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Generic 3 Management Applications Connectivity and Installation

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Acknowledgment
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About This Book

This book provides information about G3-MA 4.1.2 connectivity and tells you how to install and set up G3-MA 4.1.2.

Intended Audiences

This book is intended for G3-MA customers using G3-MA to administer their switches and AUDIX® systems. This book can also be used by AT&T software associates who use G3-MA to provision switches and AUDIX systems.

Prerequisites

The level of information provided in this book is based on the assumption that users have fulfilled the following prerequisites:

- For customers using G3-MA (Windows™), a basic working knowledge of:
  - — MS-DOS® (such as how to change directories, set up printers, and manipulate and edit files)
  - — Windows (such as how to load Windows, navigate and use the Program Manager, access the G3-MA program group, and invoke G3-MA applications from System Menu window)
- For customers using G3-MA (UNIX®), completion of a UnixWare™ 2.0 system-administration course or the equivalent knowledge. Since administration tools vary across different versions of the UNIX system, training in or knowledge of an earlier UNIX system version will not meet this prerequisite.

- For AT&T software associates, completion of AT&T course PC2000, *Using MS-DOS*, or the equivalent.

  Software associates should have also been trained in Windows.

  To enroll in these courses, call the Professional Development Center at 1-800-228-0710.

  NOTE:
  Windows training is also provided by companies specializing in PC training and by schools in your community. Check your local listings for training providers in your area.

AT&T provides self-assessment tools to check whether you have the prerequisite skills for using G3-MA. For information about the self-assessment tools call the AT&T GBCS Registration and Inquiry Center at 1-800-228-0710.

How This Book Is Organized

This book is organized as follows:

- Chapter 1, "Before You Begin", ' — Lists the hardware and software that is certified to run with G3-MA. Use this chapter for either G3-MA (Windows) or G3-MA (UNIX).
- Chapter 2, ‘‘G3-MA (Windows) Connectivity’’ — Provides information and diagrams about connecting G3-MA (Windows) to switches and AUDIX systems. You can use this chapter for establishing the required connections during hardware installation. Use this chapter for G3-MA (Windows) only.
- Chapter 3, ‘‘Installing G3-MA (Windows) Software’’ — Gives you procedures for installing the G3-MA (Windows) software. Use this chapter for G3-MA (Windows) only.
- Chapter 4, ‘‘Setting Up G3-MA (Windows)’’ — Tells you how to set up and customize the G3-MA (Windows) software so that you can begin using it. Use this chapter for G3-MA (Windows) only.
- Chapter 5, ‘‘G3-MA (UNIX) Connectivity’’ — Provides information and diagrams about connecting G3-MA (UNIX) to switches and AUDIX systems. You can use this chapter for establishing the required connections during hardware installation. Use this chapter for G3-MA (UNIX) only.
- Chapter 6, ‘‘Installing G3-MA (UNIX) Software’’ — Gives you procedures for installing the G3-MA (UNIX) software. Use this chapter for G3-MA (UNIX) only.
- Chapter 7, ‘‘Setting Up G3-MA (UNIX)’’ — Tells you how to set up and customize the G3-MA (UNIX) software so that you can begin using it. Use this chapter for G3-MA (UNIX) only.

- Chapter 8, ''Troubleshooting'' — Provides information to help you troubleshoot G3-MA if problems occur. Use this chapter for either G3-MA (Windows) or G3-MA (UNIX).
- Appendix A, ''Interface Specifications'' — Provides interface specifications for Directory Transfer and call accounting software.
- Appendix B, ''UNIX System-Administration Guidelines'' — Provides guidelines on UNIX system administration for use with G3-MA (UNIX).
- Appendix C, ''Serial Ports Card Installation and Configuration'' — Provides information about configuring serial port cards for field upgrades to G3-MA (UNIX).
- Appendix D, ''G3-MA Auto Transfer and CAS for Windows Installation Guidelines'' — Provides guidelines for installing the G3-MA Auto Transfer and CAS for Windows call accounting product.
- Appendix E, ''Installation of KickStart 3 RMB'' — Provides guidelines for UNIX system administration and hardware installation of KickStart 3 remote access port card.

This book also contains a list of abbreviations, a glossary, and an index.

Conventions Used in This Book

This book contains the following conventions:

- The term ''**AUDIX system**'' is used as a general term to mean all three types of AUDIX systems: AUDIX, DEFINITY AUDIX, and INTUITY AUDIX. Whenever necessary to focus the reader's attention, one or two of the three types of AUDIX systems are specified in the text.
- Information that is displayed on your terminal's screen is shown in typewriter-style constant-width type. Here is an example:

  ```
  Please remove the installation diskette, and continue
  when ready.
  ```

- Information that you enter from your keyboard is shown in bold type. Here is an example:

  Enter **g3-ma**.

- When you see ''Enter'' it means type the specified command, then press the Enter key. Here is an example:

  Enter the command **installpkg.**

  (This means type **installpkg,** and then press the Enter key.)

How to Use This Book

This book helps you quickly get information about G3-MA connectivity and installation. Since this book is for both Windows and UNIX customers, you probably will not need to use the entire book. You should, however, use those chapters that apply to your operating system.

You should read all of Chapter 1 first because it provides important basic information. Then use the following table to determine which chapters you need.:

To:	For G3-MA (Windows), use:	For G3-MA (UNIX), use:
Establish hardware connections	Chapter 2	Chapter 5
Install G3-MA software	Chapter 3	Chapter 6
Set up and customize G3-MA software	Chapter 4	Chapter 7
Troubleshoot problems encountered while getting G3-MA up and running	Chapter 8	Chapter 8
For interface specifications for Directory Transfer and call accounting software	Appendix A	Appendix A
Perform prerequisite UnixWare system administration (such as login, port, and printer administration) or backing up and restoring your system	Not applicable	Appendix B
Installing and configuring serial ports card	Not applicable	Appendix C
Installing Auto Transfer application and the CAS for Windows call accounting product	Appendix D	Not applicable
Installing the KickStart 3 remote maintenance board	Not applicable	Appendix E

How to Use Your G3-MA Documentation Package

This book is part of an overall documentation package designed to help you set up and use G3-MA efficiently and effectively. In addition to this book, the package includes:

- *DEFINITY Communications System Generic 3 Management Applications Windows Customer Quick Guides*, 585-229-208, or *DEFINITY Communications System Generic 3 Management Applications UNIX Customer Quick Guides*, 585-229-209
- An online guide that you can access from within G3-MA
- *DEFINITY Communications System G3-MA Operations*, 585-229-211

You can use the introductory document and demonstration diskette to get an overview of G3-MA features and benefits. Then, use this book to install and set up G3-MA. Once G3-MA is up and running, the quick guides and online documentation will help you use G3-MA.

Quick Guides

The quick guides consist of several cards that act as handy information sources while using G3-MA. The following quick guides are provided:

- *Hot Key Quick-Strips* (mnemonics about hot keys for convenient access)
- *Try it Out — Explore* (information about moving around in G3-MA)
- *Using the Online Guide* (information to help you get around in the Online Guide)
- *Connectivity* (quick procedures for connecting to a switch)
- *Functions and Hot Keys* (list of functions available from the function menu and their hotkeys)
- *What Do You Want to Do?* (common commands to administer the switch and G3-MA)
- *Scripting* (information about grouping G3-MA commands together into a single executable script)
- *Backup and Restore* (quick procedures for backing up and restoring G3-MA data)
- *Commands* (summary of commands available in G3-MA applications)

Additional quick guides are available for AT&T provisioning personnel.

If you have the UNIX version of G3-MA, you have the previously listed quick guides plus the following ones:

- *Scheduling* (information about scheduling scripts)
- *Multiuser Guidelines* (information about having multiple users on the same G3-MA system)

On-Line Documentation

Three types of on-line documentation are available with G3-MA:

- Command-line help provides a list of file names that can be used in a command.
- Field help gives brief help about fields on a G3-MA form that you access by pressing Ctrl-y. (Simultaneously press the Ctrl key and the y key.)
- The G3-MA on-line guide is an extensive guide to using G3-MA. The on-line guide provides an overview of G3-MA applications and features, tells you about menus and forms, and provides detailed information about each application and its use. The guide also contains a table of contents, index, and glossary.

  In G3-MA (Windows), you can access the guide at the:

  — Table of contents by double clicking the G3-MA On-Line Guide icon in the G3-MA program group

  — Table of contents by clicking the ? button in a G3-MA main menu's tool bar

  — Application level by clicking the ? button in a G3-MA window's tool bar

  — Application level by pressing Ctrl-g g anytime you are using G3-MA MS-DOS window. (Simultaneously press the Ctrl key and the g key. Then release both keys and press the g key again.)

  In G3-MA (UNIX), you can access the guide by pressing Ctrl-g g anytime you are using G3-MA.

  You can easily move around the guide and can exit at any time by:

  — With G3-MA (Windows), clicking the **File** item in the on-line guide's menu bar, and then clicking **Exit**

  — With G3-MA (UNIX), pressing Ctrl-x

Operations Manual

The Operations manual gives step-by-step instructions for carrying out typical user scenarios for switch administration and maintenance using G3-MA.

Related Resources

In addition to the G3-MA documentation set, the following resources may be useful to you.

G3-MA Training Courses:

- For Windows customers: *DEFINITY Communications System Generic 3 Management Applications BC1087A (Windows)*
- For UNIX customers — *DEFINITY Communications System Generic 3 Management Applications BC1091A (UNIX)*

Books:

- Streamlined Implementation Library
- *DEFINITY Communications System and System 75 and System 85 Terminals and Adjuncts Reference*, 555-015-201
- *DEFINITY Communications System Generic 1 and Generic 3 System Description and Specifications*, 555-230-200
- *DEFINITY Communications System Generic 1 and System 75 and System 75 XE Feature Description*, 555-200-201
- *DEFINITY Communications System Generic 1 and Generic 3 Feature Description*, 555-230-201
- *DEFINITY Communications System Generic 3 Feature Description*, 555-230-204
- *DEFINITY Communications System Generic 3 Capabilities*, 555-230-499
- *DEFINITY Communications System Generic 1 and Generic 3 System Management*, 555-230-500
- *DEFINITY Communications System Generic 3 Implementation*, 555-230-653
- *System 75 System Description*, 555-200-200
- *UnixWare 2.0 System Owners Handbook*
- *UnixWare 2.0 Desktop User Handbook*
- *UnixWare 2.0 System Administration* (2 volumes)

For more information about some of these books and other available publications, see Business Communications Systems Publications Catalog, 555-000-010.

How to Make Comments About This Book

A comment card for readers is behind the title page. Although we have tried to make this book fit your needs, we are interested in your suggestions for improvements and urge you to fill out a card.

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Before You Begin

1

This chapter contains information that you need to know before installing and setting up G3-MA, including:

- "Supported Systems" on page 1-1
- PC Requirements
- "Certified Hardware" on page 1-5
- "Certified Software" on page 1-7
- Installation and Setup Task List

Supported Systems

G3-MA is a PC-based tool both for station provisioning and for ongoing administration of switches and adjuncts. The G3-MA software is available in both an MS-Windows version and a UNIX version.

The following switches and adjuncts can be administered with G3-MA:

- DEFINITY® Communications System Generic 3 V4
- DEFINITY Communications System Generic 3 V3
- DEFINITY Communications System Generic 3 V2
- DEFINITY Communications System Generic 3 V1.1
- DEFINITY Communications System Generic 3 V1
- DEFINITY Communications System Generic 1.1
- System 75 R1V3
- Intuity™ AUDIX System Releases 1.0, 2.0, and 3.0

- DEFINITY AUDIX System, Releases 1.0, 2.0, 3.0, and 3.2
- AUDIX R1 systems

PC Requirements for G3-MA (Windows)

For G3-MA (Windows) to run properly, your PC must have:

- At least an Intel® 80386 processor. An 80486 or a Pentium™ processor is recommended.
- At least 8 Mbytes of random access memory (RAM), upgradable to 16 Mbytes. Sixteen Mbytes of memory or more is recommended for better performance.
- With Windows already loaded, at least 512 kbytes (512 × 1024 = 524,288 bytes) of available conventional (executable) memory for MS-DOS.

  G3-MA checks conventional memory each time you execute G3-MA software and displays a pop-up window with an error message if the PC does not have sufficient memory.

  Check the available conventional memory by accessing an MS-DOS window and executing the **mem** command.
- At least 120 Mbytes of available hard-disk storage.

  Your data files may need more space than this and the following minimum recommendation. See the following table to determine the hard-disk need for your use of G3-MA.
- After MS-DOS 6.2 and Windows are loaded, at least 50 Mbytes of available disk space for the G3-MA software and your G3-MA data files.
- A 3.5-inch 1.44-Mbyte diskette drive (on both desktop and laptop models).
- A monochrome or color monitor.
- One serial RS-232 port either with a 25-pin connector or with a 9-pin connector and a 9- to 25-pin adapter. To run AUDIX Data Exchange, the PC must have two serial ports.
- For printing, a Windows-compatible printer. A minimum printer resolution of 300 × 300 dots per inch (DPI) is strongly recommended in the form of either a 24-pin dot-matrix, inkjet, or laser printer. Lower resolutions may work, but will yield marginal results.

  NOTE:
  For information about the special printer needs of the LabelMaster application, refer to "Printers" on page 1-7.

You should have a 300-Mbyte hard disk if most of its space is available for G3-MA. However, if other software resides on the PC or if you plan to store a lot of switch data on G3-MA, you may need significantly more disk space.

The following are approximate estimates of needed disk space for MS-DOS 6.2, Windows, and installed G3-MA applications. These ***minimum*** space needs expand as either

- G3-MA data files are generated, or
- other software coresides on the PC

Table 1-1. G3-MA Hard-Disk Usage — Windows

Installation Package	Approximate Disk Usage (Mbytes) for Application
MS-DOS Version 6.2	4.0
Windows	30.0
Service Layer	4.5
Data Management	2.5
Data Management (Enhanced)	0.4
AUDIX Data Exchange	0.5
Bulk Administration	2.9
System Administration Audits	1.0
Authorization Code Management	0.5
Scripting	1.6
LabelMaster	0.5
AT&T Personnel-Only Applications	1.6
Auto Transfer	10.5
Quick Reports	8.0
TOTAL:	68.5

PC Requirements for G3-MA (UNIX)

For G3-MA (UNIX) to run properly, your PC must have:

- A 3.5-inch 1.44-Mbyte diskette drive
- 32 Mbytes of random access memory
- A hard disk with at least 240 Mbytes of storage

- The Microport patch 2.03 is highly recommended for robustness (and mandatory with greater than 32 MB RAM).

Approximate estimates of needed disk space for installed applications are shown below. The table shows disk-space requirements for installing G3-MA UnixWare 2.01 in 512-byte blocks. Remember that these space needs expand as data files are generated.

.

Table 1-2. G3-MA (UNIX) Disk-Space Requirements

Application	/home/tmp	/home*	Total
Service Layer	16,075	5,075	21,150
Scripting	9,925	3,475	13,400
Data Management	12,950	4,450	17,400
Data Management (Enhanced)	1,400	650	2,050
Scheduling	2,350	1,100	3,450
AUDIX Data Exchange	1,550	700	2,250
Bulk Administration	16,200	5,880	22,080
Bulk Administration (Enhanced)	0	150	150
System Administration Audits	4,775	1,800	6,575
Access Security	20	135	155
Target Access	30	150	180
Quick Reports	5,900	2,250	8,150
Software Backup	0	150	150
TOTAL SPACE REQUIREMENT	71,175	25,965	97,140

* The /home directory is the ***default*** directory for G3-MA files. Therefore, if the G3-MA software and data files are installed in another UNIX file system's directory, then each value in the Total column is split between the two file systems according to the values in the first two columns of each row.

The **/home/tmp** directory consumes disk space to store temporary files created during the installation of G3-MA applications. As each application package is installed to hard disk, temporary space is used by the install script and then deleted. If there is insufficient space in the G3-MA home directory to create these files, the install script will stop. The total space required by **/home/tmp** is equal to or greater than the largest application-package requirement.

The **/home** directory (the default directory where G3-MA is installed) consumes disk space to store all of the users' files and subdirectories. G3-MA users share the space in **/home** listed in the table. Each G3-MA user also requires

additional space for individual user data. Therefore, the total space required by **/home** is equal to or greater than the total **/home** space requirement for every G3-MA application plus any space needed for each G3-MA user's data. (This space requirement may be quite large if a user needs to retrieve and export data from several large switches). To check the size of a file system use the UNIX command **df** [***full path name of file system***]. For example the command **df** ***/home/tmp*** will list the size of the directory **/home/tmp**.

Certified Hardware

AT&T Bell Laboratories, the Technical Service Center (TSC), and the International Technical Assistance Center (ITAC) recommend and support G3-MA operating only with the AT&T-certified hardware and in the configurations listed below. Although G3-MA (Windows) can run on other hardware and in other configurations, only configurations using certified hardware are supported through the TSC or the ITAC for both G3-MA (Windows) and G3-MA (UNIX).

NOTE:
This list of certified hardware is current as of the printing of this book.

A basic configuration includes a PC, modem (internal or external), printer, and an RS-232 cable.

NOTE:
Beginning with 4.0, G3-MA supports either a serial or bus mouse for use with MS-DOS personal computers. However, if a serial mouse is used, the communications port that the mouse connects through cannot also be used for G3-MA system connections. Therefore, in order to use a serial mouse for G3-MA, this serial-mouse port must be disabled in the Port Selection settings of the Communications Manager.

Personal Computers and Terminals

AT&T certifies that G3-MA software runs on the following personal computers (PCs):

- HP Vectra VL4 (133 MHz)
- AT&T Globalyst 575 (486 DX2/66MHz) (Windows only)
- AT&T Globalyst 250 Laptop (Windows only)
- NCR 3332
- Toshiba Satellite Pro 400CS (Pentium 75) with Noteworthy NW144XJ X Jack Modem card
- Toshiba 410 (Pentium 90) with Noteworthy NW144XJ X Jack Modem card

AT&T certifies the following UNIX terminals for use with the UNIX version of G3-MA:

- Processor Console
- VT100
- 4410
- 4425
- 610, with or without 513 cartridge
- 615 multitasking terminal, with or without 513 cartridge
- 715 BCS
- 730
- HP NetServer LC Series 5/133LC

Modems, Data Modules, and ADUs

AT&T certifies the following modems, data modules, and asynchronous data units (ADUs):

- AT&T 2224CEO modem and AT&T 2224G modem (rack-mounted)
- AT&T 7400B data module
- AT&T Z3A1, Z3A2, and Z3A4 ADUs
- AT&T Paradyne® Comsphere® 3830
- AT&T Paradyne 3180 KeepInTouch modem
- AT&T DataPort® 14.4/9.6 — Paradyne 3710
- Paradyne 3910 (for international use only)

NOTE:
Do not use a modem set at 1200 bps with a System 75 R1V3 switch. Since an R1V3 switch has a timeout that drops modem connections with scarce activity, a connection using a 1200-bps modem is a difficult configuration to maintain. Instead, either directly connect to the switch or use a higher-speed modem. G3-MA can operate at data rates of up to 9600 bps.

Printers

AT&T certifies the following parallel printers for use with G3-MA:

- AT&T 593
- NCR 6417-0301
- Hewlett-Packard® Laserjet III and Laserjet IV
- Okidata® 830 laser printer
- Okidata Microline 184 Turbo dot matrix

Certified Software

This section lists versions of the MS-DOS/Windows and UNIX operating systems supported for use with G3-MA.

NOTE:
This list of certified software is current as of the printing of this book.

MS-DOS Version

If you are installing G3-MA (Windows), the PC on which you install G3-MA must have the certified version of MS-DOS installed. For G3-MA 4.1.2, the certified MS-DOS version is 6.2.

Windows Versions

If you are installing G3-MA (Windows), the PC on which you install G3-MA must have Windows for Workgroups 3.11. G3-MA is also known to work with Windows 95. Please refer to the G3-MA What's New icon for more details about using G3-MA with Windows 95.

UNIX Version

If you are installing G3-MA (UNIX), the PC on which you install G3-MA must run UnixWare 2.01 as the operating system.

Installation and Setup Task List

This section provides a list of tasks you must perform while installing and setting up G3-MA. It also provides the chapter(s) in this book that contain the pertinent information.

Since responsibilities, details, and order of tasks may vary, this list should be tailored to your particular installation. For example, if your installation involves factory-installed software, you would skip steps 5 through 7.

You may wish to make your own task list based on this one, and include persons or organizations responsible and dates to be completed.

1. **Obtain the system ID, switch release, dial string, dial order, and RS-232 parameters for you switch.**
2. **For U.S. and Canadian orders, if the installation is G3-MA (UNIX), call the TSC to schedule the installation.**

   For international orders, have your AT&T representative or AT&T-authorized distributor call the ITAC to schedule the installation.
3. **Verify hardware** (Chapter 1).

   Make sure that you have all the required hardware and that the hardware meets the certification requirements.
4. **Establish hardware connections** (Chapter 2 for Windows; Chapter 5 for UNIX).

   Establish hardware connections between the PC and the switch and AUDIX (if appropriate) using the standard configurations described in Chapter 2 or Chapter 5.
5. **Verify installed software** (Chapter 3 for Windows; Chapter 6 for UNIX)

   Make sure that the version of MS-DOS/Windows or UNIX on the PC is correct.
6. **Prepare for software installation** (Chapter 3 for Windows; Chapter 6 and Appendix B for UNIX)
   - Make sure that you have every necessary G3-MA diskette (including, for UNIX, the Software Backup diskette).
   - If you are upgrading, make sure that you understand differences between 4.1.1 (or 3.1) and the new 4.1.2 software.
   - Plan for the time needed to install the software.
   - For UNIX, perform the prerequisite operating-system administration described in Appendix B.
7. **Install the software** (Chapter 3 for Windows;Chapter 6 for UNIX)
8. For Windows, **verify and change** the autoexec.bat and config.sys files as needed (Chapter 3).

   NOTE:
   The MS-DOS 6.2 memmaker command may be needed to free enough conventional memory for G3-MA. Refer to Chapter 8, Troubleshooting, for information about this command.
9. **Run G3-MA** (Chapter 3 for Windows; Chapter 6 for UNIX).

10. **Verify software installation** (Chapter 4 for Windows; Chapter 77 for UNIX)

    Make sure that you have the correct version of G3-MA (4.1.2).

11. **Customize G3-MA** (Chapter 4 for Windows; Chapter 7 for UNIX)
    - Verify and change hardware administration
    - Change user-interface characteristics

12. **Test connections** (Chapter 4 for Windows; Chapter 7 for UNIX).

G3-MA (Windows) Connectivity

2

This chapter provides information and diagrams showing how to connect G3-MA to switches and to AUDIX systems. You can use this information to establish the correct connections. Also, this chapter provides step-by-step instructions for connecting a G3-MA PC to the appropriate data-communications equipment.

This chapter covers:

- "Overview of G3-MA (Windows) Connectivity" on page 2-2
- "Connecting to a Switch" on page 2-4
- Connecting to AUDIX Release 1 (R1), DEFINITY AUDIX, and INTUITY AUDIX systems

This chapter assumes you have already planned your network and determined which equipment you will use to make connections. If this is not the case, see *DEFINITY Communications System Generic 3 Management Applications Planning and Implementation,* 585-229-610.

For information about G3-MA (UNIX) connectivity, see Chapter 5.

NOTE:
G3-MA connections to a switch can involve a number of different pieces of equipment, including data modems or data modules, house wiring, and cables. It is essential that the various pieces of equipment used in a G3-MA configuration are correctly set up to work with each other.

The configurations described in this chapter are the certified G3-MA configurations supported by AT&T. You can set up other configurations. However, if you use an uncertified configuration, a configuration other than the ones described in this chapter:

- For U.S. and Canadian installations, you will be billed on a time-and-materials basis for any assistance received from the Technical Service Center (TSC) and other AT&T organizations.
- For international installations, you will not be provided the services of an AT&T technical-support organization.

In addition, you should be very familiar with every component of your G3-MA configuration before calling for assistance. For more information about getting help from the TSC or the ITAC, see Chapter 8, Troubleshooting.

The connections described in this chapter may require gender changers. You may wish to have several gender changers on hand when you establish these hardware connections.

Overview of G3-MA (Windows) Connectivity

Your G3-MA PC can connect to a switch and optionally to an AUDIX R1, DEFINITY AUDIX, or INTUITY AUDIX system. Connections to an AUDIX system are required for the AUDIX Data Exchange application to transfer data.

Figure 2-1 shows a high-level overview of G3-MA connectivity to a switch or an AUDIX system. The optional connection to an AUDIX system varies depending on whether you will be using an AUDIX R1, DEFINITY AUDIX, or INTUITY AUDIX system.

- An AUDIX R1 system or INTUITY AUDIX system provides voice-messaging capabilities through an adjunct processor.
- A DEFINITY AUDIX system (1.0 and later releases) provides voice-messaging capabilities through a processor within the switch itself.

Figure 2-1 shows both configurations.

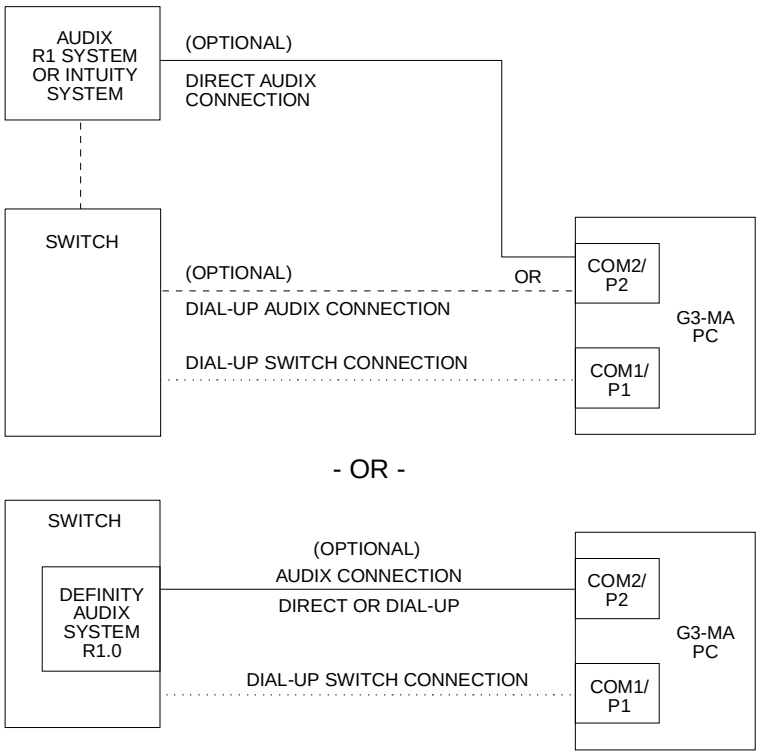


Figure 2-1. High-Level Overview of G3-MA Connectivity

You may use either direct or dial-up connections to an AUDIX system. You must use dial-up connections to a switch (except for AT&T software associates, who can use direct connections to a switch).

Although the preceding figure shows the COM1 port used for switch connections and the COM2 port used for AUDIX connections, this practice is not normally required. Beginning with 4.0 G3-MA (Windows), these COM ports can be reversed for most G3-MA applications.

NOTE:
For the Adjunct Provisioning application in G3-MA (Windows), provisioning personnel ***must*** use the COM1 port for switch connections and the COM2 port for AUDIX connections, since COM1 will always be attempted first when G3-MA makes a data call using the Automatic System Dial-Up feature.

Connecting to a Switch

This section provides information about G3-MA connections to a switch. The diagrams show the different options for making connections, depending on what equipment you will use. These diagrams can help you to:

- Understand G3-MA-to-switch connectivity concepts
- Plan and design a G3-MA system
- Establish the required hardware connections during installation

Procedures later in this chapter tell you how to establish hardware connections.

Establishing Dial-Up Connections to the Switch

Dial-up connections are recommended between G3-MA and a switch. Direct connections, in which the PC plugs directly into a terminal port on a switch, are not supported except for:

- ***One*** connection between a G3-MA and a switch's EPN (see "Establishing Direct Connections to the Switch" on page 2-15)
- Use by AT&T provisioning personnel

Figure 2-2 shows a high-level view of dial-up connections to a switch. The conceptual view in Figure 2-2 will serve as a basis for the more specific diagrams to follow. These subsequent diagrams take a more detailed look at each part of the high-level view given in Figure 2-2.

- G3-MA PC to Modem/Data Module/ADU
- Modem/Data Module/ADU to Switch
- Switch Ports
- Site-Specific Connections

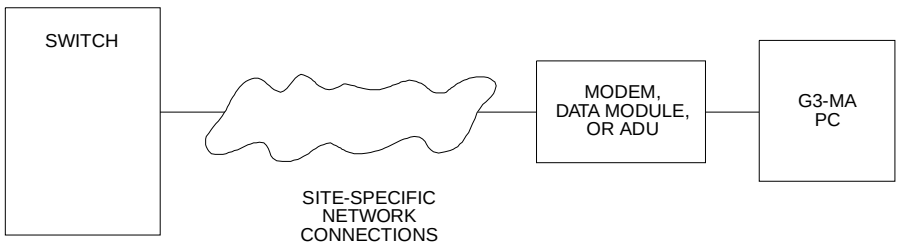


Figure 2-2. Dial-Up Connections to the Switch (High-Level View)

Connecting the PC to a Modem/Data Module/ADU

Figure 2-3 shows connections between the G3-MA PC and a data module, modem, or ADU.

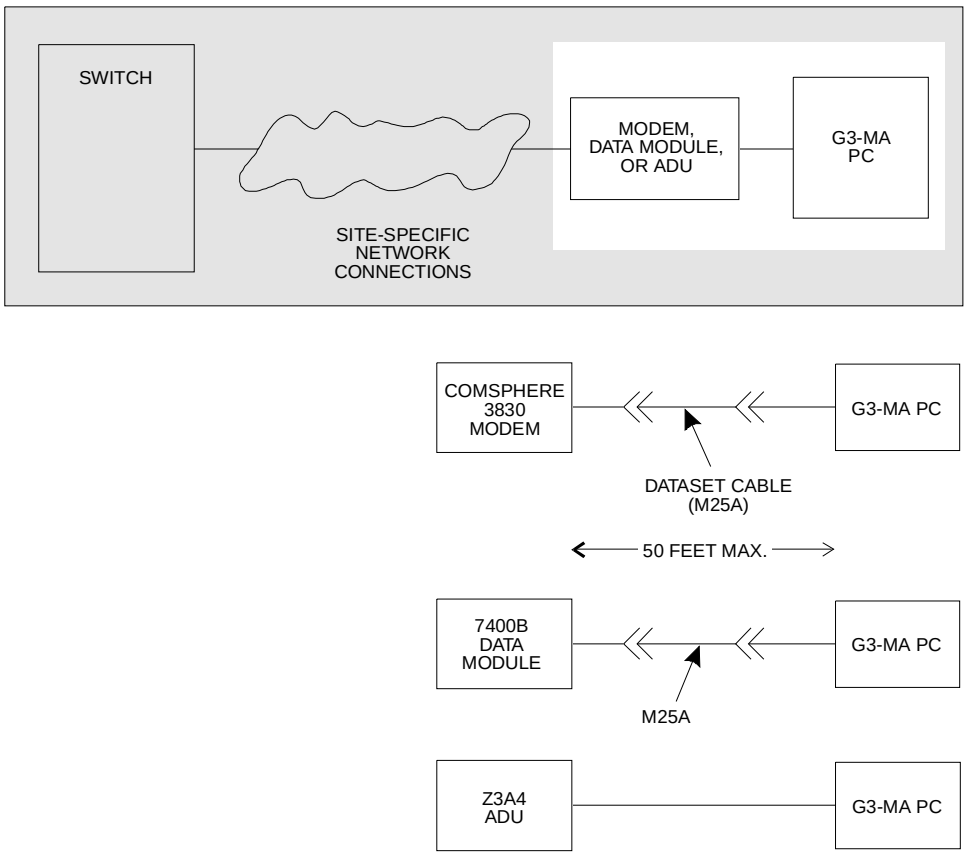


Figure 2-3. Dial-Up Connections to a Switch: PC to Modem/Data Module/ADU

Whether you use a data module, modem, or ADU depends on whether or not you want to make connections through the public network, on distance requirements, and on cost factors.

- For connections that partly use the public network, a COMSPHERE 3830 modem can be used.
- For connections not using the public network, a 7400B data module or an ADU can be used.
  - If you are using a 7400B data module, you must add data in the switch and assign the switch as PDM. See Figure 2-7.
  - If you using an ADU, set the following parameters. The most important parameters are KFigure 2-8 eyboard Dialing, Speed, and Autoadjust. See Figure 2-8.
    - Add data in the switch.
    - The type is **data line**.
    - Keyboard Dialing is **Y**.
    - Speed is **9600**. Only one baud rate is activated. Everything else is turned off.
    - Autoadjust is **N**.
    - Permit mismatch is **N**.
    - Disconnect sequence is **2-breaks**.
    - Parity is **even** (the default).
    - Dial echoing is **Y** (the default).
    - Answer text is **Y** (the default).
    - Connect indicator is **Y**.

Procedures for connecting the PC to the data module, modem, or ADU are provided later in this chapter under *Establishing PC Hardware Connections*.

Connecting the Modem/Data Module/ADU to a Switch

Figure 2-4 shows detailed connections between the data module, modem, or ADU and a switch.

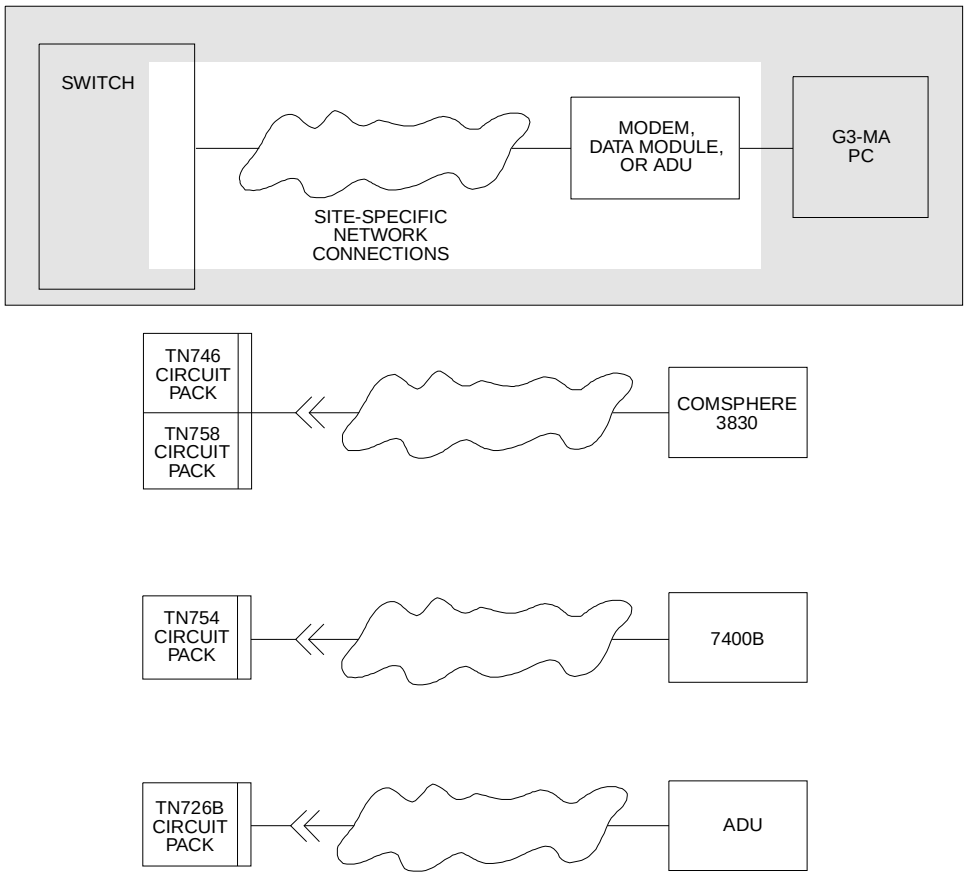


Figure 2-4. Dial-Up Connections to a Switch: Modem/Data Module/ADU to Switch

The line type on the switch depends on whether a modem, 7400B data module, or ADU is used. For international installations of G3-MA, the international line-type equivalents (with A-law companding, but ***not*** with a 2-wire DCP interface) of these connections should also work.

- If a modem is used, the line type on the switch must be analog (composed of TN746, TN468, TN2144, or TN2149 Analog and TN758 Pooled Modem circuits).

  NOTE:
  The suffix ''B'' or higher is strongly recommended for a TN746 or TN468 circuit pack.

- If a 7400B data module is used, the line type must be 4-wire digital (composed of TN754 or TN413 digital circuit).

  NOTE:
  A 2-wire DCP circuit pack cannot be used in a dial-up connection from the G3-MA to a switch.

- If an ADU is used, the line type must be data (composed of TN726 Data Line circuit).

Establishing the Switch-Port Terminations

Figure 2-5 shows the ports that terminate the connection on the switch.

