GORDON KAPES | INC.

System 920 PFT for T1

Master Reference Guide

Covering Installation, Configuration,
and Operation Topics

Issue 2 of this guide covers System 920 software version 1.02 and later. Contact Gordon Kapes, Inc. Technical Support for further information.

Gordon Kapes, Inc.
5520 West Touhy Avenue
Skokie, Illinois 60077 U.S.A.
Telephone 847|676-1750
Fax 847|982-0747
www.gkinc.com

40630, Issue 2
October 1995

NO WARRANTIES OF ANY NATURE ARE EXTENDED BY THE DOCUMENT. Gordon Kapes, Inc. cannot accept any financial or other responsibility that may be the result of your use of the information in this document or software material, including direct, indirect, special, or consequential damages.

The information contained herein is subject to change without notice. Revisions may be issued to advise of such changes and/or additions.

The statement below is included in this document to comply with a Federal Communications Commission (FCC) regulation. The FCC is an agency of the United States government; thus, the statement below applies to computing equipment installed in the United States of America. Gordon Kapes, Inc. is taking appropriate steps to be in compliance with FCC regulations and similar regulations of other countries.

WARNING: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measure may be required to correct the interference.

Printed in the United States of America

Contents

Part III Configuring the System 920

Part IV Operating the System 920

Foreword

A Welcome from Gordon Kapes

I'm proud to welcome you to the latest product from Gordon Kapes, Inc. The System 920 is the culmination of everything I've learned about power failure transfer over the past 10 or so years. I'm confident that as you become accustomed to the System 920, you'll share my enthusiasm for the power and versatility that it contains. I take a personal interest in every product we make, and I feel that this one is truly outstanding.

I give much credit to those people who contributed to making the System 920 a reality. The software was written by Larry Leviton and Steve Malott. Circuit boards were designed by Al Lux. Mechanical design was by Fred Roeck. Testing was handled by Joe Urbanczyk. The documentation was written by Bill Beaman, with editing and production by Barbara Govednik. Prototype hardware was built by Maxine Allbritton. Hardware was designed by Tom Dawson, with consultation from Mitch Budniak. The graphics were designed by Jim McGuire. Engineering support and personal publishing was performed by Carrie Loving. Ben Kamen provided technical support. I did the overall product design and kept adding features until my presence was definitely not welcome!

Field performance is the only accurate measurement of just how good the System 920 really is. To that end I welcome your comments, suggestions, or questions. Please call me at 847|676-1750, send a fax at 847|982-0747, or visit our website at www.gkinc.com.

This page intentionally left blank.

Chapter One
Understanding the System 920

Once the sole province of telephone companies, T1 digital transmission technology is now directly available to business and industry on a widespread scale. Capable of handling 24 voice conversations over two twisted pairs of telephone cable, T1 helps companies enhance communication efficiency, improve reliability, and lower costs.

As organizations become more and more dependent upon T1-based equipment, the need to implement a flexible, robust, and yet cost-effective backup system becomes more and more important. Gordon Kapes, Inc. believes the System 920 PFT for T1 is such a system.

The System 920 PFT for T1

The System 920, a completely self-contained backup phone system, extends the concept of power failure transfer (PFT) to T1 circuits. The System 920 goes to work automatically when normal operation of customer-premise-T1 (CPE-T1) equipment is inhibited due to a power failure or system malfunction.

The System 920 sits between the customer-premise-T1 equipment and the network-T1 circuit. When a failure occurs, the System 920 seizes the network T1—enabling personnel at the site to continue to receive inbound calls and continue to place outbound calls.

The System 920 is a single-cabinet unit intended to be mounted on the wall of an equipment room. It combines the capabilities of a channel service unit (CSU), a channel bank, an automatic call distributor (ACD), a two-channel recorder/announcer, and a 24-port “micro” PBX.

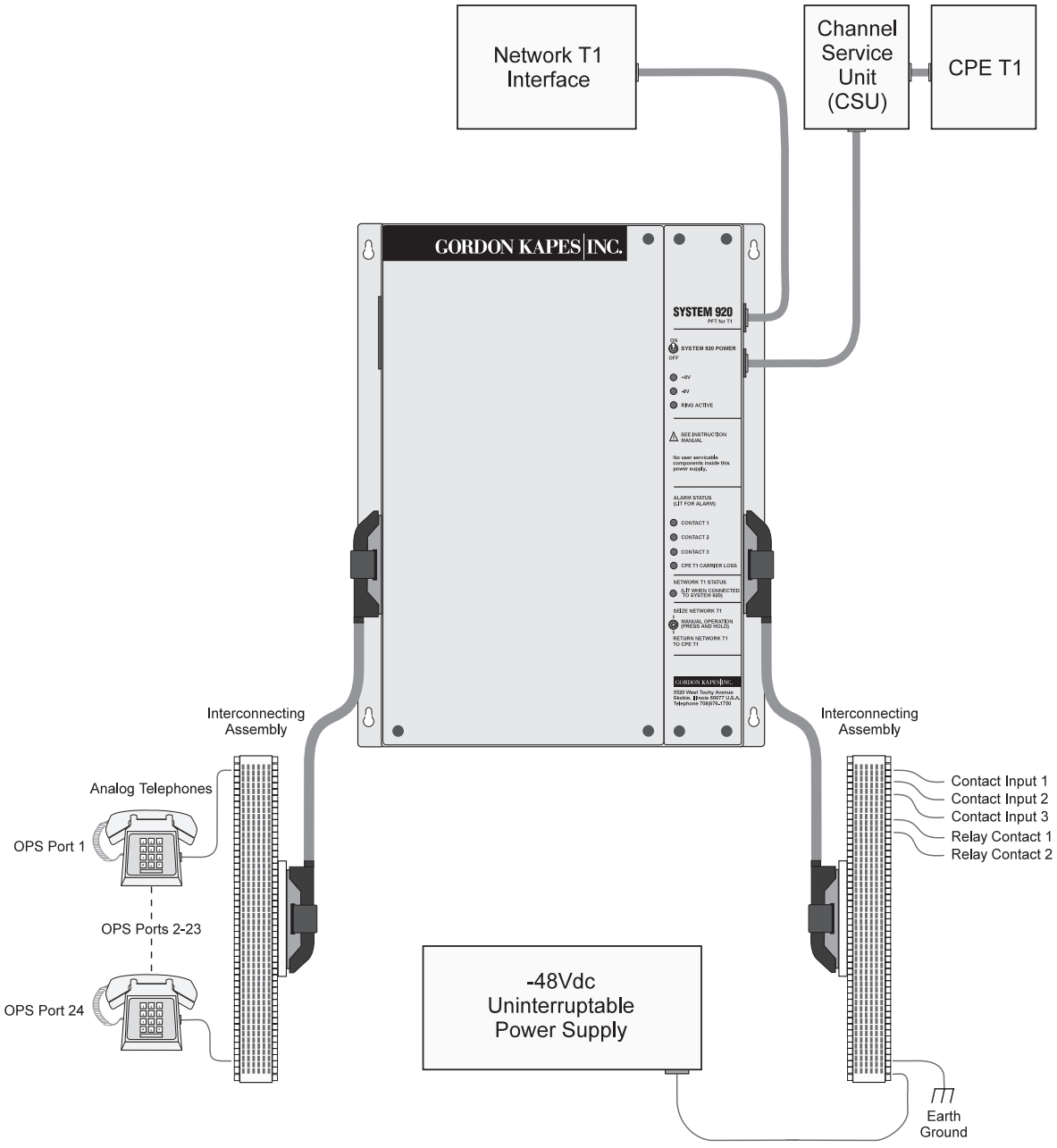


Figure 1-1. System 920 Installed in a Typical PBX-System Site

Inbound-Call & Outbound-Call Configurations

The System 920 provides communication for all 24 channels supplied by a network-T1 circuit. These can be any combination of inbound, outbound, or two-way channels.

When the System 920 seizes the network T1, incoming calls can be directed to:

- An analog telephone, either by way of an ACD function, a DNIS (dialed number identification service) function, or directly—which enables the calling party to speak with a real person. Calls received by one telephone can easily be transferred to another telephone by using switch-hook flash.
- An outside telephone number, with or without an intermediate voice message—which directs the call to an alternate site
- A voice message—which provides the calling party with prerecorded information
- A standard reorder progress tone—which indicates to the calling party that equipment normally used at the site is down

On-site personnel can use these analog telephones, which meet the technical specifications for OPS extensions, to make outgoing calls when the System 920 has seized the network T1. You can authorize each OPS extension for outbound access. From an authorized extension, a caller can access a network T1 channel by dialing the outbound-access digit (8 or 9).

You can configure the OPS extensions to be fully functional at all times. This enables you to use them as a backup or supplementary internal phone system on a day-to-day basis—whether the network T1 has been seized or not.

System 920 Resources & Hardware

As implied by the preceding description of its capabilities, the list of telephone backup resources provided by the System 920 is comprehensive. The following describes these resources in more detail.

OPS Cards Enable Voice Communications

The OPS cards enable on-premise or remotely-located analog touch-tone telephones to serve as System 920 extensions. These extensions facilitate voice communications through the network T1 after the System 920 has seized it, and they can permit internal communications on an everyday basis. As shown in Figure 1-2, the System 920 accommodates as many as three OPS cards, with each card containing eight OPS ports. This means you can install and use as many as 24 OPS extensions with a single System 920.

ACD Functions Enable Automatic Call Distribution

Two automatic-call-distributor (ACD) functions are provided by the System 920. To organize and expedite incoming calls during a backup period, you can route specific T1 channels to either ACD function. Calls routed to an ACD function connect only with those OPS extensions assigned to the function.

If all extensions assigned to the ACD function are busy, incoming calls are placed in queue where callers either hear a recorded message or an audible-ring progress tone until an extension becomes free. If the queue is full, callers hear either a recorded message or a reorder progress tone (fast busy).

DNIS Functions Enable Dialed Number Identification

Two dialed number identification service (DNIS) functions enable the System 920 to identify the telephone number the caller dialed. If the number is one of the DNIS match numbers you configured, you can route the call to an OPS extension, an ACD function, a redirect function, a message, or a reorder tone.

OPS Extensions Provide Switch-Hook Flash & Other Features

The System 920 enables you to use switch-hook flash capabilities with OPS extensions. This provides a call-transfer feature that enhances these extensions for everyday use, if desired, and extends the usefulness of the ACD functions.

Standard progress tones are used with OPS extensions, and an alert tone is used to warn calling parties when the system is about to reconnect CPE T1 with the network T1. You can configure the 3-digit dialing plan for OPS extensions. You also use an OPS extension to record or play messages on the Recorder/Announcer card.

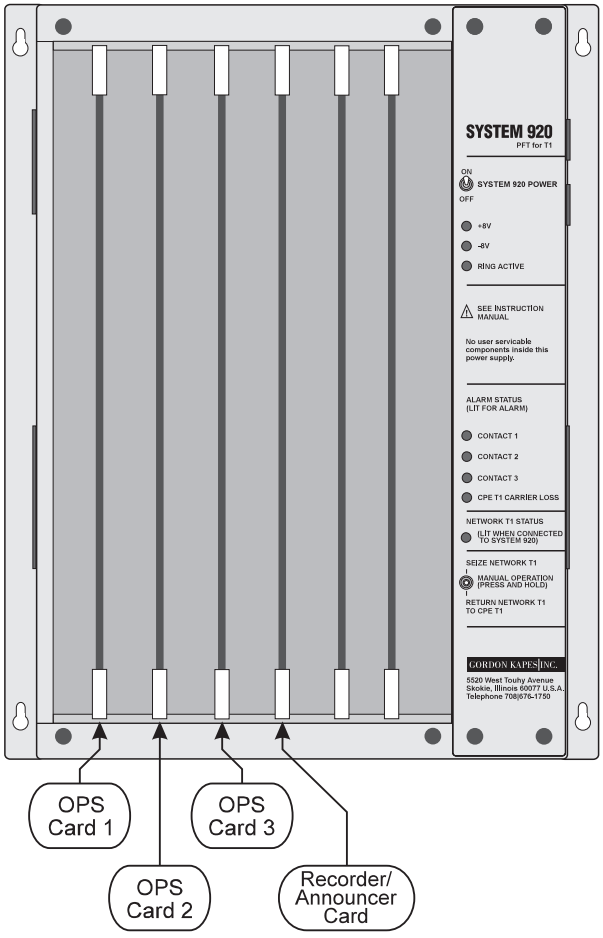


Figure 1-2. System 920 Showing OPS Card 1, OPS Card 2, OPS Card 3, and Recorder/Announcer Card

Redirect Functions Enable Off-Site Transfer

If you want to redirect incoming T1 calls to an off-site location during a backup period, you can do so—simply route the desired T1 channels to either of two redirect functions. Each redirect function contains the telephone number for an off-site location. A call coming in on a redirected channel is automatically transferred to the new telephone number. If you wish, you can configure the System 920 to play one of the recorded messages before transferring the call.

Recorder/Announcer Card Stores Recorded Messages

The Recorder/Announcer card, shown in Figure 1-2, enables you to record two separate voice messages. Each message can be as long as twenty seconds. Either message can be played to calls coming in through network-T1 channels. Either can be played before a call is redirected to another site. And either can be played when a call is placed in an ACD queue or overflow. Use an OPS extension to access the card for the purpose of recording and maintaining the messages.

Relay Contact Outputs Signal External Devices

Two relay contacts are provided by the System 920. These change state whenever the System 920 seizes the network T1. One relay, which is normally open, closes when the network is seized; the other, normally closed, opens. Once the System 920 reconnects CPE T1 to the network T1, the relay contacts return to their normal states. You can use these relay contacts to signal an external monitoring device that the network has been seized. For example, you can use the relay contacts to signal the Model 125 Site Monitor from Gordon Kapes, Inc.

Additional Cards Supply Operating Capabilities

Shown in Figure 1-3, the T1/DS1 Interface card interfaces the T1/DS1 circuit from the network with the System 920. No external channel service unit (CSU) is needed when the System 920 seizes the network T1, since this card contains one built-in. (This CSU serves only the System 920 and is not provided for use by the CPE site.)

The CPU card contains a powerful 32-bit microprocessor and logic circuitry used for operating the System 920. Also on this card is ROM memory used for storing program code, and battery-backed RAM memory for storing configuration parameters set using the menu system (described later in this chapter).

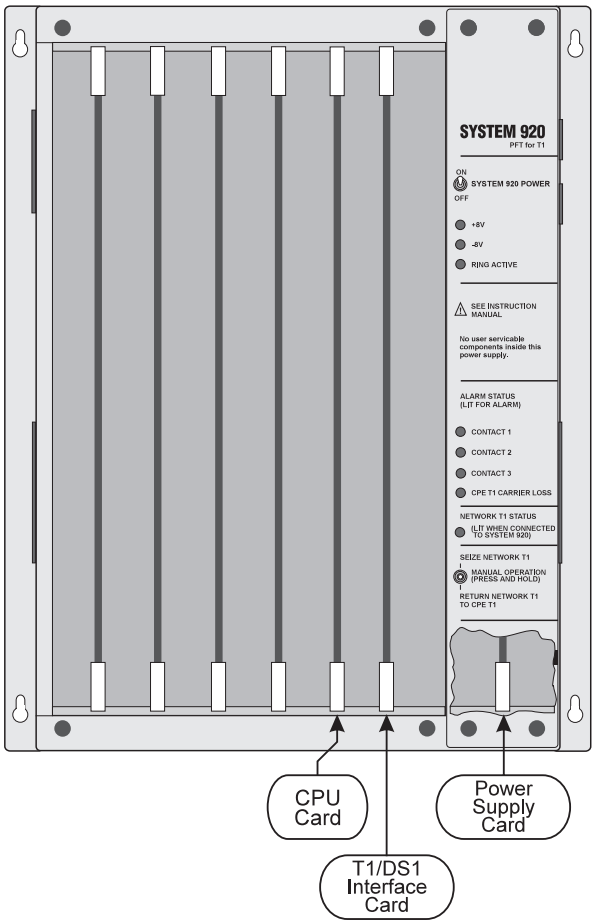
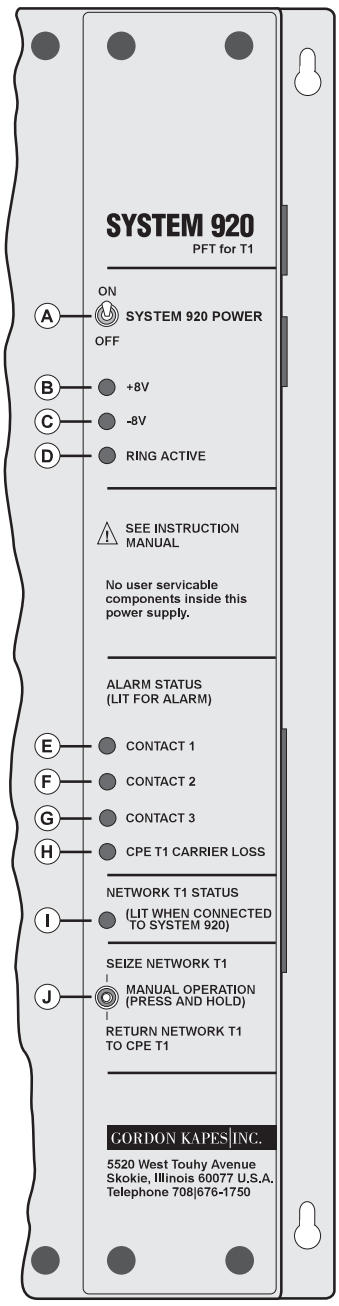


Figure 1-3. System 920 Showing CPU Card, T1/DS1 Interface Card, and Power Supply Card

Finally, the Power Supply card generates operating voltages and provides the user controls and status LEDs. These include the Manual Operation switch, which enables you to manually seize the network T1. (Refer to Figure 1-4 for more details about the status LED panel.)



(A) System 920 Power switch

Controls entry of –48V to the system. Move switch to the On or Off position. Since the system cannot function without power, the switch should be left in the On position during normal operating conditions.

(B) +8V

When lit, indicates +8V is being generated by the Power Supply card and sent to other System 920 cards. This LED should always be lit when power to the System 920 is applied and the power switch is in the On position.

(C) –8V

When lit, indicates –8V is being generated by the Power Supply card and sent to other System 920 cards. This LED should always be lit when power to the System 920 is applied and the power switch is in the On position.

(D) Ring Active

Flutters when active. This indicates ringing current is being generated by the Power Supply card upon request of one of the OPS cards. LED should flutter only when ringing current is being generated. Continuous fluttering indicates a problem such as an OPS extension accidently left off-hook and ringing another extension.

(E) Contact 1

When lit, indicates contact-input-monitoring 1 function is enabled and in the alarm state.

(F) Contact 2

When lit, indicates contact-input-monitoring 2 function is enabled and in the alarm state.

(G) Contact 3

When lit, indicates contact-input-monitoring 3 function is enabled and in the alarm state.

(H) CPE T1 Carrier Loss

When lit, indicates CPE-T1 monitoring function is enabled and in the alarm state.

(I) Network T1 Status

When lit, is either lit steadily or flashes on and off. When lit steadily, indicates System 920 has seized the network T1 and is synchronized with it. When flashing on and off, indicates System 920 has seized the network T1 but is *not* synchronized with it.

When not lit, indicates the System 920 has not seized the network T1.

(J) Manual Operation switch

Press and hold up to seize the network T1. Press and hold down to reconnect network T1 to CPE T1.

Figure 1-4. System 920 Status LED Panel

System 920 Connections

P1 and P2 are illustrated in Figure 1-5. These plugs, located on the left and right panels of the System 920 enclosure, enable you to connect the OPS extensions, the three contact inputs, and a –48Vdc uninterruptible power source to the System 920. They also enable you to connect the two relay contacts to external devices.

J1, located on the left panel of the System 920, enables you to connect a terminal or personal computer to the System 920 for the purpose of configuring, testing, and maintaining the unit. The terminal or personal computer, which does not have to be permanently installed, must be VT100 compatible.

J2 enables you to connect the network-T1 circuit to the System 920.
J3 enables you to connect CPE-T1 equipment to the System 920.

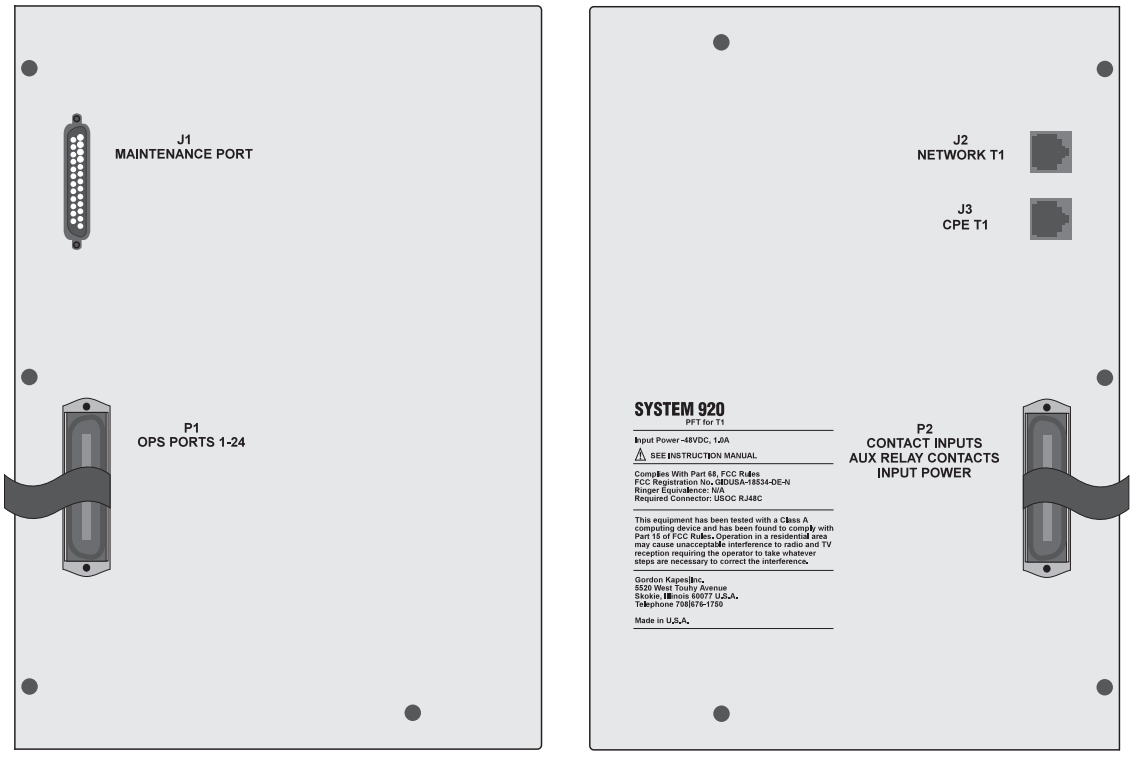


Figure 1-5. Left and Right Panels of System 920 Showing Connection Points

System 920 Monitoring Functions

Four monitoring functions are built into the System 920. These are the CPE-T1-carrier-monitoring function and the three contact-input-monitoring functions. These functions, which are implemented and configured by the site administrator, activate alarms that trigger the System 920 to seize the network T1.

CPE-T1 Carrier Monitoring

A circuit in the System 920 monitors the carrier signal coming from the CPE-T1 equipment. When the circuit detects loss of signal for more than one second, an alarm is activated, and the System 920 seizes the network T1. Once the carrier signal has been reestablished for longer than one second, the alarm state returns to normal and the System 920 can reconnect CPE T1 to the network T1. (A system configuration parameter enables you to delay reconnection for 5, 10, or 15 minutes, or until all calls have been completed. Refer to “General System Configuration,” later in this chapter.)

Contact-Input Monitoring

The System 920 also provides three contact-input-monitoring functions. These can be connected to the alarm contacts provided by CPE-T1 equipment such as a PBX, or an ACD system. You set the normal state of each contact input (open or closed). When the opposite state occurs for longer than one second, an alarm condition is activated and the System 920 seizes the network T1. After the contact has returned to normal for longer than three seconds, the system can reconnect CPE T1 and network T1.

You can also seize the network T1 manually by pressing the Manual Operation switch located on the status LED panel on the front of the unit (shown in Figure 1-4). This enables you to use the System 920 at any time. You might want to use the Manual Operation switch for a number of different reasons. You may wish to use it when there is an equipment problem or because you want to test the system. Or you may want to use it when administering system training or for providing communications while CPE-T1 equipment is undergoing routine maintenance.

Software Configuration Ensures Flexibility

To meet the differing specifications required by various sites, the System 920 provides a wide range of configuration possibilities. By using the System 920's menu-system software, you can quickly and easily make required configuration settings for the following areas:

- General system configuration
- T1/DS1 channels
- OPS ports
- ACD functions
- DNIS functions
- Redirect-dialing functions
- Recorder/Announcer-card access

General System Configuration

General system configuration consists of entering the desired OPS extension length number (3 or 4 digits), selecting the OPS operations status, selecting the connection made when you dial 0 at an OPS extension, enabling the CPE-T1-carrier-monitor and contact-input monitoring functions, and selecting the conditions under which you want the System 920 to reconnect the network T1 to CPE T1 after all alarm conditions have returned to normal.

People at the site may be making calls through a network-T1 channel when the System 920 is ready to reconnect CPE T1 to the network T1. Since the system would suddenly end these conversations if it reconnected immediately, you can specify how reconnection is to be delayed while the conversations are being completed. You can choose to have the system reconnect after all calls have been completed, or after a 5-, 10-, or 15-minute delay if all calls have not been completed sooner. In each one of these cases, the system connects an alert tone every thirty seconds. This warns people to end their conversations. You can also choose to have the system reconnect immediately without waiting for calls to be completed.

General and Individual T1/DS1-Channel Configuration

The System 920 enables you to match both the general parameters and the individual channel parameters required by the network T1. Setting these parameters enables the System 920 to interface correctly with the network T1. General parameters are framing type, zero suppression mode, line-build-out signal level, and synchronization source.

You can enable or disable each channel. For each enabled channel you can select from a wide range of signaling methods including ground start, DID, and tie trunk. You can also set channel direction as two way, inbound, or outbound, and route each channel set for inbound activity to a reorder tone, voice message, OPS extension, ACD function, or redirect function. Dial-tone source is also configurable.

Individual OPS-Port Configuration

You can also individually configure each OPS port. Using the OPS extension digit length number as a starting point, the system automatically assigns a specific extension number to each port. You complete the configuration by assigning an ACD function to each extension, and by authorizing outbound access for each extension, if these are desired.

Individual ACD-Function Configuration

ACD-function configuration consists of assigning a queue depth, queue action, and overflow action for each of the two ACD functions. Normally, a call coming in through a channel routed to a specific ACD function is connected to a free (on-hook) extension assigned to that ACD function. If all assigned extensions are busy, however, the call is placed in queue. This means that it is waiting to be connected to a free extension.

Queue depth is the maximum number of calls to be kept waiting. *Queue action* refers to the action taken by the System 920 while a call is in queue. The system can connect an audible ring, or one of the two voice messages stored in the Recorder/Announcer card.

Once queue depth has been exceeded, incoming calls routed to the ACD function are placed in overflow. You determine *overflow action*, which is similar to queue action. You can specify that the system connect a reorder tone or one of the two voice messages as the overflow action.

Individual DNIS Function Configuration

DNIS-function configuration consists of setting up several general parameters and DNIS match number call routing parameters for each of the two DNIS functions. The two functions enable you to specify two sets of 24 match numbers or ranges using two different match number lengths.

Configuration of Two Redirect Functions

T1 channels routed to one of the two redirect functions are forwarded to telephone numbers that you define. The number you enter can consist of as many as 40 characters; and can include commas for pausing, and dashes, slash marks, or parentheses for formatting. You can also configure the function to connect one of the voice messages before a call is redirected.

Recorder/Announcer Card Access Configuration

Finally, the System 920 enables you to identify a specific OPS extension (or all OPS extensions) from which you can access the Recorder/Announcer card, and specify the numeric password permitting access to the card.

Menu System Ensures Easy Status Review

In addition to configuring the system, the menu system enables you to easily review the operating status of T1 channels and other functions.

To access the menu system, connect a terminal or personal computer with VT100 emulation to the maintenance port connector on the right panel of the System 920. Use an RS-232 serial cable commonly available at any retail computer store, and the standard communication settings of 9600 baud and 8-N-1. Press the return key, enter your password, and the menu system is displayed.

The menu system is organized into two major levels, or menus—operator and administrator. You select options from the Operator Menu to view operating status, and to access the Administrator Menu. Authorized personnel select options from the Administrator Menu to configure and test the System 920. Quick-reference information is provided by on-line help.

Viewing Operating Status

A variety of status screens displayed by the menu system enable you to analyze and diagnose System 920 operating conditions. Use the menu system to review the status of the following areas:

- General system status
- ACD-function status
- Redirect-dialing status
- T1/DS1-Interface-card status
- OPS-card status
- Recorder/Announcer-card status

General System Status

General system status is comprised of information indicating the current network-T1 transfer status and the alarm status of the System 920, as well as accumulated totals for various operating parameters.

Viewing general system status enables you to determine whether the System 920 has seized the network T1. When this is the case, it enables you to identify the cause of the seizure, to verify that the System 920 and the network T1 are synchronized, and, if the network T1 is issuing an alarm, to identify the type of alarm. After seizure has occurred, and alarm conditions have returned to normal, general system status indicates why the System 920 has not reconnected CPE T1 to the network T1—if, indeed, it has not.

ACD-Function Status

ACD-function status enables you to view the configured queue depth, queue action, and overflow action for each of the two ACD functions. The ACD Status screens also indicate those T1 channels currently routed to each ACD function, those OPS extensions currently assigned to each ACD function, and those T1 channels currently in queue and in overflow for each ACD function.

Redirect-Dialing Status

Redirect-dialing status consists of identifying the T1 channels routed to each redirect function and the number of T1 channels currently being redirected to these functions.

T1/DS1-Interface-Card Status

The T1/DS1 Interface Card Status screen displays the configured parameters for each T1 channel. These show whether each channel is enabled or disabled, and for enabled channels, the selected signaling method.

In addition, this two-page screen displays the current, real-time connection and operating state for each channel. The connection for a channel can be an OPS extension, another T1 channel, the reorder tone, or a voice message.

Operating states indicate the activity occurring in the channel. For example, the operating state AUDIBLE RING indicates an audible-ring progress tone is connected to the channel. The state DIALING indicates a redirect telephone number is being dialed through the channel; and the state IDLE indicates no channel activity is occurring.

Finally, the T1/DS1 Interface Card Status screen verifies that the card is installed in the System 920 and, if applicable, synchronized with the network T1.

The T1/DS1 Interface Card Status screen makes it possible for you to view the status and activity occurring through each channel in real time. As the connection and state for each channel change, so does the screen display.

OPS Card Status

Similar in concept to the T1/DS1 Interface Card screen, the OPS Card screen enables you to view configured parameters, current operating status, and current state for each OPS port. This is a three-page screen.

For each port, the screen displays the assigned extension number, the assigned ACD function if there is one, and whether the port has been authorized for outbound access through the network T1.

The screen also displays in real time that the port is currently on-hook or off-hook, whether it is connected to another OPS extension or to a T1 channel, and whether it has currently placed another extension or T1 channel on hold.

Finally, the screen shows the current operating state of the port. Displayed states, such as AUDIBLE RING, BUSY TONE, and DIAL TONE indicate the current activity occurring through the port.

Recorder/Announcer Card Status

The final status screen is the Recorder/Announcer Card Status screen. Here you can view the real-time status of each message stored on the Recorder/Announcer card. The display indicates whether a message is currently being played.

Configurable Security and Other Features of the System 920

Additional features provided by the System 920 are configurable security for the menu system, the soft-shutdown feature, and several test functions.

Configurable Security

The System 920 enables you to devise operator-level and administrator-level passwords to allow access to these two levels of the menu system. You can enter these if you do not want to use the passwords provided by the factory.

You can also enable or disable the VT100 compatibility test. This test prevents those using an incorrect terminal or emulator from accessing the menu system.

In addition, you may want to modify the maintenance port inactivity timer. The system automatically disconnects the maintenance terminal from the maintenance port after the configured period of inactivity expires. This limits the chances that an unauthorized person might try to use the system.

Soft Shutdown

The soft shutdown function enables you to shut down the T1/DS1 Interface card or any of the OPS cards without abruptly ending conversations being conducted through them. When you activate soft shutdown for the desired card, the System 920 permanently idles each channel or port on the card as it becomes free. This enables you to remove the card after all calls have been completed. After you replace the card and return its operating status to normal, calls can once again be made.

Test Functions

When you need to send signals and alarms from the System 920 to the network T1 for testing purposes, you can do so. You can initiate network-T1 loopback, or send yellow or blue alarms from the System 920. You can also temporarily disable jitter attenuation if you need to.

This page intentionally left blank.

Chapter Two
Planning for the System 920

Overview

This chapter provides information intended to help you make several necessary decisions and do some simple planning before you actually begin installing your System 920. If you read this chapter with care and follow its suggestions, you will undoubtedly make installation a much quicker and more efficient process.

The System 920 and its reference manual may be shipped to individual sites in separate cartons. Upon receiving your System 920, you should inspect it for damage immediately. Should damage be found, file a claim with the shipper. Save the original carton and packing materials for later inspection. If necessary, order a replacement System 920 from Gordon Kapes, Inc.

Make sure your System 920 includes an installation kit containing four #8 pan-head screws (¾-inch long), two 8-position modular jacks, and two 8-position modular data cables.

If the System 920 is intact and in good shape, place it aside until after you have read this chapter. Then read Chapter Three, “Installing the System 920,” as you actually perform the installation.

Selecting Mounting Location

Since the System 920 is intended for wall mounting only, you must find a suitable position on the equipment room wall. Choose a spot where you can easily view the diagnostic LEDs located on the front of the System 920 enclosure. Also make sure you locate the System 920 close enough to the telephone circuits that need to be connected. Seven-foot modular data cables are included in the installation kit for this purpose.

Selecting –48Vdc Power Source

The System 920 requires an external source of –48Vdc, 1A maximum, for operation. This power source must be uninterruptible. In other words, it must be present at all times, even in the event of a commercial power outage. If a –48Vdc uninterruptible power source (UPS) is available at the site, you can use it to power the System 920.

If an AC UPS system providing an uninterruptible source of 120Vac is available at the site, you can use it to power a –48Vdc power supply, such as the excellent Model 723 from Gordon Kapes, Inc. The Model 723 provides –48Vdc, 2A maximum output using input power of 120Vac. A single Model 723 can power one or two System 920s.

If a UPS is not present at the site, or if it is desirable for the System 920 to operate independently of other equipment, you can use the Model 733 DC UPS from Gordon Kapes, Inc. The Model 733 is a self-contained, wall-mounted unit that provides an uninterruptible source of –48Vdc using input power of 120Vac. The Model 733 provides 2A maximum output, and can sustain 2A for a minimum of 2 hours.

When connected to a System 920, the Model 733 provides worst-case minimum operating time of 4 hours. Under more routine circumstances—where all System 920 resources, such as the OPS extensions, are used less than 100% of the time—6 to 8 hours of operation is possible. The Model 733 was expressly designed for use with the System 920; and is suitable for a wide range of other telecommunications applications as well. Contact Gordon Kapes, Inc. for details.

Obtaining Analog Telephone Sets

If you plan to install and use OPS extensions with the System 920, you must obtain the needed number of single-line, analog telephone sets (as many as 24) supporting touch-tone dialing. (Pulse dialing is not supported.) Gordon Kapes, Inc. highly recommends you supply the type of telephone set with a separate flash button. (Refer to Chapter Nineteen for more information.)

Finally, make sure you have one 914 OPS card for each set of eight telephones you intend to use.

Obtaining 25-Pair Cables & Interconnecting Assemblies

During installation, you use 25-pair plug P1 to make connections to the analog telephone sets previously described. In addition, you make ground, DC-power, contact input, and relay-contact connections using 25-pair plug P2. These plugs are standard to the telephone industry. You must provide two 25-pair cables with female connectors attached, to mate with plugs P1 and P2. Refer to Figures 3-6 and 3-8 in Chapter Three for details about the connections to be made.

You must also obtain the interconnecting assemblies of your choice, such as 66-type blocks, for terminating the various functions to the 25-pair cables.

Selecting Contacts to Monitor

The System 920 has three contact inputs for monitoring various functions. These can be connected to the alarm contacts provided by CPE-T1 equipment such as a PBX, or ACD system. Exactly how you choose to use the contact inputs depends upon the needs of the site and your own imagination.

If the uninterruptible power supply (that ultimately supplies –48Vdc) provides a contact indicating an AC failure, consider connecting it to one of the contact inputs. The Gordon Kapes, Inc. Model 733 DC UPS provides this type of contact.

When selecting monitoring applications, keep these guidelines in mind: Signals compatible with the System 920's contact inputs can be either normally open (not shorted) or closed (shorted). The signals must be in the form of isolated contacts or contacts that close (short) in reference to earth ground.

When a contact changes from the normal state for longer than one second, an alarm condition is activated. After the contact returns to the normal state for longer than three seconds, the alarm condition returns to normal. These time periods allow the System 920's operating system to correctly detect changes.

Planning for Relay Contacts

The System 920 provides two general-purpose relay contacts. These contacts consist of a normally open (not shorted) and a normally closed (shorted) contact. Each contact changes state in response to the System 920 seizing the network-T1 circuit.

You might use each contact to signal an external monitoring device, for example, that the network T1 has been seized. As with the contact inputs, exactly how you choose to use these relay contacts depends upon the needs of the site and your own imagination.

Preparing Network-T1 and CPE-T1 Terminating Jacks

The network T1 must be terminated on a jack wired as a USOC RJ48C. This is an 8-position, unkeyed, modular jack with four wires terminated: two for customer interface (CI) receive and two for customer interface (CI) transmit. The system 920 connects to the RJ48C using an 8-position modular data cable.

