection:
```

Figure 2-32 CS/1-X.25 IDP/XDG Parameters Menu

2.8.3 CS/1-X.25 SPP/RIP Parameters

This section describes the system generation parameters that apply to the Sequenced Packet Protocol (SPP) and Routing Information Protocol (RIP). Figure 2-33 shows the SPP/RIP Parameters menu for the CS/1-X.25.

The default minimum and maximum receive window sizes are optimized for terminal-to-host applications and can be adjusted to increase throughput for other applications (e.g., host-to-host file transfer). However, if window size is increased, the system requires more buffers. See the *Software Technical Reference Manual, Volume One,* for information on allocating buffers.

The SPP parameters are explained below. All values are expressed in hexadecimal.

1. **Min. rec. window.** This parameter specifies the minimum size of the receive window. The window determines the number of unacknowledged packets that the other end of a connection can send. Hexadecimal values 2 through 4 are permitted.

2. **Max. rec. window.** This parameter specifies the maximum size of the receive window. Hexadecimal values 2 through 16 are permitted.

3. **Max. no. retransmits.** This parameter specifies the maximum number of times SPP retransmits a packet to the destination socket. When the maximum number is reached, SPP assumes the other socket is no longer operational and aborts the session. Hexadecimal values 2 through A are permitted.

4. **Max. no. probes.** This parameter specifies the maximum number of times SPP sends a probe to the destination socket without receiving an acknowledgement. Probes are system packets with the Send Acknowledgement bit set. When the maximum number is reached, SPP assumes the other socket is no longer operational and aborts the session. Hexadecimal values 2 through A are permitted.

5. **User to SPP data mailbox.** This parameter specifies the depth of the data mailbox used to receive data from the user. The default value of 1 is the only permissible value.

6. **IDP to SPP data mailbox.** This parameter specifies the depth of the data mailbox used to receive data from IDP. The default value of 2 is the only permissible value.

7. **Min. retransmit timeout.** This parameter specifies the minimum number of milliseconds between attempts to retransmit the oldest unacknowledged packet in the retransmit queue. Hexadecimal values 1388 through 4E20 are permitted.

8. **Max. retransmit timeout.** This parameter specifies the maximum number of milliseconds between attempts to retransmit the oldest unacknowledged packet in the retransmit queue. Hexadecimal values 2710 through 3A98 are permitted.

9. **Probe timeout.** This parameter specifies the number of milliseconds between probes. Hexadecimal values BB8 through 2710 are permitted.

A. **Init. connection timeout.** This parameter specifies the number of milliseconds between probes sent to establish a connection. Hexadecimal values 3E8 through 2710 are permitted.

B. **Max. no. SPP processes.** This parameter specifies the maximum number of SPP processes that Parent SPP can spawn. Hexadecimal values 8 through 12 are permitted.

```
                    SPP/RIP Parameters

     Parameter                        Current Value

 1. Min. rec. window                      0x3
 2. Max. rec. window                      0x3
 3. Max. no. retransmits                  0x5
 4. Max. no. probes                       0x5
 5. User to SPP data mailbox              0x1
 6. IDP to SPP data mailbox               0x2
 7. Min. retransmit timeout               0x3E8
 8. Max. retransmit timeout               0x3A98
 9. Probe timeout                         0x1388
 A. Init. connection timeout              0x3E8
 B. Max. no. SPP processes                0x30
 C. Mailbox limit init. connection        0x5
 D. Acknowledge timeout                   0x31
 E. RIP broadcast timer(min,0/disable)    0x1


(ESC to return to previous menu)
Enter selection:
```

Figure 2-33 CS/1-X.25 SPP/RIP Parameters Menu

C. **Mailbox limit init. connection.** This parameter specifies the depth of the mailbox used to receive a connection request from a user process or from the network. Hexadecimal values 3 through 6 are permitted.

D. **Acknowledge timeout.** This parameter specifies the number of milliseconds SPP waits before sending an acknowledgement in response to a Send Acknowledgement request. Rather than immediately creating a special packet for the acknowledgement, SPP waits for the specified interval to determine if the acknowledgement can be piggybacked on another packet destined for the requesting socket. Hexadecimal values 31 through 64 are permitted.

E. **RIP broadcast timer(min,0/disable).** This parameter does not affect the CS/1-X.25 but is configurable on a GS/1.

2.8.4 CS/1-X.25 User Interface Parameters

The User Interface Parameters menu for the CS/1-X.25 is the same as the CS/1 XNS version with the exception of one parameter, described below. For details about the User Interface Parameters menu, see Section 2.2.5.

The X.25 parameter that differs is shown below:

```
1. User Interface default buffer size  0x51
```

This parameter specifies the size of the buffer available to the User Interface. Hexadecimal values 50 through 80 are permitted.

2.8.5 CS/1-X.25 Virtual Terminal Parameters

The Virtual Terminal Service supports TTY-like terminals and TTY hosts. This service is described in the *Software Technical Reference Manual, Volume Two.*

This section describes the Virtual Terminal parameters that can be adjusted during system generation. Figure 2-34 shows the Virtual Terminal Parameters menu for the CS/1-X.25.

The Virtual Terminal parameters are explained below. All values are expressed in hexadecimal.

1. **Max. no. of sessions.** This parameter specifies the maximum number of simultaneous sessions available to a single virtual port. Hexadecimal values 8 through 40 are permitted.
2. **Mailbox depth to SPP.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and each SPP process. Hexadecimal values 1 through 3 are permitted.
3. **Mailbox depth to agent.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and the SIO agent process. Hexadecimal values 1 through 3 are permitted.
4. **MORE-Bit disable(0)/enable(1).** This parameter forces EOM on for outgoing connections from the CS/1-X.25. Hexadecimal values 0 and 1 are permitted. Specify 0 (disabled) if connections will be made to the CS/1-X.25 from CS/1s running software version 16500 or earlier.
5. **Autolisten timer(min).** This parameter specifies the number of minutes after which a port changes from Command Mode to Listening Mode. This interval begins at the time the attached device is reset or powered on, or at the time of the most recent data transfer to or from the device. Hexadecimal values 0 through 3E80 are permitted. Specifying 0 disables the timer. This parameter is not applicable to the program interface.

```
            Virtual Terminal Parameters

     Parameter                    Current Value

 1. Max. no. of sessions                0x30
 2. Mailbox depth to SPP                0x1
 3. Mailbox depth to agent              0x1
 4. MORE-Bit disable(0)/enable(1)       0x1
 5. Autolisten timer(min)               0xF
 6. Use PEP/BTP
 7. X.25 incoming call service
 8. Virtual port to physical line mapping




(ESC to return to previous menu)
Enter selection:
```

Figure 2-34 CS/1-X.25 Virtual Terminal Parameters Menu

6. **Use PEP/BTP.** The Packet Exchange Protocol (PEP or PXP) and Bridge Transaction Protocol (BTP) specify how requests for clearinghouse names and certain filenames are sent and how the responses are received. BTP allows more efficient data transfer; PEP is part of the original XNS protocol. This parameter is provided for compatibility with systems that do not support the BTP protocol. Specify 1 for BTP; 0 for PEP.

7. **X.25 incoming call service.** This option branches to the X.25 Incoming Call Service menu, shown in Figure 2-35.

```
                X.25 Incoming Call Service

 1. Line 0 -- User Interface enabled/disabled      enabled
 2. Line 1 -- User Interface enabled/disabled      enabled
 3. Line 2 -- User Interface enabled/disabled      enabled
 4. Line 3 -- User Interface enabled/disabled      enabled
 5. Line 4 -- User Interface enabled/disabled      enabled
 6. Line 5 -- User Interface enabled/disabled      enabled
 7. Line 6 -- User Interface enabled/disabled      enabled
 8. Line 7 -- User Interface enabled/disabled      enabled




(ESC to return to previous menu)
Enter selection:
```

Figure 2-35 X.25 Incoming Call Service Menu

The CS/1-X.25 uses the incoming call service parameter to enable or disable the user interface (Connection Service) on each line. If the interface is disabled on a line, that line can be used only with the X.25 automatic connection service, described in the *Connection Service User's Guide,* and for connections from the Ethernet network to the X.25 network.

The X.25 automatic connection service (also called the connection pass-through service) establishes a connection between a terminal and a host without any interaction by the user with the Connection Service. This feature enhances security on incoming calls by preventing users from accessing the Connection Service, and as a result, from accessing any other device on the local area network.

The default settings make the user interface available on all lines. To suppress it on a specific line, first enter the menu option number corresponding to the line. The Sysgen program displays the following prompt:

```
enabled(1)/disabled(0) old value = 1, new value =
```

Enter 1 to enable the interface on a line for which it has been disabled; enter 0 to disable the interface.

8. **Virtual port to physical line mapping.** This option branches to the Virtual Port to Physical Line menu, shown in Figure 2-36. All values are expressed as decimal numbers.

```
                Virtual Port to Physical Line
 0). --> 0      1). --> 0      2). --> 0      3). --> 0
 4). --> 0      5). --> 0      6). --> 1      7). --> 1
 8). --> 1      9). --> 1     10). --> 1     11). --> 1
12). --> 2     13). --> 2     14). --> 2     15). --> 2
16). --> 2     17). --> 2     18). --> 3     19). --> 3
20). --> 3     21). --> 3     22). --> 3     23). --> 3
24). --> 4     25). --> 4     26). --> 4     27). --> 4
28). --> 4     29). --> 4     30). --> 5     31). --> 5
32). --> 5     33). --> 5     34). --> 5     35). --> 5
36). --> 6     37). --> 6     38). --> 6     39). --> 6
40). --> 6     41). --> 6     42). --> 7     43). --> 7
44). --> 7     45). --> 7     46). --> 7     47). --> 7




Change Port:
```

Figure 2-36 Virtual Port to Physical Line Menu

This submenu is used to map virtual ports to lines. The default mapping distributes 48 virtual ports evenly among eight lines. If the system has only one line, all 48 virtual ports should be assigned to that line. If the system has multiple lines of different speeds to a single X.25 host, the mapping can be used to distribute the load by assigning more virtual ports to the faster line(s). Or, if each line is connected to a different host, more virtual ports can be assigned to the host that typically has higher traffic loads.

The physical lines are numbered 0 through 7. To change a virtual port mapping, enter its menu option number at the menu's prompt. For example:

```
Change Port: 29
```

The Sysgen program prompts for a new value and displays the old value. For example:

```
New value (old == 4)
```

Enter the new line number.

2.8.6 CS/1-X.25 Statistics Monitor Parameters

The Statistics Monitor menu for the CS/1-X.25 is identical to the version for the CS/1 running XNS protocols. See Section 2.2.7 for details.

2.8.7 CS/1-X.25 Clearinghouse Parameters

The Clearinghouse Parameters menu for the CS/1-X.25 is identical to the version for the CS/1 running XNS protocols. See Section 2.2.8 for details.

2.8.8 X.25 Parameters for the CS/1-X.25

The X.25 parameters are used to define the interface between the CS/1-X.25 and the X.25 host. These parameters are mandatory and must be specified for each physical line attached to the CS/1-X.25. Many of the parameters are factory set to default values appropriate for a Telenet-compatible host. Obtain the appropriate values from the X.25 host documentation.

When X.25 Parameters is chosen on the Modules Select Menu, the Line Parameters menu is displayed. Figure 2-37 shows the Line Parameters menu.

This menu branches to three submenus. To branch to a submenu, first specify its option number. The Sysgen program then prompts for the number of the line to be configured:

```
Line Number (0-7):
```

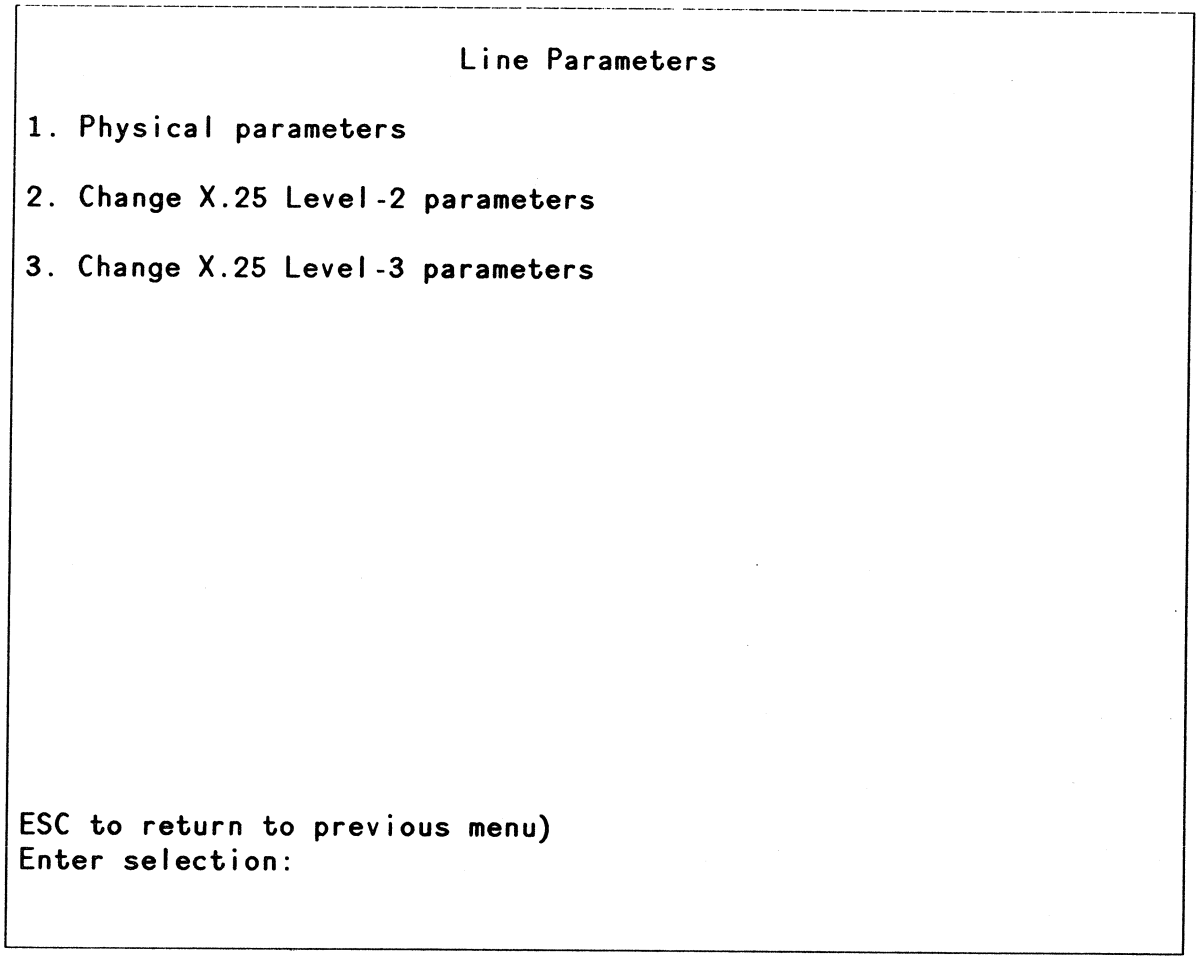


Figure 2-37 CS/1-X.25 Line Parameters Menu

2.8.9 CS/1-X.25 Physical Parameters

The Physical Parameters submenu is used to specify the speed of each synchronous line connected to the CS/1. It displays one option:

```
1. Baud rates                    4800
```

Enter 1 to display the Baud Rate Selection menu, shown in Figure 2-38.

```
                        Baud Rate Selection


0. 110 baud      1. 134.5 baud     2. 150 baud      3. 200 baud
4. 300 baud      5. 600 baud       6. 1200 baud     7. 1800 baud
8. 2400 baud     9. 3600 baud      A. 4800 baud     B. 7200 baud
C. 9600 baud     D. 19.2 kbaud     E. 38   kbaud    F. 48   kbaud
10. 56  kbaud    11. 64  kbaud


(ESC to return to previous menu)
Enter selection:
```

Figure 2-38 CS/1-X.25 Baud Rate Selection Menu

Enter the option number corresponding to the baud rate that is appropriate for the line being configured.

**** NOTE ****

If two lines connected to the same SIO board are of different speeds, the higher-speed line must be connected to port 0 and the lower-speed line must be connected to port 1.

2.8.10 CS/1-X.25 Level-2 Parameters

Level-2 parameters define the configurable features of the CS/1-X.25 frame level. Figure 2-39 shows the X.25 Level-2 Parameters menu.

```
                X.25 Level-2 Parameters

1. K -- Level-2 window size        7
2. T1 -- Level-2 timeout           3000
3. T3 -- Level-2 timeout           90000
4. N2 -- Level-2 retries           20









(ESC to return to previous menu)
Enter selection:
```

Figure 2-39 CS/1-X.25 Level-2 Parameters Menu

The Level-2 parameters are explained below. All values are expressed as decimal numbers.

1. **K -- Level-2 window size.** This parameter specifies the X.25 variable K, which represents the maximum number of outstanding unacknowledged packets permitted at Level 2. Decimal values 1 through 7 are permitted.

2. **T1 -- Level-2 timeout.** This parameter specifies the value (in milliseconds) of the Level-2 retransmission timer. The value of this parameter depends on the requirements of the X.25 interface. Decimal numbers between 100 and 1000000 are permitted.

3. **T3 -- Level-2 timeout.** This parameter specifies the value (in milliseconds) of the X.25 link initialization timer. The value of this parameter depends on the requirements of the X.25 interface. Decimal numbers between 100 and 1000000 are permitted.

4. **N2 -- Level-2 retries.** This parameter specifies the value of the X.25 variable N2, which determines how many retries are permitted after the T1 timer elapses. The value of this parameter depends on the requirements of the X.25 interface; the default value is 20, counting both the original transmission and subsequent retransmissions.

2.8.11 CS/1-X.25 Level-3 Parameters

Level-3 parameters define the configurable features of the CS/1-X.25 packet level. Figure 2-40 shows the X.25 Level-3 Parameters menu. The Level-3 parameters are explained below. Values are expressed as decimal numbers, except where hexadecimal is indicated.

1. **DTE(0) or DCE(1).** This parameter determines whether the CS/1-X.25 functions as Data Terminal Equipment (DTE) or Data Communications Equipment (DCE). For interaction with DCE (e.g, a modem), this parameter should be set to 0 (DTE). For interaction with DTE, this parameter should be set to 1 (DCE).

2. **X.25 Level-3 packet size.** This parameter specifies the maximum packet size permitted by the X.25 interface. The value of this parameter depends on the requirements of the X.25 interface; typical sizes are 128 bytes, 256 bytes, 512 bytes, and 1024 bytes. Decimal values 128 through 1024 are permitted.

   Increasing the value of the packet size parameter can affect MCPU buffer allocation; contact Bridge Communications, Inc., or an authorized service representative for detailed information.

   The CS/1-X.25 uses the level-3 packet size to obtain the value of the X.25 variable N1 (the maximum number of bytes per frame). The value of N1 is calculated as the level-3 packet size plus two bytes of HDLC header and three bytes of X.25 level-3 header.

3. **X.25 Level-3 window size.** This parameter specifies the maximum number of outstanding unacknowledged packets permitted at Level 3. Decimal values 1 through 7 are permitted.

4. **Take reverse charged calls(no/0,yes/1).** This parameter determines whether the CS/1-X.25 allows reverse charged calls from the X.25 host to the Ethernet. Specify 1 (the default) to accept reverse charged calls; 0 to not accept them.

5. **Make reverse charged calls(no/0,yes/1).** This parameter determines whether all calls from the CS/1-X.25 to the host are reverse charged. Specify 1 to indicate that calls be reverse charged; 0 (the default) to indicate that calls not be reverse charged.

6. **Incoming calls barred(off/0,on/1).** This parameter determines whether incoming calls (from the host to the Ethernet) are accepted or refused. Specify 1 to refuse incoming calls; 0 (the default) to accept them.

7. **Outgoing calls barred(off/0,on/1).** This parameter determines whether outgoing calls (from the Ethernet to the host) are accepted or refused. Specify 1 to refuse outgoing calls; 0 (the default) to accept them.

8. **Number of clear request retries.** This parameter specifies the maximum number of times a clear request can be retransmitted. Decimal values 1 through 10 are permitted.

9. **Number of reset request retries.** This parameter specifies the maximum number of times a reset request can be retransmitted. Decimal values 1 through 10 are permitted.

```
                X.25 Level-3 Parameters

     Parameter                                    Current Value

 1. DTE(0) or DCE(1)                                  1
 2. X.25 Level-3 packet size                          128
 3. X.25 Level-3 window size                          2
 4. Take reverse charged calls(no/0,yes/1)            1
 5. Make reverse charged calls(no/0,yes/1)            0
 6. Incoming calls barred(off/0,on/1)                 0
 7. Outgoing calls barred(off/0,on/1)                 0
 8. Number of clear request retries                   3
 9. Number of reset request retries                   4
10. Number of logical channels                        20
11. Beginning SVC channel number                      0x01
12. T10 -- DCE awaits restart confirmation            60000
13. T11 -- DCE awaits call accept/clear indication    180000
14. T12 -- DCE awaits reset confirmation              60000
15. T13 -- DCE awaits clear confirmation              60000
16. T20 -- DTE awaits restart confirmation            180000
17. T21 -- DTE awaits call accept/clear indication    200000
18. T22 -- DTE awaits reset confirmation              180000
19. T23 -- DTE awaits clear confirmation              180000
(ESC to return to previous menu)
Enter selection:
```

Figure 2-40 CS/1-X.25 Level-3 Parameters Menu

10. **Number of logical channels.** This parameter specifies the maximum number of logical channels permitted per physical line. The value of this parameter depends on the requirements of the X.25 interface. This value is specified in hexadecimal but displays as a decimal value on the menu. Hexadecimal values 1 through 30 are permitted.

11. **Beginning SVC channel number.** This parameter specifies, in hexadecimal, both the Logical Channel Group Number (LCGN) and the number of the first logical channel on the line. Hexadecimal values 1 through 7FF are permitted. The value must be specified in the format "xyy", where "x" represents the LCGN and "yy" represents the number of the first logical channel on the line. If "x" is omitted, the LCGN defaults to 0; if the parameter is not specified at all, both LCGN and first logical channel number default to the value 1.

12. **T10 -- DCE awaits restart confirmation.** The T10, T11, T12, and T13 parameters specify the decimal values, in milliseconds, of the X.25 level-3 timers affecting the Data Communications Equipment (DCE) ports. The values of these parameters depend on the requirements of the X.25 interface and should be changed with caution. The X.25 Level-3 Parameters menu lists the default values. Decimal numbers between 100 and 1000000 are permitted.
13. **T11 -- DCE awaits call accept/clear indication.** See menu option 12 above.
14. **T12 -- DCE awaits reset confirmation.** See menu option 12 above.
15. **T13 -- DCE awaits clear confirmation.** See menu option 12 above.
16. **T20 -- DTE awaits restart confirmation.** The T20, T21, T22, and T23 parameters specify the decimal values, in milliseconds, of the X.25 level-3 timers affecting the Data Terminal Equipment (DTE) ports. The values of these parameters depend on the requirements of the X.25 interface. The X.25 Level-3 Parameters menu lists the default values. Decimal numbers between 100 and 1000000 are permitted.
17. **T21 -- DTE awaits call accept/clear indication.** See menu option 16 above.
18. **T22 -- DTE awaits reset confirmation.** See menu option 16 above.
19. **T23 -- DTE awaits clear confirmation.** See menu option 16 above.

2.8.12 CS/1-X.25 Address Configuration Parameters

The X.25 Address Configuration menu is used to define the X.25 address of each physical line attached to the CS/1-X.25. Configuration of this menu is mandatory as it determines which lines are active. Figure 2-41 shows the CS/1-X.25 Address Configuration menu.

Enter a menu option number to display the following prompt:

```
Enter line <n> X.25 address (p = private, n = none):
```

where <n> represents the line number. Specify one of the following:

- The local X.25 line address leading to the host
- p for a private line (e.g., a leased line that is not part of an X.25 network)
- n to disable the line, thereby making fewer lines available to the network

Each line leading to an X.25 host is assigned an X.25 address by the host to which it is attached. X.25 addresses contain up to 15 decimal digits. The first 4 digits represent the Data Network Identification Code (DNIC). The next 6 to 8 digits (usually 8 for U.S. networks) represent the host address; and the last 2 to 4 digits (usually 2 for U.S. networks) represent a subhost address or port number. Not all fields appear in every installation; an individual X.25 address can be much shorter than 15 digits. Trailing zeros can be omitted.