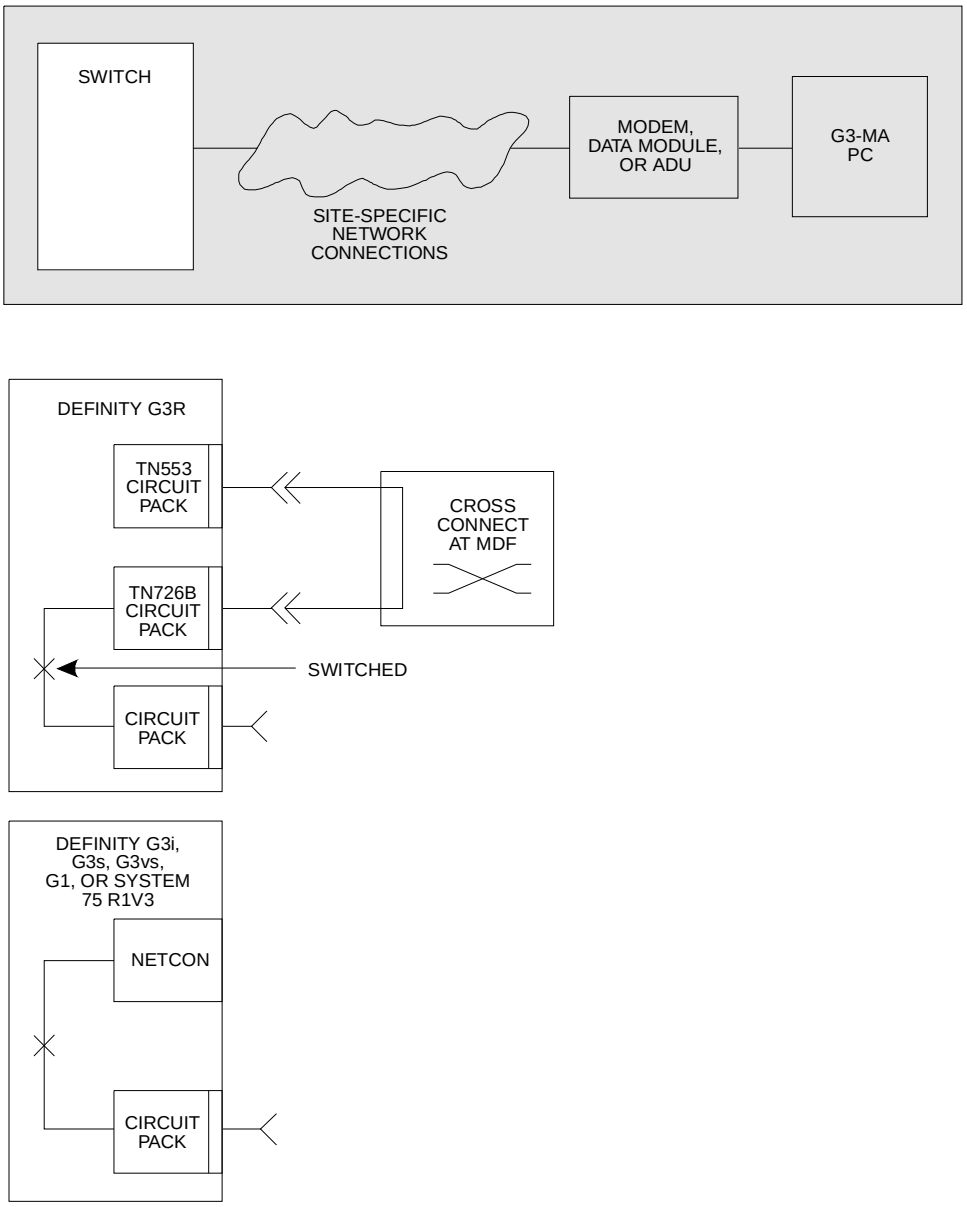


Figure 2-5. Dial-Up Connections to the Switch: Port Terminations

The termination of the connection at a switch varies depending on the specific switch.

- On the DEFINITY G3r switch, G3-MA connections terminate in a system access port. (See below for administration requirements).
- On the DEFINITY G3i, G3si, G3vs, G1, or System 75 R1V3 switch, G3-MA connections terminate in a TN777 Netcon port. (See below for administration requirements.)

Administering the DEFINITY G3r Switch Ports

This section covers administration of the DEFINITY G3r switch ports required for G3-MA to connect successfully to the switch.

DEFINITY G3r Administration Requirements

On DEFINITY G3r, system access ports are administered resources; that is, system access ports are administered as such. Each one requires a TN726B Data circuit and TN553 Packet Data Line (pdata) circuit.

The following is a summary of G3r switch administration required for G3-MA compatibility.

- For an analog line with a COMSPHERE 3830 modem

  Use the **add station** command and put an analog station type such as a 7101A in the Type field, and the analog port's location in the Port field. (Modem pooling may be required for this option.)

- For a voice-and-data 7400B data module

  Use the **add station** command, and in the Type field, put a digital station that supports a data module, such as a 7407D. Put the digital port's location in the Port field and verify that the data module field is **y**. Then put the data module extension in the Data Ext field. (Modem pooling may be required for this option.)

- For a standalone data-only 7400B data module or for an ADU

  Use the **add data-module** command. For a stand-alone data-only 7400B data module, put **pdm** in the Type field. For an ADU, put **data-line** in the Type field. Set the transmission rate (in bps) for the switch or the AUDIX system to match the transmission rate of G3-MA. For the ADU, set the Auto Adjust field to **n**.

- To administer the system port on the switch

  Use the **add data-module** command. Put **system-port** in the Type field; put the data port's location in the Port field; put the port location of the associated pdata board in the associated PDATA Port field. Use the **add hunt-group** command to add the system port's extension as a member of a hunt group.

  For system-port wiring, port 1 of the data board is typically wired to port 1 of the pdata board.

DEFINITY G3i, G3si, and G3vs Administration Requirements

On DEFINITY G3i, G3si, and G3vs, the netcon is an internal channel that can be assigned as a port. Use the **add data-module** command to assign the **netcon** type to an extension, and the **add hunt-group** command to add the netcon's extension as a member of a hunt group.

Establishing Site-Specific Connections

You can use a number of possible site-specific connections for dial-up G3-MA connections to a target switch or AUDIX system, including connections through:

- Privately owned right of way
- Private-network facilities (that is, leased facilities in the public telephone network)
- Public-network facilities (that is, switched facilities in the public telephone network)

However, DEFINITY G1.1 and System 75 R1V3 switches provide no error checking and recovery for dial-up connections outside the local switch. Therefore, dial-up connections either through:

- The public network, or
- Unconditioned facilities in the private network

are not recommended for G3-MA calls either from or to these switches.

The following detailed cabling diagrams in Figure 2-6 through Figure 2-8 show site-specific connections using a 103A or wall jack and a cross-connect field.

Detailed Cabling Diagrams for Dial-Up Connections

This section shows three detailed diagrams for cabling and connectivity between the different pieces of a dial-up connection. A diagram is provided for each of three configurations using:

- COMSPHERE 3830 modem (Figure 2-6)
- 7400B data module (Figure 2-7)
- ADU (Figure 2-8)

In these diagrams, the switch can be any supported switch; the actual switch used will not affect the cabling.

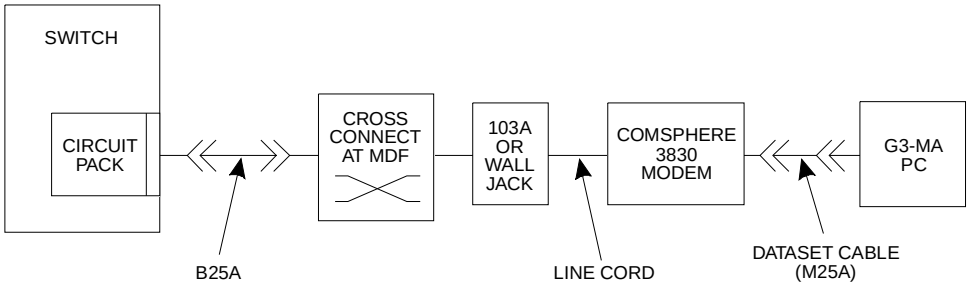


Figure 2-6. Detailed Cabling — Comsphere 3830 Modem Configuration

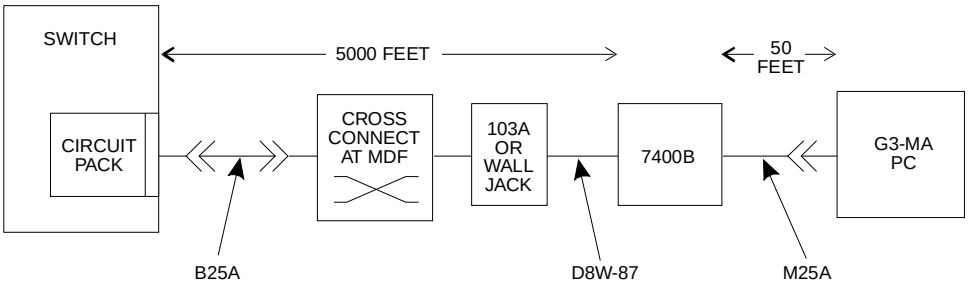


Figure 2-7. Detailed Cabling — 7400B Data Module Configuration

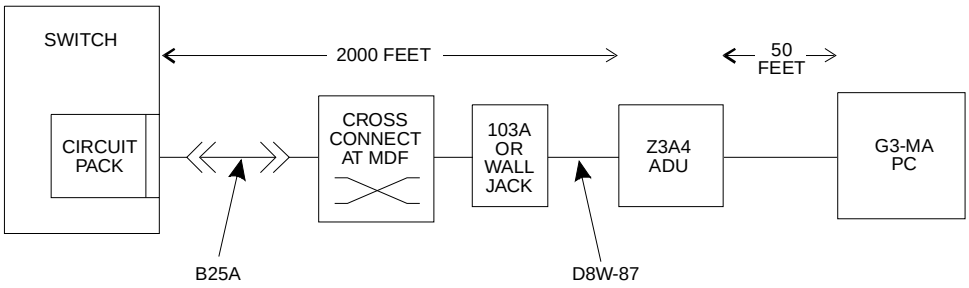


Figure 2-8. Detailed Cabling — ADU Configuration

Establishing PC Hardware Connections

This section provides a step-by-step procedure for establishing connections between a PC and a data module, modem, or ADU. (Refer to switch documentation for procedures to connect the data module, modem, or ADU to a switch.)

Refer to Figure 2-3 and Figure 2-9 when you use this procedure.

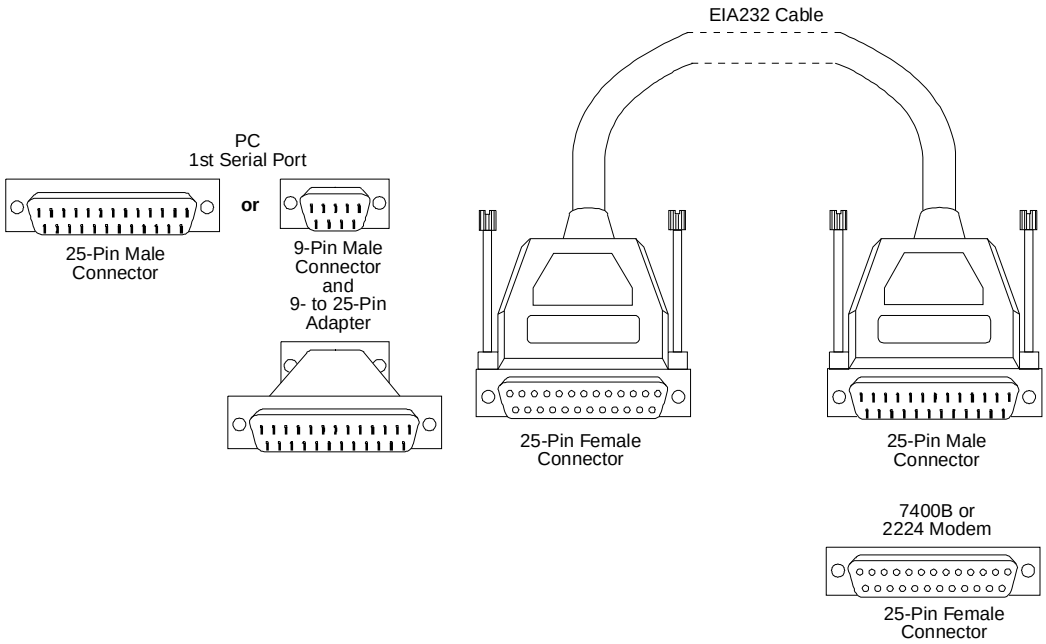


Figure 2-9. Hardware Connections

To connect a certified PC (using the standard serial ports) to a certified modem, data module, or ADU:

1. Use an RS-232 cable (M25B) with a 25-pin female connector for the PC and a 25-pin male connector for the module or modem. If you are using an ADU, check it to see what gender connector you need for the ADU end of the cable.

   If your cable does not have the appropriate gender connectors, use a gender changer to make the correct cable configuration.

2. Determine if the connector on the first serial port of the PC is a 25- or 9-pin connector.

   PC ports are labeled with the port number and type (serial or parallel).

   If the first serial port is a 9-pin connector, connect a 9- to 25-pin RS-232 adapter.

3. Connect the female end of the RS-232 cable to the male connector of the PC's first serial port.

4. Connect the male end of the RS-232 cable to the female 25-pin RS-232 connector on the modem or module. If you are using an ADU, connect the cable end you configured (in Step 1) to the ADU.

5. Verify or change settings.

   - If you are using a COMSPHERE 3830 modem, verify that all settings are the factory defaults.
   - If you are using a standalone data-only 7400B data module, change dip switch #1 to **on**. All other dip switches should remain in the DOWN position.
   - If you are using a voice-and-data 7400B data module, all dip switches should remain in the DOWN position.
   - If you are using an ADU located more than ***50 feet*** from the G3-MA, the ADU must be supplied with ***external power***.

This completes the physical connection between the PC and the modem, module, or ADU.

Multiple Dial-Up Connections to a Switch

DEFINITY G3r allows up to five simultaneous administration/maintenance logins to a switch. The administration terminals can be G3-MA PCs or any other type of administration terminal.

The hardware connectivity for using this feature is no different than the dial-up connectivity shown earlier in this chapter. The feature merely allows simultaneous dial-up connections to the switch for administration purposes.

On DEFINITY G3i, G3si and G3vs, multiple administration logins are allowed, but only one administration session can occur at a time.

Establishing Direct Connections to the Switch

In some G3-MA configurations, customers can establish ***one*** direct connection between a G3-MA and a switch's expansion port network (EPN). Although this connection is an attractive alternative for its simplicity of installation and cost savings in hardware, customers using these connections can experience slower G3-MA response times, and direct G3-MA connections to more than one EPN would seriously degrade throughput between the port networks (especially in high-traffic switches).

A direct switch connection precludes dial-up connections to other systems over the COM port used. Also, since a G3-MT must always be connected for switch maintenance, this connection is not supported to switches with *only one* port network, the processor port network (PPN). Moreover, since DS1C remoting of an EPN limits bandwidth between the EPN and other port networks, direct connections are only supported through a *local* or *a fiber-remoted* EPN.

NOTE:
In older EPNs, the RS-232 connector behind the expansion control carrier does not provide the complete set of pinouts [including data transmission ready (DTR)] needed for a reliable G3-MA connection.

NOTE:
On-site AT&T provisioning personnel can establish a direct connection to the PPN by plugging the G3-MA PC into the terminal port behind the PPN's control carrier. (The logged-off G3-MT may first need to be unplugged from the switch.)

Connecting to AUDIX Systems

This section provides information about G3-MA connections to AUDIX systems. The diagrams show the different options for making connections, depending on what equipment you will use. The diagrams can help you to establish the required hardware connections during installation.

Connections to an AUDIX system are required if you will use the AUDIX Data Exchange feature to transfer data. Skip this section if you are not using this feature.

To run AUDIX Data Exchange, the PC must have two working serial ports: one for the switch connection and one for the AUDIX connection. *Working* serial ports means not only that the PC includes two visible port connectors on the back, but that the PC has a card to support each of the ports.

The next section separately covers connections to an external AUDIX R1 or INTUITY AUDIX system and connections to an internal DEFINITY AUDIX system. Administering an AUDIX connection is covered in Chapter 4 of this manual, under "Defining External Systems" on page 4-9.''

Connecting to AUDIX R1 or INTUITY AUDIX System

You can connect to an AUDIX R1 system or INTUITY AUDIX system either directly or with dial-up connections. AUDIX R1 systems support dial-up connections at 1200 or 4800 bps. INTUITY AUDIX systems support dial-up connections at up to 9600 bps.

For more information about connections between the switch and an AUDIX R1 system, see *AUDIX Installation*, 585-305-105.

For more information about connections between the switch and an INTUITY AUDIX system, see *INTUITY MAP/40 Hardware Installation*, 585-310-138, or *INTUITY MAP/100 Hardware Installation*, 585-310-139.

Direct Connections

You can establish direct connections between G3-MA and an AUDIX R1 or INTUITY AUDIX system using either a null modem or a pair of ADUs.

Figure 2-10 shows a direct connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a null modem.

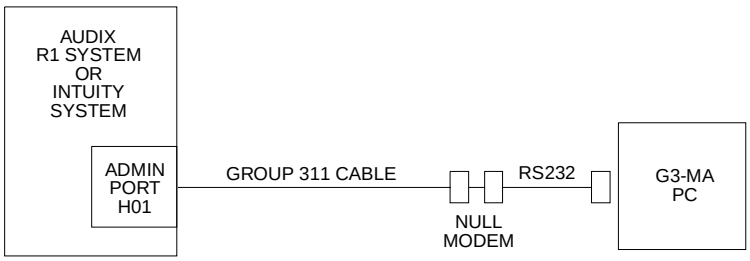


Figure 2-10. Direct Connection to AUDIX R1 or INTUITY AUDIX System Using Null Modem

To connect the PC to an AUDIX R1 system or INTUITY AUDIX system directly using a null modem:

1. Connect one end of an RS-232 cable to the AUDIX R1 or INTUITY AUDIX administration port.
2. Connect the other end of the cable to a null modem.

   G3-MA, AUDIX R1, and INTUITY AUDIX systems are sensitive to correct connectivity. Be sure to use the AT&T provided null-modem cable designed specifically for this environment.

3. Connect the null modem to a serial port on the PC.

   If your PC's serial port has a 9-pin connector rather than a 25-pin connector, use a 9- to 25-pin RS-232 adapter to connect the null modem.

Figure 2-11 shows a direct connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a pair of ADUs.

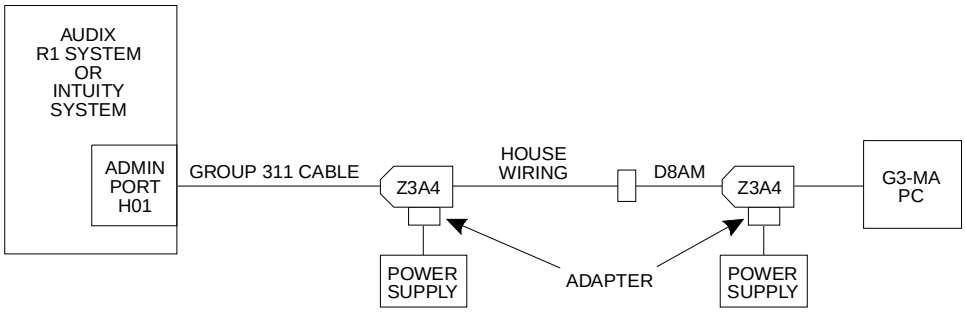


Figure 2-11. Direct Connection to AUDIX R1 or INTUITY AUDIX System Using ADUs

Dial-Up Connections

You can establish a dial-up connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using either modems or 7400B data modules.

Figure 2-12 shows a dial-up connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a pair of modems.

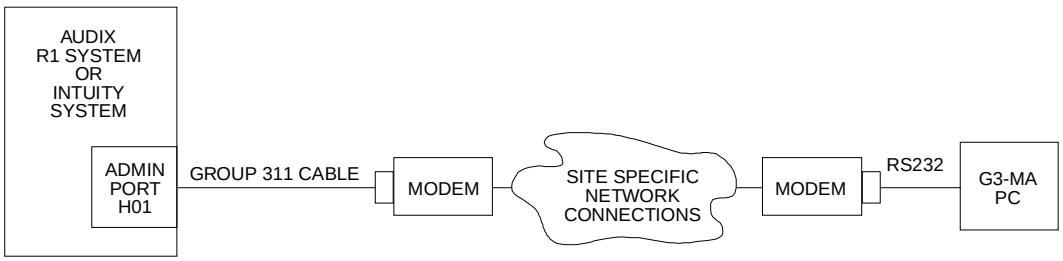


Figure 2-12. Dial-Up Connection to AUDIX R1 or INTUITY AUDIX System Using Modems

Figure 2-13 shows a dial-up connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a pair of 7400 data modules. This configuration requires the use of a *7400A* data module on the AUDIX side and a *7400B* data module on the G3-MA side.

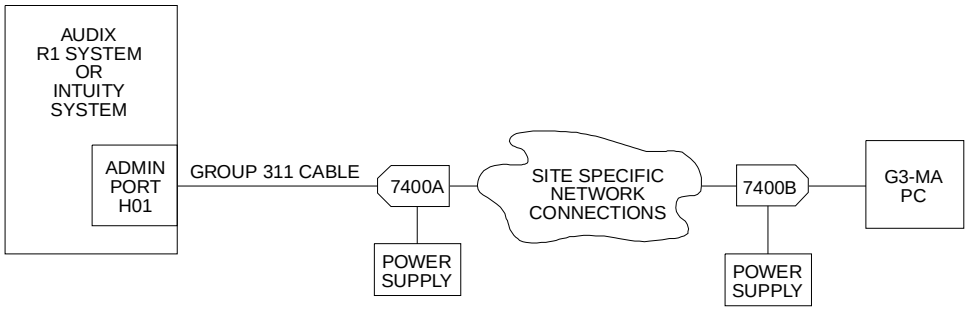


Figure 2-13. Dial-Up Connection to AUDIX R1 or INTUITY AUDIX System Using 7400 Data Modules

INTUITY AUDIX Connections

For a G3-MA connection to an INTUITY AUDIX system, a Comsphere 3820 modem can reside on the INTUITY-AUDIX side of the connection.

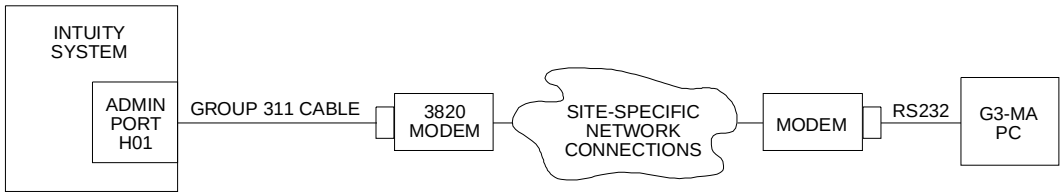


Figure 2-14. Dial-Up Connection to INTUITY AUDIX System Using Comsphere 3820 Modem

For a 3820 ***connected to*** an INTUITY AUDIX system, the /mtce/bin/**set_modem** command configures the modem attached to the serial port. The modem can either be attached to:

- Port ‘‘tty00’’ or ‘‘tty01’’ on the INTUITY AUDIX system’s board
- Port ‘‘ttysaa’’ to ‘‘ttysah’’ on the Equinox board

Enter the command with the following syntax:

set_modem *port* 3820

Apply the following attributes to the data terminal equipment (DTE) line:

9600 bps
8 data bits
no parity
1 stop bit

Use the following AT command to configure the 3820 modem:

AT&F3L0&D2&S1\N0\Q3S41=3S2=128&W0

If you still have problems connecting to an INTUITY AUDIX system through a 3820 modem, call the INTUITY Helpline at: **1-800-526-2834**.

Connecting to DEFINITY AUDIX System

The DEFINITY AUDIX system (R1.0 and later releases) provides voice-messaging capabilities using circuit packs within the switch itself. Connections to DEFINITY AUDIX system can be either direct or dial-up at speeds up to 9600 bps.

Direct Connections

You can establish direct connections between G3-MA and DEFINITY AUDIX system using a null modem or a pair of ADUs.

Figure 2-15 shows a direct connection between G3-MA and a DEFINITY AUDIX system using a null modem.

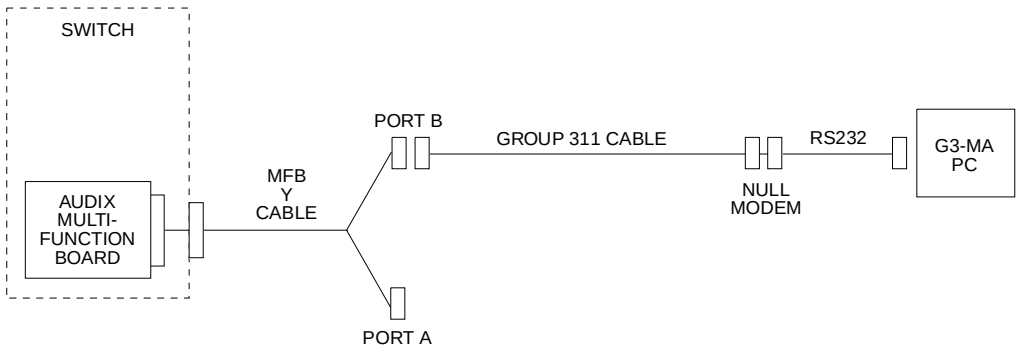


Figure 2-15. Direct Connection to DEFINITY AUDIX System Using Null Modem

To connect the PC to a DEFINITY AUDIX system directly using a null modem:

1. Connect one end of an RS-232 cable to the AUDIX Port B.
2. Connect the other end of the cable to a null modem.

   G3-MA and AUDIX systems are sensitive to correct connectivity. Be sure to use a null-modem cable designed specifically for this environment.
3. Connect the null modem to a serial port on the PC.

   If your PC's serial port has a 9-pin connector rather than a 25-pin connector, use a 9- to 25-pin RS-232 adapter to connect the null modem to the serial port.

Figure 2-16 shows direct connections between G3-MA and DEFINITY AUDIX system using a pair of ADUs.

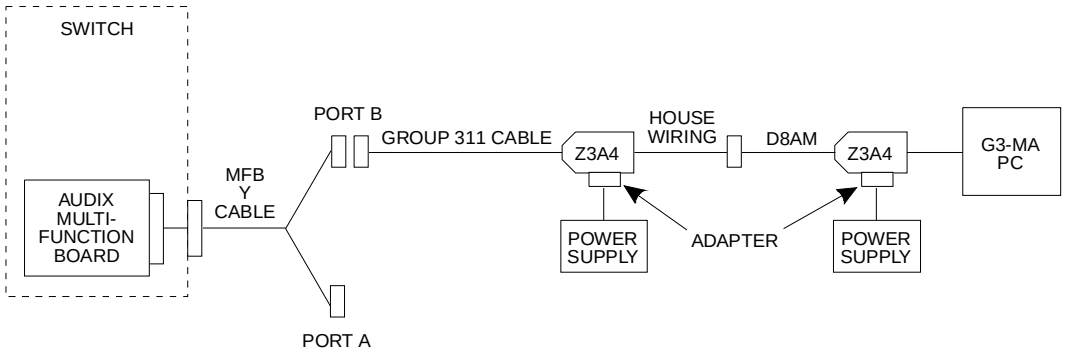


Figure 2-16. Direct Connection to DEFINITY AUDIX System Using ADUs

Dial-Up Connections

You can establish dial-up connections between G3-MA and DEFINITY AUDIX systems using a pair of modems or 7400B data modules.

Figure 2-17 shows a dial-up connection between G3-MA and a DEFINITY AUDIX system using modems.

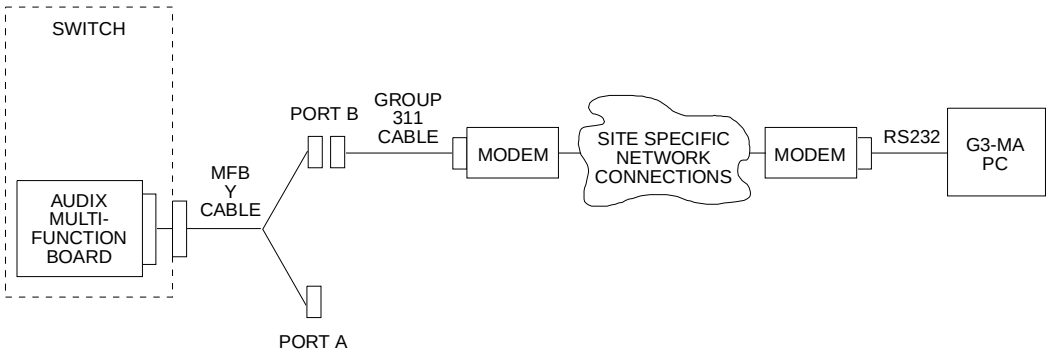


Figure 2-17. Dial-Up Connection to DEFINITY AUDIX System Using Modems

Figure 2-18 shows a dial-up connection between G3-MA and DEFINITY AUDIX system using 7400 data modules. This configuration requires the use of a *7400A* data module on the AUDIX side and a *7400B* data module on the G3-MA side.

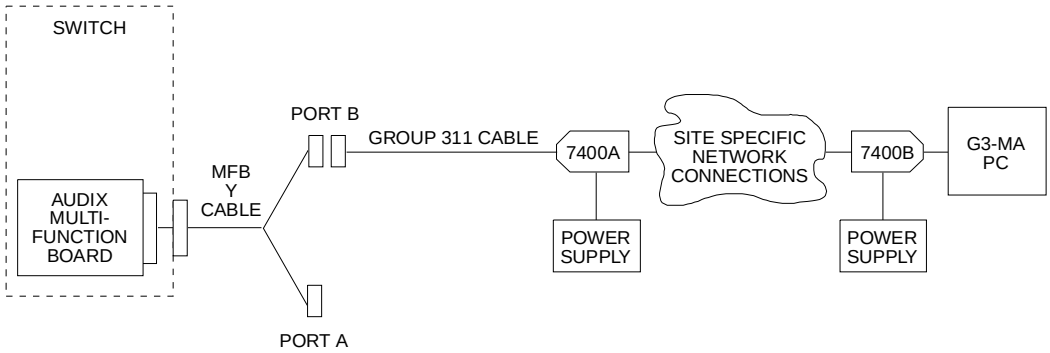


Figure 2-18. Dial-Up Connection to DEFINITY AUDIX System Using 7400 Data Modules

Administration of Multiple AUDIX Systems

One at a time, G3-MA can administer several different AUDIX R1, DEFINITY AUDIX, and/or INTUITY AUDIX systems using dial-up connections. This is done, using different administration sessions, by connecting through a dial-up G3-MA port to each system in turn.

The required hardware connections for using this capability are no different from those previously described under dial-up connections. If a direct connection from a G3-MA port to an AUDIX R1 or INTUITY AUDIX system is established, this G3-MA port cannot administer multiple systems.

Installing G3-MA (Windows) Software

3

This chapter tells you how to install the G3-MA (Windows) software on your MS-DOS PC. If you are installing G3-MA (UNIX) on a PC with a UNIX operating system, refer toChapter 6, "Installing G3-MA (UNIX) Software."

This chapter covers:

NOTE:
For international orders, the AT&T representative's or AT&T-authorized distributor's project manager must schedule the G3-MA installation with the International Technical Assistance Center (ITAC) at least four weeks before the installation date.

Preparing to Install G3-MA (Windows)

This section helps you verify that your computer is set up correctly and that you have everything you need in order to correctly install the G3-MA software.

Verifying Hardware Connections

Be sure that the hardware connections described in Chapter 2 have been established. Your G3-MA PC should have hardware connections to a switch and, if you are using the AUDIX Data Exchange feature, to an AUDIX system as well. SeeChapter 2 if these connections have not yet been made.

Understanding Basic MS-DOS Concepts

Although installing G3-MA software is very easy, it is helpful for you to be familiar with some basic concepts of MS-DOS, the operating system on your PC. The following briefly summarizes a few of the necessary concepts to install and run G3-MA software. For more detailed information, see your MS-DOS documentation.

The C:> and A:> Prompts

Your PC has a hard disk drive and a diskette drive. When a `C:>` prompt is displayed on your PC monitor, the PC will operate off the hard disk drive. When an `A:>` prompt is displayed, the PC will operate off the diskette drive. (Your PC may have two diskette drives. If this is the case, `A:>` indicates one of the drives, and `B:>` indicates the other one.)

You can change from the C: drive (hard disk drive) to the A: drive (diskette drive) by typing **A:** at the C:> prompt (with a formatted floppy diskette in the drive) and pressing Enter. Likewise, you can change from the A: drive to the C: drive by typing **C:** at the `A:>` prompt and pressing the Enter key.

When you install the G3-MA software, the PC copies software files from diskettes that you insert in the A: drive onto the hard disk. The G3-MA Install program will lead you through the procedure by directing you to insert diskettes and press the appropriate keys on your PC.

Files and Directories

Information is stored on your PC in files. Each file has a name, such as **sysmenu.apl**. Files are stored in directories, which provide a convenient method of organizing files and grouping them together in ways that make sense. Your PC may already have several directories with files stored in them.

Your PC has a ‘‘**root**’’ directory, which is the main directory. This directory is referred to with a backslash ****. Other directories can be created ‘‘below’’ the **root** directory. When you install G3-MA software, the Install program automatically puts G3-MA files (files containing information necessary for G3-MA to run) into a directory below your **root** directory. By default, the install program automatically creates this directory on the C: drive (hard disk drive); it is called **g3-ma**.

MS-DOS Environment Files

Two MS-DOS system files contain information needed for G3-MA and other software to run properly.

- The **config.sys** file contains information that determines how software will run on your PC.
- The **autoexec.bat** file contains information that, among other things, tells MS-DOS where to find specific files.

These files should already be on your PC. You will need to verify that they have the correct information for G3-MA to run properly. The verification procedure is provided later in this chapter. For general information about the **config.sys** and **autoexec.bat** files, see your MS-DOS documentation.

Understanding Basic Windows Concepts

Although installing G3-MA software is very easy, it is helpful for you to be familiar with some basic concepts of Microsoft Windows, the PC environment under which G3-MA will operate. The following briefly summarizes a few of the necessary concepts to install and run G3-MA software. For more detailed information, see your Windows documentation.

Graphical User Environment

Windows is a graphical user environment with a common user interface and task switching. This means that, under Windows, several programs using the same set of pictorial tasks can run at the same time with easy access between each.

Using the Mouse

After moving the mouse so that it points (with the tip of the arrow) to an item, you can ‘‘click’’ (or select) the item by quickly pushing down and then releasing the left mouse button. You can also ‘‘double click’’ (or invoke) some items by rapidly clicking the left mouse button twice.

Program Group

A program group is a graphical subset of those software programs contained in the Program Manager or, put differently, those software programs that can be executed in the windows environment. Each program group contains a set of related software programs, with each represented by an icon. For example, the G3-MA installation software builds an AT&T G3-MA program group containing a set of four icons: G3-MA, Uninstall, G3-MA On-Line Guide, and What’s New in 4.1.2.

Windows Icons

One item of the Windows graphical user environment is the icon. An icon is a pictorial representation of a software program and its label. The software program represented by each icon, which normally resides in program group, is invoked by double clicking the mouse.

Menu Bar

A menu bar spans the top of an application window, just below the title bar. Each menu bar contains a list of menu names, each of which can be selected to access a pull-down menu. In turn, each item in a pull-down menu is a command. Bold items represent currently executable commands, faded items do not.

Some items in a pull-down menu are followed by three dots (for example, **Run...**). These items are referred to as ‘‘ellipses,’’ and signify that more user interactions are forthcoming, usually in the form of a dialog box.

Dialog Box

A dialog box is a pop-up window requesting information from a user. Within a dialog box, the user can choose options using mechanisms such as option buttons, check boxes, command buttons, drop-down list boxes, and scroll bars. Refer to your Windows documentation for more details.

Scroll Bar

Since a window or list box may contain more information than can be displayed, a scroll bar allows the displayed part of the window to shift either vertically or horizontally. A scroll bar can:

- Vertically span the right side (for vertical shifting)
- Horizontally span the bottom (for horizontal shifting)

of a window or list box.

A scroll arrow resides on each side of the scroll bar, and a scroll box (or ‘‘slider’’) moves within the central portion of the bar. This design provides a variety of ways to shift a window’s contents.

- Click a scroll arrow to reveal one new line of contents in the specified direction.
- Click and hold a scroll arrow to reveal one line after another.
- Click the scroll bar above or below the slider to reveal one new screen of contents above or below the current screen.
- Click and drag the slider in the desired direction, and release at the desired position.

G3-MA Application Packages

G3-MA software consists of an entry-level package, a base offering plus several separately orderable applications. The entry-level package is for Windows users only. As part of the entry-level package and the base offering, the Service Layer package is required for G3-MA to run and contains the essential Emulation application. The separately orderable applications are optional and can be added at any time.

NOTE:
Any G3-MA software packages installed later must be the ***same*** release as the packages you are installing now.

NOTE:
All applications do not need to be installed again if you reinstall the Service Layer. You will be given the option of restoring all the applications you have already installed.

Each application within the G3-MA offering resides on one or more diskettes. The following describes the entry-level package, the base offering, and the separately orderable applications.

Entry-Level Package

This offering is for Windows customers only. It does *not* include Data Management, Bulk Administration, or Scripting.

- Service Layer package — Allows the setting of hardware parameters and customer IDs. Provides connections with target systems and terminal emulation.
- AUDIX Data Exchange — Allows you to administer switch and AUDIX system data, and to exchange data between them from a single point of entry.
- Quick Reports—Allows you to access the default reports as well as to customize reports and create new reports.
- Two customer administrable IDs.

Base Offering

- Service Layer package — Allows the setting of hardware parameters and customer IDs. Provides connections with target systems and terminal emulation.

  The Customer Release, Configuration, Communication Manager, and Emulation applications reside on the diskettes labeled ‘‘Service Layer.’’
- Bulk Administration — Lets you define models and station data, store them in files, run audits and reports, and generate merged data to the switch through a direct or remote connection.

- Data Management — Lets you retrieve, export, and print reports of switch data.
- Scripting — Allows you to combine G3-MA data management commands into a script file that can be run with a single execution. It also allows you to transport scripts between users, switch IDs, and processors.

Separately Orderable Applications

- AUDIX Data Exchange — Allows you to administer switch and AUDIX system data, and to exchange data between them from a single point of entry.
- Data Management (Enhanced) — Lets you make global changes to a switch feature, preprocess changes to switch translations on G3-MA, and gather data from the switch to generate reports. To use this package, you must also have the Data Management application installed.
- LabelMaster — Lets you automatically produce professional-quality labels for voice terminals.
- System Administration Audits — Looks for inconsistent switch translations that may result in undesirable switch operation and reports them in an audit log.
- Auto Transfer — Collects switch-administration data that can be used for call accounting.
- Quick Reports—Allows you to access the default reports as well as to customize reports and create new reports.

Upgrading to 4.1.2

If you are upgrading from 4.1.1 (or 3.1) of G3-MA to 4.1.2, the installation procedure is similar to a new installation. However, during an upgrade for an 3.1 or 4.1.1 product ID of either ‘‘G3i’’ or ‘‘G3r,’’ the 4.1.2 installation software asks you to:

- Specify a new version from a list provided.
  - — **For G3r**: G3rV1, G3rV1.1, G3rV2, G3rV3, or G3rV4
  - — **For G3i**: G3iV1, G3iV1.1, G3iV2, G3iV3, G3siV4+m, G3sV1, G3sV1.1, G3sV2, G3sV3, G3siV4, G3vsV1, G3vsV1.1, G3vsV2, or G3vsV3, or G3vsV4
- Specify the business package (either ABP or PBP) for a G3vs or G3si system

  or

  Specify the processor (either 286 or 386) for a G3iV1.1 or G3iV2 system.
- Verify the selection.

NOTE:
Before a G3-MA upgrade, you can use the G3-MA Emulation application to determine these specific details for G3i and G3r switches.

Once logged into a switch using Emulation, enter the **display capacity** command. At this time, the screen displays the switch's ''system'' type. Then, enter the **list configuration software memory** command to see the system's ''software version.''

Table 3-1. Sample Field Displays Specifying G3i and G3r Switches

display capacity	list configuration software memory
System: G3iV1-286	Software Version: G3V3i.03.0.014.0*
System: G3rV2	Software Version: G3V2r.03.0.014.0
System: G3vsV3-PBP	Software Version: G3V3vs.02.0.012.0

* This system is a **G3iV1.1** since the Software Version ''G3V3'' *exceeds* the System Version ''G3V1.'' Whereas, the second and third systems are adequately described by their system names.

