

**GRID SERVER  
ADMINISTRATOR'S GUIDE**

and

**SYSTEM REFERENCE MANUAL**

May 1987

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## ABOUT THIS BOOK

This combination Administrator's Guide and System Reference Manual tells you how to configure, administer, and troubleshoot the GRiD Server system. This manual is primarily a software manual, though a significant amount of detail is presented on GRiD Server hardware components (the Main Unit, Expansion Unit, Disk Units, GRiDLink local access network, PhoneLink remote access network, and all GRiD Server peripherals) in an early chapter of the manual. This manual, which covers Version 12.2 of the GRiD Server operating software, provides information on topics such as:

- o Configuring GRiD Server for the first time
- o Modifying the configuration files to add new peripherals
- o Adding new users and reporting information on existing users
- o Controlling the spooled printers
- o Updating GRiD Server's operating software
- o Using the diagnostic port to make a backup of users' files
- o Troubleshooting GRiD Server if problems occur

### How To Use This Manual

This manual is aimed at the GRiD Server System Administrator, the person responsible for managing the hardware and software comprising the GRiD Server system. This manual assumes you have already read the GRiD Server User's Guide, and already know how to use GRiD software (the GRiD Management Tools, particularly GRiDManager,

GRiDWrite, GRiDFile, and GRiDTerm).

This manual contains information intended for several audiences. In general, the first half of the manual is intended for use by all GRiD Server System Administrators, while the second half of the manual is intended for use by more technical GRiD Server System Administrators and other GRiD Server technical support personnel.

The first two chapters provide introductory and overview information about the GRiD Server. Chapter 1 contains a very broad overview of the GRiD Server system; Chapter 2 contains a detailed description of all the hardware components making up the system. Appendixes H complements these two chapters by providing capsule descriptions of each GRiD Server hardware component.

Chapter 3 is intended for the System Administrator who is setting up a GRiD Server for the first time. The chapter contains step-by-step procedures for modifying all the configuration files and other tasks necessary to customize a GRiD Server system for a particular environment. The chapter refers to information contained in Chapters 4, 5, and 7.

Chapter 4 contains detailed reference information on all the GRiD Server configuration files. The information on each configuration file is presented in two sections: "Concepts," and "Modification." For each file, the first section thoroughly describes the contents of the file, the permissible modifications, the execution of the file, and in some cases, additional internal technical details. The second section provides step-by-step procedures for modifying each file.

Chapter 5 covers three main topics: (a) how to design a GRiD Server accounting structure (user organization) to suit your particular environment, (b) how to use the AdministratorSentry program to create and control the accounting structure once you've designed it, and (c) how to administer GRiD Server disk space. Errors that can be produced by the AdministratorSentry program are documented in Appendix B.

Chapter 6 describes the GRiD Server print spooling system, including concepts, detailed information on operating a spooled printer, and how to use the GRiDSpool Manager program to control the spooled printers. Errors that can be produced by the GRiDSpool Manager program are documented in Appendix B.

Chapter 7 provides information on administering GRiD Server software. The chapter covers four categories of software: GRiD Server operating software, GRiD application software, GRiD Server MS-DOS software, and user data. Loading, backing up, updating, and maintaining the software in each of these categories is discussed in detail.

Beginning with Chapter 8, the manual begins to get more technical in

content. Chapter 8 describes how to connect to the diagnostic port, how to access the diagnostic port, and how to use the built-in diagnostic processor and file processor commands. The chapter also includes an overview in tabular form of all the GRiD Server operating software (Server Subjects).

Chapter 9 documents each of the 26 utilities that can be run on the file processor via the diagnostic port. The utilities are described in two groups: Administrative utilities, those programs likely to be used by the System Administrator during routine system administration, and General utilities, those programs more often used for special purposes such as troubleshooting. Within each group, the utilities are described in alphabetical order. Appendix C includes information on errors that can occur while running the utilities; Appendix E provides an alphabetically-ordered summary of the syntax for all of the utilities.

Chapter 10 provides troubleshooting procedures for the GRiD Server system. The information in this chapter is presented in two sections: observing system startup, and step-by-step system troubleshooting procedures. Appendix D describes how to interpret the system error log text file, one of the primary troubleshooting tools used to resolve GRiD Server system problems. Appendix F describes the CableTest program, another troubleshooting tool often used in resolving GRiDLink problems. Appendix G lists and summarizes all the diagnostic processor and file processor commands that are useful when troubleshooting a GRiD Server remotely. Appendix A supplies one-line descriptions of all the errors that can occur anywhere on the GRiD Server system.

#### Other Books You May Need

You may need to refer to the following books as you use this manual:

- o For introductory tutorial information on the GRiD computer, read Getting Started with the Compass Computer (Order No. 001101-45).
- o For detailed reference information on GRiD software, refer to the GRiD Management Tools Reference Manual (Order No. 029100-43).
- o For information on how to use GRiD Server, refer to the GRiD Server User's Guide (Order No. 001701-44).
- o For information on installing the GRiD Server hardware, refer to the GRiD Server Installation Guide (Order No. 001700-40).
- o For information on installing the GRiD Server-PCLink Hardware, refer to the GRiD Server PCLink Installation Guide (Order No. 006702-43).
- o For information on using and programming GRiDTerm softkeys, refer to the GRiDTerm User's Guide (Order No. 021141-43).

- o For information on MS-DOS utilities, refer to the GRiD MS-DOS Reference Manual (Order No. 021040-45).
- o For information on updating software from GRiD Central, refer to the Software Update Guide (Order No. 029100-46).
- o For information on hardware testing and repair, refer to the GRiD Server Hardware Service Manual (Order No. 001700-41). NOTE: This manual is only available by attending the GRiD Server Hardware Service Course given by GRiD Systems.

## CHAPTER 1: GRID SERVER OVERVIEW

This chapter presents an overview of the GRiD Server system, its hardware and software.

### SYSTEM OVERVIEW

The GRiD Server system is a multiple-processor computer system that extends the capabilities of personal computers connected to it by letting them share information, disk storage, and multiple printers. With GRiD Server, up to 58 computer users can:

- o Exchange information, files and programs.
- o Create individual, password-protected files whose titles can be seen only by the creator.
- o Share GRiD Management Tools, worksheets, databases, and other files.
- o Print correspondence and reports on GRiD Server printers.
- o Do all of the above both in the office (via high-speed cable) or while traveling (via dial-up telephone lines), using computers running either GRiD-OS, PC-DOS, or MS-DOS.

Using GRiD Server is easy for anyone familiar with GRiD software, because GRiD Server responds to the same set of commands common to all GRiD software. GRiD Server devices (for example, a spooled printer) appear to be locally connected to your computer, even though they are accessed remotely.

NOTE: The TEMPEST GRiD Server hardware and software are described in detail in the Addendum to GRiD Server Administrator's Guide for TEMPEST GRiD Server Version 12.2 Software.

## ACCESSING GRiD SERVER

Computer users can access GRiD Server directly or remotely. Direct connection to GRiD Server is via hard-wired, high-speed, shielded cables (called "GRiDLinks") that extend from the GRiD Server main unit, or expansion unit, to various office locations. Each cable has a maximum length of 1200 feet and can support up to eight computers for a maximum of 48 GRiDLink-connected computers.

Remote user access to GRiD Server is via dial-up telephone lines (called "PhoneLinks"), using 1200 or 2400 bps modems connected to both your computer and GRiD Server. A GRiD Server main unit can handle up to four PhoneLink lines; the expansion unit can handle up to an additional 12 PhoneLink lines for a maximum of 16 PhoneLink lines (when no GRiDLink lines are configured).

GRiD Server can also be accessed locally or remotely through the diagnostic port. This password-protected facility lets the System Administrator or the GRiD Resource Center run system utilities, examine error logs, and troubleshoot the system.

## GRiD SERVER HARDWARE

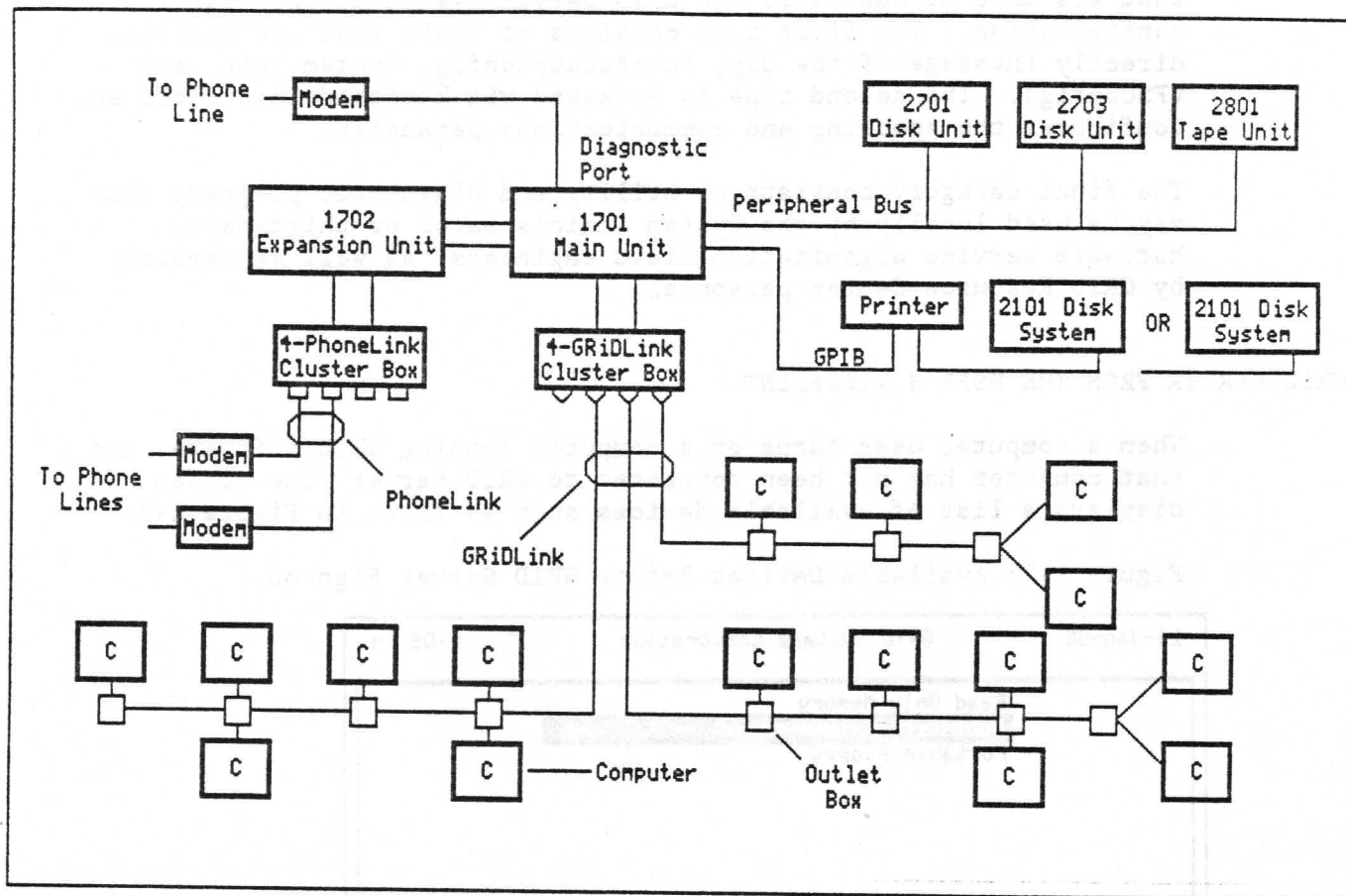
GRiD Server hardware is based on a general-purpose architecture that lets multiple single-board computers communicate through common (shared) memory. GRiD Server consists of one or two system units (the 1701 main unit and the 1702 expansion unit) and from one to eight 2701 (10MB) and/or 2703 (40MB) Disk Units.

The main unit contains three single board computers, each of which serves a particular function (diagnostic processor/common memory, file processor and communication processor), with room for a fourth (optional) application processor. The main unit also provides a GPIB (General Purpose Interface Bus, or IEEE-488) connection for printers, hard disks and floppy disk drives.

The expansion unit can contain up to three additional communication processors, again with room for a fourth (optional) application processor.

GRiD Server disk units contain either a 10-megabyte (2701) or 40-Megabyte (2703) winchester disk drive; up to eight disk units share a single high-speed connection to the main unit (called the "peripheral bus"). Figure 1-1 illustrates a typical GRiD Server configuration.

Figure 1-1: Typical GRiD Server Configuration



### GRiD SERVER SOFTWARE

GRiD Server software falls into five categories: system, administrative, user, configuration, and utility software.

The first of these categories consists of the operating systems for the individual processors, the system "managers" (e.g., the file system manager, and the admin manager), and various related utilities.

The second category of software consists of a program used by the System Administrator to add or delete users, list information about users, and change sign-on passwords.

The third category consists of programs that let both GRiD-OS users and MS-DOS/PC-DOS users access GRiD Server via GRiDLink or PhoneLink, as well as change their password and query their user information.



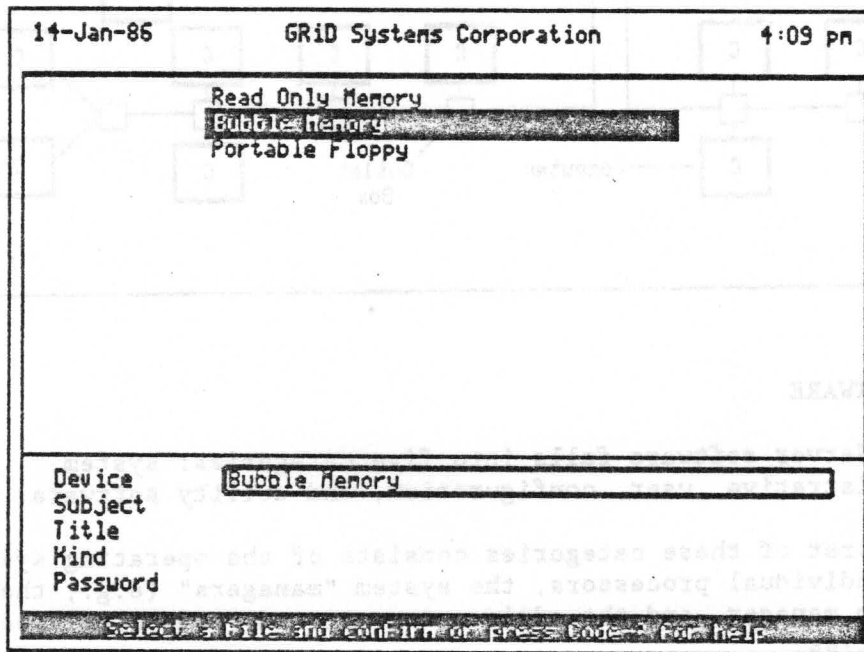
The fourth category consists of two types of configuration files that are used to customize the GRiD Server system to your particular configuration. The first type consists of files that are modified directly (Message of the Day, AutoBackupConfig, System.Init, and VFSCConfig). The second type is accessed via RemoteAdministrator and configures the spooling and communications parameters.

The final category consists of utility and diagnostic programs that may be used locally by the System Administrator or third-party hardware service organization field engineers, as well as remotely by GRiD Resource Center personnel.

#### GRiD SERVER FROM THE USER'S VIEWPOINT

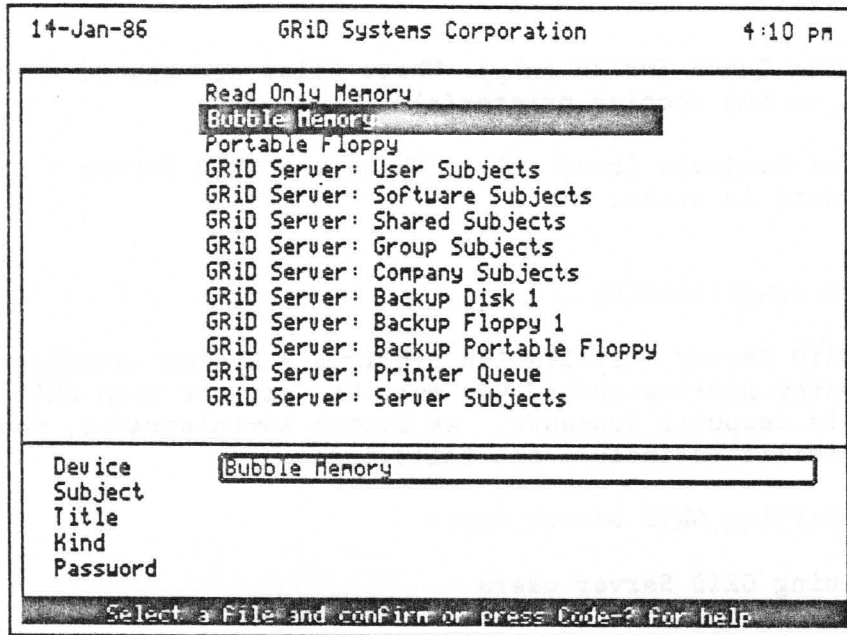
When a computer user turns on a computer running GRiD software, and that computer has not been connected to GRiD Server, the screen displays a list of available devices such as those in Figure 1-2.

Figure 1-2: Available Devices Before GRiD Server Sign-on



After a user has signed on to GRiD Server, the screen listing includes devices available locally as well as those available through GRiD Server. All of these appear local to the user's computer (see Figure 1-3).

Figure 1-3: Available Devices After GRiD Server Sign-on.



GRiD Server devices are identified by the system name ("GRiD Server:" in Figure 1-3) that precedes each one. Devices can be tailored to meet particular customer needs. Listed below is a brief description of each device in Figure 1-3; note that the read-write access given is the default from the user's point of view and can be modified by the System Administrator.

- o User Subjects (read/write): The user's private storage area.
- o Shared Subjects (read/write): A "bulletin board" area to which all GRiD Server users have access.
- o Software Subjects (read only): Where GRiD software is stored.
- o Group Subjects (read only): A file library for a subset of GRiD Server users.
- o Company Subjects (read only): A file library for a larger subset of GRiD Server users.
- o Backup Disk 1 (read only): A 2101 Hard Disk System connected to the GRiD Server's GPIB.
- o Backup Floppy 1 (read only): The floppy disk in the 2101 Hard Disk System; accessible by all users.

- o Backup Portable Floppy (read/write): A 2102 Portable Diskette Drive connected to the GRiD Server's GPIB, which is accessible by all users.
- o Printer Queue (write only): Where files are placed when they are sent to the spooled printer(s).
- o Server Subjects (read only): Where the GRiD Server's operating software is stored.

## GRiD SERVER SYSTEM ADMINISTRATOR

Every GRiD Server installation requires a System Administrator. To be a System Administrator, you must be familiar with GRiD Software and basic computer concepts. As System Administrator, your responsibilities include the following:

- o Identifying GRiD Server users
- o Training GRiD Server users
- o Helping GRiD Server users with problems
- o Setting up and maintaining the accounting (user) structure
- o Setting up and controlling access to devices (e.g., libraries)
- o Administering the spooled printers
- o Performing system-wide backups of user data
- o Running utilities, as required (e.g., setting the system clock)
- o Administering the hardware configuration and related files
- o Updating GRiD Server operating software
- o Updating GRiD application software stored on GRiD Server
- o Working with the GRiD Resource Center in case of problems

## CHAPTER 2: GRID SERVER COMPONENTS

This chapter describes all the GRiD Server hardware components. Much detail is given to help the System Administrator effectively manage the system and work with the GRiD Resource Center in case of problems. NOTE: The TEMPEST GRiD Server hardware and software are described in detail in the Addendum to GRiD Server Administrator's Guide for TEMPEST GRiD Server Version 12.2 Software.

### 1701 MAIN UNIT

The main unit of the GRiD Server system consists of a four-slot chassis containing four cards: a diagnostic processor, a file processor, a communication processor, and (optionally) an application processor.

The diagnostic processor, which lets all the independent processors in the GRiD Server communicate with each other, contains 256KB of RAM, an 8031 diagnostic processor and a time-of-day clock.

The file processor, which manages and controls access to GRiD Server's storage devices and printers, contains 512KB of RAM, an 80186 microprocessor (an advanced version of the 8086), and both high-speed peripheral bus and GPIB interfaces.

The communication processor, which manages the communication between GRiD Server and the computers connected to it, contains 512KB of RAM, an 80186 microprocessor, and four configurable communication ports. The four ports can support either four GRiDLink lines, four PhoneLinks, or two of each.

The optional application processor, which provides computing resources for GRiD Server-based applications (i.e., GRiDMail), contains 512KB of RAM, an 8086 microprocessor, and an 8087 co-processor.

Figures 2-1 and 2-2 illustrate the front and rear panels of the main unit, respectively.

Figure 2-1: 1701 Main Unit Front Panel

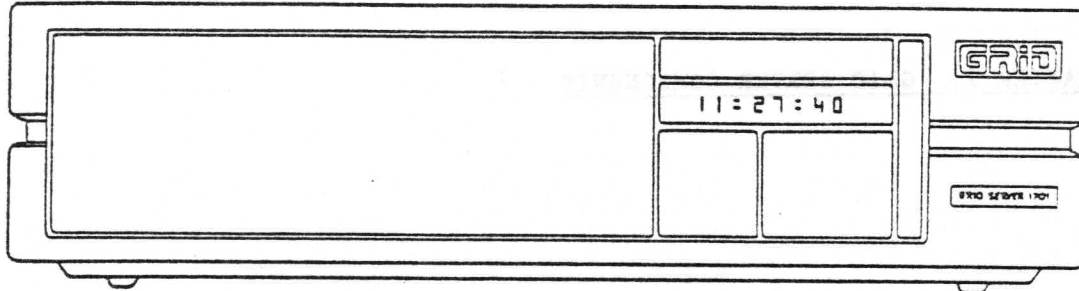
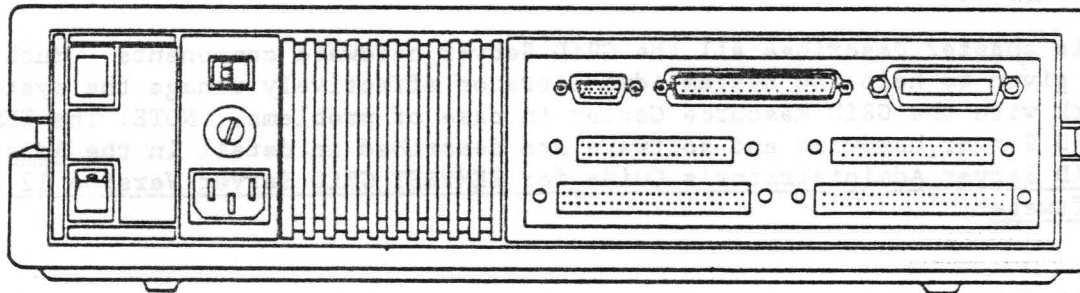


Figure 2-2: 1701 Main Unit Rear Panel



### Front-Panel Display

The 12-character LED (light emitting diode) display on the main unit front panel (see Figure 2-1) presents various information, depending on the situation. Information displayed can be either status ("SYSTEM RESET" when the system has been restarted, then "INITIALIZING" while the system is starting up), errors ("ATTENTION" when an error has occurred that requires the immediate attention of the System Administrator), or the time in the format HH:MM:SS. The latter normally appears in the display.

### Reset Button

The main unit rear panel includes a reset button that clears the "ATTENTION" message from the front-panel LED display and resets the system. If the "ATTENTION" message appears in the front-panel display, pressing the button once clears the message and returns the display to the current time without otherwise affecting the

operation of the system. If the front-panel display shows the time, pressing the button once restarts the system. Pressing the reset button to restart the system is equivalent to turning the main unit off and then on again.

NOTE: Although each system unit has a reset button, it is only active in the main unit.

## Rear-Panel Connectors

The main unit rear panel contains five kinds of connectors, as described below (see Figure 2-2 for the connector locations).

### GPIB Connector

GRiD Server peripherals (2101 Hard Disk Systems, 2102 Portable Diskette Drives, and 31xx dot-matrix printers) connect through the GPIB (General Purpose Interface Bus) connector. This port can support up to 15 daisy-chained devices on a maximum of 65 feet (20 meters) of cable.

The connector conforms to the industry-standard IEEE-488. GPIB cables are designed so that you place one cable connector on top of another cable connector, securing one to the other with setscrews. Figure 2-3 shows a GPIB cable connection; Figure 2-20 shows a GPIB cable. GPIB cables are available from GRiD in 3-, 6-, and 13-foot (1-, 2-, and 4-meter) lengths. These cables have an "open end" and a "closed end". The open end can connect both to a device and to another cable; the closed end can only connect to a device. This asymmetry means that only one end of the cable can be used to daisy-chain to another device.

Figure 2-3: Two Connected GPIB Cables

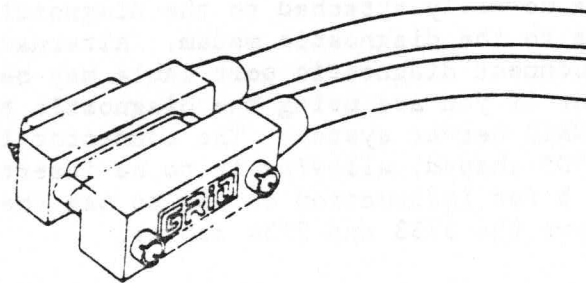
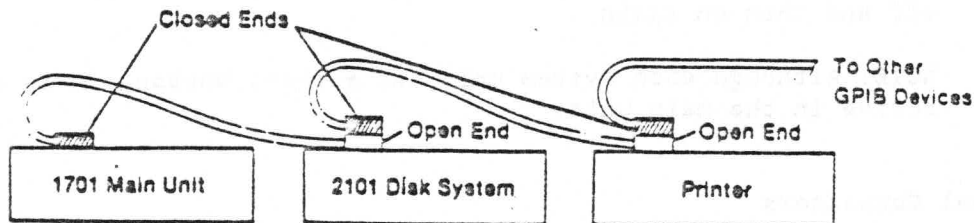


Figure 2-4 shows daisy-chained GPIB devices.

Figure 2-4: Daisy-Chained GPIB Devices



#### Peripheral Bus Connector

The cable that connects the first daisy-chained 2701 or 2703 disk unit to the main unit attaches to the peripheral bus connector. The connector has 37 pins and is "D"-shaped to prevent inserting the plug upside down. Note that GPIB peripherals cannot be attached to this port. Figure 2-20 shows a peripheral bus cable.

#### Processor Bus Connectors

Both processor bus connectors join the main unit to the expansion unit. Their length and design requires that you position the main unit directly on top of the expansion unit. The connectors have 50 pins and are self-locking; each connector has a metal tab on each side that allows the matching plug to be inserted only one way. Figure 2-20 shows a processor bus cable.

#### Diagnostic Port Connector

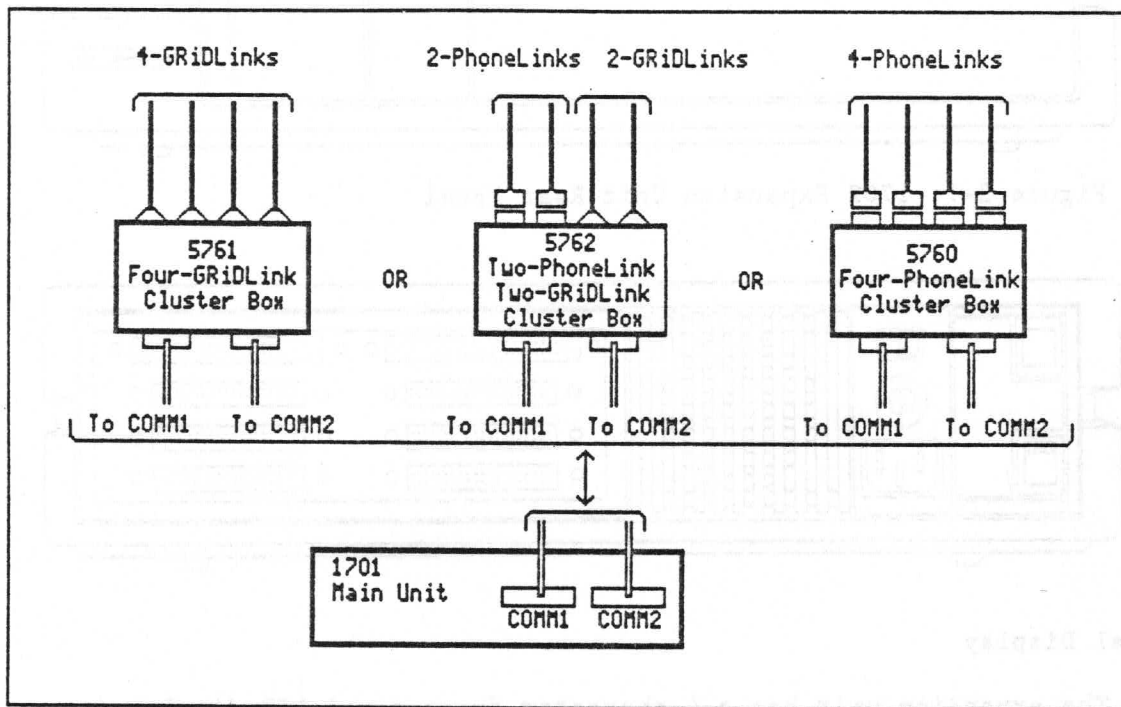
The diagnostic port allows a diagnostic terminal to access the GRiD Server either locally or via telephone. The 5733 diagnostic modem cable is normally attached to the diagnostic port connector and attaches to the diagnostic modem. Alternatively, a 5734 direct-connect diagnostic port cable may be attached to the connector if you are using the diagnostic terminal in the same room as the GRiD Server system. The connector is a 19-pin 2DE19S socket and is "D"-shaped, allowing it to be inserted only one way. See Chapter 8 for information on how to use the diagnostic port. Figure 2-20 shows the 5733 and 5734 cables.

#### Communication Port Connectors

The two communication port connectors accept the cables from the three kinds of cluster boxes (GRiDLink and/or PhoneLink "junction boxes") that can be connected to the main unit. Refer to Figure 2-20 for an illustration of the cluster box cable. Each connector handles the signals for a pair of communication processor ports (i.e., two GRiDLink lines or two PhoneLink modems). The connectors

(labeled COMM 1 & COMM 2) have 40 pins and are self-locking; each connector has a metal tab on each side that allows the matching plug to be inserted only one way. Figure 2-5 shows the connections between the main unit communication ports and the cluster boxes.

Figure 2-5: Main Unit to Cluster Box Connections



## 1702 EXPANSION UNIT

The expansion unit provides up to 12 additional PhoneLink communication lines (modems) or 10 PhoneLinks lines and 2 GRiDLink cables. The expansion unit, as supplied from the GRiD factory, consists of a four-slot chassis. From one to three communication processors, and the connecting cluster box, must be ordered separately. The communication processor contains 512KB of RAM, an 80186 microprocessor and four configurable communication ports. The fourth slot in the chassis is reserved for an optional application processor. Figures 2-6 and 2-7 show the front and rear panels of the expansion unit, respectively.



Figure 2-6: 1702 Expansion Unit Front Panel

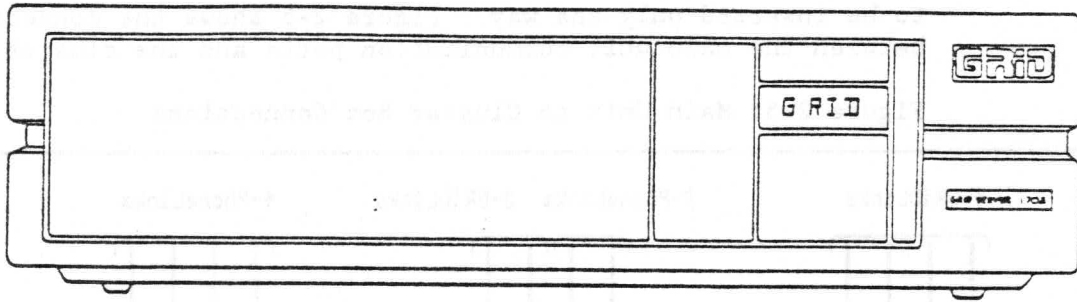
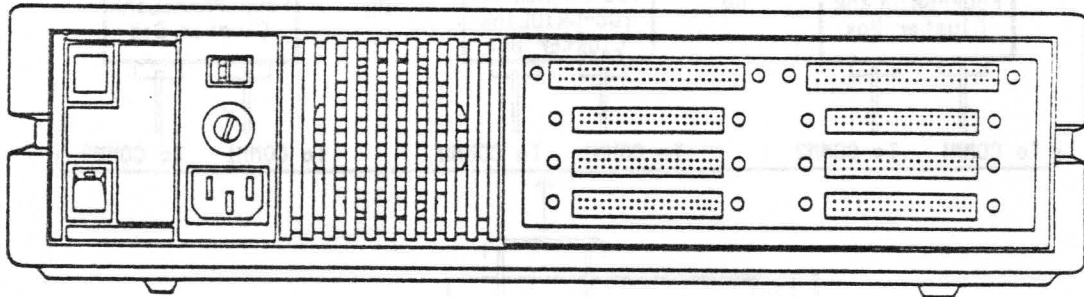


Figure 2-7: 1702 Expansion Unit Rear Panel



### Front-Panel Display

The expansion unit has a 4-character front-panel LED display (see Figure 2-6). The display always shows "GRID" to indicate that the unit is on and operating.

### Rear-Panel Connectors

The expansion unit rear panel contains processor bus port and communication port connectors (see Figure 2-7).

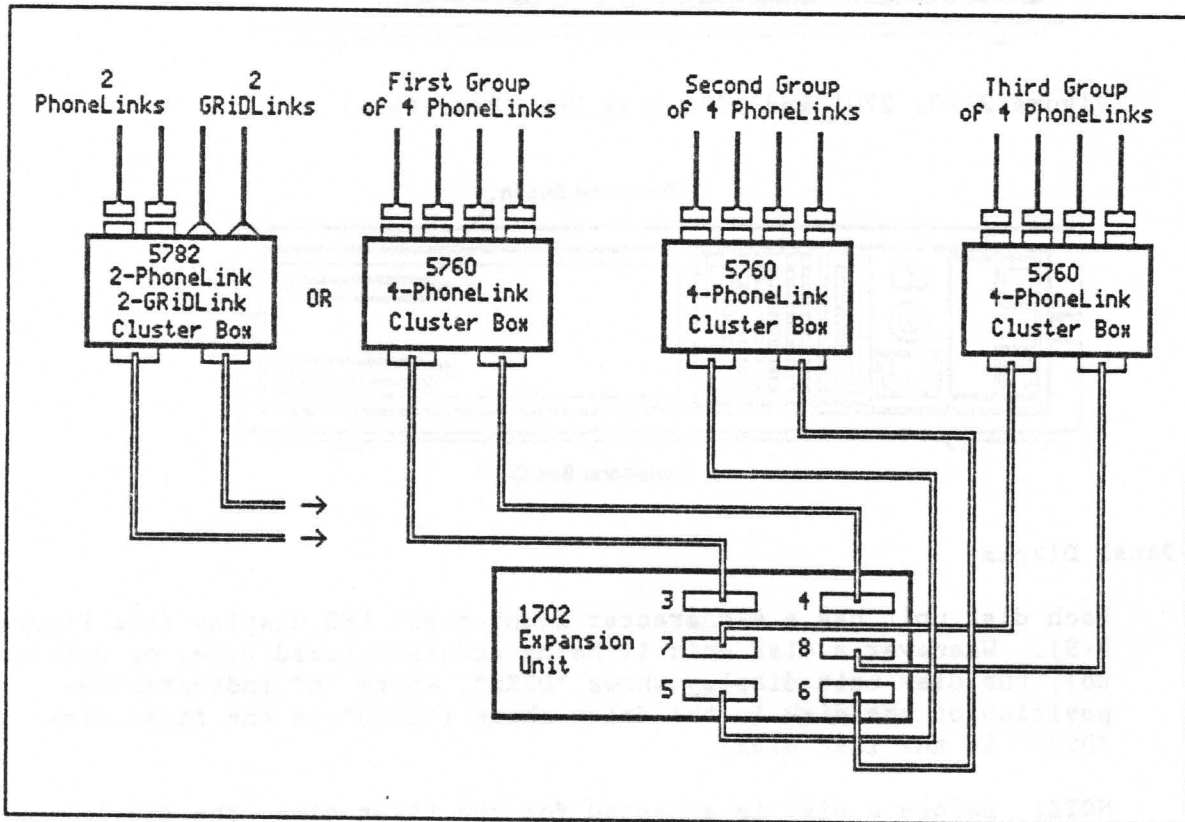
### Processor Bus Connectors

Both processor bus connectors join the expansion unit to the main unit. Their length and design require that you position the expansion unit directly underneath the main unit. The connectors have 50 pins and are self-locking; each connector has a metal tab on each side that allows the matching plug to be inserted only one way. Figure 2-20 shows a processor bus cable.

## Communication Port Connectors

The three pairs of communication port connectors (labeled COMM 3 & COMM 4, COMM 5 & COMM 6, and COMM 7 & COMM 8) accept the cables from the three cluster boxes that can be connected to the expansion unit. Figure 2-20 shows a cluster box cable. Each connector handles the signals for a pair of communication processor ports (i.e., two PhoneLink modems or two GRiDLink cables). The connectors have 40 pins and are self-locking; each connector has a metal tab on each side, which allows the matching plug to be inserted only one way. Figure 2-8 shows the connections between the expansion unit communication ports and the three cluster boxes.

Figure 2-8: Expansion Unit to Cluster Box Connections



## 2701 AND 2703 DISK UNITS

The GRiD Server system requires at least one disk unit of its own: either a 2701 or a 2703 Disk Unit. When unformatted, the 2701 has a 10-megabyte capacity, and the 2703 has a 40-megabyte capacity. The disk unit comes from the factory with the GRiD Server operating system software loaded on it. The disk unit connects to the main unit via the main unit's peripheral bus port. You can add more disk

units by daisy-chaining them together (system maximum is eight). While the 2701 or 2703 disk units cannot be used on a GRiD computer, the 2101 Hard Disk System normally used with a GRiD computer can be connected to GRiD Server via the main unit's GPIB port. Figures 2-9 and 2-10 show the 2701 and 2703 disk unit's front and rear panels, respectively.

Figure 2-9: 2701 and 2703 Disk Unit Front Panel

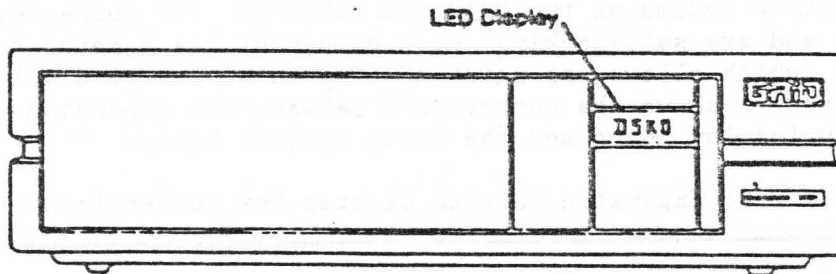
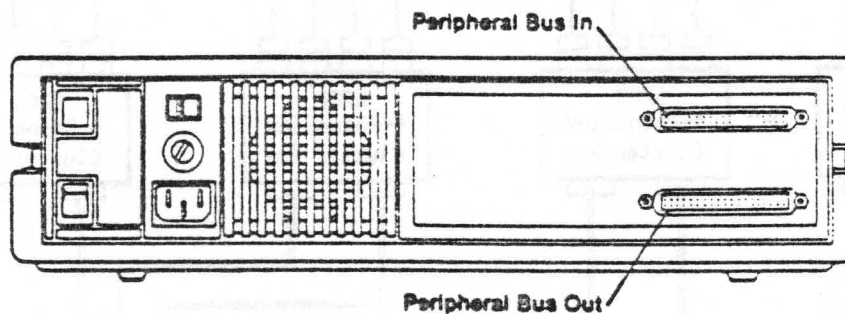


Figure 2-10: 2701 and 2703 Disk Unit Rear Panel



### Front-Panel Display

Each disk unit has a 4-character front-panel LED display (see Figure 2-9). Whenever a disk unit is being accessed (read from, or written to), the disk unit display shows "DSKn", where "n" indicates the position of the disk in the daisy chain ("DSK0" is the first disk; "DSK7" is the last disk).

**NOTE:** Before a disk is accessed for the first time, the display may contain random characters. This is normal.

### Rear Panel Connectors

The disk unit contains only two rear panel connectors. The upper peripheral bus connector on the first disk (pronged, marked "IN") is connected to the peripheral bus connector on the main unit. The lower connector (receptacle, marked "OUT") either contains a peripheral bus terminator (if the disk is the last or the only disk on a system), or is connected to the "IN" connector on another disk

(on multiple-disk systems). Additional daisy-chained disks are connected the same way, from "OUT" on one disk to "IN" on the next disk. The final disk unit in the chain must have a peripheral bus terminator (part number 100660-00, supplied with the 1701 main unit) plugged into its "OUT" port. Figure 2-11 shows the terminator pack (top view).