```
                X.25 Address Configuration

 1. Line 0 X.25 address              none
 2. Line 1 X.25 address              none
 3. Line 2 X.25 address              none
 4. Line 3 X.25 address              none
 5. Line 4 X.25 address              none
 6. Line 5 X.25 address              none
 7. Line 6 X.25 address              none
 8. Line 7 X.25 address              none









(ESC to return to previous menu)
Enter selection:
```

Figure 2-41 CS/1-X.25 Address Configuration Menu

The CS/1-X.25 uses the local X.25 line addresses when it sends packets from the Ethernet device that originates the connection to the X.25 host. The CS/1-X.25 specifies the address of the line on which the data is sent as the source of the transmission, for the benefit of the receiving host. Answering packets are sent to the X.25 line address specified in the original transmission.

2.9 GS/1

Gateway Servers provide internetwork communications between two or more networks. The GS/1 connects 2 to 48 XNS Ethernet networks with an X.25 network. It supports both the Connection Service and Interconnection Service.

The network-layer Interconnection Service provided by the GS/1 transmits packets through an X.25 network. It uses the medium of an X.25 network to connect remote Ethernet networks that use the IDP protocol. The GS/1 also provides automatic call setup services if the server is connected with the X.25 network through dedicated lines. For more information, see the *Product Line Overview* and *Internet Transport Protocols* (reference [5]).

This section describes the Sysgen menus and parameters used to configure the GS/1.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software and the X.25 protocol requirements.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-42 shows the paths of the Sysgen menus for the GS/1.

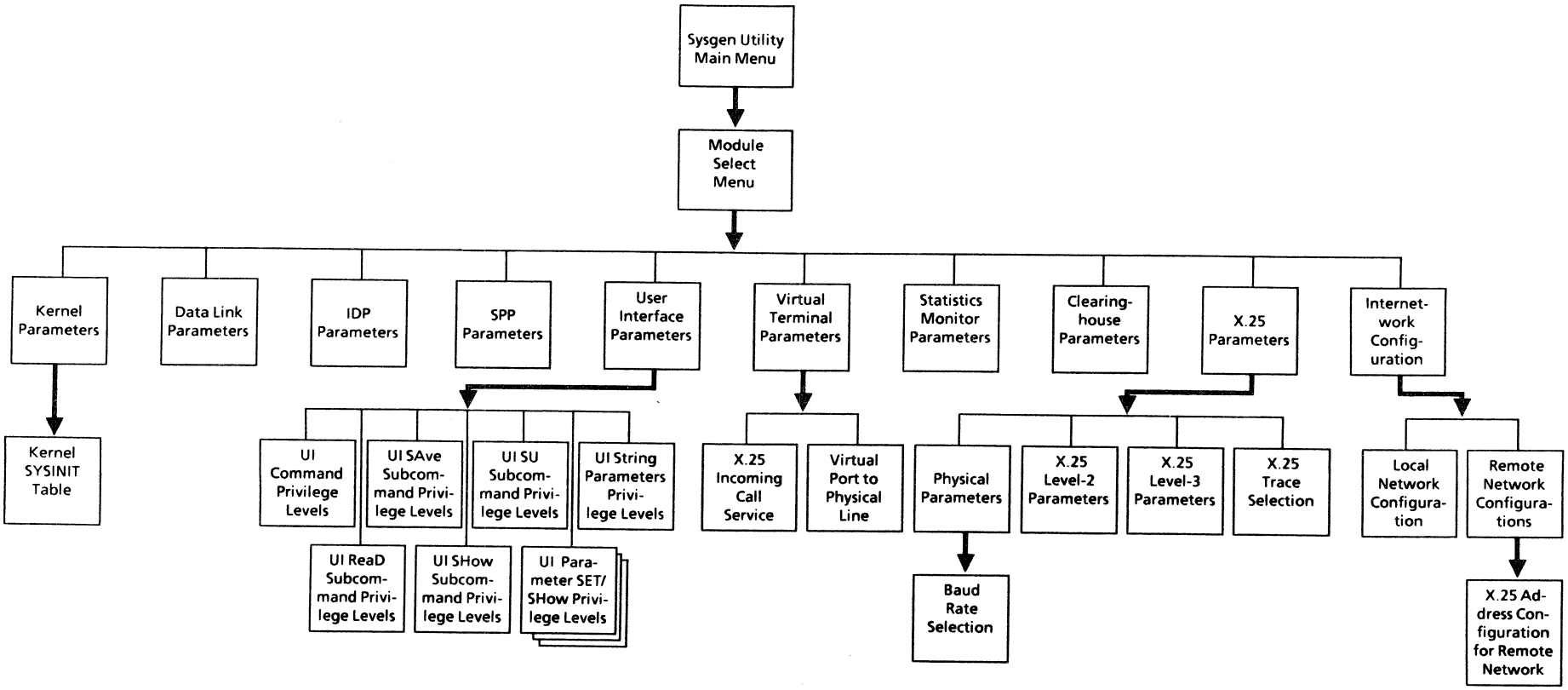


Figure 2-42 GS/1 Sysgen Menus

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. Figure 2-43 shows the Module Select Menu for the GS/1.

```
                    Module Select Menu

1. Kernel Parameters

2. Data Link Parameters

3. IDP/XDG Parameters

4. SPP/RIP Parameters

5. User Interface Parameters

6. Virtual Terminal Parameters

7. Statistics Monitoring Parameters

8. Clearinghouse Parameters

9. X.25 Parameters

A. Internetwork Configuration


(ESC to return to main menu)
Select module:
```

Figure 2-43 GS/1 Module Select Menu

Some GS/1 Sysgen menus are the same as those for the CS/1 with XNS, described in Section 2.1. References are made to that section where applicable. Parameters and menus that are unique to the GS/1 are described in detail below.

2.9.1 GS/1 Kernel Parameters

The kernel provides resource management services for the server software. These services are detailed in the *Software Technical Reference Manual, Volume One.*

Figure 2-44 shows the GS/1 Kernel Parameters menu with default values displayed.

```
                Kernel Parameters

     Parameters                    Current Value

1. Max. no. of ports                     0x8
2. Buffer size                           0x52
3. Buffer load factor                    0x1E
4. Number of macro buffers               0xC

     Kernel Submenus

5. View/Modify SYSINIT Table




(ESC to return to previous menu)
Enter selection:
```

Figure 2-44 GS/1 Kernel Parameters Menu

The Kernel parameters for the GS/1 are the same as for the CS/1 running XNS, although some default values differ. For an explanation of these parameters, refer to Section 2.2.1.

2.9.2 GS/1 Data Link Parameters

The Data Link Parameters menu for the GS/1 is identical to the version for the CS/1 running XNS protocols. See Section 2.2.2 for details.

2.9.3 GS/1 IDP/XDG Parameters

The Internetwork Datagram Protocol (IDP) is used to send datagrams to an addressable destination, which can be on another network. This section describes the IDP and X.25 Datagram Translator (XDG) parameters that can be adjusted during system generation. Figure 2-45 shows the IDP/XDG Parameters menu for the GS/1, with default values displayed.

```
                    IDP/XDG Parameters

     Parameter                          Current Value

1. Mailbox depth level 0                    0xC
2. Mailbox depth level 2                    0xC
3. Software packet checksum on/off          0x0
4. XDG timeout timer(min)                   0x5
5. Use PEP (0) / BTP (1)                    0x1









(ESC to return to previous menu)
Enter selection:
```

Figure 2-45 GS/1 IDP/XDG Parameters Menu

Most GS/1 IDP parameters are the same as for the CS/1 running XNS, although some default values may differ. For explanations of these parameters, see Section 2.2.3.

Option 4, **XDG timeout timer(min)** is unique to the GS/1. This parameter specifies the length of time the last X.25 logical connection is maintained with a remote network in the absence of any traffic on the connection. Increasing this timer value could avoid reconnection charges on a dial-up line. Hexadecimal values 1 through 3C are permitted.

2.9.4 GS/1 SPP/RIP Parameters

This section describes the system generation parameters that apply to the Sequenced Packet Protocol (SPP) and Routing Information Protocol (RIP). Figure 2-46 shows the SPP/RIP Parameters menu for the GS/1, with default values displayed.

```
                    SPP/RIP Parameters

     Parameter                      Current Value

1. Min. rec. window                      0x3
2. Max. rec. window                      0x3
3. Max. no. retransmits                  0x6
4. Max. no. probes                       0x5
5. User to SPP data mailbox              0x1
6. IDP to SPP data mailbox               0x3
7. Min. retransmit timeout               0x3E8
8. Max. retransmit timeout               0x3A98
9. Probe timeout                         0x1388
A. Init. connection timeout              0x3E8
B. Mailbox limit init. connection        0x5
C. Acknowledge timeout                   0x63
D. RIP broadcast timer(sec,0/disable)    0x1E



(ESC to return to previous menu)
Enter selection:
```

Figure 2-46 GS/1 SPP/RIP Parameters Menu

Most GS/1 SPP parameters are the same as for the CS/1 running XNS, although some default values may differ. For explanations of these parameters, see Section 2.2.4.

Option D, **RIP broadcast timer(sec,0/disable)** is unique to the GS/1. This parameter specifies the interval in minutes between RIP broadcasts from the GS/1. Hexadecimal values 0 through 3C are permitted.

2.9.5 GS/1 User Interface Parameters

The User Interface Parameters menu for the GS/1 is identical to the version for the CS/1 running XNS protocols, although some options on their submenus may differ. See Section 2.2.5 for explanations of the User Interface Parameters menu and how to alter privilege levels on its submenus.

2.9.6 GS/1 Virtual Terminal Parameters

The Virtual Terminal Service supports TTY-like terminals and TTY hosts. This service is described in the *Software Technical Reference Manual, Volume Two.*

This section describes the Virtual Terminal parameters that can be adjusted during system generation. Figure 2-47 shows the GS/1 Virtual Terminal Parameters menu.

The Virtual Terminal parameters are explained below. All values are expressed in hexadecimal.

1. **Mailbox depth to SPP.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and each SPP process. Hexadecimal values 1 through 3 are permitted.
2. **Mailbox depth to agent.** This parameter specifies the depth of the mailbox used for messages between the Virtual Terminal Monitor (TM) process and the SIO agent process. Hexadecimal values 1 through 3 are permitted.
3. **MORE-Bit disable(0)/enable(1).** This parameter, set to 0 (disabled), forces EOM on for outgoing connections from the GS/1. Specify 0 if connections will be made to the GS/1 from CS/1s running software version 16500 or earlier.
4. **Autolisten timer(min).** This parameter specifies the number of minutes after which a port changes from Command Mode to Quiescent Listening Mode. This interval begins at the time the attached device is reset or powered on, or at the time of the most recent data transfer to or from the device. Hexadecimal values 0 through 3E80 are permitted. Specifying 0 disables the timer. This parameter is not applicable to the program interface.
5. **X.25 incoming call service.** This option branches to the X.25 Incoming Call Service menu, shown in Figure 2-48.

```
                Virtual Terminal Parameters

      Parameter                          Current Value

 1. Mailbox depth to SPP                      0x1
 2. Mailbox depth to agent                    0x1
 3. MORE-Bit disable(0)/enable(1)             0x1
 4. Autolisten timer(min)                     0xF
 5. X.25 incoming call service
 6. Virtual port to physical line mapping




(ESC to return to previous menu)
Enter selection:
```

Figure 2-47 GS/1 Virtual Terminal Parameters Menu

```
                X.25 Incoming Call Service

 1. Line 0 -- User Interface enabled/disabled      enabled
 2. Line 1 -- User Interface enabled/disabled      enabled
 3. Line 2 -- User Interface enabled/disabled      enabled
 4. Line 3 -- User Interface enabled/disabled      enabled
 5. Line 4 -- User Interface enabled/disabled      enabled
 6. Line 5 -- User Interface enabled/disabled      enabled
 7. Line 6 -- User Interface enabled/disabled      enabled
 8. Line 7 -- User Interface enabled/disabled      enabled




(ESC to return to previous menu)
Enter selection:
```

Figure 2-48 GS/1 X.25 Incoming Call Service Menu

The GS/1 uses the incoming call service parameter to enable or disable the user interface (Connection Service) on each line. If the interface is disabled on a line, that line can be used only with the X.25 automatic connection service, described in the *Connection Service User's Guide,* and for connections from the Ethernet network to the X.25 network.

The X.25 automatic connection service (also called the connection passthrough service) establishes a connection between a terminal and a host without any interaction by the user with the Connection Service. This feature enhances security on incoming calls by preventing users from accessing the Connection Service and, as a result, from accessing any other device on the local area network.

One way to implement the X.25 automatic connection service is to disable the user interface for that line. The other way, described in section 2.9.15, is to assign the line a different address from the one used by the X.25 interface for that line.

The default settings make the user interface available on all lines. To suppress it on a specific line, first enter the menu option number corresponding to the line. The Sysgen program displays the following prompt:

```
enabled(1)/disabled(0) old value = 1, new value =
```

Enter 1 to enable the interface on a line for which it has been disabled; enter 0 to disable the interface on a line.

6. **Virtual port to physical line mapping.** This option branches to the Virtual Port to Physical Line menu, shown in Figure 2-49. All values are expressed as decimal numbers.

```
                Virtual Port to Physical Line
 0). --> 0      1). --> 0      2). --> 0      3). --> 0
 4). --> 0      5). --> 0      6). --> 0      7). --> 0
 8). --> 0      9). --> 0     10). --> 0     11). --> 0
12). --> 0     13). --> 0     14). --> 0     15). --> 0
16). --> 0     17). --> 0     18). --> 0     19). --> 0
20). --> 0     21). --> 0     22). --> 0     23). --> 0
24). --> 0     25). --> 0     26). --> 0     27). --> 0
28). --> 0     29). --> 0     30). --> 0     31). --> 0
32). --> 0     33). --> 0     34). --> 0     35). --> 0
36). --> 0     37). --> 0     38). --> 0     39). --> 0
40). --> 0     41). --> 0     42). --> 0     43). --> 0
44). --> 0     45). --> 0     46). --> 0     47). --> 0



Change Port:
```

Figure 2-49 GS/1 Virtual Port to Physical Line Menu

Configuring the virtual port to physical line mappings is mandatory. The GS/1 uses the port-to-line mappings to route connections from the Ethernet side of the circuit to the X.25 side of the circuit. If the lines attached to the GS/1 are connected to different X.25 Public Data Networks (PDNs), the port-to-line mapping can be used to facilitate rotaries for connection routing and to allocate ports as needed for different applications on different lines.

On a GS/1 with four SIO boards supporting two lines each, 48 virtual ports can be distributed evenly among eight lines numbered 0 through 7.

If the system has only one line, all 48 virtual ports should be assigned to that line. If the system has multiple lines of different speeds to a single X.25 host, the mapping can be used to distribute the load by assigning more virtual ports to the faster line(s). Or, if each line is connected to a different host, more virtual ports can be assigned to the host that typically has higher traffic loads.

The physical lines are numbered 0 through 7. To change a virtual port mapping, enter its menu option number at the menu's prompt. For example:

```
Change Port: 29
```

The Sysgen program prompts for a new value and displays the old value. For example:

```
New value (old == 0)
```

Enter the new line number.

2.9.7 GS/1 Statistics Monitor Parameters

The Statistics Monitor menu for the GS/1 is identical to the version for the CS/1 running XNS protocols. See Section 2.2.7 for details.

2.9.8 GS/1 Clearinghouse Parameters

The Clearinghouse Parameters menu for the GS/1 is identical to the version for the CS/1 running XNS protocols. See Section 2.2.8 for details.

2.9.9 GS/1 X.25 Parameters

The X.25 parameters are used to define the interface between the GS/1 and the X.25 PDN. The default values of many of the parameters are factory set to values appropriate for Telenet; if a different X.25 PDN is used, contact the agent of the PDN for the appropriate values.

When X.25 Parameters is chosen on the Module Select Menu, the Line Parameters menu is displayed. Figure 2-50 shows the Line Parameters menu.

```
                    Line Parameters

1. Physical parameters

2. X.25 Level-2 parameters

3. X.25 Level-3 parameters

4. X.25 Traces




ESC to return to previous menu)
Enter selection:
```

Figure 2-50 GS/1 X.25 Line Parameters Menu

This menu branches to three submenus. To branch to a submenu, first specify its option number. The Sysgen program then prompts for the number of the line to be configured:

```
Line Number (0-7):
```

2.9.10 GS/1 X.25 Physical Parameters

The Physical Parameters submenu is used to specify the speed of each synchronous line connected to the GS/1. It displays one option:

```
1. Baud rate                    4800
```

Enter 1 to display the Baud Rate Selection menu, shown in Figure 2-51.

```
                    Baud Rate Selection

1. 1200 baud     2. 1800 baud     3. 2400 baud     4. 3600 baud
5. 4800 baud     6. 7200 baud     7. 9600 baud     8. 19.2 kbaud
9. 38   kbaud    A. 56   kbaud    B. 64   kbaud

(ESC to return to previous menu)
Enter selection:
```

Figure 2-51 GS/1 Baud Rate Selection Menu

Enter the option number corresponding to the baud rate that is appropriate for the line being configured. The aggregate speed per SIO board should not exceed 84 kbaud.

2.9.11 GS/1 X.25 Level-2 Parameters

Level-2 parameters define the configurable features of the GS/1 frame level. The X.25 Level-2 Parameters menu for the GS/1 is identical to the CS/1-X.25 version. See Section 2.8.10 for details.

2.9.12 GS/1 X.25 Level-3 Parameters

Level-3 parameters define the configurable features of the GS/1 packet level. Figure 2-52 shows the X.25 Level-3 Parameters menu for the GS/1.

```
                X.25 Level-3 Parameters
     Parameter                                  Current Value

 1. DTE(0) or DCE(1)                                0
 2. X.25 Level-3 packet size                        128
 3. X.25 Level-3 window size                        2
 4. Take reverse charged calls(no/0,yes/1)          1
 5. Make reverse charged calls(no/0,yes/1)          0
 6. Incoming calls barred(off/0,on/1)               0
 7. Outgoing calls barred(off/0,on/1)               0
 8. Number of clear request retries                 3
 9. Number of reset request retries                 4
10. Number of logical channels                      48
11. Beginning logical channel number                1
12. T10 -- DCE awaits restart confirmation          60000
13. T11 -- DCE awaits call accept/clear indication  180000
14. T12 -- DCE awaits reset confirmation            60000
15. T13 -- DCE awaits clear confirmation            60000
16. T20 -- DTE awaits restart confirmation          180000
17. T21 -- DTE awaits call accept/clear indication  200000
18. T22 -- DTE awaits reset confirmation            180000
19. T23 -- DTE awaits clear confirmation            180000
(ESC to return to previous menu)
Enter selection:
```

Figure 2-52 GS/1 X.25 Level-3 Parameters Menu

The X.25 Level-3 Parameters menu for the GS/1 is the same as for the CS/1-X.25, although some default parameter values differ. For explanations of these parameters, refer to Section 2.8.11.

2.9.13 X.25 Trace Selection

Option 4, **X.25 Traces**, on the GS/1 X.25 Line Parameters menu branches to the X.25 Trace Selection menu, which displays the following options:

```
1. X.25 Level-2 Trace          Disabled
2. X.25 Level-3 Trace          Disabled
```

These options are debugging aids. They allow the network manager to view the contents of Level-2 frames and Level-3 packets.

The Level-2 Trace displays information such as line number, frame address, frame type, and other Level-2 specific parameters. The Level-3 Trace displays information such as line number, logical connection number (LCN), packet type, other Level-3 specific parameters, and the contents of data packets in both hexadecimal and ASCII format.

To use these traces, first enable one or both of the options on the X.25 Trace Selection menu. After completing system generation, reboot the server. The traces display on the terminal connected to the console port. Traces display for all lines that have been configured with the local network Sysgen parameters described in Section 2.9.15.

**** NOTE ****

Enabling either of the traces will slow performance of the GS/1.

To disable the traces, reboot the server, run Sysgen, and specify disabled on the X.25 Trace Selection menu.

2.9.14 GS/1 Internetwork Configuration

The only GS/1 Sysgen menus with significant differences from those of other servers are the Internetwork Configuration Menu and its submenus. These are described below.

The Internetwork Configuration menu displays the following options:

```
1. Local network parameters
2. Remote network parameters
```

These options branch to the submenus described below.

2.9.15 GS/1 Local Network Configuration

The Local Network Configuration menu is used to specify the network address of the Ethernet to which the GS/1 is attached and the X.25 address of each line connecting the GS/1 with an X.25 network. Configuration of this menu is mandatory. The local network must be specified, as well as the X.25 address of each active line.

Figure 2-53 shows the Local Network Configuration menu for the GS/1.

```
            Local Network Configuration

 1. Local network address          0
 2. Line 0 X.25 address            none
 3. Line 1 X.25 address            none
 4. Line 2 X.25 address            none
 5. Line 3 X.25 address            none
 6. Line 4 X.25 address            none
 7. Line 5 X.25 address            none
 8. Line 6 X.25 address            none
 9. Line 7 X.25 address            none




(ESC to return to previous menu)
Enter selection:
```

Figure 2-53 GS/1 Local Network Configuration Menu

When menu option 1 is chosen, the Sysgen program displays the following prompt:

```
Enter local network address:
```

Enter the network ID for the local network. This ID can be any hexadecimal number between one and eight digits long. Alternatively, Bridge Communications can provide a network ID; contact Bridge Communications Technical Support for this information.

The local network address must be defined before the line addresses or an error message appears. The GS/1 uses the network address when communicating with devices on remote Ethernets.

When options 2 through 9 are chosen, the Sysgen program displays the following prompt, where <n> represents the line number:

```
Enter line <n> X.25 address (p = private, n = none):
```

Each line leading to an X.25 PDN is assigned an X.25 address by the PDN to which it is attached. To determine this address, contact the X.25 PDN representative.

X.25 addresses contain up to 15 decimal digits. The first 4 digits represent the Data Network Identification Code (DNIC). The next 6 to 8 digits (usually 8 for U.S. networks) represent the host address; and the last 2 to 4 digits (usually 2 for U.S. networks) represent a subhost address or port number. Not all fields appear in every installation; an individual X.25 address can be much shorter than 15 digits. Trailing zeros can be omitted.

For a private line (i.e., a line not connected to an X.25 network), enter the letter "p" instead of an X.25 address.

The GS/1 uses the local X.25 line addresses when it sends packets from the Ethernet device that originates the connection to the X.25 network that carries the transmission. The GS/1 specifies the address of the line on which the data is sent as the source of the transmission, for the benefit of the receiving device on the X.25 network. Answering packets are sent to the X.25 line address specified in the original transmission. The X.25 network controller tracks the addresses of all devices on the network and routes packets directly to the destination lines.

The GS/1 does not refer to the X.25 addresses of its own lines before accepting transmissions; it processes any packet routed by the X.25 network controller to one of its lines. However, when the GS/1 receives a transmission from a device on the X.25 network that is not already part of an active session, the GS/1 compares the destination address of the packet with the address of the line on which the packet was received. If the addresses do not match, the GS/1 automatically treats the packet as a Connection Service connection request and interprets the destination address as a clearinghouse name.

To implement the X.25 automatic connection service (or "connection passthrough service"), assign the line a different address from the address used by the X.25 network for that line. (Alternatively, disabling the user interface for that line implements the X.25 automatic connection service.) The *Connection Service User's Guide* describes the X.25 automatic connection service in more detail.

2.9.16 GS/1 Remote Network Configuration

The Remote Network Configurations menu is unique to the GS/1. Configuration of the options on this menu is mandatory for the GS/1 Interconnection Service; it is not necessary for GS/1s running the Connection Service only. This menu is used to define the network addresses of all accessible remote Ethernets and the X.25 addresses of the lines leading to their GS/1s. The Interconnection Service uses these addresses to connect to the remote networks.

The Remote Network Configurations menu displays the following option:

```
1. Add remote network
```

This option branches to the X.25 Address Configuration for Remote Network menu, which displays the two options described below:

1. **Network address.** This parameter specifies the address of the remote network.
2. **Add X.25 address.** When this parameter is chosen, the Sysgen program displays the following prompt:

   ```
   Enter X.25 address (or p  = private, n = none):
   ```

   For a private line (i.e., a line not connected to an X.25 network), enter the letter "p" instead of an X.25 address.

   For a line to a remote X.25 network, enter the X.25 address of the remote GS/1 that will be used for the interconnection. The remote GS/1 should be attached to an Ethernet with the network number entered in option 1 above. After the X.25 address has been entered, the Sysgen program displays the following prompt:

   ```
   Enter local line number(s) with access to <n>:
   ```

   where <n> represents the X.25 address. Enter the line number of each line on the local GS/1 that will be used to reach the remote GS/1. Use only the line numbers of those lines that have been previously configured under the Local Network Configuration described above (i.e., do not use lines marked "none").

2.10 GS/3 Running XNS Protocols

Gateway Servers provide internetwork communications between two or more networks. The GS/3 connects geographically distant XNS Ethernet networks by means of medium- to high-speed communication links. It provides Interconnection Service between devices on either network.

This section describes the Sysgen menus and parameters used to configure the GS/3 running XNS protocols.

**** NOTE ****

The Sysgen parameters described below should only be modified by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-54 shows the paths of the Sysgen menus for the GS/3 running XNS protocols.

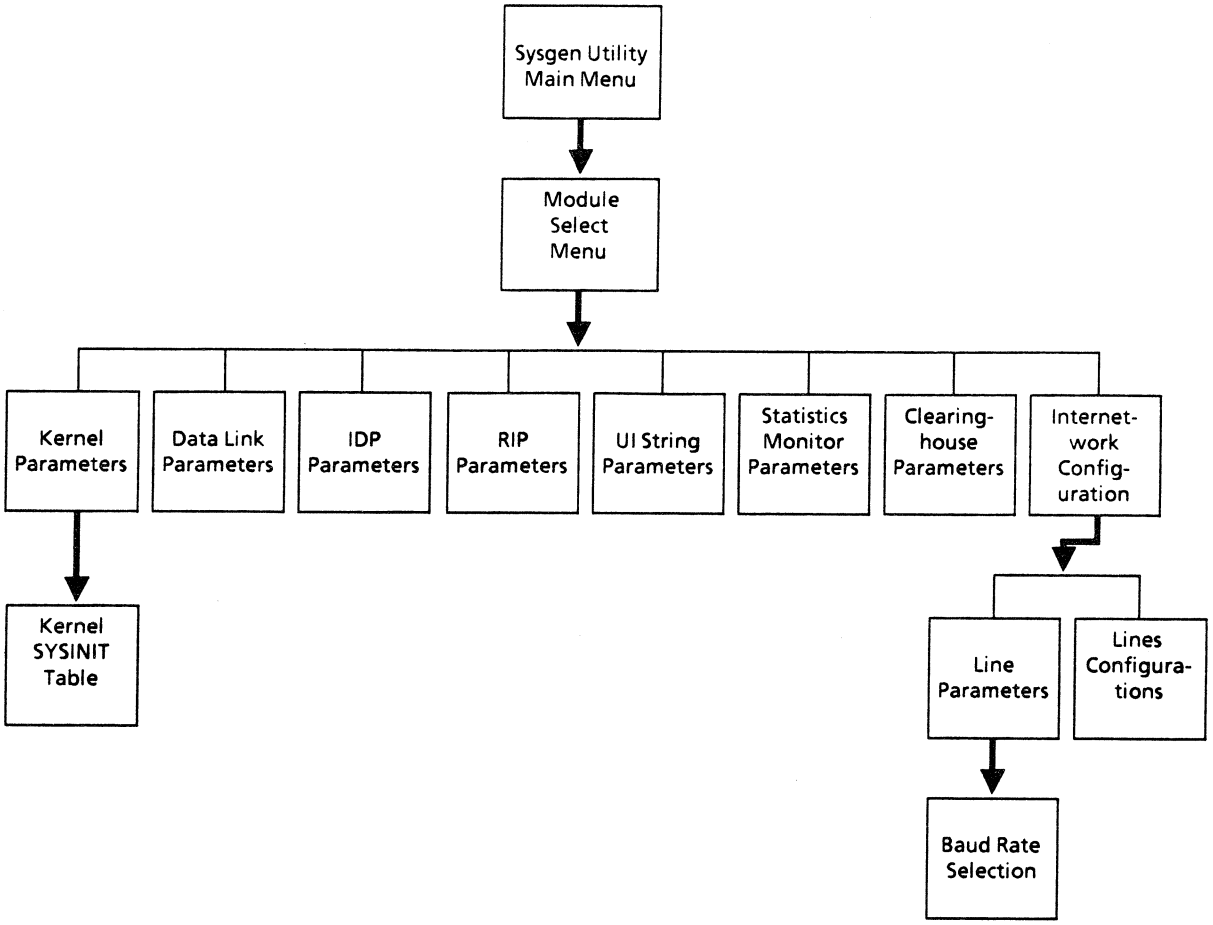


Figure 2-54 Sysgen Menus for the GS/3 with XNS

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. The Module Select Menu for the GS/3 running XNS protocols is shown in Figure 2-55.