The CPE-T1 circuit must be terminated on an 8-position modular jack wired so as to mate with an RJ48C using a modular data cable.

Two 8-position modular data cables, which use a straight-through connection arrangement, and two 8-position modular jacks are supplied with the System 920. These are for your use if you need to prepare terminating jacks, and for making the necessary network-T1 and CPE-T1 connections.

Figures 3-9 and 3-10 in Chapter Three show the wiring for both the network-T1 and CPE-T1 terminating jacks. To test the wiring, you can connect network T1 directly to CPE T1 using the straight-through connection provided by either of the provided 8-position modular data cables.

Obtaining or Preparing a Cable for the Maintenance Port

The System 920 contains a serial communications port intended for use by a terminal or personal computer with VT100 emulation to access the System 920's menu system.

This port is implemented as data communications equipment (DCE) under the RS-232-C standard. The maintenance port is accessed using a 25-pin D-subminiature female connector. You must obtain or prepare the proper cable for this port. The cable is a typical 25-pin D-subminiature male-to-male cable (straight through) used to connect DCE equipment to DTE equipment. This type of cable is commonly available at any retail computer store. (For detailed information, refer to Appendix E. The technical specifications for the port, along with specific cabling examples are provided in this appendix.)

Note: Use a "null modem cable" if you are connecting a standard modem to the maintenance port. You may need to disable DTR monitoring on the modem. This allows the modem and maintenance port, which are both configured as DCE, to be connected.

Obtaining a VT100 Terminal

Locate either a VT100 terminal, or a personal computer with software capable of emulating VT100. Either device must support the function keys F1 through F4.

If you are using a personal computer, you may need to acquire terminal emulator software. The communications program PROCOMM PLUS by DATASTORM TECHNOLOGIES, INC. provides excellent VT100 emulation. The terminal emulator available with Microsoft Windows also works very well. Appendix D contains more detailed information about terminal emulation requirements.

This page intentionally left blank.

Chapter Three
Installing the System 920

Overview

This chapter explains how to install the System 920.

Efficient installation requires some planning. Consequently, it is strongly recommended you read and follow the guidelines presented in Chapter Two, “Planning for the System 920,” before beginning installation as described in this chapter.

Words of Caution

As with any product, installing the System 920 requires a safety first approach. Please read and comply with the following warning before you begin the installation:

Never install telephone wiring during a lightning storm. Never install a telephone jack in a wet location unless the jack is specifically designed for wet locations. Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface. Use caution when installing or modifying telephone lines.

Step One: Open Carton, Check for Damage, & Locate Installation Kit

- ❑ Open the shipping carton and remove the System 920 from its packing material. As you unpack the unit, inspect it for damage. If you find damage, file a claim with the shipper. For later inspection, store the damaged unit in the original carton and packing material. If necessary, order a replacement from Gordon Kapes, Inc.
- ❑ Remove the front cover (shown in Figure 3-1) from the System 920. This panel is held in place by four Phillips-head machine screws. Remove the foam packing material and warning card placed between the cover and the System 920's enclosure. Retain these items along with the other packing material and shipping carton to use if you ever need to return the unit to the factory.

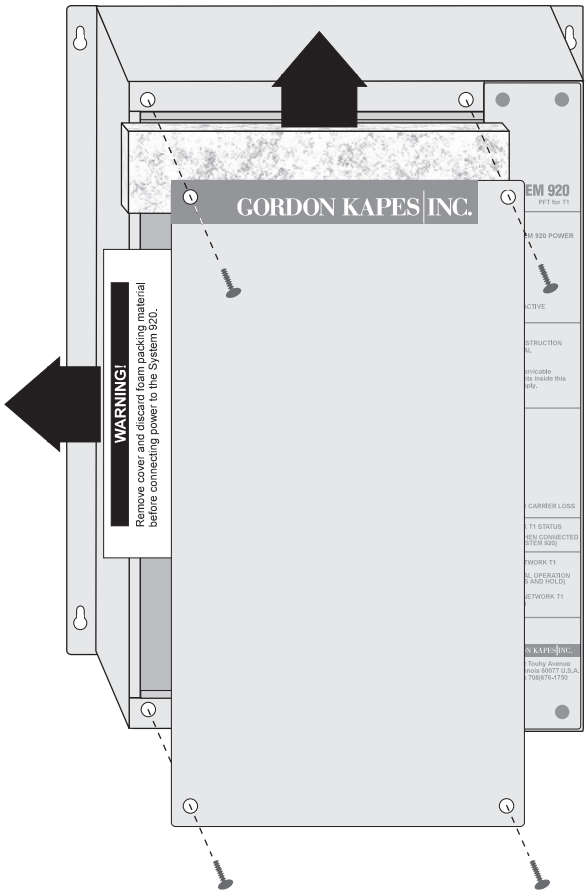


Figure 3-1. Remove Foam Packing Material and Warning Card from Unit

- ❑ Compare the circuit cards included in the System 920 with those shown in Figure 3-2. Verify the cards included are the ones ordered and needed for your installation. If they are not, contact the factory to order additional cards.

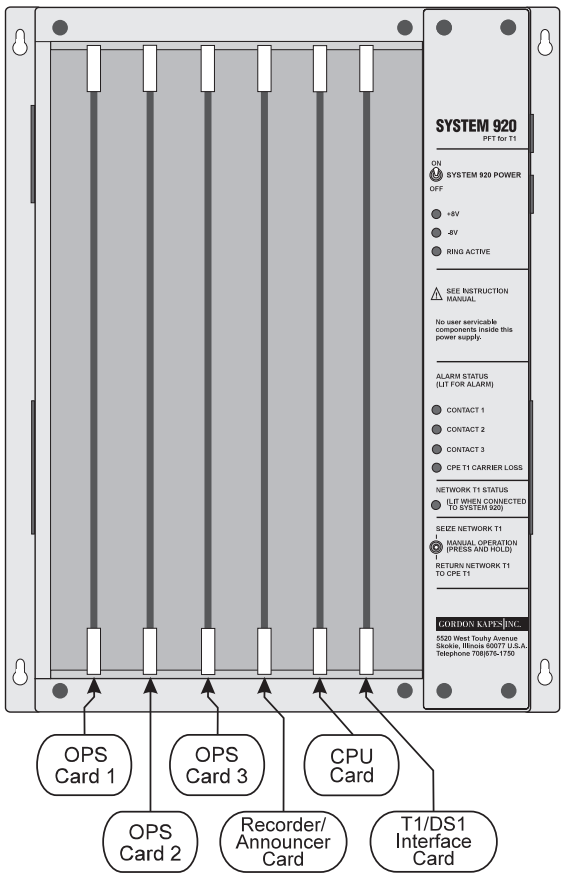


Figure 3-2. System 920 with All Cards Installed

- ❑ Ensure each card is fully inserted into the System 920. Press the plastic handles at the top and bottom of each card to verify the card is fully inserted. To ensure cards cannot be inappropriately interchanged, the height of the mating connectors for each type of card is staggered. This enables you to interchange OPS cards, but not any of the other cards.
- ❑ Since there are no switches to set on the circuit cards, you can now replace the cover.
- ❑ Locate the installation kit included in the System 920 shipping carton. The kit contains four #8 pan-head screws (type A, ¾-inch long). The shipping carton also contains two 8-position modular jacks and two 8-position modular data cables.

Step Two: Mount the System 920

Mount the System 920 on the equipment room wall.

Preparation

- ❑ Before mounting the System 920, ensure you have selected the desired mounting location. (Refer to “Selecting Mounting Location,” in Chapter Two.)

Installation Tasks

- ❑ Mount the System 920 using the four screws supplied (#8 pan head, ¾-inch long). These screws are intended for use with a wooden-backboard surface (minimum thickness ¾ inch). The System 920’s cabinet is outfitted with four keyhole screw slots. Use one screw per slot and securely fasten the unit to the backboard.

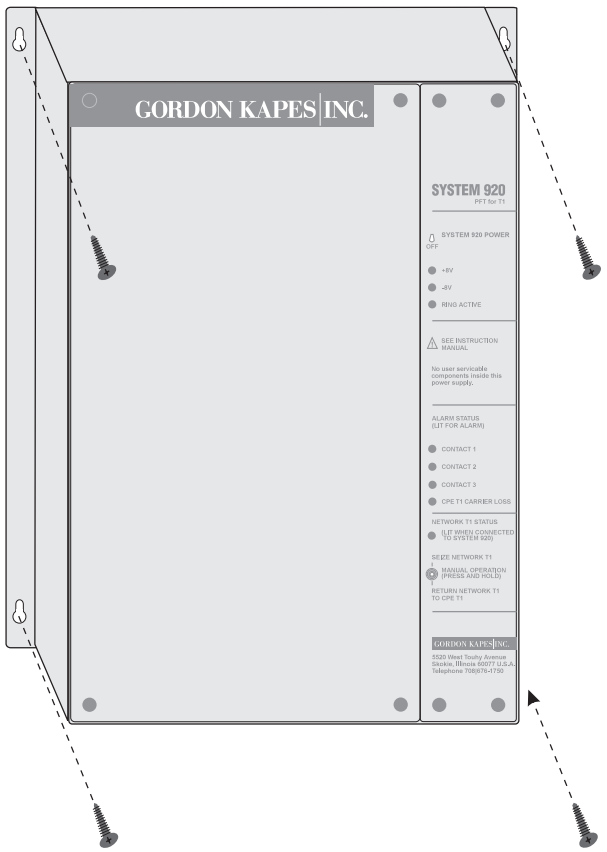


Figure 3-3. Mount the System 920

Step Three: Make Plug-P2 Connections

Use plug P2 to connect ground and power, as many as three contact inputs, and either or both of the relay contacts.

Preparation

- ❑ Locate the 25-pair cable with mounted female connector, and the interconnecting assembly you obtained for use with Plug P2. (Refer to "Obtaining 25-Pair Cables & Interconnecting Assemblies," in Chapter Two.)
- ❑ Select the –48Vdc power source to be used with the System 920. As discussed in Chapter Two, the System 920 requires an external source of –48Vdc, 1A maximum, for operation. This power source must be uninterruptible. In other words, it must be present at all times, even in the event of a commercial power outage. If a –48Vdc uninterruptible power source (UPS) is available at the site, you can use it to power the System 920.

  If an AC UPS system providing an uninterruptible source of 120Vac is available at the site, you can use it to power a –48Vdc power supply, such as the excellent Model 723 from Gordon Kapes, Inc. The Model 723 provides –48Vdc, 2A maximum output using input power of 120Vac. A single Model 723 can power one or two System 920s.

  If a UPS is not present at the site, or if it is desirable for the System 920 to operate independently of other equipment, you can use the Model 733 DC UPS from Gordon Kapes, Inc. The Model 733 is a self-contained, wall-mounted unit that provides an uninterruptible source of –48Vdc using input power of 120Vac. The Model 733 provides 2A maximum output, and can sustain 2A for a minimum of 2 hours.

  The common, or positive lead of the power source must be connected to earth ground. This creates what is called a positive-ground power source, which is common in the telecommunications industry.
- ❑ Ensure the contacts for the functions you want to monitor are ready to be connected to the System 920. (For more information, refer to "Selecting Contacts to Monitor," in Chapter Two.) If the power source provides a contact indicating AC failure, consider connecting it. (The Gordon Kapes, Inc. Model 733 DC UPS provides this type of contact.)

- ❑ As discussed in “Planning for Relay Contacts” in Chapter Two, the System 920 provides two general-purpose relay contacts; a normally open (not shorted) and a normally closed (shorted) contact. The relay contacts change state when the network-T1 circuit is seized. If you intend to connect these contacts to other devices, ensure leads to the devices are ready.

Installation Tasks

- ❑ Ensure the power switch on the System 920 (shown in Figure 3-4) is in the Off (down) position.

  Leave the power switch in the Off position until you are instructed to turn it on later in this chapter. (Leave the switch off even after you have connected the power leads.)

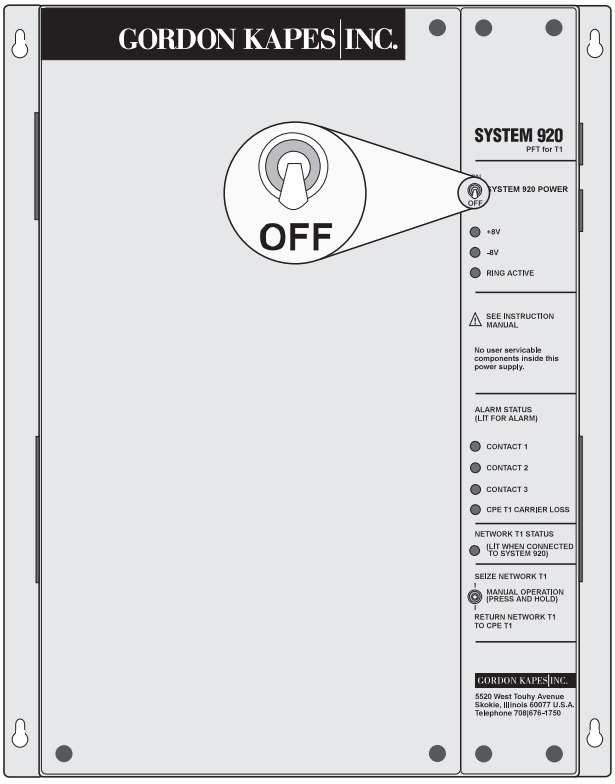


Figure 3-4. Ensure Power Switch is in Off Position

- ❑ Insert the female connector of the 25-pair cable into plug P2. Secure the connector using the fastener strap attached to the plug.
- ❑ Plug P2 is located on the right panel of the System 920 as shown in Figure 3-5.
- ❑ Terminate the 25-pair cable in the interconnection assembly you prepared for this purpose.

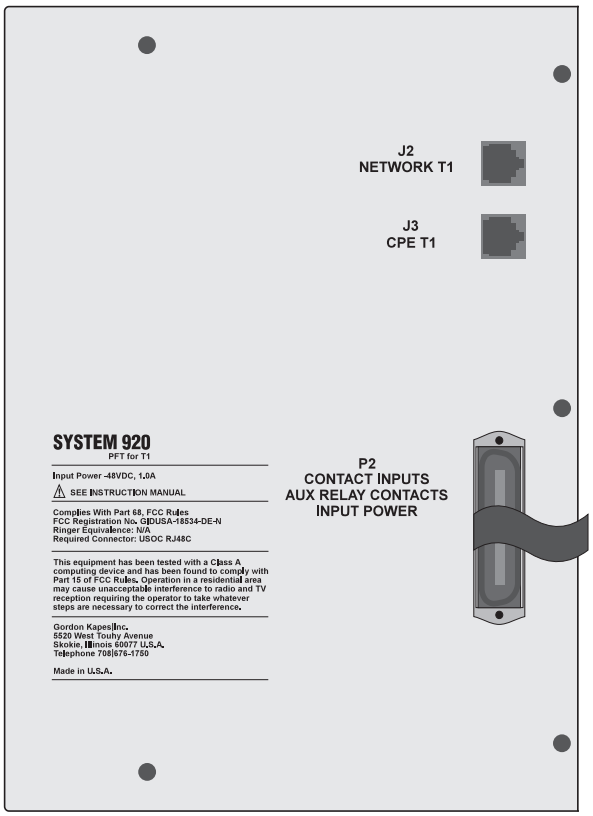


Figure 3-5. System 920 Right Panel

Connect Ground & Power Leads

The –48Vdc power connected to the System 920 must come from a fuse-protected or current-limited source. Do not connect wires directly across a battery or battery stack. A 2-ampere fuse in series with the –48Vdc source would be appropriate to protect equipment and personnel from short circuits and other wiring errors.

- ❑ Confirm that the power source has its positive or common lead connected to earth ground. This creates a –48Vdc source that is negative with respect to earth ground. If the power source is not configured in this manner, it must be changed. Perform this connection only if you are qualified to do so. If you are unfamiliar with the procedure, consider consulting with a technician qualified in DC power systems. Obtain assistance prior to making any changes that could involve a safety hazard.
- ❑ Connect the violet-brown and violet-slate leads (pins 49 and 50) on the interconnection assembly to earth ground. Since this connection acts as both a safety ground and a –48Vdc ground, a wire gauge of 22 AWG minimum should be used.
- ❑ Connect the brown-violet and slate-violet leads (pins 24 an 25) on the interconnection assembly to the –48Vdc lead of the power source.

Connect Contact Inputs

- ❑ Using the pin connections shown in Figure 3-6, connect as many as three contact inputs to the interconnection assembly.

  If your signal provides an isolated contact, connect its leads to the pair associated with the desired contact input. If your signal is referenced to earth ground, connect the contact to the positive (+) connection, and earth ground to the ground connection of the desired contact input.

Connect Relay Contacts

- ❑ Using the pin connections shown in Figure 3-6, connect either or both of the relay contacts to the interconnection assembly.

  The relay contacts are designed only to control low-voltage, low-current electrical signals. Do not use the contacts to switch AC-line (120Vac) voltage.

Plug P2 Pin Connection Chart

Pin Number	Wire Color	Description	
26	WHT-BLU	+	Contact Input 1
1	BLU-WHT	Ground	
27	WHT-ORN	+	Contact Input 2
2	ORN-WHT	Ground	
28	WHT-GRN	+	Contact Input 3
3	GRN-WHT	Ground	
29	WHT-BRN		
4	BRN-WHT		
30	WHT-SLT	NO	Relay Contact 1
5	SLT-WHT	NO	
31	RED-BLU	NC	Relay Contact 2
6	BLU-RED	NC	
32	RED-ORN		
7	ORN-RED		
33	RED-GRN		
8	GRN-RED		
34	RED-BRN		
9	BRN-RED		
35	RED-SLT		
10	SLT-RED		
36	BLK-BLU		
11	BLU-BLK		
37	BLK-ORN		
12	ORN-BLK		
38	BLK-GRN		
13	GRN-BLK		
39	BLK-BRN		
14	BRN-BLK		
40	BLK-SLT		
15	SLT-BLK		
41	YEL-BLU		
16	BLU-YEL		
42	YEL-ORN		
17	ORN-YEL		
43	YEL-GRN		
18	GRN-YEL		
44	YEL-BRN		
19	BRN-YEL		
45	YEL-SLT		
20	SLT-YEL		
46	VIO-BLU		
21	BLU-VIO		
47	VIO-ORN		
22	ORN-VIO		
48	VIO-GRN		
23	GRN-VIO		
49	VIO-BRN	Earth Ground	
24	BRN-VIO	–48Vdc	
50	VIO-SLT	Earth Ground	
25	SLT-VIO	–48Vdc	

Note 1: The ground connection associated with the contact inputs is essentially at earth-ground potential.

Note 2: A filtered and regulated source of uninterruptible –48Vdc, 1A maximum, must be connected to the brown/violet and slate/violet leads.

Figure 3-6. Plug P2 Pin Connections

Step Four: Make Plug-P1 Connections

Use plug P1 to connect OPS telephone extensions. Each OPS card in the System 920 provides eight OPS telephone circuits.

Preparation

- ❑ Locate the 25-pair cable with mounted female connector and the interconnecting assembly you obtained for use with Plug P1. (Refer to "Obtaining 25-Pair Cables & Interconnecting Assemblies," in Chapter Two.)
- ❑ Prepare the leads from the single-line analog telephones you have obtained for use as OPS extensions. As described in Chapter Two you can use as many as 24 single-line, analog telephones supporting touch-tone dialing. You must have one 914 OPS card installed in the System 920 for each set of eight telephones you use.

Installation Tasks

- ❑ Insert the female connector of the 25-pair cable into plug P1. Secure the connector using the fastener strap attached to the plug.

  Plug P1 is located on the left panel of the System 920 as shown in Figure 3-7.
- ❑ Terminate the 25-pair cable in the interconnection assembly you prepared for this purpose.
- ❑ Using the pin connections shown in Figure 3-8, connect as many as 24 OPS telephones to the interconnection assembly. A single tip-and-ring connection is required for each telephone. Figure 3-8 indicates the OPS-card port associated with each connection.

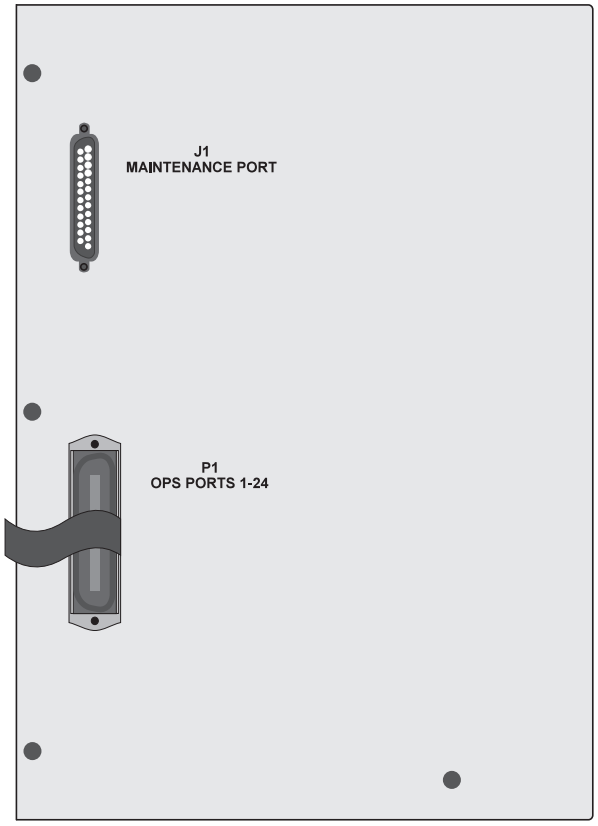


Figure 3-7. System 920 Left Panel

Plug P1 Pin Connection Chart

Pin Number	Wire Color	Description		
26	WHT-BLU	T	OPS Port 1	OPS Card 1 (Installed in slot 1)
1	BLU-WHT	R		
27	WHT-ORN	T	OPS Port 2	
2	ORN-WHT	R		
28	WHT-GRN	T	OPS Port 3	
3	GRN-WHT	R		
29	WHT-BRN	T	OPS Port 4	
4	BRN-WHT	R		
30	WHT-SLT	T	OPS Port 5	
5	SLT-WHT	R		
31	RED-BLU	T	OPS Port 6	
6	BLU-RED	R		
32	RED-ORN	T	OPS Port 7	
7	ORN-RED	R		
33	RED-GRN	T	OPS Port 8	
8	GRN-RED	R		
34	RED-BRN	T	OPS Port 9	OPS Card 2 (Installed in slot 2)
9	BRN-RED	R		
35	RED-SLT	T	OPS Port 10	
10	SLT-RED	R		
36	BLK-BLU	T	OPS Port 11	
11	BLU-BLK	R		
37	BLK-ORN	T	OPS Port 12	
12	ORN-BLK	R		
38	BLK-GRN	T	OPS Port 13	
13	GRN-BLK	R		
39	BLK-BRN	T	OPS Port 14	
14	BRN-BLK	R		
40	BLK-SLT	T	OPS Port 15	
15	SLT-BLK	R		
41	YEL-BLU	T	OPS Port 16	
16	BLU-YEL	R		
42	YEL-ORN	T	OPS Port 17	OPS Card 3 (Installed in slot 3)
17	ORN-YEL	R		
43	YEL-GRN	T	OPS Port 18	
18	GRN-YEL	R		
44	YEL-BRN	T	OPS Port 19	
19	BRN-YEL	R		
45	YEL-SLT	T	OPS Port 20	
20	SLT-YEL	R		
46	VIO-BLU	T	OPS Port 21	
21	BLU-VIO	R		
47	VIO-ORN	T	OPS Port 22	
22	ORN-VIO	R		
48	VIO-GRN	T	OPS Port 23	
23	GRN-VIO	R		
49	VIO-BRN	T	OPS Port 24	
24	BRN-VIO	R		
50	VIO-SLT	No Connect		
25	SLT-VIO	No Connect		

Figure 3-8. Plug P1 Pin Connections

Step Five: Connect to the Network-T1 & CPE-T1 Circuits

Preparation

- ❑ Ensure the network T1 is terminated on an 8-position modular jack wired as USOC RJ48C. Ensure CPE T1 is terminated on an 8-position modular jack wired so as to mate with an RJ48C using a modular data cable. Figures 3-9 and 3-10 show the wiring for the network-T1 and CPE-T1 jacks. For further details, refer to “Preparing Network-T1 and CPE-T1 Terminating Jacks,” in Chapter Two. Two 8-position modular jacks are included in the installation kit.

  It is important to ensure that the network-T1 jack is connected directly to the T1/DS1 circuit with no intervening CPE-T1 equipment. This ensures that failure of any CPE-T1 equipment does not effect operation of the System 920. (The System 920 contains its own channel-service-unit circuitry. Consequently you do not need to use an external CSU with the System 920.)

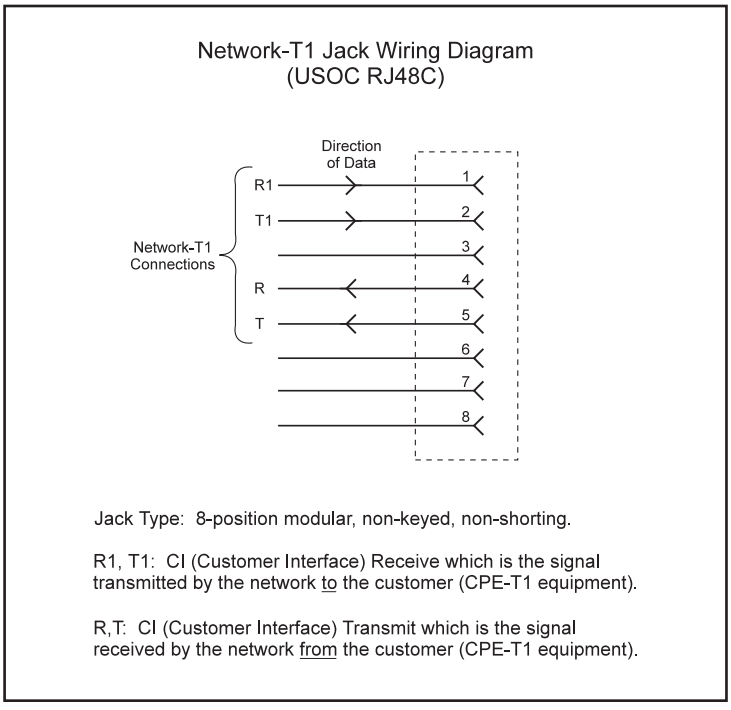


Figure 3-9. Network-T1 Jack Wiring (USOC RJ48C)

- ❑ Locate the two 8-position modular data cables included in the installation kit. (To test the wiring of the network-T1 and CPE-T1 terminating jacks, you can connect network T1 to CPE T1 by connecting the associated jacks together using one of the 8-position data cables.)

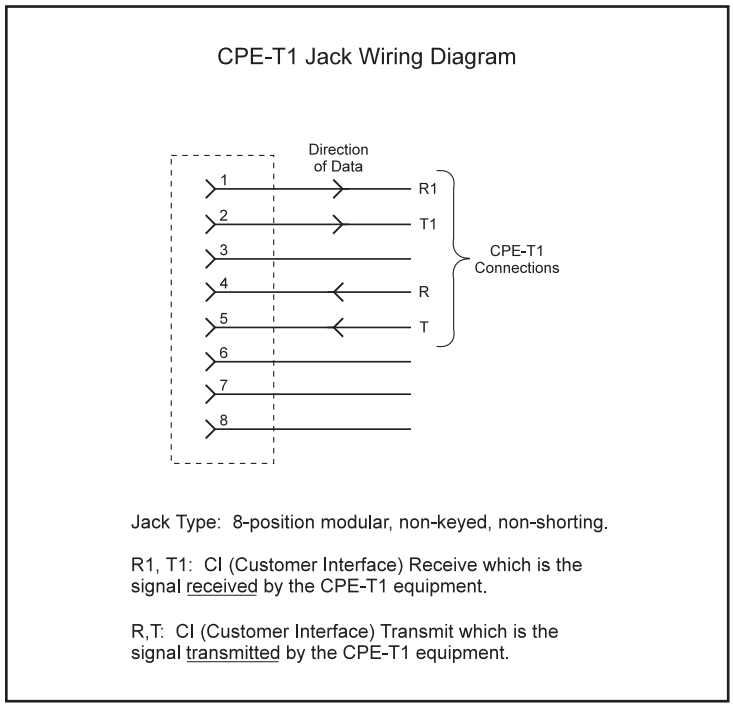


Figure 3-10. CPE-T1 Jack Wiring

Installation Tasks

- ❑ Using one of the modular data cables from the installation kit, connect the network T1 to jack J2 on the right panel of the System 920 enclosure. Jack J2 is shown in Figure 3-11.
- ❑ Using the other modular data cable from the installation kit, connect CPE T1 to jack J3 on the right panel of the System 902 enclosure. Jack J3 is shown in Figure 3-11.

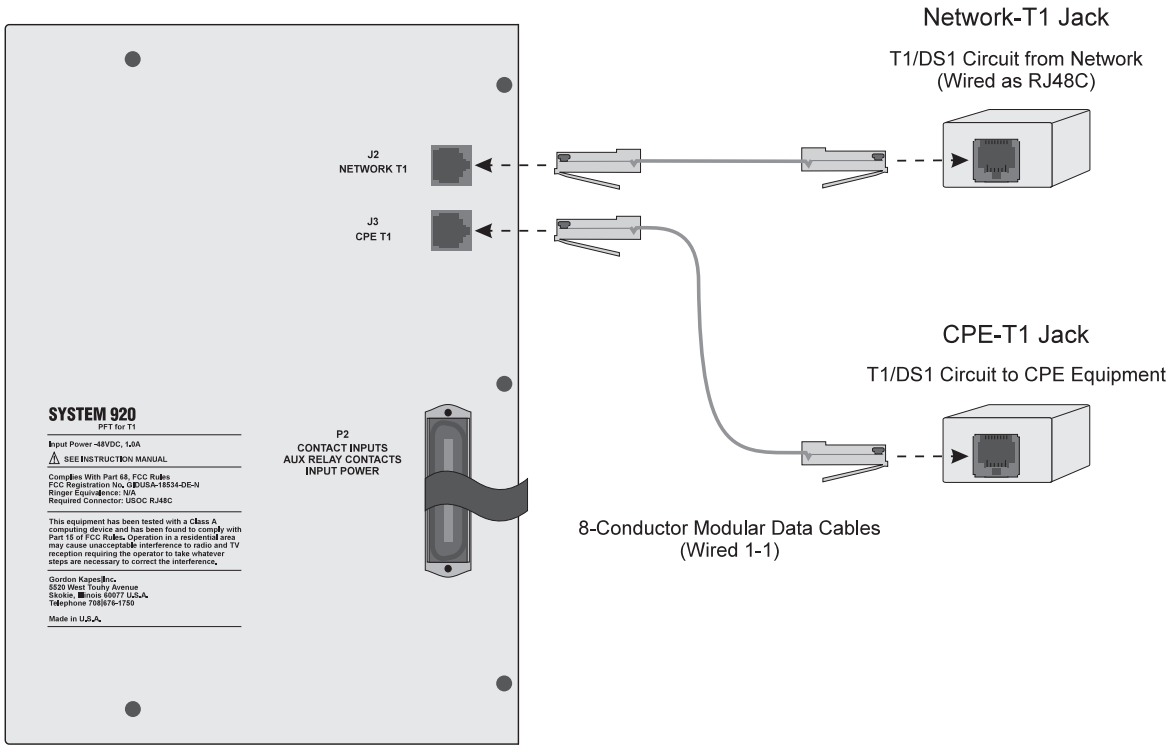


Figure 3-11. Network-T1 and CPE-T1 Connections

Step Six: Connect to the Maintenance Port

To access the System 920's menu system, connect a VT100 terminal or personal computer capable of VT100 emulation, to the maintenance port on the left panel of the System 920. The menu system enables you to configure the system and review system status.

In general, you only need to connect to the maintenance port when configuring the system after initial installation, when changing the configuration, or when testing and troubleshooting the system. You will probably not need to connect permanent wiring to the maintenance port. A technician can simply plug a standard serial communications cable into the port.

Preparation

- ❑ Locate the serial communications cable you obtained or prepared for connecting to the maintenance port. The port is implemented as data communications equipment (DCE) under the RS-232-C standard. It uses an individual 25-pin D-subminiature female connector. The cable is a typical 25-pin D-subminiature male-to-male cable (straight through) used to connect DCE equipment to DTE equipment. This type of cable is commonly available at any retail computer store. (For detailed information, refer to Appendix E. The technical specifications for the port, along with specific cabling examples are provided in this appendix.)

  Note: If you are connecting a modem to the port, use a null modem cable since the modem's port is also implemented as DCE. For correct operation, you may need to disable DTR monitoring on the modem.

- ❑ You must also have a terminal or personal computer capable of VT100 emulation.

Installation Tasks

- ❑ Connect the serial communications cable to the maintenance port on the System 920. The maintenance port is shown in Figure 3-12.
- ❑ Use the screws on the mating plug to ensure the cable is secured to the System 920's connector.

- ❑ Connect the other end of the cable to a serial port on the designated terminal or personal computer.
- ❑ Set communications settings in the terminal to the following:

  Baud rate: 9600
  Data bits: 8
  Parity: None
  Stop bits: 1
  Flow control: XON/XOFF

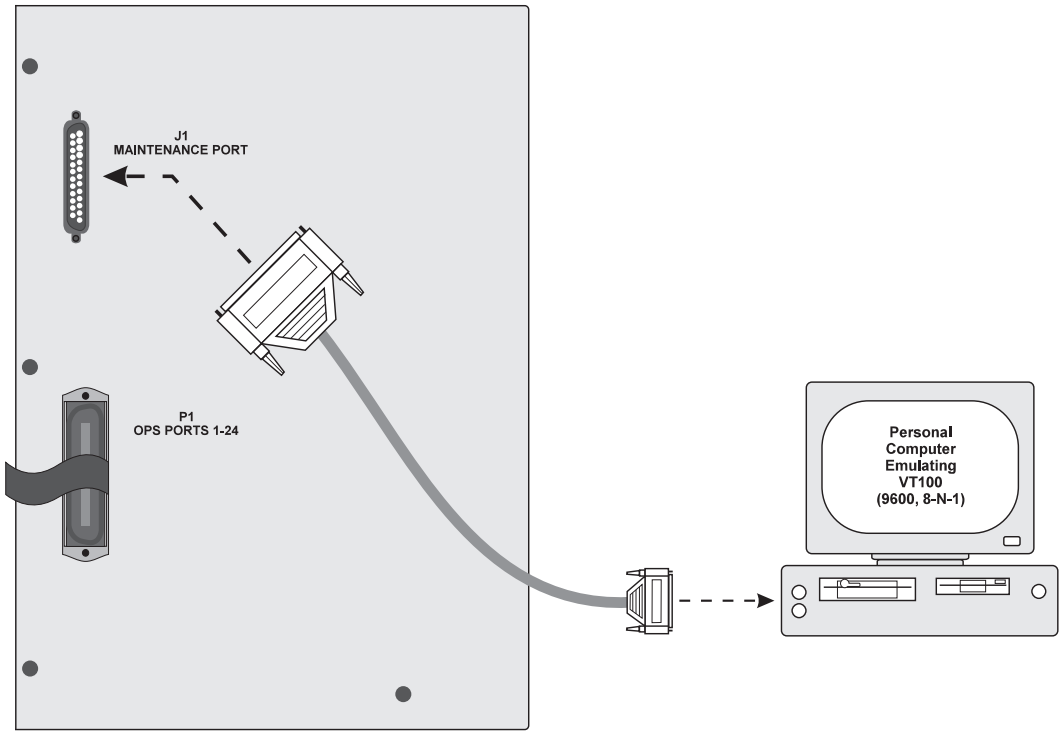


Figure 3-12. Connect Serial Communications Cable to Maintenance Port

Step Seven: Review the Installation

- ❑ Review and ensure you have taken all previous installation steps. For example, verify you have installed and correctly seated the required cards in the System 920 enclosure, and make sure all required connections have been made. Replace the cover if you have not already done so.
- ❑ Apply power to the unit at this time by placing the system power switch in the On, (up) position.

  The +8 and –8 Volt status LEDs should light. Other LEDs may also light. These may or may not indicate an installation problem.

  If a contact LED is lit, it indicates that the contact is in the shorted (closed) state. Remove the short and the LED will stop lighting.
- ❑ Test the OPS telephone extensions by taking each off-hook. Make a call to and receive a call from each telephone. The default dialing plan, beginning with the telephone connected to OPS port 1, is extension 101 through 124.

You are now ready to begin configuring the system. Proceed to Chapter Four, “Getting Started with the Menu System.”

Chapter Four
Getting Started with the Menu System

Overview

The System 920 contains menu-driven software called the menu system. The *menu system* enables you to configure, test, and examine the operating status of the System 920.

The menu system and other software components of the System 920 are loaded into permanent memory at the factory.

This chapter provides basic information you need before using the menu system. It explains the following:

- How to access the menu system
- How to exit the menu system and disconnect from the System 920
- How to select menu options and enter or select information
- How to use on-line help

The menu system is extremely easy to use and quite similar to other menu-driven software widely used with IBM-compatible personal computers.

Conventions

This guide provides a detailed procedure for each task you can accomplish with the menu system. To help you read and understand these procedures easily and quickly, this guide uses several special terms, symbols, and type faces. The following explains these conventions:

Term	Meaning
menu	A numbered list of options displayed on a screen. To accomplish a task, you display the needed menu and then select the option corresponding with the task.
cursor	A highlighted box or small line which may or may not blink depending upon the terminal or personal computer you are using and how it is set up. The cursor marks the location on the screen where the information you type or select is displayed. As you move from field to field by pressing keys, the cursor moves along with you to show you where you are.
field	An area on the screen where you enter or select information or where information is displayed. In general, each field has a title displayed next to it for easy identification.