Figure 2-11: The Peripheral Bus Terminator

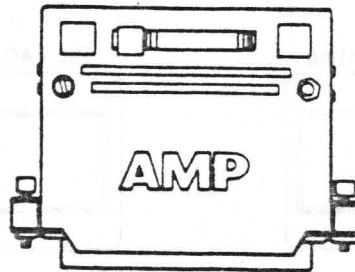
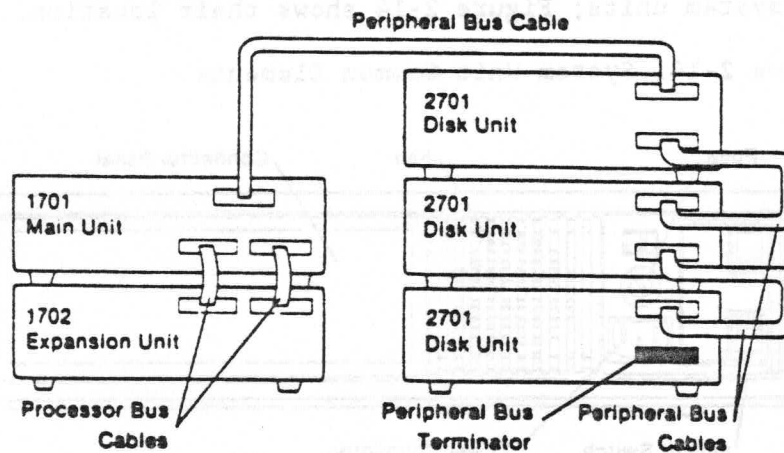


Figure 2-12 shows an example of daisy-chained disk units; (Figure 2-20 shows a peripheral bus cable).

Figure 2-12: Main Unit, Expansion Unit, and Several Disk Units



NOTE: The maximum allowable number of disk units that can be placed in a single stack is four. Refer to Chapter 5 for information on administrative changes required when adding additional 2701 or 2703 disk units.

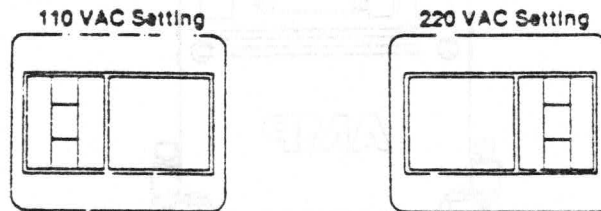
### Line Voltage Switch

The line voltage switch located on the rear panel of the 2701 and 2703 disk units lets you switch the unit between 90-140V AC line voltage and 160-280V AC line voltage (at 47-66 Hz). Figure 2-13 shows the respective switch settings. Note that only the 2701 and 2703 disk units have line voltage switches; the main unit and expansion units do not have line voltage switches and must be

ordered from GRiD with the proper AC line voltage option.

**CAUTION:** Always make sure the line voltage switch is in the proper position before plugging the power cord into an electrical outlet. An incorrect voltage setting can cause damage to the power supply in a disk unit. Also ensure that you have installed the appropriate fuse for the line voltage you have selected (see the "System Unit Common Elements" section below).

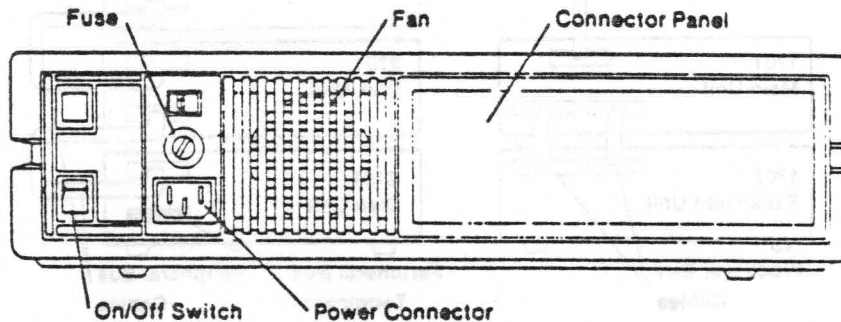
Figure 2-13: Disk Unit Line Voltage Switch Settings



## SYSTEM UNIT COMMON ELEMENTS

The three GRiD Server system units share four common elements, described below. These elements are located on the rear panel of the system units; Figure 2-14 shows their location.

Figure 2-14: System Unit Common Elements



### On/Off Switch

When the on/off rocker switch is in the off position, a red circle can be seen on its top. To turn a unit on, press the upper portion of the switch. To turn a unit off, press the lower portion of the switch.

**CAUTION:** Never turn off any GRiD Server unit when the LED display on the disk shows that the system is in use. The in-use display means that file access is taking place; turning off the main unit, the expansion unit, or a disk unit could destroy files. Whenever you turn off any GRiD Server system unit, always wait ten seconds before turning it back on again. Doing otherwise can damage the unit.

## Power Connector

The three-prong power connector provides a ground connection and prevents improper positioning of the receptacle end of the power cord. The pronged end of the power cord (part number 100712-00) should be plugged into a three prong, grounded power outlet or adaptor. If the power outlet does not provide proper grounding, data errors may occur and a shock hazard may exist.

## Fuse

The fuse protects your system from power surges. You can access the fuse by turning the fuse cover counterclockwise. All system components take the same two fuses, one for 120 VAC lines and one for 220 VAC lines.

The rating of the fuses installed in your system depends on the line voltage option you ordered (main unit and expansion unit) or the line voltage switch setting (disk unit).

For 110VAC input, the fuse is a 1.5 ampere, 250 VAC slow-blow fuse mounted in a light gray holder/cover. This fuse measures 1-1/4" x 1/4" (31.8mm x 6.4mm). The Littlefuse (manufacturer) type is 3AG number 31301.5.

For 220 VAC input, the fuse is a 0.630 ampere, 250 VAC slow-blow fuse mounted in a black carrier/cover. This fuse measures 5mm x 20mm. The Schurter (manufacturer) number is 034.13115.

**CAUTION:** To reduce the risk of fire, replace the fuse only with one of the same type and rating.

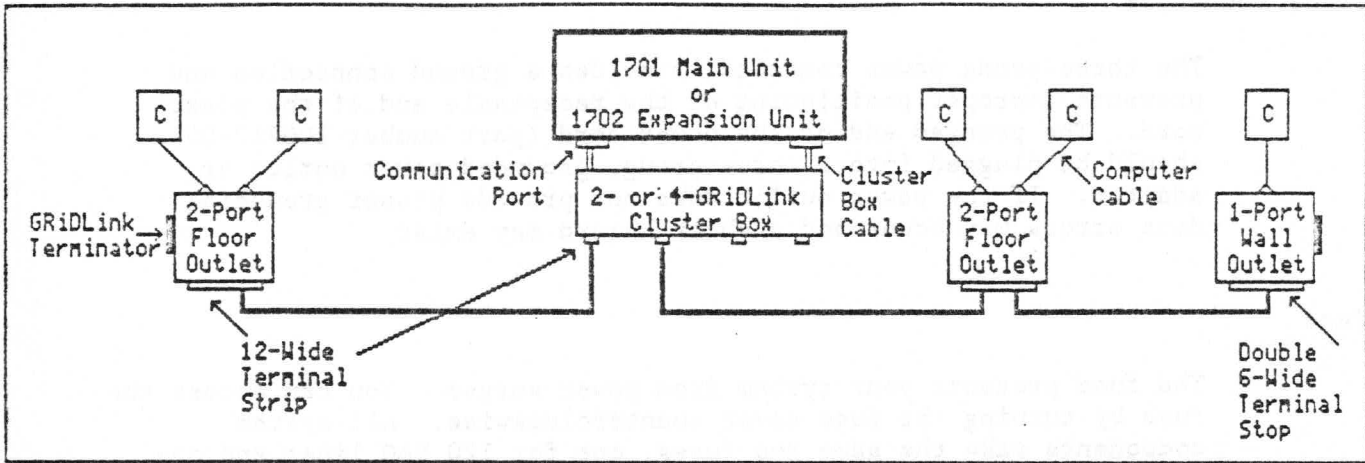
## Fan

The fan circulates air to cool components. On the main unit and expansion unit, the fan is powered by the AC line voltage; on the disk unit, the fan is powered by DC voltage taken from the power supply. There is no filter (and, thus, no maintenance) on the fan.

## GRIDLINK AND PHONELINK COMPONENTS

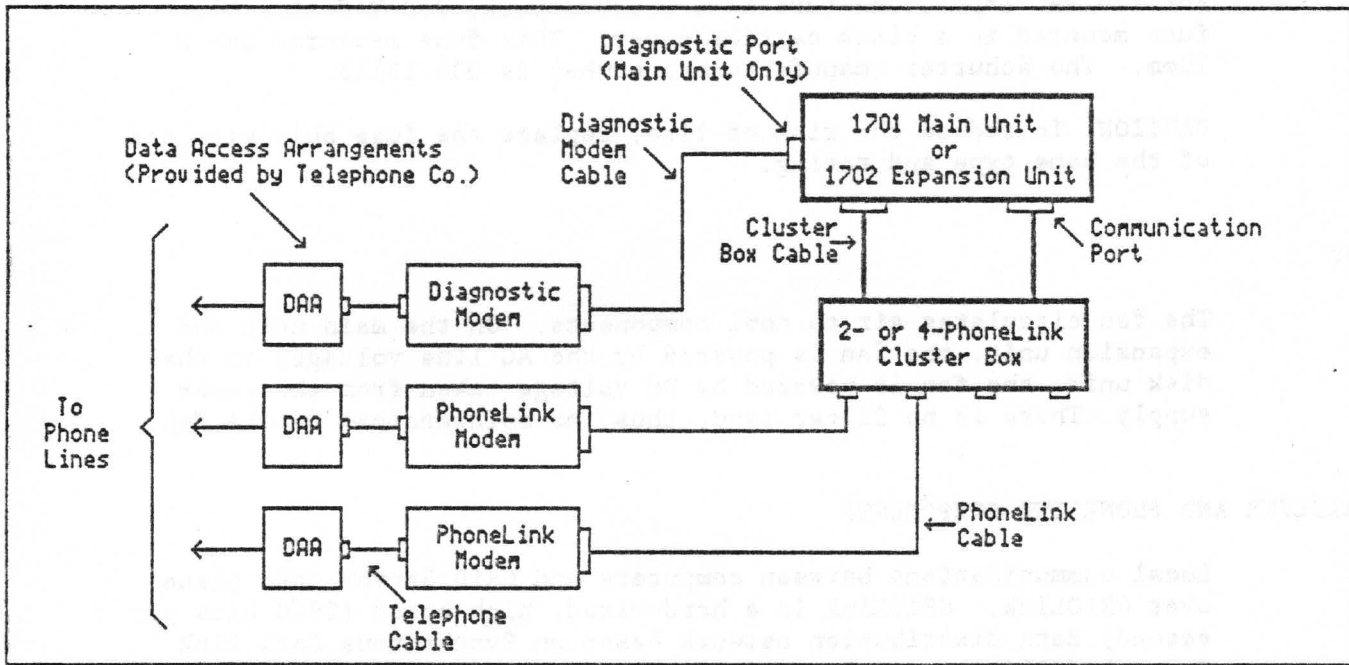
Local communications between computers and GRiD Server take place over GRiDLink. GRiDLink is a hard-wired, high-speed (250K bits per second) data distribution network based on Synchronous Data Link Control (SDLC) protocol. GRiDLink components include cluster boxes, GRiDLink cable, outlet cables, outlet boxes, and the GRiDLink terminator. Figure 2-15 shows GRiDLink components in a typical configuration.

Figure 2-15: GRiDLink Components (Typical Configuration)



Remote communications between computers and GRiD Server take place over PhoneLink. PhoneLink is a dial-up link using 300/1200/2400 baud modems connected to both the computer and GRiD Server. PhoneLink components include cluster boxes, cables, and modems. Figure 2-16 shows PhoneLink and diagnostic access components in a typical configuration.

Figure 2-16: PhoneLink and Diagnostic Access Components (Typical Configuration)



## Cluster Boxes

The cluster box is the "junction box" that connects GRiDLink and PhoneLink lines to the main and expansion units. Cluster boxes allow flexibility in connecting different numbers of GRiDLink and PhoneLink lines to a system; they also allow GRiDLink cables to be connected with screw terminals rather than solder terminals. The three kinds of cluster boxes are described below.

### 5760 Four-PhoneLink Cluster Box

The 5760 cluster box connects four PhoneLink lines to either the main unit or the expansion unit. It has two 40-pin self-locking connectors on one side (for the 5750 cables to the main or expansion unit) and four 25-pin (DB25S) connectors for the 5752 PhoneLink cables to the modems on the other.

### 5761 Four-GRiDLink Cluster Box

The 5761 cluster box connects four GRiDLink lines to the main unit. The cluster box has two 40-pin self-locking connectors on one side (for the the 5750 cables to the main unit) and four rubber-grommated holes for 5713 GRiDLink cable on the other. Inside the cluster box (accessible only with the cover removed) there are four GRiDLink test outlets, used only for troubleshooting and service purposes.

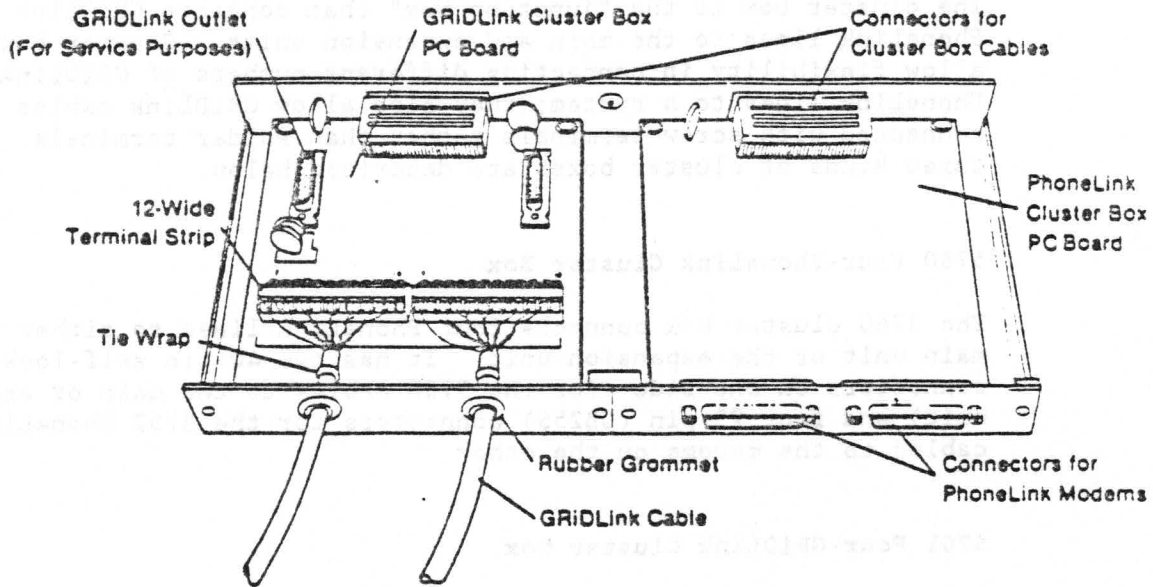
### 5762 Two-GRiDLink/Two-PhoneLink Cluster Box

The 5762 cluster box connects two GRiDLink lines and two PhoneLink lines to the main unit or the expansion unit. The cluster box has two 40-pin self-locking connectors on one side (for the 5750 cables to the main or expansion units). The other side contains two rubber-grommated holes for 5713 GRiDLink cables and two DB25S connectors for the 5752 PhoneLink cables to the modems on the other. Inside the cluster box (accessible only with the cover removed) there are two GRiDLink test outlets, used only for troubleshooting and service purposes. Figure 2-17 shows the 5762 cluster box with the cover removed; figures 2-5 and 2-8 shows the cluster box connections.

**CAUTION:** Handle the 40-pin connectors on the 5750 cluster box cables with care. A pin can easily be bent when connecting the cable if the plug is misaligned with the socket or excessive force is used.



Figure 2-17: 5762 Two-GRiDLink/Two-PhoneLink Cluster Box  
(Cover Removed)



## Cables

The GRiDLink system uses three types of cables; PhoneLink uses one additional type of cable. All four are described below. Figure 2-20 shows all GRiD Server cables.

### 5713 GRiDLink Cable

The 5713 GRiDLink cable connects the cluster boxes to the outlets. It is usually run through walls, floors, and ceilings (out of sight). The cable (a special version of Beldon 9505) consists of five twisted pairs and a foil shield with a bare ground wire, all in a PVC jacket. The difference between this cable and Beldon 9505 is that the black wire of each of the five pairs contains a colored tracer to simplify installation and maintenance. The cable is connected to the cluster boxes and outlets via screw-connection terminal strips.

### 5715 and 5716 Computer Cables

Computer cables connect users' computers to GRiDLink outlets. They are either 12' (5715) or 24' (5716) long. Each cable has a 19-pin (2DE19P) connector at the computer end and a 15-pin (DA15P) connector at the outlet end. The computer end attaches with setscrews; the outlet end attaches with a sliding lock retainer.

Most GRiD Server installations have more outlets than computers. Normal practice is to bring the computer cable with you when you

move your computer from one outlet to another; this is why the outlet end of the cable has a quick-release connector.

#### 5750 Cluster Box Cable

The 5750 cluster box cable connects the 5760, 5761, or 5762 cluster box to either the main unit or the expansion unit. Two cables are used between the main unit or expansion unit and each cluster box; each cable handles the signals for a pair of communication processor ports (i.e., two GRiDLink lines or two PhoneLink lines). The cable is 6' long; the connectors on both ends of the cable have 40 pins.

#### 5752 PhoneLink Cable

The 5752 cable connects PhoneLink modems to PhoneLink cluster boxes. The cable is 12' long with 25-pin (DB25P) connectors at each end. The cable is symmetric: either end can be used in either place.

### GRiDLink Outlets

There are two kinds of outlet boxes for attaching computers to the GRiDLink system. Outlet boxes are attached to GRiDLink cables with screw-connection terminal strips; computers are plugged into outlet boxes. Outlet boxes can contain one or two outlets; however the boxes are combined on a GRiDLink line, no more than eight outlets are permitted on a single line (if this limit is exceeded, the communication processor can be damaged).

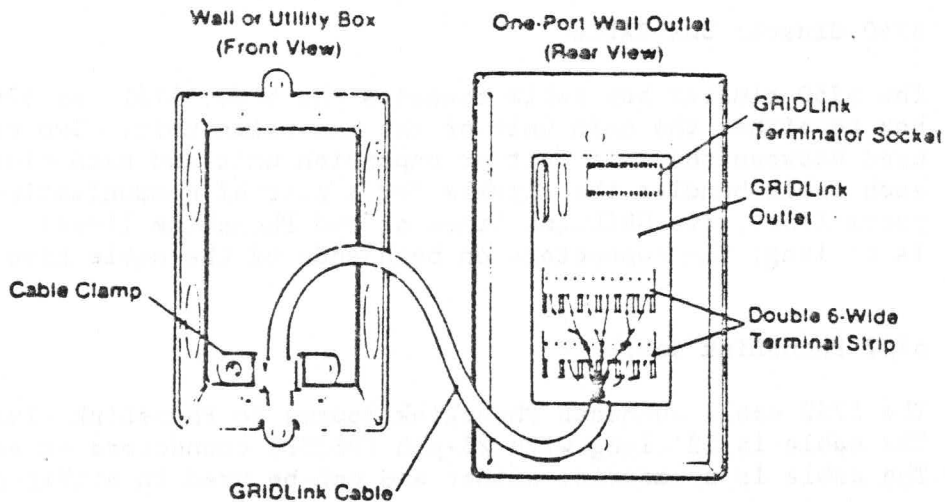
#### 5706 Two-Port Floor Outlet

The 5706 two-port floor outlet allows two computers to be connected to GRiDLink at the same location. These outlets are often used in office areas containing desks in an open plan. The 5706 consists of a metal box with two rubber-grommets for 5713 GRiDLink cable on one side and two 15-pin (DA15S) connectors on the other. The box stands free, usually under a desk. No provision is made for securing it to the floor.

#### 5708 One-Port Wall Outlet

The 5708 one-port wall outlet allows one computer to be connected to GRiDLink. This outlet is usually used in managers' offices. The 5708 consists of a metal plate containing a small printed circuit board, a terminal strip, and a 15-pin (DA15S) connector. The plate must be mounted either in a wall or in a utility box. Figure 2-18 shows a one-port wall outlet, removed from its wall box.

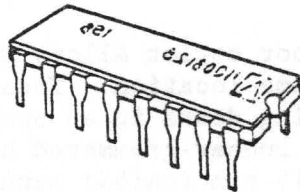
Figure 2-18: One-Port Wall Outlet (Removed from Wall Box)



### GRIDLink Terminator

Each GRIDLink line has a 5709 terminator in the last outlet box on the line. The terminator is a 16-pin DIP (Dual Inline Package) integrated circuit. The function of the terminator is to electrically "complete" the GRIDLink line. If you add GRIDLink outlets to your system in the future, you must remember to move the terminator to the new last outlet on each line. Figure 2-19 shows the GRIDLink terminator.

Figure 2-19: 5709 GRIDLink Terminator



### PhoneLink and Diagnostic Modems

The 5774 PhoneLink modems provide the link to GRiD Server for remote users. One to 10 PhoneLink modems may be used on a GRiD Server (16 if GRIDLink is not used at all). The 5742 diagnostic modem lets the System Administrator or GRiD Resource Center personnel run utility and diagnostic programs remotely. The modems supported on GRiD Server are the Hayes Smartmodem 1200 and USRobotics Courier 2400. Your system may have either or both kinds of modem on it. The PhoneLink modem and the diagnostic modem are interchangeable; the only difference between them is where they are connected and the cable supplied with them.

GRiD Server modems have three external connections:

- (1) an AC power cord (containing an in-line power supply),
- (2) a modular telephone cable to the data jack (RJ45S or RJ45M), and
- (3) the 5752 cable to the 5760 or 5762 cluster box (PhoneLink modems), or the 5733 cable to the main unit diagnostic port (diagnostic modem).

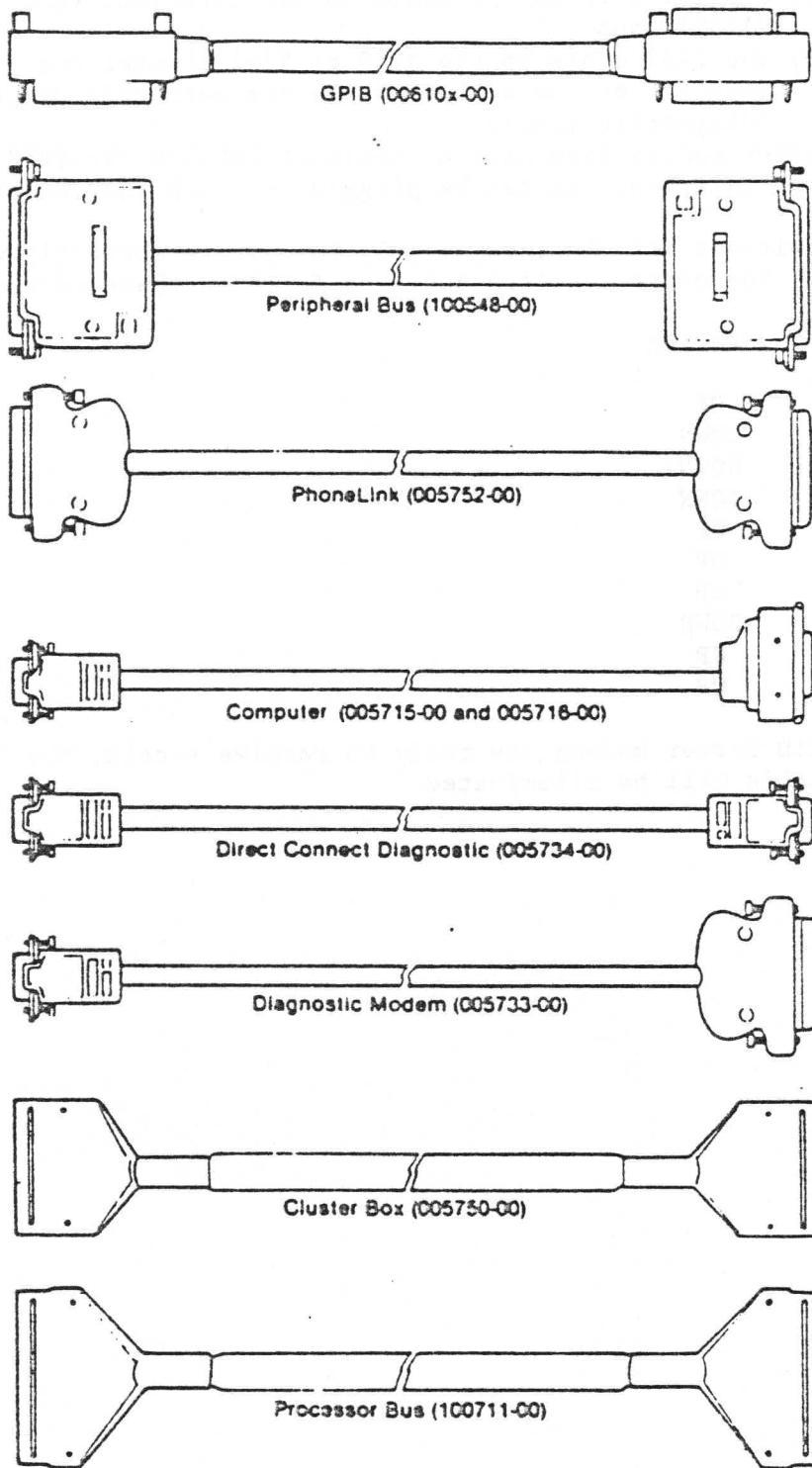
GRiD Server modems also have a connector labeled "TELSET" into which a regular telephone set can be plugged to check the telephone line.

Modem switches must be set properly to operate correctly with GRiD Server. The correct switch settings for both these modems are:

Switch	Setting
1	UP
2	DOWN
3	DOWN
4	DOWN
5	UP
6	UP
7	UP
8	DOWN
9	UP
10	UP

When GRiD Server modems are ready to receive a call, the "DTR" and "CTS" LED's will be illuminated.

Figure 2-20: GRiD Server Cables and Connectors



## CHAPTER 3: CONFIGURING GRID SERVER FOR THE FIRST TIME

This chapter shows you how to start up and configure a newly-installed GRiD Server system. Some of these procedures require you to refer to the detailed information in Chapters 4, 5, and 7. It is assumed that you know how to use GRiDManager, GRiDWrite, and GRiDFile. If you need additional information on any of these topics, refer to the GRiD Management Tools Reference Manual or the InteGRiD Software manual.

### COMPUTER SOFTWARE REQUIRED

Before accessing GRiD Server with your computer, you must have certain files in your computer's local storage device (bubble memory, floppy disk, or hard disk).

#### PhoneLink Access

To access GRiD Server for administrative purposes via dial-up telephone lines (PhoneLink), you must have the following files in the Programs subject of your computer's local storage device, in addition to the normal minimum files required to start up GRiD-OS or InteGRiD:

- o GRiDManager
- o PhoneLink
- o Modem

If you do not have these files, you must duplicate them from a GRiD Software release diskette or some other local storage device, after

starting up (booting) from that device. Refer to the "System Basics" and "GRiDManager" chapters of the GRiD Management Tools Reference Manual if you are unfamiliar with duplicating files.

### GRiDLink Access

To access GRiD Server for administrative purposes via hard-wired cable (GRiDLink), you need two additional files in the Programs subject of your computer's local storage device: GRiDLink and Serial. These files can be duplicated from GRiD Server Floppy #5 (shipped with GRiD Server). Refer to the "System Basics" and "GRiDManager" chapters of the GRiD Management Tools Reference Manual.

If your GRiD Server system supports GRiDLink, you should locate a copy of the GRiDLink program now before going any further in this chapter.

### POWERING UP THE SYSTEM

Once the system hardware installation is complete, turn on the GRiD Server system in this order:

1. GPIB Peripherals
2. 2701 and 2703 Disk Units
3. 2801 tape backup unit
4. 1702 Expansion Unit
5. 1701 Main Unit

This order gives the disk units time to get up to speed before being polled by the main unit. It takes about three minutes for the system to run power-on diagnostics and load its operating software; the next section describes what you see while this is happening.

**CAUTION:** Always turn off the GRiD Server system and all devices connected to it (except computers connected via GRiDLink and PhoneLink lines) before removing or adding any device. Doing otherwise can damage data and the devices. Whenever turning off any GRiD Server system unit, always wait ten seconds before turning it back on again. Doing otherwise can damage the units. Turn the system off in reverse order from that given for turning it on.

## OBSERVING SYSTEM STARTUP

When you turn on the GRiD Server main unit, you see the following things happen in order:

1. The message "SYSTEM RESET" appears in the front-panel display on the main unit. This message means that the system is beginning its startup process.
2. The message "INITIALIZING" appears next.
3. During the "INITIALIZING" period, the following things occur:
  - A. The first disk unit's front-panel display lights up ("DSK0") when the disk is being accessed. If additional 2701 or 2703 disks are present on the system, they are also accessed ("DSK1" through "DSK7"), though not as frequently as the first disk.
  - B. Any GPIB printers connected to the system make resetting noises.
  - C. Any 2101 Hard Disk Systems and/or 2102 Portable Diskette Drives attached to the GPIB are briefly activated one or more times (their access lights light up).
4. After about three minutes, the front-panel display on the main unit begins displaying the time in the format HH:MM:SS.

NOTE: If the time displayed is not correct, you can reset it yourself by running the GS.SetTime utility via the diagnostic port. See Chapter 8 for information on how to use the diagnostic port, and Chapter 9 for information on how to run the GS.SetTime utility.

If you are connected to the diagnostic port during system startup, your console shows much more information about the initialization process. For details about observing system startup via the diagnostic port, see Chapter 8.

At this point the GRiD Server has finished its startup process and is ready for you to proceed with the initial configuration. If you did not observe all the above things, something may be wrong with the GRiD Server system units.

## INITIAL CONFIGURATION

Before you can begin using GRiD Server, you must make some changes in certain files to match your particular hardware and software configuration. These changes include:



- o Modifying the GRiDNetwork Manager file to reflect your particular communication hardware.
- o Modifying the system initialization command file (System.Init) to reflect your particular peripherals (hard disks and floppy disks), your choice of system name, starting the automatic backup software, and the GRiDspool Manager program so that printers can be configured.
- o Creating and entering your accounting structure (user names, passwords, and groupings) into the system.
- o Modifying the AutobackupConfig file to set the time and day when disks are to be backed up.
- o Modifying GRiDspool Manager to reflect the printers attached to the system.
- o Modifying the virtual file system configuration database (VFSConfig) to add device names for your particular peripherals and other accounting-structure dependent devices.
- o Creating the remote printer driver for each printer attached to the system.

NOTE: If you are modifying more than one of these files, it is simpler to wait until all the changes have been made to each file before restarting the GRiD Server system.

#### Data Communication Configuration File

When shipped from GRiD, the GRiDNetwork Manager configuration file is set up for a system with two PhoneLinks (COMM 1 on the main unit rear-panel), two GRiDLinks (COMM 2 on the main unit rear-panel), and no expansion unit. If your system uses this "2+2" configuration, you do not have to change anything and can skip ahead to the "System Initialization File" section below. If your system is in any other configuration (i.e., has no GRiDLinks or four GRiDLinks, or includes a 1702 Expansion Unit), you must modify the GRiDNetwork Manager program as follows:

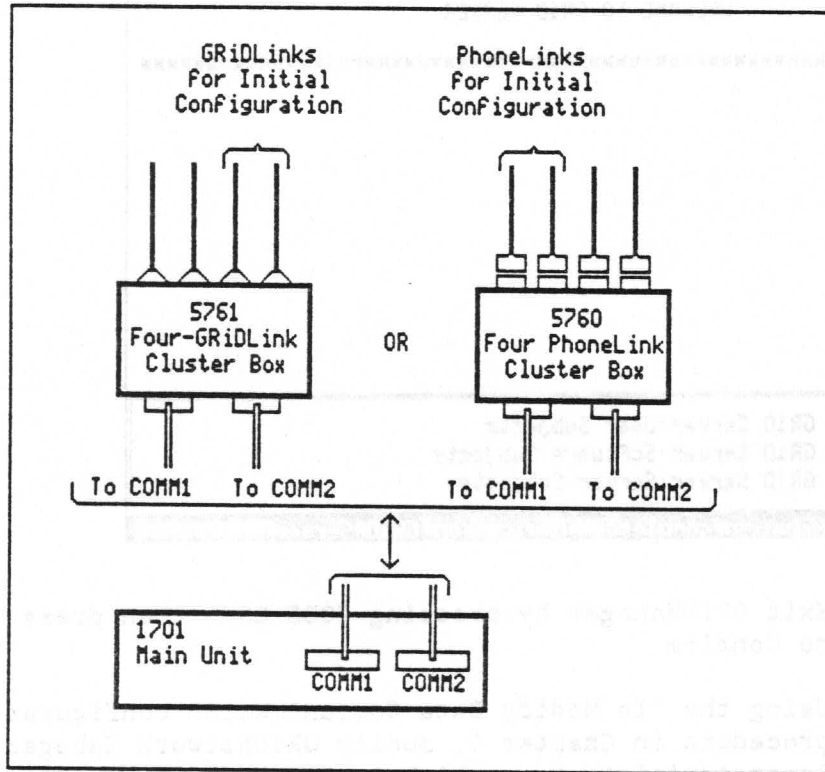
#### ➤ TO MODIFY GRIDNETWORK MANAGER

1. Read the "GRiDNetwork Manager Concepts" section in Chapter 4.
2. Select either GRiDLink or PhoneLink to sign on to GRiD Server.
  - o If your system has no GRiDLinks, you must sign on via PhoneLink. You must use the phone number for one of the modems connected to the two right-hand DB-25S connectors (as you face the connectors) on the front panel of the

main unit's 5760 cluster box. As an aid to identifying the proper connectors, the 5750 cluster box cable plugged into the 40-pin flat connector opposite the correct DB-25S connectors is connected to the COMM 1 communication port on the main unit's rear panel (see Figure 3-1). Until you modify GRiDNetwork Manger, these are the only two modems on the system that are set up to use PhoneLink. Modems connected to an expansion unit cannot be used until GRiDNetwork Manager has been modified.

- o If your system has four GRiDLinks, you must sign on via GRiDLink (even if you have PhoneLink in the expansion unit). You must plug your computer into any outlet on one of the two GRiDLink cables coming out of the left-hand side of the 5761 cluster box (as you face the GRiDLink cables). As an aid to identifying the proper cable, the 5750 cluster box cable plugged into the 40-pin flat connector opposite the correct GRiDLink cables is connected to the COMM 2 communication port on the main unit's rear panel (see Figure 3-1). Until you modify GRiDNetwork Manager, these are the only two cables set up to use GRiDLink.

Figure 3-1: GRiDLinks and PhoneLinks for Initial Configuration.



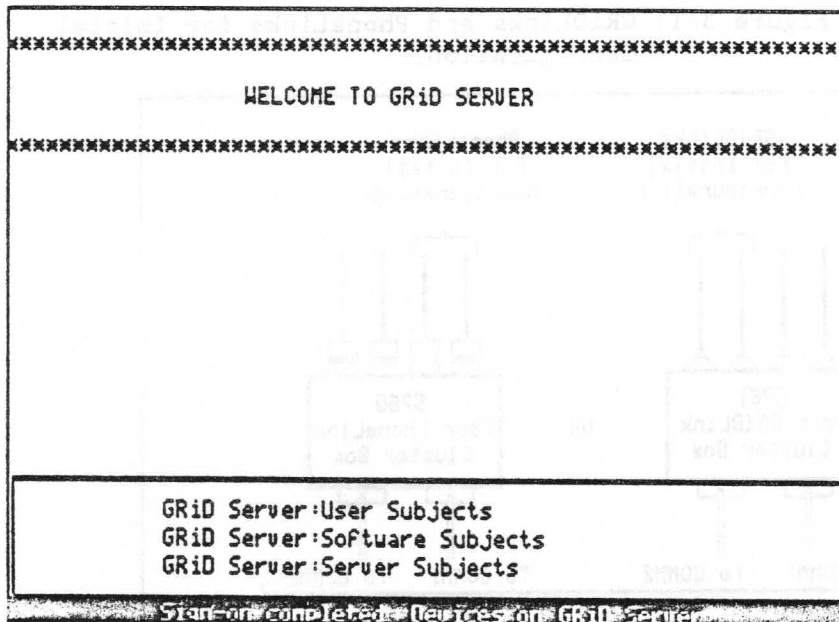
- Using the sign-on procedure found in the GRiD Server User's Guide, sign on to GRiD Server. The information needed for the sign-on form is:

Connection Type: PhoneLink or GRiDLink (see Step 2 above)  
Company: First Company  
Group: First Group  
User: First User  
Password: Password

NOTE: "First User" is a special sign-on intended for use during the initial configuration process; it lets you access the system and modify the configuration files as well as add other users.

- Once you have successfully signed on, you see the listing of new GRiD Server devices shown in Figure 3-2. This screen is for information only; it is intended to notify you that additional devices are now at your disposal. The meaning of these devices (and others) is explained in detail in Chapter 4. Press ESC to return to the GRiDManager commands menu.

Figure 3-2: GRiD Server Devices After Initial Sign-on  
(System Configured as Shipped from GRiD)



- Exit GRiDManager by pressing CODE-ESC, then press CODE-RETURN to Confirm.
- Using the "To Modify Data Communication Configuration" procedure in Chapter 4, modify GRiDNetwork Manager (via RemoteAdministrator, which is in the Programs subject of the Software Subjects device) to match your communication hardware.

7. You must reboot the GRiD Server system for your changes to take effect. Before rebooting, wait until you have made all changes to the configuration files you want to modify.

## System Initialization File

Modifying the System.Init file lets you:

- o Activate the automatic backup software (if applicable).
- o Change the "name" of the system (the characters that appear before the colon in a GRiD Server device name such as "GRiD Server:User Subjects").
- o Modify the System.Init file to indicate that your system has two or more 2101 Hard Disk Systems, or two or more 2102 Portable Diskette Drives. (The GRiD Server operating system automatically allows for one each of the 2101 and 2102 storage devices.)
- o Activate the GRiDMail Software (if applicable).
- o Start GRiDspool Manager (if applicable).

Perform the following steps to modify the System.Init system initialization file:

### ▶ TO MODIFY THE SYSTEM INTIALIZATION FILE

1. Read the "System.Init Concepts" section of Chapter 4.
2. Sign on to the GRiD Server system.
3. Using the "To Modify System.Init" procedure in Chapter 4, modify the system initialization file (System.Init, in the Programs subject of the Server Subjects device) to reflect your choice of a name and your particular additional peripheral hardware.

**NOTE:** Choosing a name can be an opportunity to use a little imagination. You could name the system after your company (i.e., "ACME"); however, when you get a second GRiD Server, it must be changed because each GRiD Server should have a distinct name. Naming your GRiD Server after a character in literature (i.e., "HAMLET") is one possibility; using an out-of-context name (i.e., "CATFISH") is another. Give it some thought.

4. You must reboot the GRiD Server system for your changes to take effect. Before rebooting, wait until you have made all changes to the configuration files you want to modify.

NOTE: Any peripheral activation changes (2101, 2102) you made in System.Init also must be configured in the VFSSConfig virtual file system configuration database. If you are technically inclined, you can connect to the diagnostic port and watch the system execute System.Init during startup; this lets you see immediately any errors reported during the execution of the GS.Activate utility. See the "Watching System.Init Execute" section in Chapter 10 for details.

## Creating the Accounting Structure

Your next task is to create and enter the user accounting structure. "Accounting structure" is the term used to describe how GRiD Server users identify themselves to the system, how they are grouped together, what administrative capabilities they have (if any), and how much disk space they can use. At one extreme, you can set up an accounting structure in which all users have their own strictly limited private file space, with no shared files and no way for users to communicate. At the other extreme, you can create one user name to be used by everyone, so that nobody has any private files and everyone shares every file. The most useful structure is probably between these two extremes, reflecting your particular organization and way of doing business. (Chapter 5 of this Guide covers the subject in detail.)

### ▶ TO CREATE THE ACCOUNTING STRUCTURE

1. Read Chapter 5 thoroughly.
2. On a piece of paper or a whiteboard, lay out a chart of your accounting structure, including all company, group, and user names. As explained in Chapter 5, identify the users who will be Group and Company Administrators (these are optional). Also identify the disk space limit for each user. Finally, remember to include yourself, as well as any other person who is to be a System Administrator, in the chart as the System Administrator.
3. Choose initial passwords. Instead of polling each user for his desired password, it may be easier to use a user's first name (as published in the company telephone directory) as his or her initial password, and let the user change it later with the UserSentry program.
4. Use the AdministratorSentry program to enter the accounting structure (company, group, and user names, passwords, administrative capabilities, and disk space limitations) into the system. Refer to Chapter 5 for instructions on how to use AdministratorSentry.

5. Sign off GRiD Server and then sign back on again using your new System Administrator user name.
6. Use the AdministratorSentry program again to list all the companies, groups, and users you entered. Verify that everything is in order. If not, use the Query-Update-Delete function of AdministratorSentry to make the appropriate changes.
7. Finally, use AdministratorSentry to lock the "First User" sign-on (see "The Locking Function" in Chapter 5).

NOTE: This is very important to prevent unauthorized access to your system by others who are aware of the "First User" sign-on.

### Virtual File System Configuration Database

The four objectives in modifying the virtual file system configuration database are to:

- o Add device names (e.g., "Server Floppy") to let users access the GPIB peripherals connected to the system (2101 Hard Disk Systems and 2102 Portable Diskette Drives).
- o Add device names for shared file libraries at the group, company and system-wide levels (i.e., "Shared Subjects"), as required by the accounting structure you designed in the previous section.
- o Determine what kind of administrative capability (if any) is required to read and write files on each device.
- o Determine what devices should be searched by the system for a GRiD application when a user selects a data file with a corresponding Kind.