```
                    Module Select Menu

1. Kernel Parameters

2. Data Link Parameters

3. IDP Parameters

4. RIP Parameters

5. UI String Parameters

6. Statistics Monitoring Parameters

7. Clearinghouse Parameters

8. Internetwork Configuration



(ESC to return to main menu)
Select module :
```

Figure 2-55 Module Select Menu for the GS/3 with XNS

Most GS/3 Sysgen menus are the same as for other servers, although the GS/3 versions display some different defaults and permit slightly different ranges of values to be specified. For menus that are similar, Table 2-4 refers to the appropriate manual sections. Menus with significant differences are discussed following the table.

Table 2-4 Locating GS/3 XNS Sysgen Menu Descriptions

GS/3 XNS Menu	*Similar to*	*Where Described*
Kernel Parameters	—	2.10.1
IDP Parameters	—	2.10.2
Data Link Parameters	CS/1 XNS	2.2.2
RIP Parameters	—	2.10.3
UI String Parameters	—	2.10.4
Statistics Monitor Parameters	CS/1 XNS	2.2.7
Clearinghouse Parameters	CS/1 XNS	2.2.8
Internetwork Configuration	—	2.10.5

2.10.1 GS/3 Kernel Parameters

The kernel provides resource management services for the server software. These services are detailed in the *Software Technical Reference Manual, Volume One.*

Figure 2-56 shows the Kernel Parameters menu for the GS/3 running XNS protocols.

```
                    Kernel Parameters

     Parameters                        Current Value

1. Max. no. of ports                        0x8
2. Buffer size                              0x80
3. Buffer load factor                       0x4B

     Kernel Submenus

5. View/Modify SYSINIT Table




(ESC to return to previous menu)
Enter selection:
```

Figure 2-56 Kernel Parameters Menu for the GS/3 with XNS

The GS/3 Kernel Parameters menu is similar to the Kernel Parameters menu for the CS/1 with XNS, although some default values may differ. For parameter explanations, see Section 2.2.1.

2.10.2 GS/3 IDP Parameters

The Internetwork Datagram Protocol (IDP) is used to send datagrams to an addressable destination, which can be on another network. This section describes the IDP parameters that can be adjusted during GS/3 system generation. Figure 2-57 shows the IDP Parameters menu for the GS/3, with default values displayed.

```
                    IDP Parameters

     Parameter                        Current Value

1. Mailbox depth level 0                  0x80
2. Mailbox depth level 2                  0xC
3. Software packet checksum on/off        0x0
4. Use PEP (0) / BTP (1)                  0x1









(ESC to return to previous menu)
Enter selection:
```

Figure 2-57 GS/3 IDP Parameters Menu

The GS/3 IDP Parameters Menu is similar to the IDP Parameters menu for the CS/1 running XNS, although some default values may differ. For parameter explanations, see Section 2.2.3.

2.10.3 RIP Parameters

The single option on the RIP Parameters menu is shown below:

```
1. RIP broadcast timer(second, 0 = disable)      0x1E
```

This parameter specifies the interval in seconds between RIP broadcasts from the GS/3. Hexadecimal values 0 through 7FFF are permitted.

2.10.4 UI String Parameters

The UI String Parameters menu displays the following options:

```
1. Product string                                SW/n-
2. Version string                                nnnnn
```

where n represents the software product number, and nnnnn represents a five-digit version number. The product string and version number display in response to the SHow VERSion command issued through the User Interface.

2.10.5 Internetwork Configuration for the GS/3 Running XNS Protocols

The GS/3 provides a network-layer Interconnection Service, which routes packets between two networks that both use the same Ethernet protocol.

One or more leased lines are required between the server and the remote GS/3. On a switched line, the user must dial manually.

To support the Interconnection Service, a GS/3 must be configured with two kinds of information:

- The network number of the Ethernet to which the GS/3 is directly connected.

  The GS/3 uses this number to identify itself when communicating with remote Ethernets.

- The network numbers of all remote Ethernet networks attached to the GS/3 and the physical characteristics of each line connecting the GS/3 with a network.

  The GS/3 uses the list of remote Ethernet numbers and the associated line numbers to create a routing table for sending packets to the remote networks.

If the GS/3 has multiple lines to a single remote Ethernet, the GS/3 monitors availability and reliability of each line, automatically switching packets to different lines when necessary. If a line remains idle for the time interval used by the reliability checking algorithm, the server sends a probe packet to test the line. If no acknowledgement is received, the GS/3 removes the line from the routing table until subsequent probes show that it is operational.

The initial routing table is established through option 6, Internetwork Configuration, on the main Module Select menu. These parameters must be set for every GS/3.

The Internetwork Configuration menu contains three options:

```
1. Local network address
2. Line configuration
3. Line map display
```

These options are described below:

1. **Local network address.** Enter the network ID for the local network. This ID can be any hexadecimal number between one and eight digits long. Alternatively, Bridge Communications can provide a network ID; contact Bridge Communications Technical Support for this information. This number must be set before the other menu options can be configured.

2. **Line configuration.** This parameter specifies the characteristics of the lines attached to the server's SIO boards. When this option is chosen, the Sysgen program prompts for a line number in the range 0 through 7. Table 2-5 lists the eight possible lines and their locations.

Table 2-5 GS/3 Line Numbers

Line Number	*Location*
0	Connector 0, SIO board 1
1	Connector 1, SIO board 1
2	Connector 0, SIO board 2
3	Connector 1, SIO board 2
4	Connector 0, SIO board 3
5	Connector 1, SIO board 3
6	Connector 0, SIO board 4
7	Connector 1, SIO board 4

The Line Configuration parameter branches to the Line Parameters submenu, which displays the following options:

```
1. Baud rate                          4800
2. Network ID of remote Ethernet      00000000
```

These options are explained below:

- **Baud rate.** This parameter branches to the Baud Rate Selection menu, which is the same as the one for the GS/1 shown in Figure 2-51. The default baud rate for all lines is 4800. Reset this parameter for each line that operates at a different baud rate. The aggregate speed per SIO board should not exceed 84 kbaud.

  If the GS/3 is attached to a modem, the modem usually provides the transmit and receive clocks, rather than the GS/3. However, the baud rate of each line should be set to the baud rate of the attached modem, so that the load balancing feature operates properly.

- **Network ID of remote Ethernet.** Enter the network ID for the remote network. This ID can be any hexadecimal number between one and eight digits long. Alternatively, Bridge Communications can provide a network ID; contact Bridge Communications Technical Support for this information. The system does not accept a remote network address that is identical to the address already specified for the local address.

3. **Line map display.** This parameter branches to the Lines Configurations menu, which displays the settings of all lines attached to the GS/3. Figure 2-58 shows the line map display for the GS/3 running XNS protocols.

```
                    Lines Configurations

              Remote Network      Baud Rate

Line 0 :        00000000            4800

Line 1 :        00000000            4800

Line 2 :        00000000            4800

Line 3 :        00000000            4800

Line 4 :        00000000            4800

Line 5 :        00000000            4800

Line 6 :        00000000            4800

Line 7 :        00000000            4800


(ESC to return to previous menu)
```

Figure 2-58 Lines Configurations Menu for the GS/3 with XNS

2.11 GS/3 Running IP Protocols

Gateway Servers provide internetwork communications between two or more networks. The GS/3 running IP protocols connects geographically distant TCP/IP Ethernet networks by means of medium- to high-speed communication links. It provides Interconnection Service between devices on either network.

This section describes the Sysgen menus and parameters used to configure the GS/3 running IP protocols.

**** NOTE ****

The Sysgen parameters described below should only be modified by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-59 shows the paths of the Sysgen menus for the GS/3 running IP protocols.

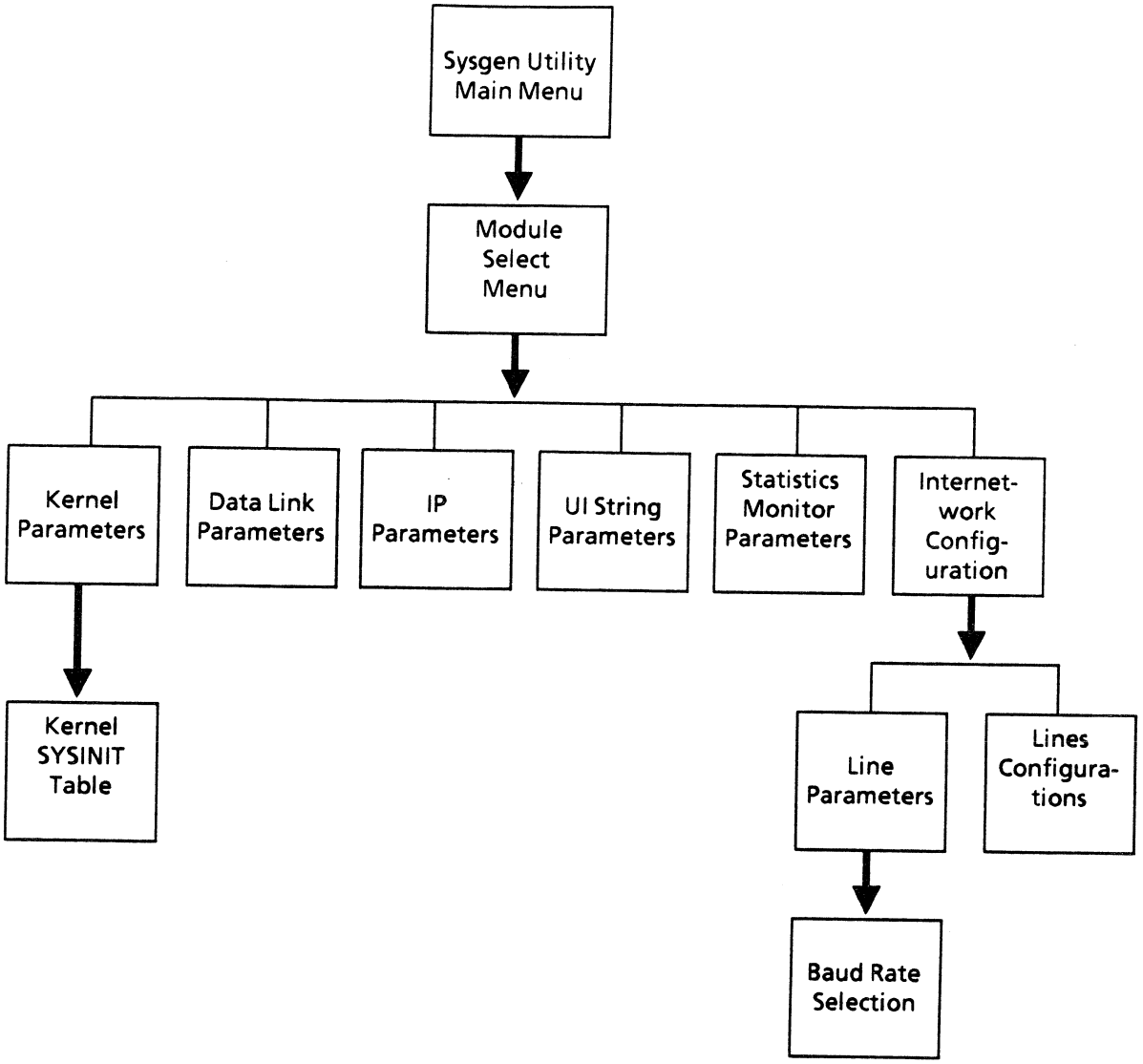


Figure 2-59 Sysgen Menus for the GS/3 with IP

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. The Module Select Menu for the GS/3 running IP protocols is shown in Figure 2-60.

```
                    Module Select Menu

1. Kernel Parameters

2. Data Link Parameters

3. IP Parameters

4. UI String Parameters

5. Statistics Monitoring Parameters

6. Internetwork Configuration




(ESC to return to main menu)
Select module :
```

Figure 2-60 Module Select Menu for the GS/3 with IP

Many Sysgen menus for the GS/3 running IP protocols are the same as for other servers. For menus that are similar, Table 2-6 refers to the appropriate manual sections. Menus with significant differences are discussed following the table.

Table 2-6 Locating GS/3 IP Sysgen Menu Descriptions

GS/3 IP Menu	*Similar to*	*Where Described*
Kernel Parameters	GS/3 XNS	2.10.1
Data Link Parameters	CS/1 XNS	2.2.2
IP Parameters	—	2.11.1
UI String Parameters	GS/3 XNS	2.10.4
Statistics Monitor Parameters	CS/1 XNS	2.2.7
Internetwork Configuration	—	2.11.2

2.11.1 GS/3 IP Parameters

The Internetwork Protocol (IP) is an internetwork datagram protocol that delivers packets to and from an attached network. This section describes the IP parameters that can be adjusted during GS/3 system generation. Figure 2-61 shows the IP Parameters menu for the GS/3 running IP protocols.

The IP Parameters menu for the GS/3 running IP protocols is the same as the version for the CS/1 running TCP/IP protocols with the exception of one parameter, described below. For details about the first four IP parameters, see Section 2.3.3.

The GS/3 parameter that differs is shown below:

```
5. Extended ARP responses          no
```

This parameter determines whether or not the GS/3 performs extended ARP routing. When option 5 is chosen, Sysgen prompts for a "y" (yes) or "n" (no). If "y" is specified, the GS/3 will respond positively to an IP address request directed either to itself or to one of its remote lines. If "n" is specified, the GS/3 will respond positively only to an IP address request directed to the GS/3 itself.

```
                    IP Parameters

     Parameter                    Current Value

1. Network to IP mailbox                0x80
2. Client to IP mailbox                 0xC
3. Server internet address         000.000.000.000
4. Server subnet mask              not a subnet
5. Extended ARP responses               no




(ESC to return to previous menu)
Enter selection:
```

Figure 2-61 GS/3 IP Parameters Menu

2.11.2 Internetwork Configuration for the GS/3 Running IP Protocols

The GS/3 provides a network-layer Interconnection Service, which routes packets between two networks that both use the same Ethernet protocol.

One or more leased lines are required between the server and the remote GS/3. On a switched line, the user must dial manually.

To support the Interconnection Service, a GS/3 must be configured with two kinds of information:

- The network number of the Ethernet to which the GS/3 is directly connected.

  The GS/3 uses this number to identify itself when communicating with remote Ethernets.

- The network numbers of all remote Ethernet networks attached to the GS/3 and the physical characteristics of each line connecting the GS/3 with a network.

  The GS/3 uses the list of remote Ethernet numbers and the associated line numbers to create a routing table for sending packets to the remote networks.

If the GS/3 has multiple lines to a single remote Ethernet, the GS/3 monitors availability and reliability of each line, automatically switching packets to different lines when necessary. If a line remains idle for the time interval used by the reliability checking algorithm, the GS/3 sends a probe packet to test the line. If it does not receive an acknowledgement, the GS/3 removes the line from the routing table until subsequent probes show that the line is operational.

The initial routing table is established through option 6, Internetwork Configuration, on the main Module Select menu. These parameters must be set for every GS/3.

The Internetwork Configuration menu contains three options. These options are described below:

1. **Local network address.** This parameter cannot be specified on the Internetwork Configuration menu for the GS/3 running IP protocols. The network address for this server is generated from the IP address and IP subnet mask that were specified on the IP Parameters menu.

2. **Line Configuration.** This parameter specifies the characteristics of the lines attached to the server's SIO boards. When this option is chosen, the Sysgen program prompts for a line number in the range 0 through 7. Table 2-6 (in Section 2.10.5) lists the eight possible lines and their locations.

   The Line Configuration parameter branches to the Line Parameters submenu, which displays the following options:

```
1. Baud rate                                4800

2. Network ID of remote Ethernet
   ( includes subnet, if any )              000.000.000.000
```

These options are explained below:

- **Baud rate.** This parameter branches to the Baud Rate Selection menu, which displays all baud rates supported by the GS/3. The Baud Rate Selection menu for the GS/3 is the same as the one for the GS/1, shown in Figure 2-51. The default baud rate for all lines is 4800. Reset this parameter for each line that operates at a different baud rate. The aggregate speed per SIO board should not exceed 84 kbaud.

  If the GS/3 is attached to a modem, the modem usually provides the transmit and receive clocks, rather than the GS/3. However, the baud rate of each line should be set to the baud rate of the attached modem, so that the load balancing feature operates properly.

- **Network ID of remote Ethernet.** Enter the network ID for the remote network. This ID can be any hexadecimal number between one and eight digits long. Alternatively, Bridge Communications can provide a network ID; contact Bridge Communications Technical Support for this information. The system does not accept a remote network address that is identical to the address already specified for the local address.

3. **Line map display.** This parameter branches to the Lines Configurations menu, which displays the settings of all lines attached to the GS/3. Figure 2-58 (in Section 2.10.5) shows the line map display for the GS/3 running XNS protocols. The IP version displays fewer lines.

2.12 GS/300

The GS/300 is functionally similar to the GS/3. It interconnects up to four geographically distant XNS Ethernet networks by means of medium- to high-speed communications links. This section describes the Sysgen menus and parameters used to configure the GS/300.

**** NOTE ****

The Sysgen parameters described below should only be modified by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-62 shows the paths of the Sysgen menus for the GS/300.

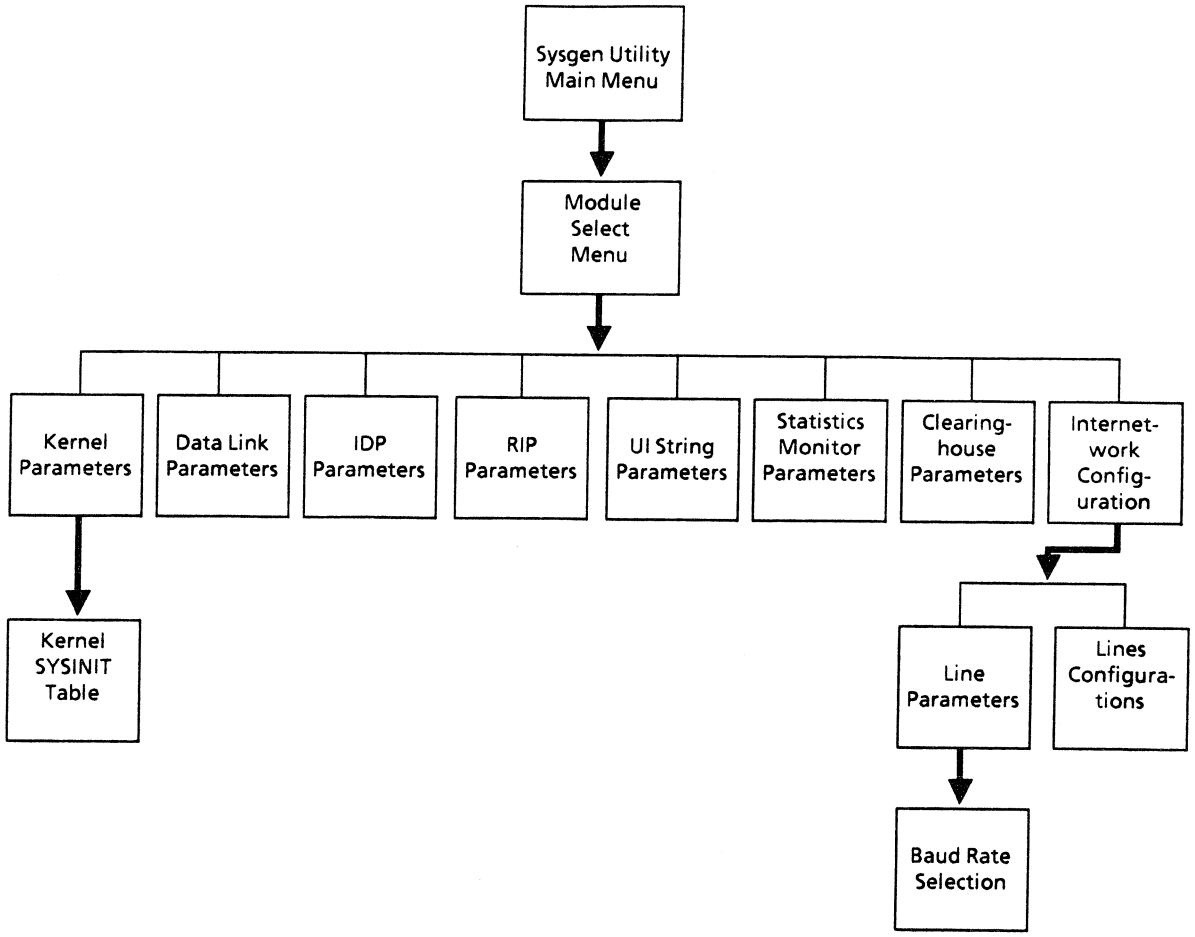


Figure 2-62 GS/300 Sysgen Menus

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. The Module Select Menu for the GS/300 is shown in Figure 2-63.

```
                    Module Select Menu

1. Kernel Parameters

2. Data Link Parameters

3. IDP Parameters

4. RIP Parameters

5. UI String Parameters

6. Statistics Monitoring Parameters

7. Clearinghouse Parameters

8. Internetwork Configuration



(ESC to return to main menu)
Select module :
```

Figure 2-63 GS/300 Module Select Menu

All GS/300 Sysgen menus are the same as those for other servers, although the GS/300 versions may display different defaults and permit slightly different ranges of values to be specified. Table 2-7 refers to the manual sections that describe similar menus.

Table 2-7 Locating GS/300 Sysgen Menu Descriptions

GS/300 Menu	*Similar to*	*Where Described*
Kernel Parameters	GS/3 XNS*	2.10.1
Data Link Parameters	CS/1 XNS	2.2.2
IDP Parameters	GS/3 XNS	2.10.2
RIP Parameters	GS/3 XNS	2.10.3
UI String Parameters	GS/3 XNS	2.10.4
Statistics Monitor Parameters	CS/1 XNS	2.2.7
Clearinghouse Parameters	CS/1 XNS	2.2.8
Internetwork Configuration	GS/3 XNS	2.10.5

* The GS/300 buffer size parameter has a default value of 8C.

2.13 GS/4

The GS/4 directly connects two adjacent XNS Ethernet networks. This section describes all the Sysgen menus and parameters that are used to configure the GS/4. Only two parameters are mandatory: the local network address and the remote network address. The GS/4 must be configured with these parameters to support the Interconnection Service. Other system generation parameters are factory set to default values designed for standard software.

**** NOTE ****

The Sysgen parameters described below should be modified only by someone with a thorough understanding of the system software.

The network manager performs system generation by choosing options on Sysgen menus, which branch from one menu to the next along defined paths. Figure 2-64 shows the paths of the GS/4 Sysgen menus.

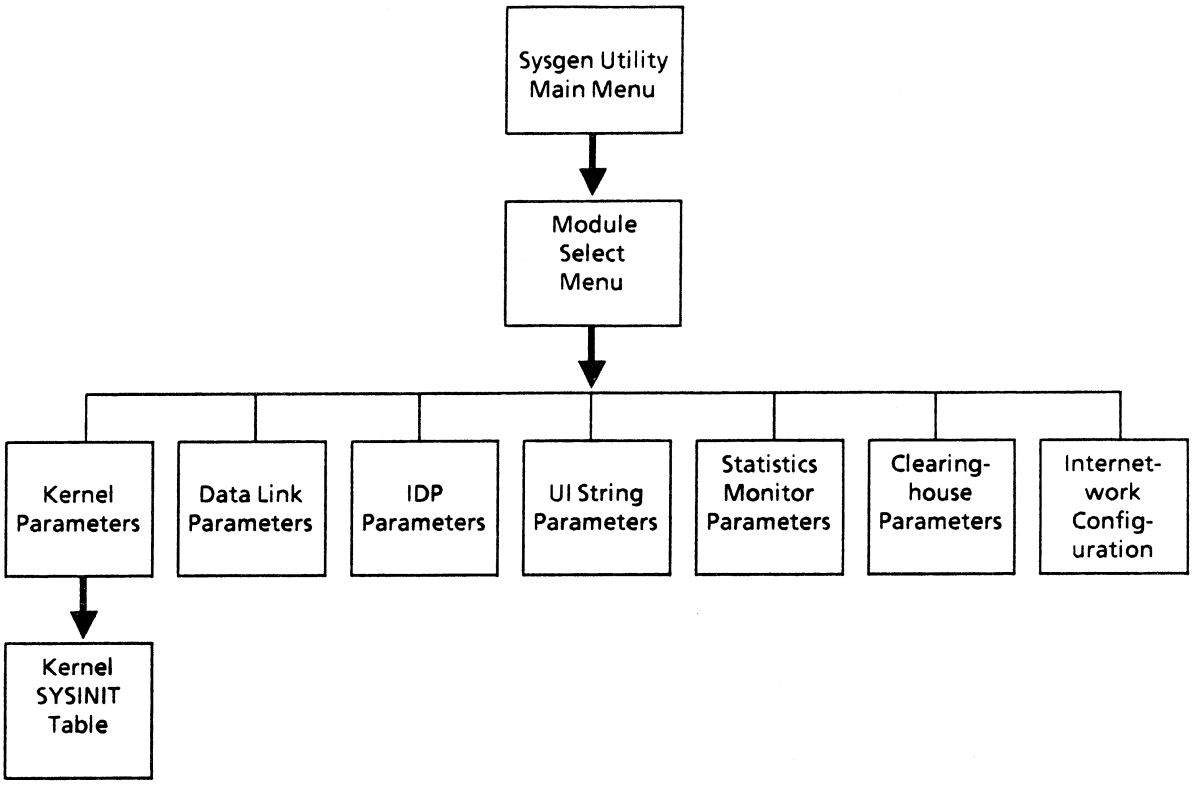


Figure 2-64 GS/4 Sysgen Menus

When option 1, View/Alter Module Parameters, is selected on the main Sysgen menu, the Sysgen program displays the Module Select Menu. Figure 2-65 shows the GS/4 Module Select Menu.