Type style	Purpose
bold	Used to indicate words you must type exactly as they appear, and to indicate the names of keys you must press.
italic	Used to highlight a key term defined in this guide. Also used for emphasis and to indicate variable information. For example, ACD *n* stands for either ACD 1 or ACD 2.
Condensed	Used to indicate information exactly as it is displayed on a screen.
Condensed Bold	Used to indicate field titles.

Symbol	Purpose
↵	Used to indicate the Enter key on the keyboard. Press ↵ after entering information.
↓	Used to indicate the down-arrow key. Press ↓ to move down from field to field on a screen.
↑	Used to indicate the up-arrow key. Press ↑ to move up from field to field on a screen.
←	Used to indicate the left-arrow key. Press ← to move to the left among fields in columns.
→	Used to indicate the right-arrow key. Press → to move to the right among fields in columns.

The menu system consistently uses specific function keys to perform the following operations:

Function Key	Purpose
F1	Press to display On-line Help available on a separate screen.
F2	Press to exit a screen and return to the previous menu.
F3	Press to display the previous page of a multi-page screen.
F4	Press to display the next page of a multi-page screen.

Accessing the Menu System

To access the menu system, take the following steps:

1. Connect a VT100 terminal to the maintenance port (J1) located on the left panel of the System 920 enclosure. Figure 4-1 illustrates the location of the maintenance port. (For more information about maintenance port connection and cabling refer to Appendix E, “Maintenance Port Connections.”)
2. Ensure power is turned on to both the terminal and the System 920.
3. Press ↵ to display the Login screen.

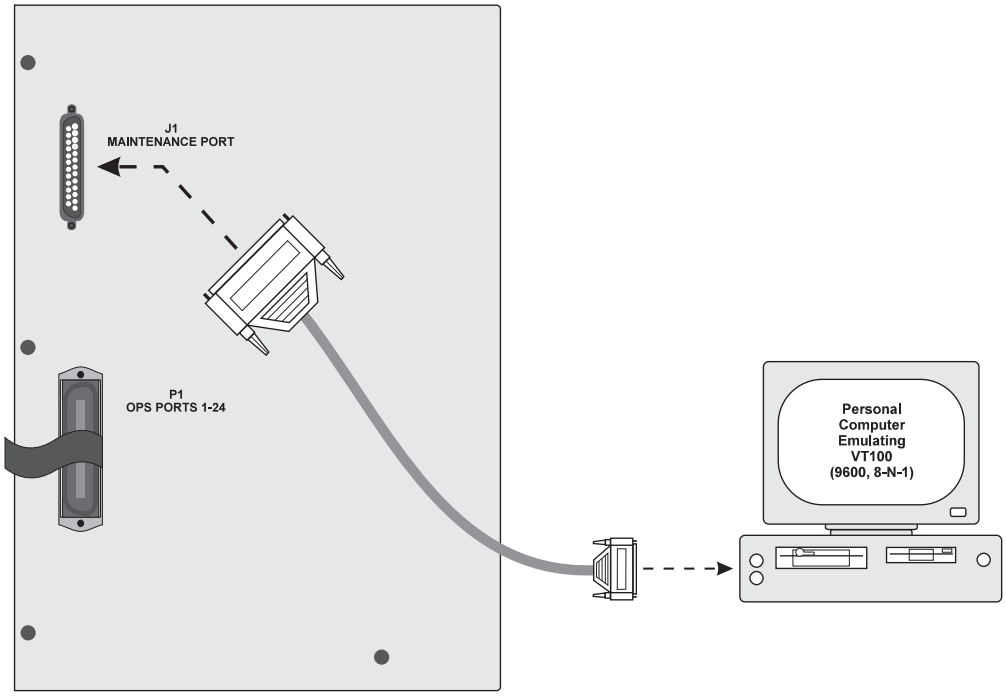


Figure 4-1. VT100 Terminal Connected to Maintenance Port J1

Choose a terminal or software that is capable of VT100 emulation supporting the function keys F1 through F4. If you are using a personal computer, you may need to acquire terminal emulator software capable of emulating VT100. The communications program PROCOMM PLUS by DATASTORM TECHNOLOGIES, INC. provides excellent VT100 emulation. The terminal emulator available with Microsoft Windows also works very well. Appendix D contains more detailed information about terminal emulation requirements.

Set communications settings in the terminal to the following:

Baud rate:	9600
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	XON/XOFF

If You Have Problems with Garbage on the Screen

Should you access the Login screen or the Operator Menu using inappropriate terminal emulation or baud rate, the screen may appear filled with “garbage.” Ensure the baud rate is set to 9600 and that your terminal emulator is set to VT100. Then press ↵ or **F2** to refresh the screen.

The VT100 compatibility test enables you to verify VT100 emulation prior to using the menu system. The test requires you to press F1, F2, F3, and F4 after entering a valid login password. If the terminal emulator does not support these keys, you are prevented from proceeding with the menu system. The test is enabled by default. Chapter Twelve, “Configuring System Security,” explains how to enable and disable the test.

Exiting the Menu System and Disconnecting

To exit the menu system and disconnect from the System 920, select option 8, Exit Menu System and Disconnect from the Operator Menu.

To exit and disconnect, take the following steps:

1. At any screen in the menu system, press **F2** until the system displays the Operator Menu.
2. At the Operator Menu, press **8** to select Exit Menu System and Disconnect.

   The System 920 clears the screen.

Selecting Menu Options

To select an option from a menu, either press the key with the number of the option or press ↓ or ↑ to highlight the option, then press ↵.

Entering and Selecting Information

When configuring the System 920, you must make an entry or select a value in specific fields displayed on a configuration screen.

To make an entry, move to the field by pressing ↑, ↓, ←, or →. Type the entry, then press ↵. To delete an entry, press **Backspace**.

To select a value in a field, move to the field by pressing ↑, ↓, ←, or →. Press the spacebar to scroll forward through a list of possible values. Press **Backspace** to scroll backward through the list. Display the value you want to select. This value is saved and activated.

Using On-line Help

The menu system displays brief operating instructions at the bottom of each screen. These instructions, which can change as you move from field to field, tell you how to make an entry or select a value in the highlighted field.

Many screens in the menu system provide additional on-line help using separate screens, which supplement the information available in this guide. Press <F1> for help displayed at the bottom of a screen indicates additional help is available. Press **F1** to display the on-line help screen.

This page intentionally left blank.

Chapter Five
Performing General System Configuration

Overview

The software resident in the System 920 enables you to quickly and easily configure the system for use within your specific environment.

Chapters Five through Twelve explain how to configure various operational functions of the System 920. This chapter describes general parameters and how to configure them. These are the following:

- OPS extension digit length number
- OPS extension dial 0
- OPS extension operating status
- Three contact-input monitoring functions
- CPE-T1-carrier monitoring function
- Network-T1-to-CPE-T1 reconnection conditions

The menu-driven software has been designed for maximum simplicity and ease of use. However, if this is your first experience, you may want to review Chapter Four, “Getting Started with the Menu System.”

Note: To perform all configuration tasks you must use a terminal set for VT100 emulation.

Appendix A contains a set of master worksheets designed to aid you with the configuration process. These worksheets are similar to the data-entry screens you use with the software. Photocopy the master worksheets and use the copies as you gather needed data for your system configuration.

Once you have recorded the necessary information on a worksheet, use it to quickly make entries on a specific screen. Save completed worksheets after using them for data entry since they make an excellent record of your total system configuration.

OPS Extension Digit Length

The *OPS extension digit length* is a number specifying the length of every OPS extension used with the System 920. Select either 3 or 4 as the extension digit length. The System 920 automatically numbers extensions 101-124 when you choose 3. It numbers extensions 1001-1024 when you choose 4. To change automatically numbered extensions, refer to Chapter Seven, “Configuring OPS Cards.”

OPS Extension Dial 0

You can choose one of five possible connections when a person dials 0 at an activated OPS extension. These connections are the vacant tone, either of the two ACD functions, or either of the two messages. (Refer to Chapters Eight and Ten for more information about ACD functions and messages.)

OPS Extension Operation

You determine whether all OPS extensions provide communications service at all times, or only after the System 920 has seized the network T1.

Contact and CPE-T1-Carrier Monitoring Functions

The System 920 provides you with four monitoring functions that direct the system to seize the network T1 when an alarm condition is detected.

Three of these are contact-input functions. You set the normal, or non-alarm, state of each contact (either open or closed). When a contact input changes from normal, it is in an alarm state and the System 920 seizes the network T1. You can connect contact inputs to a variety of devices including manual switches, CPE equipment, remote control systems, and UPS power supplies. Your System 920 may be powered by a Model 733 DC UPS System by Gordon Kapes, Inc. The 733 has a contact closure you may want to monitor.

The fourth function is CPE-T1-carrier monitoring. A circuit on the System 920 T1/DS1 Interface card monitors the electrical signal coming from the CPE-T1 equipment. If generation of this signal ceases, an alarm state occurs and the System 920 seizes the network T1.

You enable or disable these functions when setting general configuration parameters.

Network-T1 and CPE-T1 Reconnection Options

Finally, as a part of setting general-configuration parameters, you specify the conditions under which you want to reconnect the network T1 to CPE T1 after an alarm condition has been restored to normal. You can select immediate reconnection, reconnection after all calls over the network T1 have been completed, or reconnection after a maximum delay of five, ten, or fifteen minutes.

Begin with Your Worksheet

Use a working copy of the General System Configuration worksheet found in Appendix A to specify and record general system parameters for the System 920. Refer to Table 5-1 for a description of each parameter. Enter data from the worksheet using the System 920 software as described in the procedure following Table 5-1.

Table 5-1. General System Configuration Parameters

Field	Description
OPS Extension Digit Length	Select a number representing the number of digits for OPS extensions. Choices are: 3 4 **Comments** If you intend to use 3-digit numbers such as 101, 214, and 355 as OPS extensions, select 3. If you intend to use 4-digit numbers such as 5505, 5605, and 5704, select 4. To change automatically-numbered extensions, refer to Chapter Seven, “Configuring OPS Extensions.”
OPS Extension Operation	Select the operating status for all OPS extensions. Choices are: ALWAYS TRANSFER MODE ONLY **Comments** To enable OPS extensions to provide internal communications under normal conditions as well as after the System 920 has seized the network T1, select ALWAYS. To enable OPS extensions to provide internal communications *only* after the System 920 has seized the network T1, select TRANSFER MODE ONLY.
OPS Extension Dial 0	Select the connection you want the System 920 to make when a person dials 0 at an activated OPS extension. Choices are: VACANT TONE ACD1 ACD2 MESSAGE1 MESSAGE2

continued

Table 5-1. General System Configuration Parameters (cont.)

Field	Description
Contact 1 Status Contact 2 Status Contact 3 Status	Select the status of each contact-input-monitoring function. Choices are: NORMAL-OPEN NORMAL-CLOSED DISABLED **Purpose** Each monitoring function causes the System 920 to seize the network T1 when an alarm state is activated. **Comments** You select the normal state for each contact. The alarm state is the opposite of the normal state. Choices have the following meanings: *Normal-Open* — Open (not shorted) is the normal state of the contact. An alarm state occurs when the contact is continuously closed (shorted) in excess of one second. An alarm state does not return to normal until an open condition has been reestablished for longer than three seconds. *Normal-Closed* — Closed (shorted) is the normal state of the contact. An alarm state occurs when the contact is continuously open (not shorted) in excess of one second. An alarm state does not return to normal until a closed condition has been reestablished for longer than three seconds. *Disabled* — The contact is not being used.
CPE T1 Carrier Monitoring	Select the status of the CPE-T1-carrier monitoring function. Choices are: ENABLED DISABLED

continued

Table 5-1. General System Configuration Parameters (cont.)

Field	Description
CPE T1 Carrier Monitoring (cont.)	**Purpose** A circuit on the System 920 T1/DS1 Interface card monitors the carrier signal coming from the CPE-T1 equipment. The CPE-T1-carrier monitoring function causes the System 920 to seize the network T1 when it detects the absence of this signal for longer than one second. **Comments** The CPE-T1-monitoring function reacts solely to the presence or absence of the carrier signal in determining its normal and alarm states. The monitoring function performs no other type of diagnosis. The monitoring function is in its normal state when detecting the presence of the carrier signal from your CPE-T1 equipment. An "alarm" state is activated when the signal is continuously absent for longer than one second. An alarm state does not return to normal until the carrier signal has been reestablished and has remained continuously present for longer than one second.
CPE T1 Reconnect to Network T1	Select the reconnect option appropriate to your needs. Choices are: RECONNECT IMMEDIATE - NO DELAY RECONNECT AFTER ALL CALLS COMPLETED RECONNECT AFTER 5 MINUTE DELAY RECONNECT AFTER 10 MINUTE DELAY RECONNECT AFTER 15 MINUTE DELAY **Comments** The network T1 can be seized by the System 920 because an alarm state has occurred for any one of the three contact-input-monitoring functions or for the CPE-T1-carrier monitoring function, or because the Manual Operation switch on the front of the unit has been thrown. Use this parameter to specify *when* the System 920 reconnects the network T1 to CPE T1 after a normal condition has been reestablished.

continued

Table 5-1. General System Configuration Parameters (cont.)

Field	Description
CPE T1 Reconnect to Network T1 (cont.)	Choices have the following meanings: *Reconnect Immediate - No Delay* The reconnection is immediate. The reconnection is made even though one or more calls may be in progress through the network T1. These calls are disconnected without warning. *Reconnect After All Calls Completed* The reconnection is made after all calls through the network T1 have been completed. After a normal condition has signaled the System 920 to reconnect the network T1 to CPE T1, the system connects an alert tone every thirty seconds. This alerts all callers to complete their calls so reconnection can take place. As each call through network T1 is completed, its communication channel is idled. All channels not in use are also idled to prevent new calls from being placed. The reconnection does not take place until the last call has been completed, no matter how long this call may last. ***Note:*** Using this option enables a single caller to "lock" the system, preventing the reconnection of the network T1 to CPE T1. *Reconnect After 5 Minute Delay* The reconnection is made either after all calls through the network T1 have been completed, or after a maximum of five minutes has expired. After a normal condition has signaled the System 920 to reconnect the network T1 to CPE T1, the system connects an alert tone every thirty seconds. This alerts all callers to complete their calls so reconnection can be established. Those who fail to do so within five minutes are disconnected.

continued

Table 5-1. General System Configuration Parameters (cont.)

Field	Description
CPE T1 Reconnect to Network T1 (cont.)	*Reconnect After 10 Minute Delay* The System 920 acts the same as with the reconnect-after-5-minute-delay option, except that callers must complete their calls within ten minutes. *Reconnect After 15 Minute Delay* The System 920 acts the same as with the reconnect-after-5-minute-delay option, except that callers must complete their calls within fifteen minutes.

Procedure

To configure general system parameters, you must access the General System Configuration screen. First, with the Operator Menu displayed, access the Administrator Menu. Then select the General System Configuration option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **1** to select General System Configuration.

   The system displays the General System Configuration screen, shown in Figure 5-1. The cursor is initially in the **OPS Extension Digit Length** field.

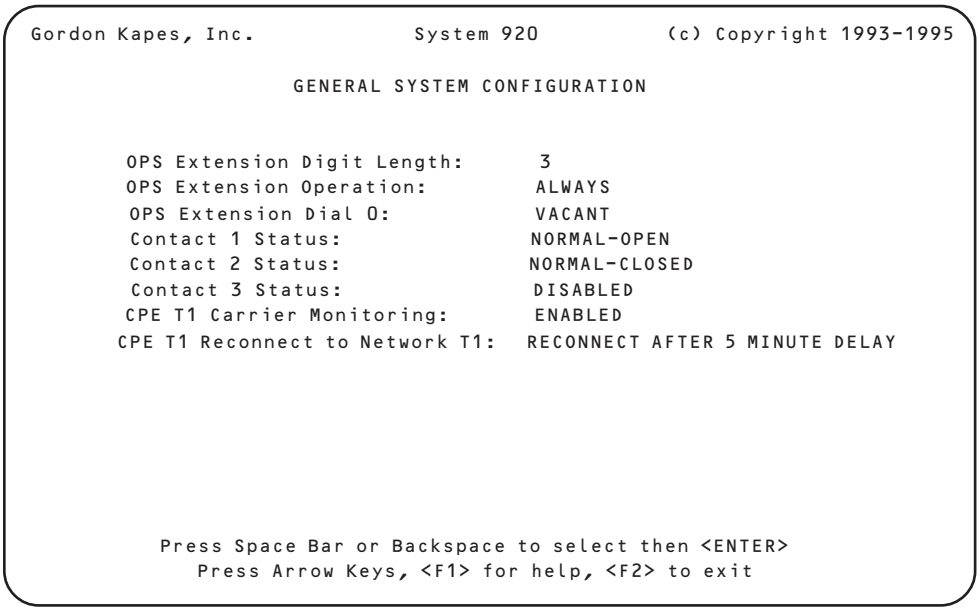


Figure 5-1. General System Configuration Screen

5. Enter a number in the **OPS Extension Digit Length** field and press ↵. Select a value in all fields. To make selections, use the following table.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. After selecting OPS extension digit length, press ↵ to save and activate. At other fields, displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the Administrator Menu	Press **F2**.

6. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Chapter Six
Configuring the T1/DS1 Interface Card

Overview

The T1/DS1 Interface card is an essential component of the System 920. This card provides the interface between the network T1 and the System 920.

You must configure two types of parameters on the T1/DS1 card. These are general parameters and channel parameters.

General Parameters

You must set the following general parameters:

- Framing type
- Zero suppression mode
- Line-build-out signal level
- Synchronization source

Although you must set only four general parameters, it is essential that you set each one correctly. Otherwise, the System 920 may completely fail to operate.

For each general parameter, you must make the setting required by the network T1. If you do not know the requirements of the network T1, match the appropriate settings used by the CPE equipment or by the external channel service unit (CSU) that serves the network T1.

The System 920 provides selectable choices for each of the four parameters. Once you have correctly set general parameters, you will probably not need to change them.

Channel Parameters

Five channel parameters enable you to establish compatibility with and routing for each of the 24 network-T1 communication channels. You must set the status, signaling, and sometimes the direction required by the network T1 for each channel. You must determine the routing desired for each inbound or two-way channel and specify the dial-tone source for each two-way or outbound channel.

As with the general parameters, the system provides selectable choices for each parameter.

You can configure the T1/DS1 card whether it is currently installed or not. You must install the card, however, to enable the system to seize and communicate with the network T1.

Begin with Your Worksheet

Use a working copy of the T1/DS1 Interface Card Configuration worksheet found in Appendix A to specify and record parameters for this System 920 card. Refer to Table 6-1 for a description of each general parameter and to Table 6-2 for a description of each channel parameter. (The **Card Present** and **Synchronized** fields described in the tables are screen displays only.) Enter data from the worksheet using the System 920 software as described in the procedures following Table 6-2.

Table 6-1. T1/DS1 Interface Card General Parameters

Field	Description
Card Present	Indicates whether the T1/DS1 Interface card is currently installed in the System 920 enclosure. YES indicates the card is installed. YES - DISABLED indicates the card is in soft-shutdown mode. NO indicates the card is not installed. **Comments** You can configure the card whether it is currently installed or not. If the card is not currently installed, the parameter settings you make take effect as soon as the card is installed.
Framing	Select the framing used by the network T1. Choices are: D4 (SUPERFRAME) ESF (EXTENDED SUPERFRAME) **Comments** Match the setting that the CPE equipment or the external CSU uses. This matches the requirement of the network T1. D4 is the default choice since it is used at many installations. D4 is also known as superframe or SF framing. ESF is also known as extended superframe.
Zero Suppression	Select the zero suppression mode used by the network T1. Choices are: AMI (ALTERNATE MARK INVERSION) B8ZS (BINARY EIGHT ZERO SUPPRESSION) ZCS (ZERO CODE SUPPRESSION) **Comments** Match the setting that the CPE equipment or the external CSU uses. This matches the requirement of the network T1. The default choice AMI essentially means no zero suppression. The acronym B8ZS is also known as binary eight zero suppression or binary eight zero substitution.

continued

Table 6-1. T1/DS1 Interface Card General Parameters (cont.)

Field	Description
Line Build Out	Select the line-build-out signal level required by the network T1. Choices are: 0dB –7.5dB –15dB **Comments** Match the setting that the CPE equipment or the external CSU uses. This matches the requirement of the network T1. In most cases the default setting of 0dB is appropriate.
Synchronization Source	Select the source of synchronization for the T1/DS1 interface. Choices are: NETWORK LOCAL **Comments** In most installations, the network T1 serves as the source of synchronization and NETWORK should be selected. In some cases, however, the CPE equipment is the source of synchronization for the network T1. This might be the case in a private network where the CPE equipment at a specific location happens to be the source of synchronization for the network. When CPE equipment is the source of synchronization, select LOCAL. This means the System 920 provides synchronization when it seizes the network T1.

Table 6-2. T1/DS1 Interface Card Channel Parameters

Field	Description
(pages 1 and 2 of screen)	
Card Present	Indicates whether the T1/DS1 Interface card is currently installed in the System 920 enclosure. YES indicates the card is installed. YES - DISABLED indicates the card is in soft-shutdown mode. NO indicates the card is not installed. **Comments** You can configure the card whether it is currently installed or not. If the card is not currently installed, the parameter settings you make take effect as soon as the card is installed.
Synchronized	Indicates whether the T1/DS1 Interface card is synchronized with the network T1. YES indicates the card is synchronized. NO indicates the card is not synchronized. **Comments** Several seconds after the System 920 has seized the network T1, the T1/DS1 Interface card should synchronize with it.
Channel	The system displays the number of each communication channel provided by the network T1. You must select the status, signaling, direction, routing, and dial-tone source for each channel. **Comments** Page 1 of the T1/DS1 Interface Card Channel Parameters screen displays information for channels 1-12. Page 2 of the screen displays information for channels 13-24. Channel configurations are not always identical. Therefore, you must configure each channel individually.
Status	Select the status of the channel. Choices are: ENABLED DISABLED

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description
Status (cont.)	**Comments** Choices have the following meanings: *Enabled* — The channel is being used with the displayed parameter settings. *Disabled* — The channel is not being used and is not available for communication. Should you enable the channel, the displayed parameter settings take effect. When disabled, the channel transmits its idle state based on its signaling method.
Signaling	Select the signaling method required by the network T1 for this channel. Choices are: GROUND START FXS GROUND START FXO GROUND START SAS GROUND START SAO LOOP START FXS LOOP START FXO LOOP START SAS LOOP START SAO OPS FXO DID WINK DID IMMEDIATE DOD WINK DOD IMMEDIATE DID/DOD WINK DID/DOD IMMEDIATE TIE TRUNK WINK TIE TRUNK IMMED **Comments** Match the setting that the CPE equipment or the external CSU uses. This matches the requirements of the network T1. When status is set to disabled, the channel continues to transmit its idle state based on the selected signaling method.

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description
Direction	If appropriate, select the communication direction used by the network T1. Choices are: TWO WAY-8 TWO WAY-9 OUTBOUND-8 OUTBOUND-9 INBOUND **Comments** Often the channel signaling method restricts choices for direction. When the signaling method imposes a restriction, the system eliminates ineligible choices automatically. For example, if you choose DID WINK as the signaling method, inbound is the only direction possible. The system immediately displays INBOUND as the direction when you select DID WINK, and you cannot change it. No other choices are eligible for this signaling method. Choices have the following meanings when eligible: *Two Way-8* — You can use this channel both for making calls to the network T1 when the selected outbound access digit is 8, and for receiving calls from the network T1. Match the setting that the CPE equipment or the external CSU uses for the channel. This matches the requirements of the network T1. Remember when you set a direction parameter here, you are simply matching the current configuration of the channel on the network T1. For example, setting the parameter *two way* authorizes two-way communication only when the network-T1 channel has been configured for two way.

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description	
Direction (cont.)	*Two Way-9*	You can use this channel both for making calls to the network T1 when the selected outbound access digit is 9, and for receiving calls from the network T1. Match the setting that the CPE equipment or the external CSU uses for the channel. This matches the requirements of the network T1. Remember when you set a direction parameter here, you are simply matching the current configuration of the channel on the network T1. For example, setting the parameter *two way* authorizes two-way communication only when the network-T1 channel has been configured for two way.
	Outbound-8	You can use this channel only for making calls to the network T1 when the selected outbound access digit is 8. You cannot use this channel to receive calls coming in from the network T1. You do not need to make a selection for routing when direction is set to outbound.
	Outbound-9	You can use this channel only for making calls to the network T1 when the selected outbound access digit is 9. You cannot use this channel to receive calls coming in from the network T1. You do not need to make a selection for routing when direction is set to outbound.
	Inbound	You can use this channel only for receiving calls from the network T1. You cannot use this channel for making calls to the network T1. You do not need to make a selection for dial tone when direction is set to inbound.

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description
Routing	Select the routing desired for incoming calls on this channel. Choices are: REORDER ACD 1 ACD 2 MESSAGE 1 MESSAGE 2 REDIRECT 1 REDIRECT 2 EXT-*nnn* or *nnnn,* where nnn is the extension number if OPS Extension Digit Length is 3, and nnnn is the extension number if OPS Extension Digit Length is 4 DNIS 1 DNIS 2 DISA **Comments** This parameter applies only to channels whose direction has been set to INBOUND or TWO WAY. If the direction of the channel is outbound, the system displays dashes, which you cannot change. Choices have the following meanings: *Reorder* — An incoming call is directed to a reorder progress tone (fast busy). *ACD 1* — An incoming call is directed to ACD 1. *ACD 2* — An incoming call is directed to ACD 2. *Message 1* — An incoming call is directed to message 1 stored on the System 920 Recorder/ Announcer card. The caller hears at least one audible ring progress tone before being connected to message 1. If message 1 is already playing, the caller hears the ring progress tone until the message is ready to be played from the beginning.

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description	
Routing (cont.)	*Message 2*	An incoming call is directed to message 2 stored on the System 920 Recorder/ Announcer card. The caller hears at least one audible ring progress tone before being connected to message 2. If message 2 is already playing, the caller hears the ring progress tone until the message is ready to be played from the beginning.
	Redirect 1	An incoming call is redirected through an available outbound or two-way channel using the redirect 1 function. (Refer to Chapter Nine, “Configuring Redirect Dialing,” for more information.)
	Redirect 2	An incoming call is redirected through an available outbound or two-way channel using the redirect 2 function. (Refer to Chapter Nine, “Configuring Redirect Dialing,” for more information.)
	EXT-nnn or *nnnn*	An incoming call is directed to the OPS extension displayed (where nnn is the extension number if OPS Extension Digit Length is 3, and nnnn is the extension number if OPS Extension Digit Length is 4). Each channel can be directed to the corresponding extension in the dialing plan. For example, when the OPS Extension Digit Length is 3, the default extension 101 establishes the dialing plan as 101-124. Channel 1 can be routed to the first extension in the plan, which is EXT-101. Channel 2 can be routed to the second extension, which is EXT-102, and so forth. You can also assign your own extension numbers for 3 digits. The numbers must be between 100 and 798. For example, you can assign the number 421 as an extension.

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description	
Routing (cont.)	*EXT-nnn* or *nnnn* (cont.)	When the OPS Extension Digit Length is 4, the default extension 1001 establishes the dialing plan as 1001-1024. Channel 1 can be routed to the first extension in the plan, which is EXT-1001. Channel 2 can be routed to the second extension, which is EXT-1002, and so forth. You can also assign your own extension numbers for 4 digits. The numbers must be between 1000 and 7998. For example, you can assign the number 5432 as an extension.
	DNIS 1	If the DNIS 1 number configured for the channel is matched by the number of an incoming call, the call is routed as configured on the DNIS 1 Routing Configuration screen for that channel. (Refer to Chapter Ten, "Configuring DNIS Functions," for more information.)
	DNIS 2	If the DNIS 2 number configured for the channel is matched by the number of an incoming call, the call is routed as configured on the DNIS 2 Routing Configuration screen for that channel. (Refer to Chapter Ten, "Configuring DNIS Functions," for more information.)
	DISA	An incoming call is directed to network dial tone. (The system uses the DNIS 2 values you configured for first digit timeout and interdigit timeout with the DNIS function.)
Dial Tone	Select the choice indicating whether the source of the dial-tone progress tone is the network T1 or the System 920 after the System 920 has seized the network T1. This is the dial tone you hear through an outbound network T1 channel. Choices are: NETWORK LOCAL	

continued

Table 6-2. T1/DS1 Interface Card Channel Parameters (cont.)

Field	Description
Dial Tone (cont.)	**Comments** This parameter applies only to channels whose direction has been set to OUTBOUND or TWO WAY. If the direction of the channel is inbound, the system displays dashes, which you cannot change. Choices have the following meanings: *Network* — The source of the dial tone is the network T1. *Local* — The source of the dial tone is the System 920. Since the source of the dial tone is usually the network T1, you generally set this parameter to NETWORK. Sometimes, however, the network may not provide a dial tone when you access a channel for outbound dialing. In this case, select LOCAL.

Procedure for Setting General Parameters

To configure T1/DS1 Interface card general parameters, you must access the T1/DS1 Interface Card General Parameters screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, select the T1/DS1 Interface Card Configuration option. Then select the General Parameters option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **4** to select T1/DS1 Interface Card Configuration.

   The system displays the T1/DS1 Interface Card Configuration Menu.
5. Press **2** to select General Parameters.

   The system displays the T1/DS1 Interface Card General Parameters screen, shown in Figure 6-1. The cursor is initially in the **Framing** field.

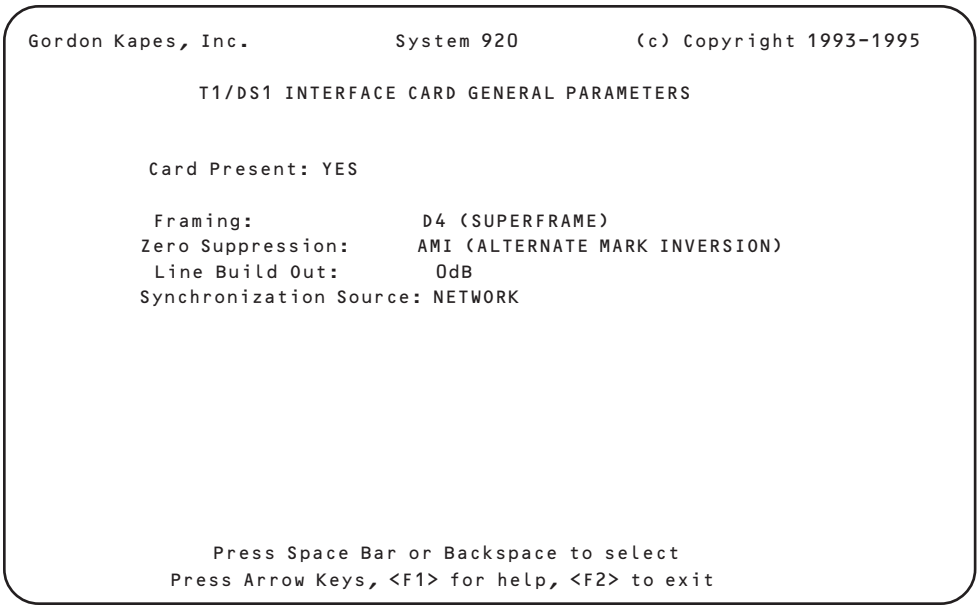


Figure 6-1. T1/DS1 Interface Card General Parameters Screen

6. Select a value in each field. To make selections, use the following table.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the T1/DS1 Interface Card Configuration Menu	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Procedure for Setting Channel Parameters

To configure T1/DS1 Interface card channel parameters, you must access the T1/DS1 Interface Card Channel Configuration screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, select the T1/DS1 Interface Card Configuration option. Then select the Channel Parameters option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **4** to select T1/DS1 Interface Card Configuration.

   The system displays the T1/DS1 Interface Card Configuration Menu.
5. Press **1** to select Channel Parameters.

   The system displays the T1/DS1 Interface Card Channel Configuration screen, shown in Figure 6-2. The cursor is initially in the **Status** field.

```
Gordon Kapes, Inc.          System 920          (c) Copyright 1993-1995

        T1/DS1 INTERFACE CARD CHANNEL CONFIGURATION - Page 1 of 2

Card Present: YES
Synchronized: YES

Channel  Status    Signaling          Direction   Routing      Dial Tone
 1       ENABLED   GROUND START FXS    TWO WAY-8   ACD 1        NETWORK
 2       ENABLED   GROUND START FXS    TWO WAY-8   ACD 1        NETWORK
 3       ENABLED   GROUND START FXS    TWO WAY-8   ACD 1        NETWORK
 4       ENABLED   GROUND START FXS    TWO WAY-8   ACD 1        NETWORK
 5       ENABLED   GROUND START FXS    TWO WAY-8   ACD 1        NETWORK
 6       ENABLED   GROUND START FXS    TWO WAY-8   ACD 1        NETWORK
 7       ENABLED    DID WINK           INBOUND     ACD 2        ---
 8       ENABLED    DID WINK           INBOUND     ACD 2        ---
 9       ENABLED    DID WINK           INBOUND     ACD 2        ---
10       ENABLED    DID WINK           INBOUND     ACD 2        ---
11       ENABLED    DID WINK           INBOUND     ACD 2        ---
12       ENABLED    DID WINK           INBOUND     ACD 2        ---
          Press Space Bar or Backspace to select then <ENTER>
     Press Arrow Keys, <F1> for help, <F2> to exit, <F4> for next page
```

Figure 6-2. Page 1 of T1/DS1 Interface Card Channel Configuration Screen

6. The screen consists of two pages. Select a value in each applicable field on each page. To make selections, use the following table.

   Note: You must press ↵,↑, ↓, ←, →, **F1**, **F2**, **F3**, or **F4** to save and activate each selection. This is required to set the correct idle state.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Press ↵ to save and activate.
Move from field to field	Press ↑, ↓, ←, or →.
Display the next page	Press **F4**.
Display the previous page	Press **F3**.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the T1/DS1 Interface Card Configuration Menu	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Chapter Seven
Configuring OPS Cards

Overview

An *off-premise-station (OPS) card* is a card enabling you to connect 2500-type analog telephones for use with the System 920. Each OPS card contains eight ports used to establish eight OPS circuits. Each circuit can be accessed using the telephone extension number you assign.

You can install as many as three OPS cards in a System 920 enclosure. Since each card provides eight OPS ports, using all three cards gives you a maximum of 24 ports to which analog telephones can be connected.

This chapter explains how to configure the eight OPS ports on each OPS card you intend to use. The configuration tasks described are completed using the System 920 menu system. Consequently, it is not necessary that the card be physically present in the System 920 when you enter the information. (The card must be installed, of course, before you can operate any equipment assigned to one of its ports.)

You configure each OPS card individually, although the cards you purchase and install are physically identical.

Identifying OPS Cards

Figure 7-1 shows where the OPS cards are installed in the System 920. You identify each card by the number of the slot in which the card is installed. The card installed in OPS slot 1 is known as card 1, the card in slot 2 as card 2, and the card in slot 3 as card 3.

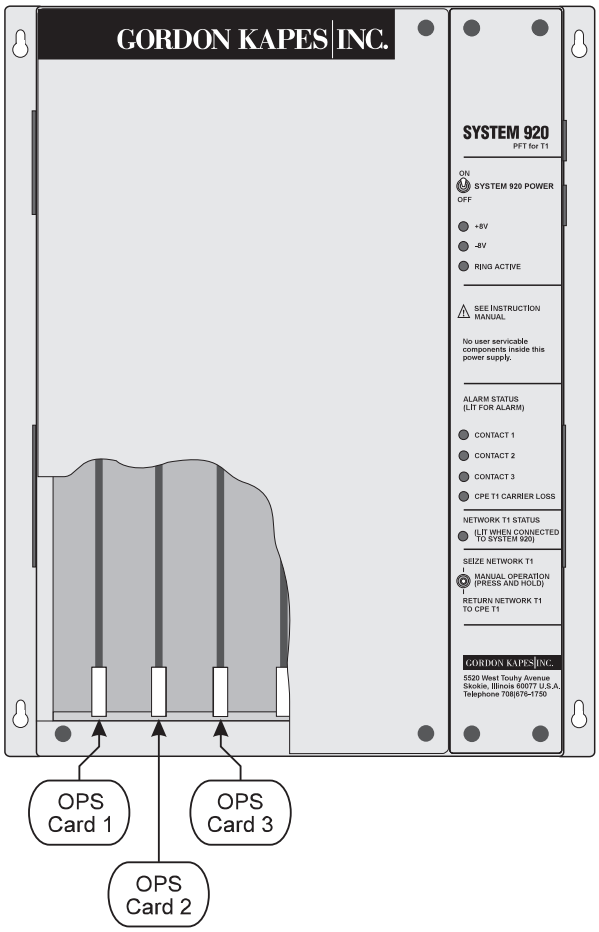


Figure 7-1. OPS Card Slots 1, 2, and 3

Since OPS cards are physically identical, they are interchangeable. You can use a specific card in any slot desired. And you can also configure OPS cards in any order desired. Before you operate the System 920, however, ensure an OPS card is installed in each slot for which you have completed a needed configuration. For example, if you have completed a needed configuration for OPS Card 1, you must ensure a card is installed in slot 1.

Configuring a Port

Configuring a port is simply a matter of assigning the port's extension to one of two automatic-call-distribution (ACD) functions, as desired, and of authorizing the port for outbound access, if that is desired.

System 920 ACD Functions

The System 920 enables you to define two ACD functions for use when incoming calls arrive from the network T1. After the System 920 has seized the network T1, it can route incoming calls on network T1 channels to either of two ACD functions. These are ACD function 1 and ACD function 2. When you assign an extension to an ACD function, you make that extension available to answer a call from an incoming channel that is routed through the ACD function.

(To route an incoming call to an ACD function, refer to Chapter Six, "Configuring the T1/DS1 Interface Card." The instructions in this chapter explain how to assign an extension to an ACD function. Chapter Eight explains how to configure the general parameters for each of the two ACD functions.)