As can be seen when reading the appropriate part of Chapter 4, we have tried to make it easy for you by including most of the entries you may need as comments in the configuration file. All you have to do is remove one character from a few lines to change them from comments into active entries. Then carry out the following procedure:

#### ▶ TO MODIFY THE VIRTUAL FILE SYSTEM CONFIGURATION DATABASE

1. Read the "VFSSConfig Concepts" section of Chapter 4.
2. Decide on device names for your peripherals and shared libraries; decide who can read and write files on each device; and decide which devices are to be searched for GRiD applications.

3. Using the "To Modify VFSSConfig" procedure in Chapter 4, modify the virtual file system configuration database (VFSSConfig-Database-, in the Programs subject of the Server Subjects device) to reflect your decisions. For now, do not worry about the order of devices in VFSSConfig. After you have used GRiD Server for a while, you may want to change the order in which the devices are listed on the File form in order to save keystrokes. See the "Controlling the Order of Devices" section in Chapter 4 for details.
4. You must reboot the GRiD Server system for your changes to take effect. Before rebooting, wait until you have made all changes to the configuration files you want to modify.

### Modifying AutoBackupConfig~Text~

Modify the automatic backup configuration file (AutoBackupConfig~Text~) if you have installed a 2801 tape backup unit and want to use the automatic backup software to automatically back up your peripheral bus disks to tape cartridges or other peripheral bus disks.

#### ▶ TO MODIFY THE AUTOBACKUPCONFIG FILE

1. Read the "AutoBackupConfig Concepts" section of Chapter 4.
2. Decide which disk drive(s) should be backed up to which other disk or tape drive(s), and at what time and day.
3. Using the guidelines detailed in the "Modifying The Automatic Backup Configuration File" section, make all necessary changes to the file.
4. You must reboot the GRiD Server system for your changes to take effect. Before rebooting, wait until you have made all changes to the configuration files you want to modify.

### Modifying GRiDSpool Manager

Adding printers is done via GRiDSpool Manager. This program is described in detail in Chapter 6.

#### ▶ TO ADD A PRINTER

1. Read Chapter 6 of this manual. Before GRiDSpool Manager can be accessed, it must be activated in the System.Init~Com~ file.
2. Access GRiDSpool Manager by selecting the RemoteAdministrator program in the Programs subject of the Software Subjects device. After Confirming, the RemoteAdministrator menu lets you select GRiDSpool Manager.

3. Follow the instructions in Chapter 6 to add a printer.

### Creating Remote Printer Driver Files

Creating remote printer driver files is the next to last initial system setup task. When users have these files on their local storage media, they can access GRiD Server spooled printers over both GRiDLink and PhoneLink by setting the current printer to Servername:Printername. Then all printouts from that workstation are directed to the GRiD Server printer.

You must create these files in Software Subjects so that your users can duplicate them onto their local storage media.



#### TO CREATE REMOTE PRINTER DRIVER FILES

1. Read the "Remote Printer Driver Concepts" section of Chapter 4.
2. Use the "To Create Remote Printer Driver Files" procedure in Chapter 4 to create appropriately-named remote printer driver files in the Programs subject of the Software Subjects device.
3. Sign off GRiD Server and sign on again. Use the procedure in the "GRiD Server Printers" section of the GRiD Server User's Guide to verify that you can successfully access GRiD Server's printers.

### Verifying and Backing Up Your Changes

After completing the work mentioned above, it is essential to verify that the modifications you have made are in effect and to make a backup copy of those changes.

Verify that your modifications are correct and that all the communication hardware is operating correctly by signing on (using a System Administrator sign-on) via each PhoneLink modem connected to your system, and then while connected to any outlet on each of the individual GRiDLink cables. Sign off between each new test.

Figure 3-3 shows how the sign-on device list appears if all the commented lines in the configuration database are made active and all the GPIB devices identified therein are physically present. Note that the system name used in this illustration (and throughout this Guide) is "GRiD Server". Remember that the system name and the device names are your choice; you may prefer "Server Floppy", for example, instead of "Backup Portable Floppy".



Figure 3-3: GRiD Server Devices After Modifying VFSConfig

```
*****
WELCOME TO GRiD SERVER
*****

GRiD Server:User Subjects
GRiD Server:Software Subjects
GRiD Server:Shared Subjects
GRiD Server:Group Subjects
GRiD Server:Company Subjectss
GRiD Server:Backup Disk 1
GRiD Server:Backup Floppy 1
GRiD Server:Backup Disk 2
GRiD Server:Backup Floppy 2
GRiD Server:Backup Portable Floppy 2
GRiD Server:Printer Queue
GRiD Server:Server Subjects

Sign-on completed. Devices on GRiD Server
```

▶ TO MAKE A BACKUP COPY OF YOUR MODIFIED CONFIGURATION FILES

1. If you are not already signed on, sign on as the System Administrator.
2. Use GRiDManager's CODE-D command to duplicate System.Init, VFSConfig, and AutoBackupConfig from the Programs subject of the Server Subjects device to a floppy disk. Do not put the backup copies of your modified configuration files on GRiD Server Floppy #1 or #2. Your configuration files backup should be kept separate from the GRiD Server system files backup to allow for the latter's use in troubleshooting procedures.

NOTE: When you duplicate the virtual file system configuration database, use the CODE-W wild card as the Kind, so that you duplicate both the database and its index in one step. Figure 3-4 illustrates the GRiDManager verification screen you should see during this step.

Figure 3-4: Backing Up Your Modified Configuration Files

Source	
Device	GRiD Server:Server Subjects
Subject	Programs
Title	WFSConfig
Kind	.....

Destination	
Device	Floppy Disk
Subject	Backup of Configuration Files
Title	.....
Kind	.....

Enabled	<input checked="" type="checkbox"/> Disabled
Verification	<input type="checkbox"/> Disabled
New version only	No
Which files	All source files

Verify duplicate: Fill in form and confirm

### Loading Software Subjects

This is the last initial system setup task: load the current release of GRiD application software into the Software Subjects device so that all GRiD Server users can access it.

#### ▶ TO LOAD SOFTWARE SUBJECTS

1. Read the "GRiD Application Software" section of Chapter 7.
2. Use the appropriate "To Load Software Subjects" procedure in Chapter 7 to copy the current release from the device of your choice (a 2101 Hard Disk System, a 2102 Portable Diskette Drive, or GRiD Central) into the Programs subject of the Software Subjects device.
3. Sign off GRiD Server and sign on again as a "Normal User". Select or exchange for any GRiD application in the Programs subject of the Software Subjects device to verify that the software is accessible by everyone.

Your GRiD Server system is now ready for use; the initial configuration is complete.

## CHAPTER 4: ADMINISTERING THE CONFIGURATION

This chapter explains how to administer the GRiD Server configuration files. It provides the information needed to change the name of the GRiD Server, add or remove peripheral devices such as printers and GPIB disks, change the sign-on "welcome message," change GRiD Server device names and the order in which they are seen by users, as well as other administrative tasks.

After an initial overview, the chapter covers two major topics for each configuration file: what is in the file and why it is there (Concepts), and how to change it (Modification). The chapter concludes with six quick-reference procedures summarizing the changes required to add peripheral devices.

### CONFIGURATION FILES OVERVIEW

This chapter covers two types of files. The files of the first type are accessed directly by the System Administrator to change such things as the system name, change device names, set system characteristics, change the message of the day, activate peripheral devices, and create remote printer driver files. The second type are accessed via the RemoteAdministrator program and let you, as the System Administrator, set the communication parameters for your system, add and remove printers from your system as well as control their functions, and (if your system has the optional GRiDMail package) define all aspects of the GRiDMail functions.

Files of the first type are:

- o System.Init
- o VFSConfig

- o Message of the Day
- o Remote Printer
- o AutoBackupConfig

System.Init ("System Initialization") is a command file executed by the GRiD Server operating system at startup. In addition to system commands, the file contains the name of the GRiD Server system and activation commands for GPIB peripherals. Although the file is of Kind Com (command) rather than Kind text, it contains text and can be edited with GRiDWrite.

VFSConfig ("Virtual File System Configuration") is a GRiDFile database used by the GRiD Server operating system at startup to define a variety of system characteristics, including device names, read/write access to devices, and which devices are searched for GRiD applications. Since the file is a database, it can be modified with GRiDFile.

Message of the Day contains the "welcome message" that appears on the new device information screen when you first sign on to GRiD Server. This file does not affect the system configuration in any way, but is included in this discussion because as System Administrator you typically change the contents of this file regularly. The method used to change it is the same as that for any text file (via GRiDWrite).

RemotePrinter is a device driver file that allows users to access GRiD Server printers via GRiDLink or PhoneLink. As the System Administrator, you use GRiDManager to duplicate the RemotePrinter file into one or more new files titled to match the name of your GRiD Server system and the names of your printers; users then duplicate these uniquely-named files from GRiD Server into their local storage devices.

AutoBackupConfig is a text file that lets you set the time of day when a GRiD Server disk is backed up to a tape or another GRiD Server disk, as well as the source and destination devices for the backup.

As shipped from GRiD, the system contains two copies of three of the above-mentioned files (System.Init, VFSConfig, and AutoBackupConfig): one copy under the name given above (e.g., System.Init), and another copy with the word "Model" appended to the name (e.g., System.Init Model). The "plain" files are the ones you modify to create your custom configuration; the "Model" files are for reference and backup, should something go wrong with your modifications.

Files of the second type are:

- o GRiDNetwork Manager
- o GRiDSpool Manager
- o GRiDMail programs / GRiD3780 program

These files are accessed via the RemoteAdministrator program, which is located in the Programs subject of the Software Subjects device. The RemoteAdministrator program is run on any workstation signed on to the GRiD Server via GRiDLink or PhoneLink (but not the diagnostic port). RemoteAdministrator retrieves the list of applications available on GRiD Server and is used to configure the selected application.

The GRiDNetwork Manager program lets you, as the System Administrator, define the data communication configuration of your system. This includes setting the protocols (PhoneLink or GRiDLink) for ports as well as all parameters of the modems attached to those ports configured for PhoneLink. The program also lets you define some GRiDMail parameters (see section 5.4 of the GRiDMail Installation and Administration Guide).

The GRiDSpool Manager program lets you configure your GRiD Server system for GPIB and serial printers. It also lets you add, delete, modify, enable, and disable printers, change the administrative password that gives access to the complete GRiDSpool Manager form, and delete files in a printer's queue.

For detailed information on the GRiDMail programs, see the GRiDMail Installation and Administration Guide.

GRiD3780 is an optional application that allows the GRiD Server to emulate an IBM3780 terminal in order to download or upload data files from a mainframe. For detailed information on the GRiD3780 program, see the GRiD3780 Installation and Administration Guide.

## SYSTEM.INIT CONCEPTS

As described in the overview at the start of this chapter, System.Init ("System Initialization") is a command file executed by the GRiD Server operating system at startup. In addition to system commands, the file contains the name of the GRiD Server and activation commands for GPIB peripheral storage devices as well as the (optional) GRiDMail programs. The file is located in the Programs subject of the Server Subjects device.

Figure 4-1 shows a listing of the System.Init file that is shipped on each GRiD Server. The following discussion explains the contents of the file in two parts: (a) the information all System Administrators need to know (how to set the system name and activate GPIB peripheral storage devices), and (b) additional information for

more technically inclined System Administrators. Refer to the numbered circles in Figure 4-1 as you read the following paragraphs. Procedures for modifying the System.Init file are given at the end of this section.

Figure 4-1: Listing of System.Init Configuration File

```

;*****
; System.Init: GRiD Server boot configuration
;*****

; Set the disk cache parameters
1 — SetCache 32 6

; Recover file space of deleted users
2 — UAFDelete

; Start automatic disk backup
3 — AutoBackup AutoBackupConfig-Text-

; Set the system name
4 — SystemName 'GRiD Server'

; Example of how to start second 2101 disk system
5 — GS.Activate device 'Hard Disk' as 'Extra Hard Disk' 12
   — GS.Activate device 'Floppy Disk' as 'Extra Floppy Disk' 13

; Start admin manager
6 — AdminManager 200

; Verify disk space information
7 — UAFActualDisk

; Start VFS manager
8 — VFSManager VFSConfig-Database-

; Boot other cards
9 — Bootcards

; Configure the communication cards
10 — >2 'GRiDNetwork Manager'

; Start the GRiDMail Broadcast manager on the
; application processor, usually in slot 3
; >3 'BroadcastManager'
11 —
; Start the GRiDMail Post Office on the
; application processor, usually in slot 3
; >3 'GRiDMail Post Office'

; Start Spool manager
12 — 'GRiDSpool Manager'

; End of System.Init-Com- file

```

## AutoBackup

The automatic backup program (item ③ in Figure 4-1) lets you automatically backup from, and add to, specified disk or tape drives. As shipped from the GRiD factory, this program is commented in the System.Init file. To activate AutoBackup, the semicolon (";") at the beginning of that line must be removed (see the Modifying System.Init section in this chapter). For details about the AutoBackupConfig file, which lets you configure the time and day of week when a specific source disk is backed up to a destination disk, see the AutoBackupConfig Concepts section in this chapter.

## System Name

The system name (item ④ in Figure 4-1) is the name by which GRiD Server devices are recognized. The system name is the string of characters appearing before the colon in a device name such as "GRiD Server:Software Subjects." The name distinguishes this particular GRiD Server from local devices and other GRiD Servers in your organization. The system name must be at least three characters long. As System Administrator, you have the responsibility of choosing a name.

The length of the system name, the longest device name, and the colon cannot be more than 35 characters long. For example, "GRiD Server:Backup Portable Floppy" is 34 characters long. If a shorter name were chosen for the portable floppy, the system name could be longer. We recommend that short system names be used (e.g., "ACME" or "FRED") to make the device names easier for users to recognize.

The system name can contain any special characters except DEL, CTRL, ', ~, or |. If the name contains any special characters or blanks, the name in the System.Init file must be enclosed in single quotation marks (e.g., 'GRiD Server'). If the name itself contains a single quotation mark, the quotation mark must be repeated (e.g., 'ACME''s Server').

## GPiB Peripheral Storage Device Activations

Item ⑤ in Figure 4-1 consists of GPiB peripheral device activations. As shipped from GRiD, all the activations are commented out (a ";" as the first character tells the system to ignore the line).

The GRiD Server operating system automatically activates the first 2101 Hard Disk System and 2102 Portable Diskette Drive. As you can see in item ④ of Figure 4-1, the activation commands for the second 2101 are commented out. From the commands, you can see that for a 2101, the hard disk and the floppy must be activated separately, since they are separate GPiB devices. The format of the commands has two requirements:

- o The word "device" must be inserted in the command. It tells the operating system to look in the active device table (rather than on disk) for the driver name. In effect, the command tells the operating system to share a copy of an already-active driver. This means that if you have two GPIB disks configured on your system, you cannot use the second disk without the first disk, since the driver for the first disk is not in the active device table unless the disk is physically present.
- o You must use special reserved words recognized by the operating system: "Hard Disk," "Floppy Disk," and "Portable Floppy." These reserved words must be spelled exactly as shown, and since they have a blank in them, they must be enclosed in single quotation marks.

The device name is your choice, except that you cannot use the special reserved words as device names (i.e., you cannot call a 2101 disk "Hard Disk", you must use a different name such as "Extra Hard Disk" or "Disk2"). The name "Extra Hard Disk" and the address of 12 were chosen to be consistent with the name used by GRiD-OS when you connect a second hard disk to a GRiD computer. If the device name contains any blanks, the name must be enclosed in single quotation marks (e.g., 'Extra Hard Disk').

It is important to realize that the device name in these activation commands is not the device name seen by the user. The name in System.Init is an "intermediate name" needed by the VFSConfig configuration file; the actual device name seen by the user is in the latter file. Thus, it does not matter what name you use in these commands, as long as it is consistent with the Device Location column of VFSConfig. There is one exception to this rule: if the 2101 has been partitioned with GRiD-OS, the name in System.Init must not include the volume number, while the name in VFSConfig must include the volume number (e.g., "Extra Hard Disk Volume 2").

Although Figure 4-1 only contains the commands for a second 2101, the number of 2101's and 2102's you can attach to GRiD Server is limited only by the restriction that the total number of GPIB devices must be less than 15 (remember that a 2101 counts as two devices: one for the hard disk, and one for the floppy). To add a third 2101, for example, simply duplicate the two activation commands, and then change the device names and addresses. To add a second 2102, duplicate one of the 2101 floppy disk commands and change the names and addresses appropriately, for example:

```
GS.Activate device 'Portable Floppy' as 'Extra Portable Floppy' 14
```

NOTE: The address for the 2101 Floppy Disk is always one greater than that for the 2101 Hard Disk. The address of the Hard Disk is the one that is physically set on the rear of the device.



Table 4-1. GPIB Device Addresses and Switch Settings

Device	Address (Decimal)	Switch Settings
First 2101 Hard Disk	4 *	3 up
First 2101 Floppy Disk	5 *	(Part of 2101 Disk)
Second 2101 Hard Disk	12	2,3 up
Second 2101 Floppy Disk	13	(Part of 2101 Disk)
First 2102 Portable Diskette	6 *	3,4 up
Second 2102 Portable Diskette	14	2,3,4 up

(\* address cannot be changed)

### GRiDMail Programs

The GRiDMail programs (item 11 in Figure 4-1) let you run the optional GRiDMail software package. GRiDMail allows users on a GRiD Server to exchange mail electronically with other users on the same GRiD Server (or other GRiD Servers in a GRiDMail network). For detailed information about GRiDMail, see the GRiDMail Installation and Administration Guide.

### GRiDSpool Manager

The GRiDSpool Manager program (item 12 in Figure 4-1) lets you add, delete, modify, enable, and disable printers attached to the GRiD Server system. As shipped from the GRiD factory, this program is commented in the System.Init file. Before you can modify this program via RemoteAdministrator, you must activate GRiDSpool Manager by removing the semicolon (";") at the beginning of that line (see the Modifying System.Init section in this chapter). For details about the GRiDSpool Manager program, see GRiDSpool Manager Concepts and the Modifying GRiDSpool Manager sections in this chapter.

### System.Init Execution

When System.Init is executed during system startup, a variety of errors can be produced. Since the file contains operating system commands rather than data input to a configuration program (as is the case with VFSConfig), the range of errors that can occur is considerably wider.

The best method of observing and resolving errors caused during System.Init execution is: (a) watch System.Init execute using the

procedure given in Chapter 10; (b) examine the system error log text file after execution is complete; and (c) use the information in Appendix D to determine the cause of any errors.

#### For More Technical System Administrators

The following is a brief discussion of other commands in System.Init (not normally modified by the System Administrator). Refer to the numbered items in Figure 4-1.

**CAUTION:** All the programs discussed below are designed to be run only from System.Init during system startup. Running them at any other time can cause the system to require restarting. Also, do not change the order of commands in System.Init. The current order is required for proper system startup.

- 1 SetCache activates disk cacheing for the 2701 and 2703 Disk Units. If this command is commented out, no disk cacheing is done. The first parameter is the number of 512-byte buffers allocated from the file processor's RAM for the cache memory. The second parameter is the number of sectors that are read ahead (the "fetch limit"). The defaults are 32 and 6. The maximum number of buffers that can be used for the cache memory depends on the amount of free memory on the file processor card. As the cache is made larger, fewer accesses to disk are required for read requests. However, as the cache is made larger, other system processes running on the file processor may run out of memory.
- 2 UAFDelete deletes the file space (including passworded files) of users, groups, and companies deleted by the System Administrator.
- 6 AdminManager controls all GRiD Server internal administrative functions.
- 7 UAFActualDisk checks the actual file space occupied by each user's User Subjects and updates the total stored in the User Authorization File (UAF). UAFActualDisk also compresses the UAF (physically deletes logically deleted records). As the number of users and files increases on your GRiD Server system, UAFDelete and UAFActualDisk have more work to do. As a result, they take longer to execute. On a large GRiD Server system (e.g., 40 users and 80MB of data), these programs can increase the startup time significantly (to over ten minutes). Commenting out these lines in System.Init (by putting a ";" as the first character in the line) can be useful if you restart the system frequently (i.e., during testing or troubleshooting). Note, however, that by commenting out these lines, (a) the file space of deleted users is not recovered, and (b) the disk space usage values may become inaccurate due to re-starts and power failures. When you uncomment these lines again and restart the system, both of these conditions are fixed automatically.

- 8 VFSManager controls all interaction with the GRiD Server disk units.
- 9 BootCards loads the communication and application processors' operating systems.
- 10 GRiDNetwork Manager controls the GRiD Server system communication processor(s). The number after the "<" sign indicates the slot number of the communication processor on which the GRiDNetwork Manager should be running.

## MODIFYING SYSTEM.INIT

After reading the System.Init concepts section, you are ready to modify the System.Init file. Before proceeding, note that:

- o The following procedure assumes you are signed on to GRiD Server as the System Administrator via GRiDLink or PhoneLink (the former is faster, but both work).
- o After making changes, the system must be restarted for the changes to take effect.
- o Any changes in GPIB storage device activations must be reflected in the VFSSConfig database before the changes can take effect (see the VFSSConfig section of this chapter).

### ▶ TO MODIFY SYSTEM.INIT

1. Select GRiDWrite from a local device or the Programs subject of the Software Subjects device (see Figure 4-2). Note that normally you select a file of Kind Text, and GRiD-OS retrieves GRiDWrite for you, instead of selecting GRiDWrite directly. You are doing this because the file to be edited is of Kind Com. If you are modifying System.Init via PhoneLink, it is faster if you select a copy of GRiDWrite from a local storage device.

Figure 4-2: Selecting GRiDWrite from Software Subjects

23-Jan-86		GRiD Systems Corporation		11:28 am	
GRiDtaskBuilder				Run	
GRiDTerm				Run Terminal	
GRiDTerna				Run Terminal	
GRiDTerna Serial				Device	
GRiDTransfer				Run	
GRiDUT100				Run UT100	
GRiDUT100A				Run UT100	
GRiDWrite				Run Text	
GRiDWrite (overlays)				Run Text	
Hayes				Modem	
Hayes2400External				Modem	
HayesExternal				Modem	
HP2225GPIB				Printer	
HP2225Parallel				Printer	
Device	GRiD Server:Software Subjects				
Subject	Programs				
Title	GRiDWrite				
Kind	Run Text				
Password					
Select a File and confirm or press Code for Help					

2. Once in GRiDWrite, you have a blank screen, ready for what normally would be text entry. Press CODE-T, and select Include a File.
3. Select the System.Init file from the Programs subject of the Server Subject device, and Confirm (see Figure 4-3). Be careful to select System.Init and not System.Init Model.

Figure 4-3: Including System.Init from Server Subjects

23-Jan-86	GRiD Systems Corporation	11:29 am
SetBootLine		Run
SETCACHE		RUN
SetDebugMask		Run
SETSPEED		run
SpoolManager		Run
Status		Run
Sullivan		Notes
SWITCHBOARD		RUN
<b>System.Init</b>		<b>Con</b>
System.Init Model		Con
SystemName		Run
TapeEdit		Run
TernLink		Run
TernLink		Text
Device	GRiD Server:Server Subjects	
Subject	Programs	
Title	<input type="text" value="System.Init"/>	
Kind	Con	
Password		
Include: Fill in Form and confirm		

4. Confirm again to define the top of the screen as the destination for the included file.
5. When the file has been included into GRiDWrite's workspace, press CODE-SHIFT-UpArrow to bring the file into view. Use normal GRiDWrite commands to make the changes you have planned. As discussed in the "Concepts" section above, these changes may include:
  - o Changing the system name
  - o Uncommenting the second 2101 disk activation commands and changing the device names and addresses as desired
  - o Duplicating the second 2101 disk activation commands to activate a third or further disk, then changing the device names and addresses as desired.
  - o Adding one or more activation command for second and further 2102 Portable Diskette Drives.
  - o Starting the autobackup software.
  - o Starting GRiDspool Manager.
  - o Starting the GRiDmail programs.

6. When your changes are complete, press CODE-T and select Write to a File. GRiDWrite presents you with a File form to specify where you want to write the file. Select System.Init again, just as in Step 3 above (see Figure 4-3), and Confirm twice to save your changes over the original copy.
7. Press CODE-ESC (not CODE-Q) to exit GRiDWrite.

## VFSCONFIG CONCEPTS

As described in the overview at the start of this chapter, VFSConfig ("Virtual File System Configuration") is a GRiDFile database used by the GRiD Server operating system at startup to define a variety of system characteristics, including:

- o The device names used for each GRiD Server storage device.
- o The administrative capability required (if any) for read/write access to each device.
- o The devices that the system searches for an application when a user selects a data file with a corresponding Kind.

The file is located in the Programs subject of the Server Subjects device. Figure 4-4 gives a listing of the VFSConfig database that is shipped on each GRiD Server. Procedures for modifying VFSConfig are given at the end of this section.

Figure 4-4: Listing of Standard VFSConfig Database

Device Name	Device Type	Device Location	Files Organized By	Files Read By	Files Changed By	Start Spool	Spool Banner	Search Device
;Backup Disk 1	NormalFiles	Hard Disk	System	SystemAdmin	SystemAdmin			No
;Backup Disk 2	NormalFiles	Extra Hard Disk	System	SystemAdmin	SystemAdmin			No
;Backup Floppy 1	NormalFiles	Floppy Disk	System	NormalUser	NormalUser			No
;Backup Floppy 2	NormalFiles	Extra Floppy Disk	System	NormalUser	NormalUser			No
;Backup Portable Floppy	NormalFiles	Portable Floppy	System	NormalUser	NormalUser			No
;Company Subjects	NormalFiles	System Disk	Company	NormalUser	CompanyAdmin			No
;Group Subjects	NormalFiles	System Disk	Group	NormalUser	GroupAdmin			No
;Shared Subjects	NormalFiles	System Disk	System	NormalUser	NormalUser			No
Software Subjects	NormalFiles	System Disk	System	NormalUser	SystemAdmin			Yes
User Subjects	NormalFiles	System Disk	User	NormalUser	NormalUser			No

### Database Structure and Format

Each column in the VFSConfig database contains a different kind of configuration information; each row represents all the

characteristics for one GRiD Server device. As in the System.Init file, a semicolon (";") as the first character in a row means the row is only a comment (i.e., it is ignored when the file is processed). Note that as the file is shipped from GRiD, only two devices are active; all other devices are commented out. One of the purposes of this section is to help you decide which devices you need to activate (uncomment) for your system configuration.

### Column Definitions

In general, all entries in the VFSConfig database except those in the Device Name column must be spelled exactly as shown in Figure 4-4 (including blanks, where used). Capital letters are not significant: they only make the entries easier to read. The information contained under the headings in the columns are:

- o "Device Name" is the name that a user sees on the computer screen (prefixed by the system name) for each GRiD Server device. For example, "GRiD Server:User Subjects" (the last row in the file) is the name for the user's private file storage area. Device names can be changed as desired, within the following restrictions:
  1. The total number of characters of the system name plus the device name plus the colon can be no greater than 35.
  2. GPIB disk Device Names cannot be the same as the names in the Device Location column (i.e., you cannot use "Hard Disk" as a device name).
  3. Device names must be unique (i.e., you cannot have two devices called "Backup Disk 1").
  4. Device names cannot contain the special characters DEL, CTRL, ', -, and |.
  5. None of the following can be used as device names: the numbers 0-7 followed by the letters A-D, B, BB, Boot Device, C, CI, CO, F, FO, GPIB, N, Name Device, W, or WO.
  6. Unlike System.Init, single quotation marks are not used to enclose a device name containing a blank, and single quotation marks appearing in the name are not repeated.
- o "Device Type" identifies the kind of files that exist on the device. There are only "NormalFiles".
- o "Device Location" identifies the physical location of the files that exist on the device. There are two categories of devices in this column: 2701/2703 disks and GPIB disks. The "System Disk" location collectively represents all the 2701 and 2703 Disk Units connected to your GRiD Server. "Hard Disk," "Floppy Disk," and

"Portable Floppy" are the location names (special reserved words) for the first 2101 and 2102 storage units that are automatically configured on every GRiD Server. "Extra Hard Disk" and "Extra Floppy Disk" are the intermediate device names that appear in System.Init for the second 2101.

- o "Files Organized By" defines the subset of users that can access files on each device. There are only four valid entries in this column: "System," "Company," "Group," and "User." "System" means that all users on the system can access files on the device; "Company" and "Group" mean that only users belonging to a Company or a Group respectively can access files on the device; "User" means that only the user can access files in his User Subjects device. There is one key restriction on this column: the "Company," "Group," and "User" entries can only appear once. Thus, you cannot change anything in this column.
- o "Files Read By" determines what kind of user can read files without changing them. The five valid entries in this column are "SystemAdmin," "CompanyAdmin," "GroupAdmin," "NormalUser," and "Not Applicable." Files that can be read by NormalUsers can also be read by those with higher authorization (in increasing order of authority: GroupAdmin, CompanyAdmin, and SystemAdmin). Files that can be read by those with higher authorization (e.g., CompanyAdmin) cannot be read by those with lower authorization (e.g., GroupAdmin). See Chapter 5 for more information on Companies, Groups, and their Administrators.
- o "Files Changed By" determines what kind of user can modify files. The same five entries from the "Files Read By" column are valid here and operate in the same manner.
- o "Start Spool" is an empty column that exists because of a function from an earlier software version. This column must remain empty and may not be deleted.
- o "Spool Banner" is an empty column that exists because of a function from an earlier software version. This column must remain empty and may not be deleted.
- o "Search Device" determines which devices are automatically searched by GRiD-OS for a GRiD application when a user selects a data file with a corresponding Kind. An entry of "Yes" means that the particular device is searched (e.g., for GRiDWrite, when a user selects a file of Kind Text). An entry of "No" means that the device is not searched. The order in which devices are searched is that in which the devices appear on the the user's screen. You must put an entry in this column for every device.



## Device Definitions

The values used for device name, read-write access, and other characteristics in the VFSCONFIG database of Figure 4-4 were chosen as a reasonable starting configuration, and to help illustrate the function of the device. You can change most of these values, as desired. Reading from bottom to top, the function of each device is:

- o "User Subjects" is the user's private file storage area. Other possible names for this device are "Work Area" or "User's Work." No other column values are typically changed for this device.
- o "Software Subjects" is the storage area for GRiD Software (the Management Tools, GRiD Server MS-DOS software, and other GRiD programs). Another name for this device might be "GRiD Software."

Write access to Software Subjects is normally limited to System Administrator so that only you are able to erase or update GRiD Software. Software Subjects is the only device that is searched in the standard configuration (see the last column in Figure 4-4) because GRiD software is normally resident only in Software Subjects. If your firm develops some user-written applications, these programs might be located in another device such as Company Subjects; if this is the case, then the Search Device column on that device should be set to "Yes" so that GRiD-OS can find the applications.

NOTE: The system is shipped with files already loaded into the Software Subjects device; thus, if you want to change "Software Subjects" to another name, a special procedure is required (see the "To Change the Name of a Device Containing Files" procedure later in this chapter).

- o "Shared Subjects" is a file storage area to which (in the standard configuration) all users on GRiD Server have read and write access. The device location is normally System Disk. The semicolon in front of this device name in Figure 4-4 indicates that this device is not active when GRiD Server is shipped. You must decide whether your particular firm has a need for this device and the other commented-out devices above it.

Depending on the application, other possible names for this device are "Bulletin Board," or "Shared Data." There is no limit on the number of devices of this class. For example, two additional devices can be configured, one called "Bulletin Board" to which everyone has read-write access, and one called "Templates" to which all normal users have read access but only System Administrators have write access. The former device can contain "announcements" (subjects) into which users can put messages and memos. The latter device can be loaded by the

System Administrator with templates (worksheets, graph files, and databases with labels and calculations but no data) of general interest; users can duplicate them with CODE-D into their own work areas as needed with no possibility of the templates being accidentally modified or erased.

- o "Group Subjects" and "Company Subjects" are similar devices in concept. In the standard configuration, they are both read-only file libraries, accessible to all users belonging to a group or a company, respectively. Their intended application is similar to the "Templates" device described under "Shared Subjects" above, except that access to these libraries is limited to subsets of GRiD Server users rather than to all users.

A typical application of Company Subjects is in an organization where the various departments (Marketing, Engineering, Manufacturing, etc.) are defined as GRiD Server "Companies." In this case, Company Subjects serves as a department-wide, read-only library for forecasting templates and other files unique to each department. Users can duplicate the templates into their local storage device, then complete the template with any required information, with no possibility of accidentally erasing or modifying the standard template in Company Subjects.

These devices must exist for all groups and/or all companies; it is not possible to have a Company Subjects device for one company and not for another. (Note that devices can be empty; they can exist without containing files. This means that all users, regardless of the group or company they belong to, see the same device names. This somewhat limits your flexibility when modifying the device's name, because it should not be tied to a specific group or company. In the example above, where companies are actually Departments, it might make sense to change the name of Company Subjects to "Department Subjects." In any case, we recommend that you not activate these devices unless you have an application for them; this lessens the possibility of confusion among users.

- o "Backup Disk 1" and "Backup Floppy 1" are the first 2101 on the GPIB; "Backup Disk 2" and "Backup Floppy 2" are the second 2101 on the GPIB. As with any device, the names are your choice, though the Device Location names must match those you put in System.Init, with the exception that 2101's partitioned under GRiD-OS must have the volume number in VFSConfig but not in System.Init.

The read-write access for each of these devices depends on your environment. 2101's are generally used as moveable, shared devices.

The devices are nearly always defined as readable and writeable by normal users. In this case, the disk may spend more time off GRiD Server than on; the device is used as a more convenient

medium than floppy disks for transferring data between other computers and GRiD Server.

NOTE: Once the system has been started with a 2101 connected, you can disconnect it only by removing the GPIB cable first and then turning off the 2101. To reconnect it, turn on the 2101 first and then reconnect the GPIB cable. Doing otherwise interferes with the operation of other GPIB devices on the system.

- o "Backup Portable Floppy" is the first 2102 on the GPIB. It is intended for use by individual users to back up their files, and for other administrative uses. If you intend to leave a 2102 permanently attached to GRiD Server, a better name might be "Server Floppy."
- o One device that does not appear in VFSConfig is Server Subjects. This device contains the operating software for GRiD Server. The name "Server Subjects" is hard-coded into the operating system and cannot be changed. The operating system also forces Server Subjects to be the last device on the device list. Read access to Server Subjects is NormalUser. A user cannot damage GRiD Server by reading Server Subjects, but trying to execute some of the files in Server Subjects can cause the workstation to require restarting. Write access is SystemAdmin: only the System Administrator should be able to change anything in Server Subjects (e.g., System.Init). Server Subjects is never searched for a GRiD application.

#### VFSConfig Execution

When VFSConfig is executed (interpreted) during system startup, only a few errors can occur. The following list covers the majority of errors and some messages that can appear in the system error log text file as a result of VFSConfig problems:

- o If you misspell one of the keywords in VFSConfig (e.g., "NotApplicable" instead of "Not Applicable."), you see error 901 (Invalid configuration file).
- o If you misspell one of the keywords for a GPIB disk, you see both error 901 and error 227 (Device not ready).
- o If you put duplicate names in Column A and Column C, you see error 230 (Device already active).
- o If you put duplicate names in Column C, no errors are produced, but both of the corresponding Column A devices access the same physical device.
- o If you put duplicate names in Column A, you cannot access the physical device corresponding to the second occurrence of the name.

MODIFYING VFSCONFIG

After reading the VFSConfig concepts section, you are ready to modify the VFSConfig database. Note the following before proceeding:

- o The following procedure assumes you are signed on to GRiD Server as the System Administrator via GRiDLink or PhoneLink (the former is faster, but both work).
- o After making changes, the system must be restarted for them to take effect.
- o Any changes in GPIB device locations (Column C) must be consistent with System.Init before the changes can take effect (see the System.Init section earlier in this chapter).

▶ TO MODIFY VFSCONFIG

1. Select VFSConfig from the Programs subject of the Server Subjects device (see Figure 4-5), and Confirm. Be careful to select VFSConfig, not VFSConfig Model. GRiD-OS retrieves GRiDFile for you, from a local storage device if you have it, or from GRiD Server's Software Subjects device if a copy resides there. If you are modifying VFSConfig via PhoneLink, it is faster if you have a copy of GRiDFile on a local storage medium.

Figure 4-5: Selecting VFSConfig from Server Subjects

23-Jan-86		GRiD Systems Corporation		2:37 pm	
UAFCHANGEDEVICE					RUN
UAFDELETE					RUN
User				Profile	
<u>VFSConfig</u>				<u>Database</u>	
VFSConfig				Database Index A	
VFSConfig Model				Database	
UFSManager					Run
UFSsignon					Run
UFSUipclink					Run
Uipc					Run
Uipc128K					Run
VolumeName					Run
Wait					Run
Work					Run
Device	GRiD Server:Server Subjects				
Subject	Programs				
Title	<u>VFSConfig</u>				
Kind	Database				
Password					

2. Press CODE-F, and Confirm to find all the records in VFSConfig. When the file appears in GRiDFile's workspace, use normal GRiDFile commands to make the changes you have planned. As discussed in the "Concepts" section above, these changes may include:
  - o Uncommenting (activating) one or more devices.
  - o Changing device names.
  - o Changing the requirements to read and write on each device.
  - o Increasing the number of devices that are searched for a GRiD application by GRiD-OS.

NOTE: You can change column widths in VFSConfig as required to see all the entries (use CODE-P).

3. When your changes are complete, press CODE-T and Confirm Save This File. GRiDFile ensures that all of your changes are reflected in the database.
4. Press CODE-? and select Compress (Remove Deleted Records). Confirm to clear the screen and compress the database.
5. When the compress is complete, press CODE-F and Confirm to find all records. Verify your changes.
6. If you want to control the order in which the devices appear on a user's computer screen, perform the (optional) "To Control the Order of Devices" procedure explained below.
7. Press CODE-Q or CODE-ESC to exit GRiDFile.

### Controlling the Order of Devices

Because of the way GRiDFile works, the order of the devices on your GRiDFile screen is usually not the same as appears on a user's screen. There may be good reasons to control this order, for example:

- o Minimizing File form keystrokes by ensuring that the most frequently used subject (e.g., "User Subjects") is the first choice on the device list.
- o Minimizing user confusion by maintaining a consistent device order over time. This is especially important to MS-DOS users, where each device is identified with only a single letter.

The objective of the following procedure is to put the VFSConfig records into the inverse physical order of that desired on the



NOTE: Be sure to use Kind Graph, not Kind Database!

4. Use CODE-E and CODE-R to erase all the records in the database.
5. Press CODE-?, select Compress (Remove Deleted Records), then Confirm to clear the screen and compress the empty database.
6. Press CODE-T, select Include a File, select the file you just created in Step 3, and Confirm to bring the properly-ordered records back into the database.

NOTE: From this point to the end of the procedure, be very careful not to press any other keys accidentally (such as the space bar). Any change to a record, even adding a blank, moves the record down to the end of the file (though the change is not visible on your screen unless you press CODE-F again).

7. When the outline is over column A, press CODE-P. Set the Column Index property back to Unique Entries, and Confirm to recreate the index.
8. Press CODE-T, select Save This File, and Confirm. GRiDFile ensures that the database is complete.
9. Press CODE-Q or CODE-ESC to exit GRiDFile.

#### Maintaining the Order Over Time

The purpose of the index on Column A in VFSConfig is to ensure that you do not create duplicate device names. The index is not used by the operating system in any way. If you use a manual method of avoiding duplicate device names, you can leave the database un-indexed. This has a significant advantage: the order of the records on your GRiDFile screen after a CODE-F is always the actual order of the records in the file.

This means that you can use the following method of maintaining the order once it has been established:

#### ▶ TO CONTROL THE ORDER OF DEVICES (METHOD 2)

1. After using the Method 1 procedure above to get the devices into the desired order, make the necessary changes in the database without regard to order.
2. Move the outline to Column A in the top row, and move the cursor to the extreme left-hand side of column A.
3. Alternatively, press BACKSPACE and DownArrow until you reach the line below the last record on the screen. Pressing

BACKSPACE flags the record as "deleted" and writes a new copy at the end of the database (even though you have made no changes). Since the records are in the right order, changing every record from top to bottom keeps them in the right order.

4. Compress the database and exit. Be careful not to press any other keys accidentally; if you do, go back to Step 2.

### Changing the Name of a Device Containing Files

When a device contains files, the GRiD Server operating system establishes a series of directories to those files and an entry in the User Authorization File (UAF). If you change the name of the device in VFSSConfig (e.g., change "Software Subjects" to "GRiD Software"), the directories and the entry in the UAF are not automatically renamed. Instead, you must first create the new device, then move the files from the old device to the new device, and finally delete the old device.

This procedure leaves the old (empty) device directories on the disk, but since they occupy only very little disk space, and are not visible except via the diagnostic port, this normally is not a problem. To delete the empty directories, you must use the HDelete utility via the diagnostic port (see Chapters 8 and 9).

The following procedure assumes you are signed on to GRiD Server as the System Administrator via GRiDLink or PhoneLink (the former is faster, but both work).

#### TO CHANGE THE NAME OF A DEVICE CONTAINING FILES

1. Use the "To Modify VFSSConfig" procedure above to add the new device name to the database.
2. Restart GRiD Server to make your change take effect, then sign on as the System Administrator again.
3. Use GRiDManager's CODE-M command to move all the files from the old device to the new device (use the CODE-W wildcard for Subject, Title, and Kind).
4. Use the "To Modify VFSSConfig" procedure again to delete the old device from the database (you can simply comment it out).
5. Restart GRiD Server for your change to take effect.