```
                    Module Select Menu

1. Kernel Parameters

2. Data Link Parameters

3. IDP Parameters

4. UI String Parameters

5. Statistics Monitoring Parameters

6. Clearinghouse Parameters

7. Internetwork Configuration




(ESC to return to main menu)
Select module :
```

Figure 2-65 GS/4 Module Select Menu

Most options on the GS/4 Sysgen menus are the same as for other servers. For menus that are similar, Table 2-8 refers to the appropriate manual sections. Menus with significant differences are discussed following the table.

Table 2-8 Locating GS/4 Sysgen Menu Descriptions

GS/4 Menu	*Similar to*	*Where Described*
Kernel Parameters	—	2.13.1
Data Link Parameters	CS/1 XNS	2.2.2
IDP Parameters	—	2.13.2
UI String Parameters	GS/3 XNS	2.10.4
Statistics Monitor Parameters	CS/1 XNS	2.2.7
Clearinghouse Parameters	CS/1 XNS	2.2.8
Internetwork Configuration	—	2.13.3

2.13.1 GS/4 Kernel Parameters

The kernel provides resource management services for the server software. These services are detailed in the *Software Technical Reference Manual, Volume One.*

Figure 2-66 shows the GS/4 Kernel Parameters menu.

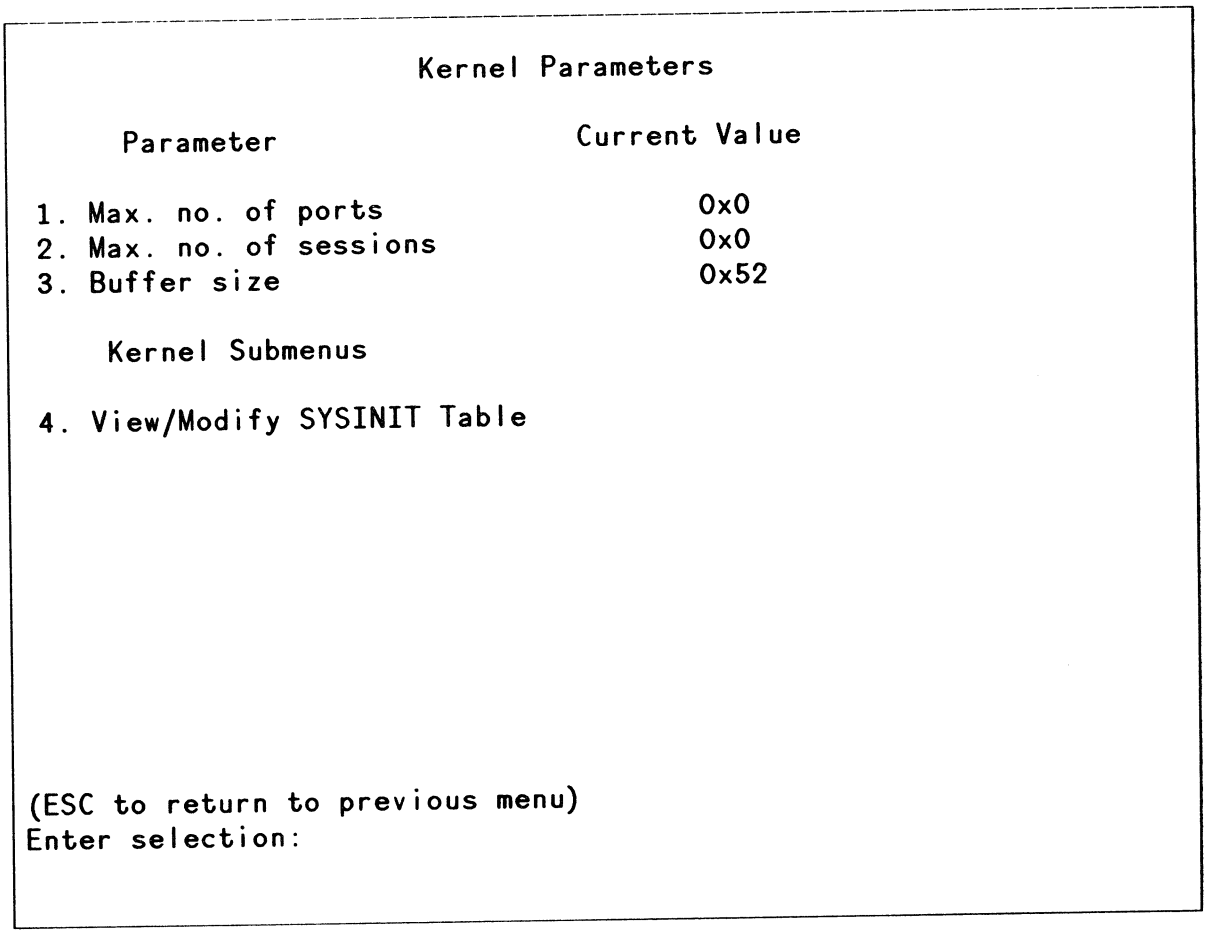


Figure 2-66 GS/4 Kernel Parameters Menu

The options on the GS/4 Kernel Parameters menu also appear on the Kernel Parameters menu for the CS/1 running TCP/IP protocols. See Section 2.3.1 for parameter descriptions.

2.13.2 GS/4 IDP Parameters

The Internetwork Datagram Protocol (IDP) is used to send datagrams to an addressable destination, which can be on another network. This section describes the IDP parameters that can be adjusted during GS/4 system generation. Figure 2-67 shows the IDP Parameters menu for the GS/4, with default values displayed.

```
                        IDP Parameters

     Parameter                      Current Value

 1. Mailbox depth level 0                  0x20
 2. Mailbox depth level 2                  0xC
 3. Software packet checksum on/off        0x0









(ESC to return to previous menu)
Enter selection:
```

Figure 2-67 GS/4 IDP Parameters Menu

The GS/4 IDP Parameters menu is similar to the version for the CS/1 running XNS, although some default values may differ. For explanations of the parameters on this menu, see Section 2.2.3.

2.13.3 GS/4 Internetwork Configuration

The GS/4 Internetwork Configurations menu is used to configure the two mandatory parameters for the GS/4, the addresses of the local and remote networks.

The Internetwork Configuration menu displays the following options:

```
1. EBA network address

2. SBA-E network address
```

These options are described below:

1. **EBA Network Address.** This parameter establishes the network address of the local network that is attached to the transceiver connector labeled "EBA" on the GS/4. Specify any hexadecimal number between one and eight digits long. Alternatively, Bridge Communications can provide a network ID; contact Bridge Communications Technical Support for this information.

2. **SBA-E Network Address.** This parameter establishes the network address of the remote network that is attached to the transceiver connector labeled "SBA-E" on the GS/4. Specify any hexadecimal number between one and eight digits long. Alternatively, Bridge Communications can provide a network ID; contact Bridge Communications Technical Support for this information. The system does not accept a remote network address that is identical to the address already specified for the local address.

3.0 PORT CONFIGURATION

This section describes the port configuration parameters and provides sample configurations for devices of various types. The information is grouped into the following sections:

- Section 3.1 describes the configuration parameters applicable to asynchronous ports and provides sample configurations appropriate for various asynchronous devices.
- Section 3.2 describes the configuration parameters applicable to character-synchronous ports and provides sample configurations appropriate for various character-synchronous devices.
- Section 3.3 describes the configuration parameters applicable to bit-synchronous devices and provides sample configurations appropriate for various bit-synchronous devices.
- Section 3.4 describes the configuration parameters applicable to ports on the CS/1-X.25.
- Section 3.5 describes the configuration parameters applicable to the IVECS.
- Section 3.6 describes the configuration parameters applicable to the CS/1-HSM and the CS/1-SNA.
- Section 3.7 describes the configuration parameters applicable to the GS/1.

Each port on a Communications Server and each virtual port on a GS/1 has a set of default configuration parameters that determine how the port and the attached or remote device interact. Some of the parameters may have to be adjusted for the local installation.

The default parameter tables are stored in the server's memory and in files on the diskette. The tables on the diskette are stored with filenames consisting of numbers corresponding to the ports to which the files apply. Default parameters are divided into four categories:

- Port parameters depend on the needs of the device interacting with the port and typically remain constant for a single port.
- Session parameters are more likely to vary when the device communicating with the port is interacting with different remote devices or running different applications.
- Editing parameters determine the functions of several special characters.
- Global parameters (e.g., passwords or welcome messages) apply to all ports on the server.

When a port becomes active, the system creates a working parameter table by copying the port's port parameters, editing parameters, and the global parameters from the default parameter table. When a session is established to a remote device, the server completes the active parameter table by copying the session parameters from the port's default parameter table. For each new session, the system creates a new active parameter table based on the default parameter table.

For asynchronous ports and Gateway Server virtual ports, settings in both the active and default parameter tables can be altered. For character-synchronous and bit-synchronous ports, only default parameter tables can be altered. For virtual ports on the CS/1-HSM, CS/1-SNA, and IVECS, only default parameter tables can be altered, and only a limited number of parameters apply.

Active parameters can be changed only while an active parameter table exists. The SET command changes the active parameter table in the server's memory. The change remains in effect only as long as the active parameter table is in use (i.e., while the port remains in Data Transfer or Command mode or while a connection exists).

Default parameters can be changed at any time. The SETDefault command changes the default parameter table stored on the disk. The change takes effect the next time the server uses the default table to create a new active parameter table. It creates this table whenever the port enters Command mode from Listen mode or enters a new session in response to the Connect command. Only the default parameters can be altered remotely by the network manager.

**** NOTE ****

A Global Network Manager can set default parameters remotely, but only if the destination server is running, not if it is powered off or running utilities from the monitor.

Some of the commands that affect parameter tables are ReaD, SAve, SET, and SETDefault:

- ReaD reads an entire table into memory and automatically saves the table onto the diskette.
- SAve writes an entire table from memory onto diskette.
- SET changes the setting of an active parameter.
- SETDefault changes the setting of a default parameter.

Figure 3-1 illustrates the effects of these commands. The *Connection Service User's Guide* describes these commands and the SHow command, which, depending on the option selected, displays the parameters in default or active parameter tables.

Many parameters can be specified with either the SET command or the SETDefault command. Other parameters can be specified only with the SET command or only with the SETDefault command. The parameter descriptions in the following sections indicate which command(s) can be used to specify each parameter.

In the detailed descriptions, values separated by vertical bars are mutually exclusive (i.e., only one can be specified). Where a list of mutually exclusive values is separated from another such list by a comma, one value can be specified from each list. Sets of nonexclusive values (i.e., more than one of which can be specified) are enclosed in parentheses and separated by commas.

When a connection is made to an X.25 destination, the session parameters may have to be changed to conform to the requirements of the host. When the connection is established, one or more of the default session parameters can be altered from the host side of the connection. Parameters most likely to affect the user are ECMChar and BReakAction. The X.25 interface can alter these parameters when a connection is made either to a host connected to a CS/1-X.25 or to a host on a Public Data Network (PDN) accessed through a GS/1. For example, if the port's default parameter table has ECMChar set to <CTRL-^> and BReakAction set to <EscDTM>, the X.25 interface can reset ECMChar to <^P> and BReakAction to <OutofBand>. In this case, neither <CTRL-^> nor the break key can change the port from Data Transfer mode to Command mode.

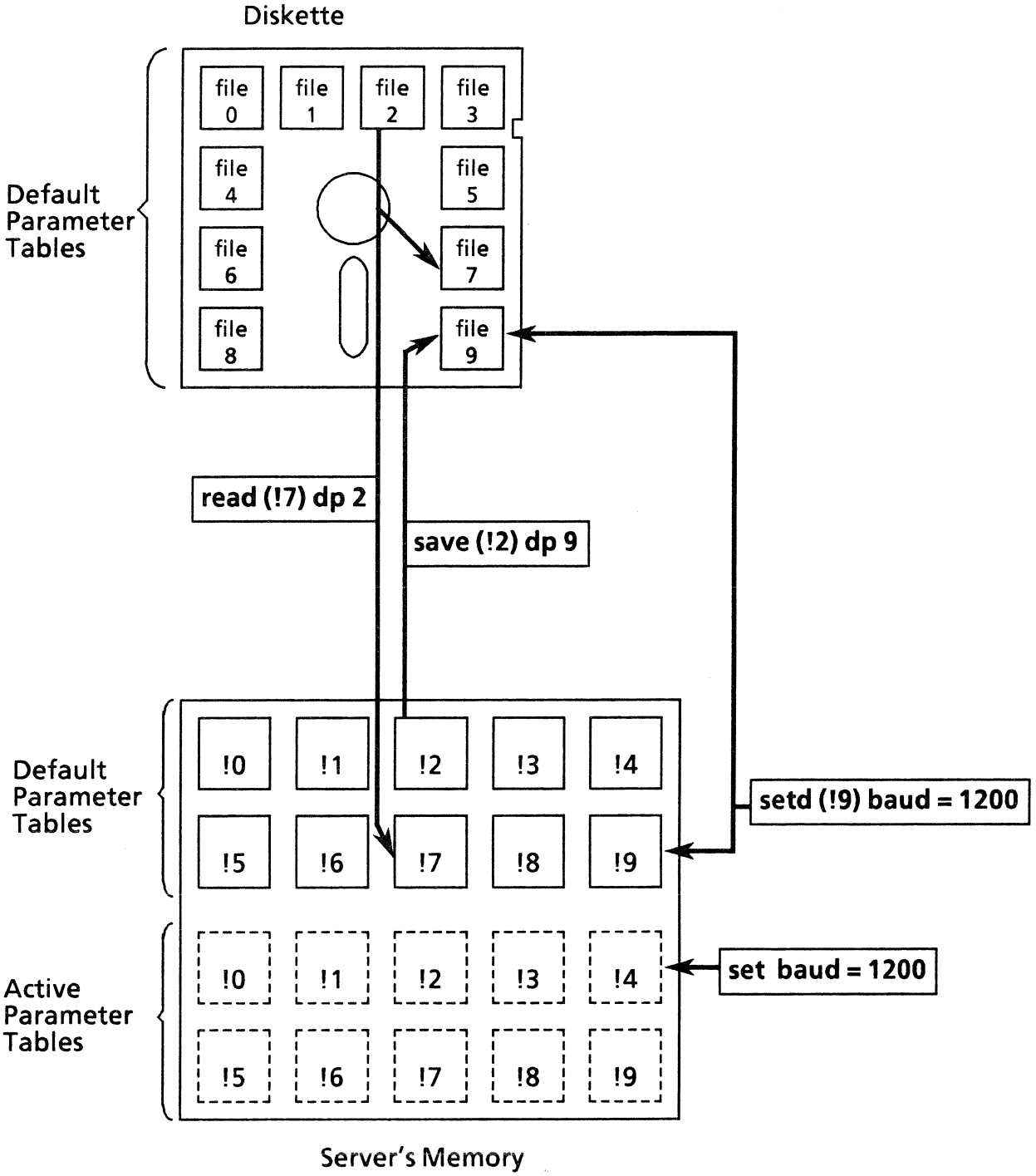


Figure 3-1 Effects of the ReaD, SAve, SET, and SETDefault Commands

3.1 Asynchronous and 3270 Server Configuration Parameters

Table 3-1 lists all asynchronous and 3270 port parameters alphabetically and gives the section number of each description. Uppercase characters represent the minimum unambiguous abbreviation of each parameter. These parameters are supported on all ports of a CS/1 with asynchronous or 3270 interfaces, a CS/100 with asynchronous interfaces, and a CS/200. A server running XNS protocols supports slightly different parameters than a server running TCP/IP protocols. These differences are noted in the table.

Table 3-1
Asynchronous and 3270 Configuration Parameter Summary

Parameter	*Section*	*Parameter*	*Section*
AccessGroup *	3.1.1	GroupxPasswd *	3.1.5
AccessWord *	3.1.1	IdleTimer	3.1.3
AUditServerAddr	3.1.5	InitMacro	3.1.1
AUToDisconnect	3.1.1	InterAction	3.1.1
AUtoLogoff	3.1.1	InternetPort ***	3.1.5
BAud **	3.1.2	LFDelay **	3.1.2
BootServerAddr	3.1.5	LFInsertion	3.1.3
BReakAction	3.1.3	LFPad **	3.1.2
BReakChar	3.1.3	LineERAse	3.1.4
BSDelay **	3.1.2	LinePRotocol **	3.1.2
BSPad **	3.1.2	LocalEDiting	3.1.4
BUffersize	3.1.1	LocalPassWord	3.1.5
CONNectAudit	3.1.5	LogoffStr	3.1.5
CRDelay **	3.1.2	LongBReakAction	3.1.3
CRPad **	3.1.2	MaxSessions	3.1.1
DataBits **	3.1.2	MOde	3.1.3
DataForward	3.1.3	NMPrompt	3.1.5
DATE	3.1.5	Organization *	3.1.5
DefaultGateway ***	3.1.5	PARIty **	3.1.2
DeVice	3.1.1	PermanentVC	3.1.1
DIsconnectAction	3.1.3	PrimaryNS ***	3.1.5
DOmain *	3.1.5	PRIvilege	3.1.1
DUplex **	3.1.2	PROMPt	3.1.5
ECHOData	3.1.3	ReprintLine	3.1.4
ECHOMask	3.1.3	SecondaryNS ***	3.1.5
ECMChar	3.1.3	StopBits **	3.1.2
EOM	3.1.3	TabDelay **	3.1.2
ERAse	3.1.4	TabPad **	3.1.2
ERRorAudit	3.1.5	UseDCDout **	3.1.2
FFDelay **	3.1.2	UseDTRin **	3.1.2
FFPad **	3.1.2	VERBatim	3.1.4
FlowControlFrom **	3.1.3	WelcomeString	3.1.5
FlowControlTo **	3.1.3	WordERAse	3.1.4
FlushVC	3.1.3	XOFF	3.1.3
GlobalPassWord	3.1.5	XON **	3.1.3

* Applies to XNS servers only.
** Not applicable to an SIO-3270 interface.
*** Applies to TCP/IP servers only.

3.1.1 Asynchronous and 3270 Port Transmission Parameters

This section describes the asynchronous and 3270 port transmission parameters, usually set by the network manager for each port. The parameters and their permitted values are listed in Table 3-2.

Descriptions of all parameters and parameter values follow the table. If the indicated default value is the value desired, the parameter need not be set.

Table 3-2 Asynchronous and 3270 Port Transmission Parameters

Parameter	*Permitted Values*
AccessGroup *	NoGroup | AllGroups | (1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 , 10 , 11 , 12 , 13 , 14 , 15 , 16)
AccessWord *	NoGroup | AllGroups | (1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 , 10 , 11 , 12 , 13 , 14 , 15 , 16)
AUToDisconnect	Disabled | <number> (1-16000 minutes)
AUtoLogoff	[OFF | ON]
BUffersize	<number> (1-512 bytes)
DeVice	(Host | Terminal , Paper | Glass)
InitMacro **	"<macro name>" | ""
InterAction	(Brief | Verbose , Echo | NoEcho , MacroEcho | NoMacroEcho , BroadcastON | BroadcastOFF , LFinsert | NoLFinsert MacroBreak * | NoMacroBreak *)
MaxSessions	<number> (1-8 sessions)
PermanentVC	"" | "<address>"
PRIvilege ***	User | LocalNM | GlobalNM

* Applies to XNS servers only.
** Can be set only with SETDefault, not SET.
*** Can be set only with SET, not SETDefault.

The **AccessGroup** and **AccessWord** parameters together determine which ports can make connections to which ports, as described in the *Connection Service User's Guide*. When a connection is requested, the system compares the AccessWord of the requesting port with the AccessGroup of the destination port. If at least one common number appears in both sets, the connection is established.

If no common group numbers appear, the system prompts the user for a password associated with the AccessGroup parameter for the destination port. If the AccessGroup has more than one value, the password for any one of the values is accepted. Each of the two parameters can have the value NoGroup, AllGroups, or one or more numbers from 1 to 16. The default value for both parameters is 1.

Bridge recommends setting AccessWord to NoGroup for any port to which a dial-in modem is attached. This requires entry of the appropriate password before the user calling in can establish a connection through that modem.

The AccessGroup and AccessWord parameters are not available on TCP/IP servers.

The **AUToDisconnect** parameter specifies an interval after which the current session is disconnected if no activity occurs. The AUToDisconnect interval can be set to Disabled or to a number in the range 1 to 16000 (in minutes). Setting a value other than Disabled is appropriate only for host ports. The default value is 60 minutes for host ports and Disabled for terminal ports.

The **AUtoLogoff** parameter determines whether or not the string defined by the LogoffStr parameter is transmitted to the destination of a connection when the connection is broken by the DisConnect command or by the expiration of the AUToDisconnect interval. The string is not transmitted if the disconnection is the result of a Listen command or if traffic to the destination port is flow controlled and the logoff string cannot be transmitted within six seconds. Setting this parameter to ON is appropriate only for host ports, because the logoff string usually consists of a logoff command, which causes the host to close the port in an efficient manner. The LogoffStr parameter is described in Section 3.1.5.

The **BUffersize** parameter specifies the size of the data buffer in bytes. It can be set to a value in the range 1 to 512. Except to accommodate custom software, the BUffersize port parameter should not exceed the server's buffer size, which is specified by the Buffer Size Sysgen parameter on the Kernel Parameters menu. Setting BUffersize to a smaller value than the server's buffer size can be useful for PC-to-host file transfer applications, because the buffers are forwarded sooner, and the remote asynchronous line is used simultaneously with the local asynchronous line.

The data buffer accumulates data until the buffer becomes full, until the server's preconfigured buffer size has been reached, or until the interval specified by the IdleTimer parameter elapses, whichever comes first; then the data is packetized and forwarded. Depending on the value of the DataForward parameter, data can also be forwarded when a data-forwarding character is entered.

The default BUffersize is equal to the value specified for the Buffer Size parameter during system generation. The factory-specified default is 82. Normally, a CS/1 with an asynchronous or 3270 interface can have up to four ports whose BUffersize is set to 512; the BUffersize for the remaining ports must not exceed 82 for each port. A CS/100 with an asynchronous interface can have up to two ports whose BUffersize is set to 512; the BUffersize for the remaining ports must not exceed 82 for each port. A CS/200 can have up to 10 ports whose BUffersize is set to 512.

The **DeVice** parameter specifies the local device type. One of two primary values can be specified:

Host | Terminal

Specifies whether the device is a host or a terminal.

Setting DeVice to Host automatically resets the following parameters: BReakAction is set to Ignore, AUToDisconnect is set to 60, and ECMChar and BReakChar are disabled. The InterAction parameter is set to Verbose and Echo; BUffersize is set to the buffer size specified at the time of system generation.

Setting DeVice to Terminal automatically resets the following parameters: BReakAction is set to EscDTM and InterAction is set to Verbose and Echo. BUffersize is set to the buffer size specified at the time of system generation.

On a CS/1 with an asynchronous, 3270, bisynchronous, or bit-synchronous interface, the default DeVice parameter values are Host for ports 0 through 3 of each SIO board and Terminal and Glass for ports 4 through 7 of each SIO board. On the CS/100 with an asynchronous or bisynchronous interface, the default values are Terminal and Glass for ports 0 through 7, and Host for ports 8 through 13. On the CS/200, the default values are Terminal and Glass for odd-numbered ports, and Host for even-numbered ports.

If DeVice is set to Terminal, one of the following secondary characteristics can also be specified:

Paper | Glass

Determines whether the terminal is a video display unit (Glass, the default) or a hard-copy printer (Paper). The setting affects how backspacing is handled during local editing, for instance, when the user erases a character or a word using the backspace key or the local editing characters. If DeVice is set to Glass, the server moves the terminal cursor to the left one column for each character erased. If DeVice is set to Paper, the server prints a crosshatch symbol (#) for each character erased instead of attempting to move the print mechanism.

The **InitMacro** parameter specifies the name of a port initialization macro to be executed automatically each time the device makes a transition from Listening mode to Command mode. The macro itself is defined with the DEFine command. Port modes and the DEFine command are described in the *Connection Service User's Guide.*

**** NOTE ****

This parameter cannot be used to establish a system initialization macro; a system initialization macro can be established only by defining a macro whose name begins with the letters "init" (refer to the *Connection Service User's Guide).*

The **InterAction** parameter describes the interaction between the local device and the server. This parameter has no effect on a host port. The possible values are described below:

Verbose | Brief

Determines whether responses or error messages from the server to the local device are sent in their short form (Brief) or full-length form (Verbose, the default). Brief responses are "OK" if the requested action is successful, and "Err <n>" if an error is encountered. The *Connection Service User's Guide* lists all error messages and their corresponding error numbers. This pair of values also determine whether broadcast messages are preceded by a header indicating the port number of the sender of the message. The value Brief is appropriate for a host or a terminal emulator program; Verbose is appropriate for a terminal.

Echo | NoEcho

Determines whether input from the local device, while the device is in Command mode, is echoed back to the device. The default is Echo.

MacroEcho | NoMacroEcho

Determines whether or not macros are echoed on the screen as they are executed. The default is MacroEcho.

BroadcastON | BroadcastOFF

Determines whether or not the port receives messages sent with the Broadcast command when the port is in Command or Data Transfer modes. The default is BroadcastON.

LFinsert | NoLFinsert

Determines whether or not the server echoes a return and a linefeed when the user enters a command. This option is useful for terminals that perform local echo but do not generate a linefeed echo when a return is entered. The default is NoLFinsert.

MacroBreak | NoMacroBreak

Determines whether the <BREAK> key can be used to stop execution of a macro. In macros that raise the privilege level to Local or Global Network Manager, setting NoMacroBreak prevents the user from breaking out of the macro and, as a result, being left in network manager privilege level. The default is MacroBreak.

The **MaxSessions** parameter specifies the maximum number of open sessions permitted on a single port. The parameter can be set to a number in the range 1 to 8. The default value is 2. Because the number of sessions for the entire server is limited, a port might not be able to establish the number of sessions specified by this parameter.

The **PermanentVC** parameter specifies a permanent virtual circuit from the current or specified port to the specified address or clearinghouse name. The default is a null string, represented by double quotes (""), which indicates no permanent virtual circuit. This parameter is available on host ports only; however, the destination end of the circuit can be a terminal or host port. PermanentVC can be defined on both ends of the circuit.

To disable an existing permanent virtual circuit, set the parameter to a null string. This removes the definition, but does not disconnect any existing connection.

The **PRIvilege** parameter specifies the privilege level of the local device. This parameter affects all sessions, not just the current or next session. Privilege is not affected if a new configuration table obtained via the ReaD command contains a different privilege level (the *Connection Service User's Guide* describes the ReaD command). The default value is User. The PRIvilege parameter is the only parameter whose default value cannot be changed with the SETDefault command.

Three privilege levels are available:

User

Specifies User privilege level. User privilege permits the user to display or set characteristics for the local device port.

LocalNM

Specifies Local Network Manager privilege level. This level permits the user to set characteristics and control the status of any port on the local server and to define the setup of the local server.

GlobalNM

Represents Global Network Manager privilege level. This privilege level permits the user to set characteristics and control the status of any port on the network and to define the setup of either the local or a remote server.

3.1.2 Asynchronous Port Physical Parameters

This section describes the asynchronous port physical parameters, which are usually set by the network manager for all ports. The parameters and their possible values are summarized in Table 3-3.

Physical parameters do not apply to Communications Server ports on an SIO-3270 interface.

Table 3-3 Asynchronous Port Physical Parameters

Parameter	*Permitted Values*
BAud	AutoBaud | Low_AutoBaud | Hi_AutoBaud | 50 | 75 | 110 | 134.5 | 150 | 200 | 300 | 600 | 1200 | 1800 | 2400 | 3600 | 4800 | 7200 | 9600 | 19.2K | 38.4K *
BSDelay	None | <number> (1-127 sixtieths of a second)
CRDelay	" " "
FFDelay	" " "
LFDelay	" " "
TabDelay	" " "
BSPad	None | <number> (1-127 nulls of padding)
CRPad	" " "
FFPad	" " "
LFPad	" " "
TabPad	" " "
DataBits	5 | 6 | 7 | 8
DUplex	Half | Full
LinePRotocol **	ASynchronous | BYTESynchronous | BITSynchronous
PARIty	None | Odd | Even | 1 | 0 | AutoParity
StopBits	1 | 1.5 | 2
UseDCDout **	(AlwaysAssert | OnConnection , ToggleonDisc | NoToggle)
UseDTRin **	Ignore | AsDTR | AsDCD

* AutoBaud is available on CS/200 only. Hi_AutoBaud and Low_AutoBaud are available on CS/1, CS/1-HSM, and CS/100 only. The value 38.4K is unavailable on CS/100.

** Can be set only with SETDefault, not SET.

The **BAud** parameter specifies the local device baud rate. The default for all ports is 9600. The availability and effect of AutoBaud, Low_AutoBaud, or Hi_AutoBaud depends on the type of server:

- On a CS/1 port on an SIO-16 interface: When the BAud parameter is set to Low_AutoBaud or Hi_AutoBaud, the SIO-16 automatically selects the appropriate device baud rate from one of the numeric values listed in Table 3-3.

  If the SIO-16 sets the baud rate to 300 or higher, a <RETURN> must be entered immediately after the device is powered on or reset. If it sets the baud rate to 200 or lower, the first sequence typed after the device is powered on or reset must be <RETURN><RETURN>, with no delay between the key strokes.

- On the CS/1 (with all other interface types) and CS/100: When the BAud parameter is set to Hi_AutoBaud, the server automatically selects the appropriate device baud rate of 2400, 4800, or 9600. If the BAud parameter is set to Low_AutoBaud, the server automatically selects the appropriate device baud rate of 300 or 1200.

  If either Hi_AutoBaud or Low_AutoBaud is selected, a <RETURN> must be the first character entered after the device is powered on or reset.

- On the CS/200: When the BAud parameter is set to AutoBaud, the server automatically selects the appropriate device baud rate from one of the numeric values listed in Table 3-3.

  If AutoBaud sets the server's baud rate to 300 or higher, a <RETURN> must be entered immediately after the device is powered on or reset. If AutoBaud sets the server's baud rate to 200 or lower, the first sequence typed after the device is powered on or reset must be <RETURN><RETURN>, with no delay between the key strokes.

The **BSDelay, CRDelay, FFDelay, LFDelay,** and **TabDelay** parameters specify the length of the delay (in sixtieths of a second) following the echo or transmission of the specified character before the server echoes or transmits another character. The default value is None (i.e., no delay). This parameter is designed for use with terminals with a moving print-head mechanism. The delay allows the mechanism to complete its motion before subsequent characters are received.

The **BSPad, CRPad, FFPad, LFPad,** and **TabPad** parameters specify the number of nulls the server inserts between the specified character and the next character. The default value is None (i.e., no nulls inserted).

The **DataBits** parameter specifies the number of databits per byte. The value can be set to 5, 6, 7, or 8. The default is 8 for all host ports, for one of the terminal ports on the CS/100, and for one of the terminal ports on each CS/1 SIO board. With DataBits set to 8, PARIty should be set to None, Odd, or Even; 0 and 1 are meaningless. The default for most terminal ports is 7.

The **DUplex** parameter specifies whether the local device transmits and receives in half-duplex mode or full-duplex mode. The default value is Full; half-duplex mode is not currently implemented.

The **LinePRotocol** parameter specifies the type of line protocol used by the port. For ports attached to the asynchronous interface of a CS/1 or CS/100, any value other than ASynchronous is illegal. The server automatically sets the value based on the SIO firmware present on the board.

The **PARIty** parameter specifies the local device parity. The possible values are None, Odd, Even, 1 (mark), 0 (space), or AutoParity.

- On the CS/1 and CS/100, the default value is None for host ports (ports 0 through 3 on each asynchronous CS/1 SIO board and ports 8 and 9 on the CS/100 with an asynchronous interface).

  The default value varies for each terminal port.

  The value AutoParity is valid only if the BAud parameter is set to Lo_AutoBaud or Hi_AutoBaud. If AutoParity is in effect, the first sequence entered after the device is powered on or reset must be <RETURN>.<RETURN>.

- On the CS/200, the default value is Even for ports 0 and 1, mark for ports 4 and 5, Odd for ports 6 and 7, and None for ports 2, 3, 8, and 9. (Ports 0, 2, 4, 6, and 8 are host ports; ports 1, 3, 5, 7, and 9 are terminal ports.)

  The value AutoParity is valid only if the BAud parameter is set to AutoBaud. If the baud rate is set to 300 or higher, the first sequence entered after the device is powered on or reset must be <RETURN>.<RETURN>. If the baud rate is set to 200 or lower, the first sequence entered after the device is powered on or reset must be <RETURN><RETURN>.<RETURN>, with no delay between the first two key strokes.

The **StopBits** parameter specifies the number of stopbits per byte. The value can be set to 1, 1.5, or 2. The default is 1.

The **UseDCDout** parameter specifies how the server supplies the Data Carrier Detect (DCD) signal to the attached device. This option is supported on all ports of a CS/1 with asynchronous interface, CS/100 with asynchronous interface, CS/200, and IVECS. Only some ports on other Communications Server types support this option. Refer to the appropriate installation guide for mapping between DCD, DTR, and the EIA connector pins. One each of two sets of parameter values can be specified:

AlwaysAssert | OnConnection

Determines when the DCD output signal is asserted.

AlwaysAssert causes the DCD output signal to be asserted at all times.

OnConnection causes the DCD output signal to be deasserted as long as no connection is established to the device and to be asserted when a connection is made.

ToggleonDisc | NoToggle

Determines whether or not the DCD output signal toggles when a connection is broken.

ToggleonDisc causes the DCD output signal to be deasserted for at least 65 milliseconds within 150 microseconds after disconnection. Depending on the other UseDCDout parameter setting, the signal then either remains deasserted or returns to asserted. This value is used when the server is connected to certain data switch devices.

NoToggle suppresses the toggle upon disconnection. The signal either remains asserted or is deasserted, depending on the other UseDCDout parameter setting.

The default value of UseDCDout is AlwaysAssert, NoToggle for all terminal ports and OnConnection, NoToggle for all host ports. The interaction between these sets of values is illustrated in Figure 3-2; Table 3-12 lists recommended settings of the UseDCDout parameter for use with various devices (both figure and table are in Section 3.1.9).

The **UseDTRin** parameter specifies the server's response to the value of the Data Terminal Ready (DTR) input signal received from the attached device. This option is supported on all ports of a CS/1 with asynchronous interface, CS/100 with asynchronous interface, CS/200, and IVECS. Only some ports on other CS/1 types support this option; refer to the appropriate installation guide for mapping between DCD, DTR, and the EIA connector pins. One of three parameter values can be specified:

Ignore

Specifies that the server does not check the state of the DTR or DSR input signal when a connection is made and takes no action when the signal changes value.

This value should never be specified if the FlowControlTo and FlowControlFrom parameters are set to CTS_RTS (refer to Section 3.1.3).

When the FlowControlFrom/To parameters are set to CTS_RTS, the SIO firmware uses DTR to enable and disable the SIO receiver; the UseDTRin parameter must not be set to Ignore or the SIO receiver is never enabled, and the port appears to hang. If the application requires that the DTR signal be ignored, the customer must build a special cable that holds the DTR signal high.

This value is the default for terminal ports.

AsDTR

Specifies that the server checks the state of the DTR input signal before establishing a connection to a port. If the DTR input is deasserted, the server rejects any connection requests to the port. If the DTR input changes from asserted to deasserted, all connections to the port are terminated and the port enters Listening mode. If the device is a terminal and the input signal changes from deasserted to asserted, a Connection Service process is started for the port (i.e., the WelcomeString is transmitted to the terminal and the InitMacro, if any, is executed).

This value is the default for host ports.

AsDCD

Specifies that the Communications Server does not reject a connection request to the port based on the value of the DTR input. However, if the DTR input changes from asserted to deasserted, all connections to the port are terminated and the port enters Listening mode. If the device is a terminal and the input signal is changed from deasserted to asserted, a Connection Service process is started for the port.

3.1.3 Asynchronous and 3270 Session Transmission Parameters

Table 3-4 lists the session transmission parameters. A description of each parameter, an explanation of each possible value, and an indication of the default follows the table. If the default is acceptable, the parameter does not have to be set.

These parameters can be set with either SET or SETDefault unless otherwise indicated in the table.

Table 3-4 Asynchronous and 3270 Session Transmission Parameters

Parameter	*Permitted Values*
BReakAction	IGnore | (OutofBand , FlushVC , InBand , EscDTM)
BReakChar	Disabled | <char>
DataForward	None | (AlphaNum , CR , ESC , EDiting , Term , FormEf , COntrol , Punct)
DIsconnectAction	None | SendLongBreak
ECHOData	OFF | ON
ECHOMask	None | (AlphaNum , CR , ESC , EDiting , Term , FormEf , COntrol , Punct)
ECMChar	Disabled | <char>
EOM ***	Disabled | <char>
FlowControlFrom *	None | CTS_RTS | XON_XOFF | ENQ_ACK
FlowControlTo *	None | CTS_RTS | XON_XOFF | ENQ_ACK
FlushVC **	OFF | ON
IdleTimer	Disabled | <number> (1-255 sixtieths of a second)
LFInsertion	None | (OutputCrlf , EchoCrlf)
LongBReakAction	IGnore | (Listen , OutofBand , InBand)
MOde	Transparent | Scroll
XOFF *	Disabled | <char>
XON *	Disabled | <char>

* Not applicable to servers with an SIO-3270 interface.
** Can be set only with SET, not SETDefault.
*** Applies to XNS servers only.

The **BReakAction** parameter specifies the action taken by the server when a break (or the alternative character specified by the BReakChar parameter) is detected. The value IGnore is mutually exclusive with any other value; more than one of the remaining values can be specified. The default value is InBand for terminal ports and IGnore for host ports. There are five possible values:

IGnore

Specifies no action.

OutofBand

Specifies that an out-of-band break (for servers running XNS) or an IP signal (for servers running TCP/IP) is transmitted to the remote device.

FlushVC

Specifies that all packets for this session currently in the circuit are flushed when a break is detected. If this value is set, either OutofBand or InBand (or both) must also be set.

For servers running XNS protocols, this value implements X.3 parameter 7 and operates in conjunction with the FlushVC parameter (X.3 parameter 8). This value must not be specified unless the destination host supports X.3 parameters 7 and 8 or equivalent functions.

For servers running TCP/IP protocols, this parameter uses the Telenet DO TIMING option. This value must not be specified if the remote host does not respond to a DO TIMING command. Either a negative or a positive response is acceptable, but no response at all makes the port appear to hang.

Refer to the FlushVC parameter in this section for a description of how this BReakAction value operates, and to Section 3.7 for a discussion of the X.3 parameters.

InBand

Specifies that an in-band break (for servers running XNS) or an IP signal (for servers running TCP/IP) is transmitted to the remote device.

EscDTM

Specifies that the user port will change from Data Transfer mode to Command mode.

The **BReakChar** parameter specifies the character that is interpreted by the server as a break signal. This parameter is useful for terminals that do not have a break key. Since most terminals have a break key, the default is Disabled.

The **DataForward** parameter specifies the events that cause data to be packetized and forwarded in Data Transfer mode. Some events are predetermined DataForward conditions; these include the elapsing of the IdleTimer (if enabled), the End of Message (EOM) signal, and the ATTN or break signal. One or more of the events listed below can also be specified. The default DataForward value is None, which is mutually exclusive with any other value.

None

Specifies that data is forwarded if the data buffer (size specified by the BUffersize parameter) becomes full or the IdleTimer elapses (if set). This is the default value.

AlphaNum

Specifies that a packet is created and forwarded as soon as any upper- or lowercase alphabetic character or numeric character is detected.

CR

Specifies that a packet is created and forwarded as soon as a return is detected.

ESC

Specifies that a packet is created and forwarded as soon as an escape (ESC, BEL, ENQ, or ACK) signal is detected.

EDiting

Specifies that a packet is created and forwarded as soon as any editing character is detected. Alternative editing characters can be specified; Section 3.1.4 lists the characters and their default values.

Term

Specifies that a packet is created and forwarded as soon as any terminator (ETX or EOT signal) is detected.

FormEf

Specifies that a packet is created and forwarded as soon as any Form Effector character is detected. Form Effectors are the linefeed, tab, and formfeed characters.

COntrol

Specifies that a packet is created and forwarded as soon as any control character is detected.

Punct

Specifies that a packet is created and forwarded as soon as any punctuation character is detected (includes all the nonalphanumeric characters, i.e., ! @ # $ % ^ & * ( ) _ - + = ~ ‘ | \ [ ] { } : ; " ’ < > , . ? / and space).

The **DIsconnectAction** parameter specifies the action taken by the server when a session is disconnected. This parameter applies only to host ports, and only to hosts that distinguish between the break signal (approximately 150 milliseconds) and the long break signal (approximately 3 seconds). There are two possible values:

None

Specifies that no long break is sent on disconnection (default).

SendLongBreak

Specifies that the server sends a long break to the host when a session is disconnected.

The **ECHOData** parameter specifies whether or not the server will echo input data back to the device while the device is in Data Transfer mode. The default value is OFF.

The **ECHOMask** parameter specifies which characters are echoed if ECHOData is enabled. The character classes are the same as those listed for the DataForward parameter. If ECHOData is enabled, then all characters that fit the ECHOMask descriptions are echoed when typed. The default ECHOMask values are AlphaNum, CR, Term, and Punct.

The **ECMChar** parameter specifies a character that the server interprets as a request to change from Data Transfer mode to Command mode. The default value is "^^" (representing the character <CTRL-caret>). The defined character cannot be transmitted as data. This parameter is used only if the application requires that a break signal be transmitted as data (i.e., the BReakAction parameter is set to InBand or OutofBand).

**** NOTE ****

The ECMChar does not change from Data Transfer mode to Command mode if the IdleTimer parameter is set to Disabled and the DataForward parameter is set to None.

The **EOM** parameter specifies a character to represent the local End of Message (EOM) signal. When the parameter is set to Disabled (the default), every packet that is transmitted is terminated with an EOM signal; in this case, the EOM parameter for the destination port should be set to the same value. This parameter does not apply to servers running TCP/IP.

The **FlowControlFrom** and **FlowControlTo** parameters specify the flow control mechanism from the server to the local device (i.e., the server can turn transmission from the local device on or off) and from the local device to the server (i.e., the local device can turn transmission from the server on or off), respectively. For all ports, the default value of both FlowControlFrom and FlowControlTo is XON_XOFF. For the GS/1, only None and XON_XOFF can be specified.

These parameters govern local flow control (i.e., between the local device and the local server). The remote device can use different flow control than the local device, since flow control across the network is handled by the servers at either end of the circuit independently of local flow control. Permitted values are described below:

None

Specifies that no flow control is used.

CTS_RTS

Specifies that the hardware control lines CTS and RTS are used. Refer to the appropriate installation guide for the mapping between these lines and EIA connector pins, and to Section 3.1.2 for a description of the UseDTRin parameter. This value must not be selected if UseDTRin is set to Ignore. This value is not valid on an SIO-16.

When the FlowControlFrom/To parameters are set to CTS_RTS, the SIO firmware uses DTR to enable and disable the SIO receiver; the UseDTRin parameter must not be set to Ignore or the SIO receiver is never enabled, and the port appears to hang. If the application requires that the DTR signal be ignored, the customer must build a special cable that holds the DTR signal high.

XON_XOFF

Specifies that the characters defined by the XON (transmit on) and XOFF (transmit off) parameters are used.

ENQ_ACK

Specifies that the server sends the device an ENQ message before sending a block of data, and sends the data only if the device responds with an ACK message indicating it is ready to receive data.

The FlowControlFrom and FlowControlTo parameters do not apply to Communications Server ports on an SIO-3270 interface.

The **FlushVC** parameter applies only if the BReakAction parameter is set to FlushVC. It specifies whether packets for a session are flushed (discarded) or transmitted after a user sends a break signal to the server.

The FlushVC parameter can have two possible values:

OFF

Specifies that packet flushing is disabled (default).

ON

Specifies that packet flushing is enabled. If the BReakAction parameter is set to FlushVC and a break is detected, the local server forwards the break signal to the remote server and enables packet flushing. The remote server then forwards the break to the host. If the host supports X.3 parameters 7 and 8 (or a comparable function) the host sends a request to the local server to reset the FlushVC parameter to OFF. If the host does not support X.3 parameters 7 and 8, the user must not set the BReakAction parameter to FlushVC, because the host will be unable to disable packet flushing and no packets will be transmitted to the terminal following a break signal.

The **IdleTimer** parameter specifies the interval after which, if no further characters are input from the local device, all accumulated characters are packetized and forwarded. In Data Transfer mode, characters are accumulated in a data buffer until an event specified by the DataForward parameter occurs, the buffer fills, or the IdleTimer interval elapses. IdleTimer can be set to Disabled or to a number in the range 1 to 255 (sixtieths of a second).

The default value for host ports is 1, which is appropriate for line speeds of 9600 baud or greater. The default value for terminal ports is 2. Since characters take longer to be transmitted from the device to the server at lower line speeds, the IdleTimer parameter should be adjusted to an interval greater than or equal to the time needed for a single character to be transmitted (e.g., set IdleTimer to 2 for 4800 baud lines, and to 4 for 1200 baud lines). This reduces packet overhead and improves system performance.

The **LFInsertion** parameter specifies whether linefeeds are transmitted or echoed following a carriage return character (CR), or following an EOM signal if EOM is set to CR. The default value is None. The parameter accepts three values:

None

Specifies that no linefeed is echoed or transmitted following a CR. When this value is specified, neither of the other values can be specified.

OutputCrlf

Specifies that if the server receives a CR from the remote device, it sends a CR and a linefeed character (LF) to the local device.

EchoCrlf

Specifies that if a CR is received from the local device, a CR and an LF are echoed to the device.

The **LongBReakAction** parameter specifies the action taken by the server when a long break is detected. This parameter applies only to terminal ports. For servers running the TCP/IP protocols, LongBReakAction operates only if the source and destination are on the same server; for connections across the network, LongBReakAction has essentially the same effect as BReakAction. The value IGnore is mutually exclusive with any other value; more than one of the remaining values can be specified. The default value is IGnore for both terminal and host ports. There are four possible values:

IGnore

Specifies no action (default).

Listen

Specifies that the port is placed in Listening mode and all sessions for the port are disconnected.

OutofBand

Specifies that the long break signal is transmitted out-of-band to the remote device.

InBand

Specifies that the long break signal is transmitted in-band to the remote device.

The **MOde** parameter specifies one of two Data Transfer modes:

Transparent

Specifies that the local device is a screen-oriented intelligent terminal whose display format is controlled by an application. Local editing and local echo are disabled. Except for the characters defined by the ECMChar and BReakChar parameters, all input from the terminal in Data Transfer mode is transmitted exactly as is; no translation is provided. This is the default value.

Setting MOde to Transparent automatically resets the following parameters: ECHOData is set to OFF, LFInsertion is set to None, DataForward is set to None, IdleTimer is set to 1, and BReakAction is set to InBand.

Scroll

Specifies that the local device is a line-oriented TTY-type terminal or application. Local editing and local echo are enabled.

Setting MOde to Scroll automatically resets the following parameters: ECHOData is set to ON; LFInsertion is set to EchoCrlf and OutputCrlf; DataForward is set to CR, ESC, EDiting, and COntrol; and IdleTimer is set to Disabled.

The **XOFF** and **XON** parameters specify characters that are recognized by the server as XOFF/XON flow control characters. The default XOFF character is <CTRL-S>; the default XON character is <CTRL-Q>.

For ports on an SIO-3270 interface, the XON parameter does not apply and the XOFF parameter has a non-standard meaning. Setting XOFF to the value ^S specifies that the port is in the default terminal emulation mode; the value d specifies VT100 emulation mode; the value i specifies extended VT100 emulation mode.

3.1.4 Session Editing Parameters

Table 3-5 summarizes the editing parameters, which can be used in Command mode and during sessions in which the MOde parameter is set to Scroll. A description of each parameter, with an explanation of its possible values and its default value, follows the table. If the default value is acceptable, the parameter need not be set.

These parameters can be set either with SET or SETDefault.

Table 3-5 Editing Parameters

Parameter	*Permitted Values*
ERAse	Disabled | <char>
LineERAse	Disabled | <char>
LocalEDiting	(NoDataEditing | DataEditing , NoCmdEditing | CmdEditing)
ReprintLine	Disabled | <char>
VERBatim	Disabled | <char>
WordERAse	Disabled | <char>

The **ERAse** parameter specifies the character (default <CTRL-H>) that the server interprets as an ERAse character. Entered before the current line is terminated by the return key, the ERAse character deletes the most recently typed character. On most terminals, the backspace key also performs the ERAse function.

The **LineERAse** parameter specifies the character (default <CTRL-U>) that the server interprets as a LineERAse character. Entered before the current line is terminated by the return key, the LineERAse character deletes the entire line.

The **LocalEDiting** parameter specifies whether local editing is permitted. The default value enables local editing in Command mode but not in Data Transfer mode. One each of two pairs of values can be specified:

NoDataEditing | DataEditing

Disables (the default) or enables local editing in Data Transfer mode during a session in which the MOde parameter is set to Scroll.

NoCmdEditing | CmdEditing

Disables or enables (the default) local editing in Command mode.

The **ReprintLine** parameter specifies the character (default <CTRL-R>) that the server interprets as a ReprintLine character. This character is used to reprint all pending input on the current line before the line is terminated by the return key.

The **VERBatim** parameter specifies the character (default <CTRL-V>) that the server interprets as a VERBatim character. The VERBatim character causes the next character entered to be used verbatim rather than interpreted by the server as a special character. The VERBatim character has no effect if the next character entered is a return or the VERBatim character itself.

The **WordERAse** parameter specifies the character (default <CTRL-W>) that the server interprets as a WordERAse character. Entered before the current line is terminated by the return key, the WordERAse character deletes the most recent word typed.

3.1.5 Global Parameters

Table 3-6 lists the configuration parameters that determine the welcome message, date, prompts, passwords, and NCS audit trail functions. For TCP/IP servers, these parameters also determine the addresses of the Name Servers and Default Gateway. Each of these parameters affects the entire server, not just the current port or session. All of the global parameters except DATE and BootServerAddr must be specified with the SETDefault command, not the SET command.

Table 3-6 Global Parameters

Parameter	*Permitted Values*
AUditServerAddr	<address>
BootServerAddr *	<address>
CONNectAudit	OFF | ON
DATE	<yy/mm/dd hh:mm[:ss]> <mm/dd/yy hh:mm[:ss]>
DefaultGateway **	<physical-address>
DOmain ***	<string>
ERRorAudit	OFF | ON
GlobalPassWord	<string>
GroupxPasswd ****	<string>
InternetPort **	<address>
LocalPassWord	<string>
LogoffStr	<string>
NMPrompt	<string>
Organization ***	<string>
PrimaryNS **	<physical-address>
PROMPt	<string>
SecondaryNS **	<physical-address>
WelcomeString	<string>

* Can be set with SET only, not SETDefault.
** Applies to TCP/IP servers only.
*** Applies to XNS servers only; on a diskless server, can be set with SET only.
**** Applies to XNS servers only.

The **AUditServerAddr** parameter specifies the address of the NCS to which the local server sends audit trail data. This parameter is used only to send the local server's audit trail to an NCS other than the one to which the server is bound or to send an unbound server's audit trail to an NCS. Each NCS installation and operation guide describes the NCS audit trail.

The **BootServerAddr** parameter, valid only on servers booted from an NCS, specifies the address of the NCS from which the local server boots. This parameter is used only to override the NCS to which the server is bound (e.g., if the server's primary and secondary NCSs are down, and another NCS can enable the server to function on a temporary basis). Each NCS installation and operation guide describes this facility.

The **CONNectAudit** parameter disables (OFF) or enables (ON) generation of connection-related audit trail statistics by the server. If this parameter is set to ON, the audit trail data is sent to the NCS to which the server is bound or to the NCS specified by the AUditServerAddr parameter (if any is specified). Each NCS installation and operation guide describes the NCS audit trail.

The **DATE** parameter is used to set the system clock. The value can be entered in either of the two formats shown in Table 3-6. Times are entered in 24-hour-clock time. The clock is used by the network management reports and should be set after each system boot, unless there is an NCS in the network. Unusually frequent disk activity can cause the clock to drift by a few seconds per year.

The **DefaultGateway** parameter applies to TCP/IP servers only. When a server must communicate with a destination server that has a different network number, the source server looks up which Gateway Server provides access to the other network. If the source server has no record of a Gateway Server that can provide access to the other network, it sends its request to the default Gateway Server, specified by this parameter, and records the Gateway Server address for later use with the specified Internet address.

The default value for the DefaultGateway parameter is 0, which specifies use of ARP-based routing for internetwork traffic.

The **DOmain** and **Organization** parameters specify the default domain and organization fields for all clearinghouse names entered on the server. These defaults are automatically appended to the local name unless overridden when the name is entered. The default value of these parameters is a null string, represented by double quotes ("").

An NCS and the servers that it supports normally have the same default domain and organization strings. The network manager can use the SET command on a diskless server to override the defaults, but the new values remain in effect only until the next boot, at which time the server reverts to the defaults established for the NCS. These parameters are not valid on TCP/IP servers.

The **ERRorAudit** parameter disables (OFF) or enables (ON) generation of error-related audit trail data by the server. If this parameter is set to ON, the error statistics are sent to the NCS to which the server is bound or to the NCS specified by the AUditServerAddr parameter (if any is specified). Each NCS installation and operation guide describes the NCS audit trail.

The **GlobalPassWord** parameter specifies the password (maximum 14 characters) that the user must type when setting the privilege level to Global Network Manager. The default value is a null string, represented by double quotes (""). On a server supported by an NCS, the password must be established remotely on the NCS.

The **GroupxPasswd** parameter specifies a password for each of 16 possible access groups. The "x" represents a number from 1 to 16 indicating which group's password is being set. The password is a string (maximum 14 characters) that a user must enter in order to connect with a device when the user's AccessWord values do not match any of the device's AccessGroup values. Each AccessGroup can have its own password.

This system is designed to limit access within the network for security purposes, as described in the *Connection Service User's Guide*. Only a Global Network Manager can set or change AccessGroups, AccessWords, or GroupxPasswds. The default password for all AccessGroups is a null string, represented by double quotes (""). On a server supported by an NCS, the passwords must be established remotely on the NCS. The GroupxPasswd parameters are not valid on TCP/IP servers.

The **InternetPort** parameter specifies the Internet address of each physical or rotary port. This parameter is similar to a port transmission parameter in that it is set on a per-port basis. To set the InternetPort parameter, use the SETDefault command. This parameter's value does not display in response to the SHow DefaultParameters command. To remove an Internet address, set this parameter to 000.000.000.000.

The **LocalPassWord** parameter specifies the password (maximum 14 characters) that the user must type when setting the privilege level to Local Network Manager. The default value is a null string, represented by double quotes ("").

The **LogoffStr** parameter specifies the string to be transmitted to the host when a connection is broken by the DisConnect command or by the expiration of the AUToDisconnect interval. The string is transmitted to the host port before the port closes the circuit. The string usually consists of a logoff command, which causes the host to close the port in an efficient manner. The string can be up to 24 characters long. The AUtoLogoff parameter, described in Section 3.1.1, must be set ON for this string to be transmitted. The LogoffStr parameter is available on XNS servers and on TCP/IP servers with software version 13000 or later.

The **NMPrompt** parameter specifies the string (maximum 14 characters) that the server prints on the local device (starting in column 1) to indicate Command mode if the port has Local or Global Network Manager privilege. The default prompt for all servers consists of the server model in lowercase followed by a crosshatch symbol (#) and a space. For example, on the CS/1, the default prompt is "cs/1# ".

The **PrimaryNS** applies to TCP/IP servers only. It specifies the address of the server's primary Name Server. All internet name requests are sent first to the server specified by this parameter. If this parameter is set to 000.000.000.000 (none established), internet name requests are sent to the server's boot source (itself or an NCS). This parameter can be set to the server's own address only if the server boots from an internal disk drive.

The **PROMPt** parameter specifies the string (maximum 14 characters) that the server prints on the local device (starting in column 1) to indicate Command mode if the port has User privilege. The default prompt for all servers consists of the server model followed by a right angle bracket (>) and a space. For example, on the CS/1, the default prompt is "CS/1> ".

The **SecondaryNS** parameter applies to TCP/IP servers only. It specifies the address of the server's secondary Name Server. If the server gets no response from the primary Name Server, it sends all internet name requests to the address specified by this parameter. If this parameter is set to 000.000.000.000, the server only sends internet name requests to the primary Name Server.

The **WelcomeString** parameter specifies the string printed on the local device by the Communications Server when the device or the server is powered on or reset. The maximum length of the string is 80 characters. For Communications Servers, the default string is "^M^J Welcome to your Communications Server ^J^M".

The *Connection Service User's Guide* describes the conventions for entering string text.

3.1.6 Sample Asynchronous Configurations

This section contains examples of typical asynchronous port configurations and describes how configuration parameters interact with one another depending on the device type of the port and the nature of the application.

Tables 3-7 through 3-11 summarize some of the parameters that are critical to the ability of an asynchronous port to function as required by the application or by the connected device. The tables describe five types of applications:

Table 3-7 Parameters for a terminal-to-host, line-oriented application (e.g., a user terminal interacting with a command interpreter or line-oriented editor)

Table 3-8 Parameters for a terminal-to-host, screen-oriented application (e.g., a user terminal interacting with a screen-oriented editor)

Table 3-9 Parameters for a host-to-host file transfer application

Table 3-10 Parameters for a host-to-printer file transfer application

Table 3-11 Parameters for ports to which dial-in or dial-out modems are attached

Table 3-7 Configuration Parameters for Terminal-to-Host, Line-Oriented Applications

Parameter	*Terminal Port Setting*	*Host Port Setting*
DeVice	Terminal	Host
InterAction	Verbose, Echo	N/A
DataForward	ESC, CR, COntrol	None
IdleTimer	Disabled	1
MOde	Scroll	Transparent
ECHOData	ON	OFF
LFInsertion	OutputCrlf, EchoCrlf	N/A
BReakAction	EscDTM	IGnore
BReakChar	(1)	N/A
ECMChar	Disabled (2)	N/A
UseDCDout (3)	AlwaysAssert	OnConnection
UseDTRin (3)	AsDTR	AsDTR

(1) BReakChar is defined only if there is no break key on the terminal.
(2) An ECMChar may be preferable to a break signal if in-band breaks to the host are desired.
(3) See Sections 3.1.2 and 3.1.9 for more information.

Table 3-8 Configuration Parameters for Terminal-to-Host, Screen-Oriented Applications

Parameter	*Terminal Port Setting*	*Host Port Setting*
DeVice	Terminal	Host
InterAction	Verbose, Echo	N/A
DataForward	None	None
IdleTimer	1	1
MOde	Transparent	Transparent
ECHOData	OFF	OFF
LFInsertion	None	N/A
BReakAction	InBand	IGnore
BReakChar	(1)	N/A
ECMChar	<CTRL-^>(2)	N/A
UseDCDout (3)	AlwaysAssert, NoToggle	OnConnection, ToggleonDisc
UseDTRin (3)	AsDTR	AsDTR

(1) BReakChar is defined only if there is no break key on the terminal.
(2) The ECMChar can be any control character not normally transmitted as data.
(3) See Sections 3.1.2 and 3.1.9 for more information.

Table 3-9 Configuration Parameters for Host-to-Host File Transfer Applications

Parameter	*Initiating Host Port Setting*	*Destination Host Port Setting*
DeVice	Terminal (1)	Host
InterAction	Brief, NoEcho	N/A
DataForward	None	None
IdleTimer	60-255 (2)	1
MOde	Transparent	Transparent
ECHOData	OFF	OFF
LFInsertion	None	N/A
BReakAction	InBand	IGnore
BReakChar	(3)	N/A
ECMChar	<CTRL-^>(4)	N/A
UseDCDout (5)	OnConnection	OnConnection
UseDTRin (5)	AsDTR	AsDTR

(1) The initiating host must be configured as a terminal to initiate the connection, unless the network manager form of the Connect command is used to connect the two ports remotely.

(2) The IdleTimer setting is host-dependent.

(3) BReakChar is defined only if the initiating host cannot generate a break signal and needs to signal the other host.

(4) The ECMChar applies only to the initiating host, and can be any control character not normally transmitted. The host should be programmed to wait after issuing an ECMChar for the interval specified by the IdleTimer parameter before sending more characters.

(5) See Sections 3.1.2 and 3.1.9 for more information.

Table 3-10 Configuration Parameters for Host-to-Printer File Transfer Applications

Parameter	*Host Port Setting*	*Printer Port Setting*
DeVice	Terminal (1)	Host
InterAction	Brief, NoEcho	N/A
DataForward	None	None
IdleTimer	60-255 (2)	1
MOde	Transparent	Transparent
ECHOData	OFF	OFF
LFInsertion	None	N/A
BReakAction	InBand	IGnore
BReakChar	Disabled	N/A
ECMChar	<CTRL-^> (3)	N/A
UseDCDout (4)	OnConnection	OnConnection
UseDTRin (4)	AsDTR	AsDTR

(1) The host port must be configured as a terminal to initiate the connection unless the network manager form of the Connect command is used to connect the two hosts remotely.

(2) The IdleTimer setting is host-dependent.

(3) The ECMChar applies only to the initiating host, and can be any control character not normally transmitted. The host should be programmed to wait after issuing an ECMChar for the interval specified by the IdleTimer parameter before sending more characters.

(4) See Sections 3.1.2 and 3.1.9 for more information.

Table 3-11
Configuration Parameters for Modem Ports

Parameter	*Dial-in Modem Setting*	*Dial-out Modem Setting*
DeVice	Terminal	Host
InterAction	Verbose, Echo	N/A
DataForward	None	None
IdleTimer	1	1
MOde	Transparent	Transparent
ECHOData	OFF	OFF
LFInsertion	None	N/A
BReakAction	InBand	IGnore
BReakChar	(1)	N/A
ECMChar	(1)	N/A
BAud	(2)	(2)
UseDCDout (3)	AlwaysAssert, ToggleonDisc	OnConnection, ToggleonDisc
UseDTRin (3)	AsDTR	AsDCD

(1) BReakChar and ECMChar must be defined if the devices accessing the modem use them.
(2) Set to the same speed as the modem itself.
(3) See Sections 3.1.2 and 3.1.9 for more information.

3.1.7 Asynchronous Host Configuration

This section describes the procedure for configuring an asynchronous port as a host port.

**** NOTE ****

This information does not apply to the virtual ports on a CS/1-HSM, CS/1-SNA, or CS/1-X.25, or IVECS. Refer to the *Network Management Guide* for information on configuring the virtual ports on these systems.

On a new unit, some ports are configured for terminal device connections; the following parameters are in effect:

device=terminal
mode=transparent

The default configuration specifies ports 0 through 3 on each asynchronous CS/1 SIO board, ports 8 and 9 on the asynchronous CS/100, and ports 0, 2, 4, 6, and 8 on the CS/200 as host ports. The network manager can configure additional ports as host interface ports by respecifying the DeVice parameter. For example, to convert port 7 into a host port, the network manager types the following command from any terminal port other than port 7:

```
setdefault (!7) device=host
```

The *Connection Service User's Guide* describes the SETDefault command. Section 3.1.1 describes the DeVice parameter.

Setting DeVice equal to Host disables ECMChar and BReakChar; sets InterAction to Brief, NoEcho, NoMacroEcho, and BroadcastOFF; sets BReakAction to IGnore; sets AUToDisconnect to 60 minutes; and sets BUffersize to the default small buffer size (typically 82 bytes).

3.1.8 Asynchronous Terminal Configuration

The specific configuration appropriate for an asynchronous terminal device depends on the type of device and on the application being run. This section describes some of the configuration parameters and commands that frequently cause confusion.

- Port physical parameters specified with the SETDefault command do not take effect until a Listen command is issued to the port. Existing sessions are not affected. Session parameters go into effect with the next new session. The parameters then remain in effect until overridden explicitly via another SETDefault or SET command or implicitly via the setting of another configuration parameter.
- The SETDefault command performs an automatic save on the diskette, thus changing the configuration table that is read from the diskette when the system is booted.
- Parameters specified with the SET command take effect immediately and remain in effect until overridden explicitly via another SET command or until the session is terminated. When an additional session is opened while the first connection is still intact, the server copies a new session parameter table from the default configuration table, not from the current session table.

After multiple sessions are opened, the session parameters for each session can be altered without affecting the parameters of the other sessions.

- The AccessGroup, AccessWord, BReakAction, ECHOMask, LFInsertion, and DataForward parameters accept one or more of a set of values. When new values are set, they are added to the existing list, but values already in the list are not deleted. To remove a value from the list, first set the parameter equal to NoGroup (for AccessGroup and AccessWord), IGnore (for BReakAction), or None (for ECHOMask, LFInsertion, and DataForward). Then set any desired values.
- The BReakAction parameter values OutofBand and InBand are often confused. The difference between the two values is whether or not the break affects the characters that were transmitted just ahead of it and have not yet reached the other end of the circuit. An OutofBand break causes the characters ahead of it in the circuit to be garbled and discarded. An InBand break, however, remains in the queue of characters in the circuit, and characters ahead of the break reach the other end of the circuit before the break.
- Setting BReakAction to both InBand and EscDTM has one side effect. If the user has established a connection to a host and then presses the break key or enters the BReakChar (if one is set), the break is sent in-band to the host and is also intercepted by the server as a request to change to Command mode.

  The Connection Service sends a server prompt to the terminal, and the host sends a host prompt to the terminal. The host prompt, however, is not displayed on the terminal until the user enters a RESume command and returns to Data Transfer mode. This can be avoided by changing BReakAction to EscDTM only. The parameter must be set first to IGnore, then to EscDTM. For example:

```
set mode=transparent breakact=ignore breakact=escdtm
```

- If a port is in Command mode, and a Connect, DEFine, DO, Pause, or SHow request is in progress, the request can be aborted with the break key or BReakChar. This terminates the request even if the BReakAction parameter is set to IGnore.
- A connection from one device to another cannot be established unless the destination device port is in Listening mode. If the destination port is in Command mode or Data Transfer mode, either a user at the terminal or a network manager at a remote terminal can convert the port to Listening mode with the Listen command. The *Connection Service User's Guide* describes the modes of operation and the Listen command.
- Setting the MOde parameter to Transparent is desirable for many applications (e.g., screen editors) but has some side effects. Setting MOde to Transparent automatically sets BReakAction to InBand only, IdleTimer to 1, ECHOData to OFF, LFInsertion to None, and DataForward to None. With BReakAction set to InBand only, the user cannot return from Data Transfer mode to Command mode using the break key or the BReakChar (if one is set), since neither break signal is intercepted by the server. Therefore, when setting MOde to Transparent, either set BReakAction to EscDTM before going into Data Transfer mode or ensure that an ECMChar is set. The default ECMChar is <CTRL-^>.
- The LinePRotocol parameter can be displayed but not set for asynchronous terminal ports. This parameter is settable only on character-synchronous and bit-synchronous ports; it determines which of these protocols the port uses.

- If the network manager specifies values for the PARIty and DataBits parameters that are inappropriate for the device (e.g., setting DataBits to 8 and PARIty to 0 or 1), the port may appear to hang. To recover from this condition, the network manager must use the SETDefault command remotely to establish appropriate values and then use the Listen command remotely to reinitialize the port.
- The LongBReakAction parameter takes advantage of some terminals' ability to generate both a normal break signal (approximately 200 milliseconds) and a long break signal (at least 2 seconds). Long breaks are usually generated by pressing both shift and break keys simultaneously. For terminals that can generate a long break signal but cannot toggle the DTR signal, setting the LongBReakAction parameter to Listen permits long breaks to simulate the toggling of DTR (thus placing the port in Listening mode).

3.1.9 Asynchronous Modem Control Lines

Table 3-12 describes the interaction between the hardware modem control lines Data Terminal Ready (DTR) and Data Carrier Detect (DCD) and the software configuration parameters UseDTRin and UseDCDout. The information covers terminal ports, host ports, and modem ports, since these lines can be used by devices other than modems. Section 3.1.2 describes the UseDTRin and UseDCDout parameters.

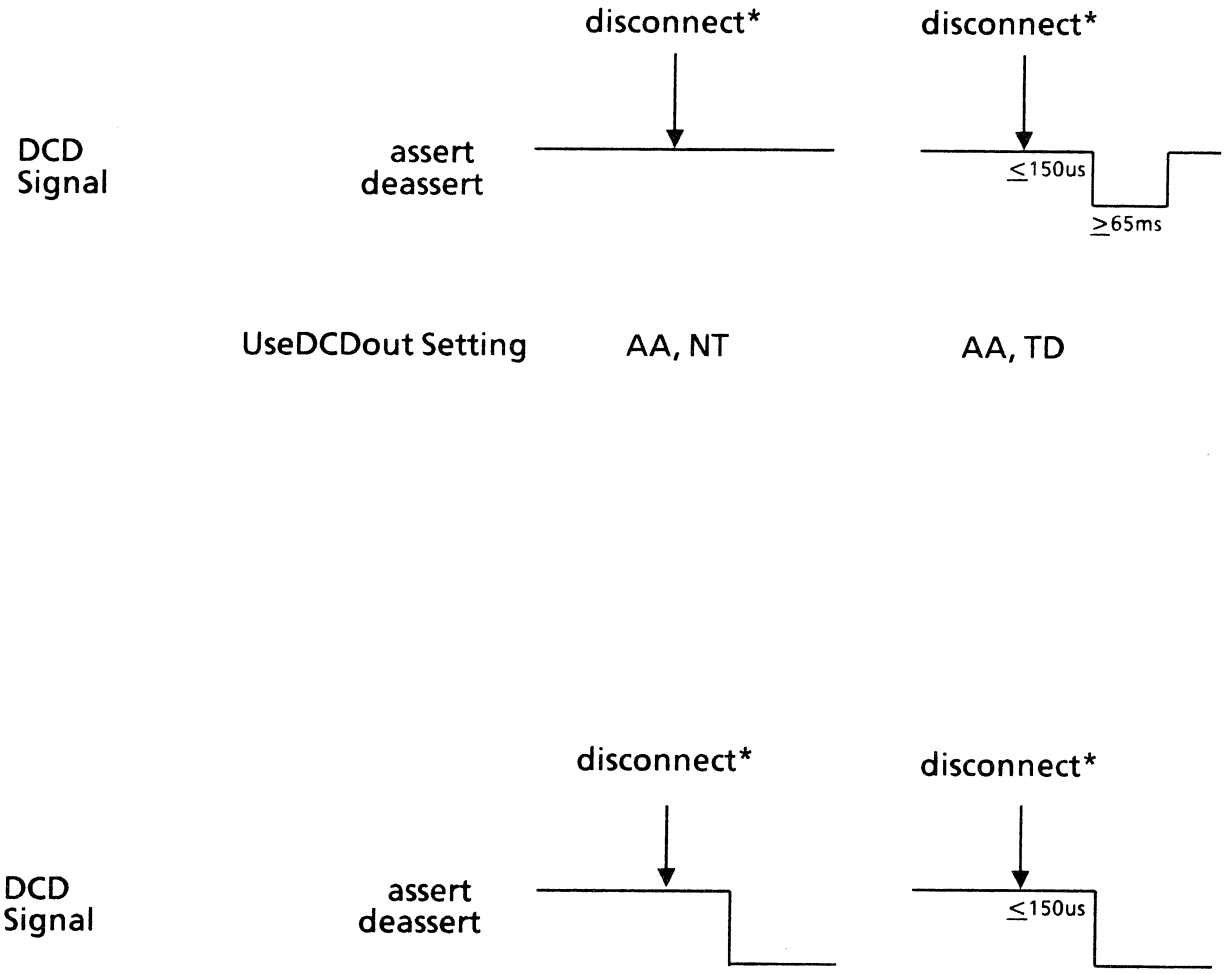
The UseDCDout parameter controls the signal sent on the server's DCD pin to the modem. In most hardware configurations, the modem receives this signal on its DTR pin and interprets it as DTR. This signal switching is necessary because the server is set up as Data Communications Equipment (DCE), as is the modem. It sends the DCD signal to indicate its readiness to the connected device. The modem must perceive the server as Data Terminal Equipment (DTE) in order to communicate with it. This is accomplished by connecting the server's DCD to the modem's DTR and altering server parameter settings.

Similar signal switching takes place from the modem to the server. The signal from the modem originates from the modem's DCD or DSR pin and is received by the server's DTR. The server then interprets the signal as DTR or DCD depending on the setting of the UseDTRin parameter.

Some modems expect a toggle in the DCD signal at disconnect. Figure 3-2 illustrates the effect of different UseDCDout parameter settings on the DCD signal at disconnect. Table 3-12 includes separate entries for modems that expect the toggle and modems that do not expect the toggle.

The support of modem control lines can also be affected by the cable used to connect the device to the server. Refer to the appropriate installation guide for cable information.

Most originating modems will not activate their end of a connection unless the DTR signal is asserted. Most answering modems will not answer a ringing line unless the DTR signal is asserted. Most modems provide an option to hang up the switched line when the modem's DTR signal is deasserted.



* The disconnect can come from either end of the session; it can be the dropping of DTR if the UseDTRin parameter is set to anything other than Ignore.

Figure 3-2 Effect of UseDCDout Parameter Settings

Table 3-12 Recommended Settings of UseDCDout and UseDTRin

Device Type	*UseDCDout Setting*	*UseDTRin Setting*
Terminal without DTR and DCD lines	Don't care	Ignore
Terminal with DTR and DCD lines	AlwaysAssert NoToggle	AsDTR
Host without DTR and DCD lines	Don't care	Ignore
Host with DTR and DCD lines	OnConnection NoToggle	AsDTR
Dial-in modem without unattended disconnect	AlwaysAssert NoToggle	AsDTR
Dial-out modem without unattended disconnect	OnConnection NoToggle	AsDCD
Dial-in modem with unattended disconnect	AlwaysAssert ToggleonDisc	AsDTR
Dial-out modem with unattended disconnect	OnConnection ToggleonDisc	AsDCD

3.2 Character-Synchronous Configuration Parameters

This section describes the port parameters specific to character-synchronous devices (also called byte-synchronous or bisynchronous devices). These parameters are supported on all ports of a CS/1, CS/100, and CS/200. The server must provide a bisynchronous interface.

Since the Connection Service commands are not available directly to a character-synchronous port, parameters for a character-synchronous port are set remotely from an asynchronous terminal port on a different Communications Server on the same Ethernet. On a hybrid CS/1 containing both character-synchronous and asynchronous boards, parameters for a character-synchronous port can be set from a port on an SIO-A board on the same CS/1.

Because the Connection Service is not available, editing and global port parameters do not need to be set for character-synchronous ports.

There are two ways to remotely set parameters for a Communications Server running XNS protocols: from a different Communications Server, either connect to port 136 (the network management port) of the server to be configured or use the REMOTE command. To set parameters remotely for a Communications Server running TCP/IP protocols, use the REMOTE command from a different Communications Server on the same Ethernet. To set parameters remotely from an NCS, use the REMOTE command. The required network management functions and the REMOTE command are described in the *Connection Service User's Guide*.

Table 3-13 is a summary of all character-synchronous port parameters, listed alphabetically. Uppercase characters represent the minimum unambiguous abbreviation of each parameter. All character-synchronous port parameters must be set with the SETDefault command, except where indicated otherwise in Table 3-13.

Table 3-13 Character-Synchronous Port Configuration Parameter Summary

Parameter	*Section*	*Parameter*	*Section*
AccessGroup	3.1.1	FlowControlTo	3.2.3
AccessWord	3.1.1	InitMacro *	3.1.1
AUToDisconnect	3.1.1	InterAction *	3.1.1
BAud	3.2.2	INTerfaceType	3.2.2
BinaryData	3.2.2	LinePRotocol	3.2.2
BlockCheck	3.2.2	MaxSessions *	3.1.1
BReakAction	3.2.3	PARIty	3.2.2
BSCProtocol	3.2.2	PassCheck	3.2.2
BUffersize	3.1.1	PRIvilege *	3.1.1
CarrierSense	3.2.2	RECvTimer	3.2.2
CharCode	3.2.2	RESpTimer	3.2.2
CRossCLocks **	3.2.2	SOH	3.2.2
DataBits	3.2.2	SYN	3.2.2
DeVice	3.1.1	SynCharCount	3.2.2
DLE	3.2.2	UseDSRout	3.2.2
DUplex	3.2.2	UseDTRin	3.2.2
FlowControlFrom	3.2.3	XmitTimer	3.2.2

* May be displayed with SHow, but not set with SETD.
** Applies to CS/200 only.

3.2.1 Character-Synchronous Port Transmission Parameters

The port transmission parameters for character-synchronous ports are identical to the port transmission parameters for asynchronous ports. These parameters are described in detail in Section 3.1.1.

All character-synchronous port parameters must be specified with the SETDefault command, not the SET command.

3.2.2 Character-Synchronous Port Physical Parameters

This section describes the character-synchronous port physical parameters, usually set by the network manager for each port. The parameters and their possible values are listed in Table 3-14.

Definitions of each parameter, explanations of each possible value, and an indication of the default follow the table. If the default value is appropriate, the parameter does not have to be set.

Table 3-14 Character-Synchronous Port Physical Parameters

Parameter	*Permitted Values*
BAud	50 | 75 | 110 | 134.5 | 150 | 200 | 300 | 600 | 1200 | 1800 | 2400 | 3600 | 4800 | 7200 |9600 | 19.2K | 38.4K * | 56K *
BinaryData	OFF | ON
BlockCheck	None | LRC | CRC16 | CCITT16
BSCProtocol	UTS | VIP | MODE4C | BASIC | 3270 | 3780 | HASP | FREE-FORM | SPECIAL
CarrierSense	OFF | ON
CharCode	ASCII | EBCDIC
CRossCLocks **	OFF | ON
DataBits	5 | 6 | 7 | 8
DeVice	(Host | Terminal , Paper | Glass)
DLE	<char>
DUplex	Full | Half | RecvOnly | XmitOnly
INTerfaceType	DCE | DTE
LinePRotocol	ASynchronous | BYTESynchronous | BITSynchronous
PARIty	None | Odd | Even
PassCheck	Pass | Strip
RECvTimer	Disabled | <number> (1-255 sixteenths of a second)
RESpTimer	Disabled | <number> (1-255 sixteenths of a second)
SOH	Include | Exclude
SYN	<char>
SyncCharCount	4 | 8 | 12 | 16
UseDSRout	(AlwaysAssert | OnConnection , NoToggle | ToggleonDisc)
UseDTRin	Ignore | AsDTR | AsDCD
XmitTimer	Disabled | <number> (1-255 sixteenths of a second)

* Applies to CS/1 only.
** Applies to CS/200 only.

The **BAud** parameter determines the baud rate of the port and applies only if the SIO board is configured for internal clocks. The setting of this parameter is ignored if the SIO board is configured for external clocks. The maximum load per SIO board is two 56K half-duplex ports.

The **BinaryData** parameter specifies whether or not IBM transparent procedures for passing binary data are used. The default value is OFF. When the parameter is set to ON, so that the procedures are used, binary data transmission begins when a DLE.STX or DLE.SOH is detected, and continues until a DLE.ETX, DLE.ETB, or DLE.ITB is detected. A DLE.EOT or DLE.ENQ aborts the block. A DLE.DLE is treated as a binary number. The DLE character is excluded from block check calculations, except for the second DLE of a DLE.DLE sequence detected within binary transmission. When the value of the parameter is OFF, the DLE is included in the block check calculations. The BinaryData parameter should never be set to ON if PARIty is enabled.

The **BlockCheck** parameter specifies the kind of block check character that is generated following a block. The parameter can be set to one of four possible values:

None

Specifies that no block check character is generated or checked.

LRC

Specifies that the ANSI-standard Longitudinal Redundancy Check (LRC) is calculated and appended to the block. If the port is set up for EBCDIC encoding, the LRCs are 8 bits wide with no parity. If the port is set up for ASCII encoding, the LRCs are 7 bits wide, independent of parity. This value is usually appropriate if the ASCII character code is being used.

CRC16

Specifies that the block check character is generated using this polynomial:

$$x^{16} + x^{15} + x^{2} + 1$$

This value, the default, represents the standard IBM character-synchronous block check character. If this value is set, the DataBits parameter must be set to 8.

CCITT16

Specifies that the block check character is generated using this polynomial:

$$x^{16} + x^{12} + x^{5} + 1$$

If this value is set, the DataBits parameter must be set to 8.

The **BSCProtocol** parameter defines the control character conventions used at the datalink process. This parameter can be set to one of nine values:

UTS

For compatibility with Sperry character-synchronous Uniscope devices.

VIP

For compatibility with Honeywell character-synchronous VIP devices.

MODE4C

For compatibility with Control Data Corporation standard devices.

BASIC

For compatibility with Burroughs standard devices.

3270

For compatibility with IBM 3270 equipment. This is the default.

3780

For compatibility with IBM 3780 equipment.

HASP

For compatibility with IBM HASP equipment.

FREE-FORM

For use with custom applications. The datalink process monitors only SYN and line-marking characters. When the BSCProtocol parameter is set to FREE-FORM, the BlockCheck parameter must be set to None.

SPECIAL

For use with custom applications. The datalink process follows control character specifications supplied by the user.

The **CarrierSense** parameter determines whether or not the system uses carrier sensing before line turnaround. The possible values are OFF (the default) and ON. This parameter takes effect only if the port is operating in half-duplex mode, which is standard for character-synchronous communication.

On the CS/100, the effect of the CarrierSense parameter depends on the settings of the DUplex and INTerfaceType parameters. On the CS/1, the effect of the CarrierSense parameter depends both on the settings of the DUplex and INTerfaceType parameters and also on whether the device is connected to an SIO-SM (synchronous modem) or SIO-ST (synchronous terminal) board. Table 3-15 shows the interaction among these parameters.

The **CharCode** parameter specifies how data is encoded. The possible values are EBCDIC (the default) and ASCII. The value EBCDIC can be set only if the BSCProtocol parameter is set to 3270, 3780, or HASP. The value ASCII can be set regardless of the BSCProtocol parameter setting.

The **CRossCLocks** parameter specifies the clock arrangement for the RS-232 line. This parameter can only be set for ports 0 and 1 of the CS/200. When CRossCLocks is set OFF, both the transmit and receive clocks are provided by the DCE. When CRossCLocks is set ON, the DCE provides the receive clock, and the DTE provides the transmit clock.

The **DataBits** parameter specifies the number of databits per byte. Available values are 5, 6, 7, or 8. The default is 8.

The **DeVice** parameter specifies whether the device is a host or a terminal. This parameter is identical in function to the DeVice parameter for asynchronous devices; refer to Section 3.1.1 for a complete description.

The **DLE** parameter specifies the Data Link Escape (DLE) character. The value can be entered as the numeric value of the DLE character or as a printing character representing the ASCII equivalent of the numeric value of the DLE character. The default (hexadecimal 10) is appropriate in almost all applications. The Communications Server always displays the value of this parameter as the printing character representing the ASCII equivalent of the parameter value. Hexadecimal 10 is displayed as "^P". The *Connection Service User's Guide* describes the conventions for entering numbers.

The **DUplex** parameter specifies the type of physical interface provided by the SIO board for the port. If DUplex is set to Full, the SIO board provides a Bell 212-type interface. If DUplex is set to Half (the default), the SIO board provides a Bell 208-type interface. When the parameter is set to either RecvOnly or XmitOnly, the SIO board provides a one-way, Bell 208-type interface.

Table 3-15 Interaction Among Carrier Sense, Duplex, and Interface Type Parameters

Case	*Carrier Sense*	*Duplex*	*Interface Type*	*Result*
1	ON	Full	DTE	The SIO firmware places the receiver in and out of hunt phase in response to changes in DCD. DCD is on pin 8 on an SIO-SM board and on pin 20 on an SIO-ST board or a CS/100.
2	ON	Full	DCE	The SIO firmware places the receiver in and out of hunt phase in response to changes in RTS. RTS is on pin 5 on an SIO-SM board and on pin 4 on an SIO-ST board or a CS/100.
3	ON	Half	DTE	The SIO firmware places the receiver in and out of hunt phase in response to changes in DCD. DCD is also used to condition transmission; when DCD is true, transmission is inhibited. In this configuration, the DCE device must toggle DCD. DCD is on pin 8 on an SIO-SM board and on pin 20 on an SIO-ST board or a CS/100.
4	ON	Half	DCE	The SIO firmware places the receiver in and out of hunt phase in response to changes in RTS. RTS is also used to condition transmission; when RTS is true, transmission is inhibited. In this configuration, the DTE device must toggle RTS. RTS is on pin 5 on a SIO-SM board and on pin 4 on an SIO-ST board or a CS/100.
5	OFF	Full	DTE	The SIO firmware ignores DCD. DCD is on pin 8 on an SIO-SM board and on pin 20 on an SIO-ST board or a CS/100.
6 *	OFF	Full	DCE	The SIO firmware ignores RTS. CTS is constant. RTS is on pin 5 on an SIO-SM board and on pin 4 on an SIO-ST board or a CS/100. CTS is on pin 4 on an SIO-SM board and on pin 5 on an SIO-ST board or a CS/100.
7	OFF	Half	DTE	RTS is toggled by the SIO firmware at line turn-around points and transmission waits for CTS. RTS is on pin 4 on an SIO-SM board and on pin 5 on an SIO-ST board or a CS/100.
8	OFF	Half	DCE	DCD is toggled by the SIO firmware at line turn-around points. RTS is on pin 20 on an SIO-SM board and on pin 8 on an SIO-ST board or a CS/100.

* On the CS/1-BSC, this combination is functionally the same as case 1.

The **INTerfaceType** parameter specifies whether the port is acting as a DCE or DTE device. If the parameter is set to DCE, the port sets the CTS signal, allowing transmission, whenever the RTS signal is asserted by the other end of the connection. The port transmits after asserting DCD, without waiting for a response. If the parameter is set to DTE, the port first asserts the RTS signal to the modem and then waits for assertion of the CTS signal from the modem before transmitting. The port begins receiving whenever the DCD signal from the modem is asserted. On the CS/100, the cable connectors are wired as DCE devices. Therefore, the RTS signal to the modem is sent from the CTS pin on the CS/100, the CTS signal from the modem is received at the RTS pin on the CS/100, and the DCD signal from the modem is received at the DTR pin on the CS/100. On a port connected to a terminal or host, this parameter should usually be set to DCE, the default. On a port connected to a modem, this parameter should usually be set to DTE.

The **LinePRotocol** parameter specifies whether asynchronous, character-synchronous, or bit-synchronous transmission is used. The Communications Server automatically sets the value at boot time to either ASynchronous or BYTESynchronous based on the SIO firmware present on the board and on the default value of the LinePRotocol parameter. If synchronous firmware is present, and the default LinePRotocol value is ASynchronous, the value is automatically changed to BYTESynchronous. The network manager should use the SETDefault command to set the value to BITSynchronous for operation with the SDLC pass-through service.

The **PARIty** parameter specifies the local device parity. The possible values are None, Odd, or Even. The default is None. If the BinaryData parameter is set to ON, the **PARIty** parameter must be set to None.

The **PassCheck** parameter determines how the Communications Server processes the block check character. When it receives a block from an attached device, the Communications Server generates its own block check character and compares it with the block check character received with the block. Whether or not an error is detected, the block is transmitted to the other end of the circuit. The PassCheck parameter determines whether the transmitted block carries the block check character. This parameter can be set to one of two values:

Pass

> Specifies that the block check character generated by the source device is transmitted over the network with the data block. This is the default value and the appropriate value for use with the pass-through service now available for character-synchronous communications.

Strip

> Specifies that the original block check character is stripped from the block before transmission over the network. When the block arrives at the destination Communications Server, the server regenerates the block check character before transmitting the block to the destination device.

The **RECvTimer** parameter sets the reception error recovery timer. This timer aborts block reception and generates a timeout error signal if a block's reception time exceeds the time specified by the parameter. The parameter can be set to Disabled, in which case the timer is always off, or to a number between 1 and 255, representing sixteenths of a second. The default value is 64.

The **RESpTimer** parameter sets the response timer. This timer generates a timeout error signal if the interval between the end of transmission from the Communications Server at one end of a circuit and the beginning of reception at the same server exceeds the setting of the timer. The parameter can be set to Disabled, in which case the timer is always off, or to a number between 1 and 255, representing sixteenths of a second. The RESpTimer parameter is not used by the current Connection Service software. The default value is Disabled.

The **SOH** parameter determines whether the first Start of Header (SOH) or Start of Text (STX) character is included in the block check character calculation. The parameter can be set to either:

Include

Specifies that the character is included in the calculation. This setting is required if the BSCProtocol parameter is set to MODE4C.

Exclude

Specifies that the first SOH or STX character is excluded from the calculation. This setting is the default and is appropriate for all BSCProtocol values except MODE4C.

The **SYN** parameter specifies the SYN character. The value can be entered as the numeric value of the SYN character or as the printing character representing the ASCII equivalent of the numeric value of the SYN character. The Communications Server always displays the value of this parameter as the printing character representing the ASCII equivalent of the parameter value. The default (hexadecimal 32) is usually appropriate if the CharCode parameter is set to EBCDIC. The hexadecimal value 16 is usually appropriate if the CharCode parameter is set to ASCII. The Communications Server displays hexadecimal 32 as "'2'" and displays hexadecimal 16 as "^V". The *Connection Service User's Guide* describes the conventions for entering numbers.

The **SyncCharCount** parameter determines the number of SYN characters that precede each block transmitted. The possible value of this parameter is 4, 8, 12, or 16. The default value (4) is appropriate for most installations.

The **UseDSRout** parameter specifies how the Communications Server supplies the DTR signal to the attached device.

On the CS/1, the effect of this parameter varies depending on the interface hardware. On an SIO-ST board, UseDSRout has no effect. On an SIO-SM board, UseDSRout affects the DTR signal from the CS/1 to the modem.

On the CS/100, the effect of this parameter depends on the setting of the port's INTerfaceType parameter. If the INTerfaceType parameter is set to DCE, UseDSRout has no effect. If the INTerfaceType parameter is set to DTE, UseDSRout influences the DTR signal to the modem, which is the DCD signal from the CS/100. Refer to the appropriate installation guide for mapping between DSR, DTR, and the EIA connector pins.

One each from two sets of parameter values must be set:

AlwaysAssert | OnConnection

Determines when the DTR signal is asserted.

AlwaysAssert causes the signal to be asserted at all times.

OnConnection (the default) causes the signal to be deasserted as long as no connection is established to the device, and asserted when a connection is made.

NoToggle | ToggleonDisc

Determines whether or not the signal toggles when a connection is broken.

NoToggle (the default) suppresses the toggle upon disconnection. The signal either stays asserted or changes to deasserted, depending on the other UseDSRout parameter setting.

ToggleonDisc causes the signal to be deasserted for at least 200 milliseconds after disconnection. Depending on the other UseDSRout parameter setting, the signal then either changes to asserted or remains deasserted. This value is used when the Communications Server is connected to certain data switch devices.

The action of these parameter settings is illustrated in Figure 3-3 in Section 3.2.5. For recommended settings of this parameter for use with various devices, see Table 3-26 in Section 3.2.5.

The **UseDTRin** parameter specifies the response of the Communications Server to the value of the DTR or DSR signal received from the attached device. On the CS/1, the parameter affects system response to the DTR signal for ports on an SIO-ST board, and to the DSR signal for ports on an SIO-SM board. On the CS/100, the effect of the parameter depends on the setting of the INTerfaceType parameter. If INTerfaceType is set to DTE, the UseDTRin parameter has no effect. If INTerfaceType is set to DCE, the parameter affects system response to the DTR signal from the terminal, which is also the DTR signal to the CS/100. Refer to the appropriate installation guide for mapping between DSR, DTR, and the EIA connector pins.

For a third-party, pass-through connection or for a permanent virtual circuit, never set this parameter to any value but Ignore, the default. The Communications Server recognizes three possible values:

Ignore

Specifies that the Communications Server does not check the state of the DTR or DSR input signal when a connection is made and takes no action when the signal changes value.

AsDTR

Specifies that the Communications Server checks the state of the DTR or DSR input signal before establishing a connection to a port. This value is not appropriate for the pass-through Connection Service currently available to character-synchronous ports.

AsDCD

Specifies that the Communications Server does not reject a connection request to the port based on the value of the DTR or DSR input. This value is not appropriate for the pass-through Connection Service currently available to character-synchronous ports.

The **XmitTimer** parameter sets the transmission error recovery timer. This timer aborts block transmission and generates a timeout error signal if the transmission time of a block exceeds the time specified by the XmitTimer parameter. The parameter can be set to Disabled, in which case the timer is always off, or to a number between 1 and 255, representing sixteenths of a second. The default value is 64.

3.2.3 Character-Synchronous Session Transmission Parameters

This section lists the session transmission characteristics for character-synchronous ports.

The parameters and their possible values are listed in Table 3-16. Descriptions of each parameter, explanations of the possible values, and an indication of the default follow the table. If the default is acceptable, the parameter does not have to be set.

All character-synchronous port parameters must be specified from a remote port with the SETDefault command, not the SET command.

Table 3-16 Character-Synchronous Session Transmission Parameters

Parameter	*Permitted Values*
BReakAction	IGnore | (OutofBand , FlushVC , InBand , EscDTM)
FlowControlFrom	None | CTS_RTS
FlowControlTo	None | CTS_RTS

The **BReakAction** parameter specifies the action taken by the Communications Server when a timeout error occurs. The timeout error can be generated by any one of three timers: the RECvTimer, the RESpTimer, or the XmitTimer. The value IGnore is mutually exclusive with any other value; more than one of the remaining values can be specified. The parameter has five possible values:

IGnore

Specifies no action. This is the default value.

OutofBand

Specifies that an out-of-band break is transmitted to the remote device when a timeout error occurs.

EscDTM

Specifies that the user port changes from Data Transfer mode to Command mode. This value is not currently implemented.

InBand

Specifies that an in-band break is transmitted to the remote device when a timeout error occurs.

FlushVC

Specifies that all packets for this session currently in the circuit are flushed. This value is not currently implemented.

The **FlowControlFrom** parameter specifies the flow control mechanism from the Communications Server to the local device. The Communications Server cannot interrupt transmission once it has started, but it can disallow transmission before it starts. The STX-ETX flow control protocol established for synchronous transmission is always in effect, regardless of the setting of this parameter. On the CS/1, this parameter applies only to devices attached to an SIO-ST board. On the CS/100, this parameter applies only to ports on which the INTerfaceType parameter is set to DCE. The FlowControlFrom parameter accepts the same values as the FlowControlTo parameter, discussed below. The default value is None.

The **FlowControlTo** parameter specifies the flow control mechanism from the local device to the Communications Server. The local device cannot interrupt transmission once it has started, but it can disallow transmission before it starts. The STX-ETX flow control protocol established for synchronous transmission is always in effect, regardless of the setting of this parameter. On the CS/1, this parameter applies only to devices attached to an SIO-SM board. On the CS/100, this parameter applies only to ports on which the INTerfaceType parameter is set to DTE. The FlowControlTo parameter accepts one of two values:

None