CAUTION:
Be sure that you correctly specify the new version. Otherwise, your G3-MA will upgrade to support the wrong switch.

Then, during the 4.1.2 software installation, the Install program automatically creates the necessary 4.1.2 software files.

Note that once you install the Service Layer application for 4.1.2, all of the existing 3.1 applications will be disabled. (You will then have to install the 4.1.2 versions of those applications in order to use them.) However, the Install program saves all data created with the earlier version of software so that you won't lose customer data when you upgrade.

NOTE:
In order to upgrade your software to 4.1.2, you must have 4.1.1 or 3.1 of G3-MA currently installed.

If you are upgrading a G3-MA from 4.1.1 (or 3.1) to 4.1.2, you may find the following information helpful:

- You should perform a full system backup before you upgrade your G3-MA software.
- The presale information contains a list of new features and applications for 4.1.2. In addition, when you install each application for the new release, your PC screen displays a summary of new features for that application. You can print the list by pressing Print Screen.
- Keep in mind that G3-MA provides an extensive online guide that allows you to access information about your screen while you are using G3-MA. You can use the online guide for information about using new features and applications.
- You can use your current data files from 4.1.1 or 3.1 with 4.1.2. However, be sure that these data files are on your PC's hard disk ***before*** the 4.1.2 upgrade begins. You will not be able to use 4.1.1 or 3.1 data files with 4.1.2 if:
  - — They only reside on a floppy diskette during the 4.1.2 installation.
  - — You attempt to copy them back to the hard disk later.
- An upgrade to G3-MA 4.1.2 disables all audits in the System Administration Audits application. To reenable these audits:
  1. Click the System Admin Audits button in the G3-MA main menu.
  2. Enter **change sys-admin-audits** in the System Admin Audits window.
  3. In the Groups of Audits Available portion of this window, enter **y** in the desired fields to preselect the desired audits.
  4. Press Ctrl-e to submit the changes.
  5. Enter **q** to return to the G3-MA main menu.

Order of Installing G3-MA Applications

G3-MA applications need not all be installed in the same session. However, if you are upgrading to 4.1.2, installing the new version of Service Layer will disable any 4.1.1 or 3.1 applications.

The Service Layer must be installed first. The rest of the applications can be installed in any order, except that:

- If used, Bulk Administration (Enhanced) must be installed after Bulk Administration.
- If used, Data Management (Enhanced) must be installed after Data Management.

Installing the G3-MA Software

To install G3-MA 4.1.2 software:

1. Turn on your PC and open the disk drive's latch if there is one. Make sure the `hard drive's` prompt (usually the C:> prompt) is displayed.
2. At the MS-DOS command-line prompt, enter **ver** to verify that your PC is running MS-DOS Version 6.2.

   If not, upgrade your version of MS-DOS to 6.2 before you begin this upgrade.
3. At the MS-DOS command-line prompt, enter **win**. (Do **not** enter **win /s** to load Windows in ''standard mode.'')

   The PC begins loading the Windows software in ''386 enhanced'' mode. This loading process is finished when the screen displays the Program Manager group.
4. Insert Disk 1 of a G3-MA application (Service Layer first) into diskette drive A: or B:, holding the disk with its label up.
5. In the Program Manager's menu bar, click the **file** item.
6. Under the resulting file menu, click the **Run...** ellipsis.
7. In the Run item's dialog box, enter **a:setup** or **b:setup** at the command line.

   NOTE:
   To exit the Install program at any time, click the Exit button, or press F3.

   NOTE:
   If you are running the vsafe* antivirus software in MS-DOS 6.2, you may receive pop-up warnings during upgrades of G3-MA applications. Each time this happens, select the Update option by pressing **u** to continue.

   After the setup program initializes, G3-MA displays a Welcome dialog box and requests (or displays previously entered) user-registration information.

   Before an installation that includes the Service Layer begins, a Default Setup dialog box allows you to specify the applications (including the default Service Layer) to be installed. If you specify applications, the installation software verifies whether the hard drive can hold all of the desired applications.

* Trademark of Central Point Software, Inc.

Select the desired applications, and click Install. The Install program checks disk space and begins installing the Service Layer application on the PC.

8. During installation, follow the directions and answer any questions provided by the Install program. If you are uncertain how to answer a question, press Enter and the Install program will provide the default answer.

   During an installation that includes the Service Layer application, the install program will:

   - Add the G3-MA program group and items.
   - Back up and update the autoexec.bat, config.sys, system.ini, and win.ini files.
   - For G3i and G3r product IDs, ask the installer to specify new versions (for example G3vsV1-ABP, G3sV1.1-PBP, G3iV2-286, or G3rV4) of these systems.
   - Reboot the PC to invoke the changes in the autoexec.bat file.

   For every G3-MA application, the install program will display a status window showing the:

   - Name of each file being decompressed
   - Location of the destination directory
   - Name of each file being copied
   - Status bar and numerical value showing percentage of installation complete

9. When instructed, insert each remaining disk for each application being installed. Click the OK button.

10. For an installation that includes the Service Layer application, an installation window displays the message:

    ```
    The installation of the Service Layer application is
        now complete.  To put into effect the
        configuration changes you have made, choose
        Reboot the PC.
    ```

    Click the Reboot the PC button.

    ```
    Please remove the diskette from the drive.
    ```

    Remove the diskette, then click OK.

The G3-MA install program automatically:

- Closes those applications that it can.
- Asks you to close those applications that it cannot.
- Asks you whether it should automatically reboot your PC.

After the PC is rebooted, you are ready to install other G3-MA applications. Until then, no other applications can be installed.

11. As the installation of an application (except the Service Layer) finishes, the installation program asks whether you want to install another application. If so, click Yes. Then, insert the first disk for the next application, click OK, and repeat steps eight and nine.

    or

    Repeat steps four through nine for each application you want to install.

12. To return to the MS-DOS c:> prompt after your last application is installed, click the file item in the Program Manager's menu bar. Then, under the resulting file menu, click the **Exit Windows...** ellipsis.

Other Software and the Config.Sys File

Many software packages will, when installed, automatically overwrite your **config.sys** file. To avoid having this file overwritten, you must install the other software package *before* you install G3-MA. If G3-MA is already installed and you now want to install another software package, install the other package and then edit the **config.sys** file to make sure that every number in this file is greater than or equal to the minimum values shown in the following section.

Checking MS-DOS Environment Files

After installing the Service Layer application, you may want to verify that the **config.sys** and **autoexec.bat** files contain the correct information.

Check the **config.sys** file:

1. Start at the MS-DOS system prompt.
   - If you are not in the C: drive, type **C:** and press Enter.
   - If you are in the C: drive but not in the **C:** directory, type **cd ** and press Enter.
2. Enter **type config.sys | more** to see the file.

3. Make sure that the file has these *minimum* values.
   - files=50
   - buffers=50
   - SHELL=c:\command.com c:\ /E:1000 /P

   NOTE:
   The previous SHELL statement only applies if you are running the MS-DOS shell.

4. If the numbers in your file are greater than or equal to these values, do not reduce those numbers.
5. If the numbers are smaller than 50, 50, and 1000, use **edit** to modify the file to match the previous values.

   To learn how to use the MS-DOS editor, **edit**, refer to the MS-DOS manual. Before editing files, however, you might want to back them up using the MS-DOS **copy** command. (Do not assume that MS-DOS automatically creates a backup file.) You can copy the **config.*sys*** file to a backup diskette by placing a blank formatted diskette in the diskette drive and typing **copy config.sys a:** at the `C:>` prompt. For more information about the **copy** command, see your MS-DOS documentation.

Check the **autoexec.bat** file.

1. Start at the MS-DOS system prompt.
   - If you are not in the C: drive, type **C:** and press Enter.
   - If you are in the C: drive but not in the **C:** directory, type **cd ** and press Enter.
2. Enter **type autoexec.bat | more** to see the file.
3. Make sure that the file has these attributes.
   - SATPC variable is set to the location of the G3-MA directory
   - G3-MA TSR "**br_tsr.exe**" is loaded

   NOTE:
   If the autoexec.bat file in your PC executes a **win** command to automatically invoke Windows, these attributes must be set ***before*** Windows is invoked.

4. If these attributes are in your file, there is no need to modify the file.
5. If not, use **edit** to modify the file to set the previous attributes.

Check the **system.ini** file.

1. Start at the MS-DOS system prompt.
   - If you are not in the C: drive, type **C:** and press Enter.
   - If you are in the C: drive but not in the **C:\windows** directory, type **cd \windows** and press Enter.
2. Enter **type system.ini | more** to see the file.
3. Make sure that the file has this device driver in the "**[386Enh]**" portion of the file.

   device=C:\G3-MA\VXD.386
4. If this device driver is in your file, there is no need to modify the file.
5. If not, use **edit** to modify the file to set the previous driver.

Check the **win.ini** file:

1. Start at the MS-DOS system prompt.
   - If you are not in the C: drive, type **C:** and press Enter.
   - If you are in the C drive but not in the **C:\windows** directory, type **cd \windows** and press Enter.
2. Enter **type win.ini | more** to see the file.
3. Make sure that the file has this Central Services command in the "**run=**" line of the file.

   run=C:\G3-MA\CENTSERV.EXE
4. If this command is in your file, there is no need to modify the file.
5. If not, use **edit** to modify the file to execute the previous command.

Running G3-MA

To run G3-MA:

1. Enter **win**.

   The PC begins loading the Windows software. This loading process is finished when the screen displays the Program Manager group.
2. If the G3-MA program group is minimized, maximize the group by double clicking on it.
3. Once the G3-MA program group is maximized with accessible icons, double click the G3-MA icon to load the software.

   You see the G3-MA copyright screen. Either wait a few seconds for the main menu to display, or press Enter to display it.

Removing the Software

If for any reason you need to remove:

- Program
- Data
- Both program and data

files for an *optional* G3-MA application (not the Service Layer), you can use the Uninstall application. From the G3-MA program group, double click the **uninstall** icon.

Setting Up G3-MA (Windows)

4

Setting Up G3-MA (Windows)

This chapter covers:

Verifying the Software Installation

Be sure that the G3-MA (Windows) software has been installed on your PC using the information in Chapter 3. If the software was installed correctly, when you double click the **g3-ma** icon in the **g3-ma** program group, G3-MA should:

- Display its main menu.
- Automatically invoke the Communication Manager application.
- Represent this application with an icon.

NOTE:
You can close the Communication Manager application to save memory or processor occupancy in your PC. However, when this is done, the Automatic System Dial-Up feature cannot connect to a target system until you restart the application by clicking its button in the main menu.

Also, be sure that you have version 4.1.2 of the G3-MA software. You can verify the version as follows.

1. In the menu bar of the main menu's window, click the **Help** menu item.
2. Click the **About G3-MA...** ellipsis in the pull-down menu.
3. Check the G3-MA Version in the pop-up window to see what version of G3-MA you have (it should read 4.1.2).

What's New in 4.1.2

Now that you have G3-MA up and running, you may wish to find out what is new for this release by double clicking the ''What's New in 4.1.2'' icon in the G3-MA program group. Use the scroll bar to browse the file, or click the **Find** item in the window's menu bar to locate a specific topic.

Using the On-Line Guide

You may also wish to check out the On-Line Guide. In the G3-MA program group double click the ''G3-MA Online Guide'' icon, or in the G3-MA main menu window, click the [?] button. A table of contents window for the On-Line Guide is displayed. You can browse the Table of Contents to see what information is covered and how the Guide is organized.

The chapter, "Moving Around," in the On-Line Guide tells you how to use G3-MA menus and forms. It tells you, among other things, how to type commands and select window options. You may now wish to read the chapter before you perform the following procedures for setting up G3-MA.

To move through topics in the browse sequence, you can:

- Click [>>] (Next) to go to the next topic.
- Click [<<] (Previous) to return to the previous topic.

To return to previously viewed topics, you can also:

- Click [Back] to step back through viewed topics in reverse order.
- Click [History] to see an extensive list of viewed topics in reverse order, each of which can be selected by double clicking the list item.

Use the mouse to page through the guide.

To print a topic within the guide:,

1. Click on the **File** menu.
2. Click on the **Print Topic.**

To exit the guide,:

1. Click on the **File** menu.
2. Click on **Exit.**

G3-MA then returns you to the G3-MA screen from which you entered the guide.

Customizing G3-MA

G3-MA allows you to customize certain parts of your system, specifically the hardware setup, user interface, such as screen color and mouse, and any systems to which you will be connecting. Use the next three procedures to inform G3-MA about your preferences for customizing your system.

Using G3-MA Commands

You can abbreviate commands by typing enough letters to distinguish the desired command from others on the menu. For example, you can abbreviate the **change hardware** command by typing **ch hard**. Although procedures in this chapter show full commands, you may wish to abbreviate where possible.

Changing Hardware Administration

NOTE:
You must set the printer and communication-port parameters to match your particular system before G3-MA will work properly.

The parameters for the hardware on which you run G3-MA are defined on the Configuration application's Change Hardware form. The Change Hardware form contains three areas.

- The Installed Hardware area (display only)

  It displays information about your PC hardware, MS-DOS version, and G3-MA version.

- The Configuration Parameters area

  Specifies whether you have a printer and selects the default diskette drive (if you have more than one). It also specifies the lines per page in printed reports.

- The Serial Port Default Parameters area

  Defines the parameters to be used for communication with switches, and AUDIX R1, DEFINITY AUDIX, and Intuity AUDIX systems. The default values are set for communicating with the systems that G3-MA supports. You probably do not need to change these defaults.

  If you will be communicating with a host system other than a switch or an AUDIX system (such as a mainframe) using the Emulation application, the defaults may not match the host specifications. If this is true, do not change the defaults here. Use the Customer Release form to specify the needed host values, rather than changing the hardware defaults here for the whole system.

The defaults on the Change Hardware form are system-wide. For example, the port parameters on the form are used by the Communication application to make a connection.

To verify or change the hardware specifications:

1. In the main menu's window, click the Configuration button.

   G3-MA displays the action submenu as a MS-DOS window.

   NOTE:
   To enlarge this or any other MS-DOS window to a full-screen display in a Windows environment, press Alt-Enter. To restore the MS-DOS window to its original size, press Alt-Enter again.

2. Enter **change hardware**

   The values under the Installed Hardware field are supplied by G3-MA software. They describe your installed hardware as known by MS-DOS, as well as your MS-DOS version and G3-MA version.

   The cursor is on the Printer Type field.

3. If you have a printer, press Ctrl-y (Help) at the Printer Type field.

   NOTE:
   To print G3-MA files successfully, you must also designate a printer as the ***default*** printer in the Windows Control Panel.

   a. Use Alt-Tab (that is, press and ***hold*** Alt while repeatedly pressing Tab) to reach the Program Manager.

   b. Double click the **Control Panel** icon in the Program Manager's Main program group.

   c. Double click the **Printers** icon in the Control Panel program group.

      Windows displays a list of installed printers in the Printers window.

d. Select the desired default printer by clicking a line in this list.

NOTE:
If your printer is not in this list, refer to the Windows documentation or your printer's documentation for information about installing the printer in a Windows environment.

e. Click the Set As Default Printer button.

f. Click the Close button.

g. Click the **Settings** item in the Control Panel's menu bar.

h. Click **Exit** in the resulting pull-down menu.

i. Use Alt-Tab to return to the G3-MA Configuration window.

4. Select **standard** from the pop-up window.

   Highlight an option with the arrow keys. Select the highlighted option by pressing Enter .

   NOTE:
   If you enter **print model** in the Bulk Administration application and the resulting printed output contains unusual characters (rather than a line drawing of the model), try selecting **non-standard** in this field. The default font may work better for dot matrix printers and may improve their speed.

   If you wish to exit the pop-up window without making a selection, press Esc .

5. If you have more than one diskette drive and want to change the default diskette drive, move the cursor to the Default Diskette Drive field and make your selection.

   If you have only one diskette drive, this is a display-only field and will display **A:**.

   If you have more than one diskette drive, set this field to the one that you want G3-MA to use. For example, if you have a 5.25-in. drive for a: and a 3.5-inch drive for B:, set this field to B: for reading and writing to 3.5-inch diskettes. The default is A:

6. You probably do not need to change any of the fields in the Serial Port Default Parameters section.

7. If you made changes, press Ctrl-e (Submit). If you made no changes, or you want to exit without saving changes, press Ctrl-x (Cancel).

   G3-MA displays the action menu.

8. Enter **quit.**

   G3-MA displays the main menu.

Changing Screen Colors, Mouse, and Beep in MS-DOS

From the **configuration** form, the **change user-interface** command lets you::

- Indicate whether your PC has a color capacity
- Change screen colors
- Set the mouse speed
- Specify if you want beep tone for operational errors

Typically, you use this command only when initially setting up G3-MA. Even then, changing the default values is more a matter of preference than necessity.

One field that you may want to change is Color Option. If you have a laptop or monochrome PC and you leave this field set to the default, which assumes color, your screen could be difficult to read.

To verify or change screen colors, mouse, and beep options:

1. In the main menu's window, click the Configuration button
2. Enter **change user-interface**.

   You see three Configuration Options fields and a Color Parameter question.
3. Press Ctrl-y (Help) at each field to see the choices.

The following table shows the choices available for each field.

Table 4-1. User-Interface Fields

Field	Choices	Result
Color Option	customized	Gives access to next three pages to redefine colors
	default	Gives original screen colors
	lcd	Gives appropriate setting for laptop PCs (liquid crystal display)
	monochrome	Gives appropriate setting for PCs without color
Mouse Speed	fast	Racing mouse
	medium	Jogging mouse
	slow	Pokey mouse
Audible Beep Tone?	yes	Beep for screen errors
	no	No beep for screen errors
Is This Line Flashing?	yes, no	Shows PC's color range and produces best color display for your PC

4. If you choose **customized** at the Color Option field, press Ctrl-n (Next) to see the next page for changing screen colors, and use the following procedure for changing screen colors. Otherwise, press Ctrl-e (Submit) and go to the procedure below for "Defining External Systems" on page 4-9'

To change screen colors:

1. Press b (or the left mouse button) to change background colors. Continue pressing b until you get a color you like.
2. Press f (or the right mouse button) to change foreground colors. Continue pressing f until you get a color you like.
3. Select a color for each field.

   Notice that the sample screen shows the results of your color choices.
4. Press Ctrl-n (Next) when you are ready to see the next page.

   Complete this page, and then the next one, to your satisfaction.
5. Press Ctrl-e (Submit) when you are satisfied with all three pages.

   The colors you now see are what you chose.
6. If you do not like the results, return to the User Interface form and select **default** in the Color Option field.

Selecting Screen Colors in Windows

Beginning with 4.0, the G3-MA Main Menu and the Communication applications are fully converted to the Windows graphical interface. With this conversion, the Windows operating system (not G3-MA) controls the colors for the screens in these applications. In Windows, screen colors are changed via the Control Panel in the following manner.

1. In the Main program group of the Program Manager, double click the Control Panel icon.
2. In the resulting Control Panel window, double click the Color icon.
3. In the resulting Color window, click the pull-down arrow to open the Color Schemes list.
4. Use the scroll bar to select the predefined color scheme you want.

   The colors of the sample screen change to reflect your choice.
5. Click OK to invoke your selection.

NOTE:
The Windows software also allows you to customize and save new color schemes using either predefined or custom colors. For more information about user-defined color schemes, refer to your Windows documentation.

Changing Screen Colors in On-Line Help

The on-line help for G3-MA contains reference points in the text, referred to as **pop-ups** and **jumps**. Clicking a pop-up, a high-lighted phrase with a dotted underline, invokes a pop-up window with additional information. Clicking a jump, a highlighted phrase with a solid underline, sends you to related information.

The default color for pop-ups and jumps is green. You can change this default, as with any Windows-based help system, by editing the **win.ini** file.

1. At the **c:>** MS-DOS prompt, enter **cd \windows**.
2. Enter type **win.ini | more** to see the file.
3. In the **[windows help]** section of this file, check for the following lines:

   ```
   jumpcolor=000;255;000      (green)
   popupcolor=000;255;000     (green)
   ```

   In both of the previous lines, the hue is set to pure green. However, jumps could be set to pure red and pop-ups could be set to pure blue with the following syntax:

   ```
   jumpcolor=255;000;000      (red)
   popupcolor=000;000;255     (blue)
   ```

   Or, jumps could be set to black and pop-ups could be set to white with the following syntax:

jumpcolor=000;000;000 (black)
popupcolor=255;255;255 (white)

Also, a variety of additional hues can be realized by setting one or more of the three hue elements (red, green, and blue) to values between 000 and 255 in increments of 64.

4. If the **jumpcolor** and/or **popupcolor** lines are not present or are not set to your liking, use the **edit** command to make the desired modifications to the win.ini file.

Defining External Systems

G3-MA requires an ID (a name tag) for each system to which it will connect. To add information in the Customer Release application:

1. In the main menu's window, click the Customer Release button.
2. Enter **change id**.

   G3-MA displays the ID Records form. Refer to the following section, "Changing the Active ID" on page 4-9 for information about the Active ID field.
3. Move to a blank Dial String field.
4. Enter the ID name, switch release, and dial string.

   At this time G3-MA displays a pop-up window with two sections:

   - RS-232 Parameters
   - Customer Information

   You can enter information into any field in this window except the Customer Location field.
5. Enter the RS-232 parameters.
6. Within the Customer Information section of the pop-up window, you can enter a descriptive name for each switch or AUDIX system in the Customer Name field. These names are for your records only.
7. Press Ctrl-e (Submit).
8. Enter **quit**.

   G3-MA displays the main menu.

Changing the Active ID

For many G3-MA applications, the active system ID serves as the inferred destination for connecting to a target system as well as the directory in which the current data is stored. Therefore, for these applications, the active system ID must always match the target system with which you are attempting to connect.

NOTE:
Since you can specify separate destinations for connections using the Emulation, Communication Manager, AUDIX Data Exchange, and Call Account Transfer applications, these applications do not infer the current destination from the active system ID.

If there is more than one available ID in the ID Records form, you can select the active ID. (If not, you cannot change this field.) If you do not select the active ID, G3-MA defaults to the first available ID.

To change the active system ID in the main menu:

1. In the main menu, click the **ID:[xxxx]** button in the window's tool bar.

   NOTE:
   The value "**xxxx**" represents the currently active system ID.

2. Click the desired active ID in the resulting pop-up window, and click OK.

   The value "xxxx" in the ID:[xxxx] button changes to the selected system ID.

To change the active system ID in the ID Records form:

1. In the main menu's window, click the Customer Release button.
2. Enter **change id**.

   G3-MA displays the ID Records form.
3. Select the desired active system ID in the Active ID field.
4. Press Ctrl-e to submit the change.
5. Enter **quit**.

   G3-MA displays the main menu, and the value "xxxx" in the ID:[xxxx] button changes to the selected system ID.

Connecting to a System

When you are using G3-MA (Windows), you connect to a system by letting G3-MA automatically connect to the system. With the G3-MA Automatic System Dial-Up feature, G3-MA automatically calls a system whenever you use a feature that requires a switch connection (for example, the **add data-template** feature). G3-MA (Windows) calls the system that is either:

- Inferred by the currently active system ID
- Specified by the user as a separate destination in the Emulation, Communication Manager, or AUDIX Data Exchange application

and brings up a login window for you to log in to that system. This is the method used for connecting to a system, because it's convenient and efficient.

Testing Connections

You can now test the G3-MA software setup by connecting to each system. This basic sanity test checks an entire G3-MA (Windows) connection by:

- Starting the connection at the application-level software
- Passing it through the service-layer, communications-system, and Windows software to the physical hardware

If this test passes, for a connection to a target system ID, no other tests are necessary for that system ID. If not, refer to Chapter 8 for information about lower-level tests that should help isolate the problem.

To connect to a system:

1. In the main menu's window, click the Emulation button.

   The G3-MA displays the Emulation window.

2. Enter **connect**.

   G3-MA prompts you to select a system ID from a pop-up list.

3. Select the desired target system ID, and press Enter.

4. The G3-MA Automatic System Dial-Up feature:

   - Verifies that the Communication Manager application is running.

     NOTE:
     If not, a pop-up window will display this message. ''You need to restart the Communication Manager application (click on the Communication Manager button) prior to executing this application.''

   - Dials the connection to the selected target system using its first assigned dial string.

   The G3-MA displays a 60-second countdown on the message line. This is the time allotted for the first attempt to connect. You can stop the countdown by pressing Ctrl-x (Cancel).

   If the target system is available, you usually see the login/password window in the first few seconds. If not, the countdown finishes for the first dial string. Then, if a backup dial string is assigned, G3-MA will repeat Step 4 for the second dial string.

5. Once G3-MA connects to a target system, enter the *system login*.

6. Enter the *password*.

   When you successfully log in, the G3-MA displays an administration window for the target system. Otherwise, it displays an error message in a pop-up window.

7. You will be asked if you want the login and password permanently saved and encrypted for automatic script use (If you have the scripting application installed). Select **Y** if you want this option.

Notice that the target system's administration window shows you the:

- ID of the system that you are connected to in the window's title bar
- G3-MA Ctrl-sequence prompts beneath the administration portion of the window

Repeat this connect and the following disconnect sequence for each system ID.

Disconnecting from a System

Using the Communications Server Icon

If a connection's Communications Server icon is ***not*** obscured by other application windows, a simple two-step procedure will disconnect G3-MA from the system.

1. Select, if necessary, and click the Communications Server icon.
2. Click the **Close** item in the resulting pull-down menu.

Using the Task List Window

If a connection's Communications Server icon ***is*** obscured by other application windows, you can use the Task List window to disconnect G3-MA from the system.

1. Press Ctrl-Esc to pop up the Task List window.
2. Select the **AT&T Comm. Server** line in the window, and click the End Task button.

Using the Communication Manager Application

1. In the main menu's window, click the Communication Manager button.

   G3-MA displays the Communications Manager window.
2. Click the **Diagnostics** item in this window's menu bar.
3. Click the **Disconnect** item in the resulting pull-down menu.
4. Specify the desired port in the resulting pop-up window, and click OK.

G3-MA (UNIX) Connectivity

5

This chapter provides information and diagrams showing how to connect G3-MA to switches and to AUDIX systems. You can use this information to establish the correct connections. Also, this chapter provides step-by-step instructions for connecting the G3-MA PC to the appropriate data-communications equipment.

This chapter covers:

- "Overview of G3-MA (UNIX) Connectivity" on page 5-2
- "Connecting to a Switch" on page 5-4
- Connecting to AUDIX Release 1 (R1), DEFINITY AUDIX, and INTUITY AUDIX systems

This chapter assumes you have already planned your network and determined which equipment you will use to make connections. If this is not the case, see *DEFINITY Communications System Generic 3 Management Applications Planning and Implementation,* 585-229-610.

For information about G3-MA (Windows) connectivity, see Chapter 2.

NOTE:
G3-MA connections to a switch can involve a number of different pieces of equipment, including data modems or data modules, house wiring, and cables. It is essential that the various pieces of equipment used in a G3-MA configuration are correctly set up to work with each other.

The configurations described in this chapter are the certified G3-MA configurations supported by AT&T. You can set up other configurations.

However, if you use an uncertified configuration, a configuration other than the ones described in this chapter.

- For U.S. and Canadian installations, you will be billed on a time-and-materials basis for any assistance received from the Technical Service Center (TSC) and other AT&T organizations.
- For international installations, you will not be provided the services of an AT&T technical-support organization.

In addition, you should be very familiar with all the components of your G3-MA configuration before calling for assistance. For more information about getting help from the TSC or the ITAC, see Chapter 8.

The connections described in this chapter may require gender changers. You may wish to have several gender changers on hand when you establish these hardware connections.

Overview of G3-MA (UNIX) Connectivity

Your G3-MA PC can connect to a switch and optionally to an AUDIX, DEFINITY AUDIX, or INTUITY AUDIX system. Connections to an AUDIX system are required for the AUDIX Data Exchange application to transfer data.

Figure 5-1 shows a high-level overview of G3-MA connectivity to a switch or an AUDIX system. The optional connection to an AUDIX system varies depending on whether you will be using an AUDIX R1, DEFINITY AUDIX, or INTUITY AUDIX system.

- An AUDIX R1 system or INTUITY AUDIX system provides voice-messaging capabilities through an adjunct processor.
- A DEFINITY AUDIX system (R1.0 and later releases) provides voice-messaging capabilities through a processor within the switch itself.

Figure 5-1 shows both configurations.

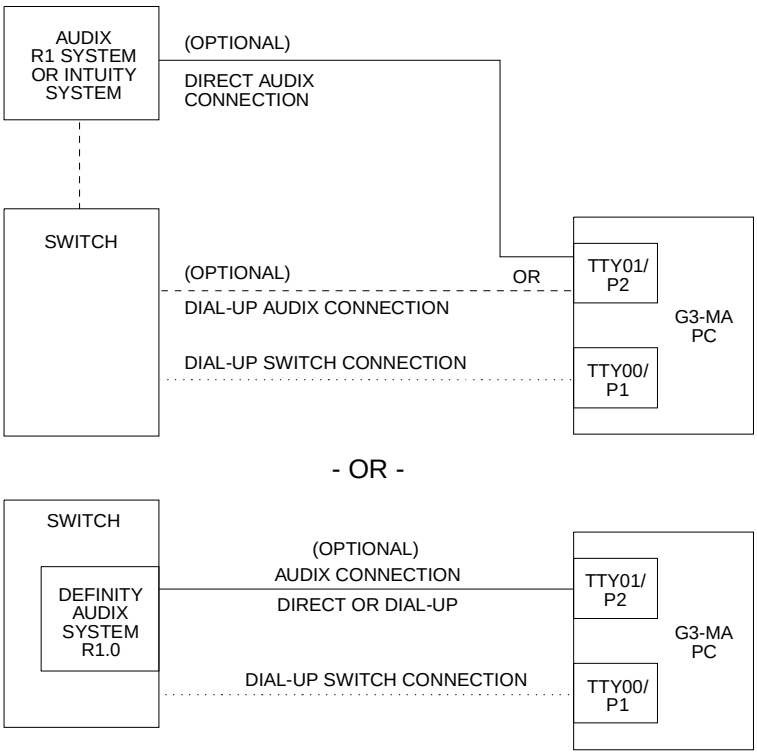


Figure 5-1. High-Level Overview of G3-MA Connectivity

You may use either direct or dial-up connections to an AUDIX system. You must use dial-up connections to a switch (except for AT&T software associates, who can use direct connections to a switch).

Although the preceding figure shows communications port ‘‘TTY00’’ used for switch connections and communications port ‘‘TTY01’’ used for AUDIX connections, this practice is not required. Beginning with 4.0 G3-MA (UNIX), these communications ports can be reversed.

Connecting to a Switch

This section helps you plan for the correct connectivity and make the required hardware connections.

Connecting a PC to a Modem/Data Module/ADU

You must first identify what type of data communication equipment you will need for the correct connection. Whether you use a data module, modem, or ADU depends on whether you want to make connections through the public network and on distance requirements and cost factors.

- For a connection that partly uses the public network, you can use a COMSPHERE 3830 modem.
- For a connection not using the public network, you can use a 7400B data module or an ADU.
  - — A 7400B data module can be up to 5000 feet from the switch. In addition, the 7400B has Autobaud capability, which is an advantage if you will be connecting to a number of remote systems (that is, switches and AUDIX R1, DEFINITY AUDIX, and INTUITY AUDIX systems).
  - — An ADU can be up to 2000 feet from the switch and is less expensive than the 7400B data module.

Procedures for connecting the PC to a data module, modem, or ADU are provided later in this chapter under *Establishing PC Hardware Connections*.

Refer to Figure 5-2, which shows detailed connections between the G3-MA PC and either a data module, a modem, or an ADU. This figure contains four diagrams. The first diagram shows the high-level overview of G3-MA connectivity, highlighting the connection between a G3-MA PC and a modem, data module, or ADU. The second, third, and fourth diagrams show the connections between a G3-MA PC and a modem, data module, and ADU, respectively.

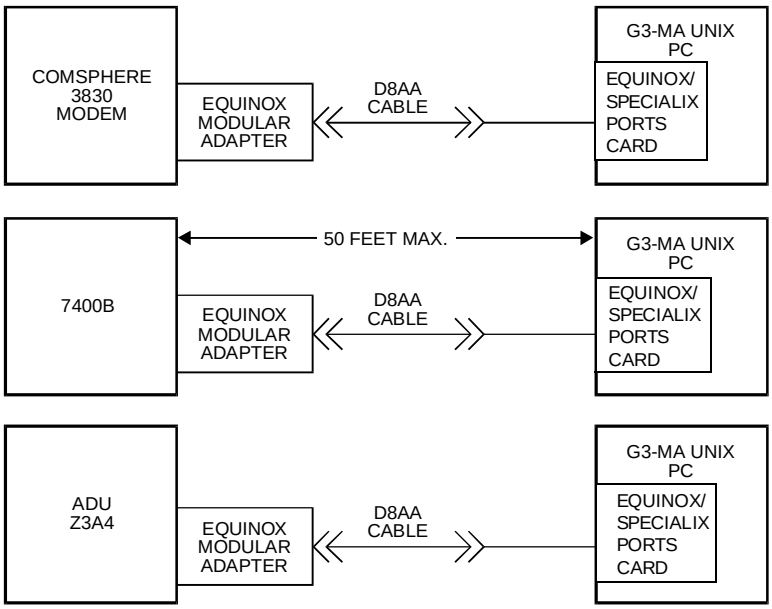


Figure 5-2. Connections from the G3-MA PC to the Modem, Data Module, and ADU

Connecting the Modem/Data Module/ADU to a Switch

Next, you must identify which circuit pack to use for connecting the modem, data module, or ADU to a switch. Refer to Figure 5-3 for assistance.

The line type on the switch depends on whether a modem, 7400B data module, or ADU is used. For international installations of G3-MA, the international line-type equivalents (with A-law companding, but ***not*** with a 2-wire DCP interface) of these connections should also work.

- If a modem is used, the line type on the switch must be analog (composed of TN746, TN468, TN2144, or TN2149 Analog and TN758 Pooled Modem circuits).

  NOTE:
  The suffix ''B'' or higher is strongly recommended for a TN746 or TN468 circuit pack.

- If a 7400B data module is used, the line type must be 4-wire digital (composed of TN754 or TN413 Digital circuit).

  NOTE:
  A 2-wire DCP circuit pack cannot be used in a dial-up connection from the G3-MA to a switch.

- If an ADU is used, the line type must be data (composed of TN726 Data Line circuit).

Figure 5-3 shows detailed connections between the data module, modem, or ADU and the switch. This figure contains four diagrams. The first diagram shows the high-level overview of G3-MA connectivity, highlighting the connection between the modem, data module, or ADU and the switch. The second, third, and fourth diagrams details between the switch and the modem, data module, and ADU, respectively.

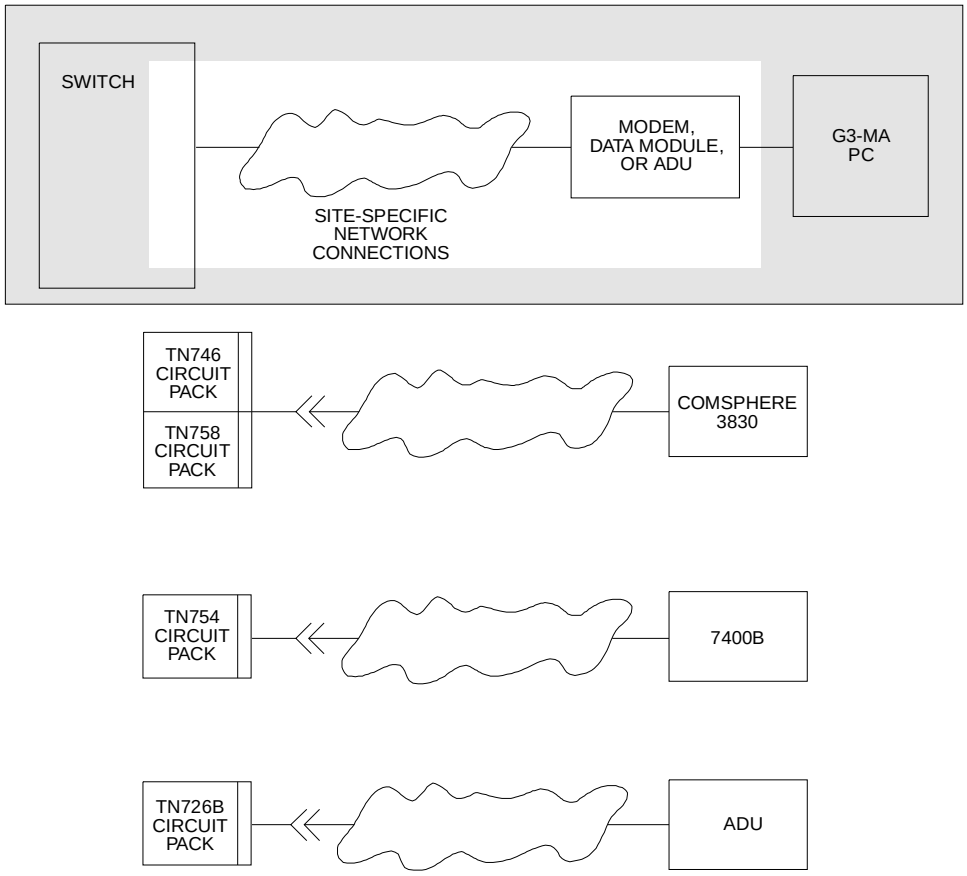


Figure 5-3. Dial-Up Connections to the Switch: Modem/Data Module/ADU to Switch

Establishing the Switch-Port Terminations

Next, you must establish the switch-port terminations. Terminating a G3-MA connection to a switch varies depending on the specific switch:

- With a DEFINITY G3r switch, G3-MA connections terminate to a system access port.
- With a DEFINITY G3i or G1 switch or System 75 R1V3 switch, G3-MA connections terminate to a TN777 Netcon port.