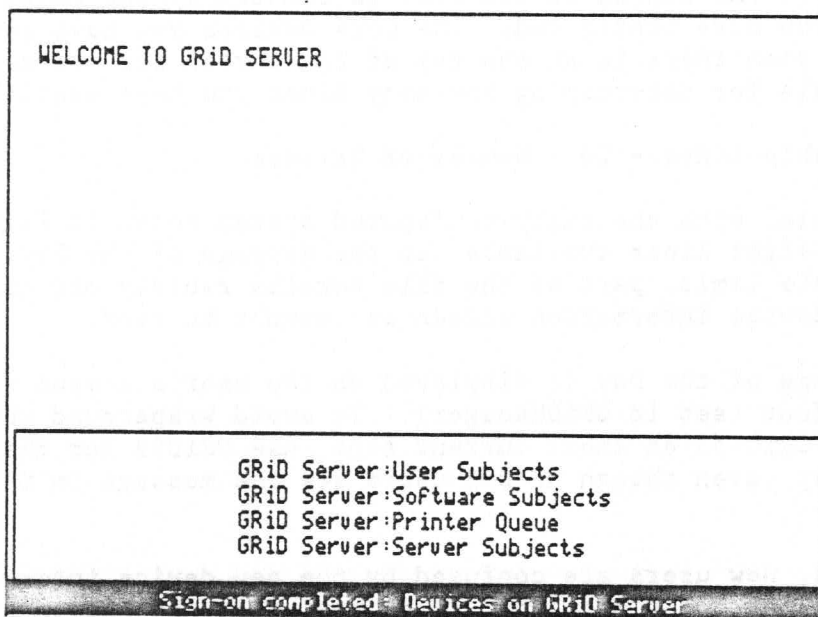
### MESSAGE OF THE DAY CONCEPTS

As described in the overview at the start of this chapter, Message of the Day is a text file containing the "welcome message" that



appears on the new device information screen when you first sign on to GRiD Server. This file is not a configuration file but a communication medium between you (the System Administrator) and your system's users. The file is located in the Programs subject of the Server Subjects device. Figure 4-7 shows how the standard Message of the Day file appears when it is viewed in GRiDWrite.

Figure 4-7: Message Of The Day File Viewed In GRiDWrite



A few of the many possible applications for the Message of the Day file are:

- o Informing users whom they can call for help with problems.
- o Notifying users of new hardware (e.g., a new printer, a 2703 disk unit, etc.) that has been attached to the system.
- o Notifying users of new versions of software in Software Subjects.
- o Notifying users of planned down time, for example, for wiring changes in the room where GRiD Server is located.
- o Announcing contests such as one to find a new system name for GRiD Server.
- o Reminders to users to back up their files themselves between system-wide backups.
- o Notifying users of temporarily missing hardware, for example, a printer that has been loaned to a user for a special project.
- o Informing users of new phone numbers for PhoneLink lines.

- o Wishing a user happy birthday.
- o Announcing department or company meetings.
- o Welcoming users to GRiD Server.

The Message of the Day file is a text file; you edit it via GRiDWrite. The length of the file is limited by the number of devices you have configured. The more devices you have configured, the less room there is at the top of the screen for the message. The formula for determining how many lines you have available is:

Available Lines = 20 - Number of Devices

For example, with the fully-configured system shown in Figure 3-3, you have eight lines available for the Message of the Day. If you exceed this limit, part of the file scrolls rapidly off the top of the new device information screen and cannot be read.

The Message of the Day is displayed on the user's computer in the current font (set in GRiDManager). To avoid wraparound when users have set GRiD-53 as their current font, use GRiD53 for the Message of the Day (even though MS-DOS users see the message in GRiD80 or PC80).

Sometimes, new users are confused by the new device information screen. They don't know what to do next when the screen appears. One solution is to make the last line of the Message of the Day state that they should "Press any key to return to GRiDManager."

Some GRiD Server installations choose to save old Messages of the Day in a subject in Shared Subjects called "Previous Messages of the Day" for documentation purposes. Whenever you update the Message of the Day, you can use the Append to a File item on GRiDWrite's CODE-T menu to add the old message to the end of a history file.

NOTE: Users must be running version 3.1 or later of GRiDManager to see the Message of the Day.

## MODIFYING MESSAGE OF THE DAY

After reading the Message of the Day concepts section, you are ready to modify the Message of the Day file. The following procedure assumes you are signed on to GRiD Server as the System Administrator via GRiDLink or PhoneLink (the former is faster, but both work).

➤ TO MODIFY MESSAGE OF THE DAY

1. Select Message of the Day from the Programs subject of the Server Subjects (see Figure 4-8). GRiD-OS retrieves GRiDWrite for you. If you are modifying Message of the Day via PhoneLink, it is faster if you have a copy of GRiDWrite on a local storage medium.

Figure 4-8: Selecting Message Of The Day From Server Subjects

23-Jan-86                      GRiD Systems Corporation                      5:15 pm

INIT.ORA	text
IOR	RUN
Ladt	Run
LineEdit	Run
MachineID	Run
Memcruncher	Run
MenFile	Database
Message Of The Day	Text
MoveHexusUsers	Con
moveSullivan	Con
MoveUser	Con
NetworkManager	Configuration
NMI	Run
notes	Subject

Device	GRiD Server:Server Subjects
Subject	Programs
Title	Message Of The Day
Kind	Text
Password	

Select a file and confirm or press Code-? for help

2. When the file appears in GRiDWrite's workspace, use normal GRiDWrite commands to make the changes you have planned. Remember to limit yourself to the number of available lines for your configuration.
3. When your changes are complete, press CODE-Q and Confirm twice to save your changes over the original copy and to exit GRiDWrite.

#### REMOTE PRINTER DRIVER CONCEPTS

In order for a user to access a GRiD Server printer with the Print This File command on any CODE-T menu, the user must have a special remote printer driver file on a local storage medium (analogous to the EpsonFX80 file of Kind Printer used to access a locally-attached EpsonFX80 printer). This file is created by the System Administrator and placed in Software Subjects so that the system users can duplicate it to their local storage media.

Once a user has this file on a local storage device, it appears as a

choice for printers in GRiDManager's CODE-O Options form. If this printer is selected, all print output from all GRiD applications is redirected to the print queue for the particular printer on GRiD Server. The user must have a separate remote printer driver file for each GRiD Server printer to be accessed. By selecting from the printers listed in GRiDManager's CODE-O form, the user can quickly switch between several different GRiD Server printers and a locally attached printer.

A user does not have to be signed on to select the remote printer driver; only when using it. If the user is not signed on when printing is attempted, an error 227 (Device not active) is returned to the workstation screen. When the user successfully sends print output to a GRiD Server printer, the title on the banner page is in the form "User Name's ~Printout~" (e.g., "Smith's ~Printout~").

NOTE: Users must be running version 3.1 or later of GRiD-OS to use this capability.

### Printer Driver File Name Format

The remote printer driver file is created by duplicating the RemotePrinter file of Kind Device (located in the Programs subject of the Software Subjects device) into one or more new uniquely-titled files. You must create one remote printer driver file for each GRiD Server printer.

The title of each remote printer driver file is a composite of the system name and the printer name. The formal syntax of the file name is:

<GRiD Server System Name>:<Printer Queue Subject Name>

The Kind of the file must be Printer. For example, if you have chosen "ACME" as your GRiD Server system name, and "Wide Printer" and "Narrow Printer" as your GRiD Server printers' names, you must create two remote printer driver files of Kind Printer called:

ACME:Wide Printer (and) ACME:Narrow Printer

The contents of both files are identical: they are copies of the RemotePrinter device file. When the remote printer driver is executed on a user's computer, it uses its own name in forming the file system device name used to access the particular GRiD Server printer.

NOTE: If you change your system name or printer names in the future, remember to create new, appropriately-titled remote printer driver files. Use the Message of the Day to tell your users to duplicate the new files from Software Subjects into their local storage devices.

## CREATING REMOTE PRINTER DRIVER FILES

After reading the Remote Printer Driver Concepts section, you are ready to create your own remote printer driver files. Note that the following procedure assumes you are signed on to GRiD Server as the System Administrator via GRiDLink or PhoneLink (the former is faster, but both work).

### ▶ TO CREATE REMOTE PRINTER DRIVER FILES

1. Select GRiDManager from the Programs subject of your local storage device.
2. Press CODE-D (Duplicate), and select the RemotePrinter file of Kind Device in the Programs subject of the Software Subjects device as the source file.
3. For the destination file, select the same Device and Subject, but enter a new title consisting of your system name and the spooled printer name in the format "System Name:Printer Name" as discussed in the Concepts section above. Enter a Kind of "Printer."
4. Disable verification, and Confirm to create the new remote printer driver file (see Figure 4-9).

Figure 4-9: Creating a Remote Printer Driver File.

Source	
Device	GRiD Server:Software Subjects
Subject	Programs
Title	RemotePrinter
Kind	Device

Destination	
Device	GRiD Server:Software Subjects
Subject	Programs
Title	ACME:Narrow Printer
Kind	Printer

Enabled	<input type="checkbox"/> Disabled
Verification	<input type="checkbox"/> Disabled
New version only	No
Which files	All source files

Verify duplicate - Fill in form and confirm

5. Repeat Steps 2, 3, and 4 for each spooled printer that you have defined in System.Init and VFSConfig.

6. Press CODE-Q or CODE-ESC to exit GRiDManager.

## AUTOBACKUPCONFIG CONCEPTS

The AutoBackupConfig file is read during system initialization by the AutoBackup program. The AutoBackupConfig file sets the time at which the automatic backup is to begin. It also states the disk or tape drive from, and to, which the backup is made each day of the week. This text file can be modified via GRiDWrite.

## MODIFYING THE AUTOMATIC BACKUP CONFIGURATION FILE

You can use the AutoBackupConfig~Text~ file, which contains the following lines, as a model of the configuration file required by the automatic backup software.

```
; This is the AutoBackup configuration file

; Execute the backup at 11:30 pm every night
TIME 23.30

; The tape is drive 3

; Backup disk 1 to tape on Monday & Tuesday
Monday 1 3
Tuesday 1 3

; Backup disk 2 to tape on Wednesday & Thursday
Wed 2 3
Thu 2 3

; Backup disk 0 to tape on Friday, Saturday & Sunday
Other 0 3
```

To modify this file for your desired backup schedule, use the standard file form to select the AutoBackupConfig~Text~ (see Figure 4-10), which will retrieve GRiDWrite as its application.

Figure 4-10: Selecting AutoBackupConfig-Text~ From Server Subjects

9-Mar-86		GRiD Systems Corporation		2:00 pm	
@OracleErrors					Text
@ServerErrors					Text
AddAppMen					run
AddSubject					Run
AdminLog					Text
AdminManager					Run
Alias					Run
AutoBackup					Run
AutoBackupCompletion					Run
autobackupcompletion.normal					run
AutoBackupCompletion.Test					run
AutoBackupConfig					text
AutoBackupConfig Model					text
AutoBackupTerminate					Run
Device	GRiD Server:Server Subjects				
Subject	Programs				
Title	AutoBackupConfig				
Kind	text				
Passuord					
Select a File and confirm or press Code-? for help					

Modify the AutoBackupConfig-Text~ file with GRiDWrite commands according to the following rules:

- o Each item in the configuration file is specified as a keyword followed by one or more parameters.
- o The valid keywords are Time, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Other.
- o Each item must be on its own line and every line including the last must be terminated with RETURN (carriage return, line feed).
- o Keywords may be in any combination of upper and lower case.
- o Only the first three letters of a keyword are recognized.
- o Lines that do not begin with a keyword are ignored and may be used as comments.
- o The order of occurrence of the keywords in the file is not significant.
- o Parameters may be separated from keywords and from one another by blanks or tabs.

- o The time of day at which backup is to begin on all designated days is specified as

TIM[E] <hh>.<mm>

where:

TIME is the keyword, which may be abbreviated as TIM.

<hh> is the hour, which is expressed as an integer in the range 0 to 23.

<mm> is the minutes, which is expressed as an integer in the range 0 to 59.

For example,

Time 2.30

indicates that backup is to begin at 2:30 A.M., and

Time 14.15

indicates that backup is to begin at 2:15 P.M.

- o The source and destination devices for a day of the week are specified as

<Day> <SourceDeviceNumber> <DestinationDeviceNumber>

where:

<Day> is one of the following keywords: Sun[day], Mon[day], Tue[sday], Wed[nesday], Thu[rday], Fri[day], Sat[urday], or Oth[er] (for all days not explicitly specified).

<SourceDeviceNumber>

is an integer in the range 0 to 7 representing the position of the source disk on the peripheral bus chain.

<DestinationDeviceNumber>

is an integer in the range of 0 to 7 representing the position of the destination disk or tape unit on the peripheral bus chain.

For example,

Monday 1 3

indicates that peripheral bus disk 1 is to be backed up to



peripheral bus device 3 (disk or tape) every Monday.

Other 0 2

indicates that peripheral bus disk 0 is to be backed up to peripheral bus device 2 (disk or tape) on all days not explicitly specified (i.e., as Sunday, Monday, ..., Saturday) in the automatic backup configuration file.

After finishing the file modification, press CODE-Q and Confirm to save it.

If you need to change the time of day that automatic backup begins, or if you add peripheral bus disks to your GRiD Server system, you should modify your automatic backup configuration file to reflect the new disk and the new position of the tape drive. Any modifications made to the configuration file do not take effect until the system has been rebooted.

## REMOTEAADMINISTRATOR CONCEPTS

The RemoteAdministrator-Run- program provides access for configuring various applications on a GRiD Server. RemoteAdministrator is run on any workstation signed on to the GRiD Server via GRiDLink or PhoneLink (but not the diagnostic port). This program retrieves the list of applications available on GRiD Server and is used to configure the selected application. The applications available through RemoteAdministrator, which are documented here, are GRiDNetwork Manager and GRiDSpool Manager.

To access RemoteAdministrator, select this program from the Programs Subject in the Software Subjects device, then Confirm. The menu displayed shows a list of applications that are running on the GRiD Server and can be configured via RemoteAdministrator. If you are signed on to more than one GRiD Server, a menu of these GRiD Servers is displayed first.

## GRIDNETWORK MANAGER CONCEPTS

The system's communication processors are configured via the menus and forms of the GRiDNetwork Manager program (which is accessed through the RemoteAdministrator program). The GRiDNetwork Manager program is a simple menu and form driven program that leads you through the steps of modifying your GRiD Server's data communication configuration.

GRiDNetwork Manager enables the System Administrator to define, modify, and store the data communication configuration. Through it, you can identify how the communication processors in the system are configured for the GRiDLink and PhoneLink protocols. (For the TEMPEST GRiD Server, another option has been added, called "OpticGRiDLink"; refer to the 12.2 Addendum to GRiD Server Administrator's Guide for TEMPEST GRiD Server.) GRiDNetwork Manager

is accessed via the RemoteAdministrator program, located in the Programs Subject of the Software Subject device.

For further information on communication configuration concepts and restrictions, refer to the GRiD Server Administrator's Guide.

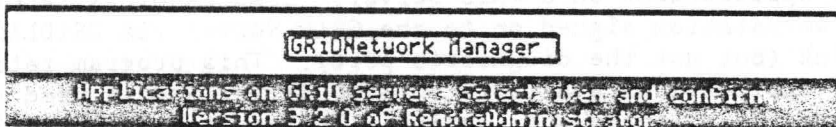
## MODIFYING THE COMMUNICATION CONFIGURATION VIA GRiDNETWORK MANAGER

After reading the GRiDNetwork Manager concepts section, you are ready to modify the communication configuration. Note that GRiDNetwork Manager options not explained below are specific to the optional GRiDMail package; refer to section 5.4 of the GRiDMail Installation and Administration Guide.

### ▶ TO MODIFY THE DATA COMMUNICATION CONFIGURATION

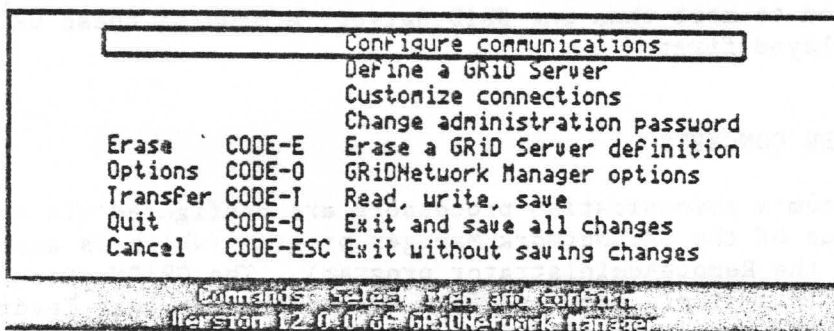
1. Sign on to GRiD Server via GRiDLink or PhoneLink.
2. Select RemoteAdministrator from the Programs Subject of the Software Subjects Device. Figure 4-11 shows the RemoteAdministrator menu.

Figure 4-11: RemoteAdministrator Menu



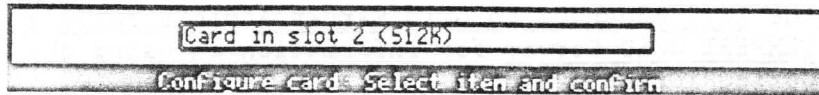
3. After the RemoteAdministrator menu is displayed (Figure 4-11), select GRiDNetwork Manager and Confirm. The following menu (Figure 4-12) is displayed.

Figure 4-12: GRiDNetwork Manager Menu



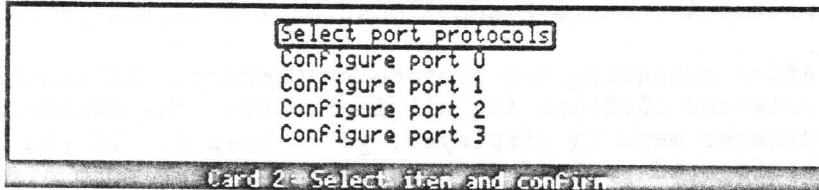
4. Select the "Configure communications" item, and Confirm. A list of communication processors in your GRiD Server is displayed (Figure 4-13).

Figure 4-13: List Of Communication Cards



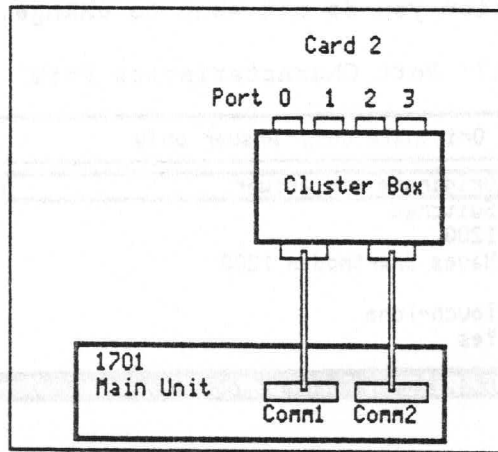
5. Select the card that you want to configure, and Confirm. Figure 4-14 shows the next menu displayed.

Figure 4-14: Selecting Port Protocols Menu



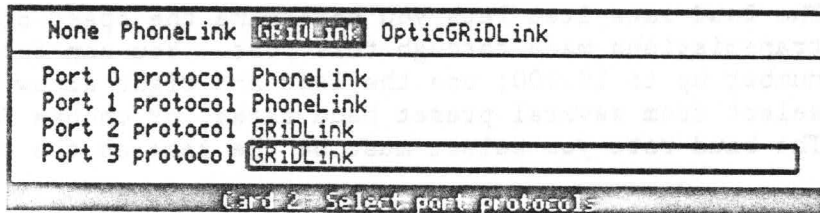
The following diagram (Figure 4-15) shows the cluster box and the corresponding port numbers.

Figure 4-15: Cluster Box With Numbered Ports



6. Choose the "Select port protocols" item, and Confirm. Each communication card has four ports. The next menu that is displayed (Figure 4-16) is used to select the protocol for each port on the card that you chose.

Figure 4-16: Port Protocols Form



NOTE: OpticGRiDLink is not a valid option for commercial GRiD Servers and should not be selected. If OpticGRiDLink is selected, your users cannot sign on to the GRiD Server. See the 12.2 Addendum to GRiD Server Administrator's Guide for TEMPEST GRiD Server for information on using the OpticGRiDLink protocol.

Select the port protocols for your GRiD Server system.

NOTE: Communication processor ports must be configured in pairs. When configuring a communication processor for both PhoneLink and GRiDLink, ports 0 and 1 must have PhoneLink protocols, ports 2 and 3 must have GRiDLink protocols.

7. After selecting the protocols, Confirm. If you have selected GRiDLink for all four ports, the GRiDNetwork Manager menu is displayed; go to step 8. If you have configured ports for PhoneLink, the next form displayed (Figure 4-17) lets you set the characteristics of the first (i.e., lowest numbered) port with the PhoneLink protocol. At the bottom of the screen is the number of the card and port whose characteristics are shown in the menu. (See Figure 4-15 for an explanation of card/port #3.) Confirm for the menu of each port configured previously and whose configuration you do not want to change.

Figure 4-17: Port Characteristics Form

<del>Originate and answer</del>	Originate only	Answer only
PhoneLink type	Originate and answer	
Line type	Switched	
Baud rate	1200	
Modem type	Hayes Smartmodem 1200	
External access code		
Dial type	Touch-Tone	
Auto dial	Yes	

Card 2 Port 0 \* Fill in Form and confirm

The items in this form are explained below, in alphabetic order.

The Auto dial item lets you determine whether the modem attached to this port is automatically ("Yes", default) or manually dialed and answered. This item must be set to "Yes".

The Baud rate item lets you determine the speed of transmissions made through this port. You can enter any number up to 19,200; use the left and right arrow keys to select from several preset baud rates, or choose External. The baud rate you select must be the same as the one set on

the modem that users call in on. If you select External, the baud rate is automatically set by the modem attached to that port. The modem must be capable of, and configured for, providing clock information to the GRiD Server.

NOTE: If you have a U.S. Robotics Courier 2400 modem attached to the port whose parameters are being set, it is possible to receive 1200 or 2400 baud transmissions without reconfiguring the port. The baud rate should be set to 1200/2400. It is not necessary to reset the port characteristic because of the automatic speed detection feature. (See Appendix K for an explanation of the automatic speed detection feature.)

The Dial type applies only to the optional GRiDMail Electronic Mail System. See the GRiDMail Installation and Administration Guide.

The External access code applies only to the optional GRiDMail Electronic Mail System. See the GRiDMail Installation and Administration Guide.

The Line type applies only to the optional GRiDMail Electronic Mail System. See the GRiDMail Installation and Administration Guide.

The Modem type item lets you determine whether the modem on this port is a Hayes Smartmodem 1200 (default) or USRobotics 2400. Use "Other" if any other kind of modem is attached (i.e., Ventel or Racal Vadic).

The PhoneLink type item lets you determine whether this port is used to Originate and answer (default), Originate only, or Answer only. Originate and answer means that that port can be used to initiate (dial out) as well as answer calls. The Originate function is used only by the optional GRiDMail program. Answer only means that the port can be used only to answer incoming calls.

8. After making your selections for the port, Confirm. The same form appears for the next (i.e., next higher numbered) port with a PhoneLink protocol. After the characteristics of all the ports with a PhoneLink protocol on that communication processor have been set, the GRiDNetwork Manager command menu is displayed again. If you have additional communication processors in the 1702 expansion unit, repeat this process for each processor card.
9. Press CODE-Q, then Confirm to save the changes you have made.
10. Restart the GRiD Server to effect your configuration changes.

## GRIDSPPOOL MANAGER CONCEPTS

GRIDSpool Manager is a program that lets you add, delete, modify, enable, and disable printers, as well as change the administrative password that gives access to all the commands of the GRIDSpool Manager form.

In order to activate a printer attached to the GRID Server, the GRIDSpool Manager program must be started by modifying the System.Init file. To start the GRIDSpool Manager program, its activation line must be uncommented by removing the ";" from the beginning of the activation line. This requires modifying the System Init file, a procedure described near the beginning of this chapter.

The GRIDSpool Manager program supports GPIB and serial printer interfaces. GPIB printers must have a unique address. When using serial printers, you must have a dedicated communication processor for them; thus, it is not possible to share serial printer ports and PhoneLink ports on the same communication processor. For more information about GRIDSpool Manager, refer to Chapter 6. For information about GRIDSpool Manager running on the TEMPEST GRID Server, see the Addendum to GRID Server Administrator's Guide for TEMPEST GRID Server.

## MODIFYING THE PRINTER CONFIGURATION VIA GRIDSPPOOL MANAGER

After reading the GRIDSpool Manager concepts section, signing on to GRID Server as the System Administrator, uncommenting the GRIDSpool Manager activation line in System.Init, and rebooting the GRID Server, you are ready to modify the printer configuration via GRIDSpool Manager.

### ▶ TO ADD A PRINTER

1. Select RemoteAdministrator in the Programs subject of Software Subjects device. Then select the GRIDSpool Manager item. The following menu is displayed (Figure 4-18).

Figure 4-18: GRiDspool Manager Menu

	<input type="text" value="Add or modify printer"/>
	Delete printer
	Printer status
	Reprint current file
	Disable printer
	Enable printer
	Change administration password
Erase	CODE-E Erase print file
Quit	CODE-Q Exit and save all changes
Cancel	CODE-Esc Exit without saving changes
Commands: Select item and confirm	
Version 12.2.0 of GRiDspool Manager	

2. Select the Add or modify printer item, and press CODE-RETURN to Confirm. The following form is displayed (Figure 4-19).

Figure 4-19: Printer Selection Form

<input type="text" value="Enter name"/>
Printer name <input type="text" value="Epson MX-82"/>
Add or modify printer - Fill in form and confirm

3. Type in the name of the printer you wish to add or modify. This name is the one a user sees when selecting a printer from the Printer Queue subject. After filling in this form and Confirming, the following form is displayed (Figure 4-20).

Figure 4-20: Printer Characteristics Form (Printer Driver)

EpsonFX100	<input type="text" value="EpsonMX82"/>
Printer driver	<input type="text" value="EpsonMX82"/>
Printer type	GPIO
Priority	Medium
Banner	Yes
Printer characteristics: Fill in form and confirm	
Epson MX-82	

4. For the printer driver field, select the driver that corresponds to the model of printer being added or modified; then press RETURN.

**CAUTION:** Ensure that the driver type corresponds to the printer type being added; i.e. if the printer type is serial, the printer driver must be serial. Mismatching printer driver and type can cause the operation of the GRiD Server system to be disrupted. In such a case, it is imperative that you contact a GRiD representative.

- After selecting the printer driver, press RETURN. Then select the printer type (either GPIB or serial) of the printer being added or modified (see Figure 4-21). Note that serial printers are connected to a cluster box, which, in turn, is connected either to the main unit or the Expansion unit; GPIB printers are connected to the GPIB connector on the main unit.

Figure 4-21: Printer Characteristics Form (Printer Type)

<b>GPIB</b> Serial	
Printer driver	EpsonMX82
Printer type	<u>GPIB</u>
Priority	Medium
Banner	Yes
Printer characteristics: Fill in Form and confirm Epson MX-82	

- After selecting the printer type, press RETURN. The next field (Figure 4-22), Priority, is important when more than one printer is attached to the GRiD Server system. If two printers are printing at the same time, the printer with the highest priority is first to receive data from the GRiD Server. For example, if you have two printers of the same type, and equal-sized files printing on both, the printer with the higher priority is going to finish first. After determining the priority of the printer being added, press RETURN.

Figure 4-22: Printer Characteristics Form (Priority)

Low	<b>Medium</b>	High
Printer driver	EpsonMX82	
Printer type	GPIB	
Priority	<u>Medium</u>	
Banner	Yes	
Printer characteristics: Fill in Form and confirm Epson MX-82		

- The next field (Figure 4-23), Banner, lets you determine whether the printout from the printer being added or modified begins with a banner page, which identifies the name given to the file being printed (usually the name of the user). If a GRiD Server has many users who print similar documents (memos, tables, etc.), then it is advisable to use banners. These can help to sort printer output.



Figure 4-23: Printer Characteristics Form (Banner)

<input checked="" type="checkbox"/> Yes	No
Printer driver	EpsonMX82
Printer type	GPIB
Priority	Medium
Banner	Yes
Printer characteristics: Fill in form and confirm Epson MX-82	

8. After this field is completed, press CODE-RETURN to Confirm this form. If the printer type selected was Serial, skip to step 9. If the printer type selected was GPIB, the following form is displayed (Figure 4-24).

Figure 4-24: GPIB Address Form

<input checked="" type="checkbox"/> 0-31	
GPIB address	21
GPIB address: Fill in form and confirm Epson MX-82	

The GPIB addresses and switch settings for printers are given in Table 4-1. The default address (21) is appropriate for the first GPIB printer being added. Each printer must have a unique GPIB address.

After typing in the address and Confirming, the message Updating configuration is displayed at the bottom of the screen. Since this printer is being added to the GRiD Server system for the first time, the message Adding printer follows the previous one.

9. If the printer type selected in the printer characteristics form was Serial, then, after Confirming, the following form is displayed (Figure 4-25).

Figure 4-25: Serial Address Form (Card Number)

<input checked="" type="checkbox"/> 2	
Card number	5
Port number	0
Serial address: Fill in form and confirm Epson MX-82	

Type in the card number of the communication processor to which the printer is to be connected via a cluster box. This corresponds to the comm connector on the main or expansion unit to which the cluster box is attached (see Figure 4-27). From this figure you can see that:

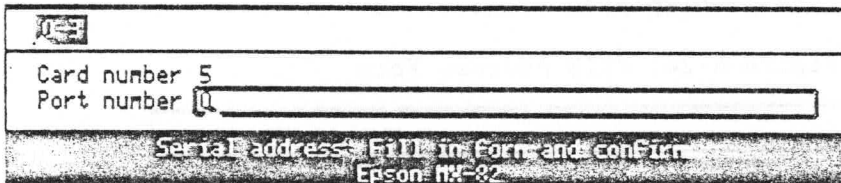
COMM is connected to Card

1 + 2	2
3 + 4	4
5 + 6	5
7 + 8	6

NOTE: Ensure that the card to which you are adding a printer is not configured for PhoneLink.

After typing the number of the card to which the printer is to be added, press RETURN. The next framed field is for the port number (Figure 4-26).

Figure 4-26: Serial Address Form (Port Number)



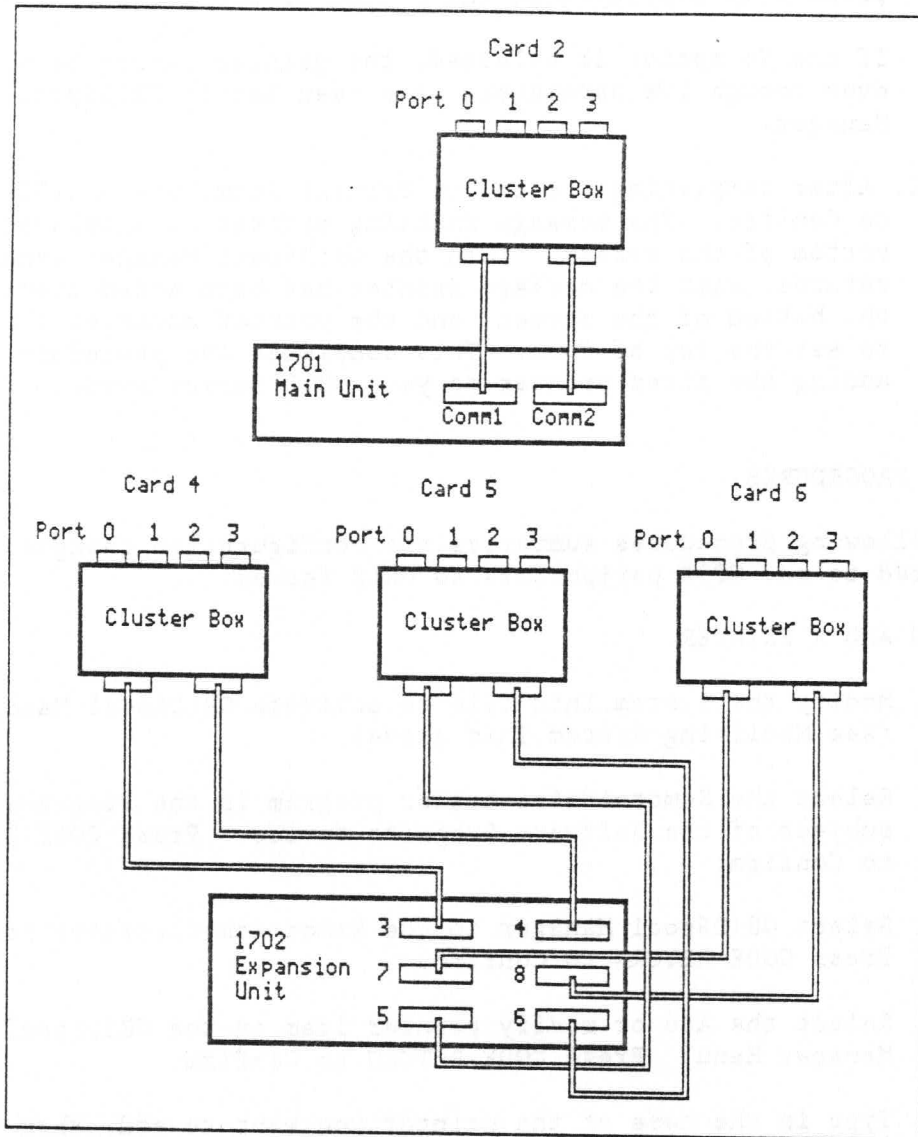
Card number 5  
Port number 0

Serial address - Fill in form and confirm  
Epson: M8-82

Type in the port number (of the card just selected) to which the printer is to be attached. This corresponds to the port on the cluster box to which the printer is attached. See Figure 4-27 for a diagram of the GRiD Server port/card layout.

After Confirming, the message Updating information is displayed at the bottom of the screen. Since this printer is being added to the GRiD Server system for the first time, the message Adding printer follows the previous one.

Figure 4-27: GRiD Server Port/Card Layout



10. After the GPIB address or the serial address form has been completed and CODE-RETURN pressed (to Confirm), the following form is displayed (Figure 4-28).

Figure 4-28: Enable Printer Form

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Enable printer	<input type="text" value="Yes"/>
Enable printer: Fill in form and confirm Epson MX-82	

If the Yes option is selected, the printer is made ready to print files in its printer queue, and the message Enabling printer is displayed at the bottom of the screen.

If the No option is selected, the printer cannot be used, even though its parameters have been set in GRiDspool Manager.

11. After completing the Enable Printer form, press CODE-RETURN to Confirm. The message Enabling printer is displayed at the bottom of the screen. Then the GRiDspool Manager menu returns, with the message Printer has been added displayed at the bottom of the screen, and the printer advances the paper to set the top of form. This completes the procedure for adding the first printer to your GRiD Server system.

## QUICK REFERENCE PROCEDURES

The following procedures summarize the configuration changes required to add GPIB peripherals to GRiD Server.

### ▶ TO ADD A PRINTER

1. Modify the System.Init file to activate GRiDspool Manager (see Modifying System.Init above).
2. Select the RemoteAdministrator program in the Programs subject of the Software Subjects device. Press CODE-RETURN to Confirm.
3. Select GRiDspool Manager in the RemoteAdministrator menu. Press CODE-RETURN to Confirm.
4. Select the Add or modify printer item in the GRiDspool Manager Menu. Press CODE-RETURN to Confirm.
5. Type in the name of the printer you want to add, then press CODE-RETURN to Confirm.
6. Determine the printer characteristics (driver, type, priority, banner), then press CODE-RETURN to Confirm.
7. For a GPIB printer, enter the address. For a serial printer, enter the card and port number to which the printer is attached. Then press CODE-RETURN to Confirm.
8. Select Yes for the Enable Printer Form, then press CODE-RETURN to Confirm.

▷ TO ADD THE FIRST 2101 HARD DISK SYSTEM

1. Uncomment the "Backup Disk 1" and "Backup Floppy 1" entries in VFSSConfig. If the 2101 has been partitioned under GRiD-OS, add the volume number to the Device Location. Change the Files Read By and Files Changed By settings to meet your application needs.
2. Check that the address switches on the 2101 are set to 4.
3. Restart the GRiD Server system.

▷ TO ADD THE SECOND 2101 HARD DISK SYSTEM

1. Uncomment the two second-disk activation commands in System.Init.
2. Uncomment the "Backup Disk 2" and "Backup Floppy 2" entries in VFSSConfig. Check that the device name used in System.Init matches the Device Location in VFSSConfig, except for the case of a GRiD-OS partitioned-2101, where the Device Location must include the volume number. Change the the Files Read By and Files Changed By settings to meet your application needs.
3. Check that the address switches on the 2101 are set to 12.
4. Restart the GRiD Server system.

▷ TO ADD THE THIRD OR FURTHER 2101 HARD DISK SYSTEM

1. Add two additional 2101 activation commands to System.Init by duplicating the commands for the second 2101. Use unique device names and addresses in the commands.
2. Add two additional 2101 entries to VFSSConfig by duplicating the entries for the second 2101. Use Unique Device Names in VFSSConfig. Check that the device names used in System.Init match the Device Locations in VFSSConfig, except for the case of a GRiD-OS partitioned-2101, where the Device Location must include the volume number. Check that the Files Read By and Files Changed By settings meet your application needs.
3. Change the address switches on the 2101 to the address you specified in System.Init.
4. Restart the GRiD Server system.

> TO ADD THE FIRST 2102 PORTABLE DISKETTE DRIVE

1. Uncomment the "Backup Portable Floppy" entry in VFSConfig. Change the Files Read By and Files Changed By settings to meet your application needs.
2. Check that the address switches on the 2102 are set to 6.
3. Restart the GRiD Server system.

▶ TO ADD THE SECOND OR FURTHER 2102 PORTABLE DISKETTE DRIVE

1. Add one additional 2102 activation command to System.Init. Use a unique device name and address in the command.
2. Add one additional 2102 entry to VFSConfig by duplicating the entry for the first 2102. Use a unique Device Name in VFSConfig. Check that the device name used in System.Init matches the Device Location in VFSConfig. Change the Files Read By and Files Changed By settings to meet your application needs.
3. Change the address switches on the 2102 to the address you specified in System.Init.
4. Restart the GRiD Server system.

## CHAPTER 5: ADMINISTERING THE ACCOUNTING STRUCTURE

This chapter shows you how to administer the GRiD Server accounting structure. Beginning with some introductory definitions, the chapter explains administrator levels, then provides several examples of accounting structures. Next, the AdministratorSentry program is described in detail. The chapter concludes with a discussion of how to administer GRiD Server disk space.

### WHAT IS AN "ACCOUNTING STRUCTURE"?

"Accounting structure" is the term used to describe how GRiD Server users identify themselves to the system, how they are grouped together, what administrative capabilities they have (if any), and how much disk space they are allowed to use. When users sign on to GRiD Server, each is identified (via the information entered in the sign-on form) as belonging to a group and a company.

### WHAT ARE GROUPS AND COMPANIES?

A group is a collection of users who can share files that are not accessible to any other users on the system. While each user has a private file storage area (the User Subjects device), all the users in a group can share the files in the Group Subjects device. The titles of the files in a given group's Group Subjects device are only visible to the users in the group.

A company is a collection of groups. All the users belonging to a given company can share the files in that company's Company Subjects device as well as the files in their group's Group Subjects device. The files in a given company's Company Subjects device are only visible to the users in the company; as is the case with Group Subjects, users in another company are unaware of the existence of these files.

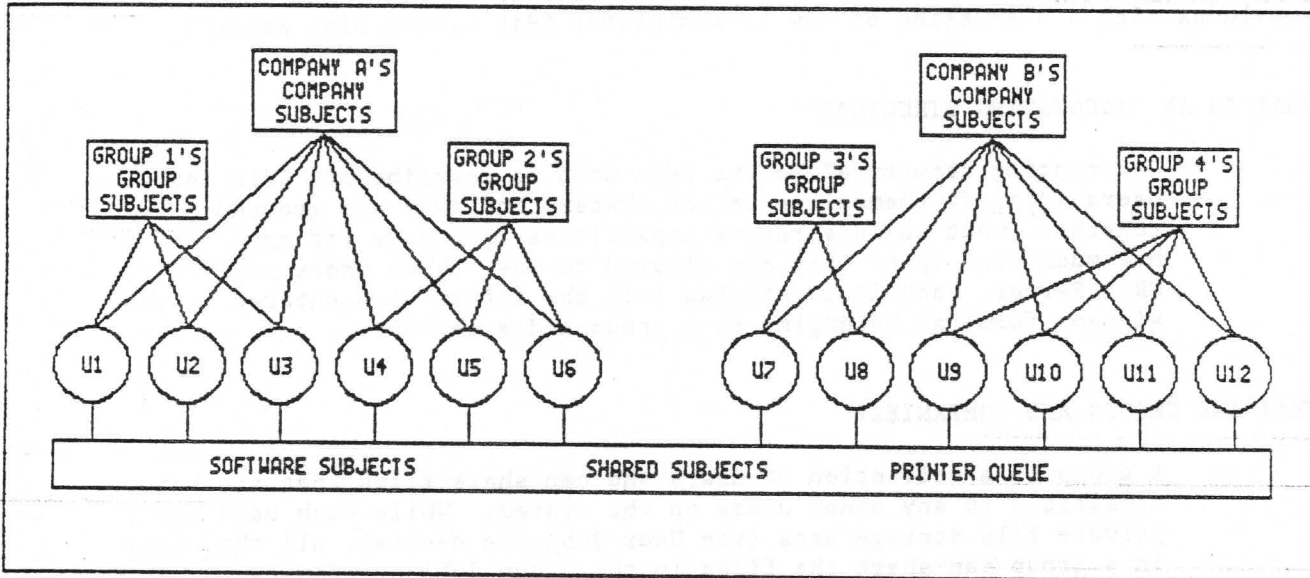
Figure 5-1 below illustrates the linkage between users, groups, and companies. Each line in the drawing represents a user's access to a

device other than his own User Subjects. For example, User 5 has access not only to his own User Subjects, but also to Group 2's Group Subjects, Company A's Company Subjects, and all the system-wide devices (Software Subjects, Shared Subjects, and the Printer Queue). Using the default configuration values, User 5 has read and write access to User Subjects, write access to the Printer Queue, and Shared Subjects and read-only access to Group Subjects, Company Subjects, and Software Subjects. You can change these defaults for each application, except the Printer Queue, by modifying the VFSSConfig-Database- file (see Chapter 4).