Authorizing Outbound Access

If you want to allow calls to be placed through the network T1 from an OPS extension, you can authorize that capability. A caller can place an outbound call using an OPS extension authorized outbound access either through a specific T1/DS1 channel or through the next available T1/DS1 channel. To make an outbound call, the caller dials the outbound access digit configured for the System 920, then the telephone number. (Refer to the description of the **T1/DS1 Outbound Access** field in Table 7-1 for further information.)

Assigning Extensions to Ports

Extension numbers are automatically assigned to OPS card ports when you enter an OPS extension digit length on the General System Configuration screen. (To enter an OPS extension digit length, refer to Chapter Five, "Performing General System Configuration.") You can change any automatically assigned extension number, however, as long as the new number is within the range 100-798 (for 3-digit numbers) or 1000-7998 (for 4-digit numbers), and is either a 3- or 4-digit number as previously configured. (The extensions 799 and 7999 are reserved for accessing the Recorder/Announcer Card.)

Begin with Your Worksheet

Use a working copy of the OPS Card Configuration worksheet found in Appendix A to specify and record parameters for each of the three possible OPS cards in the System 920. Refer to Table 7-1 for a description of each parameter. Enter data from the worksheet using the System 920 software as described in the procedure following Table 7-1. (The first three parameters in the table explain information displayed on each of the three OPS Card Configuration screens. These do not apply to the worksheet.)

Table 7-1. OPS Card Configuration Parameters

Field	Description
Card Present	Indicates whether the OPS card is currently installed in the System 920 enclosure. YES indicates the card is installed. YES - DISABLED indicates the card is in soft-shutdown mode. NO indicates the card is not installed. **Comments** You can configure the card whether it is currently installed or not. If the card is not currently installed, the parameter settings you make take effect as soon as the card is installed.
OPS Software Version	The system displays the version number of the software on the OPS card if the card is installed. **Comments** The version number is a code stored in a microcomputer chip on the OPS card. This code is used by Gordon Kapes, Inc. to identify the version of the OPS software.
Port	The system displays the number of the OPS port with which an extension, an ACD function, and a T1 outbound access parameter is associated. **Comments** Each OPS Card Configuration screen displays parameter information for each set of eight ports installed on OPS cards 1, 2, and 3.
Ext	The system displays either the extension number automatically assigned by the System 920 (in either the range of 100-798 or 1000-7998, depending upon extensions digit length) or an extension previously entered at this screen. If desired, enter a new 3- or 4-digit number as appropriate. **Comments** When you change the OPS extension digit length on the General System Configuration screen, this number is supplanted by an automatically assigned number.

continued

Table 7-1. OPS Card Configuration Parameters (cont.)

Field	Description
ACD	Select the ACD function you want to assign to the extension. Choices are: NONE 1 2 **Comments** You can define two ACD functions to which incoming network-T1 calls can be directed after the System 920 has seized the network T1. (Refer to Chapter Eight, "Configuring ACD Functions," for more information.) When you assign an ACD function to an extension you make the extension available for receiving incoming calls routed by way of the ACD function. If you select NONE, no ACD function is assigned to the extension. This means the extension cannot receive ACD-routed inbound calls. (It can make outbound calls, however, if you authorize outbound access.)
T1/DS1 Outbound Access	Select NO OUTBOUND ACCESS if you do not want to authorize the extension to access the network T1. Select T1/DS1-*n* ONLY (where n is the channel number) if you want to authorize the extension outbound access through the displayed T1/DS1 channel only. Each extension can be authorized specific outbound access through its corresponding T1/DS1 channel. For example, the extension assigned OPS port 1 can only be authorized specific access through T1/DS1 channel 1. Select NEXT AVAILABLE CHANNEL if you want to authorize the extension outbound access through the next available T1/DS1 channel. **Comments** If you select either of the choices allowing outbound access, the extension can access an outside line by dialing the network-T1 outbound-access digit. Configure the network-T1 outbound-access digit on the General System Configuration screen. (Refer to Chapter Five, "Performing General System Configuration," for more details about outbound-access digit configuration.)

continued

Table 7-1. OPS Card Configuration Parameters (cont.)

Field	Description
T1/DS1 Outbound Access (cont.)	An outbound call from an authorized extension must be transmitted through a T1/DS1 channel whose direction has been configured as outbound or two-way. (Refer to Chapter Six, "Configuring the T1/DS1 Interface Card," for more details about T1/DS1 channel configuration.) In addition, the System 920 must have seized the network T1 and the network T1 must physically support the outbound access of System 920 OPS extensions. ***Note:*** You may wish to restrict the number of extensions authorized for outbound access depending upon the number of outbound or two-way channels configured and available. If you select NO OUTBOUND ACCESS, a caller receives a vacant progress tone when the outbound-access digit is dialed.

Procedure

To configure OPS card parameters, you must access the configuration screen for the OPS card you want to configure. First, with the Operator Menu displayed, access the Administrator Menu. Next select the OPS Card Configuration option. Then select the option for the specific OPS card you want to configure.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **5** to select OPS Card Configuration.

   The system displays the OPS Card Configuration Menu.
5. Press the option number for the card you want to configure.

   The system displays the OPS Card Configuration screen. The OPS Card 1 Configuration screen is shown in Figure 7-2. The cursor is initially in the **Ext** field for port 1.

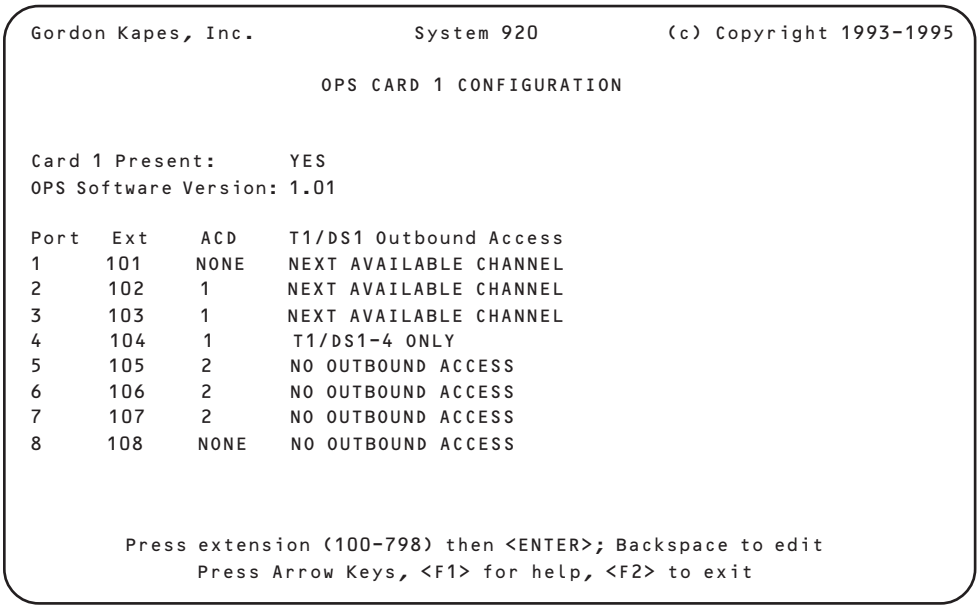


Figure 7-2. OPS Card 1 Configuration Screen

6. For each port, select a value in the **ACD** and **T1/DS1 Outbound Access** fields. If desired enter a value in the **Ext** field. To make selections, use the following table.

To	Take this Action
Delete characters	Press **Backspace**.
Enter characters	Type characters. Press ↵ to save and activate.
Select a value	Press spacebar to scroll forward through the displayed list. Press **Backspace** to scroll backward through the list. Displayed value is saved and activated.
Move from field to field	Press ↑, ↓, ←, or →.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the OPS Card Configuration Menu	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

This page intentionally left blank.

Chapter Eight
Configuring ACD Functions

Overview

The System 920 enables you to define two automatic-call-distributor (ACD) functions for use at any time when the System 920 has seized the network T1. Each ACD function distributes calls carried by those network T1 channels that have been routed to it. Each ACD function distributes received calls to assigned OPS extensions.

Chapter Six of this manual explains how to route one or more network T1 channels directly to one of the two ACD functions. Chapter Ten, “Configuring DNIS Functions,” explains how to route a DNIS number match to an ACD function. Chapter Seven explains how to assign an extension to either ACD function. This chapter explains how to configure general operating parameters for the two ACD functions.

Configuring an ACD function for the System 920 entails determining and specifying three parameters for each function. These are:

- Queue depth
- Queue action
- Overflow action

Queue depth means the maximum number of calls to be kept waiting for a connection when all assigned extensions are busy. A call placed in queue stays in queue until either the caller hangs up or until the call is connected to an available extension. Calls are connected to available extensions on a first-in-first-out basis.

Queue action refers to the action taken by the System 920 while a call is in queue—that is, awaiting connection to an extension. By setting queue action you enable the system to do one of the following while a call is in queue:

- Connect to an audible ring
- Play Message 1 on the Recorder/Announcer card
- Play Message 2 on the Recorder/Announcer card

Overflow action refers to the action taken by the System 920 when a call is placed in overflow. A call is placed in overflow after the queue is full—that is, the number of calls awaiting connection equals the queue depth. For example, if the queue depth is four and four calls are in queue, the next incoming call is placed in overflow. You set the overflow action to enable the system to do one of the following while a call is in overflow:

- Connect to a reorder progress tone (fast busy)
- Play Message 1 on the Recorder/Announcer card
- Play Message 2 on the Recorder/Announcer card

A call placed in overflow is held in overflow until the caller hangs up. It is never transferred to the queue.

Begin with Your Worksheet

Use a working copy of the ACD Configuration worksheet found in Appendix A to specify and record parameters for the two ACD functions. Refer to Table 8-1 for a description of each parameter. (The last two fields described in the table are screen displays only.) Enter data from the worksheet using the System 920 software as described in the procedure following Table 8-1.

Table 8-1. ACD Configuration Parameters

Field	Description
Queue Depth	Select the number of calls to be held while waiting to be connected to an available extension. Choices are 0-24 **Comments** Generally, you would probably not want to select a queue depth greater than the difference between the number of network T1 channels directed to the ACD function and the number of extensions assigned to the ACD function. Calls placed in the queue are handled on a first-in-first-out basis.
Queue Action	Select the action taken by the System 920 when a call is put in queue. Choices are: AUDIBLE RING MESSAGE 1 PLAY TWICE MESSAGE 2 PLAY TWICE MESSAGE 1 CONTINUOUS MESSAGE 2 CONTINUOUS **Comments** Choices have the following meanings: *Audible Ring* — The calling party hears audible ring progress tone until an ACD extension becomes free and answers the call. *Message 1 Play Twice* — After at least one cycle of audible ring progress tone, the calling party hears message 1 as previously recorded on the Recorder/Announcer card. The message plays no more than twice. If an ACD extension has not become free by the end of the second playing, a hold tone is issued every five seconds. This indicates the connection is still active. The hold tone is issued until an ACD extension becomes free and answers the call.[1]

[1]You must have installed a 915 Recorder/Announcer card or 916 DTMF Receiver and Recorder/Announcer card and recorded the message for this option to work. (Refer to Chapter Twenty, "Playing and Recording Recorder/Announcer Card Messages," for more information.)

continued

Table 8-1. ACD Configuration Parameters (cont.)

Field	Description	
Queue Action (cont.)	*Message 2 Play Twice*	After at least one cycle of audible ring progress tone, the calling party hears message 2 as previously recorded on the Recorder/Announcer card. The message plays no more than twice. If an ACD extension has not become free by the end of the second playing, a hold tone is issued every five seconds. This indicates the connection is still active. The hold tone is issued until an ACD extension becomes free and answers the call.[1]
	Message 1 Continuous	After at least one cycle of audible ring progress tone, the calling party hears message 1 as previously recorded on the Recorder/Announcer card. The message plays over and over until an ACD extension becomes free and answers the call.[1]
	Message 2 Continuous	After at least one cycle of audible ring progress tone, the calling party hears message 2 as previously recorded on the Recorder/Announcer card. The message plays over and over until an ACD extension becomes free and answers the call.[1]
Overflow Action	Select the action taken by the System 920 when a call is put in overflow. Choices are: REORDER MESSAGE 1 CONTINUOUS MESSAGE 2 CONTINUOUS **Comments** Choices have the following meanings:	
	Reorder	An incoming call is directed to a reorder progress tone (fast busy).

[1]You must have installed a 915 Recorder/Announcer card or 916 DTMF Receiver and Recorder/Announcer card and recorded the message for this option to work. (Refer to Chapter Twenty, "Playing and Recording Recorder/Announcer Card Messages," for more information.)

continued

Table 8-1. ACD Configuration Parameters (cont.)

Field	Description	
Overflow Action	*Message 1 Continuous*	After at least one cycle of audible ring progress tone, the calling party hears message 1 as previously recorded on the Recorder/Announcer card. The message plays over and over until the caller hangs up.[1]
	Message 2 Continuous	After at least one cycle of audible ring progress tone, the calling party hears message 2 as previously recorded on the Recorder/Announcer card. The message plays over and over until the caller hangs up.[1]
T1/DS1 Channels Routed to ACD *n*	The system displays the numbers of the network T1 channels assigned, either directly or through DNIS routing, to the ACD function (where n is the number of the function).	
OPS Extensions Assigned to ACD *n*	The system displays the numbers of those OPS extensions assigned to the ACD function (where n is the number of the function).	

[1]You must have installed a 915 Recorder/Announcer card or 916 DTMF Receiver and Recorder/Announcer card and recorded the message for this option to work. (Refer to Chapter Twenty, "Playing and Recording Recorder/Announcer Card Messages," for more information.)

Procedure

To configure ACD parameters, you must access the configuration screen for each ACD function. First, with the Operator Menu displayed, access the Administrator Menu. Next, select the ACD Configuration option. Then select the option for the ACD function you want to configure.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **2** to select ACD Configuration.

   The system displays the ACD Configuration Menu.
5. Press the option number for either ACD 1 or ACD 2.

   The system displays the selected ACD Configuration screen. The ACD 1 Configuration screen is shown in Figure 8-1. The cursor is initially in the **Queue Depth** field.

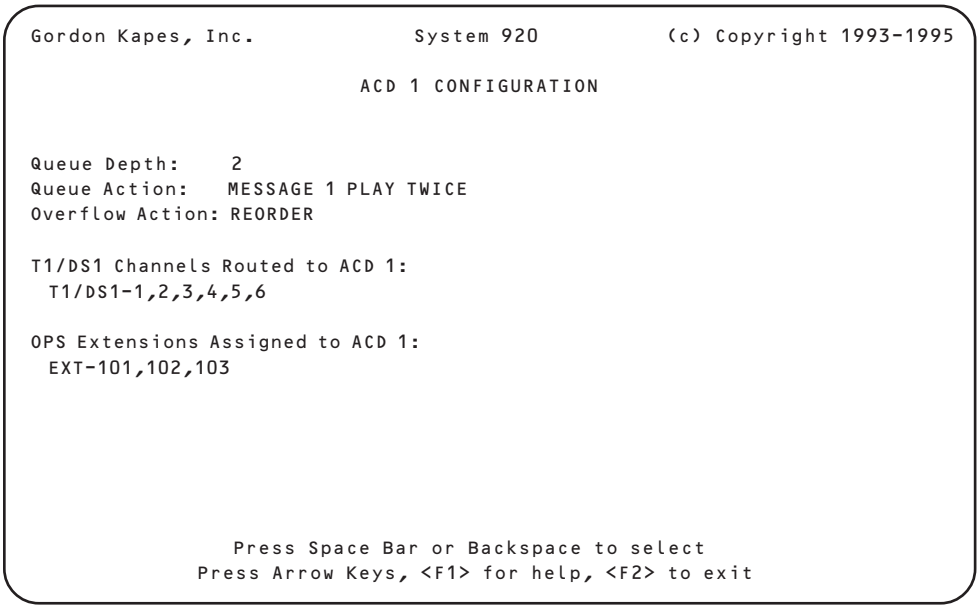


Figure 8-1. ACD 1 Configuration Screen

6. Select a value in each applicable field. To make selections, use the following table.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the ACD Configuration Menu	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

This page intentionally left blank.

Chapter Nine
Configuring Redirect Dialing

Overview

When you configure the T1/DS1 Interface card, you are given the option of routing any inbound or two-way network-T1 channel directly to either of two redirect telephone numbers. (Refer to Chapter Six, “Configuring the T1/DS1 Interface Card.”) You can also route any inbound or two-way network T1 channel to a redirect telephone number through a DNIS number match. (Refer to Chapter Ten, “Configuring DNIS Functions.”)

A channel routed to a redirect telephone number directs an incoming call to that telephone number. This enables you to divert calls away from the site during a power failure, system malfunction, or maintenance interval, and route them to an alternate location.

For the redirect functions to work efficiently, you must have a sufficient number of outbound or two-way network-T1 channels. Redirect telephone numbers must be accessible through the network T1.

In addition to entering a redirect number (dialing command line), you can specify that message 1 or message 2 be played to the caller before the call is diverted. These messages can be used to tell the caller why the call is being diverted.

This chapter explains how to enter the two redirect telephone numbers and select, if desired, the message to be played before the call is diverted.

Begin with Your Worksheet

Use a working copy of the Redirect Configuration worksheet found in Appendix A to specify redirect telephone numbers and action options. Refer to Table 9-1 for a description of each parameter. (The last field described in the table is a screen display only.) Enter data from the worksheet using the System 920 software as described in the procedure following Table 9-1.

Table 9-1. Redirect Configuration Parameters

Field	Description
Dialing Command Line	Enter the telephone number to which you want the call redirected. Use a maximum of 40 characters. **Comments** Make sure you include all the digits you would dial if you picked up an extension to call the destination manually over the network T1 channel. You can use the digits 0-9, the letters A-D, *, and #. You can also include a comma (,) to cause a 2-second pause in dialing. (For a longer pause, use more than one comma. For example, to pause for 6 seconds, use three commas in a row.) If you wish to format the redirect number for greater readability, use dashes (-), forward slash marks (/), or parentheses (()). These characters are counted as part of the 40-character maximum field length. The system ignores these characters when dialing the number. **Example** You enter a number that looks like the following: 1-303-555-6666,,777 where: 1 is the long-distance access number 303 is the area code 555 is the exchange number 6666 is the line number ,, causes the system to wait four seconds before dialing the extension 777 is the extension In the example, dashes have been used to format the redirect number. These dashes are ignored by the system when it dials the number. You cannot use the redirect function to direct an incoming call to a System 920 OPS extension. If you want to direct a call to an OPS extension, route the network-T1 channel to either the extension or to the ACD function to which the extension is assigned.

continued

Table 9-1. Redirect Configuration Parameters (cont.)

Field	Description
Action	Select the choice indicating the message to be played, if desired, before the call is diverted. Choices are: IMMEDIATE MESSAGE 1 MESSAGE 2 **Comments** Choices have the following meanings: *Immediate* — Redirect the call immediately. Do not play a message before redirecting the call. *Message 1* — Play message 1 before redirecting the call.[1] *Message 2* — Play message 2 before redirecting the call.[1] The system plays the specified message one time when a caller calls on the redirected channel. The call is then redirected to the specified redirect number.
T1/DS1 Outbound Access Group	Select the choice indicating the outbound access group to be used, if desired, before the call is diverted. Choices are: 8 9 **Comments** Choices have the following meanings: *8* — Two way-8 Outbound-8 *9* — Two way-9 Outbound-9
T1/DS1 Channels Routed to Redirect *n*	The system displays the numbers of those channels routed to the redirect function (where n is the number of the redirect function).

[1]You must have installed a 915 Recorder/Announcer card or 916 DTMF Receiver and Recorder/Announcer card and recorded the message for this option to work. (Refer to Chapter Twenty, "Playing and Recording Recorder/Announcer Card Messages," for more information.)

Procedure

To configure redirect dialing parameters, you must access the configuration screen for each redirect number. First, with the Operator Menu displayed, access the Administrator Menu. Next, select the Redirect Configuration option. Then select either Redirect 1 or Redirect 2.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **3** to select Redirect Configuration.

   The system displays the Redirect Configuration menu.
5. Press the option number for either Redirect 1 or Redirect 2.

   The system displays the selected Redirect Configuration screen. The Redirect 1 Configuration screen is shown in Figure 9-1. The cursor is initially in the **Dialing Command Line** field.

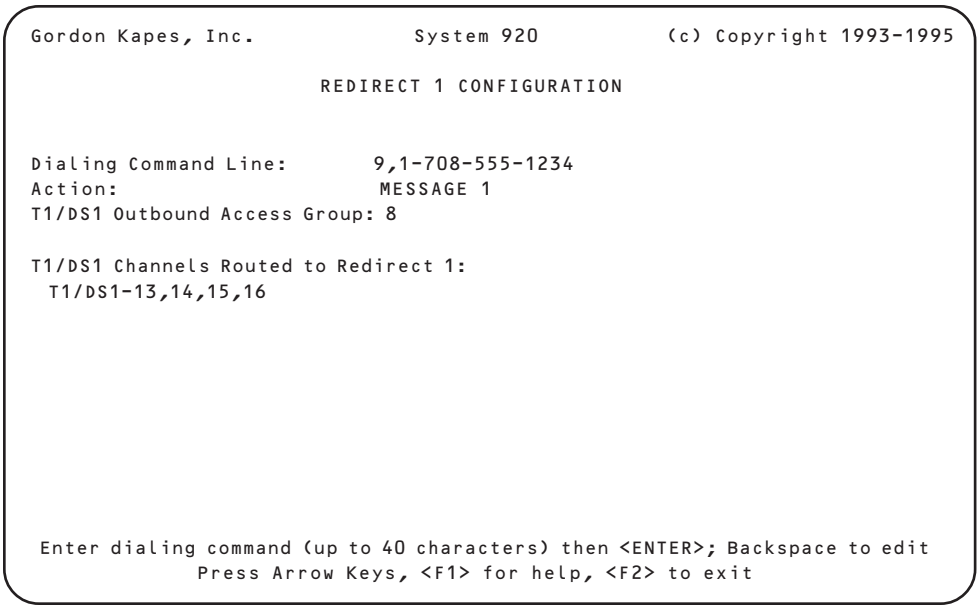


Figure 9-1. Redirect 1 Configuration Screen

6. Enter a value in the **Dialing Command Line** field and press ↵. Select a value in the **Action** field. To make the entry and the selection, use the following table.

To	Take this Action
Delete characters	Press **Backspace**.
Enter characters	Type the characters. Press ↵ to save and activate.
Select a value	Press spacebar to scroll forward through the displayed list. Press **Backspace** to scroll backward through the list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the Redirect Configuration Menu	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

This page intentionally left blank.

Chapter Ten
Configuring DNIS Functions

Overview

The two DNIS (Dialed Number Identification Service) functions enable the System 920 to identify the telephone number the caller dialed. Consequently, when a call is made through an incoming T1/DS1 channel configured for either DNIS 1 or DNIS 2, the System 920 can identify the number being called. If the called number matches a specific number or falls within a range of numbers you have specified, the incoming call is a DNIS match. The call is routed according to your configuration—that is, to an OPS extension, an ACD function, a redirect function, a message, or if desired, to a reorder progress tone.

The optional 916 DTMF Receiver and Recorder/Announcer card contains the circuitry and logic required to enable the System 920 DNIS functions. Consequently, you must have installed this card prior to using these functions. You can, however, configure these functions without the card being present.

The following example illustrates a simple way in which you might use either DNIS function. Imagine you have a dial-up line at your place of business. When the CPE-T1 equipment at your site is operating normally, anyone outside the company can speak with you directly by calling your number, which is 555-1234. You would like to maintain this direct access when a power failure or system malfunction has caused the System 920 to seize the Network T1. You can do so by using either DNIS function. This example uses DNIS 1.

First you configure the routing on one or more incoming T1/DS1 channels as DNIS 1. You then specify 5551234 as a DNIS 1 number match with routing to OPS extension 104, which is the extension for the OPS analog telephone on your desk. After the System 920 seizes the network T1 and someone calls 555-1234, a DNIS 1 match is made. The call is routed to the telephone on your desk, which rings.

You can specify as many as 24 specific DNIS match numbers or ranges for each of the two DNIS functions. You can route each DNIS match number (or range) to an OPS extension, an ACD function, a redirect function, a message, or, if desired, a reorder progress tone. If the incoming number does not match a specified DNIS match number, it is routed to the default configuration, which can be to an ACD function, either message, or to an audible ring or reorder progress tone.

This chapter explains how to configure DNIS parameters. You must configure two groups of parameters: general parameters and routing parameters for each of the two DNIS functions.

General Configuration

You can configure as many as 24 individual DNIS match numbers or ranges for each DNIS function. All of these are restricted by four general parameters. The first parameter is number of digits required. All DNIS match numbers in the same DNIS function must be the same length. You specify that length as the number of digits required.

For each DNIS function, you must also specify first-digit and interdigit timeout periods in number of seconds. The first-digit timeout period is the maximum length of time the System 920 waits to detect an address-signaling digit. If the system does not detect a digit within the specified time period, it connects the channel to the reorder progress tone.

The interdigit timeout period is similar to the first-digit timeout period. This period is the maximum time System 920 waits between address-signaling digits. As with the first-digit timeout, the System 920 connects the channel to the reorder progress tone if it does not detect a digit within the specified time period.

The final general parameter is the default route connection. You can configure this as an audible ring, a reorder progress tone, one of the ACD functions, or one of the messages.

Routing Configuration

To specify routing configuration, you simply display the DNIS Routing Configuration screen for either DNIS function and list as many as 24 DNIS match numbers or ranges. The length of these numbers must equal the number of digits required, which you specified under general parameters for the function. You also specify the individual route or connection to be made when an incoming address-signaling number matches a specific listed number or falls within a specific listed range of numbers. Possible connections are audible ring, a reorder progress tone, one of the ACD functions, or one of the messages.

Begin with Your Worksheet

Use a working copy of the DNIS Configuration worksheet found in Appendix A to specify both general and routing configuration parameters for each DNIS function. Refer to Table 10-1 for a description of each general parameter and to Table 6-2 for a description of each routing parameter. (The **Resource Available** field described in Table 10-1 is a screen display only.) Enter data from the worksheet using the System 920 software as described in the procedures following Table 10-2.

Table 10-1. DNIS General Configuration Parameters

Field	Description
Resource Available	Indicates whether the 916 DTMF Receiver and Recorder/ Announcer card is currently installed in the System 920 enclosure. YES (916 CARD PRESENT) indicates the card is installed. NO indicates the card is not installed. **Comments** You can specify the DNIS configuration whether the card is currently installed or not. If the card is not currently installed, the parameter settings you make take effect as soon as the card is installed.
Number of Digits Required	Select the number of digits the network T1 provides the System 920 for address signaling. Choices are 3-15 **Comments** The match numbers you list on the DNIS Routing Configuration screen must equal the number selected for this parameter.
First Digit Timeout	Select the maximum number of seconds you want the System 920 to wait to detect the first address-signaling digit. Choices are 1-9. **Comments** If the System 920 does not detect a digit within the specified number of seconds, a first-digit timeout occurs. The system connects the seized channel to the reorder progress tone. The default setting for this parameter is 5 seconds.
Interdigit Timeout	Select the maximum number of seconds you want the System 920 to wait between address-signaling digits. Choices are 1-9. **Comments** If the system does not detect a digit within the specified number of seconds, an interdigit timeout occurs. The system connects the seized channel to the reorder progress tone. The default setting for this parameter is 1 second.

continued

Table 10-1. DNIS General Configuration Parameters (cont.)

Field	Description
Default Route	Select the connection you want the System 920 to make with the seized T1/DS1 channel when it fails to make a DNIS number match. Such a failure occurs when incoming address-signaling digits do not match any listed match number or number in a listed range. Choices are: REORDER ACD 1 ACD 2 MESSAGE 1 MESSAGE 2 AUDIBLE RING

Table 10-2. DNIS Routing Configuration Parameters

Field	Description
DNIS Number Match	Enter individual address-signaling digits (such as a telephone number) or a range of address-signaling digits. **Comments** To enter a range of digits, enter the lower number followed by a hyphen (-) and then the higher number. Make as many as 24 entries. Each string of digits you enter should not exceed the number-of-digits-required value that you entered under DNIS general configuration. **Example** The number of digits required is configured as 4. You enter the following DNIS match number and DNIS match range: 1. 5023 2. 5100-5150 The System 920 checks the four incoming address-signaling digits on a DNIS-configured channel to see if they match the specific DNIS match number 5023, or if they fall within the range 5100 through 5150. If either event occurs, a match is made and the system routes the call as configured for the specific DNIS match (individual number or range). If a match is not made, the system routes the call to the default route as configured under DNIS general configuration.
Route if Match	Select the connection the system makes if a DNIS number match is made. Choices are: REORDER ACD 1 ACD 2 MESSAGE 1 MESSAGE 2 REDIRECT 1 REDIRECT 2 EXT-*nnn* or *nnnn,* where nnn is the extension number if OPS Extension Digit Length is 3, and nnnn is the extension number if OPS Extension Digit Length is 4

Procedure for Setting General Parameters

To configure DNIS general parameters, you must access the DNIS General Configuration screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, select the DNIS Configuration option. Then select the option for the DNIS function you want to configure. Finally, select the DNIS General Configuration option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **7** to select DNIS Configuration.

   The system displays the DNIS Configuration Menu.
5. Press the option number for either DNIS 1 or DNIS 2.

   The system displays the configuration screen for the selected DNIS function.
6. Press **2** to select DNIS General Configuration.

   The system displays the selected DNIS General Configuration screen. The DNIS 1 General Configuration screen is shown in Figure 10-1. The cursor is initially in the **Number of Digits Required** field.

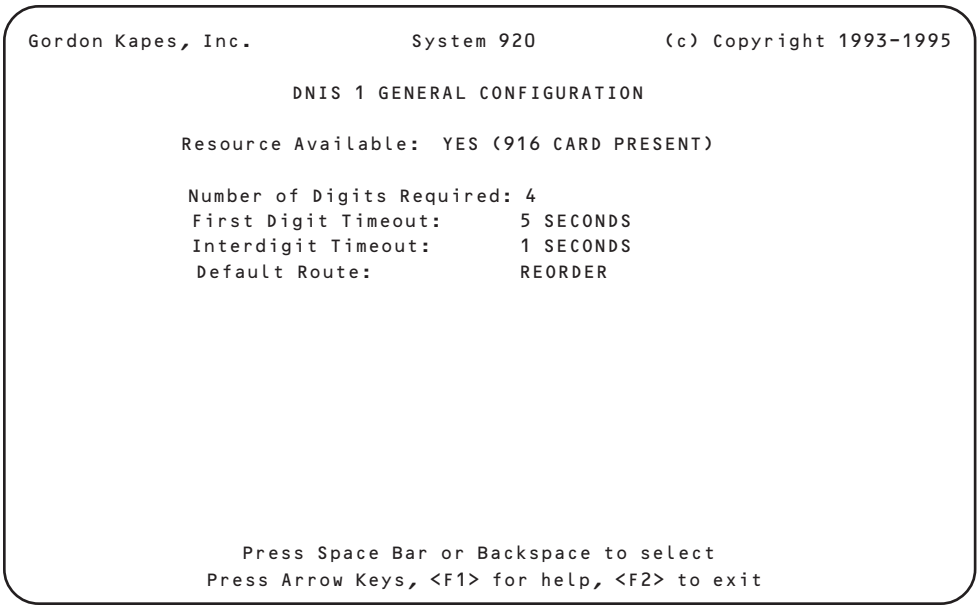


Figure 10-1. DNIS General Configuration Screen

7. Select a value in each field. To make selections, use the following table.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display Online Help	Press **F1**.
Exit Online Help	Press **F2**.
Return to the DNIS Configuration Menu.	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Procedure for Setting DNIS Routing Configuration Parameters

To configure DNIS routing configuration parameters, you must access the DNIS Routing Configuration screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, select the DNIS Configuration option. Then select the option for the DNIS function you want to configure. Finally, select the DNIS Routing Configuration screen.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **7** to select DNIS Configuration.

   The system displays the DNIS Configuration Menu.
5. Press the option number for either DNIS 1 or DNIS 2.

   The system displays the configuration screen for the selected DNIS function.
6. Press **1** to select DNIS Routing Configuration.

   The system displays the DNIS Routing Configuration screen. The DNIS 1 Routing Configuration screen is shown in Figure 10-2. The cursor is initially in the first **DNIS Number Match** field.

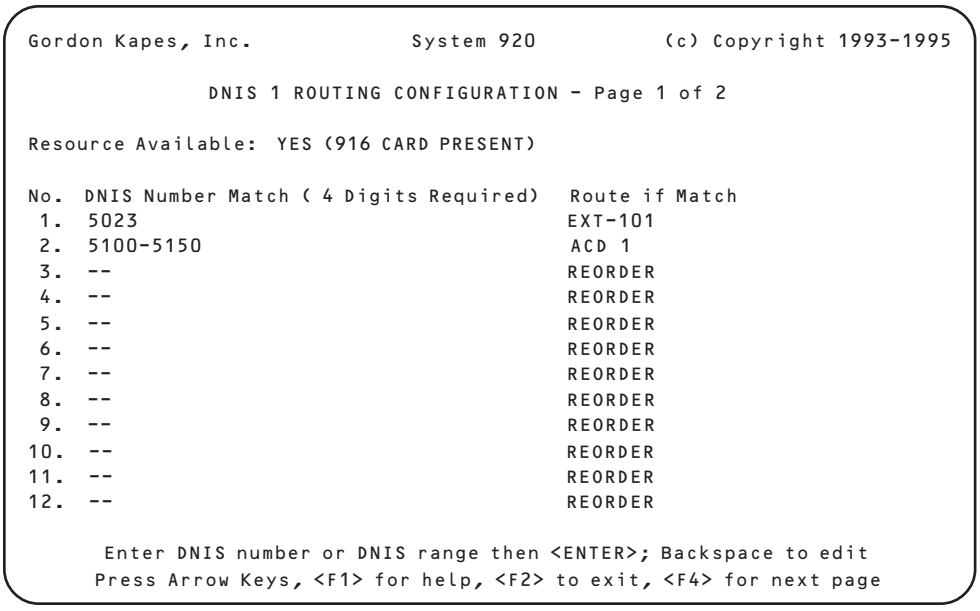


Figure 10-2. DNIS Routing Configuration Screen

7. The screen consists of two pages enabling you to list as many as 24 DNIS match numbers (or ranges) paired with their corresponding match routes. Enter a number in the **DNIS Number Match** field. Select a corresponding route in the **Route if Match** field. To make entries and selections, use the following table.

To	Take this Action
Enter numbers	Type the numbers.
Delete numbers	Press **Backspace**.
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑, ↓, ←, or →.
Display Online Help	Press **F1**.
Exit Online Help	Press **F2**.
Return to the DNIS Configuration Menu.	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Chapter Eleven
Configuring Recorder/Announcer Parameters

Overview

This chapter explains how to configure parameters associated with the optional 915 Recorder/Announcer card or 916 DTMF Receiver and Recorder/Announcer card. These consist of the following:

- Entering a telephone extension from which to access the card
- Entering the numeric password required for accessing the card

Recorder/Announcer Access Extension

Either card enables you to record two voice messages for use in system-configured functions. These messages can vary in length with a maximum of 20 seconds per message. To record these messages, or to listen to them for the purpose of maintenance, you must use a telephone connected to one of the OPS ports on the System 920.

When you configure the Recorder/Announcer access extension, you can select the extension number of the phone you want to use for this purpose, or, if you want to access the Recorder/Announcer from *all* your OPS phones, you can select ALL. You must choose either a single extension number or all extension numbers. You cannot enter a selected group of extensions.

Recorder/Announcer Numeric Password

When you dial the Recorder/Announcer from an authorized extension, it "answers" by sending a new dial tone after pausing momentarily. You must then enter a 7-digit access password through the telephone keypad. This 7-digit number enables only authorized personnel to access the Recorder/Announcer.

The default password is 1234567. If you desire to change the default, compose a new 7-digit number for use at the site.

Begin with Your Worksheet

Use a working copy of the Recorder/Announcer Configuration worksheet found in Appendix A to specify and record Recorder/Announcer parameters. Refer to Table 11-1 for a description of each parameter. (The first field described in the table is a screen display only.) Enter data from the worksheet using the System 920 software as described in the procedure following Table 11-1.

Table 11-1. Recorder/Announcer Configuration Parameters

Field	Description
Resource Available	Indicates whether either the 915 or 916 card is currently installed in the System 920 enclosure. YES (91*n* CARD PRESENT), where n = 5 or 6, indicates the card is installed. NO indicates the card is not installed.
Recorder/Announcer Access Extension	Select the number of the OPS extension through which you want to be able to access the Recorder/Announcer for maintenance. If you want to be able to access the Recorder/Announcer from all of the OPS extensions, select ALL.
Recorder/Announcer Numeric Password	Enter the 7-digit number you want to use as a password to access the Recorder/Announcer for maintenance. **Comments** Use numbers only. Do not use * or # or any other symbol found on a telephone keypad. After a person dials 799 or 7999 from an authorized extension, he or she must enter this number at the telephone keypad to access the Recorder/Announcer.

Procedure

To configure recorder/announcer parameters, you must access the Recorder/Announcer Configuration screen. First, with the Operator Menu displayed, access the Administrator Menu. Then select the Recorder/Announcer Configuration option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **6** to select Recorder/Announcer Configuration.

   The system displays the Recorder/Announcer Configuration screen, shown in Figure 11-1. The cursor is initially in the **Recorder/Announcer Access Extension** field.