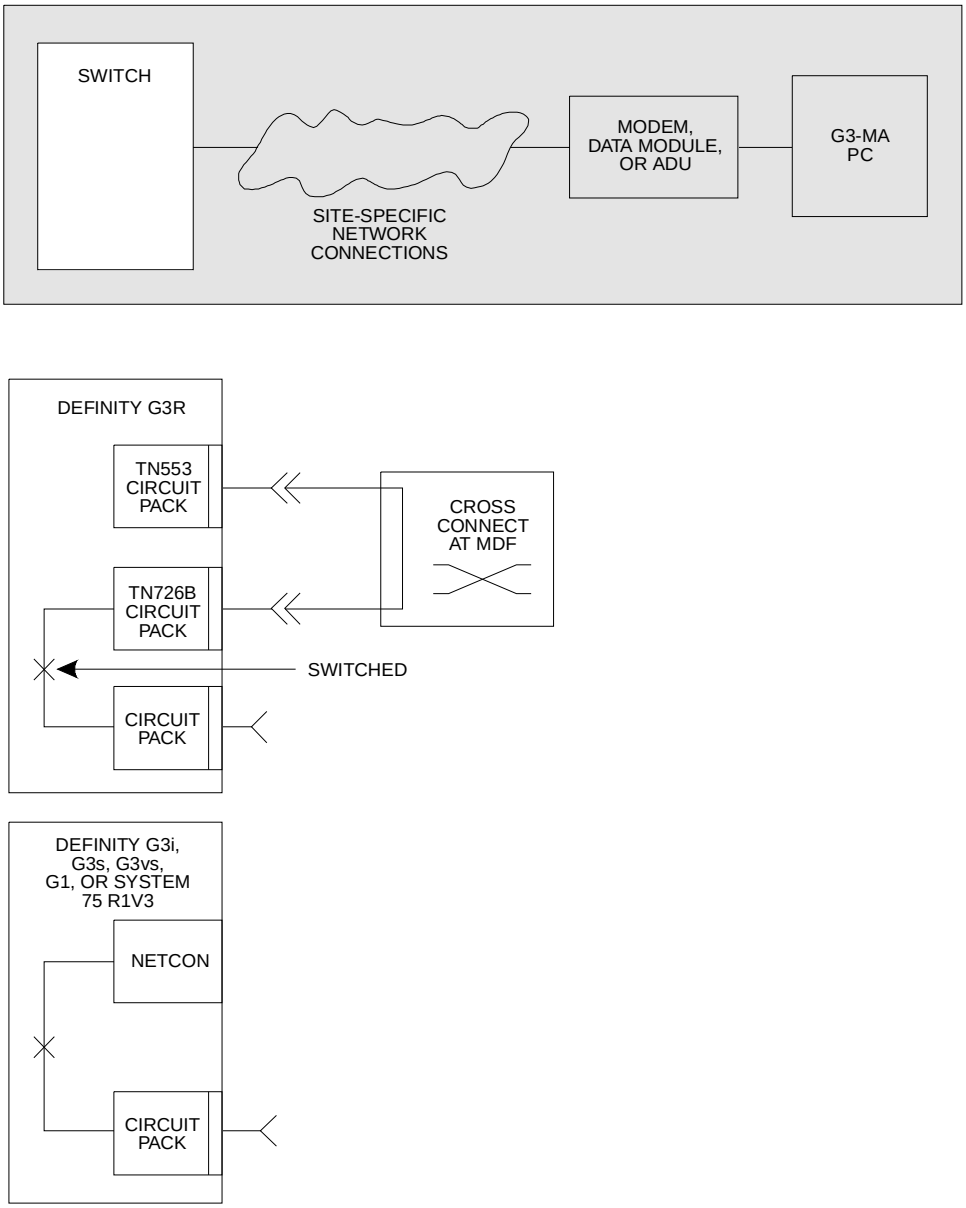


Figure 5-4. Dial-Up Connections to the Switch: Port Terminations

Figure 5-4 shows the ports that terminate a G3-MA connection to these switches.

Administering the DEFINITY G3 Switch Ports

Finally, you must administer ports for the G3r and G3i systems. Use the following guidelines to administer these systems correctly.

DEFINITY G3r Administration Requirements

On DEFINITY G3r, system access ports are administered resources; that is, system access ports are administered as such. Each one requires a TN726B Data circuit and TN553 Packet Data Line (pdata) circuit.

The following is a summary of G3r switch administration required for G3-MA compatibility.

- For an analog line with a COMSPHERE 3830 modem

  Use the **add station** command and put an analog station type such as a 7101A in the Type field, and the analog port's location in the Port field. (Modem pooling may be required for this option.)

- For a voice-and-data 7400B data module

  Use the **add station** command, and in the Type field, put a digital station that supports a data module, such as a 7407D. Put the digital port's location in the Port field and verify that the data module field is **y**. Then put the data module extension in the Data Ext field. (Modem pooling may be required for this option.)

- For a standalone data-only 7400B data module or for an ADU

  Use the **add data-module** command. For a standalone data-only 7400B data module, put **pdm** in the Type field. For an ADU, put **data-line** in the Type field. Set the transmission rate (in bps) for the switch or the AUDIX system to match the transmission rate of G3-MA. For the ADU, set the Auto Adjust field to **n**.

- To administer the system port on the switch

  Use the **add data-module** command. Put **system-port** in the Type field; put the data port's location in the Port field; put the port location of the associated pdata board in the Associated PDATA Port field. Use the **add hunt-group** command to add the system port's extension as a member of a hunt group.

  For system-port wiring, port 1 of the data board is typically wired to port 1 of the pdata board.

DEFINITY G3i, G3si, and G3vs Administration Requirements

On DEFINITY G3i, G3si, and G3vs, the netcon is an internal channel that can be assigned as a port. Use the **add data-module** command to assign the **netcon** type to an extension, and the **add hunt-group** command to add the netcon's extension as a member of a hunt group.

Establishing Site-Specific Connections

You can use a number of possible site-specific connections for dial-up G3-MA connections to a target switch or AUDIX system, including connections through:

- Privately owned right of way
- Private-network facilities (that is, leased facilities in the public telephone network)
- Public-network facilities (that is, switched facilities in the public telephone network)

However, DEFINITY G1.1 and System 75 R1V3 switches provide no error checking and recovery (except what the modems may provide) for dial-up connections outside the local switch. Therefore, dial-up connections either through:

- The public network
- Unconditioned facilities in the private network

are not recommended for G3-MA calls either from or to these switches.

The following detailed cabling diagrams in Figure 5-5 through Figure 5-7 show site-specific connections using a 103A or wall jack and a cross-connect field.

Detailed Cabling Diagrams

This section shows three detailed diagrams for cabling and connectivity between the different pieces. For the connections between the PC Ports card and modem/data module/ADU, see Figure 5-8. A diagram is provided for each of four configurations using:

- COMSPHERE 3830 modem (Figure 5-5)
- 7400B data module (Figure 5-6)
- ADU (Figure 5-7)
- EQUINOX Megaplex Ports Card (Figure 5-8)
- EQUINOX SST Ports Card (Figure 5-8)
- Specialix SLXOS Ports Card (Figure 5-8)

In these diagrams, the switch can be any supported switch; the actual switch used will not affect the cabling.

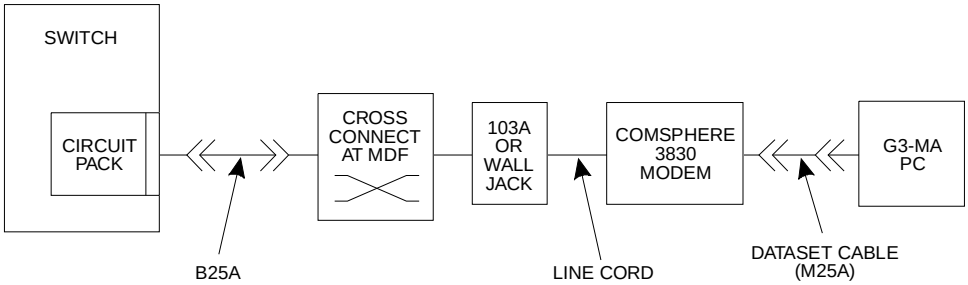


Figure 5-5. Detailed Cabling — COMSPHERE 3830 Modem Configuration

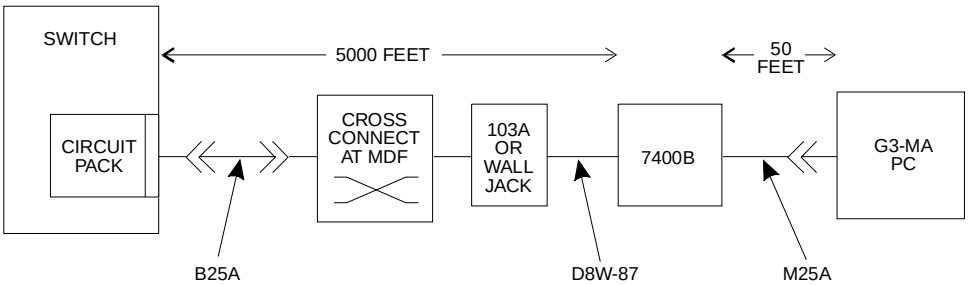


Figure 5-6. Detailed Cabling — 7400B Data Module Configuration

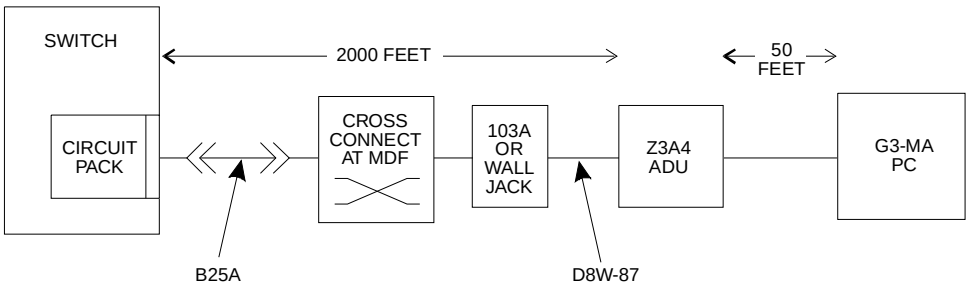


Figure 5-7. Detailed Cabling — ADU Configuration

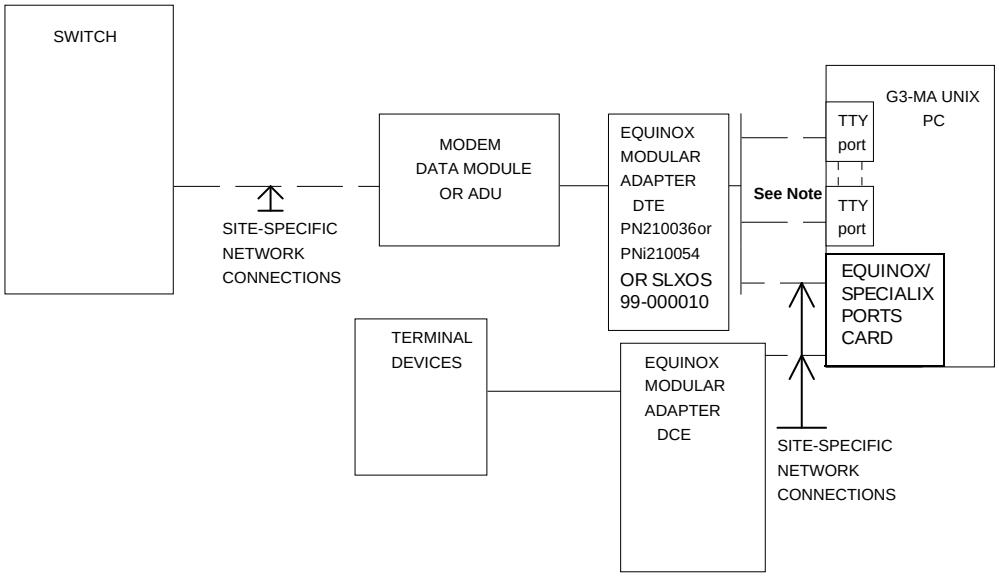


Figure 5-8. Detailed Cabling EQUINOX Megaplex, SST, or Specialix Ports Cards

NOTE:
The UNIX operating system will select a TTY port based on the baud rate specified for the connection by the system administrator.

If you have a ports card installed in your UNIX PC, refer to Appendix C and to the documentation furnished with the ports card for information needed to install hardware and software.

Establishing UNIX-PC Hardware Connections

This section provides a step-by-step procedure for establishing connections between a PC and a data module, modem, or ADU. (Refer to switch documentation for procedures to connect the data module, modem, or ADU to a switch.)

Refer to Figure 5-2, Figure 5-8, and Figure 5-9 when you use this procedure.

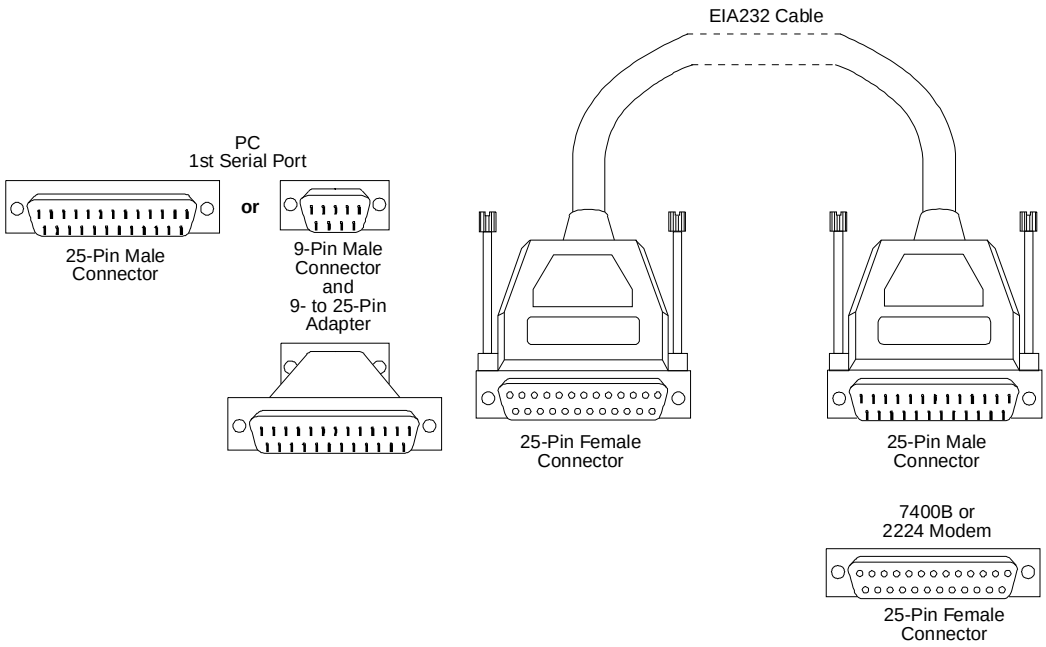


Figure 5-9. Hardware Connections

To connect a certified UNIX PC (using the standard serial ports) to a certified modem, data module, or ADU:

1. Use an RS-232 cable (M25B) with a 25-pin female connector for the PC and a 25-pin male connector for the module or modem. If you are using an ADU, check it to see what gender connector you need for the ADU-end of the cable.

   If your cable does not have the appropriate gender connectors, use a gender changer to make the correct cable configuration.

2. Determine if the connector on the first serial port of the PC is a 25-pin or 9-pin connector.

   PC ports are labeled with the port number and type (serial or parallel).

   If the first serial port is a 9-pin connector, connect a 9- to 25-pin RS-232 adapter.

3. Connect the female end of the RS-232 cable to the male connector of the PC's first serial port.

4. Connect the male end of the RS-232 cable to the female 25-pin RS-232 connector on the modem or module. If you are using an ADU, connect the cable end you configured (in Step 1) to the ADU.

5. Verify or change settings.
    - If you are using a COMSPHERE 3830 modem, verify that all settings are the factory defaults.
    - If you are using a standalone data-only 7400B data module, change dip switch #1 to ON. All other dip switches should remain in the DOWN position.
    - If you are using a voice-and-data 7400B data module, all dip switches should remain in the DOWN position.
    - If you are using an ADU located more than ***50 feet*** from the G3-MA, the ADU must be supplied with ***external power***.

To connect a certified UNIX PC (using EQUINOX/SPECIALIX ports cards) to a certified modem, data module, or ADU, do the following.

Connect a RJ11 modular cable connected to a EQUINOX modular adapter (Megaplex - PN210026 DB-25 DTE male, or a PN 210027 DB-25 DTE female; SST - PNi210054 DTE 818; Specialix - SLXOS 00-000010) 6-wire modular adapters on the modem end. Part numbers for 8-wire and 10-wire modular adapters are listed in the *MEGAPORT XP Hardware Reference Manual PN 560074/A, SST SVR 4.2 Streams Device Driver V1.05,* and *Specialix SLXOS Guide to Installation and Operation*.

This completes the physical connection between the PC and the modem, data module, or ADU.

Establishing Incoming Ports for Remote Access

For G3-MA (UNIX), incoming ports are established so that maintenance personnel and the TSC can monitor the G3-MA system's health. Each incoming G3-MA port is comprised of either a:

- RMB ports card
- COMSPHERE 3830

modem (on the ***far*** side of the incoming connection) and terminates to either a:

- Communications port (either TTY00 or TTY01)
- EQUINOX/SPECIALIX port

at the G3-MA.

COMSPHERE 3830 Modem

Follow these steps to set the options for an COMSPHERE 3830 modem on TTY00.

1. Connect a dumb terminal to the 25-pin connector located behind the modem. For information about connecting the terminal to the modem, refer to the modem's user documentation.

   NOTE:
   Set the terminal's transmission rate to 2400 bps.

2. Connect the power cords to the modem and the terminal.
3. Turn on the power to the modem and the terminal.
4. At the terminal, enter the following soft options (these commands use numerical zeros and ones, not their similar letters).

AT&F	(factory default settings)
ATS41=6	(2400-bps handshake)
AT&T5	(double remote loop-back test)
ATE0Q1&W0	(no local echo, no result codes, save to active, profile)

   If necessary, reset the modem using its power switch.

Multiple Dial-Up Connections to a Switch

DEFINITY G3r allows up to five simultaneous administration/maintenance logins on the switch. The administration terminals can be G3-MA PCs or any other type of administration terminal.

The hardware connectivity for using this feature is no different than the dial-up connectivity shown earlier in this chapter. The feature merely allows simultaneous dial-up connections to the switch for administration purposes.

On DEFINITY G3i, you may use multiple administration logins, but only one administration session can occur at a time.

Establishing Direct Connections to the Switch

In some G3-MA configurations, customers can establish ***one*** direct connection between a G3-MA and a switch's expansion port network (EPN). Although this connection is an attractive alternative for its simplicity of installation and cost savings in hardware, customers using these connections can experience slower G3-MA response times, and direct G3-MA connections to more than one EPN would seriously degrade throughput between the port networks (especially in high-traffic switches).

A direct switch connection precludes dial-up connections to other systems over the COM port used. Also, since a G3-MT must always be connected for switch maintenance, this connection is not supported to switches with *only one* port network, the processor port network (PPN). Moreover, since DS1C remoting of an EPN limits bandwidth between the EPN and other port networks, direct connections are only supported through a *local* or *a fiber-remoted* EPN.

NOTE:
In older EPNs, the RS-232 connector behind the expansion control carrier does not provide the complete set of pinouts [including data transmission ready (DTR)] needed for a reliable G3-MA connection.

Connecting to AUDIX Systems

This section provides information about G3-MA connections to AUDIX systems. The diagrams show the different options for making connections, depending on what equipment you will use. The diagrams can help you to establish the required hardware connections during installation.

Connections to an AUDIX system are required if you will use the AUDIX Data Exchange feature to transfer data. Skip this section if you are not using this feature.

This section separately covers connections to an external AUDIX R1 or INTUITY AUDIX system and connections to an internal DEFINITY AUDIX system. Administering an AUDIX connection is covered in Chapter 7 under "Defining External Systems" on page 7-5'

Connecting to AUDIX R1 or INTUITY AUDIX System

You can connect to an AUDIX R1 or INTUITY AUDIX system either directly or with dial-up connections. AUDIX R1 systems support dial-up connections at 1200 or 4800 bps. INTUITY AUDIX systems support dial-up connections at up to 9600 bps.

For more information about connections between the switch and an AUDIX R1 system, see *AUDIX Installation*, 585-305-105.

For more information about connections between the switch and an INTUITY AUDIX system, see *INTUITY MAP/40 Hardware Installation*, 585-310-138, or *INTUITY MAP/100 Hardware Installation*, 585-310-139.

Direct Connections

You can establish direct connections between G3-MA and an AUDIX R1 or INTUITY AUDIX system using either a null modem or a pair of ADUs.

Figure 5-10 shows a direct connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a null modem.

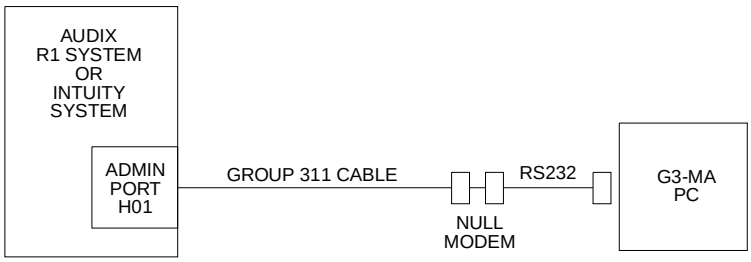


Figure 5-10. Direct Connection to AUDIX R1 or INTUITY AUDIX System Using Null Modem

To connect the PC to an AUDIX R1 system or INTUITY AUDIX system directly using a null modem:

1. Connect one end of an RS-232 cable to the AUDIX R1 or INTUITY AUDIX administration port.
2. Connect the other end of the cable to a null modem.

   G3-MA, AUDIX R1, and INTUITY AUDIX systems are sensitive to correct connectivity. Be sure to use the AT&T-provided null-modem cable designed specifically for this environment.
3. Connect the null modem to a serial port on the PC.

   If your PC's serial port has a 9-pin connector rather than a 25-pin connector, use a 9- to 25-pin RS-232 adapter to connect the null modem to the serial port.

Figure 5-11 shows a direct connection between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a pair of ADUs.

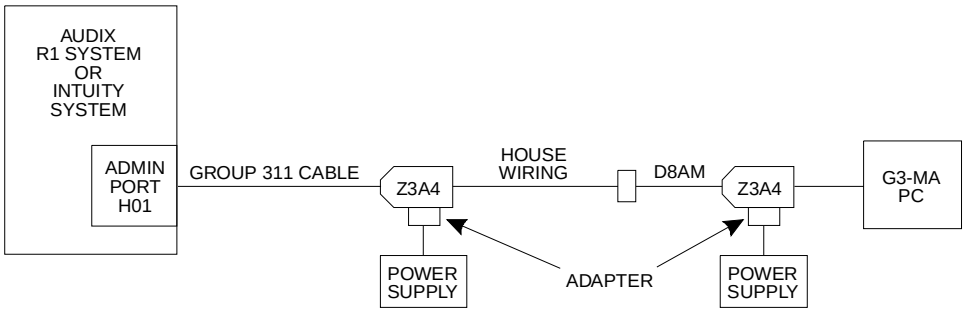


Figure 5-11. Direct Connection to AUDIX R1 or INTUITY AUDIX System Using ADUs

Dial-Up Connections

You can establish dial-up connections between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using modems or 7400 data modules.

Figure 5-12 shows dial-up connections between G3-MA and an AUDIX R1 system or INTUITY AUDIX system using a pair of modems.

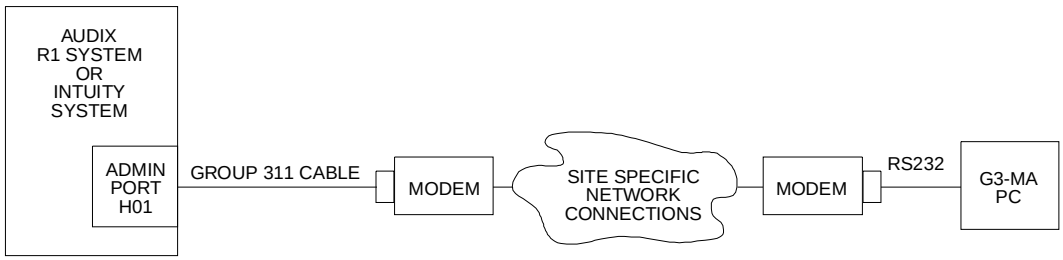


Figure 5-12. Dial-Up Connection to AUDIX R1 or INTUITY AUDIX System Using Modems

Figure 5-13 shows a dial-up connection between G3-MA and AUDIX R1 system or INTUITY AUDIX system using a pair of 7400 data modules. This configuration requires the use of a 7400A data module on the AUDIX side and a 7400B data module on the G3-MA side.

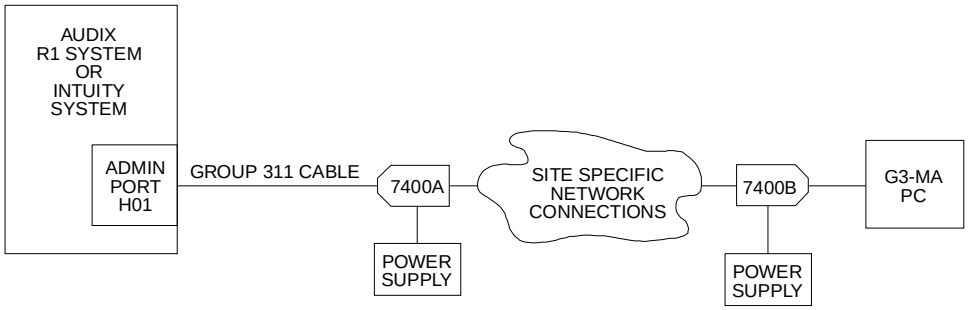


Figure 5-13. Dial-Up Connection to AUDIX R1 or INTUITY AUDIX System Using 7400 Data Modules

INTUITY AUDIX Connections

For a G3-MA connection to an INTUITY AUDIX system, a Comsphere 3820 modem can reside on the INTUITY-AUDIX side of the connection.

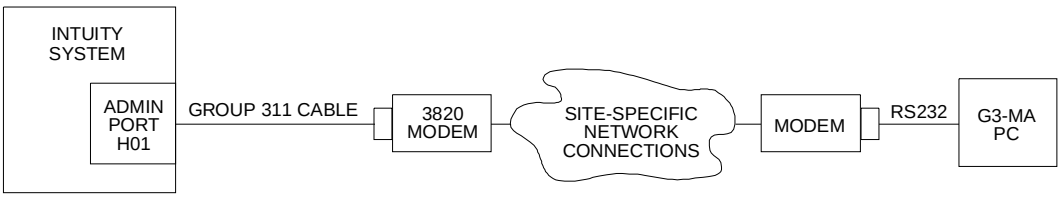


Figure 5-14. Dial-Up Connection to INTUITY AUDIX System Using Comsphere 3820 Modem

For a 3820 ***connected to*** an INTUITY AUDIX system, the /mtce/bin/**set_modem** command configures the modem attached to the serial port. The modem can either be attached to

- Port ‘‘tty00’’ or ‘‘tty01’’ on the INTUITY AUDIX system’s board
- Port ‘‘ttysaa’’ to ‘‘ttysah’’ on the Equinox board

Enter the command with the following syntax.

set_modem *port* 3820

Apply the following attributes to the data terminal equipment (DTE) line.

9600 bps
8 data bits
no parity
1 stop bit

Use the following AT command to configure the 3820 modem.

AT&F3L0&D2&S1\N0\Q3S41=3S2=128&W0

If you still have problems connecting to an INTUITY AUDIX system through a 3820 modem, call the INTUITY Helpline at: **1-800-526-2834**.

Connecting to DEFINITY AUDIX System

The DEFINITY AUDIX system (R1.0 and later releases) provides voice-messaging capabilities using circuit packs within the switch itself. Connections to DEFINITY AUDIX system can be either direct, or dial-up at speeds up to 9600 bps.

Direct Connections

You can establish direct connections between G3-MA and DEFINITY AUDIX system using a null modem or a pair of ADUs.

Figure 5-15 shows a direct connection between G3-MA and DEFINITY AUDIX system using a null modem.

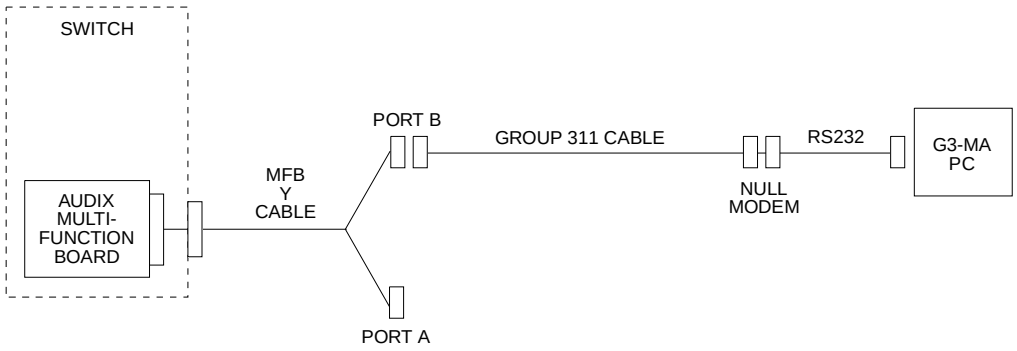


Figure 5-15. Direct Connection to DEFINITY AUDIX System Using Null Modem

To connect the PC to a DEFINITY AUDIX system directly using a null modem:

1. Connect one end of an RS-232 cable to the AUDIX Port B.
2. Connect the other end of the cable to a null modem.

   G3-MA and AUDIX systems are sensitive to correct connectivity. Be sure to use a null-modem cable designed specifically for this environment.
3. Connect the null modem to a serial port on the PC.

   If your PC's serial port has a 9-pin connector rather than a 25-pin connector, use a 9- to 25-pin RS-232 adapter to connect the null modem to the serial port.

Figure 5-16 shows direct connections between G3-MA and DEFINITY AUDIX system using ADUs.

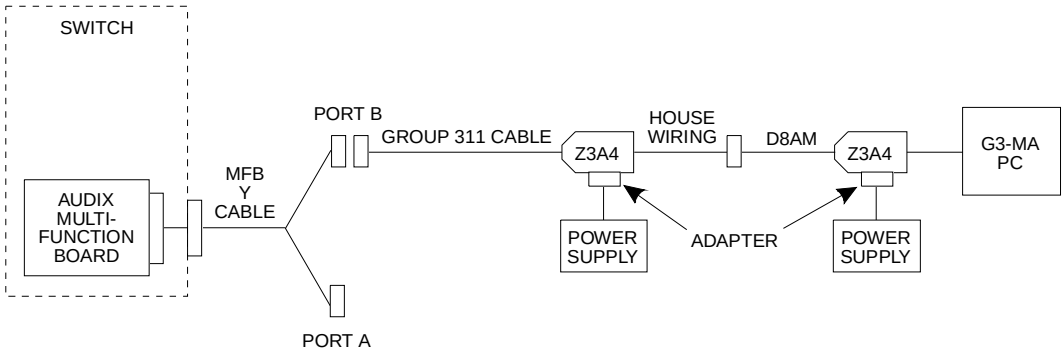


Figure 5-16. Direct Connection to DEFINITY AUDIX System Using ADUs

Dial-Up Connections

You can establish dial-up connections between G3-MA and DEFINITY AUDIX system using modems or 7400 data modules.

Figure 5-17 shows dial-up connections between G3-MA and DEFINITY AUDIX system using modems.

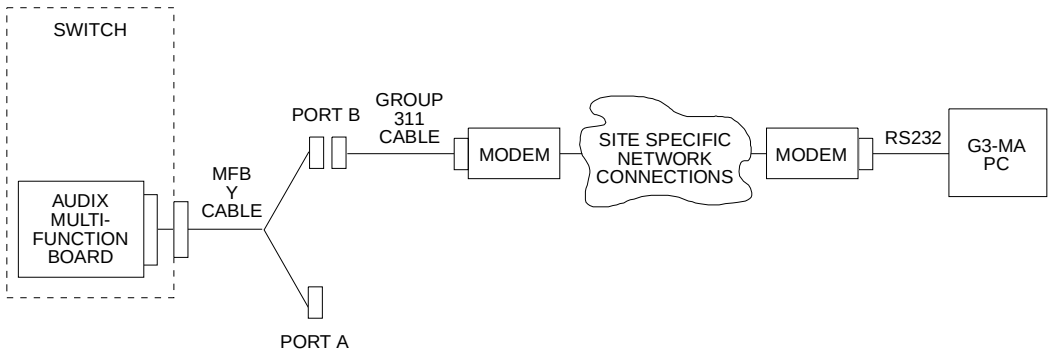


Figure 5-17. Dial-Up Connection to DEFINITY AUDIX System Using Modems

Figure 5-18 shows dial-up connections between G3-MA and DEFINITY AUDIX system using 7400 data modules. This configuration requires the use of a 7400A data module on the AUDIX side and a 7400B data module on the G3-MA side.

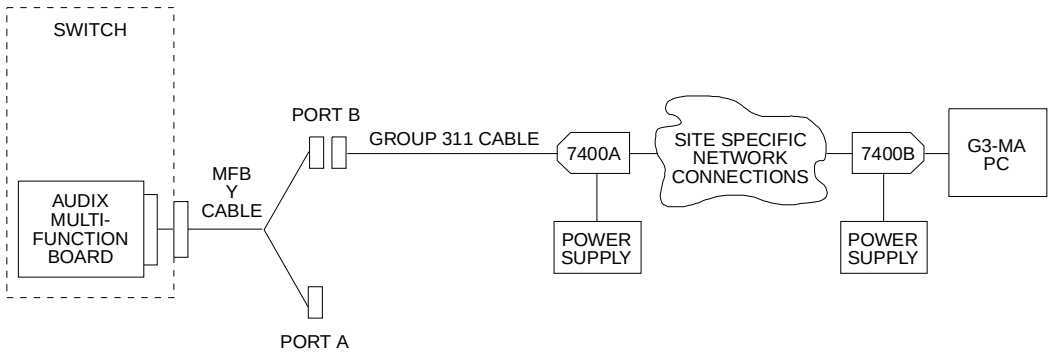


Figure 5-18. Dial-Up Connection to DEFINITY AUDIX System Using 7400 Data Modules

Administration of Multiple AUDIX Systems

One at a time, G3-MA can administer several different AUDIX R1, DEFINITY AUDIX, and/or INTUITY AUDIX systems using dial-up connections. This is done using different administration sessions, by connecting through a dial-up G3-MA port to each system in turn.

The required hardware connections for using this capability are no different from those previously described under dial-up connections. If a direct connection from a G3-MA port to an AUDIX R1 or INTUITY AUDIX system is established, this G3-MA port cannot administer multiple systems.

Installing G3-MA (UNIX) Software

6

This chapter tells you how to install the G3-MA (UNIX) software on your UNIX PC. If you are installing G3-MA (Windows) refer to Chapter 3, Installing G3-MA (Windows) Software. This chapter covers:

NOTE:
For U.S. and Canadian orders, the Project Manager must schedule the G3-MA (UNIX) installation with the Technical Service Center (TSC) at least two weeks before the installation date.

For international orders, the AT&T representative's or AT&T-authorized distributor's project manager must schedule the G3-MA installation with the International Technical Assistance Center (ITAC) at least four weeks before the installation date.

Preparing to Install G3-MA

This section helps you to verify that your computer is set up correctly and that you have everything you need to correctly install the G3-MA software.

Verifying Hardware Connections

Be sure that the hardware connections described in Chapter 5 have been established. Your G3-MA PC should have hardware connections to a switch and, if you are using the AUDIX Data Exchange feature, to an AUDIX system as well. See Chapter 5 if you have not made these connections.

Verifying Installed Software

Verify your current software.

- Your PC's operating system must be UnixWare 2.01. The minimum foundation set requirements for UnixWare running G3-MA must include the following packages.
  - — Base system package
  - — Editing
  - — Remote terminal
  - — Network-support utilities
  - — Sysadm

NOTE:
If you are upgrading from 4.1.1 (or 3.1) of G3-MA to 4.1.2, you will need to take special steps to save your data files before migrating your operating system to UnixWare. These steps are detailed in a later section.

Preparing PC for TSC/ITAC Support

NOTE:
If a new UNIX PC was ordered from the factory for this G3-MA installation, the factory prestaged the UNIX operating system and the G3-MA software on the PC.

1. Power up the UNIX PC and connect the remote maintenance modem.
2. Enable the remote maintenance port ''tty00.''

   For instructions, refer to "Installing the RMB in Your UNIX PC" on page E-1.
3. Administer the modem to the remote maintenance port ''tty00.''

   For instructions, see Appendix C.
4. Change the permissions of files in /dev/ttyxxx (where ''xxx'' corresponds to entries of concern in the Devices file) to ''**666**'' using the command:

   chmod 666 tty*.
5. Set modem options for the incoming remote maintenance port.

For instructions, see Chapter 5.

6. For ***U.S. and Canadian*** installations, call the TSC at **1-800-548-8861 (extension 6767)** to continue the ***scheduled*** installation with the provisioning group.

   For ***international*** installations, call the AT&T representative or the AT&T-authorized distributor so that the ***scheduled*** installation can be continued with the ITAC.

Understanding G3-MA on UNIX

This guide assumes that you know the basics of using your computer — how to input commands and how to verify that the operating system is running and in good health. You must have a working knowledge of the UNIX file system and the commands necessary to move around in the directories and files. You must be able to use one of the UNIX Editors (vi) or (ed) to customize G3-MA to meet site requirements.

This section summarizes some of the UNIX concepts you need to understand when installing and running G3-MA UNIX. For more detailed information, see the *UnixWare 2.0 Owner Handbook, UnixWare 2.0 Desktop User Handbook,* and *UnixWare 2.0 System Administration* (2 volumes).

The UNIX operating system is made up of four major parts:

- The kernel
- The file system
- The shell
- Commands

The UNIX Kernel

The kernel is the "*heart*" of the operating system. It allocates the system resources among users, manages memory, and maintains the file system.

The UNIX File System

The file system manages the storage and retrieval of information for the operating system. It is arranged in a hierarchical structure and is composed of three main parts:

- Directories
- Special files
- Ordinary files

A directory is a super-file and is the storage location for a group of related files and subdirectories. For example, a directory named **g3-ma** would contain the files and subdirectories to support the user of a G3-MA application.

The UNIX System maintains a group of directories for its own use. These directories are much the same on every UNIX system. The home directory for these files is a directory named **root**. The **root** directory is represented by the designation (**/**) and is the starting point for the UNIX file system. All UNIX directories and files are arranged hierarchically under the **root** directory. When you are assigned a login on a UNIX system, you are given a home directory. As a system user, you have full control over this directory. When you login to the UNIX system, that directory becomes your working or current directory.

A directory environment for G3-MA may look like Fig. 6.1. Notice that the root directory is always represented as a (/). If you used the UNIX command to move from the root directory to the **g3-ma** directory, you would use the command **cd** (change working directory) followed by the directory name or path. For example, the **cd /home /g3-ma** command would move you from root directory to the **g3-ma** directory. You would use the command **ls** to see what files and subdirectories reside below **g3-ma**.