Note that although every user on the system sees the Group Subjects and Company Subjects device names (assuming that you have activated them in the VFSSConfig database), each group and company has its own private library of files.

There is no limit to the number of groups and companies that can exist on a GRiD Server system. Create as many as you need to suit your particular situation.

Figure 5-1: Relationship Between GRiD Server Devices



#### ADMINISTRATION LEVELS

Each group and company can have one or more administrators; the primary function of these administrators is to help you administer the accounting structure.

A Company Administrator can add or delete groups and users within his company, and can change the password of any user within his company. A Group Administrator can add or delete users within his group, and can change the password of any user within his group.



System Administrators can add or delete companies, groups, and users, as well as change the password of any user on the system.

There is no limit to the number of Group, Company, and System Administrators on a GRiD Server, though it can become confusing when administrators begin overlaying each other's changes.

Another possible application for Group Administrators is for setting up a structure where some users have read-write access to a group of files, and other users have only read access. This can be accomplished by defining the first set of users as Group Administrators (who have read-write access to Group Subjects), and the second set of users as Normal Users (who have read-only access to Group Subjects). Then you can put a password known only to you on the AdministratorSentry program, so that Group Administrators cannot change the passwords of other group users.

Note that no level of administrative authority gives you access to another user's files. With regard to data, an administrator is just like any other user, with a private User Subjects and access to Group and Company subjects. The only way to access files in the User Subjects of other users is via the diagnostic port utilities (see Chapter 9).

#### ACCOUNTING STRUCTURE EXAMPLES

Every GRiD Server is shipped with one company, group, and user already defined: First Company/First Group/First User. Although it has a special purpose (that of allowing you to sign on to create other users), First Company is an example of the smallest possible accounting structure.

In many cases, a small structure is all that you need on your GRiD Server. Consider the case of a GRiD Server used by the management team of a small company. Typically, there may be only one company defined on the system (typically named after the actual firm). There might be two groups, one called Exec containing all the management users, and one called Admin containing all the administrative users. Each group of users can share the files in their Group Subjects, and everybody in the company can share the files in Company Subjects (assuming that the devices exist at all, they are not required).

If the structure is even smaller, with only one group, then Group and Company Subjects become, in effect, two independent file libraries accessible by everyone on the system. This is convenient when using GRiD Server in training one group of students: the two libraries then can be used for master copies of exercise files, bubble memory loaders, etc.

Note that in a structure with only one company, Shared Subjects becomes, in effect, like Company Subjects but with read-write access.

In a larger firm, a larger structure may be required. Consider the case of a manufacturing firm where many managers in several departments use the GRiD Server. Each department can be defined as a company on the GRiD Server (Manufacturing, Marketing, Engineering, etc.). Within each company, groups can represent functions within each department (Customer Support, Publications, Training, Product Marketing, Communications, etc.). Within each group, Group Subjects can be used effectively as a read-only file library for function-specific data such as budgeting worksheets and schedules; within each company (department), Company Subjects can be used in similar ways for data that is common to the department. And finally, Shared Subjects (which is accessible to all users on the system), can be used for files of broad interest (e.g., income tax templates) or other firm-wide data.

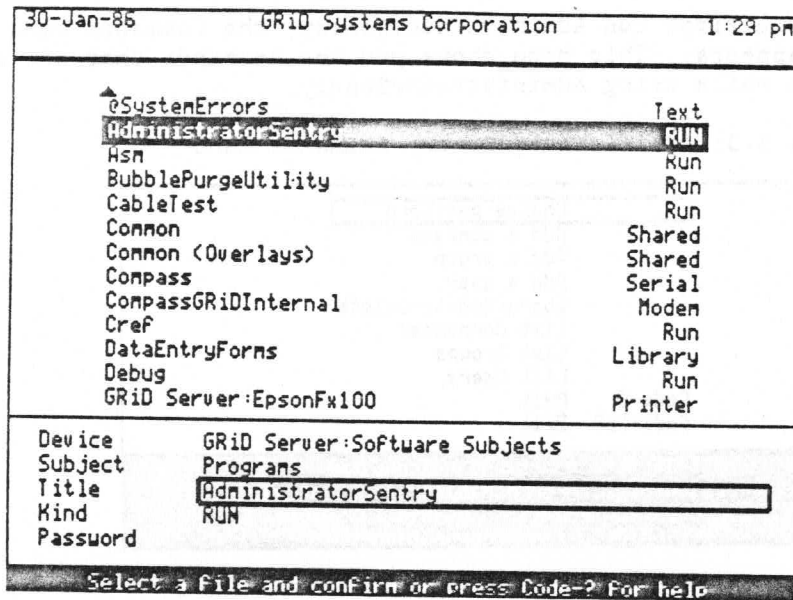
#### WHAT IS ADMINISTRATORSENTRY?

AdministratorSentry is a program that allows you, the System Administrator, to create and control the GRiD Server accounting structure. Its primary functions include adding, updating, and deleting users, groups, and companies; changing user passwords; and querying and listing information about the accounting structure.

#### RUNNING ADMINISTRATORSENTRY

AdministratorSentry is normally stored in GRiD Server's Software Subjects device and is shipped on Floppy #5 (Programs for Workstations). To run AdministratorSentry, simply select it from Software Subjects, as shown in Figure 5-2.

Figure 5-2: Selecting AdministratorSentry from Software Subjects



AdministratorSentry is normally run by any user with Administrator capability. When a user runs the program, it checks the user's capability and only allows the user to execute those commands which are consistent with his capability. For example, the Add a Company command can only be executed by a System Administrator. If normal users run AdministratorSentry, they can only change their own password and query their own user information. The error message you see when you try to exceed your authority is, "1006: Invalid authority for transaction."

The first time you run AdministratorSentry to create your accounting structure, you sign on as First Company/First Group/First User (with a password of "password"). Thereafter, you sign on with whatever personal sign-on you created for yourself as System Administrator. GRiD recommends that you restrict access to the First User signon after you have created your accounting structure, this prevents unauthorized use of it by anyone else. This helps preserve security on your system, since anybody who reads this manual knows the default First User password. There are three ways of restricting access to First User: locking the user, changing the password, and deleting the user. GRiD recommends the first alternative, so that the GRiD Resource Center can have a consistent access to your system for the purpose of problem diagnosis. In addition, you can use the second alternative if you are especially concerned about security.

## ADMINISTRATORSENTRY COMMANDS

When you first run AdministratorSentry, the Commands menu (Figure 5-3) appears. This menu shows you the commands that are available to you while using AdministratorSentry.

Figure 5-3: AdministratorSentry Commands Menu

```
Change password
Add a company
Add a group
Add a user
Query-Update-Delete
List Companies
List Groups
List Users
Code-Q Quit
Code-ESC Exit

Select transaction and confirm
Version 5.0.115 of Administrator Sentry
Copyright © 1983, 1984, 1985
GRiD Systems Corporation
```

The following sections describe the purpose of each command. Refer to Appendix B for an explanation of all the errors issued by AdministratorSentry.

### Add a Company

Use the Add a Company command to add a new company to the system. After selecting this item and Confirming, the Add Company form is displayed (Figure 5-4). You enter the name of the new company you are creating in the Company Name item; maximum length is 20 characters.

Figure 5-4: Add Company Form

```
Company name Any Company

Add company: Fill in form and confirm
```

Capitalization is not significant in any company, group, user name, or password; any mixture of upper and lower case works in the sign-on form. Note, however, that the name appears just as you entered it in any listing (report) of the accounting structure. The limitations on the company, group, user name, and password are the same as for any GRiD-OS file title: you cannot use DEL (CODE-SHIFT-hyphen), back-quote (`), tilde (~), vertical bar (|), or the CTRL key. Otherwise the name or password can contain any characters.

After completing the Add Company form and Confirming, the message "Add company: In progress" is displayed at the bottom of the screen. After several seconds, this is followed by the message "Add company: Complete."

## Add a Group

Use the Add a Group command to add a new group within an existing company. After selecting this item and Confirming, the Add Group form is displayed (Figure 5-5). You enter the name of an already existing company in the Company Name field; then you enter the name of the new group you are creating in the Group Name item (maximum length is 20 characters). The company and group names must be different; if you enter the same name for both, you see the message "1002: Invalid property value". If you enter the name of a company that does not exist, you see the message "1015: Company not defined".

Figure 5-5: Add Group Form

Company name	Any Company
Group name	Marketing

Add group - Fill in form and confirm

After completing the Add Group form and Confirming, the message "Add group: In progress" is displayed at the bottom of the screen. After several seconds, this is followed by the message, "Add group: Complete." If you enter the name of a group that already exists, you see the message, "1017: Already defined."

If you are adding more than one group at a time, pressing any key except ESC after the "Add group: Complete" message redisplay the company name in the form.

## Add a User

Use the Add a User command to add a new user within an existing company and group. After selecting this item and Confirming, the Add User form is displayed (Figure 5-6). You enter the name of an already existing company and group in the Company Name and Group Name items; you enter the name of the new user you are creating in the User Name item. One common approach to creating users is to use surnames; this has the advantage of making users readily identifiable on any listings (reports). The maximum length of this name is 20 characters. The group and user names must be different; if you enter the same name for both you see the message, "1002: Invalid property value." If you enter the name of a company or group that does not exist, you see the message, "1016: Account not defined."

Only unique user names can be added, regardless of the attached company and group names. Attempting to add a nonunique user name results in the message "1037: User name is nonunique." To add this user, the user name portion of the signon identification must be changed to a unique name. To change the user name, simply choose another (unique) name with which the user can sign on.

Use the Password item in the form to enter the new user's password. Using the user's first name (as it appears in the company telephone directory) is an easy method of selecting passwords; it's only a starting point, since the user can change it himself later with the UserSentry program (this should be encouraged to maintain security). The maximum length of the password is 20 characters.

The Authority item lets you determine the new user's authority; the possible values are Normal User, Group Administrator, Company Administrator, and System Administrator.

The Disk Space item lets you set a limit on the User Subjects disk space that can be used by the new user. The choices are a number between 1 and 99999 representing the number of thousands of characters (K-Bytes, increments of 1024), Unlimited, or None. A value of 384 entered in this field means the user is limited to 384 times 1024, or 393,216 characters. "Unlimited" means that the user can use all the available space on the disk to which he is assigned. "None" means that the user cannot save any files in his User Subjects, though he can still retrieve files. (Note that First User's Disk Space value is None.)

Figure 5-6: Add User Form

<b>Normal User</b>	Group administrator	Company administrator	Sys
Company name	Any Company		
Group name	Marketing		
User name	Smith		
Password	Fred		
Authority	Normal user		
Disk Space	Unlimited		
Add user: Fill in form and confirm			

After completing the Add User form and Confirming, the message "Add user: In progress" is displayed. After several seconds, this is followed by the message "Add user: Complete."

If you are adding more than one user at a time, pressing any key except ESC after the "Add user: Complete" message redisplay the company name, group name, authority, and disk space limit in the form.

### Change Password

Use the Change Password command to change a user's password. You do not need to know the user's current password to change it; as long as you have the authority to change it, you just enter the new password. When you Confirm, after selecting this command from the Commands menu, the Change Password form is displayed (Figure 5-7). Enter the name of an already existing company, group, and user in the Company Name, Group Name, and User Name items; then enter the

new password in the New Password item. Maximum length is 20 characters.

Figure 5-7: Change Password Form

Company name	Any Company
Group name	Marketing
User name	Smith
New password	Frederick

Change password: Fill in form and confirm

After completing the Change Password form and Confirming, the message "Change password: In progress" is displayed. After several seconds, this is followed by the message "Change password: Complete." If you enter the name of a company, group, or user that does not exist, you see the message, "1005: User is unknown to the server."

Pressing ESC returns you to the AdministratorSentry commands menu.

#### Exit (CODE-ESC)

The Exit command lets you exit AdministratorSentry. Since AdministratorSentry does not work with any data files of its own, CODE-ESC and CODE-Q are equivalent.

#### List Companies, List Groups, and List Users

The List Companies command lets you, the System Administrator, produce a report of all the companies on the system; the List Groups command lets you produce a report of all the groups on the system; and the List Users command lets you produce a report of all users on the system. The three List commands can only be executed by a System Administrator (i.e., a Company Administrator cannot list only the groups in his company). Note that there is no way of listing a subset of companies, groups, or users. When you Confirm after selecting any of these three commands from the Commands menu, the Listing Output Device Selection menu is displayed (Figure 5-8).

Figure 5-8: Listing Output Device Selection Menu

	Write listing to console
	Write listing to printer
	Write listing to a file
Code-Q	Quit
Code-ESC	Exit

Select the desired output device

The choices on the Listing Output Device Selection menu are:

- o Write listing to console. After Confirming, a formatted listing is written to your computer's screen. You can temporarily halt output to the screen by pressing CTRL-S and restart it by pressing CTRL-S again. If this keystroke has no effect, there is probably another character ahead of the CTRL-S in the keyboard queue. Clear the keyboard queue by pressing SPACE followed by ESC, then press CTRL-S again. Note that you cannot cancel the listing once it has started (CODE-ESC has no effect).
- o Write listing to printer. After Confirming, the formatted listing is written to the printer you have previously selected with the GRiDManager Options command (the 'Printer device'). Depending on your selection, this can be either a local printer or one of the GRiD Server spooled printers.
- o Write listing to a file. After Confirming, you see a File form. When you fill in the File form with entries of your choice and Confirm, the formatted listing is written to the selected file. The file can be a permanent file located on any available storage device to which you have write access, or a print file in the GRiD Server Printer Queue.
- o Exit (CODE-ESC) and Quit (CODE-Q). Either of these commands lets you exit AdministratorSentry. These commands are identical to those on the Commands menu.

#### Sample Output from Listing Functions

The output from the listing functions is the same information that appears in the Information form when you select the Query-Update-Delete item in the RemoteAdministrator menu (Figure 5-11). Figure 5-9 below illustrates sample output from each of the three list functions. Note that in the output from listing companies, the Group and User are blank, since a company contains multiple groups and users. Note also that Authority is shown as N/A, since only a user has an authority level. Output from the listing functions is sorted by company, group, and user.



Figure 5-9: Sample Output from Listing Functions

Company	Any Company	} COMPANY LISTING
Group		
User		
Authority	n/a	
Device	2701-0000000112a	
MaxDisk (k-bytes)	Unlimited	
DiskUsed (bytes)	0	
Created	04/13/84 15:19:01	
Modified	04/17/84 08:25:22	} GROUP LISTING
Status	Unlocked	
Company	Any Company	
Group	Marketing	
User		
Authority	n/a	
Device	2701-0000000112a	
MaxDisk (k-bytes)	Unlimited	
DiskUsed (bytes)	0	
Created	04/17/84 10:56:35	
Modified	04/17/84 10:56:35	
Status	Unlocked	} USER LISTING
Company	Any Company	
Group	Marketing	
User	Smith	
Authority	Normal user	
Device	2701-0000000112a	
MaxDisk (k-bytes)	Unlimited	
DiskUsed (bytes)	0	
Created	04/17/84 10:57:02	
Modified	04/17/84 10:57:02	
Status	Unlocked	

### Using the Listing Functions to Produce Custom Reports

By writing the listing to a file of Kind Text, you can use GRiDWrite and other GRiD Management Tools to edit the data and produce custom reports. Through the use of GRiDWrite's Substitute command and Display Format Characters Option, you can transform the vertical listing into a horizontally-formatted, tabbed file ready for transfer to a database.

### Query-Update-Delete

The Query-Update-Delete command lets you query and change information about companies, groups, and users on the system. The command is a two-level command in that you first must query a company, group, or user, and then update or delete it.

## Querying Company, Group, or User Information

When you select the Query-Update-Delete item from the AdministratorSentry Commands menu and then Confirm, the Query form is displayed (Figure 5-10). The Query Record Level item lets you determine at what level you want to inquire; the choices are Company, Group, and User. Querying at the company level requires you to fill in only the Company Name item. Querying at the group level requires you to fill in both the Company Name and the Group Name item. Querying on individual users requires you to fill in all three items.

Figure 5-10: Query Form

Company	<b>Group</b>	User
QueryRecordLevel	Group	
Company name	Any Company	
Group name	Marketing	
User name		

Query: FILE in Form and confirm.

When you Confirm, the message, "Query: In progress" is displayed. After several seconds, you see the Query-Update-Delete Information form (Figure 5-11). If you enter the name of a company, group, or user that does not exist, you see the message, "1005: User is unknown to the server." Pressing ESC or CODE-? at the Query form returns you to the Commands menu.

Figure 5-11: Query-Update-Delete Information Form

Company name	Any Company
Group name	Marketing
User name	Smith
Authority	====> Normal user
Device name	2703-0000000095c
Max disk space	====> Unlimited
bytes used	0
Date created	03/25/86 00:22:50
Date last modified	03/25/86 00:22:50
Signon status	====> Unlocked
next action	====> None

Query-Update-Delete: FILE in Form and confirm.

## Updating Company, Group, or User Information

In order to update information concerning a company, group, or user, you must first select the Query-Update-Delete item in the AdministratorSentry menu and then Confirm (see the previous section). Once the Information form is displayed (Figure 5-11 above), you can change the following items (note that the items are marked on the screen with "====>").

- o Authority. The possible levels are Normal user, Group Administrator, Company Administrator, and System Administrator.
- o Maximum disk space. The possible value must be in the range of 1 to 99999 thousands of characters (K-Bytes, increments of 1024). Unlimited, or None.
- o Signon status. The possible values are Unlocked or Locked.

Once you have made the desired changes in the information, set the Next Action item to Update Record. After Confirming, the message "Confirm to update existing record" is displayed. After Confirming again, the message "Update: In progress" is displayed. After several seconds, the message "Update complete" is displayed. If you forget to change the Next Action item to either Update or Delete after changing a setting in the form and Confirming, you see the message, "Confirm for no change to existing record." Pressing ESC or CODE-? in the Query Information form brings you back one level to the Query form rather than to the Commands menu.

**Who Can Update What Information** Only administrators are allowed to update information. The information to be updated must reside within the authority of the administrator performing the update. A Group Administrator can update information for any user within his own group or for the group itself. A Company Administrator can update information for any user within his own company, for any group within the company, and for the company itself.

An administrator cannot update a user who has equal or greater administrator authority. For this reason, you cannot update your own user information. For example, a Company Administrator cannot update another Company Administrator, even if they are both in the same company. The exception to this rule is the System Administrator, who can update any System Administrator other than himself.

An administrator cannot assign an authority greater than his own. For example, a Company Administrator cannot update himself or a user to the level of System Administrator.

**The Locking Function** A sign-on status of Locked means that the user is no longer able to sign on to GRiD Server. If the user is already signed on, the prohibition does not take effect until the next attempt to sign on. Locking at the group or company level means that none of the users in the group or company are allowed to sign on.

The locking function has several useful applications: consider the case of an employee who has just left a company, but whose files you do not yet want to delete. Locking the user prevents access to any

of the user's files. You would unlock the user when you want to access those files. Another case: suppose you want to give a remote user (e.g., the GRiD Resource Center) access to your GRiD Server via PhoneLink, but only during a narrow period of time. Using the locking function can avoid adding and deleting the user unnecessarily by unlocking the user during the desired window.

#### Deleting a Company, Group, or User

In order to delete a company, group, or user you must first select the Query-Update-Delete item and Confirm (see above). Once the Information form is displayed (Figure 5-11), set the Next Action item to Delete Record. After Confirming, the message "Confirm to delete existing record" is displayed. When you Confirm again, the message "Delete: In progress" is displayed. After several seconds, this is followed by the message "Delete complete." If you forget to change the Next Action item to either Update or Delete after changing a setting in the form and Confirming, the message, "Confirm for no change to existing record" is displayed. Pressing ESC or CODE-? in the Query Information form brings you to the Query form (not the Commands menu).

NOTE: Be careful when you delete a company or group because you are deleting multiple users as well as all of their associated files by Confirming.

The disk space which was being used by the company, group, or user you deleted is not automatically made available immediately after deletion. Instead, the file directories are flagged as logically deleted, and the next time the GRiD Server system is restarted, the files and directories are physically deleted. The program which does the physical deletion is called UAFDelete; it is run from the System.Init configuration file (see Chapter 4 for more information).

**Who Can Delete What Information** Only administrators are allowed to perform a delete. The object to be deleted must reside within the authority of the administrator performing the delete. A Group Administrator can only delete users within his own group, but not the group itself. A Company Administrator can delete users within any group in his own company, or a group within the company, but not the company itself.

The request to delete a company or group is not honored if anyone in that company or group is signed on at the time of the request. Therefore a Company Administrator or Group Administrator cannot delete his own company or group. The request to delete a user is not honored if the user is signed on at the time of the request; therefore an administrator cannot delete himself.

An administrator cannot delete a user who has equal or greater administrative authority. For example, a Company Administrator

cannot delete another Company Administrator, even if they are both in the same company. The exception to this rule is the system administrator, who can delete any company, group, or user (including another System Administrator), other than himself.

#### Quit (CODE-Q)

The Quit command lets you exit AdministratorSentry. Since AdministratorSentry does not work with any data files of its own, CODE-Q and CODE-ESC are equivalent.

### ADMINISTERING GRID SERVER DISK SPACE

From the user's point of view, all the GRiD Server disk units (Model 2701 or 2703) together represent one contiguous file storage area. From the System Administrator's point of view, this is not quite the case. The following sections discuss how disk space is treated on the GRiD Server and some of the implications for the Administrator.

#### Allocation of Disk Space to Users and Devices

When a new user is added to the system, the user is automatically assigned to the disk with the most available free space. The volume name of the disk (which incorporates its tracking number) is reported as the Device item in the Information screen (Figure 5-11 above).

A single user's files cannot occupy more than one disk volume (the assigned one). This means that if your system uses Model 2701 disks (10 megabyte capacity), the most space a user can have is about 10,000 K-Bytes; with Model 2703 disks (normally partitioned into two 18 megabyte volumes), the maximum is about 18,000 K-Bytes. Note that since a company or group consists of several users, a company or group can use more than one disk.

The same rule applies to all devices. For example, Shared Subjects can occupy only one disk, it cannot span disk volumes.

#### Using the "DiskUsed" Values

The "DiskUsed" values reported on the Query Information screen represent the space used by User Subjects devices only. These values never include Group Subjects, Company Subjects, Shared Subjects, Software Subjects, Server Subjects, and the Printer Queue. To determine the disk space used by the latter four devices, you can use the GRiDManager Print/Display Titles function and observe the "Total Length" number at the end of the listing. For the former two devices, you can use the Query function as described in the next paragraph.

For Group Subjects, select the Query-Update-Delete item, then Confirm, at the user level with the company name and the group name entered as normal, but repeat the group name as the user name. The "DiskUsed" value reported is the space used by Group Subjects for the given group. For Company Subjects, select the Query-Update-Delete item, then Confirm, at the user level with the company name entered as normal, but repeat the company name as the group and user names. The "DiskUsed" value reported is the space used by Company Subjects for the given company.

**CAUTION:** Do not update any information when querying Group or Company Subjects.

### Determining Total Space Used on a Disk

As noted above, the "DiskUsed" values cannot be used to determine the total disk space used on the system because of shared devices such as Software Subjects. However, using the Cat file processor utility (via the diagnostic port), you can determine how full each individual disk is. (See Chapter 8 for information on how to access the diagnostic port and Chapter 9 for information on how to use the Cat utility.) Because the system is organized around users and devices on single disks, the amount of free space available on each disk is actually the most important value in administering the system disk space.

The DiskInfo utility gathers and displays information about the disk volumes on the peripheral bus. The free space on each disk volume is displayed in terms of K bytes, and the volume that has the largest amount of free space is flagged with an asterisk. See "DiskInfo" under "GENERAL UTILITIES" in Chapter 9 of this manual for information on how to use DiskInfo.

### Moving a User or Device from One Disk to Another

If your system has more than one disk, and one of the disks becomes nearly full, you should move a user or device from the full disk to a disk that is less full.

The UAFChangeDevice utility, in conjunction with the HCopy and HDelete utilities, provides an easy way of moving a user. UAFChangeDevice can also be used to move a device.

To move a user or device from one disk to another, perform the following steps:

**NOTE:** This procedure assumes that (a) the user being moved is not signed on to the GRiD Server system, and (b) that the device being moved is not being accessed.

▷ TO MOVE A USER OR DEVICE FROM ONE DISK TO ANOTHER

1. Sign on to the GRiD Server diagnostic port as described in "Accessing the Diagnostic Processor" in Chapter 8. Use the Exec command to sign on to the file processor.
2. At the file processor "#" prompt, use the HCopy utility (see Chapter 9) to perform a hierarchical copy of all the user's or device's files from one peripheral bus disk to another.
3. At the file processor "#" prompt, use UAFChangeDevice (see Chapter 9) to change the peripheral bus disk volume name in the user's or device's record in the User Authorization File. UAFChangeDevice allows you to specify the OldVolumeName (the name of the volume on which the user or device resided), the NewVolumeName (the name of the volume to which you moved the user or device), and a UAFKey key that identifies the record corresponding to the user or device in the User Authorization File. The Peripheral Disk Volume name in the user or device record is changed from the OldVolumeName to the NewVolumeName.
4. At the file processor "#" prompt, use the HDelete utility (see Chapter 9 of the GRiD Server Administrator's Guide) to perform a hierarchical delete of the user's or device's original files from the original disk.
5. Restart the GRiD Server.

#### Adding Another Disk to Your System

At some point in the future you may run out of disk space. If this happens, add one or more disks to your system. If you connect another disk, the system does not use it automatically because all the users and devices are already defined on (and limited to) existing disks. You must either add more users (all of whom are added to the new disk because of the "most available free space" rule), or move existing users and/or devices to the new disk by using the above-mentioned procedures.

**NOTE:** Remember to change the AutoBackupConfig file to reflect the new order of disks, as well as to backup the new disk.

#### Maximizing the Space Available on Multiple Disk Systems

Every GRiD Server disk unit is shipped with two devices already loaded on it: Server Subjects and Software Subjects. The former contains a complete copy of the GRiD Server operating software, and occupies about 420 K-Bytes. The latter contains GRiD-OS programs unique to the GRiD Server such as AdministratorSentry, and occupies about 270 K-Bytes.

After configuring the GRiD Server system, GRiD recommends that the Programs directories be deleted on all peripheral bus disk units except for DSK0. This is done through the diagnostic port, at the file processor "\*" prompt, by entering:

```
#Delete '1'Programs'* ! [if disk 1 is a 2701]
#Delete '1a'Programs'* ! [if disk 1 is a 2703]
#Delete '1b'Programs'* ! [if disk 1 is a 2703]
#Delete '2'Programs'* ! [if disk 1 is a 2701]
#Delete '2a'Programs'* ! [if disk 1 is a 2703]
#Delete '2b'Programs'* ! [if disk 1 is a 2703]
```

.

GRiD also recommends that Software Subjects be deleted (via the diagnostic port) on the second and following disks to save disk space. A backup of the files in Software Subjects is shipped on Floppy #5 (Programs for Workstations).

```
#Delete '1''Software Subjects''* ! [if disk 1 is a 2701]
#Delete '1a''Software Subjects''* ! [if disk 1 is a 2703]
#Delete '1b''Software Subjects''* ! [if disk 1 is a 2703]
#Delete '2''Software Subjects''* ! [if disk 1 is a 2701]
#Delete '2a''Software Subjects''* ! [if disk 1 is a 2703]
#Delete '2b''Software Subjects''* ! [if disk 1 is a 2703]
```

.

### Recovering from a Disk Failure

The AutoBackup software lets you either back up data to another 2703 disk or to a 2801 tape drive. If your disk fails and you have backed up to another disk, then replace the failed disk with the backup disk. If you backed up to a tape drive, then replace the failed disk and use the procedure described below to restore your data to the new disk. Recovering from a disk failure is executed via the diagnostic port (see Chapters 8 and 9). If you do not have a 2801 Tape Backup unit or a backup disk with the data, the failed disk unit must be sent back to GRiD for repair, and the data may be lost.

A backup tape contains an exact image of all of the sectors on the source disk from which it was copied including the volume name. You cannot copy a specific file from a backup tape to an active disk. If you must recover disk data from a backup tape, you must use SectorCopy to copy the entire image of the disk from the tape to the recovery disk, completely overwriting the current contents of that disk.



You must restore a backup of a 2703 disk to another 2703 disk and a 2701 disk to another 2701 disk; if you attempt to restore the image of a 2703 disk to a 2701 disk, SectorCopy issues the error message "SectorCopy: Source is LARGER than destination!" to warn you. A backup of a 2701 disk can be restored to a 2703 disk but the restored disk will only have as much available space as the original source disk (i.e., if you restore the contents of a 10 megabyte disk to a 40 megabyte disk, you will have only 10 megabytes of usable space on the 40 megabyte disk). To recover the full 40 megabytes of space on the 2703 disk, you must run GS.MediaPartition and GS.MediaFormat.

▶ TO COPY A BACKUP TAPE TO A RECOVERY DISK

1. Sign on to the diagnostic port and at the file processor "=" prompt, use the Cat utility to determine whether any users are signed on by entering:

```
Cat 'N' 'User Names' !
```

Ask all active users of the GRiD Server system to sign off.

2. Restart your GRiD Server system without executing System.Init by pressing ESC when the following prompt is shown during system initialization:

```
Press RETURN to continue processing System.Init  
<or>
```

```
Press ESCAPE to cancel System.Init
```

3. Before starting SectorCopy, verify that the backup tape contains the correct disk image by running DisplayTapeLabel (as described in "Displaying the Tape Label of a Tape Cartridge", Chapter 9) below to display the tape label.
4. Start SectorCopy at the file processor "#" prompt by entering:

```
SectorCopy '<SourceDeviceNumber>' '<DestinationDeviceNumber>'
```

where:

<SourceDeviceNumber>

is an integer in the range 0 to 7 representing the position of the 2801 tape unit on the peripheral bus chain.

<DestinationDeviceNumber>

is an integer in the range 0 to 7 representing the position of the recovery disk unit on the peripheral bus chain.

SectorCopy issues the message "SectorCopy: Tape retention in progress" and then the message "SectorCopy: Copy in

progress". SectorCopy takes about ten minutes to restore data to a 2701 disk, and about forty minutes to restore data to a 2703 disk. It issues a "% done" message periodically to indicate the progress of the copying. When the entire disk image has been restored to the destination disk, SectorCopy issues the message "SectorCopy: Copy complete".

If SectorCopy detects an error when writing to a disk it will attempt to finish restoring all data to the disk. If it successfully restores the remainder of the data, it writes error 233 (invalid bit map) to the ErrorLog file as a permanent record, and displays a message requesting that you run GS.MediaRepair before using the recovery disk. Other messages may also be logged when an error occurs during the execution of SectorCopy (see Appendix A and Appendix D of this manual).

### ▶ TO RECOVER DISK DATA FROM A BACKUP DISK

A backup disk contains the exact image of all of the sectors on the source disk from which it was copied including the volume name. During normal system operation, the backup disk is deactivated by GS.Deactivate so that it is not possible for users to write to it.

You can recover the data on a failed disk by replacing the failed disk with its backup disk, i.e., by removing the failed disk unit from the peripheral bus chain. To do so, perform the following steps:

1. Sign on to the diagnostic port and at the file processor "#" prompt, use the Cat utility to determine whether any users are signed on by entering:

```
Cat 'N' 'User Names' !
```

Ask all active users of the GRiD Server system to sign off.

2. Before disconnecting the failed disk unit, be sure that you have powered down all GRiD Server system units in the order specified in Chapter 3.
3. Disconnect the peripheral bus cables from the failed disk unit and remove it from the peripheral bus chain.
4. Be sure that the peripheral bus cables are reconnected correctly to the remaining units in the peripheral bus chain.
5. Power up the system in the order specified in Chapter 3. The system will reboot automatically.

6. Modify your automatic backup configuration file (see Chapter 5) to reflect the new positions of devices on the peripheral bus chain. Make sure that the units specified as source devices are those that should be copied from during automatic backup. Make sure that the units specified as destination devices are those that should be deactivated during normal operation and copied to during automatic backup.
7. Reboot by pressing the reset button on the 1701 main unit, or by entering the Boot command or the Boot X command at the diagnostic processor "\*" prompt on the diagnostic port.

The system will find the backup disk and activate it in place of its source disk. Because the backup disk has the same volume name as the source disk, AdminManager can correctly locate files on the backup disk.

## ADMINLOG

AdminLog is an administrative logging system that

- o is used in troubleshooting,
- o indicates when users get administrative errors,
- o catalogs activities such as users signing on and off the GRiD Server,
- o shows when new user signons are created.

This circular text file is only accessible via the diagnostic port. For detailed information on the AdminLog, see Chapter 10.

## ORIENTING NEW USERS

As System Administrator, one of your responsibilities is to orient new users to GRiD Server. To do this, GRiD recommends that you take two actions: (a) read the GRiD Server User's Guide from cover-to-cover, paying particular attention to those instances where the User's Guide tells users to contact their System Administrator, and (b) prepare an information sheet for new users. This information sheet could contain a wide variety of information, but here are a few ideas to get you started:

- o Sign-on information.
- o Standard disk space allocation for each user.
- o Installation-unique device names and the authority required to access them (e.g., "Mail" and "Templates," discussed in Chapter 4).
- o PhoneLink phone numbers.

- o Contributed programs or other special software available in Software Subjects.
- o Printer descriptions (number, size, capability, etc.).
- o The name and location of the remote printer driver files the user needs to access the GRiD Server printers.
- o System backup schedule (planned down time).

## CHAPTER 6: ADMINISTERING THE SPOOLER

This chapter shows you how to administer the GRiD Server print spooler. It begins with a discussion of the concept of spooling, then continues with the operation of spooled printers, and concludes with a detailed explanation of the GRiD Spool Manager program. GRiD Spool Manager is started by uncommenting the GRiD Spool Manager line in System.Init and restarting the system.

### WHAT IS SPOOLING?

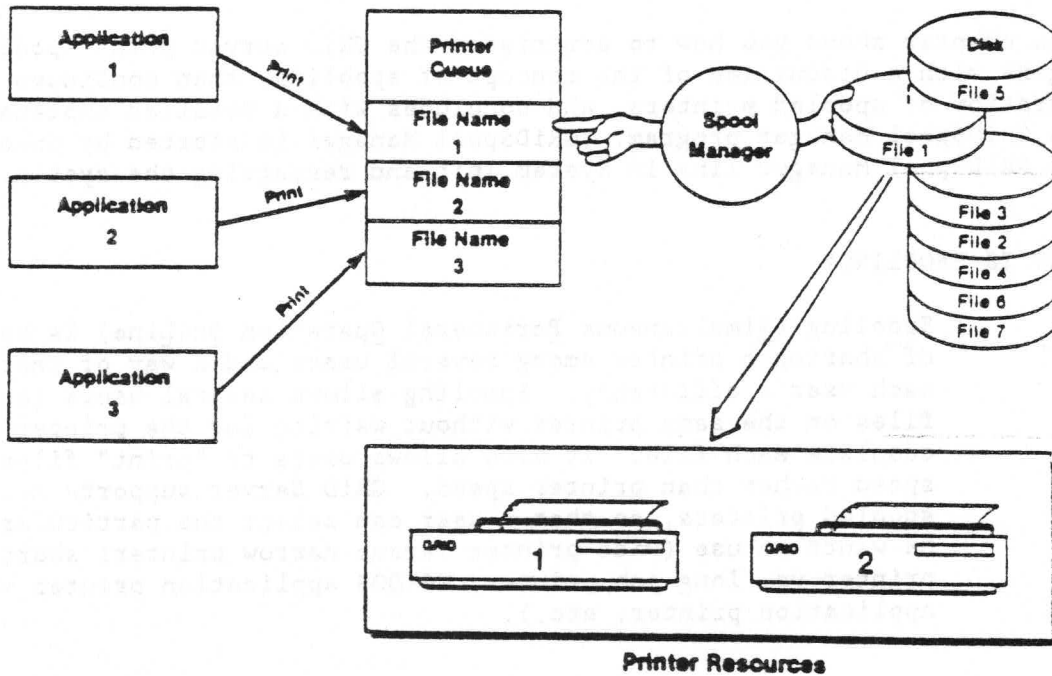
Spooling (Simultaneous Peripheral Operation On-Line) is both a way of sharing a printer among several users and a way of increasing each user's efficiency. Spooling allows several users to print files on the same printer without waiting for the printer to complete each file. It also allows users to "print" files at disk speed rather than printer speed. GRiD Server supports multiple spooled printers, so that a user can select the particular printer he wants to use (wide printer versus narrow printer; short job printer vs. long job printer, MS-DOS application printer vs. GRiD application printer, etc.).

### HOW DOES SPOOLING WORK ON GRID SERVER?

Figure 6-1 illustrates the basic concept of spooling: users running applications (such as GRiDWrite, GRiDPlan, etc.) transmit files to the Printer Queue. The Printer Queue is a GRiD Server device used to store files to be printed. As described in the GRiD Server User's Guide, a user can print files to the Printer Queue using the Print This File, Format This File, or the Write Printer Copy to a File items of the CODE-T Print command menu. A temporary copy of each file to be printed is stored on a GRiD Server disk unit; the name of each file to be printed is stored in the Printer Queue subject representing the particular printer the user selected. Once a user has printed a file to the Printer Queue, he can continue working with his computer while GRiD Server prints the file.

On GRiD Server, a program called GRiDspool Manager searches each of the Printer Queue subjects for files to be printed. Then GRiDspool Manager takes each file name found and sends the file to the appropriate printer. Files are printed in first-in first-out order. GRiD Server does this by time-stamping each file as it is put in the Printer Queue and prepending the time stamp to the file name. Since file names in a GRiD storage device are stored in alphanumeric order, GRiDspool Manager accesses the files in chronological order based on the time-stamp. This order cannot be modified by the Administrator. Note that since files are only time-stamped, not date-stamped; files retained in a print queue over several days are not printed in first-in first-out order, but instead are printed in time order.

Figure 6-1: Spooling Concept



#### SPOOLED PRINTER OPERATION

As System Administrator, you should have a clear understanding of normal spooled printer operation. This helps you determine if a problem exists and, if so, what to do about it. All printers supported on GRiD Server operate basically the same way; the following discussion applies to all of them.

## Spooler Startup

In normal operation, the spooled printers are started up at system startup time. GRIDSpool Manager sends a form feed to each active printer when the system has completed startup as a sign that the printer is active and ready for use. If there are files in a printer's print queue at startup, they begin printing immediately after the form feed.

## Effect of On-Line, Paper-Out, and Power Switches During Operation

If you take a GRiD Server parallel printer off-line or if you turn the POWER switch to OFF while the printer is printing, or if the printer runs out of paper while it is printing, the following things happen:

1. The printer stops printing.
2. Approximately 60 seconds after the printer is put back on-line or reloaded with paper, the printer form feeds and starts printing from the beginning of the file.

If you want to clear a paper jam, then using the printer's ON LINE switch is the best method because you usually want to restart the file from the beginning to reprint the portion that was lost during the jam.

For serial printers that have buffers, turning off the printer has the following effect:

1. If the file being printed was not completely contained in the buffer, and the elapsed time before the printer is turned on again is less than 60 seconds, then the GRiD Server starts printing the rest of the file that was not in the buffer. This usually means that a part of the entire file was deleted from the printer's buffer when the printer was turned off. After the rest of the file is printed, the entire file should be reprinted.
2. If the file being printed was completely contained in the buffer, anything not printed is deleted from the buffer when the printer is turned off. The file is not reprinted automatically, and you lose the rest of the file. You should print the file anew.
3. If the file being printed was not completely contained in the buffer when the printer is put offline, and the elapsed time before the printer is put online again is greater than 60 seconds, the rest of the data in the buffer is printed after putting the printer online again; then the entire file is reprinted.

4. If the file being printed was completely contained in the buffer when the printer is put offline, and the elapsed time before the printer is put online again is greater than 60 seconds, printing continues normally after the printer is put online again.
5. If a printer is put offline while a file is printing (whether or not the file is completely contained in the buffer), and the printer is put online again in less than 60 seconds, printing then continues normally. The file is not reprinted.

#### Effect of Restarting the GRiD Server

Each time you restart your GRiD Server system, all printers are sent initialization commands that reset the top-of-form position. Since the paper is normally left advanced about one-third of a page after each print file, this means that files printed after the restart is complete are incorrectly positioned on the paper. To correct this problem, manually reset each printer's top-of-form position BEFORE restarting the system. This can be accomplished by taking the printer off-line (by pressing the on-line button), pressing the form feed button to advance the paper, then putting the printer on-line again. As an alternative method, you can turn off the printer, manually adjust the paper position so that the print head is just below the paper perforation, then turn the printer on again.

#### GRIDSPool MANAGER

GRiDspool Manager is a program that lets you configure the GRiD Server system for GPIB or serial printers and administer them. (NOTE: Contact a GRiD representative for additional information on supported printers.) To start this program, the GRiDspool Manager activation line in the System.Init file must be uncommented and the system restarted. This program lets the System Administrator add, delete, modify, enable, and disable printers, as well as change the administrative password that gives access to all the commands of the GRiDspool Manager form. It also lets any user stop or restart the printing of a document, delete a file in the printer queue, and find out the status of a printer.