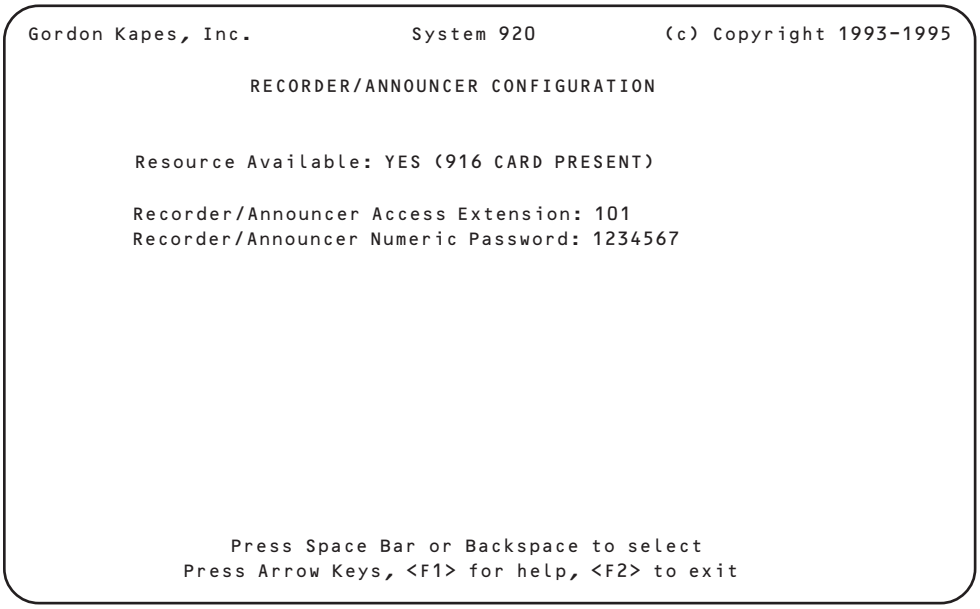


Figure 11-1. Recorder/Announcer Configuration Screen

5. Enter text in the displayed fields. Use the following table while making entries.

To	Take this Action
Delete characters	Press **Backspace**.
Enter characters	Type the characters. Press ↵ to save and activate.
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the Administrator Menu	Press **F2**.

6. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

This page intentionally left blank.

Chapter Twelve
Configuring System Security

Overview

This chapter explains how to configure parameters associated with the system security functions provided by the System 920. Configuring security consists of entering passwords for two security levels, setting the maintenance port inactivity timer, and activating the VT100 compatibility test.

Security Levels

The 920 menu system uses two security levels. These are the operator level and the administrator level.

Operator Level

Individuals authorized to use the menu system at the operator level can view the current operating status of System 920 functions. You can view these items by accessing the first six options on the Operator Menu.

Those granted operator-level privilege can only *view* function status. They cannot alter settings or reconfigure any parameters.

Administrator Level

Those granted administrator-level privilege have all the rights of operator-level privilege. In addition, the ability to change settings and reconfigure parameters is granted to these personnel. Those with administrator-level privilege can access the Administrator Menu to configure general items and functions on the T1/DS1 Interface card and the OPS card, to configure ACD functions, to add or change redirect dialing strings, to set Recorder/Announcer card parameters, and to configure the security parameters described in this chapter.

Those granted administrator-level privilege can also perform the maintenance and testing functions provided on the Maintenance and Testing Functions screen.

Configuring Operator- and Administrator-Level Passwords

Configuring security passwords consists of composing and entering two distinct passwords: one is the operator-level password and the other is the administrator-level password. Each password can be between one and ten characters in length. You assign the same operator-level password to each person in your organization granted operator privilege. You assign the same administrator-level password to each person in your organization granted administrator privilege.

The default operator-level password *OPERATOR* and the default administrator-level password *ADMIN* are set at the factory. To help you access the menu system, the system displays the prompts Default operator-level password is OPERATOR and Default administrator-level password is ADMIN on the Login screen. If your System 920 is already in a secure location, you may want to use the default passwords just as they are. However, if you need to further ensure system security, you should change each password. Once you have changed a default password, the system no longer displays its associated password prompt on the Login screen. (Should you change a password back to the default, the password prompt reappears on the Login screen.)

Maintenance Port Inactivity Time

The System 920 contains an inactivity timer that automatically disconnects the maintenance terminal from the maintenance port when you have not used the system for a certain period of time. This helps ensure the security of the system when left unattended for an unanticipated period of time. Enter the number of minutes of inactivity you want the System 920 to monitor before automatically disconnecting.

Perform VT100 Compatibility Test Upon Login

The VT100 compatibility test ensures the terminal being used to access the System 920 is fully VT100 compatible. To successfully use the menu system you must use a terminal that supports keys F1 through F4. By requiring the user to press F1, F2, F3, and F4 after entering a valid login password, the test demonstrates this capability immediately. If the terminal or terminal emulator does not support these keys, the user is prevented from proceeding with the menu system.

By default the test is enabled. However, if you are sure the terminal to be used with the System 920 is always VT100 compatible, you may choose to disable the test.

Begin with Your Worksheet

Use a working copy of the Security Configuration worksheet found in Appendix A to specify and record security parameters for the System 920. Refer to Table 12-1 for a description of each parameter. Enter data from the worksheet using the System 920 software as described in the procedure following Table 12-1.

Table 12-1. Security Configuration Parameters

Field	Description
Operator-Level Password	Enter the password you want to use to allow access to the Operator Menu. Use from one through ten characters. **Comments** You can include special characters (punctuation marks) and numbers in the password if you wish. You *cannot* include spaces in the password. The password you enter here is *not* case sensitive. You can enter the word in either uppercase or lowercase letters. (The screen always displays the word in upper-case letters.) Similarly, a user entering the password for access to the Operator Menu may do so using either uppercase or lowercase letters. The first time you enter a password it replaces the default operator password supplied with the System 920. After you have entered the new password, the default password supplied with the system is no longer displayed on the Login screen.
Administrator-Level Password	Enter the password you want to use to allow access to the Administrator Menu. Use from one through ten characters. **Comments** You can include special characters (punctuation marks) and numbers in the password if you wish. You *cannot* include spaces in the password. The password you enter here is *not* case sensitive. You can enter the word in either uppercase or lowercase letters. (The screen always displays the word in upper-case letters.) Similarly, a user entering the password for access to the Administrator Menu may do so using either uppercase or lowercase letters. The first time you enter a password it replaces the default administrator password supplied with the System 920. After you have entered the new password, the default password supplied with the system is no longer displayed on the Login screen.
Maintenance Port Inactivity Time (minutes)	Enter the length of time, in minutes, that the system monitors inactivity from the maintenance port before disconnecting. Enter a number from 1 through 999.

continued

Table 12-1. Security Configuration Parameters (cont.)

Field	Description
Perform VT100 Compatibility Test Upon Login	Select YES to enable the F1-F4 key test a user must perform immediately after logging on to the System 920. Select NO to disable the test. **Comments** If the device used to access the System 920 or the person accessing it changes frequently, Gordon Kapes, Inc. recommends you enable the test. The test takes four keystrokes to complete. Failure to pass the test immediately alerts personnel that a terminal compatibility problem exists.

Procedure

To configure security, you must access the Security Configuration screen. First, with the Operator Menu displayed, access the Administrator Menu. Then select the Security Configuration option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **8** to select Security Configuration.

   The system displays the Security Configuration screen, shown in Figure 12-1. The cursor is initially in the **Operator-Level Password** field.

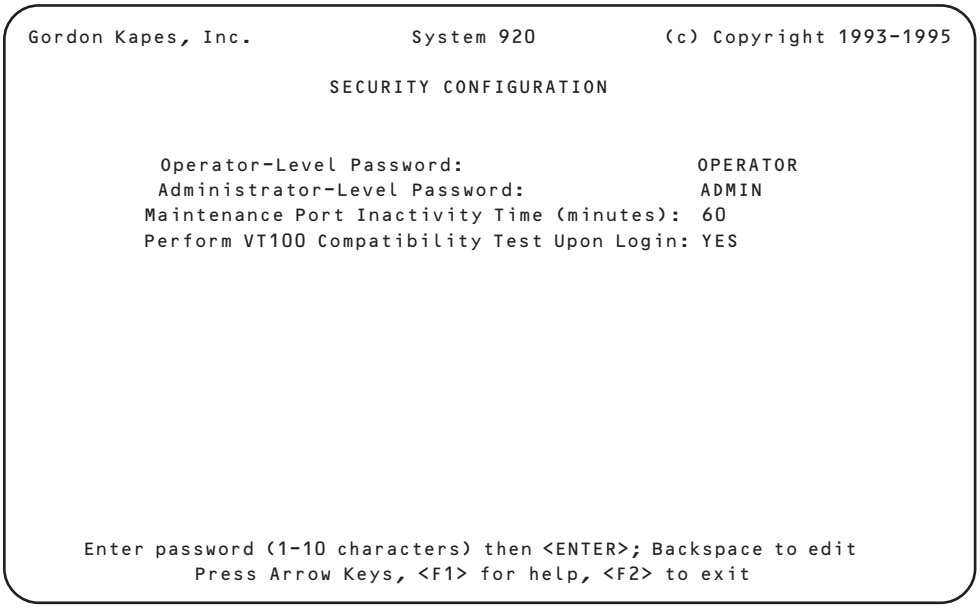


Figure 12-1. Security Configuration Screen

5. Select a value from the displayed choices in the **Perform VT100 Compatibility Test Upon Login** field. Enter text in all other fields. To make selections and entries, use the following table.

To	Take this Action
Delete text	Press **Backspace**.
Enter text	Type text. Press ↵ to save and activate.
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the Administrator Menu	Press **F2**.

6. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

This page intentionally left blank.

Chapter Thirteen
Viewing General System Status

Overview

Chapters Thirteen through Eighteen describe how to view configured parameters, operating status, and statistical totals for various System 920 functions. Each chapter explains how to display and interpret a specific status screen. The status screens, in the order described, are the following:

- General System Status screen
- ACD Status screen
- Redirect Status screen
- T1/DS1 Interface Card Status screen
- OPS Card Status screen
- Recorder/Announcer Status screen

Sit at the terminal connected to the System 920 as you read each chapter. Follow the procedure for displaying each screen, then review the table included in the chapter to confirm your understanding of each field.

Viewing General System Status

This chapter explains how to view the General System Status screen. This is a two-page screen. The first page indicates whether the System 920 has seized the network T1, and if so, provides additional information about the transfer. The first page also includes information about the System 920 contact-input and CPE-T1 monitoring functions.

Page two of the screen displays information about network-T1 status and lists accumulated totals for various network-T1 and System 920 operating parameters. As a whole, these are most useful for Gordon Kapes, Inc. technical support personnel who may ask you to display this page and report the listed information.

Procedure

To view general system status, you must access the General System Status screen. With the Operator Menu displayed, select the General System Status option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **1** to select General System Status.

   The system displays page 1 of the General System Status screen, shown in Figure 13-1.

```
Gordon Kapes, Inc.            System 920          (c) Copyright 1993-1995

                  GENERAL SYSTEM STATUS - Page 1 of 2


       Network T1 Transfer Status:    TRANSFER (NETWORK T1 SEIZED)
       OPS Extension Access Status:    AVAILABLE
        Contact 1 Status:              NORMAL
        Contact 2 Status:              NORMAL
        Contact 3 Status:              NORMAL
       CPE T1 Carrier Monitoring:     ALARM (NO CARRIER DETECTED)
       Manual Operation Switch Status: NORMAL
        Transfer Delay Status:         ---









         Press <F1> for help, <F2> to exit, <F4> for next page
```

Figure 13-1. Page 1 of General System Status Screen

4. Use the following keys while viewing the General System Status screen. Table 13-1 describes the fields on pages 1 and 2 of the General System Status screen.

To	Take this Action
Display the next page	Press **F4**.
Display the previous page	Press **F3**.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

5. To return to the Operator Menu, press **F2**.

   The system Displays the Operator Menu.

Table 13-1. General System Status Screen Parameters

Field	Description
Network T1 Transfer Status	Indicates whether the System 920 is connected to the network T1. Displays have the following meanings: *Normal (Connected to CPE T1)* The network T1 is connected to CPE T1. This is the normal state of the System 920. *Transfer (Network T1 Seized)* The System 920 has seized the network T1. **Comments** The message Warning! Transfer Relay is being forced on/off by diagnostics indicates the network T1 transfer status is under the control of the network transfer relay function on the Diagnostic Menu. This function overrides the effect of any alarm or of the Manual Operation switch.
OPS Extension Access Status	Indicates the operating status of OPS extensions. Displays have the following meanings: *Available* — OPS extensions are providing internal communications. *Not Available* — OPS extensions are not providing internal communications.
Contact 1 Status Contact 2 Status Contact 3 Status	Indicates the current status of each contact-input monitoring function. Displays have the following meanings: *Normal* — The monitoring function is enabled and the contact is in a normal state. This status does not cause the System 920 to seize the network T1.

continued

Table 13-1. General System Status Screen Parameters (cont.)

Field	Description	
Contact 1 Status Contact 2 Status Contact 3 Status (cont.)	*Alarm*	The monitoring function is enabled and the contact is in an alarm state. This status causes the System 920 to seize the network T1. (For normally open, a contact must remain closed for more than one second to activate an alarm state; it must remain open for more than three seconds to return to the normal state. For normally closed, a contact must remain open for more than one second to activate an alarm state; it must remain closed for more than three seconds to return to the normal state.)
	Disabled	The monitoring function is not active and has no effect upon the system.
CPE T1 Carrier Monitoring	Indicates the current status of the CPE-T1 monitoring function. Displays have the following meanings: *Normal (Carrier Detected)* The monitoring function is enabled and detecting a carrier signal from CPE T1. This status does not cause the System 920 to seize the network T1. *Alarm (No Carrier Detected)* The monitoring function is enabled but does not detect a carrier signal from CPE T1. This status causes the System 920 to seize the network T1. (The CPE-T1 carrier must be absent for more than one second to activate an alarm state.) *Disabled* The monitoring function is not active and has no effect upon the system.	
Manual Operation Switch Status	Indicates the status of the Manual Operation switch. Use the Manual Operation switch to seize the network T1 or return the network T1 to CPE T1. (Press the switch and hold it for one second.) The Manual Operation switch is located at the lower right on the front panel of the System 920 enclosure.	

continued

Table 13-1. General System Status Screen Parameters (cont.)

Field	Description
Manual Operation Switch Status (cont.)	Displays have the following meanings: *Normal* — The network T1 is connected to CPE T1. This is the normal state of the System 920. *Transferred (Awaiting Manual Return)* — The Manual Operation switch has been used to seize the network T1. (You must press the Manual Operation switch down and hold it for one second to return the network T1 to CPE T1.) *Manual Return* — The Manual Operation switch is returning the network T1 to CPE T1. MANUAL RETURN is displayed only while you are holding the Manual Operation switch down.
Transfer Delay Status	When no alarm conditions (due to contact inputs, CPE-T1 monitoring, or Manual-Operation-switch transfer) exist, indicates the reason why the System 920 cannot currently transfer the network T1 back to CPE T1. Displays have the following meanings: - - - — If the System 920 has not seized the network T1, or if the System 920 is seizing the network T1 due to an alarm condition, this field does not apply and is filled with dashes. *Awaiting Call Completion* — Calls are being made from System 920 OPS extensions through the network T1. The System 920 sends an alert tone every thirty seconds to encourage callers to complete calls as soon as possible. All calls must be completed before the System 920 can transfer the network T1 back to CPE T1.

continued

Table 13-1. General System Status Screen Parameters (cont.)

Field	Description
Transfer Delay Status (cont.)	*Awaiting 5 Minute Delay* Calls are being made from System 920 OPS extensions through the network T1. The System 920 sends an alert tone every thirty seconds to encourage callers to complete calls as soon as possible. All calls must be completed within five minutes or the System 920 terminates them and transfers the network T1 back to CPE T1. *Awaiting 10 Minute Delay* Calls are being made from System 920 OPS extensions through the network T1. The System 920 sends an alert tone every thirty seconds to encourage callers to complete calls as soon as possible. All calls must be completed within ten minutes or the System 920 terminates them and transfers the network T1 back to CPE T1. *Awaiting 15 Minute Delay* Calls are being made from System 920 OPS extensions through the network T1. The System 920 sends an alert tone every thirty seconds to encourage callers to complete calls as soon as possible. All calls must be completed within 15 minutes or the System 920 terminates them and transfers the network T1 back to CPE T1.
(page 2 of screen)	
Network T1 Carrier Status	Indicates whether the System 920 is synchronized with the network T1 after the System 920 has seized the network T1. Displays have the following meanings: - - - If the System 920 has not seized the network T1, this field does not apply and is filled with dashes. *Synchronized* The System 920 is synchronized with the network T1. *Not Synchronized* The System 920 is not synchronized with the network T1.

continued

Table 13-1. General System Status Screen Parameters (cont.)

Field	Description
Network T1 Alarm Status	Indicates the type of alarm being received from the network T1 if the System 920 has seized the network T1 and an alarm is being received. Displays have the following meanings: - - - If the System 920 has not seized the network T1, this field does not apply and is filled with dashes. *Normal* If the System 920 has seized the network T1, indicates that the network T1 is not sending an alarm. *Yellow Alarm* A yellow alarm is automatically transmitted to the network T1 when the receive side of the System 920's T1 interface has lost frame synchronization. With D4 (superframe) framing, a yellow alarm sends zeros in bit two of all time slots. With ESF (extended superframe) framing the format consists of repeating 16-bit patterns of eight ones followed by eight zeros in the facility data link (FDL). *Blue Alarm* A blue alarm indicates that the source of the network T1 is sending an unframed all-ones pattern. A blue alarm is also known as the alarm indication signal (AIS).
Phase Word	Provides a diagnostic indication of how well the System 920 is synchronized with the network T1. Displays have the following meanings: - - - The System 920 has not seized the network T1. *3-Digit Number* The System 920 has seized the network T1. The 3-digit number displayed provides a diagnostic indication of how well the System 920 is synchronized with the network T1. The displayed value is for use by Gordon Kapes, Inc. technical support personnel.

continued

Table 13-1. General System Status Screen Parameters (cont.)

Field	Description
System Resets	Indicates the total number of times the microprocessor in the System 920 has rebooted. The microprocessor reboots whenever power to the System 920 is interrupted or a serious error in the operating software is detected. **Comments** The System 920 accumulates the number of reboots that have occurred since the total was last cleared. (To clear this total, refer to Chapter Twenty-Two, "Performing Maintenance & Testing Tasks Using the Menu System.")
Invalid Passwords	Indicates the total number of times users have entered invalid passwords when attempting to access the System 920. **Comments** The System 920 accumulates the number of attempts that have occurred since the total was last cleared. (To clear this total, refer to Chapter Twenty-Two, "Performing Maintenance & Testing Tasks Using the Menu System.") The number displayed may indicate unauthorized personnel are tampering with the System 920.
Jitter Count Bipolar Violations ESF CRC Error Count	Indicate error counts when the System 920 is connected to the network T1. These totals are for use by Gordon Kapes, Inc. technical support personnel and are not significant for the user. For each category displayed, the System 920 accumulates the number of errors that have occurred since these totals were last cleared. (To clear totals for these categories, refer to Chapter Twenty-Two, "Performing Maintenance & Testing Tasks Using the Menu System.") For further information about the displayed categories, consult a standard T1 reference book or *Newton's Telecom Dictionary* by Harry Newton (Telecom Library, Inc.).

This page intentionally left blank.

Chapter Fourteen
Viewing ACD Function Status

Overview

View the ACD Status screen to ascertain the configuration of each of the two possible ACD functions, as well as current network T1 channel routings, assigned OPS extensions and the number of T1 channels currently in each ACD queue and in each ACD overflow.

Follow the procedure to display each ACD Status screen. Use Table 14-1 to interpret field values.

Procedure

To view ACD function status, you must access the ACD Status screen. With the Operator Menu displayed, select the ACD Status option. Then select the option for the ACD function you want to view.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **2** to select ACD Status.

   The system displays the ACD Status Menu.
4. Press the option number for either ACD 1 or ACD 2.

   The system displays the selected ACD Status screen. The ACD 1 Status screen is shown in Figure 14-1.

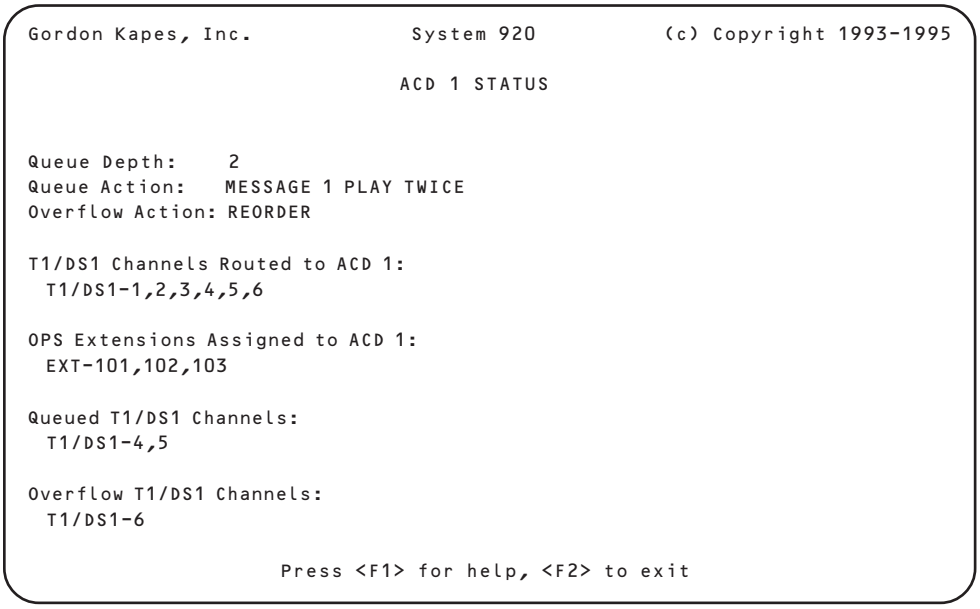


Figure 14-1. ACD 1 Status Screen

5. Use the following keys while viewing the ACD Status screen. Table 14-1 describes the fields on the ACD Status screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the ACD Status Menu	Press **F2**.

6. To return to the Operator Menu, press **F2** repeatedly.

   The system Displays the Operator Menu.

Table 14-1. ACD Status Screen Parameters

Field	Description
Queue Depth	Indicates the configured number of calls to be held while waiting to be connected to an available ACD extension.
Queue Action	Indicates the configured action taken by the System 920 when a call is put in queue. Displays have the following meanings: *Audible Ring* — The calling party hears an audible-ring progress tone until an ACD extension becomes free and answers the call. *Message 1 Play Twice* — After at least one cycle of audible ring progress tone, the calling party hears message 1 as previously recorded on the Recorder/Announcer card. The message plays no more than twice. If an ACD extension has not become free by the end of the second playing, a hold tone is issued every five seconds. This indicates the connection is still active. The hold tone is issued until an ACD extension becomes free and answers the call. *Message 2 Play Twice* — After at least one cycle of audible ring progress tone, the calling party hears message 2 as previously recorded on the Recorder/Announcer card. The message plays no more than twice. If an ACD extension has not become free by the end of the second playing, a hold tone is issued every five seconds. This indicates the connection is still active. The hold tone is issued until an ACD extension becomes free and answers the call. *Message 1 Continuous* — After at least one cycle of audible ring progress tone, the calling party hears message 1 as previously recorded on the Recorder/Announcer card. The message plays over and over until an ACD extension becomes free and answers the call.

continued

Table 14-1. ACD Status Screen Parameters (cont.)

Field	Description	
Queue Action (cont.)	*Message 2 Continuous*	After at least one cycle of audible ring progress tone, the calling party hears message 2 as previously recorded on the Recorder/Announcer card. The message plays over and over until an ACD extension becomes free and answers the call.
Overflow Action	Indicates the configured action taken by the System 920 when a call is put in overflow. Displays have the following meanings:	
	Reorder	An incoming call is directed to a reorder progress tone (fast busy).
	Message 1 Continuous	After at least one cycle of audible-ring progress tone, the calling party hears message 1 as previously recorded on the Recorder/Announcer card. The message plays over and over until the caller hangs up.
	Message 2 Continuous	After at least one cycle of audible-ring progress tone, the calling party hears message 2 as previously recorded on the Recorder/Announcer card. The message plays over and over until the caller hangs up.
T1/DS1 Channels Routed to ACD *n*	Indicates by channel number those T1/DS1 channels configured to be routed to the ACD function (where n is the number of the function).	
OPS Extensions Assigned to ACD *n*	Indicates by OPS extension number those extensions configured to be assigned to the ACD function (where n is the number of the function).	
Queued T1/DS1 Channels	Indicates by channel number those T1/DS1 channels currently in queue for this ACD function.	
Overflow T1/DS1 Channels	Indicates by channel number those T1/DS1 channels currently in overflow for this ACD function.	

Chapter Fifteen
Viewing Redirect Dialing Status

Overview

The Redirect Status screen for each redirect function shows which network-T1 channels are routed to the function and which channels are currently handling redirected calls.

Follow the procedure to display each Redirect Status screen. Use Table 15-1 to interpret field values.

Procedure

To view redirect function status, you must access the Redirect Status screen. With the Operator Menu displayed, select the Redirect Status option. Then select the option for the redirect function you want to view.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **3** to select Redirect Status.

   The system displays the Redirect Status Menu.
4. Press the option number for either Redirect 1 or Redirect 2.

   The system displays the selected Redirect Status screen. The Redirect 1 Status screen is shown in Figure 15-1.

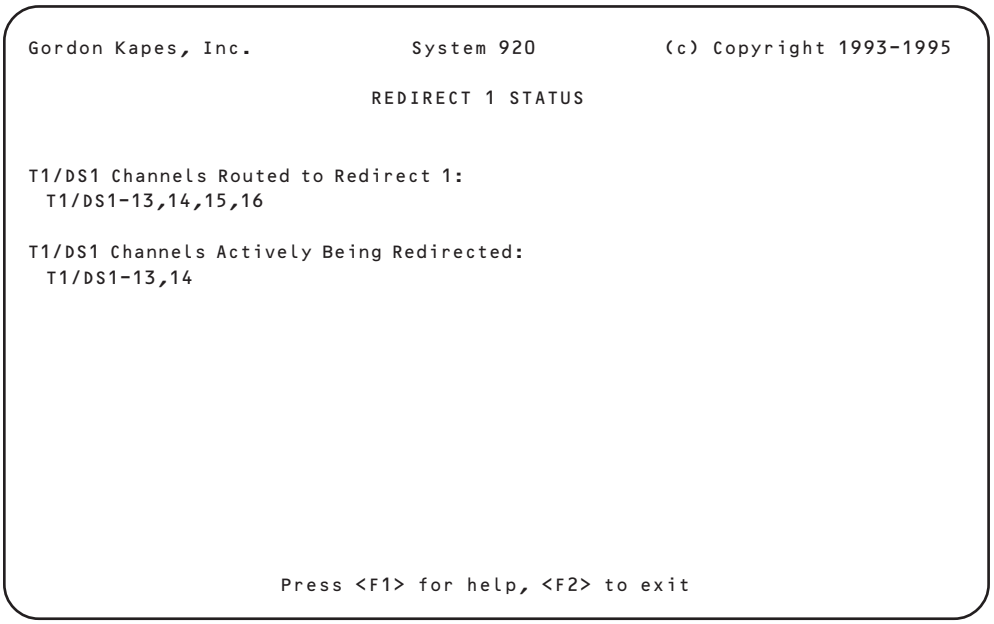


Figure 15-1. Redirect 1 Status Screen

5. Use the following keys while viewing the Redirect Status screen. Table 15-1 describes the fields on the Redirect Status screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the Redirect Status Menu	Press **F2**.

6. To return to the Operator Menu, press **F2** repeatedly.

   The system Displays the Operator Menu.

Table 15-1. Redirect Status Screen Parameters

Field	Description
T1/DS1 Channels Routed to Redirect *n*	Indicates by channel number those T1/DS1 channels configured, either directly or through DNIS routing, to be routed to the redirect function (where n is the number of the function).
T1/DS1 Channels Actively Being Redirected	Indicates by channel number those channels currently handling calls that are being redirected.

This page intentionally left blank.

Chapter Sixteen
Viewing T1/DS1 Interface Card Status

Overview

Viewing T1/DS1 Interface card status consists of examining the configured operating status, signaling method, current connection, and operating state for each of the 24 network-T1 channels.

Follow the procedure to display the T1/DS1 Interface Card screen. Use Table 16-1 to interpret field values.

Procedure

To view T1/DS1 Interface card status, you must access the T1/DS1 Interface Card Status screen. With the Operator Menu displayed, select the T1/DS1 Interface Card Status option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **4** to select T1/DS1 Interface Card Status.

   The system displays page 1 of the T1/DS1 Interface Card Status screen, shown in Figure 16-1.

```
Gordon Kapes, Inc.            System 920          (c) Copyright 1993-1995

               T1/DS1 INTERFACE CARD STATUS - Page 1 of 2

Card Present: YES
Synchronized: YES

Channel  Status     Signaling           Connection    State
 1       ENABLED    GROUND START FXS    EXT-101       RINGING
 2       ENABLED    GROUND START FXS    EXT-102       CONNECT
 3       ENABLED    GROUND START FXS    EXT-103       CONNECT
 4       ENABLED    GROUND START FXS    NONE          IDLE
 5       ENABLED    GROUND START FXS    NONE          IDLE
 6       ENABLED    GROUND START FXS    NONE          IDLE
 7       ENABLED    DID WINK            NONE          IDLE
 8       ENABLED    DID WINK            NONE          IDLE
 9       ENABLED    DID WINK            NONE          IDLE
10       ENABLED    DID WINK            NONE          IDLE
11       ENABLED    DID WINK            NONE          IDLE
12       ENABLED    DID WINK            NONE          IDLE

          Press <F1> for help, <F2> to exit, <F4> for next page
```

Figure 16-1. Page 1 of T1/DS1 Interface Card Status Screen

4. Use the following keys while viewing the T1/DS1 Interface Card Status screen. The fields on each of the two pages of the T1/DS1 Interface Card Status screen are identical. Table 16-1 describes these fields.

To	Take this Action
Display the next page	Press **F4**.
Display the previous page	Press **F3**.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

5. To return to the Operator Menu, press **F2**.

   The system Displays the Operator Menu.

Table 16-1. T1/DS1 Interface Card Status Screen Parameters

Field	Description
Card Present	Indicates whether the T1/DS1 Interface card is currently installed in the System 920 enclosure. YES indicates the card is installed. YES - DISABLED indicates the card is in soft-shutdown mode. NO indicates the card is not installed.
Synchronized	Indicates whether the T1/DS1 Interface card is synchronized with the network T1. YES indicates the card is synchronized. NO indicates the card is not synchronized. **Comments** Several seconds after the System 920 has seized the network T1, the T1/DS1 Interface card should synchronize with it.
Channel	Indicates the number of each communication channel provided by the network T1. Values in the **Status**, **Signaling**, **Connection**, and **State** fields are associated with each channel. Page 1 shows channels 1-12 and page 2 shows channels 13-24.
Status	Indicates the configured status of the channel. Displays have the following meanings: *Enabled* — The channel is being used with the displayed signaling. The values displayed under the **Connection** and **State** fields are current. *Disabled* — The channel is not being used and is not available for communication. The displayed signaling parameters affect idle state signaling only.

continued

Table 16-1. T1/DS1 Interface Card Status Screen Parameters (cont.)

Field	Description
Signaling	Indicates the signaling method configured on the T1/DS1 Interface card for the network-T1 channel. Possible displays are: GROUND START FXS GROUND START FXO GROUND START SAS GROUND START SAO LOOP START FXS LOOP START FXO LOOP START SAS LOOP START SAO OPX FXO DID WINK DID IMMEDIATE DOD WINK DOD IMMEDIATE DID/DOD WINK DID/DOD IMMEDIATE TIE TRUNK WINK TIE TRUNK IMMED **Comments** The signaling method displayed should match the requirements of the network T1. Currently when an incoming call is calling a number on a channel configured for DNIS or DISA routing, the number is displayed in this field for the channel.
Connection	Indicates the connection currently in effect for this channel. Displays have the following meanings: *Audible Ring* — This channel is connected to an audible-ring progress tone *Message 1* — This channel is connected to message 1 stored on the System 920 Recorder/ Announcer card. *Message 2* — An incoming call is connected to message 2 stored on the System 920 Recorder/Announcer card. *None* — No connection is currently in effect. *EXT-nnn* or *nnnn* — This channel is connected to the OPS extension whose number (represented by nnn or nnnn) is displayed.

continued

Table 16-1. T1/DS1 Interface Card Status Screen Parameters (cont.)

Field	Description	
Connection (cont.)	*Reorder*	This channel is connected to a reorder progress tone (fast busy).
	T1/DS1-n	This channel is connected to another network-T1 channel, where n is the channel number (1-24). For example, if this channel is connected to T1/DS1 channel 3, the display is T1/DS1-3. This type of connection occurs when an incoming call is redirected as an outgoing call through another network-T1 channel.
State	Indicates the current state, or active condition, of this channel. Displays have the following meanings:	
	Audible Ring	An audible-ring progress tone is being sent through this channel to the calling party.
	Connect	A connection has been established through this channel. Refer to the **Connection** field for more information.
	Dialing	A redirect telephone number is being dialed through this channel.
	DISA	An inbound network dial tone is provided on this channel, allowing the caller to dial either the OPS extension number they wish to access, 8 or 9 to access an outbound channel, or 0 to access the designated operator.
	DISA Link	An inbound call on another channel is being sent outbound using this channel.
	Holding	This channel has been placed on hold.
	Idle	No channel activity is occurring.
	Overflow	A call coming in through this channel has been routed to an ACD function and then placed in overflow because the configured queue depth for the ACD function has been reached.
	Queued	A call coming in through this channel has been routed to an ACD function and placed in queue.

continued

Table 16-1. T1/DS1 Interface Card Status Screen Parameters (cont.)

Field	Description	
State (cont.)	*Redirect*	A call coming in through this channel is being redirected through another outbound or two-way channel.
	Redirect Link	An inbound call on another channel is being redirected using this channel.
	Reorder	A call coming in through this channel is connected to a reorder progress tone (fast busy).
	Ringing	An OPS port has been told to supply ringing current to an OPS extension.
	Transition	This state requires a valid idle state to occur before signalling can be processed. This allows for proper synchronization with the network.
	Wait	This channel is waiting for the start of an inbound call.
	Wait Answer	This channel is waiting for the called device to answer.
	Wait Hang Up	This channel is waiting for the called device to hang up.
	Wink	Wink signaling is going through this channel.

Chapter Seventeen
Viewing OPS Card Status

Overview

Viewing OPS card status consists of examining the configured OPS extension, the assigned ACD function, and T1-outbound-access authorization for each OPS port, in addition to the current on-hook/off-hook status, connection, hold status, and operating state of each port.

Follow the procedure to display the OPS Card Status screen. Use Table 17-1 to interpret field values.

Procedure

To view OPS card status, you must access the OPS Card Status screen. With the Operator Menu displayed, select the OPS Card Status option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **5** to select OPS Card Status.

   The system displays page 1 of the OPS Card Status screen, shown in Figure 17-1.

```
Gordon Kapes, Inc.            System 920          (c) Copyright 1993-1995

                      OPS CARD STATUS - Page 1 of 3


Card 1 Present:      YES
OPS Software Version: 1.01

Port  Ext  ACD    Outbound   Status    Connect     Hold       State
1     101  NONE   NEXT       ON-HOOK   T1/DS1-1    NONE       RINGING
2     102  NONE   NEXT       OFF-HOOK  T1/DS1-2    NONE       CONNECT
3     103  NONE   NEXT       OFF-HOOK  T1/DS1-3    NONE       CONNECT
4     104  NONE   T1/DS1-4   ON-HOOK   NONE        NONE       IDLE
5     105  NONE   NO         ON-HOOK   NONE        NONE       IDLE
6     106  NONE   NO         ON-HOOK   NONE        NONE       IDLE
7     107  NONE   NO         ON-HOOK   NONE        NONE       IDLE
8     108  NONE   NO         ON-HOOK   NONE        NONE       IDLE




          Press <F1> for help, <F2> to exit, <F4> for next page
```

Figure 17-1. Page 1 of OPS Card Status Screen

4. Use the following keys while viewing the OPS Card Status screen. The fields on each of the three pages of the OPS Card Status screen are identical. Table 17-1 describes these fields.

To	Take this Action
Display the next page	Press **F4**.
Display the previous page	Press **F3**.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

5. To return to the Operator Menu, press **F2**.

   The system Displays the Operator Menu.

Table 17-1. OPS Card Status Screen Parameters

Field	Description
Card 1 Present	Indicates whether OPS Card 1 is currently installed in the System 920 enclosure. (Indicates the same for cards 2 and 3 on pages 2 and 3 of the screen.) YES indicates the card is installed. YES - DISABLED indicates the card is in soft shutdown mode. NO indicates the card is not installed.
OPS Software Version	Indicates the version number of the OPS software, if the OPS card is installed. **Comments** The version number is a code stored in a microcomputer chip on the OPS card. This code is used by Gordon Kapes, Inc. to identify the version of the software.
Port	Indicates the number of the OPS card port with which values in the **Ext**, **ACD**, **Out**, **Status**, **Connect**, **Hold**, and **State** fields are associated. This is a number within the range 1-8. **Comments** Each page of the OPS Card Status screen displays information for each set of eight ports installed on OPS cards 1, 2, and 3.
Ext	Indicates the extension number assigned this port. This can be a 3-digit number within the range 100-798 or a 4-digit number within the range 1001-7998.
ACD	Indicates the ACD function assigned the extension. Displays have the following meanings: *1* The extension is assigned to ACD 1. *2* The extension is assigned to ACD 2. *None* The extension is not assigned to an ACD function.

continued

Table 17-1. OPS Card Status Screen Parameters (cont.)