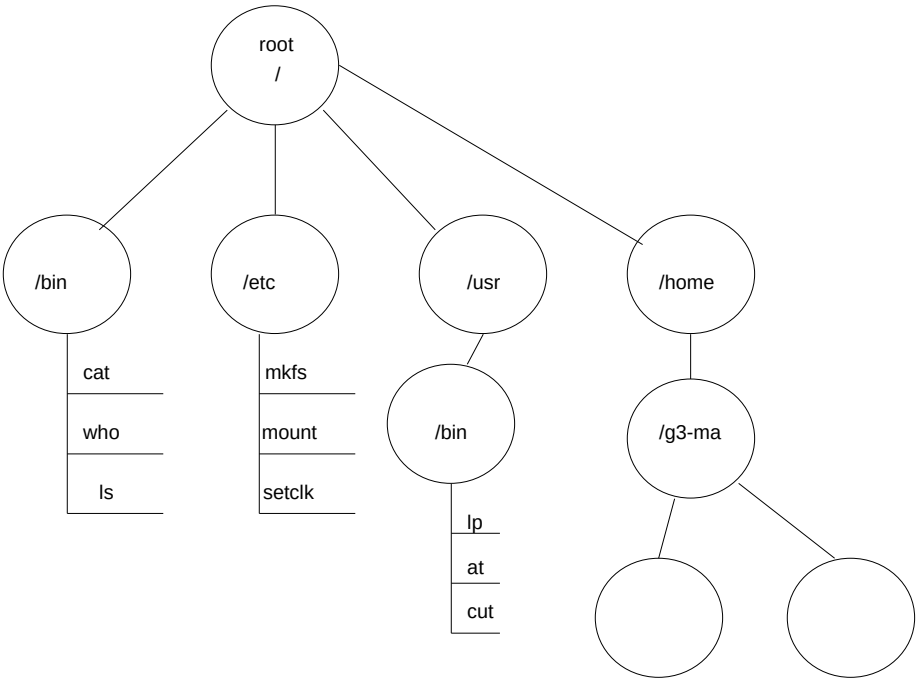


Figure 6-1. Sample Directory Hierarchy for G3-MA UNIX

Special files represent a physical device such as a disk drive, terminal, communication link, or magnetic tape drive. The UNIX system treats all files the same in that it reads and writes to special files the same as to ordinary files. This allows you to address a printer or other device as if it were a file. However, when the system reads or writes to a special file, it does not use the normal file-access method; instead it activates the device driver associated with the file.

Ordinary files can store any information that you may want to save. They may contain code, text, or commands to run your programs.

The UNIX Shell

The UNIX shell acts as a command interpreter. It reads the commands that you enter and allows you to communicate with the operating system, execute programs, or access files. The shell is also a programming language that you can use to write shell programs called shell scripts.

UNIX Commands

UNIX system commands allow you to do text processing, information management, electronic communication, software development and provides you with additional utilities to produce graphics and perform calculations.

G3-MA on UNIX

The UNIX install script will assign a default home directory for G3-MA or prompt you to enter a directory name of your choice. If you assign a directory other than the default **/home**, disk-space requirements for that directory must meet or exceed requirements for **/home** in the disk-space requirements table. All G3-MA subdirectories and files are installed in the home directory (the default is **/home**) under the directory **g3-ma**.

Disk Space Requirements

The following table shows disk-space requirements for installing G3-MA UnixWare 2.01 in 512-byte blocks.

Table 6-1. Disk-Space Requirements

Application	/home/tmp	/home*	Total
Service Layer	16,075	5,075	21,150
Scripting	9,925	3,475	13,400
Data Management	12,950	4,450	17,400
Data Management (Enhanced)	1,400	650	2,050
Scheduling	2,350	1,100	3,450
AUDIX Data Exchange	1,550	700	2,250
Bulk Administration	16,200	5,880	22,080
Bulk Administration (Enhanced)	0	150	150
System Administration Audits	4,775	1,800	6,575
Access Security	20	135	155
Target Access	30	150	180
Quick Reports	5,900	2,250	8,150
Software Backup	0	150	150
TOTAL SPACE REQUIREMENT	71,175	25,965	97,140

* The /home directory is the ***default*** directory for G3-MA files. Therefore, if the G3-MA software and data files are installed in another UNIX file system's directory, then each value in the Total column is split between the two file systems according to the values in the first two columns of each row.

Disk space in the **/home/tmp** directory stores temporary files created during installation of G3-MA applications. As each application package is installed to hard disk, temporary space is used by the install script, and then deleted. If there is insufficient space in the G3-MA home directory to create these files, the install script will stop. The total space required by **/home/tmp** must be equal to or greater than the largest application-package requirement.

Disk space in the **/home** directory stores G3-MA directories and files (**/home** is the system default directory). G3-MA users share the home space listed in the table, ***plus*** each G3-MA user requires additional space for individual user data. Therefore, the total space required by **/home** must be equal to or greater than the total home space requirement for every G3-MA application plus any space needed for each G3-MA user's data. (This space requirement may be quite large, if a user has a need to retrieve and export data from several large

switches.) To check the size of a file system, use the UNIX command **df [*full path name of file system*]**. For example, the command **df */home/tmp*** will list the size of the **/home/tmp** directory.

Documentation Needed for Installation

You will need the following documentation for UNIX System Administration of G3-MA:

- *UnixWare 2.0 Owner Handbook*
- *UnixWare 2.0 Desktop User Handbook*
- *UnixWare 2.0 System Administration* (2 volumes)

G3-MA Application Packages

G3-MA software consists of a base offering plus several separately orderable applications. As part of the base offering, the Service Layer package is required for G3-MA to run and contains the essential Emulation application. The separately orderable applications are optional and can be added at any time.

NOTE:
Any G3-MA software packages installed later must be the ***same*** release as the packages you are installing now.

NOTE:
All applications do not need to be installed again if you reinstall the Service Layer. You will be given the option of restoring all the applications you have already installed.

Each application within the base G3-MA offering and each of the separately orderable applications reside on one or more diskettes. The following describes the base offering and the separately orderable applications.

Base Offering

- Service Layer package — Allows the setting of hardware parameters and customer IDs. Provides connections with target systems and terminal emulation.

  The Customer Release, Configuration, Communication Manager, and Emulation applications reside on the diskettes labeled ‘‘Service Layer.’’

- Bulk Administration — Lets you define models and station data, store them in files, run audits and reports, and generate merged data to the switch through a direct or remote connection.
- Data Management — Lets you retrieve, export, and print reports of switch data.

- Scheduling — Allows you to schedule the execution of a G3-MA script, UNIX command, or shell script.
- Scripting — Allows you to combine G3-MA commands into a script file that can be run with a single execution. It also allows you to transport scripts between users, switch IDs, and processors.

Separately Orderable Applications

- AUDIX Data Exchange — Allows you to administer switch and AUDIX system data, and to exchange data between them from a single point of entry.
- Data Management (Enhanced) — Lets you make global changes to a switch feature, preprocess changes to switch translations on G3-MA, and gather data from the switch to generate reports. To use this package, you must also have the Data Management application installed.
- System Administration Audits — Looks for inconsistent switch translations that may result in undesirable switch operation and reports them in an audit log.
- Quick Reports—Allows you to access the default reports as well as to customize reports and create new reports.

Backing Up G3-MA Data

If you are upgrading from 3.1of G3-MA to 4.1.2, you must first save your data files to tape. Once you have saved this information you can migrate your operating system to UnixWare 2.01. Consult your UnixWare documentation for UnixWare installation details. After you install UnixWare, you can upgrade your G3-MA software to 4.1.2.

Complete the following steps to transfer G3-MA data and user information to tape.

1. Insert the floppy diskette labeled "Software Backup" provided as part of G3-MA 4.1.2 into the UNIX 3.2.3 machine you are currently using. It is recommended that you do a complete system backup prior to backing up your G3-MA data.
2. Type **installpkg** and press ENTER.
3. Make sure there is a cartridge tape in the tape drive.
4. Enter the tape device name (e.g., /dev/rmt/c0t3d0s1) and press ENTER.
5. You will see a message when the backup is complete.

This information will be restored to the UnixWare machine during the Service Layer Application installation. The installation script will read the information from the tape, administer any G3-MA user login IDs and restore the G3-MA user's home directories as well as the G3-MA data and configuration information.

NOTE:
A user's .profile may be overwritten and have to be restored.

The Software Backup Application stores the following information to tape.

- G3-MA Administrator's (g3maadm) home directory
- G3-MA configuration directory (e.g., **/usr/g3-ma/ucfg**)
- G3-MA data information (e.g., **/usr/g3-ma/data**)
- G3-MA users' home directories, determined by parsing the G3-MA user files (e.g., **/usr/g3-ma/users**). All users running G3-MA will be added.

Upgrading G3-MA

If you are upgrading from 4.1.1 (or 3.1) of G3-MA to 4.1.2, the installation procedure is similar to a new installation. However, during an upgrade for an 4.1.1 or 3.1 product ID of either ''G3i'' or ''G3r,'' the 4.1.2 installation software asks you to:

- Specify a new version from a list provided.
  - **For G3r**: G3rV1, G3rV1.1, G3rV2, G3rV3, or G3rV4
  - **For G3i**: G3iV1, G3iV1.1, G3iV2, G3iV3, G3siV4+m, G3sV1, G3sV1.1, G3sV2, G3sV3, G3siV4, G3vsV1, G3vsV1.1, G3vsV2, G3vsV3, or G3vsV4
- Specify the business package (either ABP or PBP) for a G3vs or G3si system

  or

  Specify the processor (either 286 or 386) for a G3iV1.1 or G3iV2 system.
- Verify the selection.

NOTE:
Before a G3-MA upgrade, you can use the G3-MA Emulation application to determine these specific details for G3i and G3r switches.

Once logged into a switch using Emulation, enter the **display capacity** command. At this time, the screen displays the switch's ''system'' type. Then, enter the **list configuration software memory** command to see the system's ''software version.'

Table 6-2. Sample Field Displays Specifying G3i and G3r Switches

display capacity	list configuration software memory
System: G3iV1-286	Software Version: G3V3i.03.0.014.0*
System: G3rV2	Software Version: G3V2r.03.0.014.0
System: G3vsV3-PBP	Software Version: G3V3vs.02.0.012.0

* This system is a **G3iV1.1** since the Software Version "G3V3" *exceeds* the System Version "G3V1." Whereas, the second and third systems are adequately described by their system names.

CAUTION:
Be certain that you correctly specify the new version. Otherwise, your G3-MA will upgrade to support the wrong switch.

If you are upgrading a G3-MA from 4.1.1 (or 3.1) to 4.1.2, you may find the following information helpful.

- You should perform a full system backup before you upgrade your G3-MA software.
- Keep in mind that G3-MA provides an extensive online guide that allows you to access information about your screen while you are using G3-MA. You can use the online guide for information about using new features and applications.
- You can use your current data files from 4.1.1 or 3.1 with 4.1.2. However, be sure that you backup your data files to tape before you install the new software.
- During the new installation, you will be asked to enter the name of the tape device containing the backed up files. The devices are in the /dev/rmt directory. Here are two examples of tape device names.
  - **/dev/rmt/c0t3d0s1** (UNIX 3.2.3)
  - **/dev/rmt/ctape1** (UnixWare 2.01)
- An upgrade to G3-MA 4.1.2 disables all audits in the System Administration Audits application. To reenable these audits:
  1. Enter **system-audits** in the G3-MA main menu.
  2. Enter **change sys-admin-audits** in the System Admin Audits window.
  3. In the Groups of Audits Available portion of this window, enter **y** in the desired fields to preselect the desired audits.
  4. Press Ctrl-e to submit the changes.
  5. Enter **q** to return to the G3-MA main menu.

Order of Installing G3-MA Applications

The Service Layer must be installed first. The rest of the applications can be installed in any order, except: if you are installing Data Management (Enhanced), you must install it after installing Data Management, and if you are installin Bulk Administration (Enhanced), you must install it after installing Bulk Administration.

UNIX System Tunable Parameters

Before you install the G3-MA application software, you must set the UNIX System tunable parameter **ulimit** to the maximum system value listed in the **/etc/conf/bin/idtune** tunable parameter master file. The maximum value for **ulimit** is the maximum number of 512-byte blocks that a file can contain.

When you install G3-MA UNIX, you will be asked to use a UNIX editor to modify system files. These modifications optimize the operating system for G3-MA. System files are protected and require that you use special editor commands to save changes and exit the editor. If you are using the UNIX editor vi, the command sequence is:

1. After making changes, press the Esc key followed by the : key to get the vi prompt.
2. At the vi prompt (:), enter wq! and press the Enter key to write changes and to quit the editor.

To set ulimit to the maximum value, complete the following.

1. Login as root.
2. Execute the following commands.

/etc/conf/bin/idtune SFSZLIM 0x7fffffff

/etc/conf/bin/idtune HFSZLIM 0x7fffffff

/etc/conf/bin/idtune SEGKMEM_BYTES 0xF000000

/etc/conf/bin/idtune MAXMINOR 0x3000

/etc/conf/bin/idtune HVMMLIM 0x4000000

/etc/conf/bin/idtune SVMMLIM 0x4000000

/etc/conf/bin/idtune HDATLIM 0x4000000

/etc/conf/bin/idtune SDATLIM 0x4000000

/etc/conf/bin/idbuild -B

cd /

shutdown -i6

3. To change the ulimit value, in **/etc/profile**, add the line

   ulimit -d 32000

   and save the changes.

   You can verify that the change to ulimit has been made by using the command **ulimit -a**.

Before you install the G3-MA application software, you must set the system tunable parameter **ncall** to 225. **Ncall** is the maximum number of entries that can be in the system time-out table at a given time.

To set **ncall** to **225**, complete the following.

1. Login as root.
2. Execute the following commands.

   /etc/conf/bin/idtune NCALL 225

   /etc/conf/bin/idbuild -B

   cd /

   shutdown -i6

The G3-MA install script automatically reconfigures the kernel to enable these new parameters. If you are using the previous procedure to modify or add tunable parameters, but you are not installing G3-MA, you must rebuild the kernel. See your *UnixWare 2.0 System Administration* for information on how to reconfigure the kernel tunable parameters.

Installing the Software

Before installation, you must verify that every user is logged off, and the run the UNIX **installpkg** command from the **root** directory. During installation, two separate steps must be completed to install a G3-MA application:

- Copying the application software from the G3-MA diskettes to the hard drive
- Administering both the UNIX operating system and G3-MA.

NOTE:
You must install the Service Layer application before you install any other applications.

UNIX system administration requires root permission and a working knowledge of the operating system. You must also have root permission to install G3-MA.

G3-MA administration requires that you log in as G3-MA system administrator (g3maadm) from the *root* directory. The G3-MA system administration must be completed before a G3-MA user executes the **g3-ma** command for the first time.

The install script will prompt you to press Enter, or to input information as you install the G3-MA application. You will be asked whether the install script should:

- Install G3-MA software in the default directory (under **/home)**
- Assign a user-designated home directory for G3-MA

It is recommended that you select the system default directory under **/home**.

You will also be asked to let the operating system assign a login ID and group ID for the system administrator g3maadm. The group ID (g3-ma) assigned to G3-MA system administrator (g3maadm) must also be assigned to every G3-MA user. This group ID number determines who can run G3-MA. For a more detailed description of how to administer a login ID for a new G3-MA user, see login administration in Appendix B.

You will then be asked if you want to restore G3-MA information from the tape generated using the Software Backup program. If you answer **Y** (yes), you will be prompted to supply the tape device name. You will be informed of the data that is being restored.

After administering the login ID and group ID for the G3-MA system administrator (g3maadm), the install script will install the service-layer files and directories. You will see a printout of each file or directory name echoed to the screen as it is installed to hard disk.

The install script will warn you that the operating system will shut down after installing the service layer files and directories. You must reboot the operating system and log in as *root* to install any optional G3-MA software packages.

Installing the Software Using the UNIX Command Installpkg

To install G3-MA Service Layer application software to hard disk:

1. Log in as *root* at the system console.
2. Execute the UNIX **shutdown** command. This command warns all users that the operating system is being shut down, performs various tasks to ensure that the operating system will reboot without errors, and shuts down the system.
3. Reboot from the system console to verify that the operating system will restart without errors. If an error condition exists, you must clear the error before proceeding with the installation of the G3-MA application.
4. Log in as *root*.
5. Verify that every user has logged off.
6. Enter the **installpkg command**.

You will be prompted to specify cartridge tape or floppy.

If your system has only one floppy disk drive, press Enter to install from drive 0.

If your system has more than one floppy disk drive, when prompted, select a drive that accepts 3.5-inch diskettes, and press Enter.

7. Insert Service Layer diskette number one, and press Enter.
8. When the install script prompts you, indicate the path of the directory where you want the G3-MA software installed. The install script allows you to choose the default (**/home**) or to name a home directory.

   NOTE:
   It is recommended that you select the default directory. If you do, the install program will build the home directory (**g3-ma**) under the **/home** directory.

9. If you selected the default by pressing Enter, the install script will ask you to verify that you want G3-MA installed in **/home/g3-ma**. Enter **y** for yes.
10. Press Enter to administer the group ID.

    NOTE:
    The install script automatically administers the group ID for G3-MA system administrator (g3maadm) and will display the group ID number. You should remember this number. You will use the group ID number when assigning G3-MA login IDs for new users. If you do not remember it, you can find it by looking in the file **/etc/group**.

11. The install script asks that you press Enter to administer the login ID for the G3-MA system administrator. The script does this administration automatically.
12. Establish a password for the G3-MA system administrator (g3maadm) by entering and reentering a new password as prompted.

    The install script will display the login ID, login-group name, login name, and login home-directory name.

13. You will be prompted to restore backed-up G3-MA information. If you used the Software Backup program to create a backup tape of your current G3-MA data, enter **y** for yes.

    You will then be prompted to provide the tape device name.

    Once all the data has been restored, the installation process will continue.

14. For G3i and G3r product IDs, specify new versions (for example, G3vsV1-ABP, G3sV1.1-PBP, G3iV2-286, or G3rV3) of these systems.
15. The PC will automatically reboot after the Service Layer installation is finished.

16. After the reboot is finished, continue the installation process by responding to system prompts, removing installed diskettes, and inserting new diskettes, until all of the Service Layer diskettes have been installed.

For each additional application you wish to install, use the UNIX command **installpkg** just as you did for the Service Layer diskettes.

G3-MA/UNIX Administration

G3-MA administration requires that you login as G3-MA system administrator (g3maadm). You must complete the G3-MA system administration before your G3-MA user's execute the command **g3-ma** for the first time. When you install G3-MA the install script will administer a login ID, group ID and home directory for the G3-MA system administrator (g3maadm). In addition, you must administer the following list of items:

- UNIX Login administration for G3-MA users
- UNIX port administration for modem connections
- G3-MA Customer IDs in the Customer Release application.
- UNIX printer administration if you are adding a new printer to your system
- G3-MA printer entry for the preferred printer in the G3-MA Configuration Application Change Hardware screen for each user. The default printer is the printer defined as a preferred printer by the G3-MA system administrator (g3maadm). If a user must print to a printer other than the default printer, the user must enter the G3-MA Configuration Application Change Hardware screen and select the desired printer.
- G3-MA preferred diskette-drive entry in G3-MA Configuration Application Change Hardware screen for each user. The user must enter the G3-MA Configuration Application Change Hardware screen and select the desired diskette drive.
- Set the color option on the system console — Enter the G3-MA Configuration Application Change User Interface and select Color Option.
- The time zone for your location that is listed in the **/etc/TIMEZONE** file is not in the correct format and must be modified. The following example shows the correct format for four common North American time zones.
  - **EST5EDT**
  - **CST6CDT**
  - **MST7MDT**
  - **PST8PDT**

- The **/etc/uucp/Configure** file must be modified as follows.
  - **PARITY=none**
  - **CHARSIZE=8**

This administration must be done before you run G3-MA. For a more detailed description, see the administrative guidelines in Appendix B.

Running G3-MA

NOTE:
You should only log in as **g3maadm** if you are making changes to system-wide defaults. Otherwise, you should log in with a normal user ID.

To log in as a G3-MA user, you must be assigned a G3-MA login ID and have the g3-ma group ID number in the **/etc/password** file for your group ID number.

To run G3-MA:

1. If you are logged in as G3-MA system administrator (g3maadm), you must exit and log in to your G3-MA UNIX PC, with a G3-MA user's login ID and password.
2. Enter the **g3-ma** command, and press Enter. If your system has more than one customer ID, you will be asked to select a customer ID.

The G3-MA application will now boot to the main menu. You may select a menu item from the G3-MA main menu.

Backing Up Your System

It is recommended that you perform a full system backup and a shutdown of the UNIX system once a month.

Removing the Software

If for any reason you need to remove the G3-MA software, you can do so using the standard UNIX **removepkg** command. See your UNIX system documentation for more information on the **removepkg** command.

Setting Up G3-MA (UNIX)

7

This chapter tells you how to set up the G3-MA (UNIX) software on your UNIX PC. If you are setting up G3-MA (Windows) on a PC with an MS-DOS operating system, refer to Chapter 4, *Setting Up G3-MA (Windows) Software*.

This chapter covers:

Verifying the Software Installation

Be sure that the G3-MA (UNIX) software has been installed on your PC using the information in Chapter 6. Also, be sure that the prerequisite UNIX system administration has been performed; see Appendix B for a summary of prerequisite administration. If the software was installed correctly, G3-MA will display the main menu when you enter **g3-ma** from the UNIX prompt.

Be sure that you have 4.1.2 of G3-MA software. You can verify the version as follows.

1. At the main menu, enter **configuration**
2. Enter **change hardware**
3. Check the G3-MA Version field on the Change Hardware form to see what version of G3-MA you have.

Using the Online Guide

Now that you have G3-MA up and running, you may wish to check out the Online Guide. At the main menu, simultaneously press the Ctrl key and the g key. Then release both keys and press the g key again. A screen of information on the main menu is displayed. To see the table of contents for the Online Guide, press Ctrl-g t (Go To) and select Table of Contents. You may now wish to browse the Table of Contents to see what information is covered and how the Guide is organized.

The chapter, "Moving Around," in the Online Guide tells you how to use G3-MA menus and forms. It tells you, among other things, how to type commands and select window options. You may now wish to read the chapter before you do the procedures here for setting up G3-MA.

You can use Ctrl-N (Next) to go to the next page and Ctrl-P (Previous) to return to the previous page. Use these keystrokes to page through the guide. You can use Ctrl-X (Exit) to exit the guide; G3-MA returns you to the G3-MA screen from which you entered the guide.

Customizing G3-MA

Use the next three procedures to specify user-interface choices, select a default diskette drive, and inform G3-MA about systems to which you will connect.

Changing Hardware Administration

The Configuration application's Change Hardware form contains three areas:

- The Software Versions area (display only)

  Displays information about the release and version of your UNIX and G3-MA systems.

- The Configuration Parameters area

  Specifies information about your printer and selects the default diskette drive. It also specifies the lines per page in printed reports.

- The Serial Port Default Parameters area

  Defines the parameters to be used to communicate with switches and AUDIX R1, DEFINITY AUDIX, and Intuity AUDIX systems. The default values are set for communicating with the systems G3-MA supports. G3-MA System administrators (g3maadm) can change these values to set the defaults that appear on the Customer Release form for all G3-MA users. For G3-MA users (without a G3-MA administrator (g3maadm) login), these fields are for display only.

  If you will be communicating with a host system other than a switch or an AUDIX system (such as a mainframe) using the Emulation application, the defaults may not match the host specifications. If this is true, do not change the defaults here. Log in as g3maadm and use the Customer Release form to specify the needed host values, rather than changing the hardware defaults here for the whole system.

The defaults on the Change Hardware form are system-wide. For example, the port parameters on the form are used by the Communication application to make a connection.

To verify or change the hardware specifications:

1. From the main menu, enter **configuration**

   After you enter **configuration**, G3-MA displays the action submenu.

2. Enter **change hardware**.

   The values under the Installed Hardware field are supplied by G3-MA software. They describe your installed hardware as known by UNIX, as well as your UNIX version and G3-MA version.

   The cursor is on the Printer Type field.

3. If you have a printer, in the Printer Type field press Ctrl-y (Help).

4. Select a compatible printer from the pop-up window.

   Highlight an option with the arrow keys. Select the highlighted option by pressing Enter.

   If you want to exit the pop-up window without making a selection, press Esc.

5. In the Printer Name field, enter the name of the printer you will be using with G3-MA. This printer must have been set up using UNIX system administration; seeAppendix C for more information.

6. If you want to change the lines per page in printed reports, move to the Lines/Page field and enter a number from 55 to 90. (The default is 66, and this will work for most printers. But for some printers, you will want to change this default value.)

7. To select a default diskette drive, move the cursor to the Default Diskette Drive field, press Ctrl-Y (Help), and select the appropriate diskette drive. Select 3.5” High Density diskette drive 1 as your default drive.

8. If you made changes, press Ctrl-e (Submit). If you made no changes, press Ctrl-x (Cancel).

   You see the action menu.

9. Enter **quit**.

   You see the main menu.

Changing User Interface

The **configuration change user-interface** command lets you:

- Change screen colors (if your PC, system console, or terminal has color capacity)
- Enable an optional beep tone for operational errors

Typically, you use this command only when initially setting up G3-MA. Even then, changing the default values is more a matter of preference than necessity. You may access the user-interface fields from the root console when logged in as G3-MA system administrator (g3maadm).

To verify or change screen colors and beep options:

1. From the main menu, enter **configuration**.
2. Enter **change user-interface**.

   G3-MA displays the two Configurations Options fields.

3. Press Ctrl-y (Help) at each field to see the choices.

The following table shows the choices available for each field.

Table 7-1. User-Interface Fields

Field	Choices	Result
Color Option	customized	Gives access to next three pages to redefine colors
	default	Gives original screen colors
	monochrome	Gives appropriate setting for PCs without color
Audible Beep Tone?	yes	Beep for screen errors
	no	No beep for screen errors

4. If your PC does not have color capacity, your only option for the Color Option field is Monochrome. If you choose **customized** at the Color Option field, press Ctrl-n (Next) to see the next page for changing screen colors, and refer to the following procedure for changing screen colors. Otherwise, press Ctrl-e (Submit), and refer to the next procedure for ''Defining External Systems.''

To change screen colors

1. Press b to change background colors. Continue pressing b until you get a color you like.
2. Press f to change foreground colors. Continue pressing f until you get a color you like.
3. Select a color for each field.

   Notice that the sample screen shows the results of your color choices.
4. Press Ctrl-n (Next) when ready to see the next page.

   Complete this page, and then the next one, to your satisfaction.
5. Press Ctrl-e (Submit) when you are satisfied with all three pages.

   The colors you now see are what you chose.
6. If you do not like the results, you can return to the User Interface form and select `default` at the Color Option field.

UNIX System Administration to Set the Color Option for the Console

When you select the color option on the **configuration change user-interface** form for G3-MA UNIX, you must use a UNIX editor to remove the **-M** (for monochrome) from the console line entry in the **/etc/ttytype** file. As an example, change the line from **AT386-M console** to **AT386 console**.

Defining External Systems

G3-MA requires an ID (a name tag) for each system to which it will connect. To To change information in the Customer Release application:

1. At the main menu, enter **customer-release**.
2. Enter **change id**.

   G3-MA displays the ID Records form. Refer to the following section, "Changing the Active ID" on page 7-6 for information about the Active ID field.
3. Move to a blank Dial String field.
4. Enter the ID name, switch release, and dial string.

   At this time G3-MA displays a pop-up window with two sections

- RS-232 Parameters
- Customer Information

You can enter information into any field in this window except the Customer Location field.

5. Enter the RS-232 Parameters.
6. Within the Customer Information section of the pop-up window, you can enter a descriptive name for each switch or AUDIX system in the Customer Name field. These names are for your records only.
7. Press Ctrl-n (Next) to display the next eight available IDs.

   G3-MA displays the next page of up to 50 pages (allowing up to 400 available IDs) in the ID Records form.
8. Press Ctrl-e (Submit).
9. Enter **quit**.

   G3-MA displays the main menu.

Changing the Active ID

For many G3-MA applications, the active system ID serves as the inferred destination for connecting to a target system or the ID under which data is stored. Therefore, for these applications, the active system ID must always match the target system with which you are attempting to connect.

NOTE:
Since you can specify separate destinations for connections using the Emulation, Communication Manager, and AUDIX Data Exchange applications, these applications do not infer the current destination from the active system ID.

If there is more than one Available ID in the ID Records form, you can select the Active ID. (If not, you cannot change this field.) If you do not select the active ID, G3-MA defaults to the last used ID.

To change the active system ID in the main menu:

1. At the main menu, press Ctrl-l (select function).
2. Select **Change ID** in the resulting pop-up window.
3. Select the desired active ID in the resulting pop-up window.

   G3-MA displays the main menu and the active ID in the upper right of the screen.

To change the active system ID in the ID Records form:

1. At the main menu, enter **customer-release**.
2. Enter **change id**.

G3-MA displays the ID Records form.

3. Select the desired active system ID in the Active ID field.
4. Press Ctrl-e to submit the change.

   G3-MA displays the active ID in the upper right of the screen.
5. Enter **quit**.

   G3-MA displays the main menu.

Connecting to a Switch

When you are using G3-MA (UNIX), you can connect to a switch in either of two ways.

You can let G3-MA automatically connect to the switch. With the G3-MA Automatic System Dial-Up feature, G3-MA automatically calls a switch whenever you use a feature that requires a switch connection (for example, the add data-template feature). G3-MA calls the switch indicated as the current Active ID, and brings up a login window for you to log in to that switch. This is the method most often used for connecting to a switch, because it is convenient and efficient.

You can request that G3-MA (UNIX) dial a switch by entering the Communication form and telling G3-MA which switch to call. This procedure is described in the next section, Testing Connections.

Testing Connections

You can now test the G3-MA software setup by connecting to each system. This basic sanity test checks an entire G3-MA (UNIX) connection by:

- Starting the connection at the application-level software
- Passing it through the UNIX-environment software to the physical hardware.

If this test passes, for a connection to a target system ID, no other tests are necessary for that system ID. If not, refer to Chapter 8 for information about lower-level tests that should help isolate the problem.

To connect to a system:

1. At the main menu, enter **communication**.

   G3-MA displays the first page of the Communication Manager form.

2. Press Ctrl-y (Help), and select a system ID for up to two connections.

   You select from a HELP window by moving the cursor to your selection and pressing Enter.

   NOTE:
   If the port status for a requested connection is idle, G3-MA will allow the request. If the port status is busy, G3-MA will ignore the request.

3. Press Ctrl-e (Submit).

   G3-MA displays a 60-second countdown on the message line. This is the time allotted for the first attempt to connect. If the system is available, you usually see the login/password window in the first few seconds.

   You can stop the countdown by pressing Ctrl-x (Cancel).

4. Enter the *system login*.
5. Enter the *password*.
6. If Scripting is available for the system ID, G3-MA asks whether it should save the login and password to execute scripts (only if logged in as g3maadm). Enter **y** or **n** (the default).

   When you successfully log in, the G3-MA displays the main menu; otherwise, it may display an error message or the G3-MA prompt.

   Notice that the menu screen shows you the:

   - `Connected To` *system ID* on the lower right
   - `Active ID` *system ID* on the upper right
   - How to exit G3-MA above the message line on the lower left

To disconnect from a system:

1. At the main menu, enter **communication**.

   The cursor is in the Connect To field.

2. Enter **disconnect**.

   You must type the whole word **disconnect**.

3. Repeat this connect/disconnect sequence for each system ID.

Logging off G3-MA also gracefully disconnects from the connected system. This is an easy way to disconnect when you are finished working with G3-MA.

Removing a User from G3-MA

The **rm-g3-ma** command removes the directory structure and files residing under a user's home directory for the user's G3-MA login. This command can either be executed by the:

- User wishing to be removed from G3-MA
- G3-MA system administrator (logged in as **g3maadm**) for any user wishing to be removed, except the system administrator's g3maadm login itself.

To remove a user from G3-MA:

1. A user should enter **rm-g3-ma** from the UNIX prompt.

   or

   The system administrator should enter **rm-g3-ma <login ID>** from the UNIX prompt.

2. The G3-MA system asks three times whether the G3-MA user should really be removed.

   If you are sure, respond to these questions in the affirmative.

3. While the user is being removed, the G3-MA system displays:

   ```
   Removing G3-MA area for UNIX login ID:  <login ID>
   ```

4. Once a user is removed, the G3-MA system displays:

   ```
   Removed G3-MA area for UNIX login ID:  <login ID>
   ```

Troubleshooting

8

G3-MA error messages, audits, and data-generation error-checking capabilities help ensure that errors and inconsistencies within G3-MA, and between G3-MA and the switch, are found and logged where you can access and examine them. Unexpected problems may occur while you are installing or using G3-MA. This chapter provides information that can help in troubleshooting such problems.

Guidelines for Troubleshooting

If you have trouble using G3-MA:

- Check this document's index for possible references to your problem.
- Check the troubleshooting procedures below for help with specific problems.
- If you are unable to resolve a problem, prepare to call the helpline (see "Helpline Support" on page 8-22).

This chapter presents various ideas and procedures for isolating problems in a G3-MA system. However, not every problem with a PC containing G3-MA software is a G3-MA problem.

If you are having trouble with ...	Then call ...
PC hardware or software	1-800-531-2222, the AT&T GIS support organization for PCs (U.S. and Canada) or your local AT&T GIS representative (international)
UnixWare	1-408-438-8649, for Microport support, which may possibly be billable. If the problem is related to G3-MA functionality, call 1-800-548-8861 (TSC).
MS-DOS software	1-206-454-2030, the Microsoft support organization for MS-DOS software
Windows software	1-206-637-7098, the Microsoft support organization for Windows software

The following table lists possible problems along with suggestions for correcting them.

Table 8-1. Basic G3-MA Troubleshooting for Windows and UNIX

Problem Type	If This Occurs	Then Do This
Connection	You cannot make a dial-up connection. (Make sure that the connection problem is with G3-MA, and not with Windows, UNIX CU, or the terminal)	Connect phone to a phone jack, and listen for dial tone. If no dial tone, check administration and wiring. If dial tone, dial the target system's number, and listen for carrier ready tone (data tone). If no carrier ready tone, check: dialed number, local switch's routing translations, and far-end modem.
	You cannot maintain a switch connection.	Check modem connection or, if possible, try a direct connection.
	Application running in MS-DOS window disconnects from target system when running in background	Make sure Exclusive in Foreground is *not* selected in 386 Enhanced in the Windows control panel. See "Background Processing in Windows" on page 8-7 for procedures to enable background processing.
	A "no carrier" message appears while you are using a 1200-baud analog modem, indicating that the connection was dropped.	If you had previously connected via Communication, try reconnecting.
	The login/password window is not displayed.	Press Ctrl-e Submit.
	Your login/password are not accepted.	Retry; you may have mis-typed. Check that you have the correct login/password for this switch.
	The switch is busy.	Dial the switch from a standard station. If you hear a busy signal, the switch is not available. If you hear carrier ready tone, you know that the switch is available. The problem may be in the line connectivity or line administration.
	If a timeout occurs while you are trying to connect.	Check baud rates, initialization screen, dial strings, etc., of G3-MA, devices, and system ID for accuracy and consistency.
Bulk Administration Station Generation	Data generation fails.	Check error log, fix problem, and regenerate files.

Continued on next page

Table 8-1. Basic G3-MA Troubleshooting for Windows and UNIX — *Continued*

Problem Type	If This Occurs	Then Do This
	A power failure or other screen lockup occurs during data generation.	Reboot the PC and regenerate the files.
	Data generation fails while generating custom models. Data generation makes two passes on custom model data. The first time, it sets all the custom models to set type 7405. The second time, it assigns the correct set type. Therefore, if data generation fails while generating custom models, you will see 7405 set types on the switch and an "i" in the station detail file under the status column.	Correct any possible errors that might be present and then regenerate data.
Printing	You removed the Bulk Administration application and are now unable to print a data file.	Reinstall the application and try again to print the data file. If file is still unprintable, call the helpline.

System Files

During a G3-MA (Windows) installation, the Install program backs up the system files for MS-DOS and Windows, including:

- \autoexec.bat as \autoexec.xxx
- \config.sys as \config.xxx
- \windows\system.ini as \windows\system.xxx
- \windows\win.ini as \windows\win.xxx

where "**xxx**" is a 3-digit suffix from "001" to "999" and where the suffix with the highest numerical value represents the most recent backup.

If you suspect a problem with the new system files after a G3-MA installation, you can use the MS-DOS **copy** command to restore the backed up system files. As an example, the following MS-DOS commands would restore the backed up autoexec.bat file, while saving the G3-MA's version, and reboot the PC.

At the **c:>** prompt, enter

```
cd \
copy autoexec.bat autoexec.sav
copy autoexec.001 autoexec.bat
```

Press Ctrl-Alt-Del

Dynamically Linked Libraries

G3-MA (Windows) operates with dynamically linked libraries (for example, files with **.dll** or **.vbx** suffixes). Older versions of some library files used by G3-MA (Windows) may have been installed on your PC's hard drive by other software applications, and those versions may not be compatible with G3-MA. Then, if a coresident application has already loaded an incompatible library into memory when G3-MA is started, the G3-MA software may not work correctly. To resolve such a conflict, you can close any coresident application that may have loaded the conflicting library and run G3-MA again.

One known potential conflict is with the ''Message Blaster Visual Basic Custom Control'' (that is, msgblast.vbx) library. The G3-MA (Windows) Communication Manager uses Version 2.1 of this library. However, if a coresident application has already loaded an earlier version of this library, the PC displays a message that reads ''Incorrect file format,'' and the Communication Manager will not run.

G3-MA (Windows) Memory

With G3-MA (Windows), your PC requires at least 512 kbytes (512 × 1024 = 524,288 bytes) of available conventional (executable) memory with Windows already loaded.

To find out whether your PC meets this requirement you can check the available conventional memory by accessing a ***MS-DOS window*** and then executing the **mem** command.

Accessing MS-DOS via the File Menu

If a Windows user has an infrequent need to access to the MS-DOS operating system, a fairly simple procedure should be sufficient.

1. Click the **File** item in the Program Manager's menu bar.
2. Click the **Run...** ellipsis in the resulting pull-down menu.
3. Enter **command** in the Command Line field of the Run window, and click OK.

   Your PC should present a full-screen MS-DOS display with a command-line prompt that is ready to accept MS-DOS commands.
4. If desired, press Alt-Enter to restore the full-screen display to a window.
5. Enter a MS-DOS command (for example, **mem**).
6. Enter the **exit** command to close out of MS-DOS.

Accessing MS-DOS via the MS-DOS Prompt

The MS-DOS Prompt icon provides another method to access the MS-DOS operating system.

1. Double click the MS-DOS Prompt icon in the Windows Program Manager.

   Your PC should present a full-screen MS-DOS display with a command-line prompt that is ready to accept MS-DOS commands.

2. If desired, press Alt-Enter to restore the full-screen display to a window.
3. Enter a MS-DOS command (for example, **mem**).
4. Enter the **exit** command to close out of MS-DOS.

Establishing Direct Icon Access to MS-DOS Window

If desired for frequent access, the procedure for creating ***direct*** access to an MS-DOS Window via an icon is as follows.

Create a PIF File for the MS-DOS Window:

1. At the **c:>** prompt, enter **win**. (Do **not** enter **win /s** to load Windows in ''standard mode.'')

   The PC begins loading the Windows software in ''386 enhanced'' mode. This loading process is finished when the screen displays the Program Manager group.