#### GRiDspool Manager Concepts

GRiDspool Manager can be accessed via the RemoteAdministrator program by normal users as well as by System Administrators. The commands seen by a normal user, however, are only part of the complete menu accessible by a System Administrator. Normal users can delete files in a printer's queue, reprint files, and view a printer's status. Only System Administrators can add, modify, delete, enable, and disable printers, as well as change the



administrative password that lets normal users gain access to all of the GRiDSpool Manager commands.

When using serial printers, you must have a dedicated communication processor for them; thus, it is not possible to share serial printer ports and PhoneLink ports on the same communication processor. Use GRiDNetwork Manager to verify that the card is not configured for GRiDLink or PhoneLink.

### GRiDSpool Manager From The User's Point Of View

If the GRiDSpool Manager activation line in System.Init has been uncommented and the system restarted, GRiDSpool Manager can be accessed via the RemoteAdministrator program. The RemoteAdministrator program provides access for configuring various applications on a GRiD Server. It is run on any workstation signed on to the GRiD Server via GRiDLink or PhoneLink (but not the diagnostic port).

You can access GRiDSpool Manager by selecting RemoteAdministrator in the Programs subject of Software Subjects device. The following menu is displayed (Figure 6-2).

Figure 6-2: RemoteAdministrator Menu

```
GRiDSpool Manager
GRiDMail Post Office
GRiDMail Truck
GRiDNetwork Manager

Applications on GRiD Server: Select item and confirm
Version 3.2.0 of RemoteAdministrator
```

After selecting GRiDSpool Manager and Confirming, the following form (Figure 6-3) is displayed if you signed on to the GRiD Server as a normal user (i.e., not as a System Administrator).

Figure 6-3: User Mode Form

```
Normal user Administrator
User node Normal user

User node: Fill in form and confirm
```

Note that a System Administrator is not given this menu.

If a normal user is accessing GRiDSpool Manager in order to delete a file in the queue or view the status of a printer, the default choice shown is selected. After Confirming, the following menu is displayed (Figure 6-4).

Figure 6-4: GRiDspool Manager Form (Normal User)

Printer status	
	Reprint current file
Erase CODE-E	Erase print file
Quit CODE-Q	Exit and save all changes
Cancel CODE-Esc	Exit without saving changes

Commands: Select item and confirm.  
Version 12.2.0 of GRiDspool Manager

Refer to the following section for an explanation of each of the items in this menu.

If you signed on to GRiD Server as a normal user, but need to access the complete GRiDspool Manager Menu, select the Administrator option in the user mode form (Figure 6-3, above). After Confirming, the password form, which restricts access to the complete GRiDspool Manager menu, is displayed (Figure 6-5).

Figure 6-5: GRiDspool Manager Password Form

Passuord <input type="text"/>

Passwords: Enter administrative password and confirm.  
GRiDspool Manager

The default password is "PASSWORD". The password can be changed once access is gained to the complete GRiDspool Manager menu (see the Change administrative password section, below). The menu shown in Figure 6-6 is displayed after the correct password has been typed and CODE-RETURN pressed.

#### GRiDspool Manager From The System Adminstrator's Point Of View

If you have signed on to the GRiD Server as a System Administrator and want to access the GRiDspool Manager menu, select the GRiDspool Manager item in the RemoteAdministrator menu and Confirm. A password is not required, and the complete GRiDspool Manager menu is displayed (Figure 6-6).

Figure 6-6: GRiDspool Manager Menu (System Administrator)

```

Add or modify printer
Delete printer
Printer status
Reprint current file
Disable printer
Enable printer
Change administration password
Erase CODE-E Erase print file
Quit CODE-Q Exit and save all changes
Cancel CODE-Esc Exit without saving changes

Commands: Select item and confirm
Version 12.2.0 of GRiDspool Manager

```

This menu includes all items that are shown in Figure 6-3, as well as five others.

### GRiDspool Manager Commands

Each item on the menu shown in Figure 6-6 is explained below.

#### Add or modify printer

This item lets you add a printer to the GRiD Server system, or modify the parameters of an existing one. After selecting this item and Confirming, the following form is displayed (Figure 6-7).

Figure 6-7: Printer Selection Form

```

Enter name
Printer name Epson MX-82
Add or modify printer: Fill in form and confirm

```

Type in the name of the printer you wish to add or modify. This name can be the name of the printer or a descriptive name such as "wide printer" or "letter quality." This name entered is the one a user sees when selecting a printer from the Printer Queue subject. After filling in this form and Confirming, the following form is displayed (Figure 6-8).

Figure 6-8: Printer Characteristics Form (Printer Driver)

EpsonFX100	<b>EpsonMX82</b>
Printer driver	EpsonMX82
Printer type	GPIO
Priority	Medium
Banner	Yes
Printer characteristics: Fill in form and confirm.	
Epson MX-82	

For the printer driver field, select the driver that corresponds to the model of printer being added or modified; then press RETURN.

**CAUTION:** Ensure that the driver type corresponds to the printer type being added; i.e. if the printer type is serial, the printer driver must be serial. Mismatching printer driver and type can cause the operation of the GRiD Server system to be disrupted. In such a case, it is imperative that you contact a GRiD representative.

Figure 6-9: Printer Characteristics Form (Printer Type)

<b>GPIO</b>	Serial
Printer driver	EpsonMX82
Printer type	<b>GPIO</b>
Priority	Medium
Banner	Yes
Printer characteristics: Fill in form and confirm.	
Epson MX-82	

Select the printer type (either GPIO or serial) of the printer being added or modified. Note that serial printers are connected to a PhoneLink cluster box that is attached either to the main unit or (usually) the expansion unit; GPIO printers are connected to the GPIO connector on the main unit.

Figure 6-10: Printer Characteristics Form (Priority)

Low	<b>Medium</b>	High
Printer driver	EpsonMX82	
Printer type	GPIO	
Priority	<b>Medium</b>	
Banner	Yes	
Printer characteristics: Fill in form and confirm.		
Epson MX-82		

This field is important when more than one printer is attached to the GRiD Server system. If two printers are printing at the same time, the printer with the highest priority is first to receive

of the same type, and equal-sized files printing on both, the printer with the higher priority is going to finish first.

Figure 6-11: Printer Characteristics Form (Banner)

<input type="checkbox"/> Yes	<input type="checkbox"/> No
Printer driver	EpsonMX82
Printer type	GPIB
Priority	Medium
Banner	<input type="text" value="Yes"/>
Printer characteristics: Fill in form and confirm Epson MX-82	

This field lets you determine whether the printout from the printer being added or modified begins with a banner page, which identifies the name given to the file being printed (usually the name of the user). If a GRiD Server has many users who print similar documents (memos, tables, etc.), then it is advisable to use banners. These can help to sort printer output.

Figure 6-12 illustrates a typical banner page; it contains the time the file was put into the Printer Queue in the format HH:MM:SS.S and a file identifier.

Figure 6-12: Sample Banner Page

```
*****  
*  
* 10:27:53.2 Johnson's "Printout" *  
*  
*  
*****
```

The format of the file identifier in the banner depends on how the file was sent to the spooler. If the Write Printer Copy to a File command was used, the file identification is whatever was entered into the Title and Kind fields on the File Form, in the format Title-Kind-. In this case, the maximum length of the Title is 19 characters (though the File Form allows 30), and the maximum length of the Kind is 17 characters. As System Administrator, you should suggest to users of this method of sending files to the spooler that they include their initials in the Title field to simplify identification of printouts.

If the Print This File command was used, and the GRiD Server Printer Driver was properly activated on the user's local storage medium (see the GRiD Server User's Guide), the file identification is the user's sign-on name, in the format UserName's-PrintOut.-

If the printer type selected was GPIB, then, after filling out the printer characteristics form and Confirming, the following form is displayed (Figure 6-13).

Figure 6-13: GPIB Address Form

The GPIB addresses and switch settings for printers is given in Table 6-1. The default address (21) is appropriate for the first GPIB printer being added. Each printer must have a unique GPIB address.

Table 6-1: GPIB Device Addresses and Switch Settings

Device	Address (Decimal)	Switch Settings
First 2101 Hard Disk	4 *	3 up
First 2101 Floppy Disk	5 *	(Part of 2101 Disk)
Second 2101 Hard Disk	12	2,3 up
Second 2101 Floppy Disk	13	(Part of 2101 Disk)
First 2102 Portable Diskette	6 *	3,4 up
Second 2102 Portable Diskette	14	2,3,4 up

(\* address cannot be changed)

After typing in the address and Confirming, the message Updating configuration is displayed at the bottom of the screen. If this printer is being added to the GRiD Server system for the first time, the message Adding printer follows the previous one.

If the printer type selected in the printer characteristics form was Serial, then, after Confirming, the following form is displayed (Figure 6-14).

Figure 6-14: Serial Address Form (Card Number)

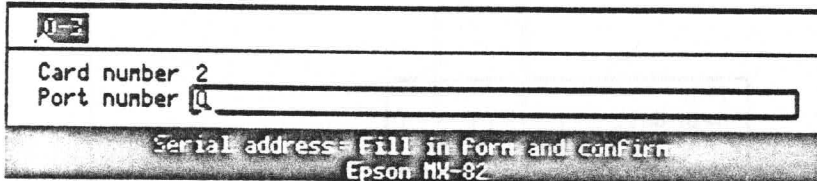
Type in the card/slot number of the communication processor to

which the printer is to be attached. This corresponds to the comm connector on the main or expansion unit to which the cluster box that the printer uses is attached. (See Figure 6-16 for a diagram of the GRiD Server card/port layout.)

NOTE: Use GRiDNetwork Manager to ensure that the card to which you are adding a printer is not configured for PhoneLink.

After typing the number of the card to which the printer is to be added, press RETURN.

Figure 6-15: Serial Address Form (Port Number)

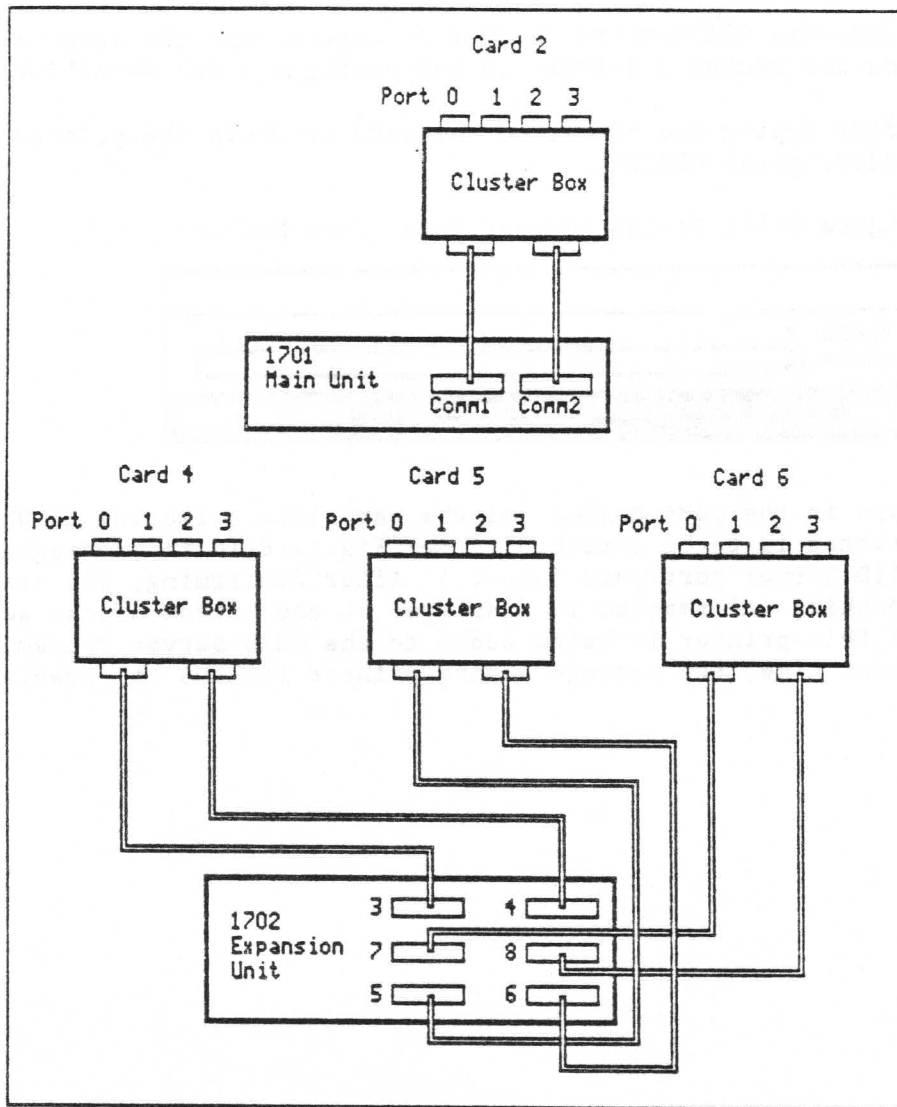


Card number 2  
Port number 0

Serial address: Fill in form and confirm  
Epson MX-82

Type in the port number (of the card just selected) to which the printer is to be attached. (See Figure 6-16 for a diagram of the GRiD Server port/card layout.) After Confirming, the message Updating information is displayed at the bottom of the screen. If this printer is being added to the GRiD Server system for the first time, the message Adding printer follows the previous one.

Figure 6-16: GRiD Server Port/Card Layout



When adding either a GPIB or a serial printer, the following form is displayed (Figure 6-17) after the GPIB address or the serial address form has been completed and CODE-RETURN pressed.

Figure 6-17: Enable Printer Form

<input checked="" type="checkbox"/> Yes	No
Enable printer <input type="text" value="Yes"/>	
Enable printer. Fill in form and confirm. Epson M8-82	



If the Yes option is selected, the printer is made ready to print files in its printer queue, and the message Enabling printer is displayed at the bottom of the screen.

If the No option is selected, the printer cannot be used, even though its parameters have been set in GRiDspool Manager.

After Confirming, the message Enabling printer is displayed at the bottom of the screen. Then the GRiDspool Manager menu returns, with the message Printer has been added displayed at the bottom of the screen, and the printer advances the paper to set the top of form.

#### Delete printer

If a printer is to be detached from the GRiD Server system, it should also be deleted from the GRiDspool Manager configuration. To delete a printer, select this item and Confirm. The following form is displayed (Figure 6-18).

Figure 6-18: Printer Selection Form

Enter name Epson FX-100 Epson MX-82 Letter Quality
Printer name Letter Quality
Delete printer - Select printer and confirm

After selecting the printer to be deleted, Confirm. The message Confirm to delete <printer name> is displayed at the bottom of the screen. After Confirming, the message Deleting printer is displayed for several seconds, then the GRiDspool Manager menu returns.

#### Printer status

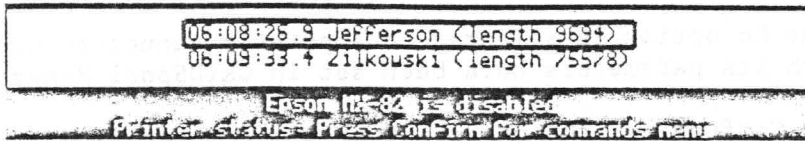
To find out the number of files (and their titles and sizes) in a particular printer's queue, select the Printer status item and Confirm. The form displayed (Figure 6-19) asks for the name of that printer.

Figure 6-19: Printer Selection Form

Enter name Epson FX-100 Epson MX-82 Letter Quality
Printer name Epson MX-82
Printer status - Select printer and confirm

After selecting the printer name and Confirming, the file names in the queue for the selected printer are displayed in the order they are to be printed (Figure 6-20).

Figure 6-20: Printer Queue File List



If there is no file in the printer queue, then the only item shown is No files found.

After viewing the file list, Confirm to return to the GRiDSpool Manager menu.

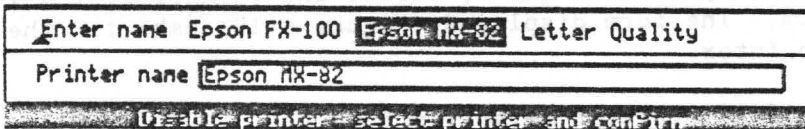
#### Reprint current file

This item lets you stop the printing of a file and immediately restart it from the beginning of that file. This is convenient if, for instance, part of the file has been printed on damaged, or the wrong type of, paper. After selecting this item and Confirming, the GRiDSpool Manager menu returns with the message Current file has been restarted displayed at the bottom of the screen.

#### Disable printer

This item is used to stop printing on a printer. This means no new files can be printed on the disabled printer. If a file was being printed at the time of disabling, only that part of the file in the printer's buffer memory is printed. (Once the printer is enabled again, the file is printed from the beginning.) If new files are being sent to that printer, they are placed in its queue. After selecting the Disable printer item and Confirming, the printer selection form is displayed (Figure 6-21).

Figure 6-21: Printer Selection Form



Once you have selected the printer that is to be disabled, Confirm. The message Confirm to disable <printer name> is displayed at the bottom of the screen. Confirm again to see the message Disabling printer displayed at the bottom of the screen. The printer is then disabled (and cannot be used until it is enabled again), and the GRiDSpool Manager menu returns. Any

other key stroke causes the GRiDSpool Manager menu to return without disabling the printer.

#### Enable printer.

This item is used to enable a printer to print files in its printer queue, usually after the printer has been temporarily disabled. After selecting this item and Confirming, the printer selection form is displayed (Figure 6-22).

Figure 6-22: Printer Selection Form

Enter name Epson FX-100 Epson MX-82 Letter Quality
Printer name Epson MX-82
Enable printer: Select printer and confirm.

After selecting the printer that is to be enabled, Confirm. The message Enabling printer is displayed at the bottom of the screen. Then the GRiDSpool Manager menu returns, and the printer carriage advances the paper to set the top of the form.

#### Change administration password

Only a System Administrator or normal user who has accessed the complete GRiDSpool Manager menu is allowed to change the password to this menu. To change this password, select the Change administration password item and Confirm. The following form is displayed (Figure 6-23).

Figure 6-23: Password Form

Passuord <input type="password"/>
Passuord: Enter new passuord and confirm.

It is recommended that the password be changed so that normal users only have access to the functions of deleting files and viewing the printer queue status.

After typing in the new password and Confirming, this form is displayed again with the message Password: Enter new password again and confirm at the bottom of the screen. The new password must be typed in exactly as it was in the previous form. If the two entries do not match exactly, the message New passwords don't match. Password not set is displayed at the bottom of the screen, and the GRiDSpool Manager menu returns. If the two

entries match exactly, the new password becomes the only one able to access the complete GRiDspool Manager menu.

#### Erase CODE-E

This item is used to erase a file in the printer queue. After selecting this item and Confirming, the printer selection form is displayed (Figure 6-24).

Figure 6-24: Printer Selection Form

Enter name Epson FX-100 Epson MX-82 Letter Quality
Printer name Epson MX-82
Erase Files Select printer and confirm

After selecting the printer and Confirming, the list of files in its queue is displayed (see example in Figure 6-25).

Figure 6-25: Example Of Printer Queue File List

06:08:26.9 Jefferson (length 9694)
06:09:33.4 Zilkowski (length 75578)
Erase Files Select item and confirm
Epson MX-82

If there is no file in the queue, the message No files found is displayed at the bottom of the screen and the GRiDspool Manager menu returns.

Once the file to be erased from the queue has been selected, Confirm. The message Confirm to erase <file name> is displayed at the bottom of the screen. Confirm again to erase the file and return to the GRiDspool Manager menu.

#### Quit CODE-Q

Selecting this item and Confirming results in the display of the message Quit: Confirm to exit (changes saved) at the bottom of the screen. To exit GRiDspool Manager and return to the RemoteAdministrator menu, Confirm again.

Cancel CODE-ESC

Selecting this item and Confirming results in the display of the message **Cancel: Confirm to exit (changes saved)** at the bottom of the screen. To exit GRiD Spool Manager and return to the RemoteAdministrator menu, Confirm again.

#### QUICK REFERENCE PROCEDURE

The following procedure summarizes the configuration changes required to add a printer to the GRiD Server system.

##### TO ADD A PRINTER

1. Uncomment the GRiD Spool Manager activation line in the System.Init file.
2. Restart the GRiD Server system.
3. Access the GRiD Spool Manager program via RemoteAdministrator in the Programs subject of the Software Subjects device.
4. Select the Add or modify printer item and follow the prompts to add the printer.

## CHAPTER 7: ADMINISTERING THE SOFTWARE

This chapter shows you how to administer the software on your GRiD Server system. The software falls into four broad categories: GRiD Server operating software, GRiD application software that runs under GRiD-OS, GRiD Server MS-DOS software, and user files. Administration (loading, organizing, maintaining, updating, and backing up) of each of these categories is discussed in detail.

### **GRiD SERVER OPERATING SOFTWARE (SERVER SUBJECTS)**

When your system is installed, each 2701 or 2703 disk unit comes with a copy of the GRiD Server operating software already installed on it in Server Subjects. This software is ready to use with the default configurations.

### **GRiD Server Floppy Disks**

Every GRiD Server also comes with a set of seven permanently write-protected floppy disks and one boot diskette (which is not write-protected). The write-protected diskettes consist of: Floppy #1 ("Operating System"), Floppy #2 ("Utilities"), Floppy #3 ("Applications and Configuration"), and Floppy #4 ("Network Applications"), contain a duplicate of all the files in Server Subjects; Floppy #5 ("Programs for Workstations") contains the programs needed to use or administer a GRiD Server (i.e., GRiDLink, RemoteAdministrator, and AdministratorSentry); Floppy #6 ("Help Files") contains the diagnostic port help files; Floppy #7 ("MS-DOS Interface Software") is an MS-DOS formatted floppy which contains all the files an MS-DOS user needs to access the GRiD Server.

This section discusses only Floppy #1, #2, #3, and #4.

Floppy #1 contains:

- o Device drivers
- o GRiD Server operating systems
- o Error message file
- o System startup programs

Floppy #2 contains:

- o File processor utilities
- o Printer drivers

Floppy #3 contains:

- o Configuration files
- o System managers (e.g., GRiDspool Manager)

Floppy #4 contains:

- o Communication software

In Chapter 3 it was suggested that you make a backup of your customized configuration files onto a separate floppy; your backup floppy together with Floppies #1, #2, #3, and #4 are the backup for your system software. Keep these floppies in a safe place. Note, however, that GRiD Resource Center personnel may ask you to put boot diskette or Floppy #1 into a floppy disk drive attached to the GRiD Server GPIB when they are troubleshooting your system over the telephone line, so you should not store the floppies off-site. The floppy holder in the "GRiD Server System Binder" that is shipped with every system is probably the best storage place.

Refer to Tables 7-1 through 7-4 for a summary of the programs and files on Floppies #1, #2, #3, and #4.

Program or File Name	Purpose or Use
@ServerErrors-Text~	List of all error numbers with their respective explanatory messages.
BootCards-Run~	Starts other processors from file processor. Started by System.Init on file processor.
C3AS-System~	Application processor operating system for application processors.
C3CS-System~	Communication processor operating system for 512K processor cards.
C3CS128K-Run~	Communication processor operating system for 128K processor cards.
C3FS-System~	File processor operating system. Runs on file processor.
Cat	Lists all file names in a directory at the specified level.
Copy-Run~	Copies files.
GS.Common-Shared~	Furnishes routines used by applications.
GS.Do-Run~	Command file processor. Executes System.Init on file processor.
GS.Executive-Run~	Command line interpreter for file processor.
Ladt-Run~	Lists active device table.
PeripheralDisk-Device~	Device driver for 2701 and 2703 disk units.
Prefix-Run~	Displays and changes default device and directory setting.

Table 7-1: Contents of Floppy #1 (Operating System)



Program or File Name -----	Purpose or Use -----
AddSubject-Run~	Creates directories.
Alias-Run~	Specifies alternate names for devices.
BootComplete	Puts time into the main unit's front panel display and write "Booting Done" message into system error log.
Compare-Run~	Compares two files for equality or inequality.
DecodeError-Run~	Displays text message for numerical errors.
Delete-Run~	Deletes files.
Diablo630Server-Printer~	Device driver for Diablo 630 printer.
DiskInfo-Run~	Displays peripheral bus disk storage information.
DisplayTapeLabel-Run~	Displays the header and trailer labels on the tape and validates tape contents. Also used to retension the tape.
Dump-Run~	Lists files in ASCII and Hex.
EpsonFX100-Printer~	Device driver for Epson FX100 printer.
EpsonFX80-Printer~	Device driver for Epson FX80 printer.
EpsonMX100-Printer~	Device driver for Epson MX100 printer.
EpsonMX82-Printer~	Device driver for Epson MX82 printer.
GS.Activate-Run~	Loads device drivers for GPIB printers and storage devices during boot sequence. Started by System.Init on file processor.
GS.Deactivate-Run~	Removes device drivers from RAM.
GS.MediaFormat-Run~	Initializes 2701 or 2703 disk.
GS.MediaPartition-Run~	Partitions 2703 disk into two, three, or four partitions
GS.MediaRepair-Run~	Repairs and/or recovers damaged files on 2701 or 2703 disks

Table 7-2: Contents of Floppy #2 (Utilities) (Continued)

Program or File Name	Purpose or Use
GS.Serial	Driver for serial printers.
GS.SetTime-Run~	Sets GRiD Server's internal clock to correct time and date.
GS.Softkeys-Text~	Text of often-used keywords recalled with CODE-number and CODE-SHIFT-number keystrokes at file processor "#" prompt. Overridden by softkeys in GRiD Server Diagnostic Port terminal file.
GS.UpdateBootCode-Run~	Copies low-level system startup program to hard or floppy disk so that system can be started from that disk.
HCompare-Run~	Compares hierarchical directory structures.
HCopy-Run~	Copies hierarchical directory structures.
HDelete-Run~	Deletes hierarchical directory structures.
HPLaserJetCourierS-Printer~	Device driver for HP LaserJet Courier printer.
HPLaserJetSerial-Printer	Device driver for HP LaserJet serial printer.
LineEdit-Run~	Simple line editor for modifying System.Init without use of GRiDWrite.
Rename-Run~	Renames files.
SectorCopy-Run~	Copies a disk or tape image to a disk or tape.
SetCache-Run~	Sets disk cache memory parameters. Started by System.Init on file processor.
Status-Run~	Displays information on memory usage.
SystemName-Run~	Sets GRiD Server system name. Started by System.Init on file processor.
Time-Run~	Display system clock time and date setting.
UAFActualDisk-Run~	Checks disk space used by each user and updates User Authorization File at startup time. Started by System.Init on file processor.

Table 7-2: Contents of Floppy #2 (Utilities) (Continued)

Program or File Name	Purpose or Use
UAFChangeDevice-Run-	Updates the User Authorization file after you have moved a user or device from one disk to another.
UAFDelete-Run-	Deletes disk space used by deleted users at startup time. Started by System.Init on file processor.
User-Profile-	Storage for system parameters such as system clock offset.
VfsVIPCLink-Device-	Allows applications (such as GRIDMail) to sign on to the file system.
VIPC-Run-	Allows applications to exchange messages with other programs from a 512K communication processor.
VIPC128K-Run-	Allows applications to exchange messages with other programs from a 128K communication processor.
VolumeName-Run-	Displays and changes volume name on disk.
Work-Run-	Displays and changes device used for work files.

Table 7-2: Contents of Floppy #2 (Utilities)

Program or File Name	Purpose or Use
AdminManager~Run~	Controls all GRID Server internal administrative functions.
AutoBackup~Run~	Automatic unattended back ups of disks to disk or tape at specified times.
AutoBackupCompletion~Run~	Restores original System.Init, starts SectorCopy, and returns system to normal operating mode.
AutoBackupConfig~Text~	AutoBackup configuration file.
AutoBackupConfig Model~Text~	Backup AutoBackup configuration file.
AutoBackupTerminate~Run~	Halts AutoBackup when it is waiting to perform the backup at the specified time of day.
GRIDSpool Manager~Run~	Lets you configure the GRID Server system for GPIB or serial printers and administer them.
GS.SerialDespooler~Run~	Causes files in the system spooling queue to be printed on a serial printer.
Message Of The Day~Text~	Information seen by users at sign-on.
System.Init~Com~	System startup configuration file.
System.Init Model~Com~	Backup system startup configuration file.
VFSConfig~Database~	Device configuration database.
VFSConfig~Database Index A~	Index to VFSConfig~Database~
VFSConfig Model~Database~	Backup device configuration database.
VFSConfig Model~Database Index A~	Index to VFSConfig Model~Database~
VFSManager~Run~	Virtual File System manager controls access to devices. Started by System.Init on file processor.

Table 7-3: Contents of Floppy #3 (Applications and Configuration)

File Name	Purpose or Use
CommGRiDandPhoneLink-Run-	Device driver for GRiDLink and PhoneLink running together on communication processor.
CommGRiDLink-Run-	Device driver for GRiDLink running alone on communication processor.
CommPhoneLink-Run-	Device driver for PhoneLink running alone on communication processor.
GRiDNetworkManager-Run-	Configures and manages the communication processors of the system.

Table 7-4: Contents of Floppy #4 (Network Applications)

## Updating Server Subjects

GRiD periodically releases new software for your GRiD Server. The new software typically contains problem ("bug") fixes and enhancements (new features).

### Updating Server Subjects from Floppy Disks

When you receive new GRiD Server software via floppy disks, you also receive an update procedure with the floppies. The following procedure is therefore only a general example meant to illustrate the principles of doing an update.

#### TO UPDATE SERVER SUBJECTS FROM FLOPPY DISKS

1. Ensure that the backup floppy containing a copy of your installation's customized configuration files is up to date. This is important because the update floppies contain the standard configuration files, which overwrites your unique files.
2. Sign on to GRiD Server as the System Administrator and use GRiDManager to copy GRiD Server Floppy #1, #2, #3, and #4 to Server Subjects. The New Version Only item on the GRiDManager CODE-D Verification form allows you to copy only files that have a different length and a later last modified date.
3. Use GRiDManager to copy the backup floppy containing your unique configuration files to Server Subjects.

4. Perform any other procedures required by the update documentation that comes with the floppy disk set.
5. Restart the GRiD Server and test for proper operation.
6. Keep the new floppies in the "GRiD Server System Binder" as your current operating software backup; also keep the old floppies containing the previous release in case you must revert to the previous software version.

### Keeping Server Subjects "Clean"

Server Subjects should only be used to contain the GRiD Server operating software. While there is no restriction against the System Administrator writing other files into Server Subjects, GRiD does not recommend it. As System Administrator, you have your own User Subjects device; you should use it for your own file storage. Keeping Server Subjects free of unrelated files makes it easier to troubleshoot your system, when necessary. Refer to Table 8-1 through 8-4 for a list of all the files in Server Subjects.

### GRiD APPLICATION SOFTWARE (SOFTWARE SUBJECTS)

When your system is installed, each 2701 or 2703 disk unit comes with a number of programs already installed in Software Subjects. These programs, GRiD applications that run under GRiD-OS, are needed to use or administer GRiD Server (e.g., GRiDLink and AdministratorSentry). These programs are also supplied on GRiD Server Floppy #5 ("Programs for Workstations"). Note that the floppy contains four subjects: Programs, Programs for Compass, Programs for GRiDCase, and Programs for IBM PC 3.1.0. Table 7-5 below summarizes some of the files contained on Floppy #5 and where to go for information on each program or file.

Program or File Name	Function
AdministratorSentry	Used by System Administrator to create and control accounting structure (see Chapter 5)
Alias	Used during program development on GRiD Server (see Chapter 9)
CableTest	Used during troubleshooting (see Appendix E)
GRiD Server Diagnostic Port	Terminal file used to simplify access to and use of diagnostic port and file processor (see Chapter 8)
GRiDLink	Device driver for GRiDLink access to system (see <u>GRiD Server User's Guide</u> )
PhoneLink	Device driver for PhoneLink access to system (see <u>GRiD Server User's Guide</u> )
RemotePrinter	Device driver for remote spooled printer access (see Chapter 4)
RemoteAdministrator	Used by System Administrator to configure various applications running on GRiD Server (i.e., GRiDNetwork Manager, GRiDSpool Manager)
UserSentry	Run by users to change sign-on password and query user information such as total disk space used (see <u>GRiD Server User's Guide</u> )

Table 7-5: Contents of GRiD Server Floppy #5

## Loading Software Subjects

While the GRiD Server is certainly useable with just the initial shipped programs in Software Subjects, normally all the GRiD applications (GRiDWrite, GRiDPlan, etc.) are stored in Software Subjects for all users to share. The procedures in this section describe loading and updating GRiD applications in Software Subjects.

NOTE: Even though one copy of GRiD application software is shared by all users on the GRiD Server, each user must still purchase his own copy of the GRiD Software. What the user is actually purchasing is a license to use the GRiD Software on his or her own machine, and a set of documentation. Note that there is no software protection or authorization mechanism on GRiD Server; instead, the above policy is enforced through the weight of the copyright and licensing laws.

The initial loading of Software Subjects with GRiD application software is usually done from floppy disks or a Hard Disk System or a Floppy Disk System, since typically most of the potential GRiD Server users at your installation have a complete local copy of the GRiD software. The following procedure illustrates the general principles of loading Software Subjects from a local device.

▶ TO LOAD SOFTWARE SUBJECTS FROM A LOCAL STORAGE DEVICE

1. Connect a local storage device to your computer and copy directly from the floppies. Note that if you connect it to GRiD Server, you must have previously configured the device in the VFSSConfig database (see Chapter 4).
2. Sign on to GRiD Server as the System Administrator and use GRiDManager to copy all the GRiD application programs to the appropriate Programs subject of the Software Subjects device.

NOTE: Depending on your equipment, you may need to create different Programs subjects for different computers, for example, "Programs for Compass" and "Programs for IBM-PC."

### Backing Up Software Subjects

Making a backup of the loaded Software Subjects device may not be necessary because every user must purchase a separate copy of the GRiD application software, most users have floppy disks that can serve as a backup.

However, having a backup usually is a good idea. If you have backup copies, be sure to update the backups when changing the masters. Keep backups in a secure place and restrict access to it.

### Maintaining Software Subjects

The key to successful administration of GRiD application software on GRiD Server is to keep only one master copy of the software for everybody to use. This copy should be the one under your control in the Software Subjects device. It is important that one person, usually the System Administrator, keep all the most recent versions of the application software, updating them when necessary, and keep users informed of any changes. It is very difficult to keep multiple copies of software in sync. The problems get especially severe if there are incompatibilities between the versions of software, so that (for example), a user ends up with incompatible versions of CCOS and Common, rendering that workstation inoperable until it is reloaded from floppy.



## Updating Users' GRiD-OS Computers

Once you have updated Software Subjects with a new version of GRiD application software, you can use the Message of the Day file (see Chapter 4) to inform your users that a new version is available. It is each user's responsibility to update a machine's local storage device (bubble memory, floppy disk, etc.) with the new version.

## GRiD SERVER MS-DOS SOFTWARE

The software that users need to access GRiD Server via PhoneLink or GRiDLink from computers running MS-DOS or PC-DOS is located on GRiD Server Floppy #7. This floppy is an MS-DOS formatted floppy. It contains directories for the IBM PC, the GRiD Compass, and the GRiDCase. The System Administrator should tell users to copy the appropriate directory (i.e., the one for the machine type they are using) to their local device.

Because the floppy is MS-DOS formatted, you cannot read it on any GRiD Server device. It is meant to be used by individual users as a source of the MS-DOS programs needed to access GRiD Server.

Table 7-6 lists the files on the floppy in each directory, as well as their function. Documentation for both groups is in the GRiD Server User's Guide and the GRiD Server User's Guide for MS-DOS and PC-DOS Users.

Program or File Name	Function
SERVER.EXE	User interface for GRiDLink and PhoneLink (similar to GRiD-OS GRiDManager program)
PHONELNK.EXE	Device driver for PhoneLink access to system
GRIDLNK.EXE	Device driver for GRiDLink access to system

Table 7-6: Contents of GRiD Server Floppy #7

## The Administrator's View of MS-DOS on GRiD Server

As the Administrator of a system with both GRiD-OS and MS-DOS users, it is useful if you have some understanding of how GRiD-OS and MS-DOS files co-exist on GRiD Server. When an MS-DOS user copies a file to any device on GRiD Server, a directory called "MS-DOS File System" is automatically created in the device. All MS-DOS files in the device are either in that directory (equivalent to the root directory), or in subdirectories under that directory. (You may want to review the topic of subdirectories in an MS-DOS manual.)

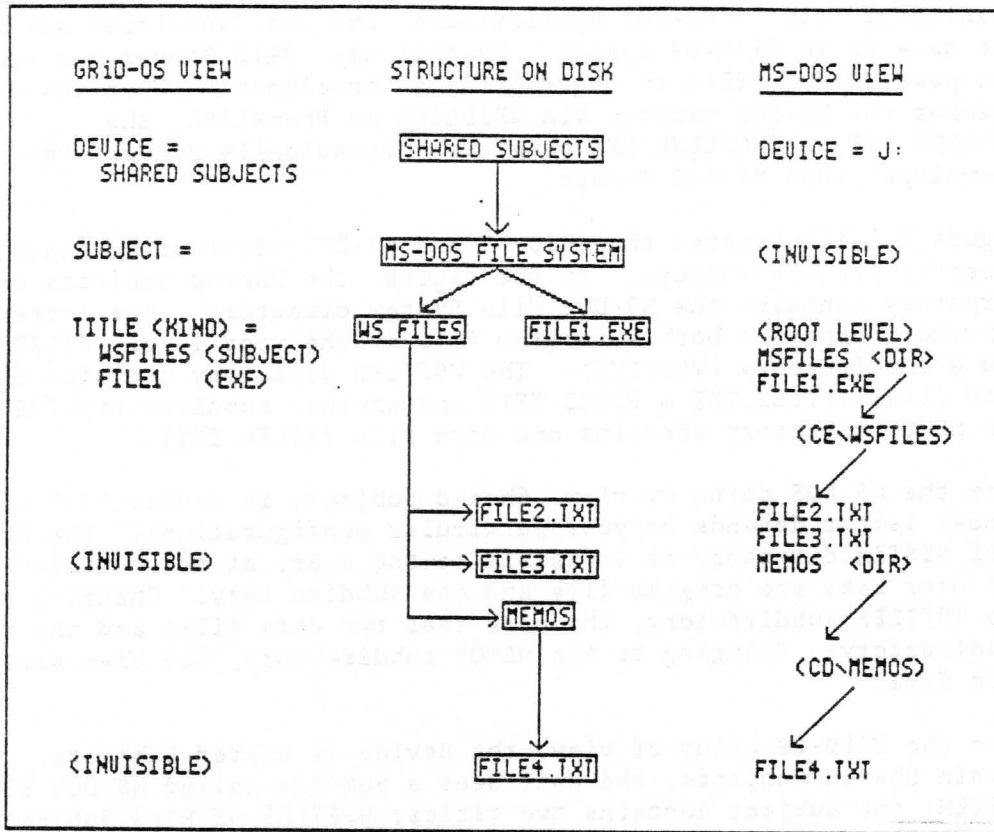
The data inside an MS-DOS file on GRiD Server is in MS-DOS format, meaningful only to MS-DOS applications, but the "envelope" around the data is in GRiD-OS format. In this way, GRiD Server can store and pass MS-DOS files in their GRiD-OS "envelopes." When the data reaches the MS-DOS machine via GRiDLink or PhoneLink, the GRIDLNK.EXE or PHONELNK.EXE programs automatically convert the "envelope" into MS-DOS format.

Figure 7-1 illustrates the GRiD-OS and MS-DOS views of an example directory/file structure. In the figure, the Shared Subjects device directory contains the MS-DOS File System directory. The latter directory contains both a program file at the root level (FILE1.EXE) and a subdirectory (WSFILES). The WSFILES directory contains two data files (FILE2.TXT & FILE3.TXT) and another subdirectory (MEMOS). The MEMOS directory contains one data file (FILE4.TXT).

From the MS-DOS point of view, Shared Subjects is device "J:" (the actual letter depends on your particular configuration). The MS-DOS FILE SYSTEM directory is invisible to the user; at the root level the user sees one program file and one subdirectory. Changing to the WSFILES subdirectory, the user sees two data files and the MEMOS subdirectory. Changing to the MEMOS subdirectory, the user sees one data file.

From the GRiD-OS point of view, the device is Shared Subjects. Within Shared Subjects, the user sees a Subject called MS-DOS FILE SYSTEM; the subject contains two titles: WSFILES of kind Subject, and FILE1 of Kind EXE. (Note that GRiD-OS users cannot read files of Kind Subject). The lower levels of the subdirectory structure visible to the MS-DOS user are completely invisible to the GRiD-OS user, since GRiD-OS does not support subdirectories.

Figure 7-1: GRiD-OS and MS-DOS Views of the Same Disk Structure



### Duplicating the MS-DOS Floppy

Since GRiD ships only one Floppy #7 with each system, you should duplicate it before you give it to your users. Multiple copies make it more convenient for users to get access to the software, as well as providing a backup.

Since it is an MS-DOS formatted floppy, you must make a copy using the MS-DOS disk copying utility on any MS-DOS computer to which you have access. Refer to the documentation for the particular computer you intend to use for the procedure (e.g., the GRiD MS-DOS Reference Manual).

### Loading The GRiD Server MS-DOS Software Into Software Subjects

You can store the GRiD Server MS-DOS software in Software Subjects by loading it from a computer running MS-DOS. Doing this has at least two advantages: first, when new versions are issued, your MS-DOS users can get new copies directly from the GRiD Server, just the way GRiD-OS users get new versions of GRiD applications. Second, storing the software on the GRiD Server provides a backup of Floppy #7.