Field	Description
Outbound	Indicates whether this port has been authorized outbound access through the network T1 when the System 920 has seized the network T1. NO indicates this port is not authorized outbound access. T1/DS1-*n* (where n is the channel number) indicates this port is authorized outbound access through a specific T1/DS1 channel only. NEXT indicates this port is authorized outbound access through the next available T1/DS1 channel.
Status	Indicates whether the telephone, or other device connected to the extension, is currently on-hook or off-hook. Displays have the following meanings: *Break* — The device is experiencing a momentary disconnect of loop current. *On-Hook* — The device is on-hook—it is not signaling the system that it is about to be used and is not connected to any particular line. The bell is active and will ring if a call comes in. *Off-Hook* — The device is off-hook—it is either signaling the system it is about to be used and requires a dial tone, or it is connected to another line.
Connect	Indicates the end point for the current line connection between this OPS extension and another OPS extension or network-T1 channel. Displays have the following meanings: *None* — This OPS extension is not connected to a line. *R/A-n* — This OPS extension is connected to a Recorder/Announcer card message, where n is the message number. For example, if the extension is connected to Message 1, the display is R/A-1.

continued

Table 17-1. OPS Card Status Screen Parameters (cont.)

Field	Description
Connect (cont.)	*EXT-nnn* or *nnnn* This OPS extension is connected to another OPS extension, where nnn or nnnn is the number assigned to the other extension. For example, if this extension is connected to OPS extension 101, the display is OPS-101. *T1/DS1-n* This OPS extension is connected to a network-T1 channel, where nn is the channel number (1-24). For example, if the telephone is connected to network-T1 channel 3, the display is T1/DS1-3.
Hold	Indicates if this OPS extension has currently placed another line on hold. Displays have the following meanings: *None* This OPS extension does not have another line placed on hold. *EXT-nnn* or *nnnn* This OPS extension has placed another OPS extension on hold, where nnn or nnnn is the number assigned to the other extension. For example, if this extension has placed OPS extension 101 on hold, the display is EXT-101. *T1/DS1-n* This extension has placed a network-T1 channel on hold, where nn is the channel number (1-24). For example, if this extension has placed network-T1 channel 3 on hold, the display is T1/DS1-3.
State	Indicates the current state, or active condition, of this OPS extension. Displays have the following meanings: *Audible Ring* An audible-ring progress tone is connected to this extension. This extension is being used to make a call. An audible-ring progress tone tells the caller that ringing current is being sent to the device being called.

continued

Table 17-1. OPS Card Status Screen Parameters (cont.)

Field	Description	
State (cont.)	*Await Response*	This extension is waiting for the network T1 to signal permission for a calling party to dial a number.
	Busy Tone	A slow-busy progress tone is connected to this extension. This extension is being used to call and connect with another line. The connection cannot be made, however, because the device being called is busy or off-hook.
	Connect	A connection between the calling device and the device being called has been established through this extension.
	Dialing	A number is being dialed through this extension. For example, if the device connected to this extension is a telephone, a person is actually dialing a number when DIALING is displayed.
	Dial Tone	A dial tone progress tone is connected to this extension. This indicates the system is ready for dialing.
	Hold Tone	A hold progress tone is connected to this extension. The device connected to this extension has placed a call on hold. The System 920 is sending the hold progress tone to the caller placed on hold.
	Howler Tone	A howler progress tone is connected to this extension. A howler tone indicates that the device connected to this extension is off-hook and should be put back on-hook.
	Idle	The device connected to this extension is on-hook and is not receiving an audible ring progress tone.
	R/A Dialing *R/A Dial Tone* *R/A Playback* *R/A Program* *R/A Record*	R/A dialing states apply when the OPS extension is accessing the Recorder/ Announcer card.
	Reorder Tone	A reorder progress tone is connected to this extension. A call has been placed using the device connected to the extension but cannot be completed because all the equipment is busy.

continued

Table 17-1. OPS Card Status Screen Parameters (cont.)

Field	Description	
State (cont.)	*Ringing*	Ringing current is being sent from this extension. A caller is attempting to call this extension and the device connected to this extension is receiving ringing current.
	Silence	The condition after howler tone completes its cycle.
	Stutter Tone	A stutter progress tone is being connected to this extension. A person using the telephone connected to this extension has executed a flash. The System 920 connects the stutter tone to confirm that the flash has been successfully executed.
	Vacant	A vacant progress tone is connected to this extension. This indicates the number dialed from this extension is not valid.
	Wait Hang Up	This extension is waiting for the called device to hang up.
	Wait T1 Conn	This extension is being used to make an outbound call through the network T1, and is waiting for an available network T1 channel. The caller hears an audible-ring progress tone.

This page intentionally left blank.

Chapter Eighteen
Viewing Recorder/Announcer Status

Overview

Display the Recorder/Announcer Status screen to examine the current operating state of both message 1 and message 2.

Follow the procedure to display the Recorder/Announcer Status screen. Use Table 18-1 to interpret field values.

Procedure

To view Recorder/Announcer status, you must access the Recorder/Announcer Status screen. With the Operator Menu displayed, select the Recorder/Announcer Status option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **6** to select Recorder/Announcer Status.

   The system displays the Recorder/Announcer Status screen, shown in Figure 18-1.

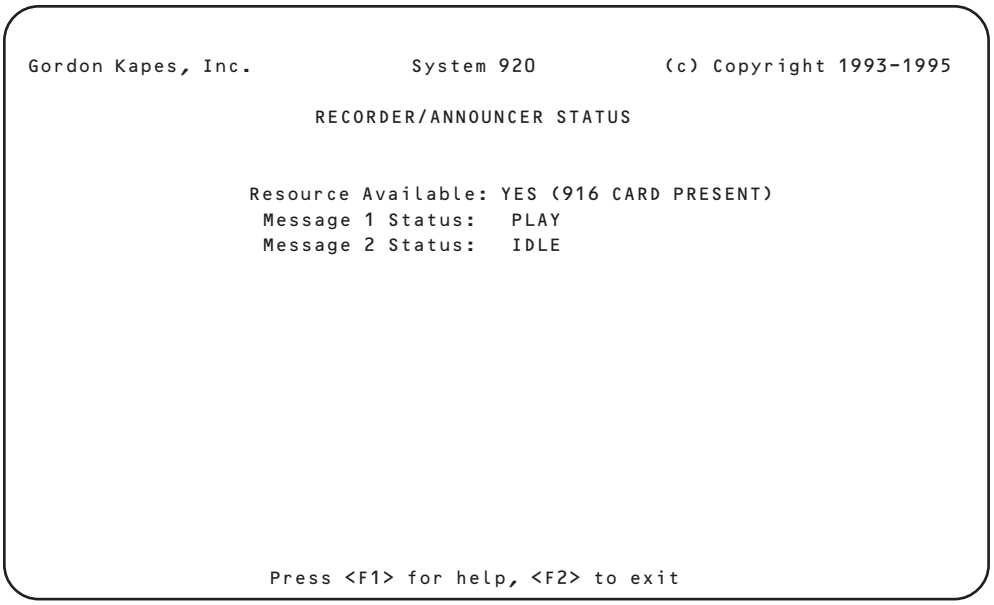


Figure 18-1. Recorder/Announcer Status Screen

4. Use the following keys while viewing the screen. Table 18-1 provides additional information about the fields on this screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

5. To return to the Operator Menu, press **F2**.

   The system Displays the Operator Menu.

Table 18-1. Recorder/Announcer Status Screen Parameters

Field	Description
Resource Available	Indicates whether the 915 or 916 card is currently installed in the System 920 enclosure. YES (91*n* CARD PRESENT), where n = 5 or 6, indicates the card is installed. NO indicates the card is not installed.
Messeage 1 Status Message 2 Status	Indicates whether each message is currently being played by the System 920. Displays have the following meanings: *Idle* — The message is not currently being played. *Play* — The message is currently being played. *Pause* — The message has finished playing and is being reset to the beginning. *Record* — A message is being recorded.

This page intentionally left blank.

Chapter Nineteen

Understanding and Using OPS Extensions

Required Equipment

As described in Chapter Three, the three OPS cards available for the System 920 enable the installation of as many as 24 analog telephones. These must be analog telephones, such as 2500-type, that support touch-tone dialing. The System 920 does not support pulse dialing.

It is highly recommended that each telephone used be equipped with a flash (or transfer) button. This simplifies use of the switch-hook flash capabilities supported by the System 920. (For more details refer to "Switch-Hook Flash Capabilities," later in this chapter.)

Purpose and Use of OPS Extensions

The primary purpose of the OPS extensions is to enable personnel at a site to communicate when customer-premise equipment (CPE-T1) is unavailable due to power loss, equipment malfunction, or maintenance downtime. When the System 920 detects loss of the CPE-T1 carrier signal, or some other alarm condition configured for the site, the System 920 seizes the network T1. This enables the use of OPS extensions to communicate over network-T1 channels; and, of course, it permits internal communication among OPS extensions when the primary phone system is shut down.

Since the System 920 always receives power, the OPS extensions can always be active. This means that *all extensions*, when configured, can be used for internal communications *at all times*—not just when the network T1 has been seized. (Refer to Chapter Five, "Performing General System Configuration," for more information.) Consequently, the system administrator at your site can implement OPS extensions as an auxiliary intercom system intended for everyday use as well as system backup.

Depending upon configuration, an OPS extension can be used to receive calls from or make calls to the network T1, or both; or an OPS extension can be configured for internal use only.

By assigning certain OPS extensions to either of the two ACD functions provided by the System 920, your system administrator may have made it possible for you, or an intermediate phone attendant, to receive calls from *selected* network T1 channels during a system shutdown or other alarm condition.

Accessing the Recorder/Announcer Card

Personnel at the site must use an authorized OPS extension for the purpose of recording or playing the messages stored in the Recorder/ Announcer card. (Either a single OPS extension or all OPS extensions can be configured to access the card. Refer to Chapter Twenty for more details.)

OPS Extension Numbering

System 920 extension numbers are automatically assigned as 101-124 when you configure a 3-digit dialing plan (OPS extension digit length), or as 1001-1024 when you configure a 4-digit dialing plan. (Refer to Chapter Five, “Performing General System Configuration.”) This covers all 24 OPS extensions if they are present. You can change automatically-assigned extension numbers to a number between 100 and 798 when the choice is 3 digits, or to a number between 1000 and 7998 when the choice is 4 digits. If your site uses more than one System 920, it is probably a good idea to use a different dialing plan for each unit since this may help to prevent confusion—even though OPS extensions installed for one System 920 cannot be used to call extensions installed for another System 920.

The outbound-access digit for each OPS extension is either 8 or 9 depending upon the configuration at your site.

Note: When speed dialing a telephone number from an OPS extension, a pause may be required after the outbound-access digit is dialed. This provides the time required to furnish dial tone.

Call Progress Tones and the Alert Tone

In general, the System 920 supports the OPS extensions with standard progress tones. For example, the System 920 uses a standard dial tone when an extension is ready to be dialed; and it uses a standard busy tone if the number called is busy. Consequently, using an OPS extension may be very similar to using your primary phone.

If you dial the outbound-access digit to call an outside number (through network T1) using an OPS extension configured for outbound dialing, the system connects a dial tone provided by either the network T1 or the System 920. If you dial the outbound-access digit using a configured OPS extension but the network T1 has not been seized or no outbound channel is available, the system connects a standard reorder tone. If you dial the outbound-access digit using an OPS extension *not configured* for outbound dialing, the system connects a standard vacant tone.

If you leave an extension off-hook, the system leaves a dial tone connected for approximately twenty seconds, replaces it with a reorder tone until a minute has expired, and then replaces the reorder tone with a howler tone for 30 seconds, then silence.

An *alert tone* is a series of three 440Hz tones produced in the sequence 0.5 second on, 0.5 second off. If you hear an alert tone while you are in progress with a call through the network T1, the System 920 is signaling you to terminate the call so it can reconnect the network T1 to CPE T1. You should end your call as soon as possible and, if need be, call the other party back using the reconnected CPE-T1 equipment by way of your primary phone.

Switch-Hook Flash Capabilities

The System 920 supports traditional switch-hook flash capabilities. These can be used with all calls among OPS extensions.

Switch-hook flash is a signaling technique enabling you to use an OPS extension to transfer a call originating either from the network T1 or from another OPS extension. By using switch-hook flash you can transfer the call to another OPS extension. This facilitates the routing and distribution of calls when the System 920 has seized the network T1 and is receiving inbound calls, and also provides flexibility when OPS extensions are used on an everyday basis.

After using your phone to connect with another party, you can signal a switch-hook flash by momentarily depressing the switch hook. On the modern telephone, the switch hook is usually the little plunger at the top of the phone that is pushed down when the handset is resting on its cradle. (To flash, you must depress the switch hook within the range 0.3 to 1.0 seconds. To receive a new dial tone, you must depress the switch hook for 1.5 seconds or more.)

Some telephones have a separate button that you press to generate a flash. Since this type of telephone eliminates the need to depress the switch hook for a specific period of time, it is recommended. Depress the switch hook on this type of telephone only to connect with a new dial tone. You cannot use the switch hook to generate a flash.

When you generate a flash, the system provides a short stutter tone telling you the flash is successful, and then a new dial tone. Dial the OPS extension of the party to whom you are transferring the call. When this party answers, you can announce the transfer and hang up. Or, if the party does not answer or does not want to take the call, you can flash again to reconnect to the original caller.

Another alternative is to flash, dial the party, and then hang up before anyone answers. This also transfers the call. The transferred party hears an audible-ring tone until the dialed extension is answered.

A step-by-step procedure for transferring a call follows.

Transferring a Call

When you are using an OPS extension to talk with someone and want to transfer the call to another OPS extension:

1. Flash your extension by pressing the flash button or switch hook.

   The system connects a momentary stutter tone to signal the flash is successful, and then a dial tone.

2. Dial the 3- or 4-digit number of the extension to which you are transferring the call.

   The system connects an audible-ring progress tone indicating that the new extension is ringing.

3. Do one of the following:

To	Take This Action
Transfer the call directly (without announcing it)	Wait until you hear the audible-ring tone, then hang up. The system connects an audible-ring tone to the calling extension, and connects the new extension when this extension is answered.
Announce the transfer	Wait for the called party to answer. Announce the call and hang up. The system connects the caller to the new extension. If the called party does not answer, flash your extension again to reconnect with the caller.

This page intentionally left blank.

Chapter Twenty
Playing and Recording Recorder/Announcer Messages

Overview

When installed in the System 920, either the 915 or 916 card can store two separate voice messages in solid-state nonvolatile memory. As described in the configuration part of this manual, each message can be used with:

- An incoming call
- An ACD function
- A redirect function
- A DNIS function

Both playing and recording messages are easy tasks. No special equipment is required. You simply access the Recorder/Announcer function using the analog telephone connected to an authorized OPS extension. (When the System 920 is configured, either all extensions or a specific extension can be authorized to access the Recorder/Announcer function.)

Next, using a touch-tone keypad, dial the number 799 (or 7999 if using 4-digit extension length). Then enter the 7-digit numeric password providing security for the function, and select the desired option as shown in Table 20-1. Play or record one or both of the messages. When finished with each task, enter #. When finished with the session, hang up.

Table 20-1. Recorder/Announcer Menu

To:	Press Touch Tone:
Play message 1	1
Play message 2	2
Record message 1	3
Record message 2	4
End each task	#

The use of Recorder/Announcer messages, which can vary greatly from site to site, depends upon available hardware and the needed configuration. Consequently, you may want to consult with your system designer before composing the required message or messages.

The 915 or 916 card may be shipped with test messages recorded at the factory. These should be immediately replaced with those appropriate to the site.

Recording a Message

Use the following instructions to record either message.

Before You Begin

Use an OPS extension authorized to access the Recorder/Announcer function. You must also have the 7-digit numeric password needed to access the function. If you do not know the password or which extension to use, consult with the system administrator at the site, or other party responsible for configuring the System 920.

Procedure

The following describes how to record a message. Use the touch-tone keypad to make all entries.

1. Lift the handset on the telephone to take it off-hook.

   You hear a dial tone.

2. Dial 799 (or 7999 if using 4-digit extension length) to access the Recorder/Announcer function.

   After a half second of silence, you hear the dial tone once again. (If you are using an unauthorized extension, you hear a reorder tone.)

3. Enter the 7-digit numeric password needed to access the Recorder/Announcer function.

   You hear a repeated beep tone. This signals that you are in the Recorder/Announcer Menu. (If you hear a reorder tone, you are not using the correct password.)

4. Use the following touch-tone keys to record a message.

To	Take this Action
Record message 1	Press **3**.
Record message 2	Press **4**.

The repeated beep tone stops. The recording begins as soon as you release the touch-tone key. The previous message is deleted.

5. Record the new message by speaking into the telephone transmitter. Press # to end the recording. (If you do not press #, the system automatically ends the recording after 20 seconds.)

   After recording ends, the new message is automatically played once. Then you hear the repeated beep tone indicating you are back in the menu.

6. Do one of the following:

To	Take this Action
Record another message	Return to step 4.
Play a message	Go to step 4 in “Playing a Message,” which follows.
Exit the Recorder/Announcer Menu	Hang up the telephone.

Playing a Message

Use the following procedure to play the existing messages. Use the touch-tone keypad to make all entries.

Before You Begin

Use an OPS extension authorized to access the Recorder/Announcer function. You must have the 7-digit numeric password needed to access the function. If you do not know the password or which extension to use, consult with the system administrator at the site, or other party responsible for configuring the System 920.

Procedure

The following describes how to play a message. Use the touch-tone keypad to make all entries.

1. Lift the handset on the telephone to take it off-hook.

   You hear a dial tone.

2. Enter 799 (or 7999 if using 4-digit extension length) to access the Recorder/Announcer function.

   After a half second of silence, you hear the dial tone once again. (If you are using an unauthorized extension, you hear a reorder tone.)

3. Enter the 7-digit numeric password needed to access the Recorder/Announcer function.

   You hear a repeated beep tone. This signals that you are in the Recorder/Announcer Menu. (If you hear a reorder tone, you are not using the correct password.)

4. Use the following touch-tone keys to play messages.

To	Take this Action
Play message 1	Press **1**.
Play message 2	Press **2**.

After the message has been played, you hear the repeated beep tone indicating you are back in the menu.

5. Do one of the following:

To	Take this Action
Play another message	Return to step 4.
Record a message	Go to step 4 in “Recording a Message,” which precedes this section.
Exit the Recorder/Announcer Menu	Hang up the telephone.

Chapter Twenty-One
Using System Diagnostics

Overview

The functions included in system diagnostics are intended to help you as troubleshooting aids for use during System 920 installation and testing. They also comprise a set of powerful tools that can assist you when using the System 920 as a network T1 simulator. This chapter has been written for the reader with significant knowledge of T1 and related communications concepts, terminology, and techniques.

You access diagnostic functions from the Diagnostic Menu. Specific options on the Diagnostic Menu enable you to do the following:

- View ST-Bus
- View T1/DS1 signal timing data
- View DNIS receiver information
- View detailed system status
- Connect tones to OPS ports and T1/DS1 channels
- Use the network transfer relay
- Reset System 920 components
- View the contents of RAM memory

Viewing ST-Bus Data

An integral part of the System 920 internal architecture is a number of “digital highways” called serial data buses. While these data buses are not part of the digital superhighway, they are relatively fast at 2.048mB/seconds! They conform with an electronic standard called ST-Bus that was cleverly created by the Mitel Corporation. ST-buses carry OPS port, T1/DS1, and progress-tone data among the System 920’s circuit cards. Monitoring the data traveling on these serial buses can often help you conceptualize what is happening inside the System 920 as it operates.

Option 1 on the Diagnostic Menu enables you to view three types of ST-Bus data. These are:

- OPS port bus data
- Network T1/DS1 bus data
- Tone plant bus data

Viewing OPS Bus Data

Option 1 on the ST-Bus Monitor Menu enables you to view OPS port ST-Bus data.

Procedure

To view OPS port data, you must access the OPS ST-Bus Monitor screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the ST-Bus Monitor option and the OPS Ports option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **1** to select ST-Bus Monitor.

   The system displays the ST-Bus Monitor Menu.
6. Press **1** to select OPS Ports.

   The system displays the OPS ST-Bus Monitor screen, shown in Figure 21-1.

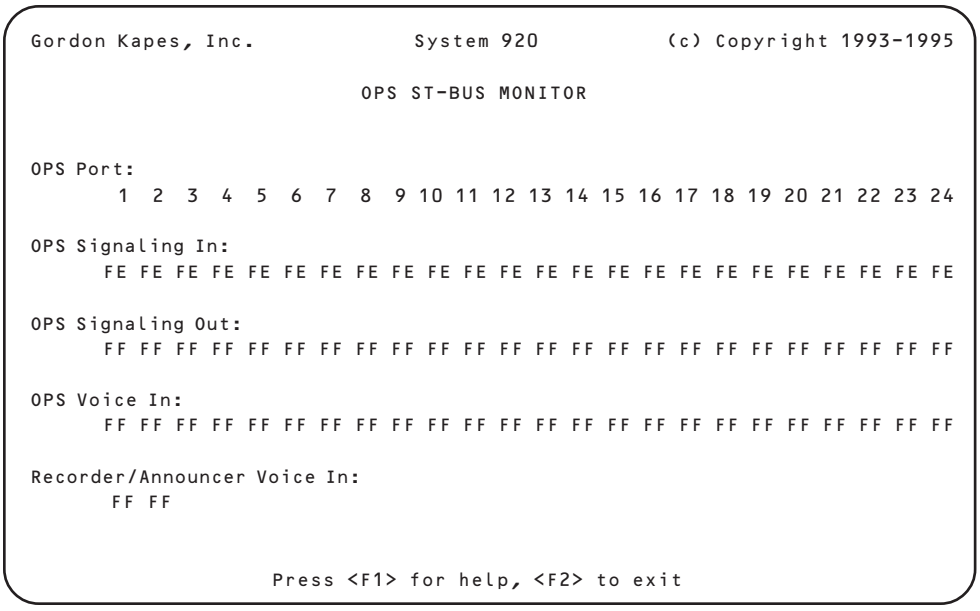


Figure 21-1. OPS ST-Bus Monitor Screen

7. Use the following keys while viewing the OPS ST-Bus Monitor screen. Table 21-1 describes the fields on the OPS ST-Bus Monitor screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-1. OPS ST-Bus Monitor Screen Parameters

Field	Description
OPS Port	Indicates OPS port number under which corresponding data is displayed.
OPS Signaling In	Indicates on-hook/off-hook status from each OPS port. Displays have the following meanings: *FD* Off-hook *FE* On-hook — Resource not present
OPS Signaling Out	Indicates ringing status to each OPS port. Displays have the following meanings: *55* Ring current *99* Break-loop *FF* Idle state — Resource not present
OPS Voice In	Displays hexadecimal data coming to each OPS port. Displays have the following meanings: *FF* Port is in the idle state *Other hex data* Port is active — Resource not present
Recorder/Announcer Voice In	Displays hexadecimal data for Message 1 and Message 2. Displays have the following meanings: *FF* Message is in the idle state *Other hex data* Message is active — Resource not present

Viewing Network T1/DS1 Channel Data

Option 2 on the ST-Bus Monitor Menu enables you to view network T1/DS1 channel data.

Procedure

To view Network T1/DS1 channel information, you must access the Network T1/DS1 ST-Bus Monitor screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the ST-Bus Monitor option and the Network T1/DS1 Channels option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **1** to select ST-Bus Monitor.

   The system displays the ST-Bus Monitor Menu.
6. Press **2** to select Network T1/DS1 Channels.

   The system displays the Network T1/DS1 ST-Bus Monitor screen, shown in Figure 21-2.

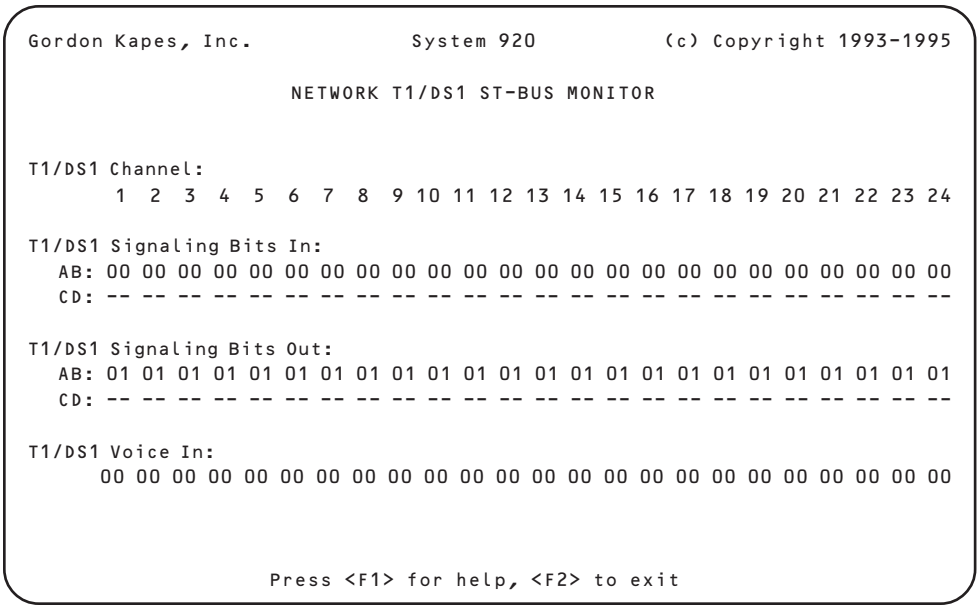


Figure 21-2. Network T1/DS1 ST-Bus Monitor Screen

7. Use the following keys while viewing the Network T1/DS1 ST-Bus Monitor screen. Table 21-2 describes the fields on the Network T1/DS1 ST-Bus Monitor screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

8. To return to the Operator Menu, press F2 repeatedly.

   The system backs out through each prior menu.

Table 21-2. Network T1/DS1 ST-Bus Monitor Screen Parameters

Field	Description
T1/DS1 Channel	Indicates channel number under which corresponding data is displayed.
T1/DS1 Signaling Bits In	Displays inbound (from network) signaling bits in binary. A and B signaling bits are used by D4 and ESF framing. C and D signaling bits are used only by ESF framing. Signaling bits are “robbed” from bit 0 of each T1/DS1 channel. — indicates signaling bits are not used.
T1/DS1 Signaling Bits Out	Displays outbound (to network) signaling bits in binary. Signaling bits are sent on bit 0 of each T1/DS1 channel. — indicates signaling bits are not used.
T1/DS1 Voice In	Displays hexadecimal voice data with robbed bit signaling from each T1/DS1 channel. Data is coming from the network.

Viewing Tone-Plant Channel Data

Option 3 on the ST-Bus Monitor Menu enables you to view tone-plant channel data.

In most cases, tone-plant channel data will only be of use to factory personnel. A ROM memory chip, located on the 912 CPU card, contains the digital representation of various tones, such as audible progress and DTMF (touch tones). The data values displayed on the tone-plant channel data monitor are simply the values stored in ROM. This monitor is of use only when a possible problem exists with one of the System 920's audible tones.

Procedure

To view tone-plant channel data, you must access the Tone Plant ST-Bus Monitor screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the ST-Bus Monitor option and the Tone Plant Channels option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **1** to select ST-Bus Monitor.

   The system displays the ST-Bus Monitor Menu.
6. Press **3** to select Tone Plant Channels.

The system displays the Tone Plant ST-Bus Monitor screen, shown in Figure 21-3.

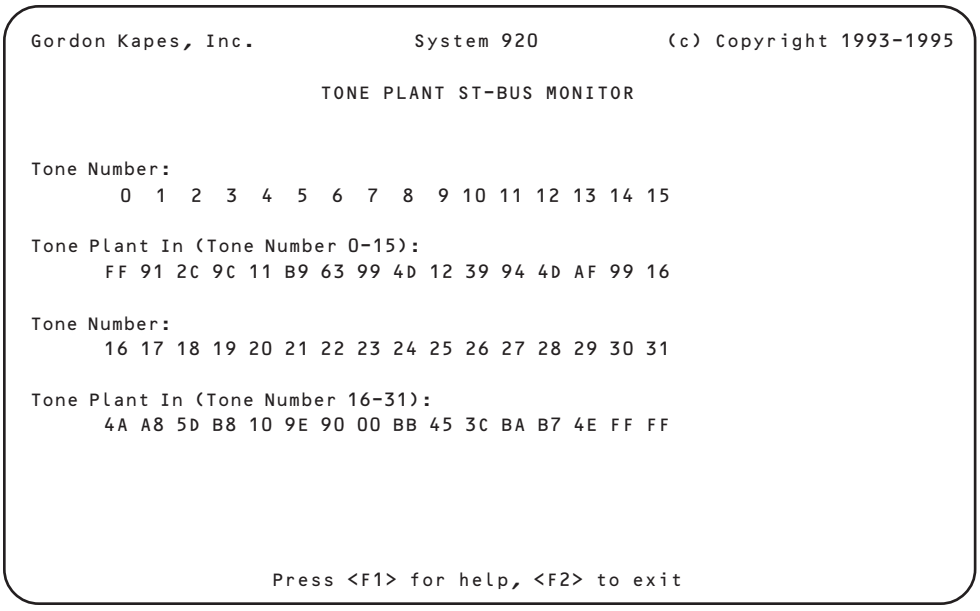


Figure 21-3. Tone Plant ST-Bus Monitor Screen

7. Use the following keys while viewing the Tone Plant ST-Bus Monitor screen. Table 21-3 describes the fields on the Tone Plant ST-Bus Monitor screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-3. Tone Plant ST-Bus Monitor Screen Parameters

Field	Description
Tone Number	Indicates tone channel number.
Tone Plant In (Tone Number 0-31)	Displays PCM-encoded tones in hexadecimal data from each tone plant channel.

Table 21-4. Tone Number Definitions

Tone Number	Meaning
0	Silence
1	DTMF 1
2	DTMF 2
3	DTMF 3
4	DTMF 4
5	DTMF 5
6	DTMF 6
7	DTMF 7
8	DTMF 8
9	DTMF 9
10	DTMF #
11	DTMF *
12	DTMF A
13	DTMF B
14	DTMF C
15	DTMF D
16	Dial Tone
17	Audible ring
18	Busy/Reorder
19	Call Waiting
20	500Hz
21	1000Hz
22	2000Hz
23	DTMF Timing (00=off, FE=pre-on, FF=on)
24	350Hz
25	480Hz
26	620Hz
27	950Hz
28	1400Hz
29	1800Hz
30	DTMF 0
31	Silence

Viewing T1/DS1 Signal Timing Data

Option 2 on the Diagnostic Menu enables you to view T1/DS1 signal timing data.

The T1/DS1 signal timing display function enables you to view changes in status of T1/DS1 signaling bits. This is useful when you are troubleshooting or monitoring a T1/DS1 channel. The function displays the exact time intervals between events such as off-hook, on-hook, wink, and answer supervision.

Procedure

To view T1/DS1 signal timing data, you must access the T1/DS1 Signal Timing screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the T1/DS1 Signal Timing option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **2** to select T1/DS1 Signal Timing.

   The system displays the T1/DS1 Signal Timing screen, shown in Figure 21-4. The cursor is initially in the **Timing Status** field.

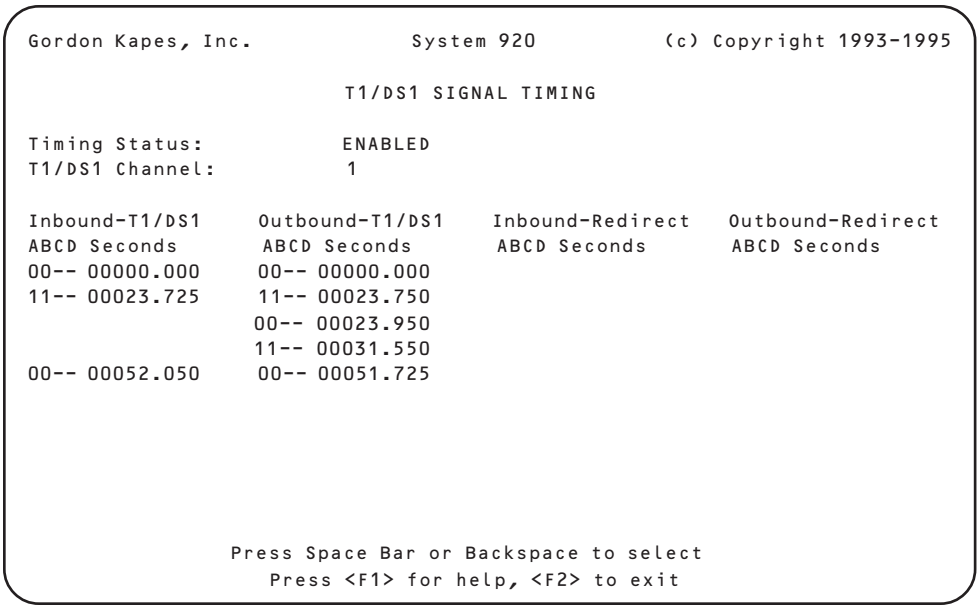


Figure 21-4. T1/DS1 Signal Timing Screen

6. Select values in the **Timing Status** and **T1/DS1 Channel** fields. View displayed data in the remaining fields. To make selections, use the following table. Table 21-5 describes the fields on the T1/DS1 Signal Timing screen.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-5. T1/DS1 Signal Timing Screen Parameters

Field	Description
Timing Status	Select the status of the timing function. Choices are: ENABLED DISABLED **Comments** Enabling the function resets time to 0.000 seconds.
T1/DS1 Channel	Select the channel for which you want to observe signal timing status. Choices are: 1-24
Inbound-T1/DS1 ABCD Seconds	Displays inbound signal timing for the selected T1/DS1 channel. ABCD shows signaling bits in binary. Seconds indicates time when signaling bit transition occurred. **Comments** A and B signaling bits are used by D4 and ESF framing. C and D signaling bits are used by ESF framing. — indicates signaling bits are not used.
Outbound-T1/DS1 ABCD Seconds	Displays outbound signal timing for the selected T1/DS1 channel. ABCD shows signaling bits in binary. Seconds indicates time when signaling bit transition occurred. **Comments** A and B signaling bits are used by D4 and ESF framing. C and D signaling bits are used by ESF framing. — indicates signaling bits are not used.

continued

Table 21-5. T1/DS1 Signal Timing Screen Parameters (cont.)

Field	Description
Inbound-Redirect ABCD Seconds	Displays inbound signal timing for a redirected channel associated with the selected T1/DS1 channel. ABCD shows signaling bits in binary. Seconds indicates time when signaling bit transition occurred. **Comments** A and B signaling bits are used by D4 and ESF framing. C and D signaling bits are used by ESF framing. — indicates signaling bits are not used.
Outbound-Redirect ABCD Seconds	Displays outbound signal timing for a redirected channel associated with the selected T1/DS1 channel. ABCD shows signaling bits in binary. Seconds indicates time when signaling bit transition occurred. **Comments** A and B signaling bits are used by D4 and ESF framing. C and D signaling bits are used by ESF framing. — indicates signaling bits are not used.

Viewing Tone Receiver Information

Option 3 on the Diagnostic Menu enables you to view tone receiver information.

The 916 card contains six DTMF (touch tone) receiver sections that serve as common control equipment for the System 920. Under software control, the receivers are assigned to inbound T1/DS1 channels that require DTMF detection. By monitoring the receivers, you can easily resolve issues of T1/DS1 trunk-type compatibility.

Procedure

To view tone receiver information, you must access the Tone Receiver Monitor screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Tone Receivers option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **3** to select Tone Receivers.

   The system displays the Tone Receiver Monitor screen, shown in Figure 21-5.

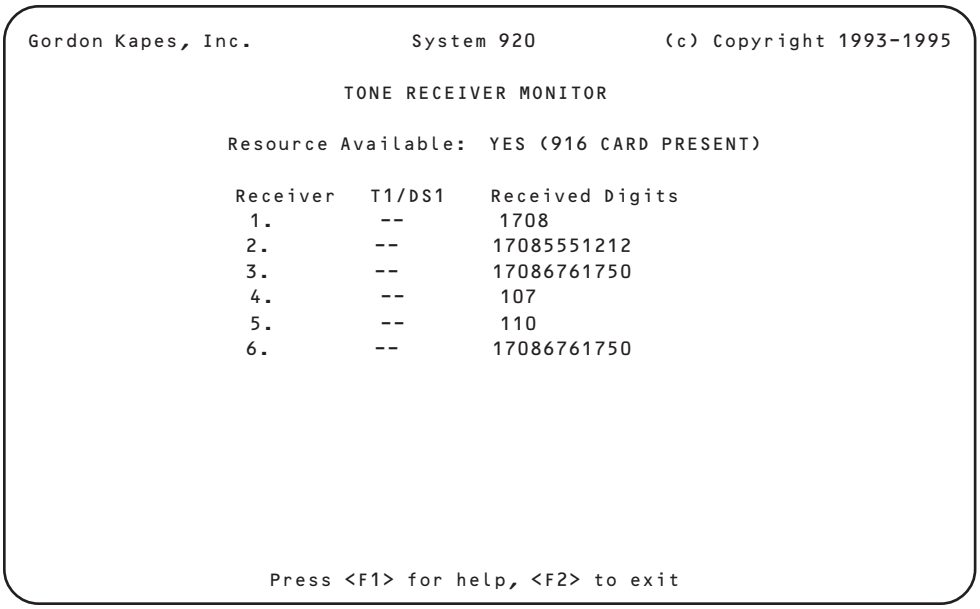


Figure 21-5.Tone Receiver Monitor Screen

6. Use the following keys while viewing the Tone Receiver Monitor screen. Table 21-6 describes the fields on the Tone Receiver Monitor screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-6. Tone Receiver Monitor Screen Parameters

Field	Description
Resource Available	Indicates whether the 916 DTMF Receiver and Recorder/ Announcer card is currently installed in the System 920 enclosure. YES (916 CARD PRESENT) indicates the card is installed. NO indicates the card is not installed.
Receiver	Indicates tone receiver number.
T1/DS1	Indicates the T1/DS1 channel currently connected to tone receiver.
Received Digits	Displays last DTMF (touch tone) digits received by tone receiver.

Viewing Detailed System Status

Option 4 on the Diagnostic Menu enables you to view detailed system status information.

Procedure

To view detailed system status information, you must access the Detailed System Status screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Detailed System Status option.

The following describes these steps in detail.