2. If the Main program group is minimized, double click the **Main** icon to maximize the group.
3. Double click the **PIF Editor** icon.
4. In the PIF Editor window:
   - Enter the path to execute your **command.com** (for example, c:\dos\command) in the Program Filename field.
   - Enter an appropriate window name (for example, **MS-DOS 6.2 Window**) in the Window Title field.
   - Verify that **Text** is selected in the Video Memory options.
   - Set the Memory Requirements fields to **-1 kB** (Required) and **-1 kB** (Desired).

     These settings will dynamically allocate memory for the MS-DOS window.
   - Set the EMS Memory to the desired limit (for example, 0 kB).
   - Set the XMS Memory to the desired limit (for example, 1024 kB).
   - Set the Display Usage option to **Windowed**.

- Set the Execution option to **Background**.
- Verify that the Exclusive option is not set.
- Enable the Close Window on Exit option.

5. Click the **File** item in the PIF Editor's menu bar.
6. Click the **Save As...** ellipsis in the resulting pull-down menu.
7. In the Save As window, enter an appropriate file name (for example, **dosprmpt.pif**) in the File Name field.

Create a MS-DOS 6.2 Icon to Execute the PIF File:

1. In the Program Manager, select the **G3-MA** Program Group.
2. Click the **File** item in the Program Manager's menu bar.
3. Click the **New...** ellipsis in the resulting pull-down menu.
4. Select **Program Item** in the New Program Object window, and click OK.
5. Enter the name of the new icon (for example, **MS-DOS 6.2 Prompt**) in the Description field of the Program Item Properties window.
6. Enter the name of the previously created .pif file (in this example, **dosprmpt.pif**) in the Command Line field.
7. Enter the path of your working directory (for example, **c:**) in the Working Directory field, and click OK.

Accessing a MS-DOS Window via the Icon

Once the MS-DOS 6.2 Prompt icon is established, accessing an MS-DOS window is a simple process.

1. Double click the MS-DOS 6.2 Prompt icon in the Windows Program Manager.

   Your PC should present an MS-DOS window with a command-line prompt that is ready to accept MS-DOS commands.
2. Enter an MS-DOS command (for example, **mem**).
3. Enter the **exit** command to close the MS-DOS window.

Freeing Conventional Memory for G3-MA

If 512 kbytes (524,288 bytes) of conventional memory are ***not*** available, you should

1. Exit Windows by clicking the **File** item on the Program Manager's menu bar, clicking the **Exit Windows...** ellipsis, and then clicking OK.

2. At the **c:>** prompt, enter **memmaker** to increase the available memory within your PC.

   The MS-DOS 6.2 **memmaker** command provides default options that are suitable for many PCs. You should first accept the defaults and then, if necessary, change them. If you do change these defaults, be sure to record your responses so that the TSC or the ITAC can later have access to this information. For details about the memmaker command, refer to your MS-DOS 6.2 documentation.

3. At the **c:>** prompt, enter **win** to reload Windows.
4. Recheck the available memory by accessing an ***MS-DOS window*** and then executing the **mem** command.

Background Processing in Windows

When installing the Windows version of G3-MA on a PC, you must ensure that background processing is enabled. To do this, set the foreground and background parameters in two places:

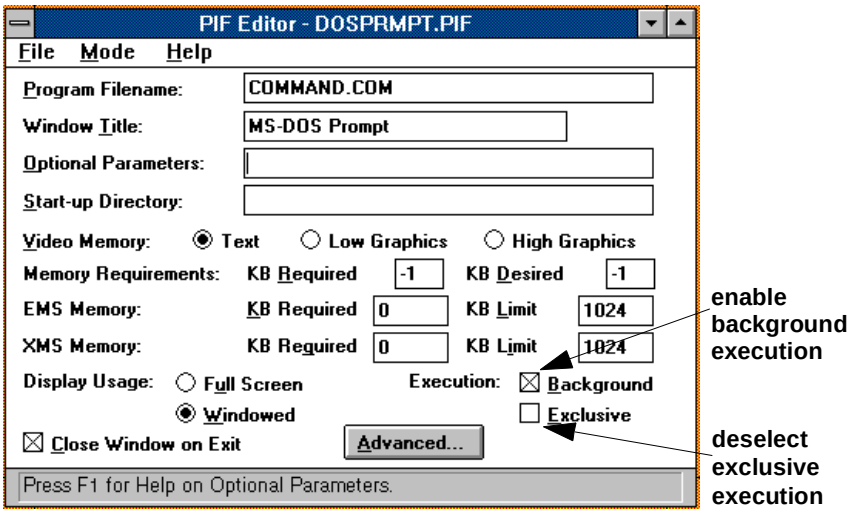
1. In the PIF file that controls the characteristics of MS-DOS windows (usually named dosprmt.pif)
2. In the “386 Enhanced” dialog box in the Windows control panel

PIF File Settings

Follow these steps to set the execution parameters in the MS-DOS PIF file.

1. In the Windows Program Manager, activate the PIF file editor.
2. In the PIF Editor dialog box, open the File menu and select **Open**.
3. Find and open the PIF file that controls the MS-DOS windows — this file is usually named `dosprmt.pif`.

4. The dialog box should now appear similar to the display below.



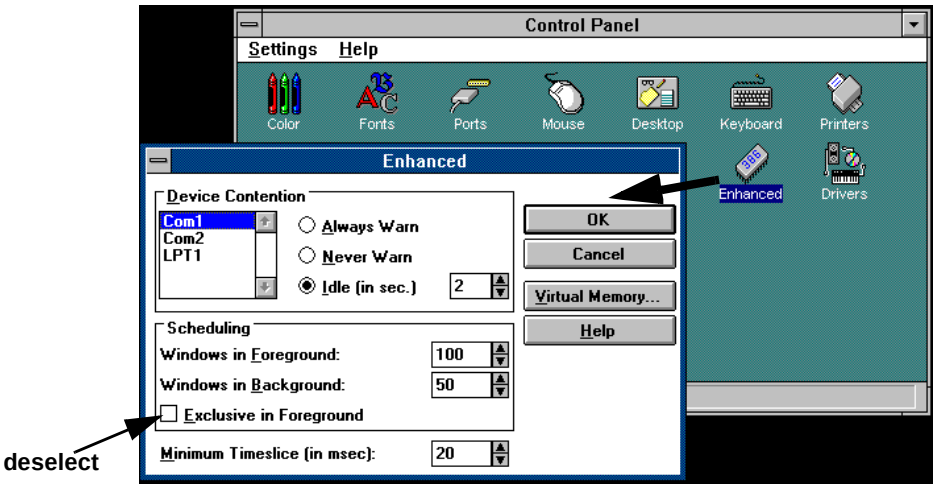
5. Make sure that background execution is enabled as shown in the display (the box next to Background has an "X" in it).
6. If background execution is not enabled, enable it by clicking the small box next to Background (an "X" will appear in the box).
7. Open the File menu and select **Save**, then select **Exit**.

Control Panel Settings

Follow these steps to set the foreground/background parameters in the Windows control panel.

1. In the Windows Program Manager, double click the Control Panel icon.
2. In the control panel, double click the 386 Enhanced icon.

3. You should see a dialog box similar to the display below.



4. Make sure the Exclusive in Foreground option, located in the Scheduling area, is ***not*** selected. When the option is not selected, the small box is empty, as shown in the display. If it is selected (an "X" is in the box), click the box to deselect the option.
5. Click the OK button to save the settings and close the dialog box.
6. Press **Alt-F4** (or double click the control bar) to close the control panel.

G3-MA (Windows) Mouse Assignment

For G3-MA (Windows), the Windows mouse driver controls the operation of the mouse in the

- G3-MA main menu
- Communication Manager application
- On-line help

However, within a G3-MA MS-DOS window (for example, Emulation), mouse operation is controlled by its own driver in the MS-DOS 6.2 software environment. If your mouse cannot select commands, fields, or field entries in a MS-DOS window, the following guidelines may help to resolve this problem.

1. Find the **path** of your mouse driver.

   As an example, the mouse driver (usually, **mouse.com** or **mouse.exe**) may reside in your **dos** directory. In this case, the path would be

   c:\dos\mouse.com

2. Before entering the **win** command to invoke windows, use the path you just found to set the mouse **environment variable.**

   This is done by placing a line like the following in your **autoexec.bat** file. Continuing the previous example:

   set mouse=c:\dos\mouse.com

3. In the next line of the autoexec.bat file, execute the mouse driver.

   c:\dos\mouse

4. In the **[NonWindowsApp]** or in the **[Keyboard]** section of the **\windows\system.ini** file, add the following line to enable the mouse in MS-DOS windows.

   MouseInDosBox=1

G3-MA (Windows) Printing

Verifying Printable Fonts

G3-MA (Windows) can use one of either of two fonts to print reports:

MS LineDraw (True Type) — provides better graphic resolution
Courier New (True Type)

Therefore, if a print request using G3-MA (Windows) either causes a printing error or prints distorted characters, verify that one of the previous fonts is loaded in Windows.

NOTE:
Sometimes the older font, **MS LineDraw (All res)**, can be found on a PC. This font will interfere with the correct operation of G3-MA as well as other Windows 3.1 programs that use the MS LineDraw font. If you use a dot matrix printer, you should remove this font. This procedure is described in step 4.

To verify that a printable font is loaded

1. Double click the **Control Panel** icon in the Program Manager's Main program group.
2. Double click the **Fonts** icon in the Control Panel program group.
3. In the resulting Fonts Window, use the scroll bar to see whether either of the previous fonts are loaded. If the **MS LineDraw (All res)** font is loaded, select this font and click the Remove button to delete it. This font, which produces strings of dots on the printed page, can interfere with printing in a Windows 3.1 or Windows for Workgroups environment.
4. If *neither* **MS LineDraw (True Type)** or **Courier New (True Type)** are loaded, refer to your Windows documentation for information about adding fonts. Since **Courier New** is shipped with Windows 3.1 and Windows for Workgroups, this font should always be available.

Setting Task Priority of Windows Print Manager

If print requests using G3-MA (Windows) respond too slowly, set the priority of Print Manager tasks to "**high**." Setting these tasks as high priority will give the fastest possible printing for any given PC.

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1. Double click the **Print Manager** icon in the Program Manager's Main program group.
2. Click the **Options** item the Print Manager's menu bar.
3. Click the **Background Printing...** ellipsis in the resulting pull-down menu.
4. Select **High** in the Printing Priority portion of the Background Printing window, and click OK.
5. Click the **Printer** item the Print Manager's menu bar.
6. Click the **Exit** item in the resulting pull-down menu.

Windows Printer Information

The following tables provide printer information that may be needed when using these printers with G3-MA.

Table 8-2. Dot Matrix Printers for Windows

Function	AT&T 493	NCR 6417
Certified?	Yes	Yes
Win Driver 1*	AT&T 493	OKIDATA ML 320-IBM
Win Driver 2		IBM Graphics
Win Driver 3		AT&T 473
Recommended G3-MA Setting	default font	standard (best quality) default-font (best speed)

* The printer drivers are listed in order of preference. Win Driver 1 is the first choice.

Table 8-3. Inkjet and Laserjet Printers for Windows

Function	HP Laserjet III	HP Laserjet IV	Okidata 830 Laser	HP Deskjet 500 Series
Certified?	Yes	No	Yes	No
Win Driver 1*	HP Laserjet IIIX†	HP Laserjet IVX†	Okidata OL800	HP Deskjet printer supplied
Win Driver 2	HP Laserjet III		HP Laserjet Series II	HP Deskjet Series
Win Driver 3				
Win Driver 4				
Recommend-ed G3-MA Setting‡	standard	standard	standard	standard

* The printer drivers are listed in order of preference. Win Driver 1 is the first choice.

† X matches model of your printer; e.g., use HP Laserjet IIIP if your printer is an HP Laserjet IIIP.

‡ See "Guidelines for G3-MA Printer Settings" on page 8-14 for more information on this printer setting.

Guidelines for G3-MA Printer Settings

If you have a printer attached to your PC, you may need to choose one of the settings listed below for the Printer Type field on the Change Hardware form in the Configuration application. The standard (default) setting should work well with most medium- and high-resolution printers. If print quality is poor with that setting, experiment with the other settings described in the table.

Setting	When to Use
standard (the default)	Use if you have a normal PC printer, or if you are not sure what you have
non-standard	Use if reports that have PC graphic characters do not print correctly. (This would be the case if you use 'print-model' in Bulk Administration and your PC doesn't have the MS-LineDraw font, for example.) This setting converts the graphic characters to characters that will work on any nonstandard printer.
default font	You may need to use this setting if you have an old and/or low-resolution printer, such as a 9-pin dot-matrix. This may provide a larger font and a higher speed for these printers.

If you want to print 132-columns, you should use a high-resolution printer. Compressed printing with a low-resolution printer (for example, a 9-pin dot-matrix) will result in poor print quality.

G3-MA (UNIX) Scheduler

If a script you have scheduled has not run, you should make sure the scheduler process is running. If the process is indeed running, you should stop the scheduler, start it again, and then check to see if the scheduled script is running.

All of the following commands require you first to exit from the Main Menu.

To find out whether or not the scheduler is working, at the UNIX prompt

type **schdmn -a**

You will see the status of the scheduler daemon, the **schdmn.exe -r** file.

To turn on the scheduler, at the UNIX prompt

type **schdmn -r**

To turn off the scheduler, at the UNIX prompt

type **schdmn -s**

When you are finished, to return to G3-MA, type **exit**.

G3-MA Hardware Connections

The following sections provide troubleshooting guidelines for cases when the G3-MA Automatic System Dial-Up feature fails to connect to the target system ID. These sections include:

- Diagnosing G3-MA (UNIX) Connectivity
- Diagnosing G3-MA (Windows) Connectivity
  - — Using G3-MA Communication Manager
  - — Using Windows Terminal Application
  - — Using AT&T Paradyne 3762 KeepInTouch Modem Card

Diagnosing G3-MA (UNIX) Connectivity

This test helps to troubleshoot a G3-MA (UNIX) connectivity problem by:

- Skipping the application-level software
- Starting the connection with the UNIX-environment software
- Passing it through to the physical hardware

If this test passes, for a connection to a target system ID, the connectivity problem should reside at the application level. If not, refer to the"Helpline Support" on page 8-22 section of this chapter and prepare to seek technical assistance.

1. Log in as root.
2. Enter **ps -ef | grep cs** to find the process id for the cs process.
3. Kill the cs process. For example, if the cs process id found in step 2 is *nnn*, enter **kill -9 nnn**.
4. Enter **/usr/sbin/cs -d** to start the cs process in the background.
5. Enter a **cu -s** command (for specified speed) at the $ prompt.

   For example, enter **cu -sg1200 -lttyaA** (line number of specific modem) and the system's number.
6. Examine the */var/adm/log/cs.debug* file for any possible hardware errors.
7. If there is no handshaking (that is, the login fails), then there is a hardware problem. Check the hardware connectivity between the G3-MA and the called system before referring to the "Helpline Support" on page 8-22' section of this chapter and then seeking assistance from
   - TSC helpline for U.S. and Canadian installations
   - AT&T representative or AT&T-authorized distributor for international installations

Diagnosing G3MA (Windows) Connectivity

Starting the Connection with the Service Layer Software

This test helps to troubleshoot a G3-MA (Windows) connectivity problem by:

- Skipping the application-level software
- Starting the connection with the service-layer software
- Passing it through the communications-system and Windows software to the physical hardware.

If this test passes, for a connection to a target system ID, the connectivity problem should reside at the application level. If not, refer to the ''G3-MA (Windows) Connectivity'' section of this chapter for more information about troubleshooting.

1. From the Main Menu window, click the Emulation button.

   G3-MA displays the Enhanced Cutthru form.

2. Enter **diagnose** (the entire string) on this form's command line.
3. Press the Enter button to exit the Help screen.
4. Press Alt-c.

   G3-MA displays the Communication Parameters form.

5. Enter the desired communications port in the first field.
6. Enter the proper data rate in the next field.
7. Press the Enter to proceed through the remaining fields.

   The form should display the modem's dial-initialization string and then ''OK.''

8. At this time either
   - Enter ATDT (for a Hayes-compatible modem), or
   - Press Alt-b (for a PDM)

   and enter the system's number.

   G3-MA should connect to the called system.

9. If not, then a hardware problem is implied by the communications port not talking to the modem.

Starting the Connection with the Windows Software

This test helps to troubleshoot a G3-MA (Windows) connectivity problem by:

- Skipping the application-level, service-layer, and communications-system software
- Starting the connection with the Windows software
- Passing it through to the physical hardware

If this test passes, for a connection to a target system ID, the connectivity problem should reside in the communications-system software. If not, the problem should be either Windows- or hardware-related.

NOTE:
This only applies to Windows for Workgroups 3.11. If you are using Windows 95, use HyperTerminal.

1. At the **c:>** prompt, enter **win**. (Do **not** enter **win /s** to load Windows in ''standard mode.'')

   The PC begins loading the Windows software in ''386 enhanced'' mode. This loading process is finished when the screen displays the Program Manager group.

2. If the Accessories program group is minimized, double click the **Accessories** icon to maximize the group.
3. Double click the **Terminal** icon.
4. Click the **Settings** item in the Terminal screen's menu bar.
5. Click the **Communications...** ellipsis in the resulting menu.
6. Click the COM port to dial out on (for example, **COM2)** in the Connector portion of the resulting dialog box.
7. For most modems and connections, accept this COM port's defaults including:

   1200 bps (or the transmission rate that the modem is set to)
   8 data bits
   1 stop bit
   No parity
   Xon/Xoff flow control
   No parity check
   No carrier detect

8. Click the OK button.
9. Click the **Settings** item in the Terminal screen's menu bar.
10. Click the **Modem Commands...** ellipsis in the resulting menu.
11. Verify that **Hayes** is selected in the Modem Default portion of the resulting dialog box.
12. Click the OK button.
13. Enter **AT&F**. (Ctrl-Break for PDMs, ADUs, and data modules.)

    The PC's modem should respond with **OK**.

14. At this time enter ATDT and enter the system's number.

    The PC should connect to the called system.

15. If not, see the Connection heading in Table 8-1, "Basic G3-MA Troubleshooting for Windows and UNIX," on page 2 to check other aspects of the connection
16. If the appropriate tests in Table 8-1 pass, then call AT&T GIS for assistance with this problem.

Using AT&T Paradyne 3762 KeepInTouch Card

Windows connectivity, using a Model 3762 KeepInTouch modem card in the 3180 laptop computer, can be more difficult since the 3762 is a fairly intelligent modem. Whereas, the modems on the switch or AUDIX side of the connection are either too intelligent or too dumb to be fully compatible with the 3762.

Hardware Connectivity

1. Make a backup copy of the **autoexec.bat** file.
2. Install the modem's **kit** utilities for the KeepInTouch modem card using its documentation.

   Loading these utilities will build the **kit** directory.
3. Enter **cd \kit** to change the current directory to kit.
4. Enter **install** to run the **install kit** utilities program.

   The install program will ask whether it can modify your autoexec.bat and config.sys files. Answer **no**. When you do, the install program will create the files **autoexec.exm** and **config.exm** in the root directory.
5. Edit the **autoexec.exm** file to change both occurrences of **com4** to **com2** in the first four lines so that they read

   ```
   set AT&TMEM=D4000
   set AT&TMANF=Intel2
   set AT&TCOM=com2
   c:\config.exe com2 start=d4000 irq1 slot auto
   ```
6. Write the previous four lines to a temporary file.
7. Add the temporary file to the end of the **autoexec.bat** file.
8. If the autoexec.bat file loads TERRANOVA drivers, comment out the following lines since they are trying to use the same IRQ's.

   ```
   LH /L:1,21504 INT61 c:\TC
   LH /L:1,18368 PRTDRV
   LH /L:1,3168 TCSWDRV
   SETDEF
   ```
9. In the **config.sys** file, comment out every line concerning the Version 1.0 PCMCIA *except* the following ones:

   ```
   device=c:\ncrnb\pcmcia\ss365s1.exe
   device=c:\ncrnb\pcmcia\cs.exe
   device=c:\ncrnb\pcmcia\cic.exe /com2 /bas d6 /siz 6 /csbas d4
           /cssiz 8 /nwbas dc /nwsbas dc /nwsiz 4
   ```

   or, for Version 2.01 PCMCIA drivers, *except* the following ones:

   ```
   device=c:\pcmcia2\ss365s1.exe
   device=c:\pcmcia2\cs.exe
   device=c:\pcmcia2\cic.exe /com2 /bas d6 /siz 6 /csbas d4 /cssiz 8
           /nwbas dc /nwsbas dc /nwsiz 4
   ```

10. At the **c:>** prompt, enter **nbconfig**.

    The following items and entries should appear on the Set System Startup Options screen.

    PCMCIA Software: Card/Socket Services
    Modem Type: PCMCIA Card

    If the entries for the previous two lines differ with those in the screen, make them agree.

11. Reboot the PC.

    The PC should display the following information and the card should beep just before the PC presents the **c:>** prompt.

    Card resetting
    Modem configured
    Modem identity is
    AT&T Paradyne
    KeepInTouch Modem Card
    3176
    C01.69.30

Establishing a Connection

The following dial string has allowed the 3180 laptop to connect to

- Intuity AUDIX system with a 3820 Comsphere modem on the ***far*** side
- G3 switches using the RMATS port

despite the potential incompatibilities.

at&fee1v1x4q0\n&c1&d2s7=255s0=0

Also, the following dial string is necessary to connecting with an R1 AUDIX system through an AT&T 2400 modem on the ***far*** side.

at&fee1v1x4q0\n&c1&d2s41=8s7=255s0=0

Bulk Administration

If a down-loading (generating) station-detail file repeatedly stops on the same station:

1. Look in both the bulk errors and MS-DOS error logs.

   To review the MS-DOS error log:

   a. Enter **cd \g3-ma\data**

NOTE:
This is the default path for the G3-MA data directory. If your G3-MA software was installed in a directory other than "**g3-ma**," then change this path accordingly.

b. Enter **type logfile.txt**, and look for information about the error in the last several lines of the file.

2. If this doesn't identify the problem, then:

   a. Cut through to the switch via the Emulation application
   b. Try to manually add the failing station with the same data that appears in the station-detail file

3. If the failing station *can* be manually added using this data, then
   a. Remove the previously failing station from the station-detail file
   b. Attempt to down-load the file again

   The data for this station in the station-detail file was probably corrupt.

4. If the failing station *cannot* be manually added using this data, then
   a. Check and respond to the error messages returned from the switch
   b. Resolve the administrative problem from the switch side of the G3-MA interface

5. If the down-loading failure still cannot be resolved, refer to the"Helpline Support" on page 8-22 section of this chapter and then seek assistance from the
   - TSC helpline for U.S. and Canadian installations
   - AT&T representative or AT&T-authorized distributor for international installations

Helpline Support

G3-MA Configurations

G3-MA connections to a switch or AUDIX can involve a number of different pieces of equipment, including modems or data modules, house wiring, and cables. It is essential that the various pieces of equipment used in a G3-MA configuration are set up to correctly work with each other.

The configurations described in this book are considered the standard G3-MA configurations supported by AT&T. You can set up other configurations. However, if a ***U.S. or Canadian*** G3-MA installation requires assistance from an AT&T technical-support organization, you will be asked to set up one of the supported configurations described in this manual before you are provided with any assistance. Also, if you use a nonstandard configuration, you will be billed on a time-and-materials basis for any assistance received from the TSC. AT&T technical-support organizations cannot provide assistance for nonstandard ***international*** G3-MA configurations.

In addition, you should be very familiar with every component of your G3-MA configuration before calling for assistance.

Sources of Technical Assistance

For ***U.S. and Canadian*** installations, the Technical Service Center (TSC) helpline is an information service for reporting trouble and getting help with problems you are unable to resolve yourself. If a U.S. or Canadian customer has tried to solve a problem using the troubleshooting guidelines listed earlier in this chapter, and is still unable to solve the problem, call the TSC helpline for assistance. The helpline number is

1-800-548-8861

For ***international*** installations, your local AT&T representative or AT&T-authorized distributor is an information source for reporting trouble and getting help with problems you are unable to resolve yourself. If an international customer has tried to solve a problem using the troubleshooting guidelines listed earlier in this chapter, and is still unable to solve the problem, call your AT&T representative or distributor for assistance.

NOTE:
International customers should not seek assistance from the Technical Service Center (TSC) or the International Technical Assistance Center (ITAC). Instead, your AT&T representative or distributor is authorized to call the ITAC for help in resolving your problems.

Windows Support

For G3-MA (Windows), before seeking assistance, please record this information.

1. What make/model is your PC?
2. What version of MS-DOS is on your PC?
3. What version of Windows is on your PC?
4. What G3-MA version is on your PC?

   To find out, view the Configuration Change Hardware form. See Chapter 4 for information on this form.
5. What software (besides G3-MA) is on your hard disk?

   To find out, look at your DOS directory contents, as follows.

   a. If you are not at the C: prompt now, enter **cd **
   b. Enter **dir** to see a list of files and subdirectories.
   c. Enter **cd** followed by a directory name to see the contents of a subdirectory.
6. What application/feature were you using when the problem occurred? What was the system's response? Were there any messages?

7. What errors are documented in the logfile.txt file?

   To access the MS-DOS logfile.txt file

   a. Enter **cd **

   b. Enter **cd g3-ma\data**

   NOTE:
   This is the default path for the G3-MA data directory. If your G3-MA software was installed in a directory other than "**g3-ma**," then change this path accordingly.

   c. Enter **type logfile.txt** to see content of log file.

   d. If a printer is available, print the screen by pressing the Print Screen key on the keyboard.

8. What kind of system (switch or AUDIX) is your G3-MA connected to? What is this system's release and version?
9. What type of system is its ID defined as in the Customer Release form?
10. Is there a communication problem between the PC and switch? Describe the problem.

    a. Is your connection dial-up or direct?

    b. If the connection is dial-up, through what means are you trying to reach the switch?

    c. What line type are you using (analog, data, digital) and how is the PC connected to it (modem, data module, ADU)?

UnixWare Support

For G3-MA (UNIX), before seeking assistance, please record this information.

1. What make/model is your PC?
2. What version of UnixWare is on your PC?
3. What G3-MA version is on your PC?

   To find out, view the Configuration Change Hardware form. See Chapter 7 for information on this form.

4. What software (besides G3-MA) is on your hard disk?

   You can display the software packages installed on your hard disk as follows:

   a. Log in from the system console as root.

   b. Execute the UNIX command **displaypkg**.

      The system displays a list of the software packages on your hard disk drive.

5. What application/feature were you using when the problem occurred? What was the system's response? Were there any messages?
6. What errors are documented in the G3-MA common error log file?

   To access the G3-MA UNIX common error log, from the G3-MA main menu, select UNIX shell. From the shell prompt, execute the command:

   - **err-log** to display all errors in the error log
   - **err-log -uxxx** to display errors with user ID xxx
   - **err-log -cyyy** to display errors with customer ID yyy
   - **err-log -s7/3/93** to display errors on or after July 3, 1993
   - **err-log -e6/24/92** to display errors on or before June 24, 1992
   - **err-log -d3/9/92** to display errors on March 9, 1992
   - **err-log -uxxx -o -uaaa** to display errors with either user ID xxx or user ID aaa
   - **err-log -s 3/31/92 -a -e 4/8/92** to display errors between March 31, 1992 and April 8, 1992 (inclusive)
   - **err-log -c bbb -a -u ccc -o -c ddd** to display errors with customer IDbbb and user ID ccc in addition to all errors with customer ID ddd
   - **err-log -h** to display help information for this command
7. What kind of system (switch or AUDIX) is your G3-MA connected to? What is this system's release and version?
8. What type of system is its ID defined as in the Customer Release form?
9. Is there a communication problem between the PC and switch? Describe the problem.
   a. Through what means are you trying to reach the switch?
   b. What line type are you using (analog, data, digital) and how is the PC connected to it (modem, data module, ADU)?

Interface Specifications

A

Call Accounting Program Interface

This section defines the program interface required between G3-MA for Windows and the call accounting software.

Description of the Interface

G3-MA for Windows and the call accounting software must be loaded on separate PCs connected by a LAN. G3-MA collects translations from the switch using a connection it invokes. The call accounting software collects call records through its own connection. The transfer of the data from G3-MA to the call accounting software is via file transfer using the LAN.

Figure A-1 shows a high-level block diagram of the interface.

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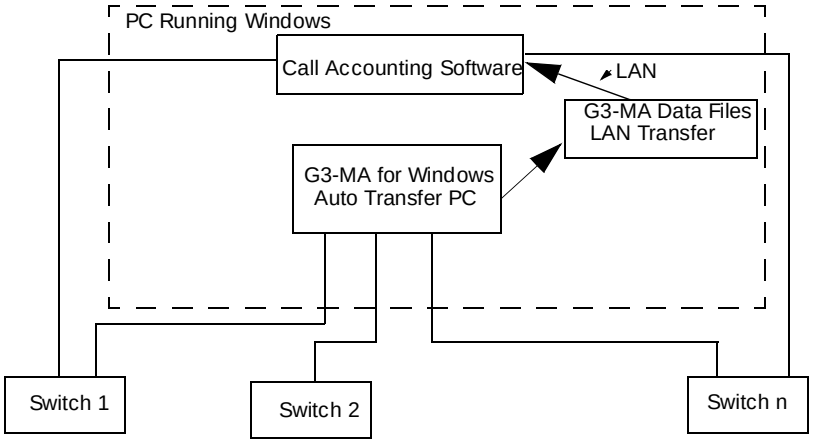

Figure A-1. G3-MA/Call Accounting Software Interface

File Transfer Method

The following method is used to ensure complete and proper transfer of data. G3-MA writes a file for each switch site into a single directory (for example **c:/g3-ma/catdata)**. The call accounting software has an administrable parameter to specify the full LAN path to that directory. The records in the file are sorted by record type.

1. G3-MA deletes any existing **.tmp** or **.g3m** files.
2. G3-MA creates a new download file called **site_ID.tmp**, where *site_ID* is the eight-character maximum site identifier.
3. When the download is complete, G3-MA renames the file **site_ID.g3m**.
4. The call accounting software renames the file **site_ID.cfw** and processes the file.
5. When complete, the call accounting software must delete the file **site_ID.cfw**.

Data Transferred

The following data is retrieved from the switches and is transferred from G3-MA to the call accounting software. The contents of the field data from G3-MA are exactly as retrieved from the switches except that empty optional switch fields are replaced by a single blank character. No additional processing of data is done by G3-MA other than the replacement of empty fields with a blank. The Name and Room fields listed in Table A-1 are the only optional fields. All other fields are required to be populated with non-blank data by the PBX administration software. Required switch fields that are empty are not replaced with blanks.

Table A-1. Retrieved Switch Data

G3-MA Files			Call Accounting Software Files		
Field Name	**Type**	**Maximum Size**	**Field Name**	**Type**	**Size**
Extension	Numeric	5	Extension	Numeric	10
Name	Alphanumeric	15	Last Name*	Alphanumeric	10
			First Name*	Alphanumeric	10
Room	Alphanumeric	10	Available for organization code		
Group Name	Alphanumeric	15	Facility Name	Alphanumeric	15
Group Type	Alphanumeric	13			
Send Answer Supervision	y or n	1	Not used in this version		
Receive Answer Supervision	y or n	1	Not used in this version		
TAC	Numeric	4	Trunk Name†	Numeric	8
Circuit Address	Alphanumeric	7			
Port Number (Circuit ID)	Numeric	3	Trunk Name†		
Authorization Code	Numeric	7	Authorization Code‡	Numeric	10

*The switch station Name received from G3-MA is typically lastname, firstname. The call accounting software is two separate fields.

†In the call accounting software, the Trunk Name is the concatenation of TAC and Circuit ID.

‡Authorization Codes are not connected to extensions in G3-MA. Thus they are not added directly to the database by the call accounting software file transfer program. G3-MA does transfer the authorization codes in the same manner as the other fields.

File Format

A file containing all records downloaded from the switch is created for each site. Each record includes a header character and data fields (separated by pipe symbols) and terminated with a MS-DOS/Windows text newline (<CR> <LF>). The **site_ID** is an eight-character field that corresponds to the ID field in the G3-MA database. The **site_ID** is used to identify sites in a multiple switch

environment. In the case of a single site system, the default call accounting software ignores the **Site_id**. The values for the type field are shown Table A-2. Each record starts with a single letter tag.

Table A-2. Values for the Type Field

Tag	Line Contents
h	Header Line
s	Station Information
g	Trunk Group Information
t	Trunk Circuit Information
a	Authorization Code Information
e	End of File Tag

The field delimiter is a pipe character and there is not string delimiter. Table A-3 shows the contents of the header line.

Table A-3. Header Line

Field Number	Contents
1	h
2	"G3-MA Call Accounting Exported Data" string
3	Switch ID (maximum eight-character switch identifier)
4	Time file is created in mm/dd/yyyy hh:mm:ss format, where mm and dd are zero-filled and hh is in 24-hour time. (Visual C++ CTime format %m/%d/%Y %H:%M.%S)
5	G3-MA Version Number

The time field is always stored in the format shown. If this is an international implementation, then the international format is translated into the U.S. format described above. Since this is an internal data transfer interface, international formats are not required for this interface.

Example: h|G3-MA Call Accounting Exported Data|inh|03/17/1994 12:48.00|P3.1.37

Table A-4 shows the contents of the station line.

Table A-4. Station Line

Field Number	Contents
1	s
2	Extension (sort key)
3	Name (as stored on the switch)
4	Room (as stored on the switch)

The room field is available to be used for the organization code or another purpose by the user. If it is used for the organization code, then its use must be agreed to and coordinated between the switch administration and the call accounting software administration. This interface saves any value stored in the room field of the station form.

Example: s|84400|Smith, Rita|131A80000

Table A-5 shows the contents of the trunk group line.

Table A-5. Trunk Group Line

Field Number	Contents
1	g
2	Group Number (sort field)
3	Group Type
4	Group Name
5	TAC
6	Send Answer Supervision? (y or n)
7	Receive Answer Supervision (y or n)

Example: g|31|isdn-pri|TIE pluto|159|n|n

Table A-6 shows the contents of the trunk circuit line.

Table A-6. Trunk Circuit Line

Field Number	Contents
1	t
2	TAC
3	Port Number (that is, if the circuit is in Port 1 field, then a 1 would appear here) - (sort key)
4	Circuit address in NNCSSLL format, where NN is the cabinet, C is the carrier (A-E), SS is the circuit card, and LL is the slot.

Note the addition of the circuit address to this line. This provides a cross check in case an administrator switches ports 6 and 7 and they both still exist but have different circuit locations. It may not be required, but might help resolve billing issues.

Example: t|159|5|05B0302

Table A-7 shows the contents of the authorization code line.

Table A-7. Authorization Code Line

Field Number	Contents
1	a
2	Authorization Code (sort key)

These records only appear if authorization codes are administered on the switch and are selected to be retrieved by G3-MA.

Example: a|1212121

Table A-8 shows the end line.

Table A-8. End Line

Field Number	Contents
1	e

Example: e

Administration Parameters

Certain parameters should be set by the user of both the call accounting software and G3-MA. G3-MA should be able to administer:

- Switches in the network that transfer data. This is administrable for each G3 switch ID.
- The frequency and the time of the data transfer (the number of days between transfer).
- Whether or not the user wants to collect data on authorization codes. (Authorization codes are not transferred if they are not used.)

The call accounting software can administer the following:

- The source directory for data transfer.
- The definition of the name separator in the G3-MA Name field. This allows for separating first and last names.

Restrictions

Certain restrictions apply to the interface of these two products. The restrictions are as follows:

- The call accounting software supports a maximum of 100 switches and 30,000 extensions. G3-MA must support the same limit. Note that the actual number of switches that can be supported may be less that these limits if the user's disk storage space is exhausted. It is the customer's responsibility to ensure that there is enough disk space to meet these limits.
- The call accounting software and G3-MA must be on separate LAN-connected PCs.
- The PCs used must meet the minimum PC requirements for both the call accounting software and G3-MA as well as any additional coresident processing requirements (documented separately for each product).
- The call accounting software and G3-MA must operate on Windows 3.1 and Windows for Workgroups 3.11. (G3-MA is also known to work on Windows 95.) This must include operation while Windows for Workgroups is connected by a LAN (allowing data transfer across a LAN by sharing the G3-MA directory on Windows for Workgroups). G3-MA must also operate while the LAN connectivity is active on Windows for Workgroups.
- The user must enter **site_ID** manually.
- The user must ensure appropriate security for the system. The file formats are ASCII-readable. To ensure security of the data, the user may choose to lock the PC, password-protect the PC, or secure it in a locked room. This is the user's responsibility and is not part of the design of G3-MA Auto Transfer or the call accounting software. Security issues associated specifically with these applications are defined by the appropriate requirements and feature specification documents for these applications.

Directory Transfer Interface Specification

This section describes the use of the interface as well as the structure. The use of the interface is presented here as background information.

Description of the Interface

G3-MA Auto Transfer uses G3-MA Data Management and Scripting to automate retrieval of data needed by directory programs. Data is retrieved for either Call Accounting Transfer or for directory services or both for each G3 switch administered on G3-MA as specified by the use on the G3-MA Auto Transfer administration screens. Once administered, G3-MA Auto Transfer automatically retrieves the administered data as frequently as once per day. It then formats

the data as specified in this document for Directory information and saves the formatted data in a file in a directory accessible from the PC. The directory default is **c:/g3-ma/dirdata**, but can be adminstered by the user to be any PC-accessible directory. Once the data is retrieved and formatted, it is up to the directory software to retrieve and use the data.

G3-MA Auto Transfer retrieves data for all stations on the switch (that is, those stations retrieved by a **list station** command). G3-MA Auto Transfer does not send information about additions, deletions, or changes. If that information is needed, then the Directory application must determine these by comparison with its existing database of directory information.

Figure A-2 shows a high-level block diagram of the interface.

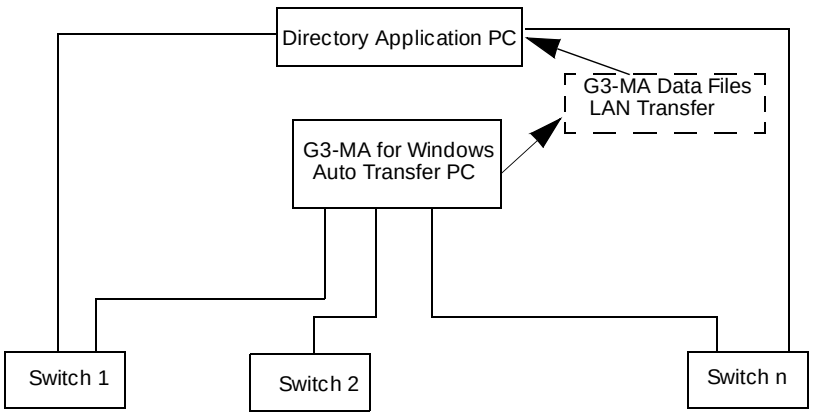

Figure A-2. G3-MA/Call Accounting Software Interface

File Transfer Method

The following method is used to ensure complete and proper transfer of data. G3-MA writes a file for each switch site into a single directory (for example, **c:/g3-ma/dirdata**). G3-MA Auto Transfer allows an administrator to specify the full path to the directory. the record in the file are sorted by extension.