▶ TO LOAD THE GRiD SERVER MS-DOS SOFTWARE INTO SOFTWARE SUBJECTS

1. Connect a computer running MS-DOS to any GRiDLink outlet, or set up the MS-DOS computer to call the GRiD Server via PhoneLink (see the GRiD Server User's Guide).
2. Put GRiD Server Floppy #7 into the MS-DOS computer's floppy disk drive.
3. Run the SERVER.EXE program by typing "Server" at the "A:" prompt.
4. Choose the Sign-on item on the SERVER.EXE menu, fill in the Signon form as System Administrator, and Confirm to sign on to GRiD Server. Make note of the letter designation of the GRiD Server Software Subjects device (assumed to be "J:" in the following steps).
5. Choose the Exit item on the SERVER.EXE menu, then Confirm to exit the program.
6. Change your current directory to J: (which corresponds to Software Subjects).
7. Use the MS-DOS MKDIR command to create three subdirectories in the Software Subjects device to contain the GRiDCase, Compass, and IBMPC directories of files:

```
J:MKDIR GRiDCase
J:MKDIR Compass
J:MKDIR IBMPC
```

8. Use the MS-DOS Copy command to copy the two sets of four files from Floppy #7 into the appropriate directory, as follows:

```
J:COPY A:\GRiDCase\*. * J:\GRiDCase\
J:COPY A:\Compass\*. * J:\Compass\
J:COPY A:\IBMPC\*. * J:\IBMPC\
```

9. Run the SERVER.EXE program again by typing "Server" at the "A:" prompt.
10. Choose the Sign-off item on the SERVER.EXE menu, and Confirm twice to sign off GRiD Server. Then choose the Exit item on the menu, and Confirm to exit the program.

## Updating Users' MS-DOS Computers

Once you have updated Software Subjects with a new version of the GRiD Server MS-DOS software, you can use the Message of the Day file (see Chapter 4) to inform your users that a new version is available. It is each user's responsibility to update his own machine's local storage device (bubble memory, floppy disk, etc.) with the new version. The procedure that a user performs to update his own machine is covered in the GRiD Server User's Guide for MS-DOS and PC-DOS Users.

## USER FILES (USER, GROUP, COMPANY, AND SHARED SUBJECTS)

User files represent the final category of software to be administered. One key responsibility the System Administrator has is to provide a system-wide backup of user data. While some individuals may minimize the importance of keeping backup copies of their own data files, backup is crucial for a multi-user system where a failure may mean the loss of 20 users' work.

### Backup Alternatives

There are several alternatives for backing up a GRiD Server system; these include:

1. No backup. This is the simplest of all, but it is NOT recommended!
2. All users can back up their own User Subjects to floppy disks or a local Hard Disk System via GRiDManager. Group and Company Administrators can be made responsible for backing up Group and Company Subjects; the System Administrator can be made responsible for backing up Shared Subjects. This is a lot of work for everybody, also it is very unreliable.
3. The System Administrator can use the AutoBackup utility to automatically back up the data on your peripheral bus disks (see "The GRiD Server Automatic Backup Software" section in this chapter). This lets you back up each 2701 and 2703 to a matching, dedicated 2701 or 2703 or to a 2801 Tape Backup unit. This can be done daily or at specified times of the week.

### The GRiD Server Automatic Backup Software

The GRiD Server automatic backup software provides for the automatic unattended backup of the entire contents of a peripheral bus disk (2701 or 2703) to a second peripheral bus disk (2701 or 2703) or to a tape cartridge loaded in a 2801 tape unit.

Using the automatic backup software to back up peripheral bus disks to disks of the same size or to a tape drive is your best alternative when system availability is important and the time taken to replace a failed disk (and its data) must be minimized. If a disk unit should fail, you can simply remove the failed unit and activate its backup unit or copy the contents of the tape to a recovery disk.

To use the automatic backup software, you must specify the time of day at which the backup is to begin, and the source and destination devices for any or all days of the week in the AutoBackupConfig file.

At the specified time, the GRiD Server system is automatically restarted and enters backup mode. Active users are not informed; they are disconnected and cannot continue to use the system. They may continue to use computers connected to the system as long as they do not attempt to access files on the GRiD Server disks; an attempt to access the GRiD Server then produces error message 701: Server not responding.

No user can sign on to the system while it is in backup mode. You may wish to specify the time of day for backup in the Message of the Day file as a reminder to the users of the system. To minimize the impact of backup on normal use of the system, it is recommended that the time of day specified for backup be late at night or early in the morning.

Any files in the printer queue when the system is restarted for backup remain there and are printed when backup is complete.

Backup of a 2701 disk takes about ten minutes; backup of a 2703 disk takes about forty minutes. When the backup is complete, the system automatically restarts into normal operating mode, and users who have not signed off are automatically reconnected the next time they access a GRiD Server device.

A backup disk or tape contains images of all of the sectors of the source disk from which it was copied, including the volume name. A backup disk can be used in place of its source disk. If you wish to recover data from a backup tape, you must copy the entire tape to the recovery disk.

The automatic backup software consists of several files. AutoBackup, AutoBackupConfig, AutoBackupCompletion, SectorCopy, and GS.Deactivate must be present in the Programs subject of Server Subjects on your system to run automatic backup. AutoBackupTerminate and DisplayTapeLabel are utility programs provided for your use in administering the automatic backup software and should also reside in the Programs subject of Server Subjects.

#### AutoBackup~Run~

This file contains the program that controls the automatic backup procedure. The program is started during system initialization by a command in the System.Init-Com- file that specifies the automatic backup configuration file.

AutoBackup runs continuously in background on your system once it has been activated. It can be terminated with AutoBackupTerminate.

#### AutoBackupCompletion~Run~

This file contains the program that

- o restores your original System.Init to System.Init-Com- once backup is complete,
- o starts the SectorCopy program (described below),
- o logs the results of the copy to the System Error Log file, and
- o returns the system to its normal operating mode.

It is started by the special System.Init file created by AutoBackup.

#### AutoBackupTerminate~Run~

This utility terminates AutoBackup when it is running in the background on your system and waiting for the time of day specified in the automatic backup configuration file. It can be invoked at the file processor "#" prompt on the diagnostic port.

#### DisplayTapeLabel~Run~

This program displays the contents of the label on a tape cartridge loaded in a 2801 tape unit. The label indicates which disk was backed up to the tape. It also indicates whether the backup was successful. DisplayTapeLabel can also be used to retension the tape in a new tape cartridge or in one on which errors have occurred.

**CAUTION:** To use DisplayTapeLabel, you must first restart the system without executing System.Init. You can then invoke DisplayTapeLabel at the file processor "#" prompt on the diagnostic port.

#### GS.Deactivate~Run~

This program is used by AutoBackup to ensure that any disk units used as destination devices for backup are deactivated during normal system operation.

## SectorCopy~Run~

This program copies sectors from one peripheral bus device to another. It is started by AutoBackupCompletion to perform the backup of a peripheral bus disk.

To restore all of the data from a backup tape to a disk, restart the system without executing System.Init and invoke SectorCopy at the file processor "#" prompt on the diagnostic port.

### For the More Technical System Administrator

When AutoBackup begins executing, it creates an entry in the name table 'N\System'AutoBackup that indicates it is running.

Every two minutes AutoBackup checks the current time of day against the time specified in the automatic backup configuration file. When the two times match, AutoBackup renames your current System.Init-Com~ to System.Init~AutoBackup~, and creates a System.Init that invokes AutoBackupCompletion, which invokes SectorCopy (described below). Your system is rebooted using the new System.Init, then your normal System.Init file is restored from System.Init~AutoBackup~ to System.Init-Com~.

The backup process then commences, first erasing the tape cartridge (which takes about two minutes) if the backup medium is tape, then copying sectors from the source disk to the backup medium. Upon completion of the backup, the system is automatically rebooted using your normal System.Init file.

The following is an explanation of the errors and messages displayed by the AutoBackup software. These messages are displayed on the diagnostic console, and the errors are logged in the System Error Log-Text~ file. For more information on what to do if any of these errors occur, refer to Appendix C of this manual.

- o When SectorCopy begins the tape backup, the system first tests the path along which the data travels. While this is happening, the following message is displayed:

SectorCopy: Tape data path verification in progress

Should the system encounter a problem, the following message is displayed:

1316: Tape data path verification failed

- o Once the disk data has been backed up to tape, the system automatically verifies the backup by comparing the original data with the tape backup. While this verification is taking place, the following message is displayed:

SectorCopy: Tape data verification in progress



- o Once the verification is successfully completed, the following message is displayed:  
SectorCopy: Tape data verification complete
- o If the verification fails, one of the following error messages appears:  
1314: Tape label verification failed  
1315: Tape trailer verification failed

In the first case (Error 1314), an error was detected while the tape header label was being read and validated. In the second case (Error 1315), an error was detected while the tape trailer was being read and validated.

- o In all cases, the tape is automatically rewound after the SectorCopy program is completed. During the rewind, the following message is displayed:  
SectorCopy: Tape rewind in progress
- o When a disk-to-disk backup has finished, the message Copy complete appears, followed by the number of read and write errors found as well as information about the first read and first write error.
- o If the source that is being backed up is larger than the destination, the following messages are displayed:  
SectorCopy: Source may not be LARGER than destination!  
1317: Source may not be larger than destination
- o If a backup cannot be completed, the SectorCopy program automatically rewinds the tape (displaying the SectorCopy: Tape rewind in progress message) and writes a label at the beginning of the tape; this label contains the message This tape does not contain valid data.
- o After you have viewed the header label and trailer on the backup tape by using DisplayTapeLabel, you are asked to Confirm to re-tension the tape. If you Confirm, the tape is rewound and re-tensioned, and the following messages are displayed on the screen:  
Re-tension in progress  
Re-tension complete

If, instead of Confirming, you press any key on the keyboard, the tape is only rewound (not re-tensioned), and the following message is displayed: Rewind in progress.

- o If the backup is invalid, the appropriate errors are logged to the ErrorLog-Text- file, and the following header label information is displayed:

```
This tape has been invalidated by SectorCopy
**** Error information from SectorCopy ****
This tape was created: 3:24:28 p.m., Monday March 24, 1985
Source drive: 1, Destination drive: 3
Source volume: 2701-0000000123a
Read error count: 0, First read error: 0
Write error count: 1, First write error: 1316
Sectors written: 0
```

NOTE: Sample values have been entered in the appropriate places.

CAUTION: All magnetic tape media (audio cassettes, data tapes, or floppy diskettes) have a finite life expectancy. This is due to normal wear and tear on the medium as a result of being used. Once data has been recorded on Model 2810 Tape cartridges, these have a shelf life of four to six months (depending upon temperature, humidity, and cleanliness of environment). These tapes should be replaced after 140 backups. Tapes should always be re-tensioned after backup.

## CHAPTER 8: THE DIAGNOSTIC PORT

This chapter provides detailed reference information on using the diagnostic port. Three basic topics are covered: connecting to the diagnostic port, accessing the diagnostic port, and using the diagnostic processor and file processor commands. Chapter 9 gives detailed information about the utilities used via the diagnostic port.

### WHAT IS THE DIAGNOSTIC PORT?

The diagnostic port is a "window" into the GRiD Server system; it can be used independently of any other part of the system. The diagnostic port is connected to the diagnostic processor, a separate microprocessor whose use does not depend on any other part of the GRiD Server except the power supply. The primary purposes of this facility are to let 1) the System Administrator run utilities affecting the entire system (e.g., SectorCopy, GS.Settime), and 2) GRiD System Engineers and GRiD Resource Center personnel to run diagnostic programs and to troubleshoot when part of the GRiD Server is producing errors (such as a failed communication processor).

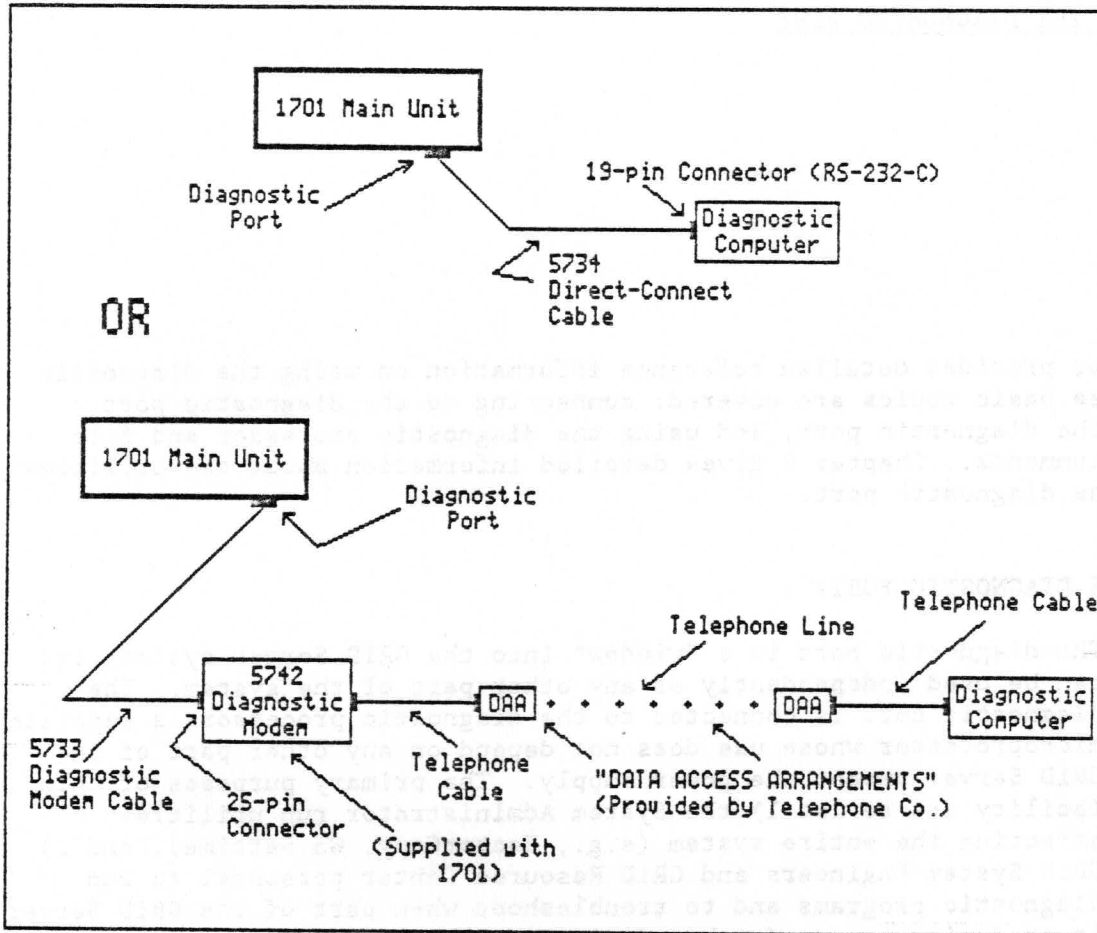
The diagnostic port may also be used by the GRiD Server System Administrator for a wide variety of activities, such as:

- o Running the GS.SetTime utility to set the GRiD Server system clock.
- o Running the SectorCopy utility to restore data from a 2801 tape drive to a 2701 or 2703 disk unit.
- o Determining the space available on an individual 2701 or 2703 Disk Unit.
- o Determining who is currently signed on to the GRiD Server.

## CONNECTING TO THE DIAGNOSTIC PORT

A computer must be running GRiDTerm if it is to be attached to the diagnostic port. You can connect your diagnostic computer to the diagnostic port either via modem or directly (hard-wired). Figure 8-1 illustrates the connection alternatives.

Figure 8-1: Diagnostic Port Connection Alternatives.



### Diagnostic Modem Connection

When the GRiD Server is installed, the installer usually connects the 5742 Diagnostic Modem (supplied with the 1701 Main Unit) to the diagnostic port connector on the rear panel of the 1701, using the 5733 Diagnostic Modem Cable. The modem, in turn, is usually connected to an outside telephone line (the "Data Access Arrangement" in Figure 8-1). Leaving the modem connected to the diagnostic port lets GRiD Resource Center personnel remotely diagnose problems with the GRiD Server; it also lets the System Administrator use the diagnostic port from any location, not only the room where the GRiD Server is located. The disadvantage to leaving the modem connected to the diagnostic port is that the

security of the data on the system may be compromised. GRiD recommends that a modem be available but attached only when needed. If the modem must be left attached to the system, the password for the file processor should be changed; this helps prevent unauthorized access to the GRiD Server system.

Using the modem connection to the diagnostic port has at least one other significant advantage over the direct connection: you can be connected to the diagnostic port and concurrently signed on to the GRiD Server via GRiDLink. This means that the software required to access the diagnostic port (see "Software Required" below) does not have to be resident on a storage device connected to the diagnostic computer; it can be accessed from GRiD Server like any other software.

NOTE: The GRiDLink software does not let you record or print data received via GRiDTerm into GRiD Server files or on GRiD Server printers without losing data. This means that if you want to record your diagnostic port session for later study, you must record it on a storage device or printer locally attached to your computer.

Setting up your computer to call the diagnostic port is the same as calling any outside computer service or data base such as Dow Jones News Service: simply use a telephone cord to connect the computer's modem (either internal or external) to the "Data Access Arrangement" (typically the RJ11C jack on the wall). The baud rate for transmissions to the diagnostic port is 1200 baud both for direct connect and over the telephone line.

### Direct Connection

A 5734 Direct-Connect Diagnostic Cable is supplied with each 1701 Main Unit. This cable lets you connect the diagnostic computer directly to the diagnostic port. To use this cable, disconnect the 5733 Diagnostic Modem Cable at the main unit rear panel, and replace it with the 5734 Direct-Connect Cable. Connect the other end of the direct-connect cable to the serial port on the diagnostic computer. The cable is symmetric: either end can be used in either place (both ends use 2DE19P connectors; see the GRiD Server Installation Guide for the pinout on the connector).

If the serial port on your diagnostic computer uses a DB25S (25-pin) connector rather than a 2DE19S (19-pin) connector, a special cable is required. Call the GRiD Resource Center for information.

The baud rate used when you access the diagnostic port either via modem or via direct-connect cable is the same: 1200 baud. Thus, there is no speed advantage to using direct connection; the only advantage is that the telephone line and its associated delays (dialing, ringing, answering, etc.) are eliminated.

## SOFTWARE REQUIRED

To access the diagnostic port directly, you must have the GRiDTerm and Serial programs present on a local storage medium (bubble memory, floppy, or hard disk) connected to your diagnostic computer, and you must be signed off GRiDLink.

To access the diagnostic port via modem, you must either (a) have the GRiDTerm and Modem programs present on a local storage medium connected to your diagnostic computer, or (b) be signed on to GRiD Server via GRiDLink and have access to the two required programs (normally located in the Programs subject of the Software Subjects device).

In the remainder of this chapter it is assumed that 1) the diagnostic port is being accessed via modem, and 2) the required software is locally resident.

## GRiD SERVER DIAGNOSTIC PORT TERMINAL FILE

To simplify access to the diagnostic port, a file of Kind Terminal called "GRiD Server Diagnostic Port" is provided with the GRiD Server software (on GRiD Server Floppy #5 and in the Programs subject of the Software Subjects device). This file provides the proper settings for GRiDTerm to access the diagnostic port, as well as a set of softkeys to reduce typing effort when running file processor utilities (see Chapter 9 for more information). To set up GRiDTerm for diagnostic port access, simply select this file.

The settings in this file are shown in Figures 8-2 through 8-5. Settings which are different from GRiDTerm's default (initial) settings are numbered and explained following Figures 8-2 and 8-3.

Figure 8-2: GRiDTerm Top-Level Properties (CODE-P) Form

<b>Full duplex</b> Half duplex	
Transmission mode	Full duplex
Backspace character	CTRL-H
Type of parity	Off
Bits per character	8
Stop bits	1
Properties Full duplex and continue	

Figure 8-3: GRiDTerm Full-Duplex Properties (CODE-P) Form

Local echo	<b>Host echo</b>
Echo mode	Host echo
Line end character sent by Host	CR
Line end string sent to Host	CR
XON / XOFF support	Disabled
ENQ / ACK support	Disabled
<b>Full duplex properties: Fill in form and confirm</b>	

Figure 8-4: GRiDTerm Options (CODE-O) Form

1-250	Window width
Display width	80
Word wrap	Enabled
Ruler	Disabled
Remove control characters	Yes
Display control characters	No
Display received characters	Yes
End line automatically	Yes
Current typeface	System-wide
<b>Options: Fill in form and confirm</b>	

NOTE: It is helpful to set your document width to 132 in the GRiDTerm CODE-O form when viewing the error log files.

Figure 8-5: GRiDTerm Access (CODE-A) Form

4	Phone number	^9^555-1212
5	Remote system name	GRiD Server Diagnostic Port
	Baud rate	1200
	Modem type	Internal
	Dial type	Touch-tone
6	Voice before data	No
	Wait for answer	20
	Speaker volume	Medium
	Try again	No
<b>Access: Fill in form and confirm to dial</b>		

- 1 Type of Parity must be set to Off, because the diagnostic processor does not use parity.
- 2 Bits per Character must be set to 8, so CODE-character commands can be sent to the diagnostic processor.
- 3 Word Wrap is set to Enabled, for ease in reading text on the diagnostic computer screen (this setting is optional).

- 4 For modem access to the diagnostic port, Phone Number must be set to an appropriate phone number (use "^" characters as required to wait for dial tones). For direct connection to the diagnostic port, Phone Number should be set to a single period (.), meaning wait one second before connecting.
- 5 The Remote System Name is filled in for documentation purposes.
- 6 For modem access to the diagnostic port, Modem Type must be left at "Internal" (the default). For direct connection to the diagnostic port, Modem Type must be set to "External."

## GRIDTERM TRANSPARENT MODE

Some diagnostic processor and file processor commands require you to Confirm in response to questions and prompts. Normally, CODE-character keystrokes are local commands in GRiDTerm; they are not passed on to the host computer; to circumvent this restriction, GRiDTerm has a special "transparent" mode that is entered and exited by pressing CODE-SHIFT-CTRL-Y, then Confirming.

When you are in transparent mode, GRiDTerm passes all CODE-character keystrokes on to the host computer (GRiD Server, in this case). This means that when you type "CODE-?", you get the commands menu for the diagnostic processor, not for GRiDTerm, since GRiDTerm does not execute the CODE-? but instead sends it on to the GRiD Server. To get the GRiDTerm commands menu, press CODE-SHIFT-?. When you are in transparent mode, CODE-SHIFT-? and CODE-SHIFT-CTRL-Y are the only CODE-character keystrokes that are interpreted as commands by GRiDTerm, rather than being sent on to GRiD Server.

When you are in transparent mode and want to execute a GRiDTerm command such as CODE-O to change the display width from 80 characters to window-width, you must first press CODE-SHIFT-? to get the GRiDTerm commands menu, then use the arrow keys to move the selection outline down to the desired command, and then Confirm. Alternatively, you could exit transparent mode (CODE-SHIFT-CTRL-Y and Confirm), type the command (CODE-O in this case), then re-enter transparent mode again (CODE-SHIFT-CTRL-Y, then Confirm).

## ACCESSING THE DIAGNOSTIC PROCESSOR

The procedure below lets you access the diagnostic port via modem.



### TO ACCESS THE DIAGNOSTIC PORT VIA MODEM

1. Connect the diagnostic computer modem (internal or external) to a telephone line.



2. Check that the GRiDTerm and Modem programs are available on a local storage device connected to your diagnostic computer. If you have a GRiDLink connection to the GRiD Server and are signed on, these files can be resident on a GRiD Server disk rather than on a local device.
3. If it is available, select the "GRiD Server Diagnostic Port" terminal file from the storage device you are using. If not, create a new file of Kind Terminal.
4. Ensure that the Type of Parity and Bits per Character on the CODE-P form are set to Off and 8, respectively.
5. Enter the phone number of the diagnostic port modem in the CODE-A form, then Confirm. The following messages appear:

Activating Modem

Dialing the telephone number

Waiting for carrier

Data mode established

6. Press RETURN once. An asterisk (\*) appears; this is the prompt for the diagnostic processor.
7. Press CODE-SHIFT-CTRL-Y. The following message appears:

Confirm to enter transparent mode

Confirm and another asterisk appears. You are now in transparent mode.

8. Press CODE-? or type "Help" and then press RETURN for a listing of the diagnostic processor commands (see the next section below for more information).

The procedure below lets you access the diagnostic port directly.



#### TO ACCESS THE DIAGNOSTIC PORT DIRECTLY

1. Connect the diagnostic computer directly to the 5734 cable, which is connected to the diagnostic port.

NOTE: When performing these steps, you cannot be signed on to GRiDLink.

2. If it is available, select the "GRiD Server Diagnostic Port" terminal file from the storage device you are using. If not, create a new file of Kind Terminal.
3. Ensure that the Type of Parity and Bits per Character on the CODE-P form are set to Off and 8, respectively.

4. Enter a period (".") for the phone number and select "External" for the modem type. The message Data mode established is displayed.
5. Press RETURN once. An asterisk (\*) appears; this is the prompt for the diagnostic processor.
6. Press CODE-SHIFT-CTRL-Y. The following message appears:  
  
Confirm to enter transparent mode  
  
Confirm and another asterisk appears. You are now in transparent mode.
7. Press CODE-? or type "Help" and then press RETURN for a listing of the diagnostic processor commands (see the next section below for more information).

## DIAGNOSTIC PROCESSOR COMMANDS

When you are in transparent mode and press CODE-? at the diagnostic processor prompt ("\*"), the list of available commands shown in Figure 8-6 is displayed. Each command is explained in detail in the following sections.

When entering commands, either Confirming or pressing RETURN executes the command. In responding to questions or prompts from a command, either Confirming or pressing RETURN works unless the question specifically asks you to Confirm (e.g., "Confirm to boot system from default device"), in which case you must Confirm. Pressing ESC in response to any question cancels the command. All commands can be abbreviated to four characters (e.g., "Conf" instead of "Configuration"). If you type an invalid command (e.g., "Cong", the diagnostic processor responds with "Invalid Command."

Figure 8-6: Diagnostic Processor Commands (CODE-?) Menu

BOOT:	boot system from default device
BOOT X:	boot system from device X
CLEAR:	clear error log
CONFIGURATION:	display system hardware configuration
CONNECT X:	connect to server in slot X
LOG:	display contents of error log
EXEC:	connect to File Server
TEST:	run high level diagnostics
LOAD:	put system in load mode

## Boot

The Boot command restarts the GRiD Server. It is equivalent to pressing the 1701 rear-panel Reset switch once if there are no errors in the diagnostic processor error log (or twice if there are messages). The GRiD Server attempts to start up from each storage device on the system in the following order: 2701 or 2703 Disk Unit #0 through #7, 2102 Portable Diskette Drive, and 2101 Hard Disk System. Normally, the system starts up from the first peripheral bus disk (DSK0), since that is where the system software usually is located.

When you type "Boot" and Confirm or press RETURN, the diagnostic processor (DP) responds with the following message:

Confirm to boot system from default device

When you Confirm, the diagnostic processor executes the normal system startup sequence (see "Observing System Startup", in Chapter 10, for more information).

NOTE: Users signed on to the system when the Boot command is executed receive Error 701 (Server not responding) when they try to access the GRiD Server. If they access the GRiD Server after the restart has completed, the GRiDLink or PhoneLink software automatically signs them back on.

## Boot X

The Boot X command functions the same as the Boot command except that you can specify the specific device from which to start. The parameter "X" can take the following values:

- 0-7 - 2701 or 2703 Disk Unit #0 through #7
- C - 2102 Portable Diskette Drive
- F - 2101 Hard Disk System (Floppy Disk)
- W - 2101 Hard Disk System (Hard Disk)

The most common use of this command is to start the GRiD Server from a floppy disk. Starting the system from the GRiD Server "Boot Diskette" causes the system to start without executing the System.Init configuration file; this is required when performing various administrative and diagnostic procedures (see Chapter 9 for more information).

If the system cannot start from the specified device, it tries to start from all other devices on the system. When using this command, it is good practice to verify the device from which the system is starting by observing disk activity lights.

## Clear

The Clear command clears all error messages from the 1701 diagnostic processor; clearing the diagnostic log automatically turns off the ATTENTION light in the front-panel display. It is equivalent to pressing the 1701 rear-panel Reset switch once when there are errors in the diagnostic processor log.

When you type "Clear" and Confirm or press RETURN, the diagnostic processor (DP) responds with the following message:

```
Confirm to clear error log
```

When you Confirm, the diagnostic processor returns the display to the current time.

NOTE: This command does not affect the System Error Log-Text- file (located in the Programs subject of the Server Subjects device).

## Configuration

The Configuration command displays information describing the number of processors (and their memory size) in the GRiD Server.

When you type "Conf" and Confirm or press RETURN, the diagnostic processor responds with a display similar to that shown in Figure 8-7. One application of this command is to verify how many communication processors (and the slot number of each) are installed in the system when you are examining a problem reported by the power-on diagnostic programs.

Figure 8-7: Output from Configuration Command

```
*
*configuration
Slot  Card Type          PROM Version      RAM Size
                               (in 128KB blocks)
0     diag processor     3.0               2
1     file processor    3.0               4
2     comm processor    3.0               4
3     apps processor    3.0               4
4     comm processor    3.0               4
5     Empty
6     Empty
7     Empty
*
```

## Connect X

The Connect X command logically connects you to the processor in slot X. The parameter "X" can take any value from 0 to 7 (the 1701 Main Unit contains slots 0 to 3; the 1702 Expansion Unit contains slots 4 to 7).

Connecting to slot 0 (the diagnostic processor) verifies that characters typed are echoed through Common RAM. This command has no other function because you are already connected to the processor in slot 0. Connecting to slot 1 (the file processor) is normally done with the "Exec" command (see below). Connecting to slots 2, 4, 5 or 6 results in a logical connection to the communication processor in that slot (if one is present). Connecting to an empty slot results in the message "Empty Slot Number: X".

The primary use of this command is to observe a communication or application processor's startup sequence during troubleshooting (see "Watching a Communication Processor Start Up" in Chapter 10).

To disconnect from the processor in slot "X" and return to the diagnostic processor, press BREAK (CTRL-ESC).

## Exec

The Exec command logically connects you to the file processor in slot 1 (actually to the program currently running on the file processor). It is equivalent to typing "Conn 1" (see above).

When you type "Exec" and Confirm or press RETURN, GS.Executive responds with a line feed but no prompt. At this point, GS.Executive awaits a Signon command. Typing "Signon" and Confirming or pressing RETURN causes GS.Executive to respond with:

    Password:

If the password has never been changed with the Password command, the default password is "password". Typing "password" (which is not displayed) and then Confirming or pressing RETURN causes GS.Executive to respond with:

    You are signed on  
    #

If you enter the password incorrectly or just press RETURN instead of entering the Signon command, GS.Executive responds with:

    You are not signed on  
    #

NOTE: As a convenience, the "Exec-Signon-Password" sequence is stored in the CODE-SHIFT-1 softkey defined in the GRiD Server Diagnostic Port terminal file (see "SoftKeys" in Chapter 9 for more information).

The "#" character is the file processor's prompt; when you see the "#" prompt, you are logically connected to the GS.Executive program that runs continuously on the file processor. There are a wide variety of utilities that the System Administrator can run on the file processor at the "#" prompt; one example is the Time utility, which displays the system clock's current time and date setting. For detailed information on the file processor utilities, see Chapter 9.

To disconnect from the file processor and return to the diagnostic processor, press BREAK (CTRL-ESC).

## Load

The Load command lets field service engineers load special hardware diagnostic programs into the GRiD Server through the diagnostic port rather than the GPIB port (as is done with the "Test" command).

When you type "Load", the diagnostic processor responds with the following message:

Confirm to put system into load mode

When you Confirm, first the system executes the power-on diagnostic programs. Next, the diagnostic processor "\*" prompt reappears. Connecting to the desired card with the "Conn" command and pressing RETURN twice at this point produces a ">" prompt; entering an "L" (for "Load") produces the message "Ready" and the card is ready to accept a diagnostic program file in Hex dump format through the diagnostic port (i.e., via the GRiDTerm CODE-T Send a File function). When the file transfer is complete, the message "Done" appears. If the file is not in the proper format, the message "Error" appears. If the transfer was on, the message "Program Running" appears next and the program begins execution immediately.

To return to normal operation, you must restart the system after using the Load command. Press BREAK (CTRL-ESC), and then enter the Boot command.

## Log

The Log command displays the contents of the diagnostic processor error log. The command does not affect the contents of the log. This command is often used to find out why the ATTENTION light is on.

When you type "Log" and then Confirm or press RETURN, the diagnostic processor responds with a list of messages such as shown in Figure 8-8.

Figure 8-8: Error Sample In Diagnostic Processor Error Queue

date	time	slot #	card type	error #	internal numeric
5/30	10:00:32	4C	253	3003	
5/30	10:00:32		UIPC		
5/30	10:00:32		PID:	0A92	
5/30	10:00:32		PARENT:	0A92	
5/30	10:00:32		PROCID:	0402	
5/30	10:00:32		PRI:	004B	
5/30	10:00:32		LASTCS:	7191	
5/30	10:00:32		LASTIP:	42A6	
5/30	10:00:32		CALL:	0012	
5/30	10:00:32		SHDRCU	0101	
5/30	10:00:32		REQ:	0001	

The first line of an error identifies the date and time that the error occurred, as well as the slot number, card type, error number, and internal numeric code. Also, numerous lines of internal information are displayed for many errors logged. Each of these lines is GRiD internal debugging information, which is useful only to GRiD and can be ignored by the System Administrator.

If the circular queue is empty when you type the "Log" command, the diagnostic processor responds with the following message:

Display log empty

To terminate a log listing, press BREAK (CTRL-ESC).

## Test

The Test command is used by field service engineers to run high-level hardware diagnostics. The command requires that the correct GRiD Server Diagnostic Diskette be in the 2102 Portable Diskette Drive, which is connected to the 1701 GPIB port.

When you type "Test", the diagnostic processor responds with the following message:

Confirm to run high level diagnostics

When you Confirm, first the system executes the power-on hardware diagnostics. Next, the message "Entering test mode" is displayed, and "TEST MODE" appears on the 1701 front-panel display. Then, as the system tries to start from the diagnostic floppy, the message "Loading high level diagnostics" is displayed. If the floppy is not

present, the message "Error: cannot load diagnostics" is displayed; then after a delay of about one minute, the message "Returning to Diagnostic Processor monitor" is displayed, and the system returns to the "\*" prompt.

For more information on the hardware diagnostics, refer to the GRiD Server Hardware Service Manual.

## FILE PROCESSOR COMMANDS

When you are in transparent mode, have executed the Exec command (see the diagnostic processor section, above), and press CODE-? at the "#" prompt, the list of available commands shown in Figure 8-9 is displayed. Each command is explained in detail in the following sections.

The concept of a "command" for the file processor is different than that for the diagnostic processor (DP). When typing commands at the DP's "\*" prompt, you are communicating to a program stored in ROM (read only memory) on the DP card. All the commands are built into the program. When typing commands at the file processor's "#" prompt, you are instructing the GS.Executive program to find and execute file processor utilities stored in the Programs subject of the Server Subjects device. The GS.Executive program only has the seven built-in commands from "Signon" through "CODE-ESC" in (Figure 8-9). In contrast, there are 26 utilities documented in Chapter 9 that can be run at GS.Executive's "#" prompt.

When entering commands, either Confirming or pressing RETURN executes the command. In responding to questions or prompts from a command, either Confirming or pressing RETURN works unless the question specifically asks you to Confirm (e.g., "Confirm to delete System.Init-Com-"), in which case you must Confirm. Pressing ESC in response to any question cancels the command. If you type an invalid command or utility name (e.g., "Signom", the file processor responds with "33: File does not exist."



Figure 8-9: File Processor Commands (CODE-?) Menu

```
*
Commands:
PROGRAM - Start 'Program' on this card
!PROGRAM - Start 'PROGRAM' in background
>nPROGRAM - Start 'PROGRAM' on remote card n
Signon - Gain access to this card
Signoff - Lock access to this card
Password - Change access password
Code-D - Display last line typed
Code-Q - Quit this session of GS.Executive
Code-U - Display memory usage on this card
Code-Esc - Cancel this session of GS.Executive

Version 12.2.0 of GS.Executive
Version 12.2.0 of C3FS
```

Note that the CODE-? display also shows the version and name of the executive and operating system running on the card.

### Break

The Break command (though it is not on the CODE-? menu) is essential to using the file processor. The command is executed by pressing CTRL-ESC. It disconnects you from the file processor and returns you to the diagnostic processor. A Signoff is not executed until ten minutes have elapsed, so if you return to the file processor by typing the Exec command again within ten minutes, you do not have to re-issue the Signon command.

Note: although the Break command disconnects you from the file processor, whatever utility you started running on the file processor (if any) continues to run. Whether you can interrupt or cancel a given utility running on the file processor depends on how it was written. If the utility was written to recognize CODE-ESC, pressing CODE-ESC usually cancels the utility, though you may have to press it six or more times in rapid succession due to timing constraints. If the utility transmits much data to the diagnostic computer screen (e.g., "Cat"), it runs to completion much faster while you are "Broken" because it does not have to write to the screen.

NOTE: If the utility requires keyboard input (e.g., GS.SetTime), it waits for input until you return to the file processor. This can be misinterpreted, since the file processor can appear to be "hung" when actually it is waiting for input.

## CODE-D

Pressing CODE-D duplicates (redisplay) the last line typed at the "#" prompt. The displayed line can be edited with the backspace key, but not with the arrow keys. Note: if the last line typed at the "#" prompt consisted of just a RETURN, there is nothing to redisplay.

Since the backspace key in GRiDTerm only functions on a single line, making effective use of the CODE-D command may require to you to reset the GRiDTerm display width (on the CODE-0 form) so that your command appears all on one line. Maximum command length is 250 characters.

## CODE-Q and CODE-ESC

The CODE-Q and CODE-ESC commands exit from a copy of GS.Executive that you had previously started with the ">nProgram" command on a processor card other than the file processor. When you press CODE-Q, GS.Executive responds with the message:

Confirm to exit

If you Confirm, you exit from the copy of GS.Executive you were running on card "n", and GS.Executive is removed from memory on that card. No further prompt appears; you must press BREAK (CTRL-ESC) to return to the diagnostic processor, then enter the Exec command to return to the file processor.

If you press CODE-Q or CODE-ESC while at the "#" prompt on the file processor, GS.Executive only returns another prompt (no action is taken).

## CODE-U

The CODE-U command displays the amount of free memory available in Hex on the card to which you are currently connected. When you press CODE-U, GS.Executive responds with a message in the format:

Free bytes = 00008350

## Signoff

Typing the Signoff command at the "#" prompt causes the file processor "security window" to be closed. The only valid file processor command acceptable after a Signoff is a Signon. The file processor automatically signs off if there has been no keyboard activity for ten minutes. This means that using the command is only necessary when you want to guarantee that the "security window" is closed immediately.

## Signon

The Signon command provides security in file processor access by prompting for, and requiring, a password before any other file processor commands can be issued. This command is only issued immediately after connecting to the file processor with the Exec command or after connecting to another processor with the Conn command (after having starting GS.Executive on the card with the >nProgram command).

Typing "Signon" and Confirming or pressing RETURN causes GS.Executive to respond with:

Password:

If the password has never been changed, then typing "password" (which does not display) and Confirming or pressing RETURN causes GS.Executive to respond with:

You are signed on

If you enter the password incorrectly or just press RETURN instead of entering the Signon command, GS.Executive responds with:

You are not signed on

## Password

The Password command is used to change the file processor signon password. When the GRiD Server system is shipped from GRiD, the password is set to "password". The password is limited to 16 characters maximum; it can contain any characters except CTRL, DEL, ', ~, |, and SPACE (blank). Note that the same password applies to all copies of GS.Executive that are run on any processor cards.

When you type Password and Confirm or press RETURN, GS.Executive prompts you with the message:

Old Password:

After you enter the old password (which is not displayed) and Confirm or press RETURN, GS.Executive prompts you with the message:

New Password:

After you enter the new password (which is not displayed) and Confirm or press RETURN, GS.Executive prompts you again for the new password with the same message. If you correctly enter the new password again (to verify that you did not make a mistake the first time) and Confirm or press RETURN, GS.Executive signals that the change is complete with the message:

### Password set

If you enter an incorrect old password, GS.Executive responds with the following message and signs you off the file processor:

### Password not set

If you do not correctly enter the new password the second time, GS.Executive responds with the same message but does not sign you off.

Note that it is up to the file processor user (generally only the System Administrator) to set and maintain the password. This password is a key component of GRiD Server's security system: knowledge of this password and experience using the file processor utilities lets the user examine the contents of any user file that is itself not password-protected.

### Program

The Program command is used to run a utility on the processor on which you are currently running GS.Executive (assumed to be the file processor, unless otherwise indicated in this manual). This is the most common command of all. To execute it, you simply type the name of the utility at the "#" prompt (e.g., Time).

Refer to Appendix C for a description of the errors that can be produced by all the file processor utilities.

### !Program

The !Program command is used to start a program running "in the background" on a processor. It is run continuously and non-exclusively under GS.Executive, usually without console interaction.

### >nProgram

The >nProgram command is used to start a specified program ("Program") on a specified card ("n"). The "n" in the command is the slot number of the card on which you want to start the specified program. When you execute this command, the program is loaded into memory on the specified card and starts executing. An example is starting GRiDNetwork Manager via the System.Init file.

## DIAGNOSTIC PORT HELP FACILITY

The on-line diagnostic port help facility lets you obtain detailed information on various subjects, including file processor utilities and syntax.

NOTE: When using this facility, make sure that your Current typeface in the Options form of GRiDTerm (CODE-0) is set to GRiDType5x8 or GRiD 64. (For information about the Options form, see Figure 8-4.)

The list of available help subjects is shown in Table 8-1.