1. If you have not done so, press to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **4** to select Detailed System Status.

   The system displays the Detailed System Status screen, shown in Figure 21-6.

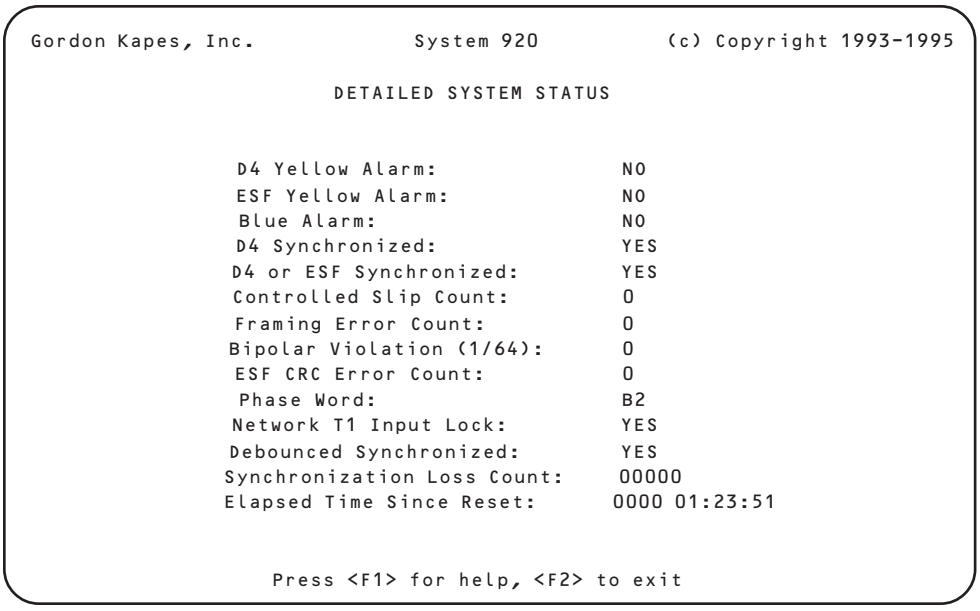


Figure 21-6. Detailed System Status Screen

6. Use the following keys while viewing the Detailed System Status screen. Table 21-7 describes the fields on the Detailed System Status screen.

To	Take this Action
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-7. Detailed System Status Screen Parameters

Field	Description
D4 Yellow Alarm	Indicates whether a D4 framing alarm is being sent from the network T1. Displays have the following meanings: *YES* Alarm is being received *NO* Alarm is not being received
ESF Yellow Alarm	Indicates whether an ESF framing alarm is being sent from the network T1. Displays have the following meanings: *YES* Alarm is being received *NO* Alarm is not being received
Blue Alarm	Indicates whether a loss of synchronization alarm is being sent from the network. Displays have the following meanings: *YES* Alarm is being received *NO* Alarm is not being received
D4 Synchronized	Indicates whether D4 framing is synchronized. Displays have the following meanings: *YES* D4 is synchronized *NO* D4 is not synchronized
D4 or ESF Synchronized	Indicates whether either D4 framing or ESF framing is synchronized. Displays have the following meanings: *YES* Either D4 or ESF is synchronized *NO* Neither D4 nor ESF is synchronized
Controlled Slip Count	Displays the buffer slip count number required to maintain synchronization, with error counts since the last time you cleared statistical information as described in Chapter Twenty-Three.
Framing Error Count	Displays the number of frames with errors since the last time you cleared statistical information as described in Chapter Twenty-Three.

continued

Table 21-7. Detailed System Status Screen Parameters (cont.)

Field	Description
Bipolar Violation (1/64)	The displayed number is 1/64 of the T1 dropped alternate pulse. For example, if the displayed number is 10, there are 640 occurrences of a dropped pulse since the last time you cleared statistical information as described in Chapter Twenty-Three.
ESF CRC Error Count	Indicates number of ESF CRC checksum errors since the last time you cleared statistical information as described in Chapter Twenty-Three.
Phase Word	Indicates line synchronization drift.
Network T1 Input Lock	Indicates whether a bipolar clock is being detected. Displays have the following meanings: *YES* Clock is being detected *NO* Clock is not being detected
Debounced Synchronized	Indicates whether bipolar clock is synchronized after time delay. Displays have the following meanings: *YES* Clock is synchronized *NO* Clock is not synchronized
Synchronized Loss Count	Indicates number of synchronization errors since the last time you cleared statistical information as described in Chapter Twenty-Three.
Elapsed Time Since Reset	Indicates the number of days, hours, minutes, and seconds since the system was last reset in the format DDDD HH:MM:SS. A reset occurs with power up, processor reboot, or when you reset the system from the Reset Menu (described later in this chapter).

Connecting Tones to OPS Ports and T1/DS1 Channels

Use the Connect Tone option on the Diagnostic Menu to connect a tone to an OPS port or to a T1/DS1 channel.

Connecting a Tone to an OPS Port

Use the OPS Ports option on the Connect Tones Menu to connect a tone to an off-hook OPS port. If you connect a tone to an on-hook OPS port, nothing happens.

Procedure

To connect a tone to an OPS port, you must access the Connect Tone To OPS Port screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Connect Tone option and the OPS Port option.

The following describes these steps in detail.

1. If you have not done so, press to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **5** to select Connect Tone.

   The system displays the Connect Tones Menu.
6. Press **1** to select OPS Port.

   The system displays the Connect Tone to OPS Port screen, shown in Figure 21-7.

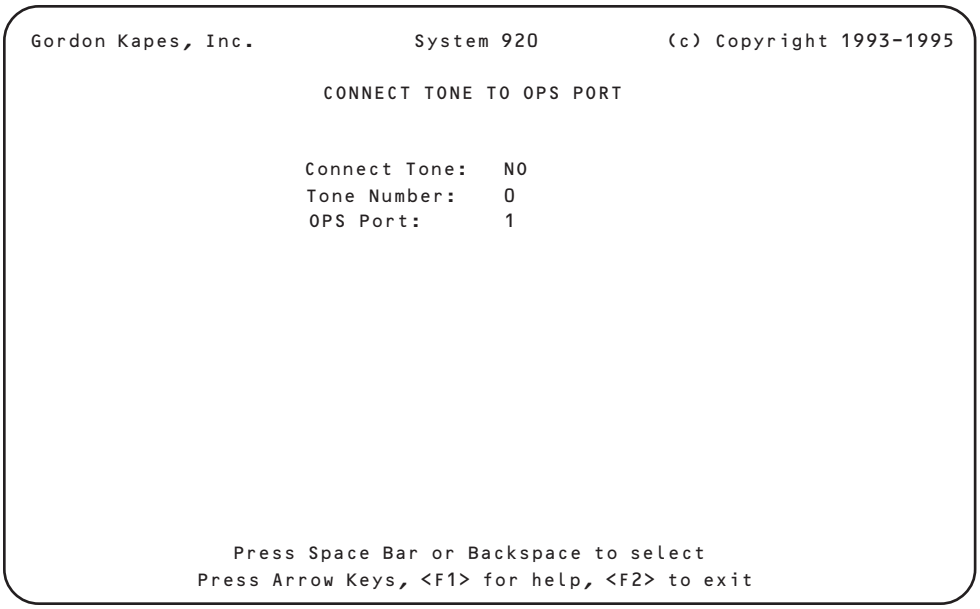


Figure 21-7. Connect Tone to OPS Port Screen

7. Select values in the fields. To make selections, use the following table. Table 21-8 describes the fields on the Connect Tone to OPS Port screen. Table 21-4 gives tone number definitions.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-8. Connect Tone to OPS Port Parameters

Field	Description
Connect Tone	Select the status of the connect tone function. Choices are: YES enables the function. NO disables the function.
Tone Number	Select the number of the tone you want to connect. The meaning of each tone number is explained in Table 21-4. Choices are 0-31.
OPS Port	Select the number of the OPS port to which you want the tone connected. Choices are 1-24.

Connecting a Tone to a T1/DS1 Channel

Use the T1/DS1 Channel option on the Connect Tones Menu to connect a tone to a seized T1/DS1 channel. If you connect a tone to an idle T1/DS1 channel, nothing happens.

Procedure

To connect a tone to a T1/DS1 channel, you must access the Connect Tone To T1/DS1 Channel screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Connect Tone option and the T1/DS1 Channel option.

The following describes these steps in detail.

1. If you have not done so, press to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **5** to select Connect Tone.

   The system displays the Connect Tones Menu.
6. Press **2** to select T1/DS1 Channel.

   The system displays the Connect Tone to T1/DS1 Channel screen, shown in Figure 21-8.

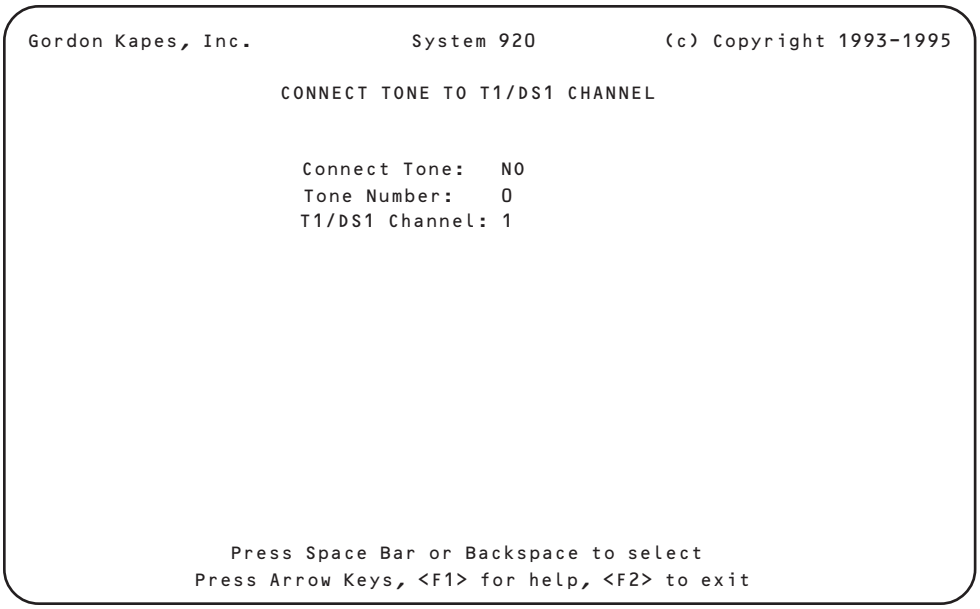


Figure 21-8. Connect Tone to T1/DS1 Channel Screen

7. Select values in the fields. To make selections, use the following table. Table 21-9 describes the fields on the Connect Tone to T1/DS1 Channel screen.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-9. Connect Tone to T1/DS1 Channel Parameters

Field	Description
Connect Tone	Select the status of the connect tone function. Choices are: YES enables the function. NO disables the function.
Tone Number	Select the number of the tone you want to connect. The meaning of each tone number is explained in Table 21-9. Choices are 0-31.
T1/DS1 Channel	Select the number of the T1/DS1 channel to which you want the tone connected. Choices are 1-24.

Seizing the Network T1 with the Network Transfer Relay

The Network Transfer Relay option performs the same function as the Manual Operation switch, which is located on the front panel of the System 920 enclosure. This option enables you to force the System 920 to seize the network T1 or to force the network T1 to connect to CPE-T1, overriding the Manual Operations switch setting or the state of any contact input.

Procedure

To operate the Network Transfer Relay function, you must access the Network Transfer Relay screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Network Transfer Relay option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **6** to select Network Transfer Relay.

   The system displays the Network Transfer Relay screen, shown in Figure 21-9.

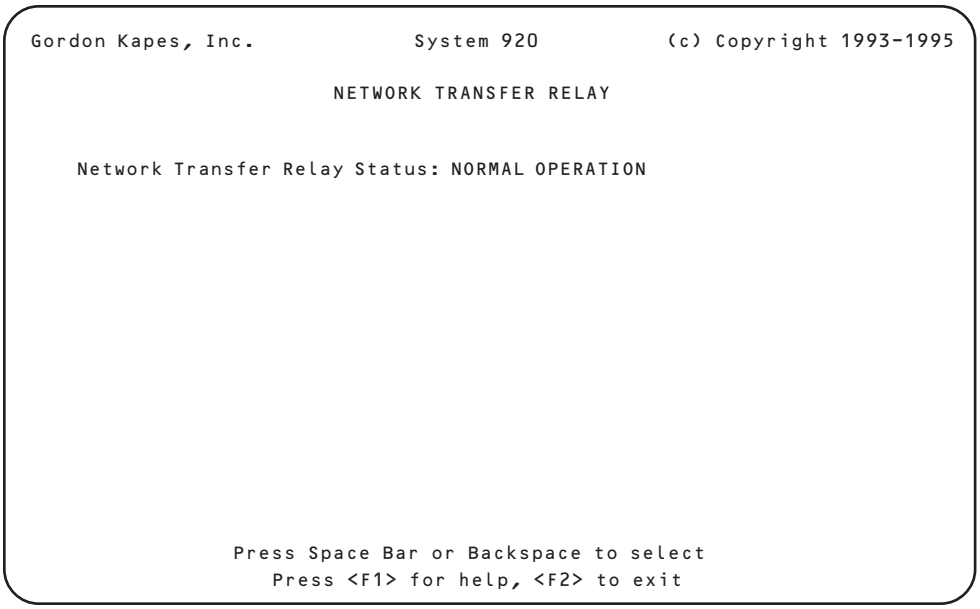


Figure 21-9. Network Transfer Relay Screen

6. Select a value in the Network Transfer Relay field. To make a selection, use the following table. Table 21-10 describes the field on the Network Transfer Relay screen.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

8. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-10. Network Transfer Relay Screen Parameter

Field	Description
Network Transfer Relay Status	Select the desired status. Choices are: NORMAL OPERATION - Enables the System 920 to function as determined by the states of contact inputs, the setting of the Manual Operation switch, or the presence of CPE-T1 carrier signal. FORCE ON (NETWORK SEIZED) - Forces the System 920 to seize the network T1. FORCE OFF (NETWORK CONNECTED TO CPE) - Forces the network T1 to connect with CPE-T1.

Resetting System 920 Components

Options available from the Reset Menu enable you to reset the following System 920 components:

- OPS ports: Resets specified port to the idle state. Does not affect configured parameters.
- T1/DS1 channels: Resets specified channel to the idle state. Does not affect configured parameters.
- T1/DS1 Interface card: Resets the entire card and clears all system statistics.
- Recorder/Announcer resource (messages): Erases two voice messages.
- Entire system: Corrupts the memory checksum and forces a reboot. Upon reboot, the System 920 detects the checksum error and as a consequence initializes all default values. You must log on again to use the menu system.

Procedure

To reset a desired component, you must access the Reset Menu. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Reset Menu option.

The following describes these steps in detail.

1. If you have not done so, press to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **7** to select Reset Menu.

   The system displays the Reset Menu, shown in Figure 21-10.

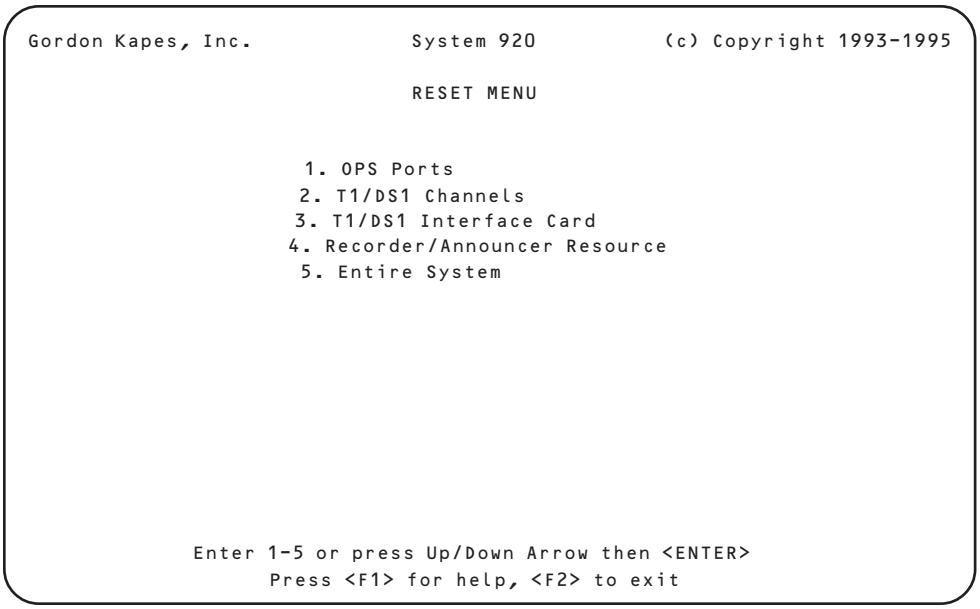


Figure 21-10. Reset Menu Screen

6. At the Reset Menu, select the option indicating the component you want to reset. Use the instructions in Table 21-11 to perform each reset. To make a selection, use the following table.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.

7. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 21-11. Resetting System 920 Components

To Reset this Component	Select Option	Then
OPS Ports	1	At the **OPS Port** field, select the desired OPS port number. Choices are 1 -24, ALL. At the **Reset** field, press **Y**. The System 920 resets the port as soon as you press **Y**.
T1/DS1 Channels	2	At the **T1/DS1 Channel** field,select the desired channel. Choices are 1 -24, ALL. At the **Reset** field, press **Y**. The System 920 resets the channel as soon as you press **Y**.
T1/DS1 Interface Card	3	At the **Do you want to reset the T1/DS1 Interface Card?** field, press **Y**. The System 920 resets the card as soon as you press **Y**.
Recorder/Announcer Resource	4	At the **Do you want to reset the recorder/announcer resource?** field, press **Y**. The System 920 erases the messages as soon as you press **Y**.
Entire System	5	At the **Do you want to reset the entire System 920?** field, press **Y**. Then press ↵ to activate the reset. The System 920 does not perform the reset until you press ↵. To cancel the reset, press **N** or exit the screen without pressing ↵. **Comments** After resetting the entire System 920, you must log in before continuing to use the menu system.

Viewing Memory Contents

Perform the following procedure to view the contents of the battery-backed RAM in the System 920.

Procedure

To view memory contents, you must access the Memory Contents screen. First, with the Operator Menu displayed, access the Administrator Menu. Next, access the Diagnostic Menu. Then select the Memory Contents option.

The following describes these steps in detail.

1. If you have not done so, press to display the Login screen.
2. Access the menu system by typing your administrator-level password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **A** to select Diagnostic Menu.

   The system displays the Diagnostic Menu.
5. Press **8** to select Memory Contents.

   The system displays the Memory Contents screen, shown in Figure 21-11. The screen shows the battery-backed RAM contents in hexadecimal and ASCII. The starting address is shown in the top address line an can range from 0000 to 7F00 (Hex).

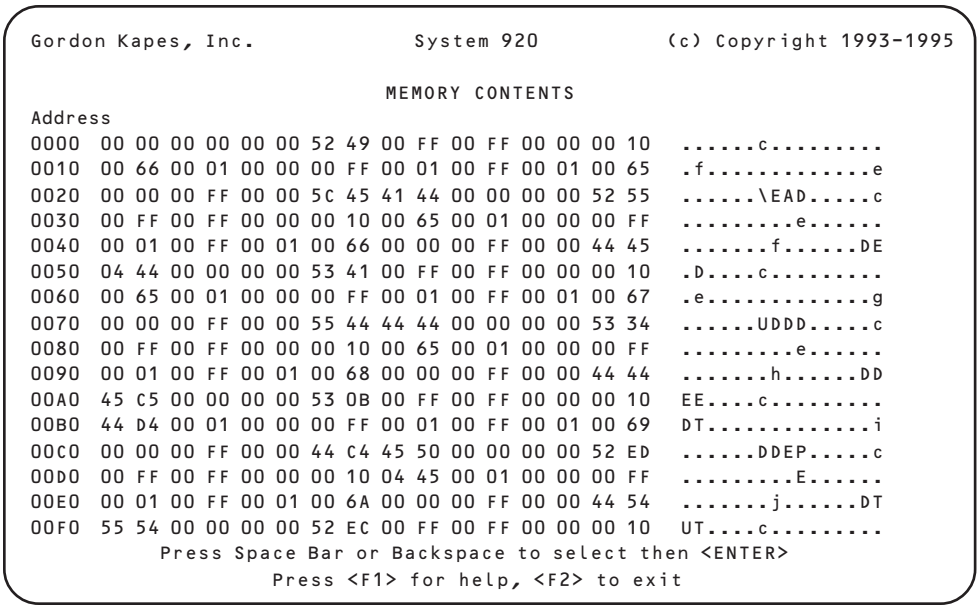


Figure 21-11. Memory Contents Screen

6. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

This page intentionally left blank.

Chapter Twenty-Two
Performing Maintenance & Testing Tasks Using the Menu System

Overview

This chapter explains how to perform the maintenance and testing functions provided by the Maintenance and Testing Functions screen. This screen is a two-page screen. The first page enables you to perform the following functions:

- Shut down the T1/DS1 Interface card
- Shut down any or all of the OPS cards
- Activate network-T1 loopback for testing
- Manually send a yellow or blue alarm to the network T1
- Deactivate jitter attenuation for testing

The second page enables you to reset system statistics accumulated on page 2 of the General System Status screen.

Conducting a Soft Shutdown

Although infrequent, circumstances may arise when you need to remove the T1/DS1 Interface card or one of the OPS cards from the System 920 while it is operating. If you need to ensure that conversations being conducted through the card are not abruptly ended, removing the card is not as simple as it might seem. The soft shutdown function, however, enables you to accomplish this with the least amount of disruption.

When you enable a soft shutdown, the system idles each communication channel or port on the card as it becomes free. This ensures that people can finish their conversations, yet prevents new calls from being placed. By monitoring the status screen for the card being shut down, you can determine when all channels have been idled. Then you can remove the card. The shutdown remains in effect until you select the normal parameter on the Maintenance and Testing screen, so do not forget to do so after replacing the card.

OPS Card Shutdown

When you need to remove an OPS card, consider performing a soft shutdown whenever calls are likely to be placed through the ports on the card. Depending upon the site, this may be whenever the System 920 is operating, or only after the System 920 has seized the network T1. Individual sites are likely to have different policies and configurations regarding OPS extensions.

T1/DS1 Card Shutdown

Consider performing a soft shutdown of the T1/DS1 Interface card only after the System 920 has seized the network T1. Since calls pass through the T1/DS1 card only at this time, a soft shutdown is not usually necessary—and you can remove the card without fear of disruption.

Activating Network-T1 Loopback

Network-T1 loopback is a type of diagnostic test where the signal transmitted by the network T1 is returned by the System 920. This enables a technician (or a diagnostic circuit built in the network T1) to compare the returned signal with the transmitted signal in the hope of determining the nature of problems.

In general, line loopback is a test you conduct at the request of, and with the guidance of, your network-T1 provider. The System 920 enables you activate a loopback test. Activate the loopback test using the Maintenance and Testing Functions screen and the directions in this chapter.

Sending a T1 Alarm

You can send T1 yellow and blue alarms (AIS), and keep alive (all-ones framed) “manually” when this capability is needed for the purpose of diagnosis and testing. In general, you send these alarms when working with, and at the direction of, your network-T1 provider. Refer to Table 22-1 for more details about these alarms.

Deactivating Jitter Attenuation

Jitter attenuation is a function of the System 920 designed to compensate for the effects of jitter—or the tendency towards lack of synchronization caused by mechanical or electrical changes. Normally jitter attenuation is enabled. However, if it is necessary to temporarily disable this function for diagnosis and testing or other reasons, you can do so at the Maintenance and Testing screen.

Clearing System Statistics

To clear the accumulated totals for the network-T1 and System 920 operating parameters displayed on page 2 of the General System Status screen, display page 2 of the Maintenance and Testing Functions screen and enter **Y** at the prompt. The system clears or zeros out all statistical information as soon as you leave the screen. (Refer to Chapter Thirteen, “Viewing General System Status,” for more information about the General System Status screen.)

Procedure

To perform a maintenance or testing task, you must access the Maintenance and Testing Functions screen. First, with the Operator Menu displayed, access the Administrator Menu. Then select the Maintenance and Testing Functions option.

The following describes these steps in detail.

1. If you have not done so, press ↵ to display the Login screen.
2. Access the menu system by typing your administrator password at the Login screen. Press ↵. Complete the VT100 compatibility test if this function is enabled.

   The system displays the Operator Menu.
3. Press **7** to select Administrator Menu.

   The system displays the Administrator Menu.
4. Press **9** to select Maintenance and Testing Functions.

   The system displays the Maintenance and Testing Functions screen, shown in Figure 22-1. The cursor is initially in the **T1/DS1 Card Operating Status** field.

```
Gordon Kapes, Inc.          System 920          (c) Copyright 1993-1995

            MAINTENANCE AND TESTING FUNCTIONS - Page 1 of 2


           T1/DS1 Card Operating Status: NORMAL
           OPS Card 1 Operating Status:  NORMAL
           OPS Card 2 Operating Status:  NORMAL
           OPS Card 3 Operating Status:  NORMAL
            Network T1 Loopback:         AUTO
            Network Alarm Status:        AUTO
           Jitter Attenuation Status:    AUTO









              Press Space Bar or Backspace to select
     Press Arrow Keys, <F1> for help, <F2> to exit, <F4> next page
```

Figure 22-1. Page 1 of Maintenance and Testing Screen

5. To enable a maintenance or testing function, select a value in the desired field. Refer to Table 22-1 for a description of each value. To clear system statistics, display page 2 of the screen by pressing **F4**. To make selections, use the following table.

To	Take this Action
Select a value	Press spacebar to scroll forward through displayed list. Press **Backspace** to scroll backward through list. Displayed value is saved and activated.
Move from field to field	Press ↑ or ↓.
Display the next page	Press **F4**.
Display the previous page	Press **F3**.
Display On-line Help	Press **F1**.
Exit On-line Help	Press **F2**.
Return to the Administrator Menu	Press **F2**.

6. To return to the Operator Menu, press **F2** repeatedly.

   The system backs out through each prior menu.

Table 22-1. Maintenance and Testing Functions Screen Parameters

Field	Description
T1/DS1 Card Operating Status	To activate a soft shutdown of the T1/DS1 Interface card, select SOFT SHUTDOWN ACTIVATED. To end the soft shutdown, select NORMAL. **Comments** NORMAL is the default operating status and is displayed at all times except when you perform the shutdown process by selecting SOFT SHUTDOWN ACTIVATED. After activating a soft shutdown, monitor the **State** fields on the T1/DS1 Interface Card Status screen. (Refer to Chapter Sixteen, "Viewing T1/DS1 Interface Card Status.") Do not forget to check both pages of the screen. After all channels are in the idle state, remove the card. Select NORMAL after you have replaced the card and want to resume operations.
OPS Card 1 Operating Status OPS Card 2 Operating Status OPS Card 3 Operating Status	To activate a soft shutdown of each OPS card select SOFT SHUTDOWN ACTIVATED in the field for the desired card. To end a soft shutdown of each card, select NORMAL in the appropriate field. **Comments** NORMAL is the default operating status and is displayed at all times except when you perform the shutdown process by selecting SOFT SHUTDOWN ACTIVATED. After activating a soft shutdown, monitor the **State** fields on the appropriate page of the OPS Card Status screen. (Refer to Chapter Seventeen, "Viewing OPS Card Status.") After all ports are in the idle state, remove the card. Select NORMAL after you have replaced the card and want to resume operations.
Network T1 Loopback	To activate line-loopback transmission, select LINE LOOPBACK (TEST ONLY). To end either loopback transmission and return to normal operating status, select AUTO.

continued

Table 22-1. Maintenance and Testing Functions Screen Parameters (cont.)

Field	Description
Network T1 Loopback (cont.)	**Comments** Line loopback return transmitted signals to the network T1 so they can be used for diagnostic purposes. The System 920 must seize the network T1 before the test can be performed. When activated, loopback is conducted from circuitry internal to the System 920. Activate these testing functions in conjunction with diagnosis and testing conducted by your network-T1 provider.
Network Alarm Status	To transmit a yellow alarm, select SEND YELLOW (TEST ONLY). To transmit a blue alarm, select SEND BLUE (TEST ONLY). To transmit a keep alive all-ones with framing, select KEEP ALIVE (TEST ONLY). To activate normal operating status, select AUTO. **Comments** AUTO is the default selection and indicates normal operating status. Should the System 920 encounter problems after seizing the network T1, it sends the appropriate alarm automatically. A yellow alarm is automatically transmitted to the network T1 when the receive side of the System 920's T1 interface has lost frame synchronization. With D4 (superframe) framing, a yellow alarm sends zeros in bit two of all time slots. With ESF (extended superframe) framing the format consists of repeating 16-bit patterns of eight ones followed by eight zeros in the facility data link (FDL). A blue alarm is automatically sent to the network T1 when the receive side of the System 920's T1 interface detects two consecutive frames with fewer than three zeros in the data bit stream. A blue alarm is also known as the alarm indication signal (AIS). When a blue alarm is active, it causes the System 920's interface to transmit an unframed all-ones pattern. A keep alive signal sends all-ones with framing.

continued

Table 22-1. Maintenance and Testing Functions Screen Parameters (cont.)

Field	Description
Network Alarm Status (cont.)	Select SEND YELLOW or SEND BLUE only when you want to "manually" transmit these alarms. In general, you send yellow or blue alarms in conjunction with the diagnosis and testing conducted by, or along with, your network-T1 provider. Your network provider may direct you to send these alarms.
Jitter Attenuation Status	To disable jitter attenuation, select OFF (TEST ONLY). To enable jitter attenuation, select AUTO. **Comments** Jitter attenuation compensates for the tendency towards lack of synchronization caused by mechanical or electrical changes. Jitter attenuation is normally enabled. It should be turned off only during testing.
(page 2 of screen)	
Do you want to clear system statistics?	To clear system statistics, press **Y** and then ↵. The system immediately deletes all totals on page 2 of the General System Status screen. (Refer to Chapter Thirteen, "Viewing General System Status.") The system resets the field to N as soon as you leave the screen.

Chapter Twenty-Three
Maintaining the System 920 & Associated Site

Overview

The System 920 requires no “traditional” maintenance such as the periodic cleaning of tape heads or making sure air vents remain unobstructed. As long as you routinely operate the System 920 with its cover in place, the enclosed cards and other hardware components should remain dust free and in good operating order.

Successful operation of the System 920 *does* depend upon the proper connection of equipment and other factors external to the System 920. Over time, inexperienced or forgetful personnel can allow the most carefully installed and configured system to deteriorate.

Needed hardware connections, for example, may not be replaced when external equipment is changed or upgraded. Outside telephone numbers may be changed but software reconfiguration neglected, and so forth. Changes such as these can go unheeded until the System 920 is actually needed for backup—and then nonworking functions are liable to be sorely missed!

This chapter reviews nine monitoring tasks you should periodically perform to ensure your System 920 is always ready as a backup or disaster-recovery resource. These tasks are the following:

- Check power switch and status LEDs
- Check OPS extensions
- Check contact connections
- Check synchronization with network T1
- Verify UPS power supply
- Review system configuration
- Ensure documentation is available
- Review disaster-recovery training plan
- Call factory for updates

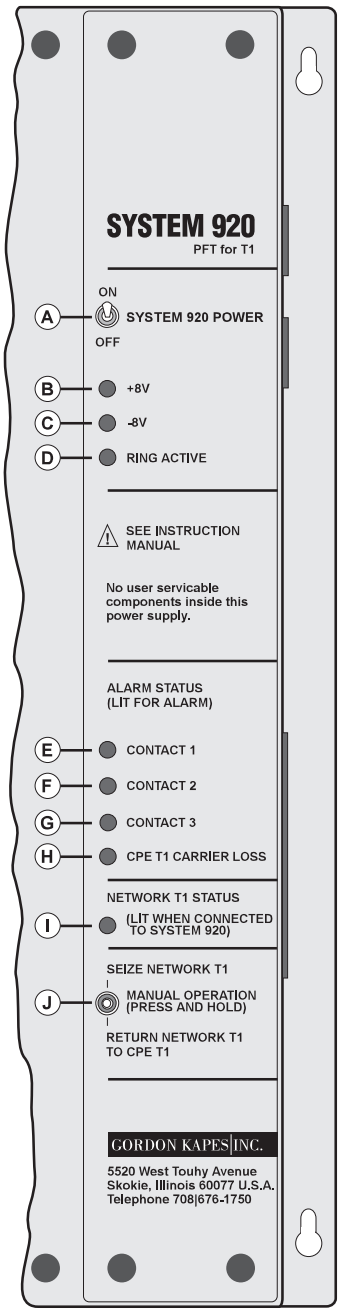
Keep a written maintenance record near the System 920. As you perform each task, note it on the record, along with the date and results.

Check Power Switch and Status LEDs

Power should always be supplied to the System 920. On a frequent and routine basis, review the status LED panel on the front of the System 920 enclosure (shown in Figure 23-1).

The +8V and –8V LEDs should always be lit. These indicate power is on and is being correctly fed to the cards in the System 920. (If power is not being supplied to the System 920, ensure the System 920 Power switch is in the On position and that the System 920 is connected to a UPS power supply.)

The Ring Active LED may also be fluttering. This indicates an OPS card is requesting ringing current from the Power Supply card. In other words, an OPS extension is being called. This usually indicates a normal situation. However, if the Ring Active LED flutters for an inordinate period of time—more than 30 seconds, perhaps—it may indicate an OPS extension calling another OPS extension has been left off-hook and is unattended. While this is not a harmful situation, it should be investigated.



A System 920 Power switch

Controls entry of –48V to the system. Move switch to the On or Off position. Since the system cannot function without power, the switch should be left in the On position during normal operating conditions.

B +8V

When lit, indicates +8V is being generated by the Power Supply card and sent to other System 920 cards. This LED should always be lit when power to the System 920 is applied and the power switch is in the On position.

C –8V

When lit, indicates –8V is being generated by the Power Supply card and sent to other System 920 cards. This LED should always be lit when power to the System 920 is applied and the power switch is in the ON position.

D Ring Active

Flutters when active. This indicates ringing current is being generated by the Power Supply card upon request of one of the OPS cards. LED should flutter only when ringing current is being generated. Continuous fluttering indicates a problem such as an OPS extension accidently left off-hook and ringing another extension.

E Contact 1

When lit, indicates contact-input-monitoring 1 function is enabled and in the alarm state.

F Contact 2

When lit, indicates contact-input-monitoring 2 function is enabled and in the alarm state.

G Contact 3

When lit, indicates contact-input-monitoring 3 function is enabled and in the alarm state.

H CPE T1 Carrier Loss

When lit, indicates CPE-T1 monitoring function is enabled and in the alarm state.

I Network T1 Status

When lit, is either lit steadily or flashes on and off. When lit steadily, indicates System 920 has seized the network T1 and is synchronized with it. When flashing on and off, indicates System 920 has seized the network T1 but is *not* synchronized with it.

When not lit, indicates the System 920 has not seized the network T1.

J Manual Operation switch

Press and hold up to seize the network T1. Press and hold down to reconnect network T1 to CPE T1.

Figure 23-1. System 920 Status LED Panel

The remaining LEDs on the panel are activated only when alarm conditions occur or when the System 920 seizes the network T1. Consequently these LEDs should not be lit under normal circumstances. A Contact LED is lit only when its contact input indicates an activated alarm condition. The CPE-T1-Carrier-Loss LED is lit only when CPE-T1-carrier monitoring activates an alarm. Once an alarm is activated, the System 920 seizes the network T1.

The Network-T1-Status LED is lit only when the System 920 has seized the network T1—either because of an activated alarm condition or because the Manual Operation switch has been used. If this LED flashes when lit, the System 920 has seized the network T1 but is not synchronized. This can indicate an error in the way general parameters have been configured for the T1/DS1 Interface card (described in Chapter Six, Configuring the T1/DS1 Interface Card).

Check OPS Extensions

Every three to six months, check each OPS extension. Check dial tone and ringing by making a call to and receiving a call from each extension.

If the Recorder/Announcer card is used at the site, access the card from an authorized OPS extension. Listen to each recorded message. Confirm that each message plays correctly and that the content is correct.

Check Contact Connections

On a quarterly basis, ensure the contact-inputs are physically connected to the devices intended.

Check Synchronization with Network T1

Every three to twelve months, make the needed arrangements at the site, and then verify that the System 920 seizes and can synchronize with the network T1. Use the Manual Operation switch to seize the network T1, or, if configured, use one or all of the contact inputs to simulate an alarm condition.

Verify the System 920 synchronizes correctly with the network T1 by checking the Network-T1-Status LED on the front panel. The LED should light when the network T1 is seized, and should remain steady when synchronized. If this LED flashes on and off, the System 920 is not synchronizing with the network T1.

Ensure calls coming in from the network T1 can be received, and that outbound calls, if configured, can be made. Test redirected T1/DS1 channels to make sure that incoming calls placed through these channels are actually redirected to valid telephone numbers.

Verifying UPS Power Supply

Ensure that the –48V power supply connected to the System 920 is an uninterruptible power supply (UPS). If CPE-T1 capability is lost at the site due to a commercial power failure, the System 920 is also rendered useless unless it is connected to a UPS power supply. No doubt, a UPS power supply was originally installed with the System 920—nevertheless, technicians have been known to exchange cables and other pieces of equipment without realizing the consequences of doing so.

Review System Configuration

Once or twice a year, review the software configuration of the system. You must connect a terminal or personal computer with VT100 emulation to serial port J1 located on the left panel of the System 920. If need be, refer to Chapters Four through Twelve, along with the configuration worksheets completed for the site, while reviewing the various configuration screens.

It is a good idea to review the configured software settings even though they do not change once they have been made. This is because the original settings may no longer be appropriate for the current site environment.

Ensure Documentation is Available

While you are checking physical connections and other aspects of the System 920, do not forget to verify that this manual is close at hand and available to personnel who may need it when configuring, maintaining, or repairing the system.