1. G3-MA deletes any existing **.top** or **gam** files.
2. G3-MA creates a new download file called **Switch_ID.tmp**, where *Switch_ID* is the eight-character maximum site identifier.
3. When the download is complete, G3-MA renames the file **Switch_ID.g3m**.

4. The directory software should copy the file to **Switch_ID.dir** or copy the file to another location before processing the file. Directory software must not erase the **Switch_ID.g3m**, as other applications may also want to use the data.
5. When complete, the directory software should delete the renamed file, especially if it is in the same directory as the one where it was originally created.

These steps will minimize the possibility that the file will be corrupted by being written to by both software programs at the same time. It is also recommended that the directory software should validate each file to ensure that the file starts with the header line and ends with the ending line, as specified in this interface specification.

Data Transferred

The following data is retrieved from the switches and is formatted from G3-MA for the Directory system. The contents of the field data from G3-MA is exactly as retrieved from the switches. No additional processing of data is done by G3-MA. Note that some of these fields may be empty (for example, the switch does not require that the room field be populated). The application receiving the data must be able to handle fields with no characters. The Extension field is a required field and, if it is empty, it should be reported as an error by the application receiving the data.

Table A-9. G3-MA Files

Field Name	Type	Maximum Size
Name	String	15
Extension	String	5
Room	String	10
Floor	String	10
Building	String	10
Jack	String	5
Cable	String	5

File Format

A file containing all records downloaded from the switch is created for each site. The file is in ASCII-delimited format, with each field separated by commas, and each alphanumeric field for the data records is surrounded by double quotes. The first record is a header record, with a header character and comma-separated fields, as described below. The header does not have double quote string delimiters. Each line of the file is terminated with an MS-DOS/Windows text newline (<CR> <LF>). The **Switch_ID** is an eight-character field that corresponds to the ID field in the G3-MA database. The **Switch_ID** is used to

identify switches in a multiple switch environment. The values for the header characters are shown below. Data lines for directory information have no header characters.

Table A-10 shows the use of single line header characters.

Table A-10. Single Letter Line Header Characters

Tag	Line Contents
h	Header Line
<none>	Station Information

Table A-11 shows the contents of the header line.

Table A-11. Header Line

Field Number	Contents
1	h
2	"G3-MA Directory Exported Data" string
3	Switch ID (maximum eight-character switch identifier)
4	Time file is created in mm/dd/yyyy hh:mm:ss format, where mm and dd are zero-filled and hh is in 24-hour time. (Visual C++ CTime format %m/%d/%Y %H:%M.%S)
5	G3-MA Version Number
6	The number of station records in this file. (This can be used to verify that the file has not been truncated. It is equal to the number of lines in file 1 for this header line.)

The time field is always stored in the format shown. If this is an international implementation, then the international format is translated into the U.S. format described above. Since this is an internal data transfer interface, international formats are not required for this interface. Since the header line is fixed and does not have commas to conflict with the comma field separator, there are no double quote string delimiters on the header line.

Example: h,G3-MA Directory Exported Data,inh,09/17/1995 12:48:00,4.1.2,1023

Station information is retrieved directly from the switch and is formatted as follows. Note that G3-MA merely retrieves and sends on the switch information. This may provide additional flexibility for some customers who choose to use the Room/Jack/Cable free format for other purposes.

Table A-12 shows the contents of the station line.

Table A-12. Station Line

Field Number	Contents
1	Name (as stored on the switch)
2	Extension (sort key on the switch)
3	Room (as stored on the switch)
4	Floor (as stored on the switch)
5	Building (as stored on the switch)
6	Jack (as stored on the switch)
7	Cable (as stored on the switch)

Example: "Colon, Juan",84400,"30K28","3","Main","2Jp5","5R5"

Administrative Parameters

Certain parameters should be set by the user of both the Directory software and G3-MA. G3-MA should be able to administer:

- Switches in the network that transfer data. This is administrable for each G3 switch ID.
- The frequency and the time of the data transfer (the number of days between transfer).

The Directory software can administer the following:

- The source directory for data transfer.

Restrictions

Certain restrictions apply to the interface of these two products. The restrictions are as follows:

- G3-Ma Auto Transfer is tested to supports a maximum of 100 switches and 20,000 extensions. Note that the actual number of switches that can be supported may be less that these limits if the user's disk storage space is exhausted. It is the customer's responsibility to ensure that there is enough disk space to meet these limits.
- The Directory software and G3-MA must be connected by a LAN from separate PCs. (They may operate properly if coresident on the same PC, but the coresident operation is not certified for G3-MA and is not supported by the TSC.
- The G3-MA PC used must meet the minimum PC requirements for G3-MA (documented separately).

- G3-MA must operate on Windows 3.1 and Windows for Workgroups 3.11. (G3-MA is known to work on Windows 95.) This must include operation while Windows for Workgroups is connected by a LAN (allowing data transfer across a LAN by sharing the G3-MA directory on Windows for Workgroups). G3-MA must also operate while the LAN connectivity is active on Windows for Workgroups.
- G3-MA must also operate while LAN connectivity is active on Windows for Workgroups.
- The user must ensure appropriate security for the system. The file formats are ASCII-readable. To ensure security of this data, the user may choose to lock the PC, password-protect the PC, or secure it in a locked room. This is the user's responsibility and is not part of the design of G3-MA Auto Transfer. Security issues associated specifically with these applications are defined by the appropriate requirements and feature specification documents for these applications.

UNIX System -Administration Guidelines

B

This appendix includes the following topics:

For more information about UNIX System Administration, see:

- *UnixWare V2.0 System Administrator's Guide*
- *Desktop User Handbook 2.0*

Login Administration

The G3-MA software requires that each G3-MA user be assigned a unique login ID, group ID, and password. You can use either:

- Sysadm Utility
- UNIX command **adduser**

to enter this information into the system. When you install G3-MA (UNIX), you will be asked to use a UNIX editor to modify system files; these modifications optimize the operating system for G3-MA. System files are protected and require

that you use special editor commands to save changes and exit the editor. If you are using the UNIX **vi** editor, the command sequence is:

1. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
2. At the **vi** prompt (**:**) enter **wq!** and press the Enter key to write changes and to quit the editor.

To use the command **adduser**:

1. Enter a user's login ID.
2. Enter the user's full name.
3. Enter the user's ID number.

   The UNIX system assigns a group ID number.
4. Enter the user's login (home) directory name.
5. Enter a password for each user.

After using the UNIX command **adduser** to assign login IDs for G3-MA users, the UNIX system administrator must assign the **g3ma** group-ID number for all G3-MA users. To assign the G3-MA group number to each new user:

1. View the **/etc/group** file to determine the group-ID number for G3-MA.
2. Edit the **/etc/passwd** file, and change each new user's group-ID field entry to the G3-MA group-ID number.
3. Edit the **/etc/group** file, and add each user's name to the G3-MA line entry.
4. After making file changes with a UNIX editor, you must write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.
5. Run the **creatiadb** command.

The UNIX system administrator must consider disk space when assigning a home directory for each user.

Adding G3-MA to CAFE

Coresident Applications Front End (CAFE) is a simple menu application that allows you to do either of the following:

- Execute CAFE from a UNIX shell.
- Set up CAFE as the default login shell for certain UNIX users.

NOTE:
With a new simplified terminal interface, CAFE supports any terminal type that is also supported by G3-MA.

If your UNIX PC is running the CAFE application, you can add G3-MA to the **/usr/CAFE/appl.list** file as follows:

- Copy the **.profile** file in the home directory for user g3maadm to **/usr/CAFE/MAprofile**.
- Change the permissions of the new **MAprofile** file to ''**755**'' using the command:

  chmod 755 /usr/CAFE/MAprofile.
- Edit the new /usr/CAFE/MAprofile file to add this as the last line:

  /usr/bin/g3-ma.
- Edit the **/usr/CAFE/appl.list** file, and add the line:

  G3-MA | /usr/CAFE/MAprofile | *user ID numbers for each login* | g3ma
- Each login ID must be separated by a semicolon (;). For example:

  g3maadm;g3mau001;g3mau002;g3mau003;g3mau004

NOTE:
Each login ID must exist in the password file, **/etc/passwd**.

Port Administration

This section provides the procedure for assigning a modem or device to a UNIX port.

Setting Up the Devices File

In order to establish connections between your G3-MA (UNIX) and switches or adjunct systems, you must set up the **/usr/lib/uucp/Devices** file according to the following guidelines:

- Designate a modem for exclusive use by G3-MA connections by placing a ''**g**'' directly before the modem speed for a particular device entry (for example **g9600**).

You must place a ‘‘g’’ before the modem speed for at least one device since only devices with a ‘‘g’’ before the modem speed can be used for G3-MA connections. If you do not do this, all G3-MA connections will fail.

- If you wish G3-MA to support multiple simultaneous connections, you must place the ‘‘g’’ before the modem speed for more than one device.
- Devices with the ‘‘g’’ before the modem speed can only be used by G3-MA and cannot be used for connections by any other software packages.
- If you have other software packages that need devices for connections, leave some devices without the ‘‘g’’ in front of the modem speed. For example, in the following Devices file, the:
  - — First entry will be used exclusively for G3-MA
  - — Second entry can be used by other UNIX software packages that require modem connectivity
  - — Third and fourth entries allow G3-MA ***and*** other UNIX software packages to ***share*** the same modem

    ACU /dev/ttysx$_1$y$_1$,M - g9600 hayes
    ACU /dev/ttysx$_2$y$_2$,M - 2400 ADU
    ACU /dev/ttysx$_3$y$_3$,M - 1200 hayes
    ACU /dev/ttysx$_3$y$_3$,M - g1200 hayes

  where $x_1y_1 \neq x_2y_2 \neq x_3y_3$.

  NOTE:
  This example applies to ports on the Equinox Megaport card. For a built-in Com 1 port, use **/dev/tty00h**. For a built-in Com 2 port, use **/dev/tty01h**.

- If you are administering a direct connection to a switch or adjunct system, the Devices file should include an entry for the device to be used in the direct connection. The entry should use the word **Direct** in the first field (type field) and **direct** in the fourth field (dialer field). Modem control (indicated by M after the device name) is not allowed for a direct connection. The following is an example of a Devices file entry for a direct connection:

  Direct /dev/ttysak - 9600 direct

  The ‘‘k’’ in this example indicates the last port on the first expansion module of the Equinox card.

Assigning a Modem or Device to a UNIX Port

To assign a modem or a device to a UNIX port:

1. Verify that the UNIX System Device file (**/usr/lib/uucp/Devices**) contains an entry for the type of hardware you are installing. If the device file does not contain an entry for your device type, use a UNIX editor and modify the **/usr/lib/uucp/Devices** file to add the correct device type.

   Examples of device type in the /usr/lib/uucp/Devices file:

   ACU /dev/ttysx$_1$y$_1$,M - g9600 hayes
   ACU /dev/ttysx$_2$y$_2$,M - 2400 ADU

   where $x_1y_1 \neq x_2y_2$.

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page B-3. It tells you how to designate a modem for exclusive use by G3-MA.

2. Verify that the UNIX System Dialers file (**/usr/lib/uucp/Dialers**) contains a dialer-string entry for the type of communication device you are installing. If the dialer file does not contain a dialer-string entry for your hardware type, use a UNIX editor and modify the **/usr/lib/uucp/Dialers** file. Add dialer entries for the type of communication devices added. See the Device type and dialer-string examples listed below:

   For the AT&T 2224G, AT&T 2224CEO, COMSPHERE 3830 and AT&T 3710, use the dial string:

fhayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧AT%C0\\N1E1V1X4Q0&C1\\D2&D2S7=255S0=0\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character ''∧'' represents a ***space*** in the dial string.

   For the AT&T 3715, use the dial string:

3715hayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧AT%C0\\N1E1V1X4Q0&C2&D2S7=255S0=0\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character ''∧'' represents a ***space*** in the dial string.

   For the AT&T 7400B, use the dial string:

7400hayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧ATE1V1X4Q0&C1&D2S7=255S0=1\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character "^" represents a ***space*** in the dial string.

For the Z3A1 Asynchronous Data Unit (ADU) or a processor data module (PDM), use the dial string:

ADU∧=+∧""∧\M\K\p∧DIAL:∧\T∧ANSWERED∧\p\c\m

where the character ''∧'' represents a ***space*** in the dial string.

It is essential to type spaces just as they are indicated above; for example, there must be a space between ''**DIAL:**'' and ''**\T**.''

3. After making changes with a UNIX editor you must write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.

See Appendix C for information about installing and assigning the and the EQUINOX MEGAPLEX XP, EQUINOX SST, and Specialix SLXOS Ports Card.

Printer Administration

To add a default printer for the G3-MA software, first assign the printer to one of the operating system's input/output (I/O) expansion ports. Next, enter the G3-MA Configuration Application Change Hardware form and assign a preferred printer name for each G3-MA user.

For more information about printer administration, see Appendix C.

Diskette-Drive Selection

Each G3-MA user must have an entry for their preferred diskette drive in the G3-MA software. Use the G3-MA Configuration Application Change Hardware Screen to define removable media type for the system. See Chapter 7 for more information.

Backup and Restore

Trying to repair lost or damaged data manually can be a very time consuming task. To help you avoid this, the UNIX operating system provides you with system-administration backup facilities.

To execute a backup, follow these steps:

1. Login as the owner of the machine (the graphical desktop user).
2. Open the Administration Tools icon.

3. Open Backup and Restore.
4. Select Backup to Cartridge Tape Drive.
5. Select Backup Type: Complete.
6. Select Backup Class: Full System.
7. Select Backup Now.

You should perform a backup and restore at regular intervals.

Complete Backup of a G3-MA User's Files

To execute a full system backup using the UNIX utility **sysadm**:

1. Log in as **root** from the system console.
2. At the UNIX # prompt, execute **schdmn -s** to stop the g3-ma schedule daemon.
3. At the UNIX # prompt, enter **who** to verify that no G3-MA users with G3-MA login IDs are active.

   NOTE:
   If you decide to postpone the backup because of active G3-MA users or scheduled G3-MA scripts, restart the schedule daemon in Step 12 before exiting this procedure.

4. At the UNIX # prompt, enter **ps -ef** to verify that no scheduled G3-MA scripts (that is, no processes with a G3-MA user's login ID) are executing.
5. At the UNIX # prompt, enter **sysadm**.
6. Select System Administration.
7. Select backup to removable media.
8. Select system backup.
9. Select full system backup.
10. Select save to execute the backup.
11. Exit the **sysadm** utility and return to the **root** prompt.
12. Execute **schdmn -r** to restart the g3-ma schedule daemon.

Backup of G3-MA Data for a Single User's ID

To backup or restore data for a single G3-MA user's ID, access the Customer Release menu and select the **backup** or **restore** command.

Recovery of G3-MA Software

When your G3-MA application software is corrupt, you must reload the G3-MA application. Refer to Chapter 6, *Installing G3-MA (UNIX) Software*, for instructions on installing the application software.

1. Log in as **root** from the system console.
2. Execute the **installpkg** command and follow the instructions in Chapter 6.

Recovery of G3-MA Data

After the application software has been reinstalled, you may wish to recover G3-MA data. The system administrator should have saved G3-MA data to removable media during scheduled backups. Select your last known good backup and follow the steps listed below:

1. Log in as **root** from the system console.
2. At the UNIX # prompt, execute **schdmn -s** to stop the g3-ma schedule daemon.
3. At the UNIX # prompt, enter **who** to verify that no G3-MA users with G3-MA login IDs are active.

   NOTE:
   If you decide to postpone the backup because of active G3-MA users or scheduled G3-MA scripts, restart the schedule daemon in Step 12 before exiting this procedure.

4. At the UNIX # prompt, enter **ps -ef** to verify that no scheduled G3-MA scripts (that is, no processes with a G3-MA user's login ID) are executing.
5. At the UNIX # prompt, enter **sysadm**.
6. Select System Administration.
7. Select Restore from removable media.

8. Select System Restore to restore ***all*** files from removable media.

   or

   Select Selective Restore to restore ***selected*** files from removable media.
9. Select the desired media and device.
10. Select Save to execute the backup.
11. Exit the UNIX utility **sysadm** and return to the UNIX prompt.
12. Execute **schdmn -r** to start the g3-ma schedule daemon.

Serial Ports Card Installation and Configuration

C

This appendix provides guidelines for hardware and software installation and UNIX system administration for the EQUINOX MEGAPLEX XP, the EQUINOX SST, and the Specialix SLXOS intelligent ports cards. It also covers the administration of tty ports on your UNIX PC.

Administration of tty00 or tty01

To add a dial-in modem for tty00 or tty01:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to change or create the **/etc/conf/init.d/ua_tty** file.

   To add a dial-in modem for **tty00,** add the line:

   t00:23:respawn:/etc/getty /dev/tty00 9600NP

   To add a dial-in modem for tty01, add the line:

   t01:23:respawn:/etc/getty /dev/tty01 9600NP
3. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

To initialize the UNIX serial port and implement the changes:

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q.**

Installation and Administration of EQUINOX MEGAPLEX XP Port Card

This section provides guidelines for installing and administering the EQUINOX MEGAPLEX XP Port Card. We recommend you use these procedures rather than using the **megadiag** tool.

Installing EQUINOX MEGAPLEX (MEGAPORT) Device Driver and Hardware

To install the EQUINOX MEGAPLEX XP (MEGAPORT) software driver and ports card:

1. Install the MEGAPORT Device Driver Version 2.22 software using the UNIX **pkgadd** command and the procedures for UnixWare V 2.01 outlined in the Equinox Software Reference Manual PN 560045/A and Technical Note MEGAPORT XP PORT INTERFACE MODULES PN 302063/A. The EQUINOX device driver is on a disk labeled '' Rel 4 Device Driver Streams ISA/EISA V 2.22.''
2. Verify the hardware switch settings if you are installing a MEGAPORT board in an Extended Industry Standard Architecture (EISA) system. See EISA installations in your Hardware Reference Manual MEGAPORT XP PN 560074/A.
3. Install the serial ports card in your UNIX PC.

Modifying the /etc/ttydefs File

The default settings for the serial port connections in the /etc/ttydefs file must be modified. You must change the line that begins with **<baud rate>:** (that is, either **9600:**, **4800:**, **2400:**, or **1200:**). Make the following changes (in two places for each applicable line).

Change **CS7** to **CS8**

Add the strings **-clocal** and **ctsxon**

Change **parenb** to **-parenb**

UNIX Administration for EQUINOX MEGAPLEX XP Ports Card

This sections provides procedures for UNIX administration for the EQUINOX MEGAPLEX XP ports card.

Setting Up the Devices File

In order to establish connections between your G3-MA (UNIX) and switches or adjunct systems, you must use the **chmod** command to change the permissions of **/dev/ttys*** to ''**666**'' and then set up the **/usr/lib/uucp/Devices** file according to the following guidelines:

- Designate a modem for exclusive use by G3-MA for connections by placing a **g** directly before the modem speed for a particular device entry (for example g9600).
- You must place a g before the modem speed for at least one device since only devices with a g before the modem speed can be used for G3-MA connections. If you do not do this, all G3-MA connections will fail.
- If you wish G3-MA to support multiple simultaneous connections, you must place the g before the modem speed for more than one device.
- Devices with the g before the modem speed can only be used by G3-MA and cannot be used for connections for any other software packages.
- If you have other software packages that need devices for connections, leave some devices without the g in front of the modem speed.

For example, in the following Devices file, the first entry will be used exclusively for G3-MA, and the next entry can be used by other UNIX software packages that require modem connectivity:

ACU /dev/ttysx_1y_1,M - g9600 fhayes
ACU /devttysx_2y_2,M - 2400 ADU

where $x_1y_1 \neq x_2y_2$ and where x = a to d, y = a to x.

NOTE:
There is no space between the ''g'' and the modem speed.

Verifying Device Types and Dial-String Entries

To assign the serial ports when you have an EQUINOX MEGAPLEX XP ports card installed in your UNIX PC verify that the:

1. UNIX System Devices file (**/usr/lib/uucp/Devices**) contains an entry for the type of hardware you are installing.

   If the device file does not contain an entry for your device type, use a UNIX editor and modify the **/usr/lib/uucp/Devices** file to add the correct device entry.

   Examples of G3-MA device types in the **/usr/lib/uucp/Devices** file:

ACU /dev/ttysx$_1$y$_1$,M - g9600 fhayes
ACU /dev/ttysx$_2$y$_2$,M - g2400 ADU

where $x_1y_1 \neq x_2y_2$ and where x = a to d and y = a to x.

2. UNIX System Dialer file (**/usr/lib/uucp/Dialers**) contains a dialer string entry for the type of communication device you are installing.

   If the dialer file does not contain a dialer string entry for your hardware type, use a UNIX editor and modify the **/usr/lib/uucp/Dialers** file. Add dialer entries for the type of communication devices added. See the following Device type and Dialer string examples:

   For the AT&T 2224G, AT&T 2224CEO, COMSPHERE 3830 and AT&T 3710, use the dial string:

fhayes^=,–,^""^\M\dAT&F\r\c^OK^AT%C0\\N1E1V1X4Q0&C1\\D2&D2S7=255S0=0\r\c^OK^\EATDT\T\r\C^CONNECT

   where the character "^" represents a ***space*** in the dial string.

   For the AT&T 3715, use the dial string:

3715hayes^=,–,^""^\M\dAT&F\r\c^OK^AT%C0\\N1E1V1X4Q0&C2&D2S7=255S0=0\r\c^OK^\EATDT\T\r\C^CONNECT

   where the character "^" represents a ***space*** in the dial string.

   For the AT&T 7400B, use the dial string:

7400hayes^=,–,^""^\M\dAT&F\r\c^OK^ATE1V1X4Q0&C1&D2S7=255S0=1\r\c^OK^\EATDT\T\r\C^CONNECT

   where the character "^" represents a ***space*** in the dial string.

   For the Z3A1 Asynchronous Data Unit (ADU) or a processor data module (PDM), use the dial string:

   ADU^=+^""^\M\K\p^DIAL:^\T^ANSWERED^\p\c\m

   where the character "^" represents a ***space*** in the dial string.

3. After making changes with a UNIX editor, you must write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

UNIX Port Administration

When you have an EQUINOX MEGAPLEX XP port card installed in your UNIX PC and you are assigning devices to ports on the card, the **inittab** file entry must contain the correct information to support the way the port will be used. The following procedures will build the **inittab** entries for each type of port that G3-MA will need.

NOTE:
When you are assigning modems to ports that will be used to communicate with switches, we recommend that the speed be set to 9600 bps.

Assigning a Dial-In Modem to an EQUINOX MEGAPLEX Port Using getty

To assign a dial-in modem to an EQUINOX MEGAPLEX port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to view the **/etc/conf/init.d/eqx** file. Locate the line entry for your port number. A line entry in the **/etc/conf/init.d/eqx** file for a idle port will look like example (a):
   a. **:23:off: /etc/getty /dev/ttysac 9600**
3. Use a UNIX editor and modify the line entry for your port number to look like example (b).
   b. **:23:respawn: /etc/getty /dev/ttysac 9600NP**
4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.

To initialize the UNIX serial port and implement the changes:

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q**.

Assigning a Dial-In Modem to an EQUINOX MEGAPLEX Port Using ttymon

To assign a dial-in modem to an EQUINOX MEGAPLEX XP port:

1. Log in as **root** on your UNIX PC.
2. Run the command **sacadm -a -p ttymona -t ttymon **

   -c "/usr/lib/saf/ttymon" -v 'ttyadm -V'
3. Run command **pmadm -a -p ttymona **

   **-s svcaa **

   **-i root -fux **

   **-S login **

**-v ‘ttyadm -V‘ -m "‘ttyadm **

**-d /dev/ttys/aa -l 9600NP **

**-s /usr/bin/shserv **

-p \"login: \" -m ldterm‘"

4. Run the command **sysadm**.

   Select **ports and ports services**.

   To modify ports service **svcaa**, change the **bidirectional field** in the port that appears from **N** to **Y**. Change disabled to enabled.

   Save your changes.

   NOTE:
   If this is the first port on the board being set up for a dial-in modem, then complete up to step 2. After the first port, just complete steps 3 and 4.

Assigning a Dial-Out Modem to an EQUINOX MEGAPLEX Port

To assign a dial-out modem to an EQUINOX MEGAPLEX XP port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to add the line in example (a) to the **/usr/lib/uucp/Devices** file for a pdm which requires a dialer type of ‘‘**ADU**.’’

   Example:

   a. ACU /dev/ttysxy,M - g2400 ADU

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page C-9. It tells you how to designate a modem for exclusive use by G3-MA.

3. Use a UNIX editor to add the line in example (b) for a Hayes modem.

   Example:

   b. ACU /dev/ttysxy,M - g9600 fhayes

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page C-9. It tells you how to designate a modem for exclusive use by G3-MA.

4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

Assigning a Bidirectional Modem to an EQUINOX MEGAPLEX Port

To assign a bidirectional modem to an EQUINOX MEGAPLEX XP port, follow the procedures for ***both*** of the previous sections, ''Assigning a Dial-In Modem to a Port Using ttymon'' and ''Assigning a Dial-Out Modem to a Port.''

Making Terminal-to-Port Assignments

To assign a terminal to an EQUINOX MEGAPLEX XP port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to view the **/etc/conf/init.d/eqx** file. Locate the line entry for your port number. A line entry in the **/etc/conf/init.d/eqx** file for a idle port will look like example (a):
   a. **:23:off: /etc/getty /dev/ttysac 9600**
3. Use a UNIX editor and modify the line entry for your port number to look like example (b).
   b. **:23:respawn: /etc/getty /dev/ttysac 9600NP**
4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.

To initialize the UNIX serial port and implement the changes:

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q**.

Administering an EQUINOX MEGAPLEX Port to a Printer

To assign a printer to an EQUINOX MEGAPLEX card you must:

1. Log in as **root** on your UNIX PC.
2. Enter the UNIX commands:

a. **/usr/lib/lpadmin -p (printer name) -T (printer type) -v (device name)**

b. **/usr/lib/accept (printer name)**

c. **enable (printer name)**

Step (d) is needed if the printer you are installing is the G3-MA default printer.

For a list of printer names that start with the letter ‘‘h,’’ enter the UNIX command: **ls /usr/lib/terminfo/h***.

d. **/usr/lib/lpadmin -d (printer name)**

The following is an example of installing an HP LASERJET printer to an EQUINOX MEGAPLEX port:

1. Log in as **root** on your UNIX PC.
2. Enter the UNIX commands:

   a. **/usr/lib/lpadmin -p lpt1 -T hplaserjet -v /dev/ttyan**

   b. **/usr/lib/accept lpt1**

   c. **enable lpt1**

   Step (d) is needed if the printer you are installing is the default printer.

   d. **/usr/lib/lpadmin -d lpt1**

Installation and Administration of EQUINOX SST Port Card

This section provides guidelines for installing and administering the EQUINOX SST Port Card.

Installing EQUINOX SST Device Driver and Hardware

To install the EQUINOX SST software driver and ports card:

1. Install the SST Device Driver Version 1.05 software using the UNIX **pkgadd** command and the procedures for UnixWare V 2.01 outlined in the Equinox Software Manual PN 560085/A and Release Notes EQUINOX SST SVR4 STREAMS Driver Software PN 560087/D. The EQUINOX device driver is on a disk labeled ‘‘ UNIX System V Rel 4.2 Streams Device Driver V1.05.’’
2. Verify the hardware switch settings if you are installing a SST board in an Extended Industry Standard Architecture (EISA) system. See EISA installations in your Hardware Reference Manual SST PN 560075/A.
3. Install the serial ports card in your UNIX PC.

UNIX Administration for EQUINOX SST Ports Card

This sections provides procedures for UNIX administration for the EQUINOX SST ports card.

Setting Up the Devices File

In order to establish connections between your G3-MA (UNIX) and switches or adjunct systems, you must use the **chmod** command to change the permissions of **/dev/term/*** to "**666**" and then set up the **/usr/lib/uucp/Devices** file according to the following guidelines:

- Designate a modem for exclusive use by G3-MA for connections by placing a **g** directly before the modem speed for a particular device entry (for example g9600).
- You must place a g before the modem speed for at least one device since only devices with a g before the modem speed can be used for G3-MA connections. If you do not do this, all G3-MA connections will fail.
- If you wish G3-MA to support multiple simultaneous connections, you must place the g before the modem speed for more than one device.
- Devices with the g before the modem speed can only be used by G3-MA and cannot be used for connections for any other software packages.
- If you have other software packages that need devices for connections, leave some devices without the g in front of the modem speed.

For example, in the following Devices file, the first entry will be used exclusively for G3-MA, and the next entry can be used by other UNIX software packages that require modem connectivity:

ACU /dev/term/1ax$_1$,M - g9600 fhayes
ACU /dev/term/1ax$_2$,M - 2400 ADU

where $x_1 \neq x_2$ and where $x = 1$ to 16.

NOTE:
There is no space between the "g" and the modem speed.

Verifying Device Types and Dial-String Entries

To assign the serial ports when you have an EQUINOX SST ports card installed in your UNIX PC verify that the:

1. UNIX System Device file (**/usr/lib/uucp/Devices**) contains an entry for the type of hardware you are installing.

   If the device file does not contain an entry for your device type, use a UNIX editor and modify the **/usr/lib/uucp/Devices** file to add the correct device entry.

Examples of G3-MA device types in the **/usr/lib/uucp/Devices** file:

ACU /dev/term/1ax$_1$,M - g9600 fhayes
ACU /dev/term/1ax$_2$,M - g2400 ADU

where $x_1 \neq x_2$ and where $x = 1$ to 16 .

2. UNIX System Dialer file (**/usr/lib/uucp/Dialers**) contains a dialer string entry for the type of communication device you are installing.

   If the dialer file does not contain a dialer string entry for your hardware type, use a UNIX editor and modify the **/usr/lib/uucp/Dialers** file. Add dialer entries for the type of communication devices added. See the following Device type and Dialer string examples:

   For the AT&T 2224G, AT&T 2224CEO, COMSPHERE 3830 and AT&T 3710, use the dial string:

fhayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧AT%C0\\N1E1V1X4Q0&C1\\D2&D2S7=255S0=0\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character "∧" represents a ***space*** in the dial string.

   For the AT&T 3715, use the dial string:

3715hayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧AT%C0\\N1E1V1X4Q0&C2&D2S7=255S0=0\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character "∧" represents a ***space*** in the dial string.

   For the AT&T 7400B, use the dial string:

7400hayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧ATE1V1X4Q0&C1&D2S7=255S0=1\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character "^" represents a ***space*** in the dial string.

   For the Z3A1 Asynchronous Data Unit (ADU) or a processor data module (PDM), use the dial string:

ADU∧=+∧""∧\M\K\p∧DIAL:∧\T∧ANSWERED∧\p\c\m

   where the character "∧" represents a ***space*** in the dial string.

3. After making changes with a UNIX editor, you must write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

UNIX Port Administration

When you have an EQUINOX SST port card installed in your UNIX PC and you are assigning devices to ports on the card, the **inittab** file entry must contain the correct information to support the way the port will be used. The following procedures will build the **inittab** entries for each type of port that G3-MA will need.

NOTE:
When you are assigning modems to ports that will be used to communicate with switches, we recommend that the speed be set to 9600 bps.

Assigning a Dial-In Modem to an EQUINOX SST Port Using ttymon Scripts

To assign a dial-in modem to an EQUINOX SST port, complete the following after installation:

1. Log in as **root** on your UNIX PC.
2. Run the command **/etc/eqnportsetup**

Assigning a Dial-Out Modem to a Port

To assign a dial-out modem to an EQUINOX SST port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to add the line in example (a) to the **/usr/lib/uucp/Devices** file for a pdm which requires a dialer type of "**ADU**."

   Example:

   a. ACU /dev/term/1a1,M - g2400 ADU

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page C-9. It tells you how to designate a modem for exclusive use by G3-MA.

3. Use a UNIX editor to add the line in example (b) for a Hayes modem.

   Example:

   b. ACU /dev/term/1a1,M - g9600 fhayes

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page C-9 It tells you how to designate a modem for exclusive use by G3-MA.

4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

Assigning a Dial-In Modem to an EQUINOX SST Port Using getty

To assign a dial-in modem to an EQUINOX SST port using getty:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to view the **/etc/conf/init.d/eqn** file. Locate the line entry for your port number. A line entry in the **/etc/conf/init.d/eqn** file for a idle port will look like example (a):
    a. **:23:off: /etc/getty /dev/term/1a1 9600NP**
3. Use a UNIX editor and modify the line entry for your port number to look like example (b).
    b. **:23:respawn: /etc/getty /dev/term/1a1 9600NP**
4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
    a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
    b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.To initialize the UNIX serial port and implement the changes:

To initialize the UNIX serial port and implement the changes.

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q**.

Assigning a Bidirectional Modem to an EQUINOX SST Port

To assign a bidirectional modem to an EQUINOX SST port, follow the procedures for ***both*** of the previous sections, ''Assigning a Dial-In Modem to a Port Using ttymon Scripts'' and ''Assigning a Dial-Out Modem to a Port.''

Making Terminal-to-Port Assignments

To assign a terminal to an EQUINOX SST port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to view the **/etc/conf/init.d/eqn** file. Locate the line entry for your port number. A line entry in the **/etc/conf/init.d/eqn** file for a idle port will look like example (a):
    a. **:23:off: /etc/getty /dev/term/1a1 9600**

3. Use a UNIX editor and modify the line entry for your port number to look like example (b).

    b. **:23:respawn: /etc/getty /dev/term/1a1 9600NP**

4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

    a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

    b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.To initialize the UNIX serial port and implement the changes:

To initialize the UNIX serial port and implement the changes.

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q**.

Installation and Administration of Specialix SLXOS Port Card

This section provides guidelines for installing and administering the Specialix SLXOS Port Card.

Installing Specialix SLXOS Device Driver and Hardware

To install the Specialix SLXOS software driver and ports card:

1. Install the Specialix SLXOS Device Driver Release 1.01 software using the UNIX **pkgadd** command and the procedures for UnixWare V 2.01 outlined in the Specialix SLXOS Guide to Installation and Operation. The Specialix SLXOS device driver is on a disk labeled ''SLXOS for UnixWare 2.x Release 1.01''
2. Verify that the RAM address 0XD0000 is available, that the IO address is not being used, and select one of the following interrupt levels: 11, 12, or 15.
3. Install the serial ports card in your UNIX PC.

UNIX Administration for Specialix SLXOS Ports Card

This sections provides procedures for UNIX administration for theSpecialix SLXOS ports card.

Setting Up the Devices File

In order to establish connections between your G3-MA (UNIX) and switches or adjunct systems, you must use the **chmod** command to change the permissions of **/dev/term/*** to ''**666**'' and then set up the **/usr/lib/uucp/Devices** file according to the following guidelines:

- Designate a modem for exclusive use by G3-MA for connections by placing a **g** directly before the modem speed for a particular device entry (for example g9600).
- You must place a g before the modem speed for at least one device since only devices with a g before the modem speed can be used for G3-MA connections. If you do not do this, all G3-MA connections will fail.
- If you wish G3-MA to support multiple simultaneous connections, you must place the g before the modem speed for more than one device.
- Devices with the g before the modem speed can only be used by G3-MA and cannot be used for connections for any other software packages.
- If you have other software packages that need devices for connections, leave some devices without the g in front of the modem speed.

For example, in the following Devices file, the first entry will be used exclusively for G3-MA, and the next entry can be used by other UNIX software packages that require modem connectivity:

ACU /dev/term/x_1y_1,M - g9600 fhayes
ACU /dev/term/x_2y_2,M - 2400 ADU

where $x_1y_1 \neq x_2y_2$ and where x = A to D, y = 1 to 8.

NOTE:
There is no space between the ''g'' and the modem speed.

NOTE:
For the purposes of a G3-MA Equinox connection, an ADU is set up like a modem or a data module (not a terminal). Therefore, the valid entries for y_2 (like y_1) are ***capitalized*** (that is, A to X).

Verifying Device Types and Dial-String Entries

To assign the serial ports when you have an Specialix SLXOS ports card installed in your UNIX PC verify that the:

1. UNIX System Device file (**/usr/lib/uucp/Devices**) contains an entry for the type of hardware you are installing.

   If the device file does not contain an entry for your device type, use a UNIX editor and modify the **/usr/lib/uucp/Devices** file to add the correct device entry.

   Examples of G3-MA device types in the **/usr/lib/uucp/Devices** file:

   ACU /dev/term/x_1y_1,M - g9600 fhayes
   ACU /dev/term/x_2y_2,M - g2400 ADU

   where $x_1y_1 \neq x_2y_2$ and where x = A to D and y = 1 to 8.

2. UNIX System Dialer file (**/usr/lib/uucp/Dialers**) contains a dialer string entry for the type of communication device you are installing.

   If the dialer file does not contain a dialer string entry for your hardware type, use a UNIX editor and modify the **/usr/lib/uucp/Dialers** file. Add dialer entries for the type of communication devices added. See the following Device type and Dialer string examples:

   For the AT&T 2224G, AT&T 2224CEO, COMSPHERE 3830 and AT&T 3710, use the dial string:

fhayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧AT%C0\\N1E1V1X4Q0&C1\\D2&D2S7=255S0=0\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character ''∧'' represents a ***space*** in the dial string.

   For the AT&T 3715, use the dial string:

3715hayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧AT%C0\\N1E1V1X4Q0&C2&D2S7=255S0=0\r\c∧OK∧\EATDT\T\r\C∧CONNECT

   where the character ''∧'' represents a ***space*** in the dial string.

For the AT&T 7400B, use the dial string:

7400hayes∧=,–,∧""∧\M\dAT&F\r\c∧OK∧ATE1V1X4Q0&C1&D2S7=255S0=1\r\c∧OK∧\EATDT\T\r\C∧CONNECT

where the character "^" represents a ***space*** in the dial string.

For the Z3A1 Asynchronous Data Unit (ADU) or a processor data module (PDM), use the dial string:

ADU∧=+∧""∧\M\K\p∧DIAL:∧\T∧ANSWERED∧\p\c\m

where the character "∧" represents a ***space*** in the dial string.

3. After making changes with a UNIX editor, you must write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

UNIX Port Administration

When you have an Specialix SLXOS port card installed in your UNIX PC and you are assigning devices to ports on the card, the **inittab** file entry must contain the correct information to support the way the port will be used. The following procedures will build the **inittab** entries for each type of port that G3-MA will need.

NOTE:
When you are assigning modems to ports that will be used to communicate with switches, we recommend that the speed be set to 9600 bps.