Specifies that no flow control other than STX-ETX is used. This is the default value.

CTS_RTS

Specifies that the hardware control lines CTS and RTS are used. Refer to the appropriate installation guide for the mapping between these lines and EIA connector pins.

3.2.4 Sample Character-Synchronous Configurations

This section contains samples of typical port configurations for use with character-synchronous equipment.

Tables 3-17 through 3-25 summarize some of the parameter settings appropriate for ports connected to various kinds of equipment:

Table 3-17 Parameters compatible with remote IBM 3274 equipment.

Table 3-18 Parameters compatible with IBM 3780 equipment.

Table 3-19 Parameters compatible with IBM HASP equipment.

Table 3-20 Parameters compatible with IBM 3270 equipment using the ASCII character set.

Table 3-21 Parameters compatible with Honeywell VIP equipment.

Table 3-22 Parameters compatible with Sperry UTS™ equipment using the standard CS/1-BSC pass-through service.

Table 3-23 Parameters compatible with Control Data Corporation MODE4C equipment.

Table 3-24 Parameters compatible with Burroughs BASIC equipment.

Table 3-17 Configuration Parameters for Remote IBM 3274 Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	OFF
BSCProtocol	3270
BlockCheck	CRC16
CarrierSense	OFF
CharCode	EBCDIC
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	'2' (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.
(2) Setting varies in different installations.
(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-18 Configuration Parameters for IBM 3780 Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	ON
BSCProtocol	3780
BlockCheck	CRC16
CarrierSense	OFF
CharCode	EBCDIC
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	'2' (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.
(2) Setting varies in different installations.
(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-19 Configuration Parameters for IBM HASP Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	ON
BSCProtocol	HASP
BlockCheck	CRC16
CarrierSense	OFF
CharCode	EBCDIC
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	'2' (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.

(2) Setting varies in different installations.

(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-20 Configuration Parameters for IBM 3270 Equipment Using the ASCII Character Set

Parameter	*Setting*
DeVice	Host
BinaryData	OFF
BSCProtocol	3270
BlockCheck	LRC
CarrierSense	OFF
CharCode	ASCII
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	^V (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.
(2) Setting varies in different installations.
(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-21 Configuration Parameters for Honeywell VIP Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	OFF
BSCProtocol	VIP
BlockCheck	LRC
CarrierSense	OFF
CharCode	ASCII
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	^V (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.

(2) Setting varies in different installations.

(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-22 Configuration Parameters for Sperry UTS Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	OFF
BSCProtocol	UTS
BlockCheck	LRC
CarrierSense	OFF
CharCode	ASCII
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	^V (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.

(2) Setting varies in different installations.

(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-23 Configuration Parameters for Control Data Corporation MODE4C Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	OFF
BSCProtocol	MODE4C
BlockCheck	LRC
CarrierSense	OFF
CharCode	ASCII
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	^V (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	4 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.
(2) Setting varies in different installations.
(3) These settings allow transmission. Depending on the device's timing characteristics, however, performance may improve with some alteration.

Table 3-24 Configuration Parameters for Burroughs BASIC Equipment

Parameter	*Setting*
DeVice	Host
BinaryData	OFF
BSCProtocol	BASIC
BlockCheck	LRC
CarrierSense	OFF
CharCode	ASCII
DataBits	8
DLE	^P (1)
DUplex	Half (2)
INTerfaceType	DCE
PARIty	None
PassCheck	Pass
RECvTimer	64 (3)
RESpTimer	Disabled
SOH	Exclude
SYN	^V (1)
SyncCharCount	4
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (3)
BReakAction	IGnore
FlowControlFrom	None (3)
FlowControlTo	None (3)

(1) The Connection Service always displays this value as the printing character that represents the ASCII equivalent of the numeric value of the setting.
(2) Setting varies in different installations.
(3) These settings allow transmission. In some installations, however, system performance may improve with some alteration.

3.2.5 Character-Synchronous Handshake Control Lines

This section describes the effects of configuration parameters on handshake control lines.

The effect of some parameters depends on whether the port is functioning as a DTE or as a DCE. For the CS/100 and CS/200, this is determined by the setting of the port's INTerface-Type parameter; for the CS/1, this is determined both by the INTerfaceType parameter and by the SIO board type.

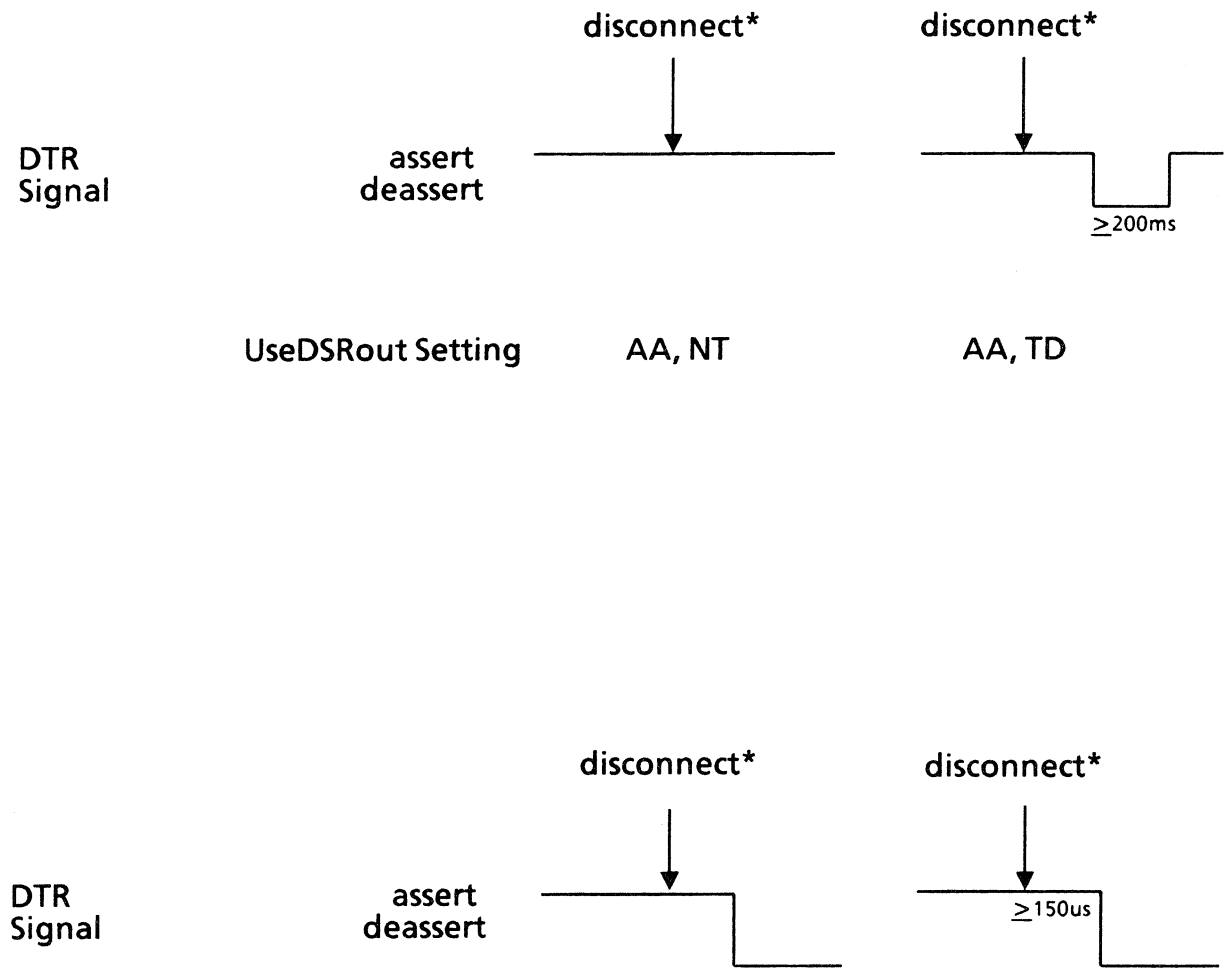
Table 3-25 summarizes the differences. The signal names in the table are relative to the modem.

Table 3-25 Effect of Parameters Dependent on Board Type and on Interface Type Parameter Setting

Parameter	*SIO-SM DTE Port*	*SIO-SM DCE Port*	*CS/100 * or CS/200 * DTE Port*	*CS/100, * CS/200, * or SIO-ST DCE Port*
CarrierSense	sense DCD set RTS	sense RTS set DCD	sense DCD set RTS	sense RTS set DCD
UseDSRout	DTR	DSR	DTR	no effect
UseDTRin	DSR	DTR	no effect	DTR
FlowCtlFrom	not used	used	not used	used
FlowCtlTo	used	not used	used	not used

* The DCD signal from the modem is delivered to the DTR pin on the CS/100 and CS/200; the RTS signal to the modem is delivered from the CTS pin on the CS/100 and CS/200; and the DTR signal to the modem is delivered from the DCD pin on the CS/100 and CS/200.

Figure 3-3 illustrates the effect of the different UseDSRout parameter settings on the DTR signal. This parameter has no effect on a port on an SIO-ST board, or a CS/100 or CS/200 port configured as a DCE device.



* The disconnect must come from a remote port.

Figure 3-3 Effect of UseDSRout Parameter Settings

Table 3-26 illustrates the recommended settings of the UseDSRout parameter for use with different kinds of modems. This table assumes that the modem is connected to a port on an SIO-SM board, or a CS/100 or CS/200 port configured as a DTE device. For the third-party, pass-through Connection Service currently available for synchronous transmission, always set the UseDTRin parameter to Ignore.

Table 3-26
Recommended Settings of UseDSRout

Device Type	*UseDSRout Setting*
Dial-in modem without unattended disconnect	AlwaysAssert, NoToggle
Dial-out modem without unattended disconnect	OnConnection, NoToggle
Dial-in modem with unattended disconnect	AlwaysAssert, ToggleonDisc
Dial-out modem with unattended disconnect	OnConnection, ToggleonDisc

3.3 Bit-Synchronous Configuration Parameters

This section describes the port parameters specific to bit-synchronous transmission. The parameters are appropriate for ports on a CS/1-SDLC.

Since the Connection Service commands are not available directly to a bit-synchronous port, parameters for the port are set remotely from an asynchronous terminal port on a different Communications Server on the Ethernet.

Because the Connection Service is not available, editing and global port parameters do not need to be set for bit-synchronous ports.

There are two ways to remotely set parameters for a Communications Server running XNS protocols: from a different Communications Server, either connect to port 136 (the network management port) of the server to be configured or use the REMOTE command. To set parameters remotely from an NCS, use the REMOTE command. The required network management functions and the REMOTE command are described in the *Connection Service User's Guide.*

On a hybrid CS/1 containing both bit-synchronous and asynchronous boards, parameters for a bit-synchronous port can be set from a port on an SIO-A board on the same CS/1.

The default parameter tables shipped with both character-synchronous and bit-synchronous systems include character-synchronous parameters only. In these parameter tables, the LinePRotocol parameter is settable to either BYTESynchronous or BITSynchronous. Before any other bit-synchronous parameters can be displayed or altered, the LinePRotocol parameter must be set to BITSynchronous. After this value is specified, the SHow DefaultParameters command displays the bit-synchronous parameter list, and the SETDefault command can be used to alter bit-synchronous parameter values.

All bit-synchronous port parameters must be set with the SETDefault command, except those indicated otherwise in the table below. Table 3-27 is a summary of all bit-synchronous parameters, listed alphabetically. Uppercase characters represent the minimum unambiguous abbreviation of each parameter.

Table 3-27 Bit-Synchronous Port Configuration Parameter Summary

Parameter	*Section*	*Parameter*	*Section*
AccessGroup	3.1.1	IdleState	3.3.2
AccessWord	3.1.1	InitMacro *	3.1.1
AddressFilter	3.3.2	InterAction *	3.1.1
AUToDisconnect	3.1.1	INTerfaceType	3.3.2
BAud	3.3.2	LinePRotocol	3.3.2
BReakAction	3.3.3	MaxSessions *	3.1.1
BUffersize	3.1.1	PRIvilege *	3.1.1
CarrierSense	3.3.2	RECvTimer	3.3.2
CRossCLocks **	3.3.2	RESpTimer	3.3.2
DUplex	3.3.2	UseDSRout	3.3.2
FlowControlFrom	3.3.3	UseDTRin	3.3.2
FlowControlTo	3.3.3	XmitTimer	3.3.2

* Can be displayed with SHow, but not set with SETD.
** Applies to CS/200 only.

3.3.1 Bit-Synchronous Port Transmission Parameters

The port transmission parameters for bit-synchronous ports are identical to the port transmission parameters for asynchronous ports. These parameters are described in detail in Section 3.1.1.

All settable bit-synchronous port parameters must be specified with the SETDefault command, not the SET command.

3.3.2 Bit-Synchronous Port Physical Parameters

This section describes the bit-synchronous port physical parameters, usually set by the network manager for each port. The parameters and their possible values are listed in Table 3-28.

Definitions of each parameter, explanations of each possible value, and an indication of the default follow the table. If the default value is appropriate, the parameter does not have to be set.

Table 3-28 Bit-Synchronous Port Physical Parameters

Parameter	*Permitted Values*
AddressFilter	Disabled | <number> (0-254)
BAud	50 | 75 | 110 | 134.5 | 150 | 200 | 300 | 600 | 1200 | 1800 | 2400 | 3600 | 4800 | 7200 | 9600 | 19.2K | 38.4K | 56K | 64K
CarrierSense	OFF | ON
CRossCLocks *	OFF | ON
DUplex	Half | Full | XmitOnly | RecvOnly
IdleState	LineMark | SyncBytes
INTerfaceType	DCE | DTE
LinePRotocol	ASynchronous | BYTESynchronous | BITSynchronous
RECvTimer	Disabled | <number> (1-255 sixteenths of a second)
RESpTimer	Disabled | <number> (1-255 sixteenths of a second)
UseDSRout	(AlwaysAssert | OnConnection , NoToggle | ToggleonDisc)
UseDTRin	Ignore | AsDTR | AsDCD
XmitTimer	Disabled | <number> (1-255 sixteenths of a second)

* Applies to CS/200 only.

The **AddressFilter** parameter determines the SDLC address. Only frames with the specified address or the broadcast address will be received. Setting the AddressFilter parameter to Disabled allows reception of all frames presented to the bit-synchronous interface.

The **BAud** parameter determines the baud rate of the port. If the SIO board is configured for external clocks, the setting of this parameter is ignored. If the SIO board is configured for internal clocks, the setting of this parameter determines the port's baud rate. The maximum load per SIO board is one 64K full-duplex port and one 9600 baud full-duplex port.

The **CarrierSense** parameter determines whether or not the system uses carrier sensing before line turnaround. The effect of this parameter depends on the settings of the DUplex and INTerfaceType parameters (see Table 3-15 in Section 3.2.2).

The **CRossCLocks** parameter specifies the clock arrangement for the RS-232 line. This parameter can only be set for ports 0 and 1 of the CS/200. When CRossCLocks is set OFF, both the transmit and receive clocks are provided by the DCE. When CRossCLocks is set ON, the DCE provides the receive clock, and the DTE provides the transmit clock.

The **DUplex** parameter specifies the type of physical interface provided by the SIO board for the port. If DUplex is set to Full, the SIO board provides a Bell 212-type interface. If Duplex is set to Half, the SIO board provides a Bell 208-type interface. When the parameter is set to either XmitOnly or RecvOnly, the SIO board provides a one-way, Bell 208-type interface.

The **IdleState** parameter determines whether the quiescent state of the line is mark (HDLC/SDLC Abort) or synchronization (x'7e'). If the parameter is set to LineMark, the line returns to marking when the final frame is sent. If the parameter is set to SyncBytes, the line sends flag bytes between frames until CTS becomes false.

The **INTerfaceType** parameter specifies whether the port is acting as a DCE or DTE device. Section 3.2.2 describes the INTerfaceType parameter.

The **LinePRotocol** parameter specifies whether bit-synchronous or character-synchronous transmission is used. The Communications Server automatically sets the value at boot time based on the SIO firmware present on the board and on the default value of the LinePRotocol parameter. If synchronous firmware is present, and the default LinePRotocol value is ASynchronous, the value is automatically changed to BYTESynchronous. For use with the SDLC pass-through service, this parameter must be set to BITSynchronous with the SETDefault command.

The **RECvTimer** parameter sets the reception error recovery timer. Section 3.2.2 describes the RECvTimer parameter.

The **RESpTimer** parameter is currently not used by the CS/1-SDLC, and the setting of the parameter is ignored by the system.

The **UseDSRout** and **UseDTRin** parameters for bit-synchronous operation are identical to the same parameters for character-synchronous operation. Section 3.2.2 describes these parameters.

The **XmitTimer** parameter sets the transmission error recovery timer. Section 3.2.2 describes the XmitTimer parameter.

3.3.3 Bit-Synchronous Session Transmission Parameters

The session transmission parameters for bit-synchronous ports are identical to the session transmission parameters for character-synchronous ports. These parameters are described in Section 3.2.3.

All settable bit-synchronous port parameters must be specified with the SETDefault command, not the SET command.

3.3.4 Sample Bit-Synchronous Configurations

This section contains samples of typical port configurations for use with various kinds of lines used with the CS/1-SDLC in the SDLC pass-through service:

Table 3-29 Parameters compatible with switched lines

Table 3-30 Parameters compatible with leased lines

Table 3-31 Parameters compatible with directly connected lines

Table 3-29 Configuration Parameters for SDLC Switched Lines

Parameter	*Setting*
AddressFilter	Disabled
AUToDisconnect	(1)
DeVice	Host
CarrierSense	ON
DUplex	Half
IdleState	LineMark
INTerfaceType	DTE
LinePRotocol	BITSynchronous
RECvTimer	64 (2)
RESpTimer	Disabled
UseDSRout	AlwaysAssert, ToggleonDisc (3)
UseDTRin	Ignore
XmitTimer	64 (2)
BReakAction	IGnore
FlowControlFrom	None (2)
FlowControlTo	None (2)

(1) Setting is user-selectable.
(2) These settings allow transmission. In some installations, however, system performance may improve with some alteration.
(3) Setting varies in different installations.

Table 3-30 Configuration Parameters for SDLC Leased Lines

Parameter	*Setting*
AddressFilter	Disabled
AUToDisconnect	Disabled
DeVice	Host
CarrierSense	OFF
DUplex	Full
IdleState	LineMark
INTerfaceType	DTE
LinePRotocol	BITSynchronous
RECvTimer	64 (1)
RESpTimer	Disabled
UseDSRout	AlwaysAssert, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (1)
BReakAction	IGnore
FlowControlFrom	None (1)
FlowControlTo	None (1)

(1) These settings allow transmission. In some installations, however, system performance may improve with some alteration.

(2) Setting varies in different installations.

Table 3-31 Configuration Parameters for SDLC Directly Connected Lines

Parameter	*Setting*
AddressFilter	Disabled
AUToDisconnect	Disabled
DeVice	Host
CarrierSense	OFF
DUplex	Full
IdleState	LineMark
INTerfaceType	DCE
LinePRotocol	BITSynchronous
RECvTimer	64 (1)
RESpTimer	Disabled
UseDSRout	OnConnection, NoToggle (2)
UseDTRin	Ignore
XmitTimer	64 (1)
BReakAction	IGnore
FlowControlFrom	None (1)
FlowControlTo	None (1)

(1) These settings allow transmission. In some installations, however, system performance may improve with some alteration.

(2) Setting varies in different installations.

3.3.5 Bit-Synchronous Handshake Control Lines

The effect of the settings of configuration parameters on the operation of handshake control lines is the same for bit-synchronous systems as for character-synchronous systems. Section 3.2.5 describes the effect of configuration parameters on handshake control lines.

3.4 CS/1-X.25 Configuration Parameters

The CS/1-X.25 provides the Connection Service via virtual ports rather than physical ports. These virtual ports support a subset of the port configuration parameters described in Section 3.1. Table 3-32 lists the parameters that apply to the CS/1-X.25 and indicates the section in which each parameter is described.

All the parameters listed can be set remotely by the network manager using the SETDefault command, although any parameters that correspond to X.3 parameters may be modified interactively by the host.

Table 3-32 CS/1-X.25 Port Configuration Parameter Summary

Parameter	*Section*	*Parameter*	*Section*
AccessGroup	3.1.1	GroupxPasswd	3.1.5
AccessWord	3.1.1	IdleTimer	3.1.3
AUToDisconnect	3.1.1	InitMacro	3.1.1
BReakAction	3.1.3	InterAction	3.1.1
BReakChar	3.1.3	LFInsertion	3.1.3
CRPad	3.1.2	LFPad	3.1.2
DataBits	3.1.2	LineERAse	3.1.4
DataForward	3.1.3	LocalEDiting	3.1.4
DATE	3.1.5	LocalPassWord	3.1.5
DeVice	3.1.1	MaxSessions	3.1.1
DOmain	3.1.5	MOde	3.1.3
ECHOData	3.1.3	NMPrompt	3.1.5
ECHOMask	3.1.3	Organization	3.1.5
ECMChar	3.1.3	PRIvilege	3.1.1
EOM	3.1.3	PROMPt	3.1.5
ERAse	3.1.4	ReprintLine	3.1.4
FlowControlFrom	3.1.3	VERBatim	3.1.4
FlowControlTo	3.1.3	WelcomeString	3.1.5
GlobalPassWord	3.1.5	WordERAse	3.1.4

3.5 IVECS Configuration Parameters

The IVECS requires only minimal port configuration. Because each IVECS virtual port does not represent a single connector and physical line, most of the port parameters described in the previous sections are not applicable.

Table 3-33 lists the parameters that apply to the IVECS and indicates the section in which each parameter is described. Except for the PermanentVC parameter, described below, these IVECS parameters are described in Section 3.1. Additional IVECS port parameters are displayed by the SHow DefaultParameters command, but only the parameters listed in Table 3-33 can be changed. The additional parameters include BAud, PARIty, and STopBits, which reflect the values programmed by the VAX for the DMF32 port.

The **PermanentVC** parameter specifies a permanent virtual circuit from the current or specified port to the specified address or clearinghouse name. Permitted values are shown below:

"" | "<address>"

To disable a permanent virtual circuit, set the parameter equal to a null string, represented by double quotes ("").

Table 3-33 IVECS Port Configuration Parameter Summary

Parameter	*Section*	*Parameter*	*Section*
AccessGroup	3.1.1	IdleTimer	3.1.3
AUToDisconnect	3.1.1	PermanentVC	3.5
BReakAction	3.1.3	UseDCDout	3.1.2
FlowControlFrom	3.1.3	UseDTRin	3.1.2
FlowControlTo	3.1.3		

IVECS configuration parameters must be set remotely by the network manager from an asynchronous terminal port on a CS/1, CS/100, or CS/200, or from an NCS. To set parameters remotely from a Communications Server, either connect to port 136 (the network management port) of the server to be configured or use the REMOTE command. To set parameters remotely from an NCS, use the REMOTE command. The required network management functions and the REMOTE command are described in the *Connection Service User's Guide.*

3.6 Configuration Parameters for the CS/1-SNA and the CS/1-HSM

Most servers that provide the Connection Service via virtual ports rather than physical ports require only minimal port configuration. Because a virtual port does not represent a single connector and physical line, most of the port parameters described in the previous sections are not applicable.

The configuration parameters for the CS/1-HSM and CS/1-SNA must be set remotely by the network manager from an asynchronous terminal port on a CS/1, CS/100, or CS/200, or from an NCS.

There are two ways to remotely set parameters for a Communications Server running XNS protocols: from a different Communications Server, either connect to port 136 (the network management port) of the server to be configured or use the REMOTE command. To set parameters remotely for a Communications Server running TCP/IP protocols, use the REMOTE command from a different Communications Server. To set parameters remotely from an NCS, use the REMOTE command. The required network management functions and the REMOTE command are described in the *Connection Service User's Guide.*

The CS/1-SNA uses only three port parameters and one global parameter. These parameters are listed in Table 3-34 and described in Section 3.1. Additional parameters appear on the SHow DefaultParameters display, but only those listed in the table can be modified.

Table 3-34 CS/1-SNA Port Configuration Parameter Summary

Parameter	*Section*
AccessGroup	3.1.1
AccessGroup	3.1.1
AccessWord	3.1.1
AUToDisconnect	3.1.1
GroupxPasswd	3.1.5

For the CS/1-HSM, the port parameters listed in Table 3-35 are configurable. Additional parameters appear on the SHow DefaultParameters display, but only those listed in the table can be modified. Some of these parameters have characteristics that are unique to the CS/1-HSM. The following paragraphs describe these characteristics.

Table 3-35 CS/1-HSM Port Configuration Parameter Summary

Parameter	*Section*
AccessGroup	3.1.1
AUToDisconnect	3.1.1
BAud	3.1.2
UseDTRin	3.1.2
FlowControlFrom	3.1.3
FlowControlTo	3.1.3

The BAud parameter can be set to provide either a fixed baud rate or AutoBaud. When the Baud parameter is set to either High_AutoBaud or Low_AutoBaud, the CS/1-HSM reads the baud rate at the remote end of the session (usually a user's terminal baud rate) and sets the metering for the session accordingly. If the remote baud rate is also set to AutoBaud, the CS/1-HSM defaults to a metering rate of 9600. If a fixed baud rate is specified, the CS/1-HSM meters at that rate.

If the UseDTRin parameter is set to AsDTR or AsDCD, the session is discontinued automatically when the user logs off the host. The CS/1-HSM does not drop a user's session if this parameter is set to Ignore.

If the FlowControlFrom parameter is set to XON_XOFF, the CS/1-HSM sends an XOFF when a session is flow-controlled and an XON when the flow is resumed. The CS/1-HSM only sends the characters XON (hexadecimal 17, DC1) and XOFF (hexadecimal 19, DC3) when this feature is enabled. Refer to Section 3.1 for parameter descriptions.

3.7 GS/1 Configuration Parameters

This section summarizes the configuration parameters that apply to GS/1 and refers to the sections that describe these parameters. It then describes the Bridge implementation of the X.3 protocol.

The GS/1 port and session parameters apply only to the GS/1 Connection Service and only to virtual ports accessed by a user dialing into the GS/1 from a PAD on an X.25 network. The global parameters (described in Section 3.1.5) apply to the GS/1 as a whole.

Table 3-36 lists all configuration parameters for the Gateway Server/1 alphabetically and gives the section number of each parameter description. Uppercase characters represent the minimum unambiguous abbreviation of each parameter. The possible values of each parameter, and the effects of the possible values, are described in Section 3.1.

Table 3-36 GS/1 Port Configuration Parameter Summary

Parameter	*Section*	*Parameter*	*Section*
AccessGroup	3.1.1	GlobalPassWord	3.1.5
AccessWord	3.1.1	GroupxPasswd	3.1.5
AUditServerAddr	3.1.5	IdleTimer	3.1.3
AUToDisconnect	3.1.1	InitMacro	3.1.1
BReakAction	3.1.3	InterAction	3.1.1
BReakChar	3.1.3	LFInsertion	3.1.3
CONNectAudit	3.1.5	LFPad	3.1.2
CRPad	3.1.2	LineERAse	3.1.4
DataBits	3.1.2	LocalEDiting	3.1.4
DataForward	3.1.3	LocalPassWord	3.1.5
DATE	3.1.5	MaxSessions	3.1.1
DeVice	3.1.1	MOde	3.1.3
DOmain	3.1.5	NMPrompt	3.1.5
ECHOData	3.1.3	Organization	3.1.5
ECHOMask	3.1.3	PermanentVC	3.1.1
ECMChar	3.1.3	PRIvilege	3.1.1
EOM	3.1.3	PROMPt	3.1.5
ERAse	3.1.4	ReprintLine	3.1.4
ERRorAudit	3.1.5	VERBatim	3.1.4
FlowControlFrom	3.1.3	WelcomeString	3.1.5
FlowControlTo	3.1.3	WordERAse	3.1.4

The Bridge implementation of the X.3 protocol provides most of the functions and some enhancements of X.3 parameters. Table 3-37 indicates the correspondence between the port configuration parameters available through the Connection Service and the X.3 parameters 1 through 18. The table also indicates any X.3 parameter values that are altered or converted by the Connection Service.

In the Bridge implementation, the InterAction, CRPad, and LFPad parameters (X.3 parameters 6, 9, and 14, respectively) are defined as port parameters rather than as session parameters. After a session is disconnected, these parameters may be different from their default values.

In all parameter exchanges between a GS/1 or CS/1-X.25 and an X.25 host, parameter conversion is effected so that the host detects no inconsistency. The X.25 interface performs the conversion and retains the X.3 value locally, in case the host needs to read the parameters back. However, if the user alters the InterAction, BReakAction, or LFInsertion parameters (X.3 parameters 6, 7, and 13, respectively) after a session has been established with an X.25 host, the host may change the parameter values for compatibility.

For Local Editing (X.3 parameter 15) to function properly, the Bridge EOM parameter must be disabled.

Table 3-37 Bridge-to-X.3 Parameter Conversions

Parameter No.	*Bridge Name/Values*	*X.3 Name/Values*	*Conversion*
1	ECMChar 0 - 127	PAD recall character 0, 1, 32 - 126	X.3 value 1 converted to <CTRL P>; no conversion on other values
2	ECHOData 0, 1	Echo 0, 1	None
3	DataForward 0 = None 1 = AlphaNum 2 = CR 4 = COntrol 8 = ESC 16 = EDiting 32 = FormEF 64 = Punct 128 = Term and combinations	Data Forward 0, 1, 2, 4, 8, 16, 32, 64, and combinations	When parameter 15 is enabled, value 8 (editing characters) is turned on locally and is transparent to the user; if the host reads the parameters back, value 8 does not appear in parameter list
4	IdleTimer 0, 1 - 255	Idle Timer 0, 1 - 255	Bridge value = (X.3 value * 3); X.3 values 85 through 255 are converted to 255 in the Bridge implementation
5	FlowControlFrom 0 = None 1 = XON_XOFF 2 = CTS_RTS 3 = ENQ_ACK	Flow Control From 0, 1	None

(continued)

Table 3-37 Bridge-to-X.3 Parameter Conversions (continued)

Parameter No.	*Bridge Name/Values*	*X.3 Name/Values*	*Conversion*
6	InterAction 0 = Brief 1 = Verbose 4 = NoEcho 8 = Completion 16 = No Macro Echo 32 = Linefeed Insertion 64 = Broadcast Off	Interaction 0, 1, 4, and combinations	Since prompt service signals cannot be suppressed separately from PAD service signals in the Bridge environment, the X.3 value 5 (4+1) is converted to 1 in the Bridge implementation; Value 4 is used for "Echo/NoEcho"
7	BReakAction 0 = Ignore 1 = OutofBand 4 = InBand 8 = EscDTM 16 = FlushVC	Breakaction 0, 1, 2, 4, 8, 21, and combinations	X.3 value 2 (RESET) is not supported by the Bridge implementation; the Bridge value 16 (FlushVC) causes output data to be flushed when a break signal is detected
8	FlushVC 0, 1	Discard Output 0, 1	None
9	CRPad 0 - 127	CR Padding 0 - 7	None; the Bridge implementation allows a wider range than the X.3 definition
10	None	Line Folding 0 - 255	The Bridge implementation accepts this parameter and performs no action on it

(continued)

Table 3-37 Bridge-to-X.3 Parameter Conversions (continued)

Parameter No.	*Bridge Name/Values*	*X.3 Name/Values*	*Conversion*
11	BAud 0 - 50 1 - 75 2 - 110 3 - 134.5 4 - 150 5 - 200 6 - 300 7 - 600 8 - 1200 9 - 1800 10 - 2400 11 - 3600 12 - 4800 13 - 7200 14 - 9600 15 - 19.2K 16 - 38.4K 17 - 64K 18 - 56K 19 - 76.8 20 - 153.6K	Baud Rate 0 - 110 1 - 134.5 2 - 300 3 - 1200 4 - 600 5 - 75 6 - 150 7 - 1800 8 - 200 9 - 100 10 - 50 11 - 75/1200 12 - 2400 13 - 4800 14 - 9600 15 - 19.2K 16 - 48K 17 - 56K 18 - 64K	The host should not set the baud rate parameter; if the host reads the parameter value, the Bridge values are converted to X.3 values
12	FlowControlTo 0 = None 1 = XON_XOFF 2 = CTS_RTS 3 = ENQ_ACK	Flow Control To 0, 1	None

(continued)

Table 3-37 Bridge-to-X.3 Parameter Conversions (continued)

Parameter No.	*Bridge Name/Values*	*X.3 Name/Values*	*Conversion*
13	LFInsertion 0 = None 1 = OutputCtrl 4 = EchoCtrl and combinations	Line Feed Insertion 0, 1, 2, 4, and combinations	X.3 value 2 (LF insertion after a <CR> from DTE) is not supported in Bridge implementation; no conversion on other values
14	LFPad 0 - 127	LF padding 0 - 7	None; the Bridge implementation allows a wider range than the X.3 definition
15	LocalEDiting 0, 1	Local Editing 0, 1	None; Bridge command editing is turned on when this parameter is set
16	ERAse 0 - 127	Char Delete 0 - 127	None
17	LineERAse 0 - 127	Line Delete 0 - 127	None
18	ReprintLine 0 - 127	Reprint Line 0 - 127	None

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