Review Disaster-Recovery Training Plan

Finally, review the disaster-recovery training program designed for the site. Ensure training in the use of the System 920 is included in this plan, and that the training is actually implemented. A properly configured and installed system is less efficient when no one knows how to use it when needed.

If the System 920 uses redirected T1/DS1 channels, contact personnel at the site or sites to which calls are redirected. Review their training plan to ensure these offsite personnel know how to handle calls redirected from the System 920.

Call Factory for Updates

Once a year, call Gordon Kapes, Inc. with the serial number for the System 920 used at your site. (The serial number is found on the right panel of the system enclosure.) Technical support personnel at the factory are glad to advise you of any upgrades recommended for your system.

Appendix A
Configuration Worksheets

Overview

This appendix contains a set of master worksheets designed to aid you with the configuration process.

The worksheets are as follows:

- General System Configuration
- T1/DS1 Interface Card Configuration
- OPS Card Configuration
- ACD Configuration
- Redirect Configuration
- DNIS Configuration
- Recorder/Announcer Card Configuration
- Security Configuration

Please photocopy the master worksheets and use the copies as you plan and gather needed data for your system configuration.

This page intentionally left blank.

General System Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Five.

OPS Extension Digit Length:	☐ 3* ☐ 4
OPS Extension Operation:	☐ ALWAYS* ☐ TRANSFER MODE ONLY
OPS Extension Dial 0:	☐ VACANT* ☐ ACD 1 ☐ ACD 1 ☐ MESSAGE 1 ☐ MESSAGE 2
Contact 1 Status:	☐ DISABLED* ☐ NORMAL-OPEN ☐ NORMAL-CLOSED
Contact 2 Status:	☐ DISABLED* ☐ NORMAL-OPEN ☐ NORMAL-CLOSED
Contact 3 Status:	☐ DISABLED* ☐ NORMAL-OPEN ☐ NORMAL-CLOSED
CPE T1 Carrier Monitoring:	☐ DISABLED* ☐ ENABLED
CPE T1 Reconnect to Network T1:	☐ RECONNECT IMMEDIATE - NO DELAY* ☐ RECONNECT AFTER ALL CALLS COMPLETED ☐ RECONNECT AFTER 5 MINUTE DELAY ☐ RECONNECT AFTER 10 MINUTE DELAY ☐ RECONNECT AFTER 15 MINUTE DELAY

* Indicates default value.

This page intentionally left blank.

T1/DS1 Interface Card Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Six.

General Parameters

Framing:	☐ D4 (SUPERFRAME)* ☐ ESF (EXTENDED SUPERFRAME)
Zero Suppression:	☐ AMI (ALTERNATE MARK INVERSION)* ☐ B8ZS (BINARY EIGHT ZERO SUPPRESSION) ☐ ZCS (ZERO CODE SUPERSESSION)
Line Build Out:	☐ 0dB* ☐ –7.5dB ☐ –15dB
Synchronization Source:	☐ NETWORK* ☐ LOCAL

* Indicates default value.

In the blanks provided, write the values required for each channel. Possible choices are listed below. (* Indicates default value.)

Channel Parameters, page 1 of screen

Channel	Status	Signaling	Direction	Routing	Dial Tone
1	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____
5	_____	_____	_____	_____	_____
6	_____	_____	_____	_____	_____
7	_____	_____	_____	_____	_____
8	_____	_____	_____	_____	_____
9	_____	_____	_____	_____	_____
10	_____	_____	_____	_____	_____
11	_____	_____	_____	_____	_____
12	_____	_____	_____	_____	_____

Choices are:

Status	Signaling	Direction	Routing	Dial Tone
DISABLED*	GROUND START FXS*	TWO WAY-8	REORDER*	NETWORK*
ENABLED	GROUND START FXO	TWO WAY-9*	ACD 1	LOCAL
	GROUND START SAS	OUTBOUND-8	ACD 2	
	GROUND START SAO	OUTBOUND-9	MESSAGE 1	
	LOOP START FXS	INBOUND	MESSAGE 2	
	LOOP START FXO		REDIRECT 1	
	LOOP START SAS		REDIRECT 2	
	LOOP START SAO		EXT-*nnn* (or *nnnn* if OPS Extension Digit Length is 4)	
	OPX FXO			
	DID WINK		DNIS 1	
	DID IMMEDIATE		DNIS 2	
	DOD WINK		DISA	
	DOD IMMEDIATE			
	DID/DOD WINK			
	DID/DOD IMMEDIATE			
	TIE TRUNK WINK			
	TIE TRUNK IMMED			

In the blanks provided, write the values required for each channel. Possible choices are listed below. (* Indicates default value.)

Channel Parameters, page 2 of screen

Channel	Status	Signaling	Direction	Routing	Dial Tone
13	_____	_____	_____	_____	_____
14	_____	_____	_____	_____	_____
15	_____	_____	_____	_____	_____
16	_____	_____	_____	_____	_____
17	_____	_____	_____	_____	_____
18	_____	_____	_____	_____	_____
19	_____	_____	_____	_____	_____
20	_____	_____	_____	_____	_____
21	_____	_____	_____	_____	_____
22	_____	_____	_____	_____	_____
23	_____	_____	_____	_____	_____
24	_____	_____	_____	_____	_____

Choices are:

Status	Signaling	Direction	Routing	Dial Tone
DISABLED*	GROUND START FXS*	TWO WAY-8	REORDER*	NETWORK*
ENABLED	GROUND START FXO	TWO WAY-9*	ACD 1	LOCAL
	GROUND START SAS	OUTBOUND-8	ACD 2	
	GROUND START SAO	OUTBOUND-9	MESSAGE 1	
	LOOP START FXS	INBOUND	MESSAGE 2	
	LOOP START FXO		REDIRECT 1	
	LOOP START SAS		REDIRECT 2	
	LOOP START SAO		EXT-*nnn* (or *nnnn* if OPS Extension Digit Length is 4)	
	OPX FXO			
	DID WINK		DNIS 1	
	DID IMMEDIATE		DNIS 2	
	DOD WINK		DISA	
	DOD IMMEDIATE			
	DID/DOD WINK			
	DID/DOD IMMEDIATE			
	TIE TRUNK WINK			
	TIE TRUNK IMMED			

This page intentionally left blank.

OPS Card Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Seven. In the blanks provided, write the values required for each port. Possible choices are listed below. (* Indicates default value.)

Card 1

Port	Ext	ACD	T1/DS1 Outbound Access
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

Choices are:

Ext	ACD	T1/DS1 Outbound Access
Enter the extension displayed on the OPS Card Configuration Screen.	NONE*	NEXT AVAILABLE CHANNEL*
	1	T1/DS1-*n* ONLY
	2	NO OUTBOUND ACCESS
Or		
Extension numbers can also be changed to a number between 100 and 798 when the choice is 3 digits, or to a number between 1000 and 7998 when the choice is 4 digits.		

In the blanks provided, write the values required for each port. Possible choices are listed below. (* Indicates default value.)

Card 2

Port	Ext	ACD	T1/DS1 Outbound Access
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

Choices are:

Ext	ACD	T1/DS1 Outbound Access
Enter the extension displayed on the OPS Card Configuration Screen.	NONE*	NEXT AVAILABLE CHANNEL*
	1	T1/DS1-*n* ONLY
	2	NO OUTBOUND ACCESS
Or		
Extension numbers can also be changed to a number between 100 and 798 when the choice is 3 digits, or to a number between 1000 and 7998 when the choice is 4 digits.		

In the blanks provided, write the values required for each port. Possible choices are listed below. (* Indicates default value.)

Card 3

Port	Ext	ACD	T1/DS1 Outbound Access
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

Choices are:

Ext	ACD	T1/DS1 Outbound Access
Enter the extension displayed on the OPS Card Configuration Screen.	NONE*	NEXT AVAILABLE CHANNEL*
	1	T1/DS1-*n* ONLY
	2	NO OUTBOUND ACCESS
Or		
Extension numbers can also be changed to a number between 100 and 798 when the choice is 3 digits, or to a number between 1000 and 7998 when the choice is 4 digits.		

This page intentionally left blank.

ACD Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Eight.

ACD 1

T1/DS1 Channels Routed to ACD 1: _____

(Refer to the ACD 1 Configuration screen, or use the T1/DS1 Interface Card Configuration worksheet for data input.)

OPS Extensions Assigned to ACD 1: _____

(Refer to the ACD 1 Configuration screen, or use the OPS Card Configuration worksheet for data input.)

Queue Depth:

☐ 0*	☐ 8	☐ 16
☐ 1	☐ 9	☐ 17
☐ 2	☐ 10	☐ 18
☐ 3	☐ 11	☐ 19
☐ 4	☐ 12	☐ 20
☐ 5	☐ 13	☐ 21
☐ 6	☐ 14	☐ 22
☐ 7	☐ 15	☐ 23
		☐ 24

Queue Action:

☐ AUDIBLE RING*
☐ MESSAGE 1 PLAY TWICE
☐ MESSAGE 2 PLAY TWICE
☐ MESSAGE 1 CONTINUOUS
☐ MESSAGE 2 CONTINUOUS

Overflow Action:

☐ REORDER*
☐ MESSAGE 1 CONTINUOUS
☐ MESSAGE 2 CONTINUOUS

* Indicates default value.

ACD 2

T1/DS1 Channels Routed to ACD 2: _____

(Refer to the ACD 2 Configuration screen, or use the T1/DS1 Interface Card Configuration worksheet for data input.)

OPS Extensions Assigned to ACD 2: _____

(Refer to the ACD 2 Configuration screen, or use the OPS Card Configuration worksheet for data input.)

Queue Depth:

☐ 0*	☐ 8	☐ 16
☐ 1	☐ 9	☐ 17
☐ 2	☐ 10	☐ 18
☐ 3	☐ 11	☐ 19
☐ 4	☐ 12	☐ 20
☐ 5	☐ 13	☐ 21
☐ 6	☐ 14	☐ 22
☐ 7	☐ 15	☐ 23
		☐ 24

Queue Action:

☐ AUDIBLE RING*
☐ MESSAGE 1 PLAY TWICE
☐ MESSAGE 2 PLAY TWICE
☐ MESSAGE 1 CONTINUOUS
☐ MESSAGE 2 CONTINUOUS

Overflow Action:

☐ REORDER*
☐ MESSAGE 1 CONTINUOUS
☐ MESSAGE 2 CONTINUOUS

* Indicates default value.

Redirect Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Nine.

Redirect 1

Dialing Command Line: _____
(Max. 40 characters)

Action:
- ☐ IMMEDIATE*
- ☐ MESSAGE 1
- ☐ MESSAGE 2

T1/DS1 Outbound Access Group:
- ☐ 8
- ☐ 9*

T1/DS1 Channels Routed to Redirect 1: _____
(Refer to the Redirect 1 Configuration screen, or use the T1/DS1 Interface Card Configuration worksheet for data input.)

* Indicates default value.

Redirect 2

Dialing Command Line: _____
(Max. 40 characters)

Action:
- ☐ IMMEDIATE*
- ☐ MESSAGE 1
- ☐ MESSAGE 2

T1/DS1 Outbound Access Group:
- ☐ 8
- ☐ 9*

T1/DS1 Channels Routed to Redirect 2: _____
(Refer to the Redirect 2 Configuration screen, or use the T1/DS1 Interface Card Configuration worksheet for data input.)

* Indicates default value.

This page intentionally left blank.

DNIS Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Ten.

DNIS 1: DNIS General Configuration

Number of Digits Required:

- ☐ 3
- ☐ 4
- ☐ 5*
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 12
- ☐ 13
- ☐ 14
- ☐ 15

First Digit Timeout:

- ☐ 1 SECONDS
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5*
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9

Interdigit Timeout:

- ☐ 1* SECONDS
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9

Default Route:

- ☐ REORDER*
- ☐ ACD 1
- ☐ ACD 2
- ☐ MESSAGE 1
- ☐ MESSAGE 2
- ☐ AUDIBLE RING

* Indicates default value.

DNIS 2: DNIS General Configuration

Number of Digits Required:

- ☐ 3
- ☐ 4
- ☐ 5*
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 12
- ☐ 13
- ☐ 14
- ☐ 15

First Digit Timeout:

- ☐ 1 SECONDS
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5*
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9

Interdigit Timeout:

- ☐ 1* SECONDS
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9

Default Route:

- ☐ REORDER*
- ☐ ACD 1
- ☐ ACD 2
- ☐ MESSAGE 1
- ☐ MESSAGE 2
- ☐ AUDIBLE RING

* Indicates default value.

In the blanks provided, write the values required for each match. Possible choices are listed below. (* Indicates default value.)

DNIS 1: DNIS Routing Configuration, page 1 of screen

No.	DNIS Number Match (*n* Digits Required)	Route if Match
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____

Choices are:

DNIS Number Match

Enter DNIS number or DNIS range.

Route if Match

Below are the factory-supplied choices for 3 digits.
Ext numbers can also be changed to a number between 100 and 798.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-106	☐ EXT-112	☐ EXT-118
☐ ACD 1	☐ EXT-101	☐ EXT-107	☐ EXT-113	☐ EXT-119
☐ ACD 2	☐ EXT-102	☐ EXT-108	☐ EXT-114	☐ EXT-120
☐ MESSAGE 1	☐ EXT-103	☐ EXT-109	☐ EXT-115	☐ EXT-121
☐ MESSAGE 2	☐ EXT-104	☐ EXT-110	☐ EXT-116	☐ EXT-122
☐ REDIRECT 1	☐ EXT-105	☐ EXT-111	☐ EXT-117	☐ EXT-123
				☐ EXT-124

Below are the factory-supplied choices for 4 digits.
Ext numbers can also be changed to a number between 1000 and 7998.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-1006	☐ EXT-1012	☐ EXT-1018
☐ ACD 1	☐ EXT-1001	☐ EXT-1007	☐ EXT-1013	☐ EXT-1019
☐ ACD 2	☐ EXT-1002	☐ EXT-1008	☐ EXT-1014	☐ EXT-1020
☐ MESSAGE 1	☐ EXT-1003	☐ EXT-1009	☐ EXT-1015	☐ EXT-1021
☐ MESSAGE 2	☐ EXT-1004	☐ EXT-1010	☐ EXT-1016	☐ EXT-1022
☐ REDIRECT 1	☐ EXT-1005	☐ EXT-1011	☐ EXT-1017	☐ EXT-1023
				☐ EXT-1024

In the blanks provided, write the values required for each match. Possible choices are listed below. (* Indicates default value.)

DNIS 1: DNIS Routing Configuration, page 2 of screen

No.	DNIS Number Match (*n* Digits Required)	Route if Match
13.	_____	_____
14.	_____	_____
15.	_____	_____
16.	_____	_____
17.	_____	_____
18.	_____	_____
19.	_____	_____
20.	_____	_____
21.	_____	_____
22.	_____	_____
23.	_____	_____
24.	_____	_____

Choices are:

DNIS Number Match

Enter DNIS number or DNIS range.

Route if Match

Below are the factory-supplied choices for 3 digits.
Ext numbers can also be changed to a number between 100 and 798.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-106	☐ EXT-112	☐ EXT-118
☐ ACD 1	☐ EXT-101	☐ EXT-107	☐ EXT-113	☐ EXT-119
☐ ACD 2	☐ EXT-102	☐ EXT-108	☐ EXT-114	☐ EXT-120
☐ MESSAGE 1	☐ EXT-103	☐ EXT-109	☐ EXT-115	☐ EXT-121
☐ MESSAGE 2	☐ EXT-104	☐ EXT-110	☐ EXT-116	☐ EXT-122
☐ REDIRECT 1	☐ EXT-105	☐ EXT-111	☐ EXT-117	☐ EXT-123
				☐ EXT-124

Below are the factory-supplied choices for 4 digits.
Ext numbers can also be changed to a number between 1000 and 7998.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-1006	☐ EXT-1012	☐ EXT-1018
☐ ACD 1	☐ EXT-1001	☐ EXT-1007	☐ EXT-1013	☐ EXT-1019
☐ ACD 2	☐ EXT-1002	☐ EXT-1008	☐ EXT-1014	☐ EXT-1020
☐ MESSAGE 1	☐ EXT-1003	☐ EXT-1009	☐ EXT-1015	☐ EXT-1021
☐ MESSAGE 2	☐ EXT-1004	☐ EXT-1010	☐ EXT-1016	☐ EXT-1022
☐ REDIRECT 1	☐ EXT-1005	☐ EXT-1011	☐ EXT-1017	☐ EXT-1023
				☐ EXT-1024

In the blanks provided, write the values required for each match. Possible choices are listed below. (* Indicates default value.)

DNIS 2: DNIS Routing Configuration, page 1 of screen

No.	DNIS Number Match (*n* Digits Required)	Route if Match
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____

Choices are:

DNIS Number Match

Enter DNIS number or DNIS range.

Route if Match

Below are the factory-supplied choices for 3 digits.
Ext numbers can also be changed to a number between 100 and 798.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-106	☐ EXT-112	☐ EXT-118
☐ ACD 1	☐ EXT-101	☐ EXT-107	☐ EXT-113	☐ EXT-119
☐ ACD 2	☐ EXT-102	☐ EXT-108	☐ EXT-114	☐ EXT-120
☐ MESSAGE 1	☐ EXT-103	☐ EXT-109	☐ EXT-115	☐ EXT-121
☐ MESSAGE 2	☐ EXT-104	☐ EXT-110	☐ EXT-116	☐ EXT-122
☐ REDIRECT 1	☐ EXT-105	☐ EXT-111	☐ EXT-117	☐ EXT-123
				☐ EXT-124

Below are the factory-supplied choices for 4 digits.
Ext numbers can also be changed to a number between 1000 and 7998.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-1006	☐ EXT-1012	☐ EXT-1018
☐ ACD 1	☐ EXT-1001	☐ EXT-1007	☐ EXT-1013	☐ EXT-1019
☐ ACD 2	☐ EXT-1002	☐ EXT-1008	☐ EXT-1014	☐ EXT-1020
☐ MESSAGE 1	☐ EXT-1003	☐ EXT-1009	☐ EXT-1015	☐ EXT-1021
☐ MESSAGE 2	☐ EXT-1004	☐ EXT-1010	☐ EXT-1016	☐ EXT-1022
☐ REDIRECT 1	☐ EXT-1005	☐ EXT-1011	☐ EXT-1017	☐ EXT-1023
				☐ EXT-1024

In the blanks provided, write the values required for each match. Possible choices are listed below. (* Indicates default value.)

DNIS 2: DNIS Routing Configuration, page 2 of screen

No.	DNIS Number Match (*n* Digits Required)	Route if Match
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____

Choices are:

DNIS Number Match

Enter DNIS number or DNIS range.

Route if Match

Below are the factory-supplied choices for 3 digits.
Ext numbers can also be changed to a number between 100 and 798.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-106	☐ EXT-112	☐ EXT-118
☐ ACD 1	☐ EXT-101	☐ EXT-107	☐ EXT-113	☐ EXT-119
☐ ACD 2	☐ EXT-102	☐ EXT-108	☐ EXT-114	☐ EXT-120
☐ MESSAGE 1	☐ EXT-103	☐ EXT-109	☐ EXT-115	☐ EXT-121
☐ MESSAGE 2	☐ EXT-104	☐ EXT-110	☐ EXT-116	☐ EXT-122
☐ REDIRECT 1	☐ EXT-105	☐ EXT-111	☐ EXT-117	☐ EXT-123
				☐ EXT-124

Below are the factory-supplied choices for 4 digits.
Ext numbers can also be changed to a number between 1000 and 7998.

☐ REORDER*	☐ REDIRECT 2	☐ EXT-1006	☐ EXT-1012	☐ EXT-1018
☐ ACD 1	☐ EXT-1001	☐ EXT-1007	☐ EXT-1013	☐ EXT-1019
☐ ACD 2	☐ EXT-1002	☐ EXT-1008	☐ EXT-1014	☐ EXT-1020
☐ MESSAGE 1	☐ EXT-1003	☐ EXT-1009	☐ EXT-1015	☐ EXT-1021
☐ MESSAGE 2	☐ EXT-1004	☐ EXT-1010	☐ EXT-1016	☐ EXT-1022
☐ REDIRECT 1	☐ EXT-1005	☐ EXT-1011	☐ EXT-1017	☐ EXT-1023
				☐ EXT-1024

Recorder/Announcer Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Eleven.

Recorder/Announcer Access Extension:

☐ 101*	☐ 109	☐ 117
☐ 102	☐ 110	☐ 118
☐ 103	☐ 111	☐ 119
☐ 104	☐ 112	☐ 120
☐ 105	☐ 113	☐ 121
☐ 106	☐ 114	☐ 122
☐ 107	☐ 115	☐ 123
☐ 108	☐ 116	☐ 124
		☐ ALL

Above are the factory-supplied choices for 3 digits. Ext numbers can also be changed to a number between 100 and 798.

☐ 1001*	☐ 1009	☐ 1017
☐ 1002	☐ 1010	☐ 1018
☐ 1003	☐ 1011	☐ 1019
☐ 1004	☐ 1012	☐ 1020
☐ 1005	☐ 1013	☐ 1021
☐ 1006	☐ 1014	☐ 1022
☐ 1007	☐ 1015	☐ 1023
☐ 1008	☐ 1016	☐ 1024
		☐ ALL

Above are the factory-supplied choices for 4 digits. Ext numbers can also be changed to a number between 1000 and 7998.

Recorder/Announcer Numeric Password: _____

(7 digits. Factory-supplied sample: *1234567*)

* Indicates default value.

This page intentionally left blank.

Security Configuration Worksheet

Use this worksheet in conjunction with the instructions in Chapter Twelve.

Operator-Level Password: _____
(Max. 10 characters. Factory-supplied sample: *OPERATOR*)

Administrator-Level Password: _____
(Max. 10 characters. Factory-supplied sample: *ADMIN*)

Maintenance Port Inactivity Time (minutes): _____ (60*) MINUTES
(1-999)

Perform VT100 Compatibility
Test Upon Login: ☐ YES*
☐ NO

* Indicates default value.

This page intentionally left blank.

Appendix B
Technical Notes

Trunk Support

The System 920 supports a number of trunk types that are commonly used with T1/DS1 circuits. The maze of overlapping, and sometimes conflicting, technical standards made selecting the exact implementation for each type quite tricky. Gordon Kapes, Inc. selected as its major reference source a standard from the Electronic Industries Association: Private Branch Exchange (PBX) Switching Equipment for Voiceband Application EIA/TIA-464-A, February 1989. For specific information concerning DID (Direct Inward Dial), DOD (Direct Outward Dial), and DID/DOD another standard was used: U S West Communications, Inc. Technical Publication, Digital Switched Services, Publication 77319, Issue A, March 1992. Please refer to these publications for detailed information on this highly exciting subject!

This page intentionally left blank.

Appendix C
System 920 Specifications

This appendix contains technical specifications for the System 920. The specifications are subject to change without notice.

General

Dimensions (Overall)

13.9 inches high (35.3cm)
11.5 inches wide (29.2cm)
10.2 inches deep (25.9cm)

Weight (all cards installed)

23.5 pounds (10.7kg)
Shipping Weight: 27.0 pounds (12.3kg)

Mounting

Wall mounted to minimum ¾-inch thick plywood backboard

Environment

0 to 50 degrees C, humidity to 95% (no condensation)

Connectors

Two 25-pair plugs (male), one 25-pin D-subminiature connector (female), two 8-position non-keyed modular jacks

Power Requirements

Voltage: –42.5 to –56Vdc, filtered and regulated

Current: 1.0 amp maximum

Type: uninterruptible, even in the event of a commercial power failure

Connections: two pairs on 25-pair plug P2

Maintenance Port

Type: RS-232-C Data Communications Equipment (DCE)

Data Format: 8 data bits, no parity, 1 stop bit (8-N-1)

Data Rate: 9600 baud

Flow Control: XON/XOFF

Connector: 25-pin D-Subminiature, female

LED Indicators

Qty: 7

Indication: +8V, –8V, ring active, contact inputs 1-3, and network T1 status

Program Data Storage

Type: 128K bytes (16 bits/byte) ROM

Configuration Data Storage

Type: 128K bytes (16 bits/byte), super low power static RAM

Backup Power: 3V, 150mAh lithium battery, field replaceable

Memory Retention with No DC Power Present: 6 years cumulative, minimum

Contact Inputs

Qty: 3

Signal Compatibility: normally open (not shorted) or normally closed (shorted)

Signal Requirements: signals connected to the contact inputs must be capable of handling 5mA at 10Vdc

Connections: 3 pairs on 25-pair plug P2

Relay Contacts

Qty: 2, one normally open (not shorted), one normally closed (shorted)

Rating: 0.5A maximum at 60Vdc or 60Vac (resistive)

Connections: two pairs on 25-pair plug P2

Network T1 Connection

Directly connects to RJ48C using an 8-position modular data cable (cable and 8-position modular jack included with System 920)

CPE T1 Connection

Connects to CPE T1 equipment using 8-position modular data cable to mate with 8-position modular jack (cable and jack included with System 920)

Network T1 to CPE T1 Transfer Method

Metallic switching using sealed, bifurcated relay contacts

Regulatory Compliance

Complies with Part 68, FCC Rules

FCC Registration Number: GIDUSA-18534-DE-N

Ringer Equivalence: not applicable

Required Connector: USOC RJ48C

Service Code: 6.0N

Facility Interface Code: 04DU9-B (D4 Framing), 04DU9-C (ESF Framing)

Radiated Noise Compliance

Complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

Reliability

MTBF - to be determined - per Method I of Bellcore TR-NWT-000332, Issue 3, September 1990

913 T1/DS1 Interface Card

Installation

For use in System 920 enclosure only, one card maximum

T1 Circuit Compatibility

Designed for direct connection to T1/DS1 circuit without requiring the use of an external channel service unit (CSU). CSU circuitry is contained on the 913 Card and is intended only for System 920 use. CSU functionality is not provided to connected CPE T1 equipment.

Framing: D4 (Superframe), ESF

Zero Suppression: AMI, B8ZS, ZCS

Signalling Method: Robbed-Bit

Trunk Support

Ground Start FXS, FXO, SAS, SAO
Loop Start FXS, FXO, SAS, SAO
OPS FXO
DID Wink, Immediate
DOD Wink, Immediate
DID/DOD Wink, Immediate
Tie Trunk Wink, Immediate

Loopback

Manual: accessed using maintenance port menu system

Automatic: in-band for D4 (Superframe), FDL message for ESF

Dial Tone Source for outbound T1 dialing: local (internally generated) or network

Transmitter

Line Rate: 1.544 Mbps ±50bps (local source)

Synchronization Source: local (internally generated) or network T1 (external)

Line Code: bipolar (except when B8ZS active)

Line Impedance: 100 ohms, resistive

Line Build Out: 0, –7.5, and –15dB

Transmit Pulse Characteristics: meets the requirements of AT&T Communications Document TR 62411 (December 1990), ANSI T1.403-1989

Receiver

Line Rate: 1.544Mbps ±200bps

Line Code: bipolar (except when B8ZS active)

Line Impedance: 100 ohms, resistive

Sensitivity: 0 to –30dBSX

Maximum Cable Length for Correct Performance: 6000 feet

Jitter Tolerance and Jitter Attenuation: meets the requirements of AT&T Communications Document TR 62411 (December 1990), ANSI T1.403-1989

CPE T1 Carrier Monitoring

Circuitry watches for the presence of digital information with a center frequency of 772kHz

914 OPS Card

Installation

For use in System 920 enclosure only, three cards maximum

OPS Ports

Qty: 8

Type: meets the requirements for FCC Part 68 Class A PBX OPS Circuit

Port Connections

8 pairs on 25-pair plug P1 (per card)

Port Parameters

Impedance: 600 ohms

Loop Supply Voltage: –48Vdc

Loop Supply Current: 22mA with 300 ohm loop, 18mA with 1300 ohm loop, 16mA with 1800 ohms loop, 24mA with shorted tip and ring

Ring Voltage: 87Vac, 20Hz, sine wave

Ring Cadence: 0.95 seconds on/3.050 seconds off

Ringer Load: maximum REN of two or less

On-Hook to Off-Hook Detection: 0.2 seconds

Switch Hook Flash Timing: 0.3 to 1.0 seconds

Off-Hook to On-Hook timing: 1.5 seconds for new dial tone

Disconnection Supervision: 1.0 second break in loop current

Dialing: DTMF only, pulse dialing not supported

Progress Tones

Dial tone (350Hz+440Hz)

Reorder tone (480Hz+62Hz)

Busy tone (480Hz+620Hz)

Audible ring tone (440Hz+480Hz)

Vacant tone (620Hz/440Hz)

Howler tone (1000Hz)

915 Recorder/Announcer Card

Installation

For use in System 920 enclosure only, one card maximum

Recorder/Announcer Channels

Qty: 2

Duration: 20 seconds, maximum, per channel

Recording Audio Source: System 920 OPS telephone only

916 DTMF Receiver and Recorder/Announcer Card

Installation

For use in System 920 enclosure only, one card maximum

Recorder/Announcer Channels

Qty: 2

Duration: 20 seconds, maximum, per channel

Recording Audio Source: System 920 OPS telephone only

DTMF Receivers

Qty: 6

DTMF Tone Present Detect Time: 40mS max

Minimum Time between DTMF Tones: 40mS max

Appendix D
Terminal Emulator Requirements

Overview

The System 920's menu system is designed to communicate with terminals and personal computers that emulate the keyboard and screen position commands of a DEC VT100 terminal.

Keyboard Commands

For operation, the maintenance port requires the use of several VT100 cursor-position and function keys. The selected terminal or terminal-emulator software must support the following keys and respective key sequences:

Key Name Values	Characters Sent	Hex
Tab	Ctrl-I	09
Backspace	Ctrl-H	08
Up Arrow	Esc [A	1B 5B 41
Down Arrow	Esc [B	1B 5B 42
Left Arrow	Esc [D	1B 5B 44
Right Arrow	Esc [C	1B 5B 43
F1	Esc O P	1B 4F 50
F2	Esc O Q	1B 4F 51
F3	Esc O R	1B 4F 52
F4	Esc O S	1B 4F 53

Please note that many of the terminal emulator software packages do a very poor job of emulation. We were shocked to find they didn't even support the function keys F1-F4. So before you try to connect with the System 920, do a careful review of your terminal emulator character set.

We are very fond of DATASTORM TECHNOLOGIES' PROCOMM PLUS software package. Its VT100 terminal emulator implementation is excellent–we highly recommend it. (They refer to it as VT100/102 emulation.) Whatever software you choose, be certain to confirm that the required keys are implemented.

Screen Position Commands

For correct operation the maintenance port requires the use of several VT100 screen-position commands. The selected terminal or terminal emulator software must support the following sequences:

Function	Characters Sent	Hex Values
Normal Video	Esc [0 m	1B 5B 30 6D
Bold Video	Esc [1 m	1B 5B 31 6D
Reverse Video	Esc [7 m	1B 5B 37 6D
Clear Screen	Esc [2 J	1B 5B 32 49
Clear from Cursor to End of Line	Esc [0 K	1B 5B 30 4A
Position Cursor at *cc* 66 Row *rr*, Column *cc* where *rr* = 1-24 *cc* = 1-80	Esc [*rr* ; *cc*f	1B 5B *rr* 3B

Appendix E
Maintenance Port Connections

This appendix is provided as a reference when you are preparing an interconnecting cable for use between the System 920's maintenance port and a serial port on a related device. Table E-1 provides detailed connection information for the port. Subsequent paragraphs describe how the port functions. At the end of this section examples are provided detailing actual cable implementations.

Table E-1. Serial Port Connection Chart

Pin	Direction	Description
2	To System 920	Transmitted Data (TD)
3	From System 920	Received Data (RD)
5	From System 920	Clear to Send (CTS)
6	From System 920	Data Set Ready (DSR)
7	To/From System 920	Signal Ground (SG)
8	From System 920	Data Carrier Detect (DCD)

Notes:

1. The port uses a 25-pin D-Subminiature female connector.
2. The port is configured as RS-232-C Data Communications Equipment (DCE).
3. Pin 1, shield, is not connected on DCE equipment. Cable shield wire will pick up shield at DTE equipment.
4. Pin 5, CTS, and Pin 6, DSR, are connected together and held high (+8Vdc through a 3300 ohm resistor) and do not change state.
5. Pin 8, DCD, is held high (+8Vdc through a 3300 ohm resistor) and does not change state.

Understanding the Serial Ports

Correct maintenance port operation depends on the careful preparation of a cable linking the System 920 maintenance port to the related equipment. Before preparing a cable, it is important to understand how the System 920's port is implemented. The port consists of two parts: data transmission to and from the connected equipment and general purpose pull-up signals.

Data transmission takes place using two pins: one pin for data sent by the System 920, and one pin for data received by the System 920. In some applications, these pins, along with signal ground, may be the only connections required to fully interface the System 920 with another device.

The System 920 holds the Clear to Send (CTS), Data Set Ready (DSR), and Data Carrier Detect (DCD) pins in the high state. These are provided for general purpose use, allowing one or more pins on the related equipment to be pulled to the high state.

Hardware Handshaking

The System 920's maintenance port does not implement hardware data-flow control. The superior XON/XOFF software data-flow control is implemented.

Preparing the Serial Cable

Preparing serial cables requires a clear understanding of three topics: System 920 serial port, the serial port on the related equipment, and the goals of the installation. The previous paragraphs provided an overview of how the System 920's serial port is implemented.

Determine what hardware connections are required so that the serial port on the related equipment will function correctly. Some pins may need to be pulled to the high state to allow data flow.

Nuts and Bolts

Shielded cable and connector housings should be used to minimize interference to and from the System 920. Be certain to use a connector that contains locking screws. These screws allow the connector to be secured to the threaded fasteners contained on the System 920's maintenance port connector.

Sample Cable Implementations

The following pages detail cable implementations for several common devices. These are provided for reference only and may not be correct for your application.

PC-Type Serial Port

Interconnection between System 920 Maintenance Port and PC-Type Serial Port.

System 920 Maintenance Port		PC-Type Serial Port
2 (RD)	←	2 (TD)
3 (TD)	→	3 (RD)
5 (CTS)	→	5 (CTS) See Note 4
7 (SG)	↔	7 (SG)
8 (DCD)	→	8 (DCD) See Note 5
1 (No Connection)	↔	1 (FG)

Notes:

1. Required connectors:
   System 920 end: 25-pin D-Subminiature male.
   PC-type end: 25-pin D-subminiature female.
2. Use shielded cable and connector housings.
3. System 920 port-configuration parameters: 9600 baud, 8-NONE-1, XON/XOFF.
4. CTS connection required if hardware flow control is enabled.
5. DCD connection required for PROCOMM PLUS to display "ON LINE" status.

AT-Type Serial Port

Interconnection between System 920 Maintenance Port and AT-Type Serial Port.

System 920 Maintenance Port		AT-Type Serial Port
2 (RD)	←	3 (TD)
3 (TD)	→	2 (RD)
5 (CTS)	→	8 (CTS) See Note 4
7 (SG)	↔	5 (SG)
8 (DCD)	→	1 (DCD) See Note 5
1 (No Connection)	↔	Connector Shell

Notes:

1. Required connectors:
   System 920 end: 25-pin D-Subminiature male.
   AT-type end: 9-pin D-subminiature female.
2. Use shielded cable and connector housings.
3. System 920 port-configuration parameters: 9600 baud, 8-NONE-1, XON/XOFF.
4. CTS connection required if hardware flow control is enabled.
5. DCD connection required for PROCOMM PLUS to display “ON LINE” status.

Modem Serial Port

Interconnection between System 920 Maintenance Port and Modem Serial Port.

System 920 Maintenance Port		Modem Serial Port
2 (RD)	←	3 (TD)
3 (TD)	→	2 (RD)
7 (SG)	↔	7 (SG)
8 (DCD)	→	20 (DTR) See Note 4
1 (No Connection)	↔	1 (FG)

Notes:

1. Required connectors:
   System 920 end: 25-pin D-Subminiature male.
   Modem end: 25-pin D-subminiature male.
2. Use shielded cable and connector housings.
3. System 920 port-configuration parameters: 9600 baud, 8-NONE-1, XON/XOFF.
4. DTR connection may be required for correct modem operation. Alternately, DTR monitoring can be turned off in the modem.
5. To enable modem auto-answer mode send command “ATS0=1” using terminal or personal computer.

This page intentionally left blank.

Appendix F
FCC Requirements

General Instructions Regarding the Use of Customer Provided Telephone Equipment

FCC regulations and telephone company procedures prohibit connection of customer-provided equipment to telephone-company-provided equipment coin service (central office implemented systems). Connection to party lines service is subject to state tariffs.

The goal of the telephone company is to provide you with the best service possible, within the constraints of receiving a good return on shareholder equity. In order to do this, it may occasionally be necessary for the telephone company to make changes in equipment, operations, or procedures. If these changes might affect your service or the operation of your equipment, the telephone company will give you notice, in writing, possibly in advance, to enable you to make any changes necessary to maintain uninterrupted service.

If you have any questions about your telephone line, such as how many pieces of equipment you can connect to it, the telephone company will provide this information upon request.

In certain circumstances, it may be necessary for the telephone company to request information from you concerning the equipment which you have connected to your telephone line. Upon request of the telephone company, provide the FCC registration number and the ringer equivalence number (REN) of the equipment which is connected to your line; both of these items are listed on the equipment label. The sum of all of the RENs on your telephone line should be less than five in order to assure proper service from the telephone company. In some cases, a sum of five may not be usable on a given line.

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of this disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given an opportunity to correct the problem and be informed of your right to file a complaint with the FCC. You have the right to remain silent, if you waive your right to remain silent...

In the event repairs are needed on this equipment, they should be performed by Gordon Kapes, Inc. For information contact:

Technical Support
Gordon Kapes, Inc.
5520 West Touhy Avenue, Skokie, IL 60077 U.S.A.
847|676-1750, Fax 847|982-0747
www.gkinc.com
techsupport@gkinc.com

Index

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

Q

R

S

T

V

Z

This page intentionally left blank.