Assigning a Dial-In Modem to a Specialix SLXOS Port Using getty

To assign a dial-in modem to a Specialix SLXOS port using getty:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to view the **/etc/conf/init.d/slx**_ file. You may find a line similar to the following.
   a. **:23:off: /etc/getty /dev/term/A1 9600**
3. Use a UNIX editor and either create a new line entry or modify the existing line entry for your port number to look like example (b).
   b. **:23:respawn: /etc/getty /dev/term/A1 9600NP**

4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

   b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.

To initialize the UNIX serial port and implement the changes:

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q**.

Assigning a Dial-In Modem to a Specialix SLXOS Port Using ttymon

To assign a dial-in modem to a Specialix SLXOS port:

1. Log in as **root** on your UNIX PC.
2. Run the command **sacadm -a -p ttymonA -t ttymon **

   -c "/usr/lib/saf/ttymon" -v 'ttyadm -V'
3. Run command **pmadm -a -p ttymonA **

   **-s svcaa **

   **-i root -fux **

   **-S login **

   **-v 'ttyadm -V' -m "`ttyadm **

   **-d /dev/term/A1 -l 9600 **

   **-s /usr/bin/shserv **

   -p \"login: \" -m ldterm`"
4. Run the command **sysadm**.

   Select **ports and ports services**.

   To modify ports service **svcaa**, change the **bidirectional field** in the port that appears from **N** to **Y**. Change disabled to enabled.

   Save your changes.

   NOTE:
   If this is the first port on the board being set up for a dial-in modem, then complete up to step 2. After the first port, just complete steps 3 and 4.

Assigning a Dial-Out Modem to a Specialix SLXOS Port

To assign a dial-out modem to an Specialix SLXOS port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to add the line in example (a) to the **/usr/lib/uucp/Devices** file for a pdm which requires a dialer type of "**ADU**."

   Example:

   a. ACU /dev/term/A1,M - g2400 ADU

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page C-9. It tells you how to designate a modem for exclusive use by G3-MA.

3. Use a UNIX editor to add the line in example (b) for a Hayes modem.

   Example:

   b. ACU /dev/term/1a1,M - g9600 fhayes

   NOTE:
   See the important information earlier in this chapter on "Setting Up the Devices File" on page C-9. It tells you how to designate a modem for exclusive use by G3-MA.

4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:

   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.

   b. At the **vi** prompt (:), enter **wq!** and press the Enter key to write changes and to quit the editor.

Assigning a Bidirectional Modem to a Specialix SLXOS Port

To assign a bidirectional modem to an Specialix SLXOS port, follow the procedures for ***both*** of the previous sections, ''Assigning a Dial-In Modem to a Port Using ttymon'' and ''Assigning a Dial-Out Modem to a Port.''

Making Terminal-to-Port Assignments

To assign a terminal to a Specialix SLXOS port:

1. Log in as **root** on your UNIX PC.
2. Use a UNIX editor to view the **/etc/conf/init.d/slx**_ file. You may find a line similar to the following.
   a. **:23:off: /etc/getty /dev/term/A1 9600**
3. Use a UNIX editor and either create a new line entry or modify the existing line entry for your port number to look like example (b).
   b. **:23:respawn: /etc/getty /dev/term/A1 9600NP**
4. After making changes with a UNIX editor, write and quit the file to save the changes. If you are using the UNIX **vi** editor, the command sequence is:
   a. After making changes, press the Esc key followed by the : key to get the **vi** prompt.
   b. At the **vi** prompt (:) enter **wq!** and press the Enter key to write changes and to quit the editor.

To initialize the UNIX serial port and implement the changes:

1. Enter the UNIX command **/etc/conf/bin/idmkinit -o /etc** to overwrite the /etc/inittab file.
2. Enter the UNIX command **telinit q**.

G3-MA Auto Transfer and CAS for Windows Installation Guidelines

D

This appendix provides guidelines for installing the G3-MA (4.1) Auto Transfer application and the Call Accounting System (CAS) for Windows (version 2.1) call accounting product.

Overview

The Products

The Auto Transfer application enables G3-MA to retrieve switch administration data that can be used by data manipulation applications outside of G3-MA. Auto Transfer currently supports Call Accounting Transfer and Directory Transfer.

AT&T's G3-MA Auto Transfer application is used with the CAS for Windows call accounting product to minimize the manual administration required on CAS for Windows when administration changes are made on G3 switches. Auto Transfer can also be used with compatible directory systems to synchronize directory entries, similarly reducing duplicate data entry. This document describes the installation of Auto Transfer.

These products run on PCs with Microsoft Windows for Workgroups (version 3.11) as the operating system. The PCs must be connected to a local-area network — you can use the Windows for Workgroups networking or a Novell network. The products integrate the administration data-retrieval features of G3-MA with the Call Detail Recording (CDR*) data collection and reporting provided by CAS for Windows, as well as integration with compatible directory products.

* CDR is also known as Station Message Detail Recording (SMDR).

This Appendix

This appendix describes the hardware and software required to set up the Auto Transfer and CAS for Windows products and provides guidelines for their installation. See the CAS for Windows documentation for detail of that product's installation. Directory product administration should be similar to CAS for Windows. Refer to the G3-MA Auto Transfer-compatible directory product documentation for installation instructions for the directory product. The remainder of this description may talk about CAS for Windows as an example. Auto Transfer use with directory products will be similar. Also, both Call Accounting Transfer and Directory Transfer may be used on the same G3-MA Auto Transfer PC.

Network installation. Network installation is a customer responsibility and is not expected to be done by AT&T support personnel*. This appendix provides some guidelines that will help customers do that installation. It contains information for the Windows for Workgroups and Novell networks. It is recommended that customers have a person educated and designated as the network administrator for the Novell network setup.

This appendix assumes that LAN connectivity has been established between the two PCs.

Software setup. Software setup is also expected to be performed by the customer. Both G3-MA and CAS for Windows have automated installation procedures and on-line use instructions. This appendix describes additional information to be incorporated in those procedures to help customers complete the integrated installation.

Hardware

This section gives hardware requirements and recommendations for setting up data-transfer capability between G3-MA's Auto Transfer application and CAS for Windows.

Hardware Requirements

The hardware environment must include two MS-DOS/Windows PCs linked together by commercial Local Area Network (LAN) hardware and software.

G3-MA, including the Auto Transfer application, must be installed on an MS-DOS/Windows PC that meets the requirements specified in Chapter 1 of *DEFINITY Communications System G3-MA Connectivity and Installation*.

* or problems with the network, contact your network system administrator or the network vendor.

CAS for Windows must also be installed on an MS-DOS/Windows PC that meets the requirements specified by the CAS for Windows Installation Guide.

In addition, both PCs must be provisioned with LAN connection hardware. Auto Transfer and CAS for Windows are certified to work with either Microsoft's Windows for Workgroups or a Novell® Netware® network. Other LAN hardware and software may also work if they allow a common appearance of disk storage on both machines. However, LAN products other than Windows for Workgroups and Novell Netware will not be supported by AT&T or MOSCOM.

Hardware Recommendations

For best performance, a Pentium or 486 PC with accelerated video and disk access is strongly recommended, along with enough hard disk space to store the applications, retrieved data, and any additional applications.

Auto Transfer and CAS for Windows programs are designed to be multi-tasking. However, for large installations, it may be appropriate to dedicate each PC to the Call Accounting services.

The most common hardware installation requires a network interface card installed on both machines, interconnecting the machines via either a twisted pair connection or a coaxial cable connection.

You can either buy a complete LAN package or use LAN connections already established for other PCs. The connection components must meet the interface requirements specified by the LAN cards and network chosen.

Example: Using the Intel Ether Express Card with Direct-Connect PCs

The Intel Ethernet Express card has been used for testing the products interconnected by twisted pair cable. Figure D-1 shows the pin configuration for the cabling between the Intel Ether Express cards.

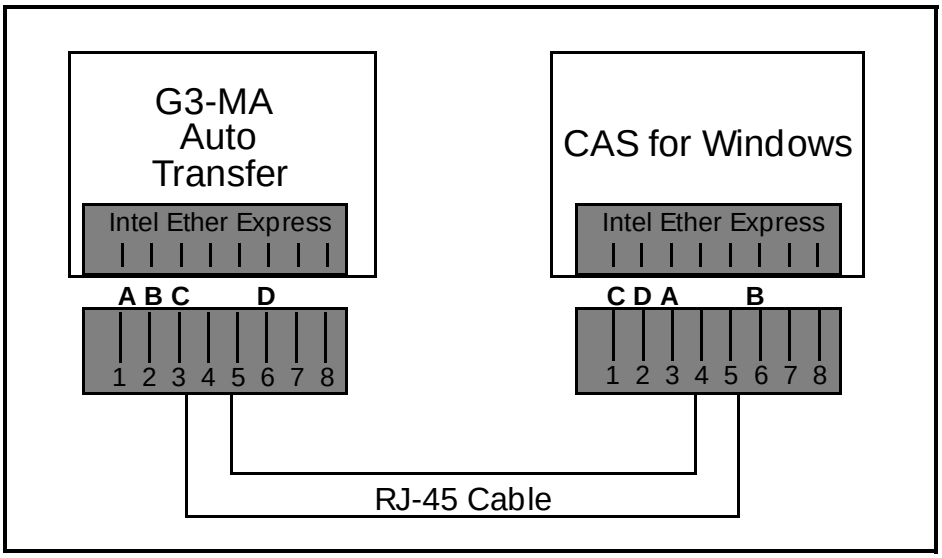

Figure D-1. Pin Configuration for Intel Ether Express Cards

Network Software

Although software installation can be done in any order, it may be easiest to test and evaluate if the network software is installed first.

You must install the appropriate network software for the network selected. Follow the manufacturer's instructions and verify that shared network access is working before proceeding to G3-MA Auto Transfer/CAS for Windows integration testing.

This appendix is not intended to describe how to set up a LAN. For help in setting up the LAN, refer to the LAN manufacturer's instructions and support.

The Shared Data-Transfer Directory

G3-MA Auto Transfer stores switch data in files on a predefined directory, which can be accessed by CAS for Windows. For this purpose, you must define a hard-drive directory that has read and write access for both PCs. The hard drive must have enough free space to store the Auto Transfer data-transfer files of all switches for which you will retrieve data.

The shared data-transfer directory can be defined on *one* of the following PCs:

- On the G3-MA PC

- On the CAS for Windows PC
- If the LAN connection uses a server, on the network server machine.

NOTE:
Auto Transfer and CAS for Windows must be installed on the client PCs, not on the server.

This section gives two examples of how to set up the shared data-transfer directory:

1. On the G3-MA PC in the Windows for Workgroups environment.
2. On the network server in the Novell Netware environment

Defining the shared directory on the CAS for Windows PC is similar to defining it on the G3-MA PC, so this case is not described separately.

NOTE:
You can use other methods to set up the shared data-transfer directory. The examples given here illustrate methods that have been used and tested.

Define the Data-Transfer Directory on the G3-MA PC in Windows for Workgroups

To use a directory on the G3-MA PC as the shared data-transfer directory

1. Windows for Workgroups on the G3-MA PC must allow sharing of the directory across the network
2. Windows for Workgroups on the CAS for Windows PC must use that directory on the G3-MA PC.

G3-MA Auto Transfer defines **c:\g3-ma\catdata** on the G3-MA PC as the default data-transfer directory for Call Accounting Transfer and **c:\g3-ma\dirdata** as the default data-transfer directory for Directory Transfer. The following example uses the **c:\g3-ma\catdata** directory to illustrate setting up the shared data-transfer directory. To share the Directory Transfer directory, you must complete the same procedure using **c:\g3-ma\dirdata**.

Share the c:\g3-ma\catdata Directory on the G3-MA PC

Follow these steps to share the **c:\g3-ma\catdata** directory (for Call Accounting Transfer).

NOTE:
To share the directory for Directory Transfer, substitute **c:\g3-ma\dirdata** in the following procedure.

1. Open File Manager on the G3-MA PC
2. Select the **C:** drive (or the drive G3-MA was installed on) and highlight the **catdata** directory name under g3ma

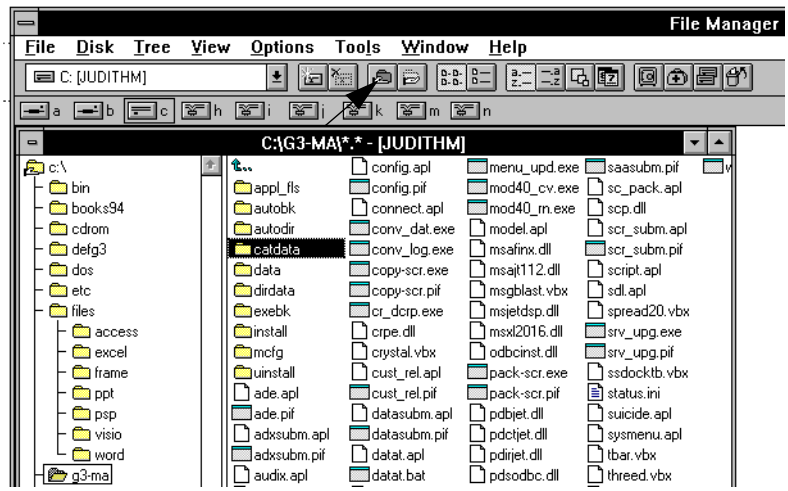

Figure D-2. Windows for Workgroups Share-As Icon

3. Select the share-as icon as shown in Figure D-2.

NOTE:
If your Windows for Workgroups File Manager does not show the share-as icon and you have enabled your network, you may need to enable file sharing on your machine. To do this, select the icon for the Network group in your Program Manager, and then select the Network Setup icon in that group. A Network Setup dialog box appears. Select the Sharing... button. Click on the "I want to be able to give others access to my files" check box and select OK. Now the share icons should appear when you open the File Manager.

4. When you press the share-as icon, the Share Directory dialog box appears as illustrated in Figure D-3.

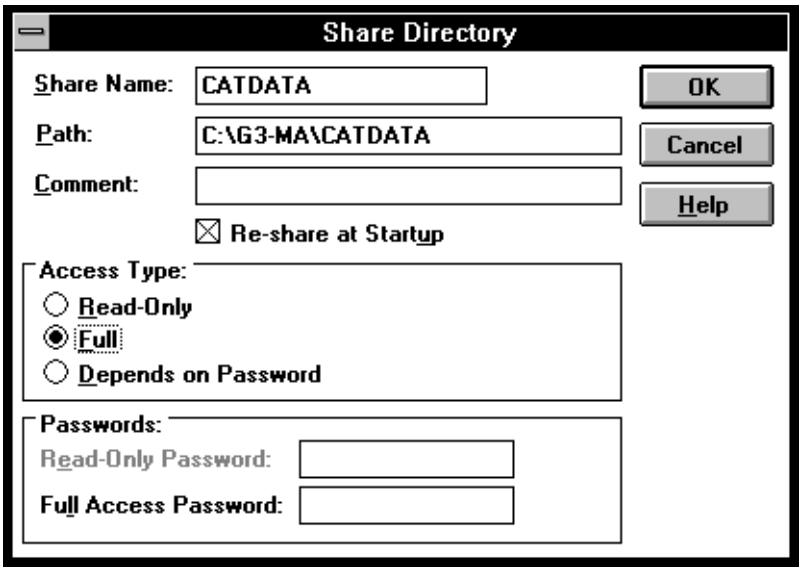

Figure D-3. Share Setup Screen

5. The Share Name and Path fields show the names you have highlighted in File Manager (**catdata**, and **c:\g3-ma\catdata**). Leave these as is.
6. Be sure that the **Re-share at Startup** option is selected so you will not have to repeat this sequence each time you start Windows.
7. In the Access Type area, select **Full** to provide read and write access permissions.
8. Leave the Passwords fields empty.
9. Press the OK button to save the settings for sharing the directory.

This completes the steps to set up sharing of the **catdata** directory on the G3-MA PC.

Now Windows for Workgroups on the CAS for Windows PC must connect to **catdata**.

Connect to the catdata Directory on the CAS for Windows PC*

To enable CAS for Windows to use the shared **catdata** directory, you will need to know the machine name of the G3-MA PC. If you do not know it, you can view a list of machine names administered on your network by pressing the Connect Network Drive icon (or select Connect Network Drive from the Disk menu) in Windows File Manager.

Enter Full Path in CAS for Windows

To connect the CAS for Windows PC to the **catdata** data-transfer directory on the G3-MA PC, you can enter the full path to that directory in CAS for Windows G3-MA Data Transfer dialog box, as illustrated in Figure D-4.

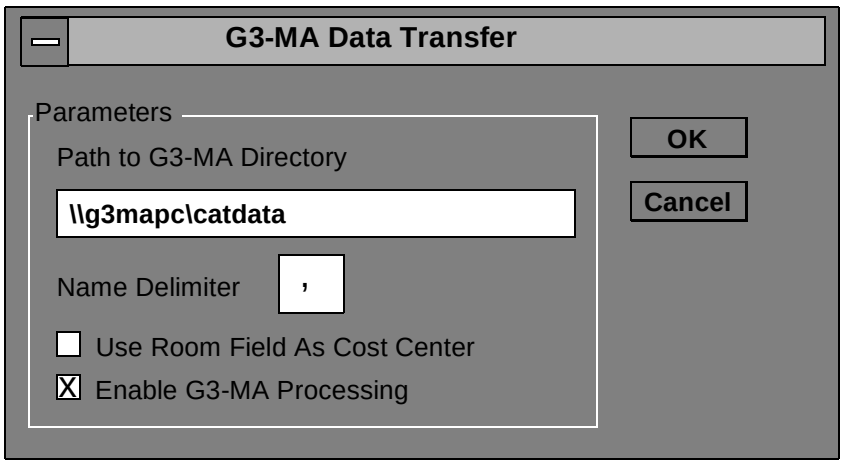

Figure D-4. G3-MA Data Transfer Dialog Box in CAS

To fill in the G3-MA Data Transfer dialog box in CAS for Windows

> **NOTE:**
> The following example uses the **catdata** directory, for Call Accounting Transfer, to illustrate the procedure. Substitute **dirdata** to complete the same process for Directory Transfer.

1. If the network name of your G3-MA PC is **g3mapc**, enter **\\g3mapc\catdata** in the Path to G3-MA Directory field.
2. Select the Enable G3-MA Processing option.

* Consult the CAS for Windows documentation for more information on CAS for Windows administration.

3. In the Name Delimiter box, enter the character that separates the last and first names as stored by the switch – this is typically a comma.
4. See the CAS for Windows documentation of a description of the Use Room Field As Cost Center option.
5. Press the OK button.

This completes the procedure to connect the CAS for Windows PC to the G3-MA data-transfer directory **catdata** using the full path name in CAS for Windows. CAS for Windows now has read and write permissions on that directory.

Define the Data-Transfer Directories on the Server for a Novell Netware Network

Instead of defining the data-transfer directories on the G3-MA PC, you could define them as network drives.

NOTE:
The following example uses the **catdata** directory, for Call Accounting Transfer, to illustrate the procedure. Substitute **dirdata** to complete the same process for Directory Transfer.

This example assumes you have a Novell Netware Hard disk called **server\public** with a directory called **usr\catdata**, which will be used as the data-transfer directory.

Follow these steps to declare a drive on the network server, **S:** for example, to be the shared drive on both machines:

1. On both PCs, use the Novell **map** command to map the netware directory to an unused disk letter. For example,
   map root s:=server\public:usr\catdata
2. Change the G3-MA Auto Transfer data-transfer directory from the default, **c:\g3-ma\catdata**, to **S:**.

   Do this in the Set Auto Transfer Directories dialog box, selected from the Options menu in the G3-MA Auto Transfer application. See Figure D-5.

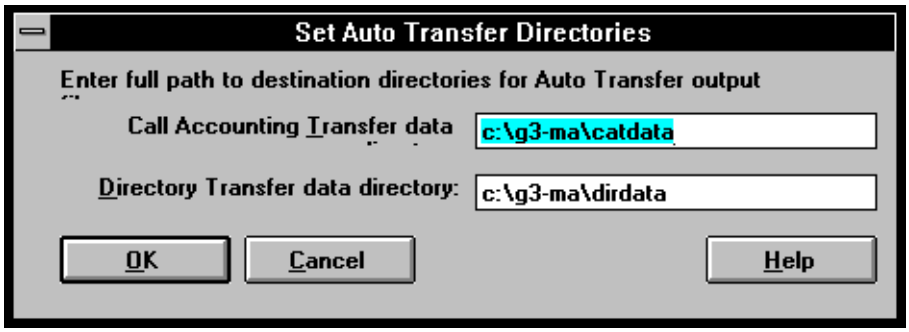

Figure D-5. G3-MA Set Auto Transfer Directories Dialog Box

3. Press OK to save the change and exit the dialog box.
4. In CAS for Windows, use the Novell map command to map the netware directory to an unused disk letter. For example:

   map root s:=server\public:usr\catdata

5. Then change the Auto Transfer directory assignment to **S:** in the Path to G3-MA Directory field in the G3-MA Data Transfer dialog box. Figure D-4 shows the dialog box before entering the **S:** in place of **c:\\g3mapc\catdata**.
6. Make sure that your network administrator has set the permissions to allow read and write from both PCs.

Application Software

This section briefly describes the installation procedures for the CAS for Windows and G3-MA Auto Transfer software.

CAS for Windows

Install CAS for Windows on its PC. Refer to the G3-MA data-transfer section in the CAS for Windows Installation and Administration manual.

Administer CAS for Windows for each of the Definity G3 switches for which you want to gather Call Accounting data. To integrate correctly with G3-MA, you must

- Administer the same Switch IDs as used in the Customer Release Application in G3-MA. To view the switch names in G3-MA, select the ID button on the G3-MA main menu.
- Enable G3-MA Auto Transfer interface for each of those Switch IDs using the configuration form in Auto Transfer.

Exception: If you are retrieving data for only one switch, CAS for Windows automatically assigns that switch with the name "default." For this single-switch case, you must set up G3-MA Auto Transfer to also retrieve data from only one switch ID. CAS for Windows will automatically assume that the retrieval data is for the "default" switch regardless of the switch ID name on G3-MA.

NOTE:
G3-MA should retrieve call accounting data only for switches that are administered in CAS for Windows. Any switch data retrieved that is not administered in CAS for Windows is declared bad by CAS for Windows and the data file is renamed with the suffix "bad." (Note that this does not restrict the number of switch IDs in G3-MA, only the IDs enabled in Auto Transfer).

G3-MA Auto Transfer

Install the G3-MA Service Layer and the following G3-MA applications:

- Basic Data Management
- Scripting — Issue 4.1 or later
- Auto Transfer

Set up each of the Definity G3 switches that you wish to integrate with CAS for Windows — use the Customer Release application with the appropriate Switch ID installation disks that you ordered through the AT&T Technical Support Center (TSC).

Be sure you have connected (through one of the G3-MA applications) to each of the Definity G3 switches at least once. Select yes (**y**) for the "Save Login and Password for Scripting" question when you log in for each of the Switch IDs. This enables you to retrieve data in Auto Transfer.

Now start G3-MA and select the Auto Transfer button. Select the Configuration form, then select **Activate Call Accounting Transfer?** or **Activate Directory Transfer?** or both as appropriate for each switch ID for which you want to retrieve data. You can use the Configuration form to manually retrieve data to test each Switch ID. You may then wish to select (on the configuration form) one of the automatic retrieval modes for each Switch ID so that future data retrieval and integration is automatic. Consult the Online Guide from the G3-MA Auto Transfer application for specific instructions.

Installation of KickStart 3 RMB

E

Installing the RMB in Your UNIX PC

1. Ensure that the BIOS Extended EPROM (BEE) enable switch on the side of the Remote Maintenance Board (RMB) (see Figure E-1) is off.

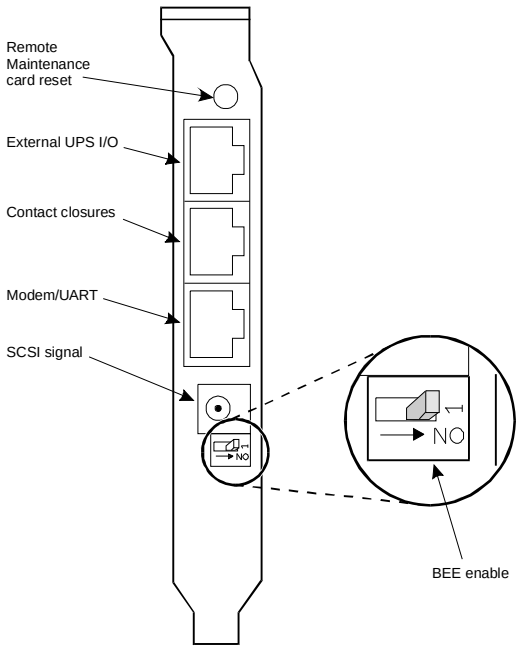

Figure E-1. RMB Faceplate and BEE Enable Switch

2. Install the RMB (see Figure E-2) by plugging it into an available slot inside the PC.

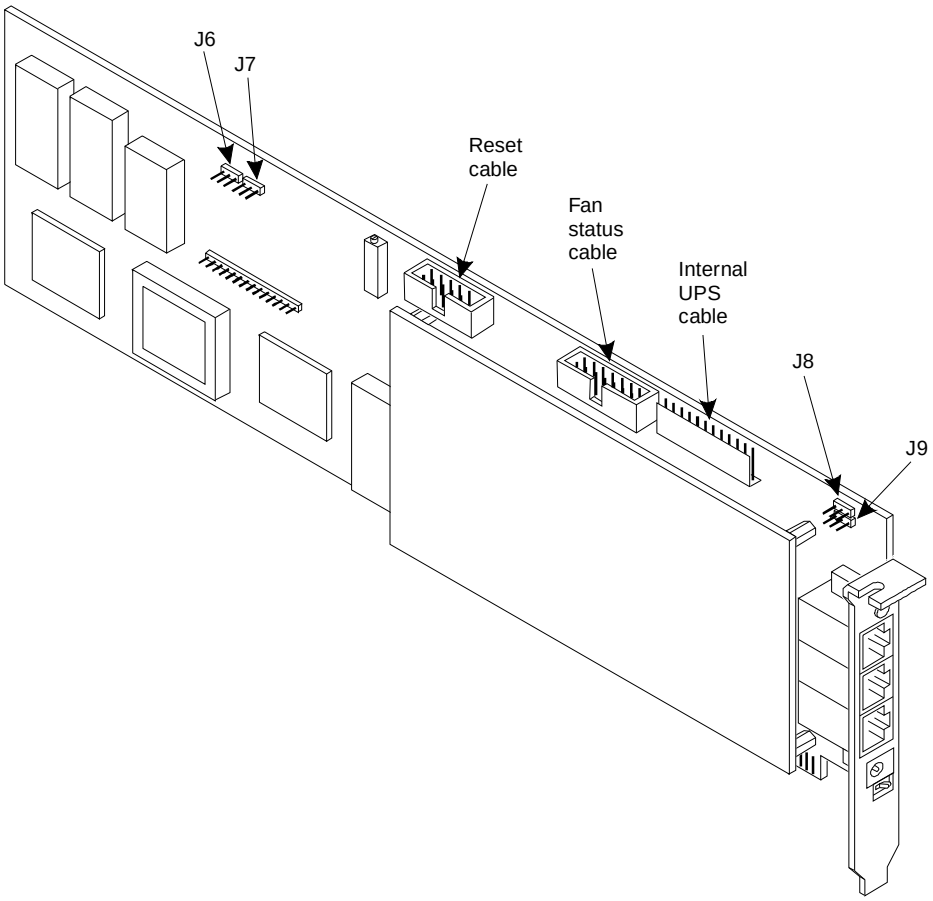

Figure E-2. RMB Layout

3. Connect the incoming phone wire to the RMB's modem jack (see Figure E-1).
4. Boot the PC with the *KickStart 3 Configuration Utility* disk in the A: drive.
5. Ensure that the ''com port'' setting in the setup screen is disabled.
6. At the A: drive root prompt, type:

   ks3cfg Enter

7. The PC requests the LEVEL 2 password. Type in the following default password, using all capital letters:

   PASSWORD2 Enter

8. The PC displays the KickStart 3 configuration options:

   ```
   A. Connections
   B. Modem
   C. Sanity
   D. Event/Actions
   E. Misc
   X. Exit Program and Save Changes
   ```

9. Type **b** to set the MODEM options. Set the modem to an available com port, then set the two emergency contact phone numbers.

10. Type **c** to set the SANITY options. Set Sanity Checking to ON.

    NOTE:
    Sanity checking monitors the PC and alerts the emergency contacts in the event of a problem.

11. Type **d** to set the EVENT/ACTIONS options.

12. In the EVENT/ACTIONS menu, type **g** to enter the ''Required sanity indicator not sent'' menu.

    a. Set the alarm level to **1**.

    b. Set the number of occurances to **1**.

    c. Set the action to **89**, which causes the PC to go into the independent state in the event of a crash.

13. Type **e** to set the MISC options.

    a. Ensure that the time and date are correct.

    b. Set the BEE address. This reserves a memory location for the diagnostic modules.

    c. Set the minimum and maximum acceptable temperatures.

    d. Specify the company or group name.

    e. Specify the product name or product-ID number.

    f. Specify the panic message (i.e., what you want displayed on the screen during an emergency).

    g. Specify the operating system.

    h. Set the outcall message style to **1**.

    i. Specify the maximum number of outcall retries (default = **2**).

    j. Reset Password 1 and Password 2 from the default settings.

14. Type **x** to return to the main menu.

Rebooting the PC

1. Set the BEE switch back ON. Remove the *KickStart 3 Configuration Utility* disk from the A: drive.
2. Reboot the PC by turning the power off, then on again.

Installing the RMB Software Package

1. Insert the *Remote Maintenance Board Package (UNIX)* disk into the A: drive.
2. At the # prompt, type:

   pkgadd -ddiskette1 Enter
3. The PC starts the installation and asks, "Enter the serial communication port used by RMB [1 or 2]?" Type **1** or **2** for com1 or com2.
4. The PC asks you if the software is to be installed from cartridge tape or floppy diskette. Type **f** for floppy and press Enter.
5. The PC asks, "Do you want to start the RMB daemon automatically (y/n)?" Type **y**. This enables the PC to check sanity timing.
6. Follow the instructions on the screen to continue. The installation takes 5 to 10 minutes to complete.
7. After the installation is complete, remove the *Remote Maintenance Board Package (UNIX)* disk from the disk drive.
8. Log in to perform normal operations.

Abbreviations

A

ABP
Advantage Business Package

ACU
automatic calling unit

ADAP
Administration and Data Acquisition Package

ADU
asynchronous data unit

Alt
Alternate (button)

AUDIX
Audio Information Exchange

B

BCS
business communications system

bps
bits per second

C

CAFE
Coresident Applications Front End

COM
communications port

CPE
customer-premises equipment

Ctrl
Control (button)

D

DCP
digital communications protocol

DOS
disk operating system

DPI
dots per inch

DS1
Digital Service 1

DSIC
Dedicated Switch Installation Crew

DTDM
digital terminal data module

DTE
data terminal equipment

DTR
data transmission ready

E

EISA
Extended Industry Standard Architecture

EPN
expansion port network

Esc
Escape (button)

F

FACE
Framed Access Command Environment

FAX
facsimile machine

G

G3-MA
Generic 3 Management Applications

G3-MT
Generic 3 Management Terminal

GIS
Global Information Solutions

H

HP
Hewlett Packard

Hz
Hertz (cycles per second)

I

ID
identification

I/O
input/output

IMS
information management system

IPC
intelligent ports card

IRQ
interrupt request

ITAC
International Technical Assistance Center

K

kbps
kilobits (2^{10} or 1024 bits) per second

kbyte
kilobyte (2^{10} or 1024 bytes)

Kit
KeepInTouch

L

LCD
liquid crystal display

M

Mbyte
megabyte (2^{20} or 1,048,576 bytes)

MHz
megaHertz (10^6 or 1,000,000 cycles per second)

MS
Microsoft

MS-DOS
Microsoft Disk Operating System

P

PBP
Premier Business Package

PC
personal computer

PCMCIA
Personal Computer Memory Card International Association

PDM
processor data module

PIF
program information file

PPN
processor port network

R

RAM
random access memory

RMATS
Remote Maintenance, Administration, and Traffic System

RS
recommended standard

S

SCSI
small computer systems interface

T

TSC
Technical Service Center

TTY
Teletype (UNIX system communications port)

W

WGS
work group station

Glossary

A

A-law companding
A logarithmic companding algorithm commonly used outside North America and Japan. Compared to Mu-law companding, A-law companding uses fewer of the 255 available quantizing levels to minimize quantizing noise at lower volumes, providing lower apparent fidelity at lower volumes and higher apparent fidelity at higher volumes. See also **companding**.

asynchronous data unit (ADU)
A type of data communications equipment (DCE) that allows a direct connection between RS-232C equipment and a digital switch.

Audio Information Exchange (AUDIX)
A fully integrated message-handling or ''voice-mail'' system that can be used with a variety of communications systems. AUDIX allows users, or ''subscribers,'' to send and receive voice messages using recorded prompts and announcements as a guide.

B

Baud
In telecommunications applications, a unit of transmission speed equal to the number of signal events per second. See also **bits per second** or **transmission rate**.

bit (binary digit)
One unit of information in binary notation having two possible states or values, ''0'' or ''1.''

bits per second (bps)
The number of binary units of information that are transmitted per second. See also **Baud** or **transmission rate**.

business communications terminal (BCT)
An integrated digital data terminal used for business applications. A BCT can function via a digital terminal data module (DTDM) or a processor data module (PDM) as a terminal for data entry and retrieval.

byte
A sequence of (usually eight) bits processed together.

C

cable
The physical connection between two pieces of equipment (for example, cable from a data terminal to a modem).

carrier
An enclosed shelf in a switch containing vertical slots that hold circuit packs.

circuit
(1) An arrangement of electrical elements through which electrical current flows, providing one or more specific functions. (2) A transmission path between two or more points.

circuit pack
A card on which electrical circuits are printed and on which integrated circuit (IC) chips and electrical components are installed. A circuit pack is installed in a carrier.

companding
A method of improving the apparent fidelity of a digitally encoded voice transmission with a limited set of discrete quantizing levels.

In digital telephony, voice signals are converted into digital bit streams by:

- Sampling the amplitude (current sound volume) of an analog signal 8000 times per second
- Digitally encoding each sample into the 8-bit content of a time slot

This conversion algorithm provides 255 discrete numerical quantities (that is ''quantizing levels'') and a signal polarity indicator. Since human listeners discriminate between and obtain more infomation from low-volume sounds, ''companding'' algorithms use more of the available quantizing levels (than a linear algorithm would) to more accurately encode low-volume sounds (that is, minimize quantizing noise at lower volumes), while allowing the higher volumes to have additional quantizing noise. See also **A-law companding**.

connectivity
The connection of disparate devices within a single system.

control carrier
A switch carrier that contains the switch processing element (SPE) circuit packs.

D

data terminal equipment
Equipment consisting of the endpoints in a connection over a data circuit. For example, in a connection between a data terminal and a host, the terminal, the host, and their associated modems or data modules comprise the DTE.

DTE usually consists of the following functional units: control logic, buffer store, and one or more input/output devices or computers. DTE can also contain error-control and synchronization capabilities.

Digital Communications Protocol (DCP)
An AT&T proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link contains two 64-kbps information (''I'') channels and one 8-kbps signaling (''S'') channel.

digital terminal data module (DTDM)
An integrated or adjunct data module that shares with a digital telephone the same physical port for connecting to a communications system. The function of a DTDM is similar to that of a processor data module (PDM) in that it converts RS-232 signals to DCP signals.

disk drive
A mechanical device that stores data on and retrieves data from one or more disks.

E

Electronics Industries Association
A trade association of the electronics industry that establishes electrical and functional standards.

expansion port network (EPN)
A port network (PN) of a switch that is connected to the time-division-multiplexed (TDM) bus and the packet bus of the processor port network (PPN). See also **port network** and **processor port network**.

F

facilities
A general term used for a telecommunications transmission pathways and their associated equipment

H

Hertz (Hz)
A unit of frequency equal to one cycle per second.

hunt group
A group of extensions that are assigned so that a call to a busy extension will reroute to an idle extension in the group.

L

line
A transmission path between a communications system and either a voice or data terminal.

M

maintenance
The activities involved in keeping a system in proper working condition: the detection and isolation of either software or hardware faults and either automatic or manual recovery from these faults.

memory
A device into which information can be copied and held and from which information can be obtained at a later time.

modem
A device that converts digital data signals to analog signals for transmission over telephone circuits. The analog signals are converted back to the original digital signals by another modem at the other end of the circuit.

N

null modem
A modem substitute serving as an interface between a data endpoint that normally connects to a modem and a ***nearby*** computer that also expects to communicate with the endpoint through its own modem; an imitation modem in both directions of data communication.

P

personal computer (PC)
A personally controllable microcomputer.

pooled modems
Shared ''conversion resources'' (modems and data modules) that provide cost-effective access to analog facilities by data terminals. When necessary, Modem Pooling inserts a conversion resource into the path of a data call. Modem Pooling serves both outgoing and incoming calls.

port
A data- or voice-transmission access point on a device that is used for communicating with other devices.

port network (PN)
An architectural component of a switch containing a time-division-multiplexed (TDM) bus and packet bus to which the following components are connected: port, tone-clock, maintenance, service, and (optionally) expansion interface circuit packs. Every PN in a switch is controlled by the switch processing element in the processor port network (PPN).

private network
A network used exclusively for the telecommunications needs of a particular customer.

processor data module (PDM)
A device that provides protocol conversion between RS-232 and digital communications protocol (DCP). On one side, a PDM provides an RS-232 data communications equipment (DCE) interface for connecting to data terminals or host computers. On the other side, a PDM provides a DCP interface for connecting to a switch.

processor port network (PPN)
The port network (PN) controlled by a switch processing element (SPE) that is directly connected to that PN's time-division-multiplexed (TDM) bus and packet bus. See also **port network** and **expansion port network**.

public network
The network that can be openly accessed by all customers for local or long-distance calling.

R

random access memory
A storage arrangement whereby information can be retrieved at a speed independent of the location of the stored information.

RS-232C
A physical interface standard specified by the EIA. The RS-232C standard provides for asynchronous data transmissions at speeds of up to 19.2 kbps over cable distances of up to 50 feet.

S

small computer system interface (SCSI)
An American National Standards Institute (ANSI) standard that provides a high-level command interface between host computers and peripheral devices.

software
A set of computer programs that do one or more tasks.

switch
A software-controlled processor complex that interprets dial pulses, tones, and/or keyboard characters and makes the proper interconnections for calls to destinations both inside and outside the system.

A switch provides voice/data communications services, including access to public and private networks, for telephones and data terminals on a customer's premises. The switch itself consists of: a digital computer, software, storage device, and carriers with special hardware to make the actual connections.

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