HELP SUBJECT	DESCRIPTION
AddSubject	Creates directories.
ADT	Active Device Table Stores a list of active devices.
Cat	Lists filenames in a directory.
Compare	Compares two files for equality or inequality.
Copy	Creates copies of files.
Delete	Deletes files.
DeviceNames	Shows System.Init and VFSConfig relationships.
DiskInfo	Displays information about the GRiD Server disks.
DisplayTapeLabel	Displays tape header and trailer, also re-tensions the tape.
Dump	Writes the contents of a file in both ASCII and Hex.
GS.Activate	Activates a new device and adds it to the Active Device Table (ADT).
GS.Deactivate	Removes a device from the Active Device Table (ADT).
GS.Do	Executes a command file (of Kind Com).
GS.MediaFormat	Formats (totally erases and prepares for use) a GRiD Server disk/partition.

Table 8-1. Diagnostic Port Help Subjects (Continued)

HELP SUBJECT	DESCRIPTION
GS.MediaPartition	Partitions a Model 2703 GRiD Server 40 MB disk..
GS.MediaRepair	Repairs or recovers damaged files on a GRiD Server disk.
GS.SetTime	Sets the GRiD Server internal clock.
GS.UpdateBootCode	Makes workstation formatted floppies bootable by GRiD Server.
HCompare	Compares multiple levels of directories and their files.
HCopy	Copies multiple directories and their files.
HDelete	Delete multiple directories and their files.
Ladt	Lists the Active Device Table (ADT).
LineEdit	Line editor for making minor changes to text files.
NameDevice	Stores information such as users currently signed on, system managers currently running, etc.
PathNames	For files and directories.
Prefix	Changes the default device and directory.
Rename	Changes the name of a file or directory.
SectorCopy	Copies disk to tape or vice versa.
SoftKeys	Used to reduce the amount of typing on the diagnostic port.
SpecialCharacters	What they are used for and how to type them.
Status	Displays current processor card status.
Syntax	Syntax conventions used in the Help screens.
Time	Displays the current time and date.

Table 8-1. Diagnostic Port Help Subjects (Continued)

HELP SUBJECT	DESCRIPTION
UAFChangeDevice	Changes disk volume name in the UAF database. Used when moving users or logical devices.
Volumename	Changes the volume name of a GRiD Server disk.
Wildcards	Summary of how to use wildcard characters.

Table 8-1. Diagnostic Port Help Subjects

### Using the Diagnostic Port Help Facility

To use the help facility, you must be signed on to the file processor.

To view the list of 36 subject names and descriptions (shown above), type Help and press RETURN. To view the help screen for one of the subjects listed, type Help, followed by a space, then the subject name. For example:

#### Help GS.MediaPartition

Make sure that you correctly type the subject name, otherwise this message appears: Sorry, there is no help for (followed by the subject name as you typed it).

The help screen for each subject is composed of four topics. The first topic, SYNTAX, shows the basic format of that command. The second topic, EXAMPLES, shows possible ways to enter the command and its various parameters. The third topic, NOTES, gives you information about prerequisites, defaults, prompts that appears, etc. The fourth topic, RELATED TOPICS, lists other subjects that are similar, have an effect on, or may be affected by this command.

Figure 8-10 shows the help screen you would see if you typed Help GS.MediaPartition at the file processor "#" prompt.

Figure 8-10: GS. MediaPartition Help Screen

```
GS.MediaPartition - Partitions a Model 2703 40MB disk.
SYNTAX
GS.MediaPartition \
```



## CHAPTER 9: FILE PROCESSOR UTILITIES

This chapter provides operating instructions for the utilities that can be run on the file processor via the diagnostic port. There are two types of utilities: administration and general utilities. The former consists of those programs the System Administrator is likely to use in routine administration of the GRiD Server system; the latter consists of less-often used, more specialized programs.

To run any of these utilities, you must access the diagnostic port via GRiDTerm, in transparent mode, be connected to the file processor, signed on, and at the "#" prompt (see Chapter 8 for details). None of these utilities can be run via GRiDLink or PhoneLink.

### SYNTAX NOTATION

Wherever syntax is given in the description of a utility in this chapter, the following conventions are used:

- o Bent brackets (< >) are used to indicate required parameters that must be supplied by the user. Parameters must be entered in the order given in the syntax statement.
- o Square brackets ([ ]) are used to delineate optional parameters.
- o Ellipsis (...) are used to indicate optionally repeated parameters.

For example, "[<DirectoryName>'...]" means that a series of one or more directory names, separated by back-quote characters, can be supplied optionally by the user. The example could represent the following character strings:

- o Programs'
- o 'Printer Queue''Narrow Printer''
- o ACME'Executive'Johnson'

## FILE AND DIRECTORY PATHNAMES

The general syntax of a file pathname on GRiD Server is:

```
['<Device>'<DirectoryName>'...]<FileName>[-<Kind>-]
```

Note that all parts of the pathname except the file name itself are optional, depending on the context and the particular utility with which the pathname is being used. Examples of valid file pathnames include:

- o GS.SetTime
- o GS.SetTime-Run-
- o '0'Programs'GS.SetTime-Run-
- o '1'ACME'Executive'Johnson'TestFiles'Temporary-Text-

The general syntax of a directory pathname on GRiD Server is almost the same as above, except that the file name and kind are not present, and the device is always required:

```
'<Device>' [<DirectoryName>'...]
```

Examples of valid directory pathnames include:

- o '0'
- o '0'Programs'
- o '0''Software Subjects''Programs'
- o '1'ACME'Executive'Johnson'TestFiles'

NOTE: When a directory pathname consists of only a device name, the final back-quote is optional (a Kind of ~Subject~ is assumed). Thus the first example above could be either '0' or just '0.

## SPECIAL CHARACTERS

The back-quote character ('), used to delineate directories, is produced by pressing CODE-' (single quote).

The tilde character (~), used to delineate file Kinds, is produced by pressing CODE-: (colon).

The vertical bar character (|), used to delineate file passwords, is produced by pressing CODE-SHIFT-; (semicolon).

Blanks are used as the delimiter between commands (utility names) and their parameters. Therefore, whenever a blank or any special character appears within a parameter such as a file or device name, the blank or special character must be enclosed in single quotes. "Special character" means anything other than a letter or a number. For example, the file name "Test Memo" must be contained in single quotes when it is supplied as a parameter to a utility because it contains a blank. Similarly, the device name "2701-0000000123a" must be enclosed in single quotes because it contains a "-" character. The single quotes can be anywhere in the name, as long as they surround the blank or special character. For example, "'Test Memo'" and "Test' 'Memo" are both valid.

NOTE: If you do not use single quotes in pairs, the message "Mismatched quotes" is displayed.

## WILDCARDS

Some of the utilities recognize the wildcard character (the asterisk "\*"). You can substitute a wildcard for any character, for any string of characters, or for no characters at all. Wildcards work only with the Cat, Copy, and Delete utilities.

For example, if you specified "GS.\*-Run-" as a file name parameter to a utility, you would be referring to all files names that begin with the characters "GS." and end with the characters "-Run-". If you specified "\*system\*," you would be referring to all files containing the characters "system" anywhere in their name.

A pathname consisting of only an asterisk acts on all the files that exist under the current prefix (see the Prefix utility description for more information).

## RUNNING UTILITIES

Although the examples and syntax descriptions in this chapter use initial caps, you can enter commands (utility names) and their parameters in any combination of upper and lower case. The file processor understands "CAT," "cat," and even "cAt" as the same command.

When you enter a command, you can Confirm or press RETURN at the end of the command. Either keystroke executes the utility. When answering prompts within a utility, either Confirm or RETURN works unless the prompt from the utility specifically asks you to Confirm.

In the latter case, only Confirm works, and RETURN sometimes aborts the utility, depending on the particular prompt.

Refer to Appendix C for explanations of errors that can be produced by file processor utilities.

## STARTING THE SYSTEM WITHOUT EXECUTING THE SYSTEM.INIT-COM- FILE

Some of the utilities described in this chapter require that system initialization be interrupted. Interrupting the system initialization means that the system is started, but the manager programs (such as GRiDNetwork Manager, GRiDSpool Manager) are not started. It also means that no user can sign on to the system.

One way of interrupting system initialization is by starting the system from the boot diskette. This diskette does not contain the System.Init file, and thus starts none of the programs whose activation lines are uncommented in this file.

The second way of interrupting system initialization is to connect to the diagnostic port, start the system, enter transparent mode, and enter the "exec" command. The console shows which cards are being tested, then the following prompt appears:

```
Press RETURN to continue processing System.Init
                    <or>
Press ESC to cancel System.Init
```

To interrupt the system initialization, press ESC.

## SOFTKEYS

To reduce the amount of typing required when running file processor utilities, a set of softkeys (pre-defined character sequences) have been defined for you. These allow you to replace common character sequences such as "Exec (CR) Signon (CR) Password (CR)" and "Cat 'N'User Names'!" with just one keystroke (CODE-SHIFT-1 and CODE-SHIFT-8, in these examples).

When you are using the GRiDTerm terminal file supplied with the GRiD Server software ("GRiD Server Diagnostic Port", in the Programs subject of the Software Subjects device), the softkeys are provided through GRiDTerm's user-definable softkeys. When you are not using the "GRiD Server Diagnostic Port" terminal file, the softkeys are provided through a text file named GS.SoftKeys, located in the Programs directory of the Server Subjects device. The GRiDTerm softkeys, when present, take precedence over those defined in the GS.SoftKeys text file.

In both cases, you can modify the contents of any or all the softkeys to suit your particular needs (refer to the GRiDTerm User's

Guide for information on modifying GRiDTerm softkeys). The content of each softkey as shipped from GRiD is described in Table 9-1.

Key	CODE-Key	CODE-SHIFT-Key*
---	-----	-----
1	'C'	(Break) Exec (CR) Signoff (CR) Signon (CR) Password (CR)
2	'F'	Ladt
3	'B'	GRiDNetwork Manager Log-Text-
4	Programs'	System Error Log-Text-
5	'Software Subjects''	System.Init-Com-
6	'Printer Queue''	DecodeError-Run-
7	Cat	VFSConfig-Database-
8	Copy	Cat 'N''User Names'' !
9	Delete	Cat 'N''Resources'' !
0	Rename	Cat 'N''System'' !

\* (CR) = Carriage Return; (Break) = Control-Escape

Table 9-1: Pre-Defined Softkey Values for GRiDTerm

Table 9-1 shows the softkeys set in the "GRiD Server Diagnostic Port" terminal file. Note that full advantage is taken of GRiDTerm's ability to include carriage returns (CR) and other special characters in the softkey definition. Because the same capability is not available through the text file mechanism, CODE-SHIFT-1 through CODE-SHIFT-3 in the GS.SoftKeys file actually contain "Exec," "Signon," and "Password," instead of the sequences shown in Table 9-1. In addition, the GS.SoftKeys file does not contain any of the carriage return characters shown in Table 9-1.

An explanation of the meaning of each softkey is provided in Table 9-2 below:

Softkey Contents	Softkey Meaning
'C'	2102 Portable Diskette device name
'F'	2101 Floppy Diskette device name
'B'	Boot device name
Programs'	Programs directory name
'Software Subjects''	Software Subjects directory name
'Printer Queue''	Printer Queue directory name
Cat	File catalog utility
Copy	File copy utility
Delete	File erase utility
Rename	File rename utility
Exec/Signon/Password	Sign-on sequence for file processor
Ladt	List Active Device Table utility
GRiDNetwork Manager Log-Text-	Communications error log file
System Error Log-Text-	System error log file
System.Init-Com-	Configuration file
DecodeError-Run-	List text for numerical errors
VFSConfig-Database-	Virtual file system configuration file
Cat 'N''User Names'' !	List users currently signed on
Cat 'N''Resources' !	List GRiD Server devices seen by users
Cat 'N''System' !	List GRiD Server system modules in memory

Table 9-2. Explanation of Softkey Contents

## UTILITIES

The utilities described in the following section are used by the System Administrator, GRiD Resource Center personnel, or GRiD

Systems engineers. These utilities are typically used for routine administration of the GRiD Server system, as well as for special purposes such as system updating, troubleshooting, testing, or other unusual situations. To run any of these utilities, you must be accessing the diagnostic port via GRiDTerm, in transparent mode, connected to the file processor, signed on, and at the "#" prompt (see Chapter 8 for details). None of these utilities can be run via GRiDLink or PhoneLink.

## AddSubject

The AddSubject utility is used to create a directory (a file of Kind Subject). Under normal circumstances, all directories are created automatically by the VFManager program. In a few special cases, you may need to create a directory yourself.

The syntax for AddSubject is:

```
AddSubject [<DirectoryPathname>]<NewDirectoryName>
```

For example, to create a directory called Printer Queue on DSK1 (the second disk), the command is:

```
AddSubject '1'Printer Queue'
```

To create the directory for a new spooled printer called "Fast Printer" in the Printer Queue device on DSK1, the command is:

```
AddSubject '1'Printer Queue'Fast Printer'
```

Note the absence of a final back-quote in these sample commands. It must be omitted because the utility expects a directory name rather than a file name. Leaving off the final back-quote is the same as adding ~Subject~; you can optionally add ~Subject- yourself, but you cannot add a final back-quote.

The AddSubject utility can only create one level of directory at a time; for example, if the "Printer Queue" directory in the second example does not already exist, the command fails.

## Alias

The Alias utility is used to specify an alternative name (an alias) for a device. The GRiD Server operating system requires that some devices (i.e., 2701 disks) have aliases. Under normal circumstances, the operating system handles the creation of aliases automatically.

The syntax of the Alias utility is:

```
Alias '<AlternateDeviceName>' '<CurrentlyActiveDevice>'
```

For example, the following command creates the "l" alias for a 2701 disk whose tracking number is 222:

```
Alias 'l' '2701-0000000222a'
```

Alias can be run on either the file processor or a GRiD-OS-based computer via GRiDLink. The most common application of the utility is to shorten file pathnames during program development for files on GRiD Server. For example, using the Alias utility, you can replace "GRiD Server:User Subjects" with "US". This shortening effect is important because the Intel compilers and linker do not allow pathnames with more than 45 characters.

For example, if you try this:

```
Pascal 'GRiD Server:User Subjects'Test'MyProgram.Pas-Text-
```

you get a "33:File does not exist" error from the Pascal compiler because the pathname of your source file exceeds 45 characters. However, if you execute the Alias utility first and then compile, as shown below, the source file pathname is less than 45 characters, and the compilation proceeds normally.

```
Alias 'US' 'GRiD Server:User Subjects'
```

```
Pascal 'US'Test'MyProgram-Text-
```

## AutoBackupTerminate

If you want to terminate the execution of AutoBackup when it is running in background on your GRiD Server system, you can do so at the file processor "#" prompt on the diagnostic port with the command:

```
AutoBackupTerminate
```

Because AutoBackup checks for requests only about every two minutes, you may have to wait as long as two minutes after giving the command before AutoBackup terminates. While you are waiting for AutoBackup to terminate, it issues the message "Waiting for reply from AutoBackup. Please be patient." During this time, you cannot issue any other commands to the file processor. When AutoBackup has been terminated, AutoBackupTerminate issues the message "AutoBackup: program terminated". To verify that AutoBackup is no longer running in the background on your GRiD Server, you can enter:

```
Cat 'N'System' !
```

and note that AutoBackup is no longer listed.



## Cat

The Cat (Catalog) utility lists all the file names in a directory. While the information provided by the Cat utility is similar to that available from the Print/Display Titles choice on GRiDManager's CODE-T menu, there are some significant differences. GRiDManager's capability is limited in that it can list only one fixed directory level ("Titles" in a "Subject"), while Cat can list file names in any directory at any level. However, GRiDManager can display the version number of each file, which Cat cannot do. One other difference is that Cat can list just the file names (without any other information such as file length), which GRiDManager cannot do; this can be very useful in creating easily-editable text files containing just file names for documentation purposes.

The syntax for the Cat utility is:

```
Cat [<SourcePathname>] [<CatalogFilePathname>] [!] [+] [&]
```

Typing the Cat utility name without any parameters causes the utility to display all the file names in the current directory (set with the Prefix utility) in a tabular form like that shown in Figure 9-1.

Figure 9-1: Output of Cat Utility

```
Files matching `b`Programs`u
File Name          Length  Last Modified
eServerErrors`Text` 17304  2/19/87 15:40
AddSubject`Run`      1812   3/03/83 14:06
AdministratorSentry`Run` 0      0/00/00 0:00
Alias`Run`           1177   3/05/85 13:20
AutoBackup`Run`     5527   1/27/86 13:42
AutoBackupCompletion`Run` 1779   1/21/86 12:14
AutoBackupCompletion.Test 1991   1/24/85 14:14
AutoBackupConfig`Text` 394    9/19/86  9:34
AutoBackupConfig Model`Te 471    8/22/85 21:25
AutoBackupTerminate`Run` 751    12/04/85 9:13
BootCards`Run`      2195   4/22/86 18:57
BootComplete`Run`   311    1/03/86 14:24
BroadcastManager`Run` 24767  6/05/86 15:34
BroadcastManagerSetDebugM 867    2/11/86 10:36
C3AS`System`        39475  6/06/86 16:12
C3CS`System`        38435  6/06/86 16:07
C3CS128K`System`    33575  6/06/86 16:02
C3FS`System`        64265  9/09/86 14:21
.
storage utilization: 3913/20808 pages, 18.8%
```

The first line in Figure 9-1 tells you the device ('b' is the "boot device"), the directory (Programs), and the file name being matched

("w" represents the "\*" wildcard, meaning "match all file names"). The first column displays the file names that meet the match criteria. The second column displays the number of bytes that each file occupies. The third column displays the date and time that the file was last modified (updated).

The first number after "storage utilization" indicates the total number of pages occupied by all files on the storage device (one page is 512 bytes); the second number shows the total number of pages on the device. To find the number of free pages available, subtract the first number from the second. To convert the result to bytes, multiply by 512. The third number is the percentage of total space occupied on the device.

NOTE: Using the Cat utility and observing this percentage number is one practical way of determining how full each 2701 or 2703 disk drive is. To do this, type "Cat '0'" (or "Cat 'la'", etc., as appropriate). The other way is to use the DiskInfo utility (see this chapter).

When file names are being displayed on the screen, you can stop scrolling by pressing CTRL-S. To restart scrolling, press CTRL-S again. Pressing CODE-ESC cancels the Cat utility and thus the scrolling (if CODE-ESC seems to have no effect, clear the keyboard queue by pressing the space bar followed by ESC, then try CODE-ESC again).

Note that when you run the Cat utility without any parameters, the utility defaults to the current device and current directory, and puts in an invisible wildcard character that causes all the file names within that directory to be listed. If you want to look at a different prefix grouping such as '0''Shared Subjects'', you must enter it explicitly. To see all the file names under this Shared Subjects (directory names, in this case), enter:

```
Cat '0''Shared Subjects''
```

Note that you are not limited to one level of directory in the source pathname. For example, to list all the file names in the TestFiles subject in user Johnson's User Subjects (where user Johnson is in the Executive group of the ACME company and is located on DSK1), the command is:

```
Cat '1'ACME'Executive'Johnson'TestFiles'
```

### Creating a Catalog File

The Cat utility lets you specify a second parameter (a Catalog File name) if you want to send your catalog information to a text file instead of to the screen. This file can be either a disk file or an output device such as printer. The Cat utility creates the file during execution.

Note that the syntax for using a catalog file requires a source pathname to be present to indicate the file names you want cataloged. At a minimum, this pathname must be the wildcard asterisk (\*). For example, the following command:

```
Cat * '0''Shared Subjects''MyWork'ListFile-Text-
```

creates a text file called ListFile in a subject called MyWork in the Shared Subjects device, and writes into it all the file names under the default prefix. Similarly, the command:

```
Cat GS.*-Run- Temp-Text-
```

creates a text file under the default directory called "Temp", and writes into it all the file names beginning with the characters "GS." and ending with the characters "-Run-". Note that if you do not precede the catalog file name with a directory pathname, the system creates the file in the current prefix.

As an illustration of using a printer as the catalog file, the following command writes a catalog of all file names under the default prefix to a spooled printer called "Narrow Printer":

```
Cat * '0''Printer Queue'Narrow Printer''
```

NOTE: Accidentally leaving a space in the source pathname usually results in creating an undesired catalog file. This is probably what happened if the Cat utility simply returns the "#" prompt instead of an expected listing. Examine your command carefully, then use the Cat utility to find the undesired catalog file and the Delete utility to delete it (the file probably has the default Kind of -Untyped-).

! (Exclamation Point), + (Plus Sign), and & (Ampersand)

Placing the exclamation point (!) after Cat (or after Cat and any of its parameters) causes the Cat utility to display file names without file lengths and last modified dates and times. This has two primary uses: creating easily-edited text files containing just file names for documentation purposes, and determining the complete name of a file whose name is too long for the limited space in the Cat screen listing. A side effect of the "!" parameter is that the file name listing displays much faster, since there is less data to write on the screen.

Placing the plus sign (+) after Cat (or after Cat and any of its parameters) causes the utility to display file names with one additional useful piece of information: the file creation date and time.

The ampersand (&) is like the "!" parameter, except that it is used

only when cataloging the Name Device (see the Ladt utility description) to display special internal information.

### Additional Applications of the Cat Utility

The Cat utility can also be used to obtain three useful pieces of information. First, the following command lists the users currently signed on to GRiD Server via GRiDLink or PhoneLink:

```
Cat 'N' 'User Names' !
```

This command (which, for convenience, is stored in the CODE-SHIFT-8 softkey) produces a listing like that shown in Figure 9-2.

Figure 9-2: Listing of Signed-On Users

```
Files matching `N`User Names`u
File Name
ACME/Executive/Johnson/2.0.3~Ipc~
ACME/Executive/Webster/2.1.3~Ipc~
ACME/Executive/Gallagher/2.2.3~Ipc~
ACME/Admin/Copeland/2.3.3~Ipc~
ACME/Admin/Whitman/2.4.3~Ipc~
ACME/Executive/Everett/2.5.3~Ipc~

storage utilization: 0/0 pages, 0.0%
```

The three items delineated by slashes in each line of Figure 9-2 are the Company, Group, and User names, respectively. The three numbers following represent the communication processor card number (2, 4, 5, or 6), the sign-on session number (0 through 7), and the port number on the card (0, 1, 2, or 3), respectively. Knowing the configuration, this information can be used to determine whether a given user is signed on via GRiDLink or PhoneLink. The "N" in the command stands for "Name Device", a pseudo-device located in RAM memory and used to store tables of information needed by the operating system. The "!" is required because the Name Device is not a real device and as such does not have file lengths, last modified dates, etc. Leaving off the "!" produces error 38 (File access denied).

This command is very useful for determining if any users are signed on to the system before restarting it.

Another more specialized application of the Cat utility is the following command:

```
Cat 'N' 'Resources' !
```

This command (contained in the CODE-SHIFT-9 softkey) lists the GRiD Server devices as seen by users signed on to GRiDLink and PhoneLink. It also lists the names of the three managers running on the file processor (verifying their presence can be useful during troubleshooting). The command produces a listing like that shown in Figure 9-3.

Figure 9-3: Listing of Resources

```
Files matching `N`Resources`u
File Name
Spool~Manager~
VFS~Manager~
User Subjects~FS~
Software Subjects~FS~
Shared Subjects~FS~
Group Subjects~FS~
Company Subjects~FS~
Backup Disk 1~FS~
Backup Floppy 1~FS~
Printer Queue~FS~
Server Subjects~FS~
Admin~Manager~

storage utilization: 0/0 pages, 0.0%
```

The "~FS~" after each device name indicates that it is a File System device. The "~Manager~" after Spool, VFS, and Admin indicate that these are manager programs running on the file processor.

The final, even more specialized application of the Cat utility is the following command:

```
Cat `N`System` !
```

This command (contained in the CODE-SHIFT-0 softkey and used during troubleshooting) provides an indication that the communication software on each communication processor card has successfully started. Included in this list are

```
timer2
MacMgr2
dlcMgr2
Ipc2
```

The command produces a list similar to the sample shown in Figure 9-4.

If these items are present in the list, the communication software on the communication processor card in the slot identified by the number at the end of each item ("2" in the figure above) has started successfully.

Figure 9-4: Listing of Communication Software

```
*Cat `N\System` !  
  
Files matching `N\System`u  
File Name  
Ipc3  
Ipc1  
NetworkManager  
tiner4  
MacMgr4  
dlcMgr4  
Ipc4  
tiner2  
MacMgr2  
dlcMgr2  
Ipc2  
AutoBackup  
2703-0000000222b~FS~  
2703-0000000222a~FS~  
H~FS~  
B~FS~  
Portable Floppy~FS~  
Name Device~FS~  
Work~FS~  
  
storage utilization = 0/0 pages, 0.0%  
*
```

### Compare

The Compare utility compares two files for equality or inequality and provides several messages that describe the results of the comparison.

The syntax for the Compare utility is :

```
Compare <Pathname1> <Pathname2>
```

Compare displays the following messages that describe the results of the comparison you request:

If the first file is identical in length to the second file, and all bytes in the first file are identical to the bytes in the second file, the utility displays the message, "The files are identical."

If one file is a different length than the other file, the utility displays the message, "File A is shorter than file B" (where "File A" and "File B" are the file names).

The message "Files are different at location xxxx" indicates that the files are the same length but not all of the bytes in the first

file are identical to the bytes in the second file. Eight bytes from each file are displayed, starting at the point of discrepancy (i.e., at the first byte that does not match).

## Copy

The Copy utility copies files from one directory to another. You can use it to copy all the files in a directory at once, or just selected files within a directory. You can also use it to change the naming of the directory and/or file name(s) being copied. Wildcards are permitted. The syntax of the Copy utility is:

```
Copy [<SourcePathname>] [<DestinationPathname>] [N] [M] [?]
```

For example, to copy all the files in the Programs directory of a floppy disk in the 2102 Portable Diskette to the Programs directory of DSK0, the command is:

```
Copy 'C'Programs' '0'Programs'
```

There is an implied wildcard character (\*) after the source pathname that means "copy all files"; unless you specify otherwise, the default is to copy all files in the specified directory. For example, to copy only one file from the floppy to DSK0 (e.g., System.Init-Com-), the command is:

```
Copy 'C'Programs\System.Init-Com- '0'Programs'
```

Note that you can leave off the file name portion of the destination pathname; by default, Copy uses the same file name as in the source pathname. To copy the file into another name (e.g., Temporary-Text-), you simply specify a new file name in the destination pathname:

```
Copy 'C'Programs\System.Init-Com- '0'Programs\Temporary-Text-
```

Similarly, to copy the file into a new directory (e.g., TempFiles), you simply specify a new directory name in the destination pathname (Copy automatically creates the directory if it does not already exist):

```
Copy 'C'Programs\System.Init-Com- '0'TempFiles\System.Init-Com-
```

If you omit the device and directory portion of the destination pathname (the prefix), Copy uses the current default prefix, not the same prefix as the source pathname. For example, if you are prefixed to '0'Programs', the file in the following example is copied to device '0', not device 'C':

```
Copy 'C'Programs\System.Init-Com- 'System.Init Model-Com-'
```

If you omit the destination pathname entirely, Copy copies the file

to the screen (device CO, "Console Out", the default destination). In this way, Copy can be used as a general-purpose file viewing utility. CTRL-S can be used to stop and restart the listing to the screen; CODE-ESC immediately cancels a listing. For example, to copy System.Init-Com- to the screen, the command is:

```
Copy 'O'Programs\System.Init-Com-
```

NOTE: If you omit both the source and destination pathnames entirely, Copy copies all files in the current prefix to the screen. This is almost always undesirable. It may be necessary to press CODE-ESC several times rapidly in succession to escape from this situation.

The wildcard character (\*) can be used to selectively copy files meeting some criteria. For example, to copy all files beginning with "GS." and ending with "-Run-" from the floppy to DSK0, the command is:

```
Copy 'C'Programs\GS.*-Run- 'O'Programs'
```

If you specify a file name in the destination pathname, you cannot use wildcards in the source pathname, since you cannot copy several files into one.

Multiple wildcards can be used in a pathname. For example, the following command copies all files with the word "config" anywhere in their names from the floppy to DSK0:

```
Copy 'C'Programs'*config* 'O'Programs'
```

The wildcard character can also be used to reduce typing effort. For example, if you want to copy Message Of The Day-Text- to the screen, you can take advantage of the fact that there is only one file in the Programs directory on DSK0 starting with "Mess", and type:

```
Copy Mess*
```

To copy a file with a password, you must append the password to the end of the file name, using a vertical bar (|) as the delimiting character. For example, to copy a text file called "Temporary" with a password of "Brown" from the Memos subject of user Johnson's User Subjects (where Johnson is in the Executive group of the ACME company) to the screen, the command is:

```
Copy 'O'ACME'Executive'Johnson'Memos'Temporary-Text-|Brown
```

There is no way to determine what a password is if you do not already know it. If you want to delete a file for which you have forgotten the password, use the HDelete utility. You cannot use Copy to add or remove a password from a file; if it currently has a password, copying it carries along the password. Finally, you



cannot use wildcards when copying password-protected files; you must copy each file individually, specifying its password.

After each file copy is complete, Copy displays a message containing the source and destination pathnames, and the keywords "to" or "over" to indicate whether the file just copied was overwriting an old file or not. Copy does not normally ask you to Confirm overwriting an old file; it just does it.

The Copy utility also supports the New version only option and the Matching files choice of the Which files option that are used by the Duplicate command in GRiDManager (see Chapter 2 of GRiD Management Tools Reference):

```
Copy [<SourcePathname>] [<DestinationPathname>] [N] [M] [?]
```

The optional N parameter indicates that you want the copy operation to be performed only if the date and time of the file identified by the SourcePathname is more recent than that of the file identified by the DestinationPathname. For example, the following command copies from a floppy to disk 0 all source files on the floppy whose names begin with "GS." and whose date and time are more recent than their corresponding files on disk 0.

```
Copy 'C'Programs'GS.*-Run~ '0'Programs' N
```

The optional M parameter indicates that you want the copy operation to be performed only when a destination file already exists that has the same Subject, Title, and Kind as the file identified by the SourcePathname. For example, the following command copies from a floppy to disk 0 only files that have "config" anywhere in their names and that have corresponding files on disk 0 with the same Subject, Title, and Kind.

```
Copy 'C'Programs'*config* '0'Programs' M
```

#### ? (Question Mark)

Typing the optional question mark at the end of the Copy command causes the utility to display a prompt before making each copy. The prompt is in the form:

```
Confirm to copy [SourcePathname] to/over [DestinationPathname]
```

You have four possible responses from which to choose:

- o Pressing Confirm indicates, "Yes, copy this file". If other files meet your wildcard description, you are prompted to copy them one at a time.

- o Pressing ESC causes the currently prompted file to be skipped. If other files meet your wildcard description, you receive a prompt for them one at a time.
- o Pressing CODE-W cancels the "?" option and causes Copy to continue copying all the remaining files without prompting.
- o Pressing CODE-ESC cancels the Copy utility altogether, without copying the currently prompted file.

Note that when using the "?" parameter, Copy indicates (before making a copy, with the keywords "to" and "over") whether the destination file overwrites an existing file. If "over" is indicated, pressing Confirm destroys the current contents of the destination file, replacing them with the source version of the file, while pressing ESC preserves the destination file contents by skipping the copy.

### Printing with the Copy Utility

You can use Copy to print a file on a GRiD Server printer during troubleshooting by copying the file into the printer queue. For example, if your system has a printer called "Narrow Printer", the following command copies the System.Init-Com- file to that printer's print queue:

```
Copy 'O'Programs\System.Init-Com-
      'O''Printer Queue'Narrow Printer''
```

If, during troubleshooting, you have manually activated a printer with a device name such as "Printer", you can copy a file to it by simply referencing the device as the destination pathname:

```
Copy 'C'Programs\System.Init-Com- 'Printer
```

### DecodeError

DecodeError gives you the error description for any specified error number. The syntax for this utility is:

```
DecodeError NN
```

where NN is the error number for which the text is displayed. This utility is used for quick reference while troubleshooting. For more extensive explanations of what happened and what to do in response to a specific error, see Appendixes B, C, and D in this manual.

The following examples illustrate the use of the DecodeError utility.

Example 1:

Given the following entry in the diagnostic port error log

```
8/23 10:32:37 1F 452 281
```

find out the error description for error 452 by signing on to the file processor, then:

```
#DecodeError 452 [At the prompt, type DecodeError,  
                  followed by a space, then the  
                  error number.]
```

The system response is:

```
Error text for 452 is-  
452: GPIB not responding - check devices and cables
```

The second line consists of the text contained in the @ServerErrors-Text- file.

Example 2:

Given the following entry in the 'System Error Log'

```
7/27 21:27:06 3 AS 1025 2261 Post Office 1: Local  
Delivery
```

find out the error description for error 1025 by signing on to the file processor, then:

```
#DecodeError 1025 [At the prompt, type DecodeError  
                  followed by a space, then the  
                  error number.]
```

The system response is:

```
Error text for 1025 is-  
1025: User has exceeded allocated file space
```

Delete

The Delete utility deletes a file from a directory. You can use it to delete a single file or a group of files. The syntax of the Delete utility is:

```
Delete <Pathname> [!]
```

For example, to delete the System.Init-Com- file in the Programs directory of a floppy disk in the 2102 Portable Diskette, the

command is:

```
Delete 'C'Programs\System.Init-Com-
```

To delete all the files in the Programs directory of the floppy, the command is:

```
Delete 'C'Programs'
```

Note that there is an implied wildcard character (\*) after the source pathname that means "delete all files matching this pathname"; thus, if you do not include a file name in the source pathname, the utility deletes all files in the specified directory.

When requested to delete something, the Delete utility displays the following prompt:

```
Confirm to delete [SourcePathname]
```

At this point you have four possible responses from which to choose:

- o Pressing Confirm indicates, "Yes, delete this file". If other files meet your wildcard description, you are prompted to delete them one at a time until the utility has exhausted all pathnames meeting your description. After each file deletion is complete, Delete displays a message specifying the pathname of the file that was deleted.
- o Pressing ESC causes the currently prompted file to be skipped. If other files meet your wildcard description, you receive a prompt for them one at a time.
- o Pressing CODE-W cancels prompting and causes Delete to continue deleting the remaining files.
- o Pressing CODE-ESC cancels the Delete utility altogether and leaves the current file untouched.

The implied wildcard mentioned above can be very useful when you want to delete a file whose name contains non-displaying characters (such a file is typically produced either by a user-written program or by a fault in system software). For example, if you want to delete such a file in a directory called TestFiles in the Shared Subjects directory on DSK1, type:

```
Delete '1' 'Shared Subjects' 'TestFiles' *
```

You can then repeatedly press ESC to skip files until you get to the file in question, Confirm its deletion, and then press CODE-ESC to cancel the rest of the deletions.

The wildcard character (\*) can also be used to selectively delete files meeting some criteria. For example, to delete all files

beginning with "GS." and ending with "~Run~" from the floppy, the command is:

```
Delete 'C'Programs'GS.*~Run~
```

Multiple wildcards can be used in a pathname. For example, the following command deletes all files with the word "config" anywhere in their names from the floppy:

```
Delete 'C'Programs'*config*
```

To delete a file with a password, you must append the password to the end of the file name, using a vertical bar (|) as the delimiter character. For example, to delete a text file called "Temporary" with a password of "Brown" from the Memos subject of user Johnson's User Subjects (where Johnson is in the Executive group of the ACME company) to the screen, the command is:

```
Delete 'O'ACME'Executive'Johnson'Memos'Temporary-Text-|Brown
```

When you delete all the files in a directory, the directory itself is not automatically deleted. Directories are password-protected. This means that you cannot use Delete to delete an empty directory. Instead, you must use the HDelete utility. To delete a file for which you have forgotten or do not know the password, delete or copy all the other files in the directory and then use the HDelete utility to delete the password-protected file and its directory. The deleted directory can be re-created by copying a file to it (since the Copy utility automatically creates directories), or by using the AddSubject utility.

#### ! (Exclamation Mark)

Typing the optional exclamation mark at the end of the delete command turns off the prompt that normally occurs before each deletion. When you include the exclamation mark, Delete removes the files you have specified via the source pathname as soon as you press a single Confirm or RETURN.

**CAUTION:** Use this feature very cautiously; you may find the utility deleting files you wanted to keep. Note that you can abort the delete process (after completion of the current deletion) by pressing CODE-ESC.

## DiskInfo

DiskInfo gathers and displays information about the disk units on the peripheral bus of your GRiD Server. The table displayed by DiskInfo can be written to the screen of your computer or to a disk file. For each disk volume, the table contains a number representing the position of the disk unit on peripheral bus, the

free space on the volume in K bytes, the percentage of free space, and the volume name.

The syntax for DiskInfo is:

```
DiskInfo [<MinSize>] [<ReportFileName>]
```

The optional MinSize parameter is an integer representing in K bytes a minimum amount of free space you want to locate. The table entry for the volume with the largest amount of free space is flagged with an asterisk unless the amount of free space is less than MinSize. If no volume has as much free space as MinSize, the message "WARNING: NO VOLUME CONTAINS THE REQUESTED FREE SPACE" is appended to the bottom of the table. If you do not wish to specify MinSize it defaults to zero and the volume with the largest amount of free space is flagged with an asterisk.

The optional ReportFileName parameter specifies a pathname for a file to which you wish the table to be written. If you specify ReportFileName and do not wish to specify MinSize, you must enter a value of zero for MinSize (see Figure 9-5). If you do not specify ReportFileName, the table is displayed on the screen of your computer.

Figure 9-5 shows the results of three invocations of DiskInfo.

Figure 9-5: DiskInfo Examples

```
*diskinfo

POSITION  FREE SPACE  PERCENT  VOLUME NAME
      (K BYTES)  FREE
0          7359      70      2701-0000000283a
1          * 7409      71      2701-00000000189a

2 volume(s) with 14768 K bytes total free space

*diskinfo 7410

POSITION  FREE SPACE  PERCENT  VOLUME NAME
      (K BYTES)  FREE
0          7359      70      2701-0000000283a
1          7409      71      2701-00000000189a

2 volume(s) with 14768 K bytes total free space

WARNING: NO VOLUME CONTAINS THE REQUESTED FREE SPACE

*DISKINFO 0 `b`programs`diskinfo`text`
*
```

## DisplayTapeLabel

You can display the tape label of a tape cartridge loaded in a 2801 tape unit by running the program DisplayTapeLabel at the file processor "#" prompt on the diagnostic port. DisplayTapeLabel can also be used to retension a new tape.

### ▶ TO RUN DISPLAYTAPELABEL

1. Restart the system without executing the System.Init-Com- file (see the Starting the System Without Executing the System.Init-Com- File section above).
2. After you have successfully restarted the system without executing System.Init, then at the file processor "#" prompt give the command:

```
DisplayTapeLabel '<TapeDeviceNumber>
```

where:

```
<TapeDeviceNumber>
```

is an integer in the range 0 to 7 representing the position of the 2801 tape unit on the peripheral bus chain.

For example, you would enter:

```
DisplayTapeLabel '3
```

to display the label of a tape cartridge loaded in a 2801 tape unit that is the fourth device on the peripheral bus chain.

The label is displayed, then the tape is retensioned.

DisplayTapeLabel displays the tape label header in the format shown in the following example:

```
**** Tape Label ****
This tape was created:
2:00:00 a.m., Friday May 1, 1987
Source drive: 2, Destination drive: 3
Source volume: 2703-0000000226a
**** End of Tape Label ****
```

A new tape has no label and elicits the message "This tape is empty". A tape on an error has occurred elicits the message "This tape does not have a valid label". The invalid label does not affect the usability of the tape.

After the DisplayTapeLabel utility has run, the tape label trailer is displayed in the following format:

```
**** Tape Trailer ****
This tape was completed:
2:48:41a.m., Friday May 1, 1987
Read error count: 0, First read error: 0
Write error count: 0, First write error: 0
Sectors written: 69631
```

```
**** End of Tape Trailer ****
```

4. DisplayTapeLabel prompts you to "Confirm to retension the tape". If tape errors have occurred during backup with this tape, confirm and wait for the tape to be retensioned. DisplayTapeLabel issues the message "Retension in progress". Retensioning involves advancing the tape to the end and then rewinding it. It takes about two minutes and cannot be aborted.

You can unload the tape cartridge whose label you have displayed, load another tape cartridge, and repeat steps 3 through 5 to display the label of the new tape cartridge.

## Dump

The Dump utility sends the contents of a file in both Hex and ASCII to a specified destination file. This utility is used primarily for debugging and troubleshooting. It is the only way (short of writing your own program) of viewing the invisible "property records" that are at the beginning of most files. (The property records are used to store file information on such things as the typeface, display width, etc.; see the Common Code Reference Manual for more information.)

The syntax for the Dump utility is:

```
Dump <SourceFilePathname> [<DestinationFilePathname>]
```

For example, to dump System.Init in both Hex and ASCII to a spooled printer called "Narrow Printer", the command is:

```
Dump System.Init-Com- '0''Printer Queue'Narrow Printer''
```

If no destination file is specified, the contents are dumped to the screen. A portion of the output produced from the above command is reproduced in Figure 9-6.



Figure 9-6: Dump of a Portion of System.Init

```

FILE = System.Init~Con~
0000 FE 04 00 61 8B 52 00 FE 04 00 77 01 00 34 FE 0B *...a.R...u..4..*
0010 00 6D 0F 50 05 39 01 00 00 00 00 00 FE 01 00 68 *.m.P.9.....h*
0020 FD 09 00 6F 00 01 00 00 00 01 01 00 FE 0C 00 6E *...o.....n*
0030 53 79 73 74 65 6D 2D 77 69 64 65 3B 2A 2A 2A 2A *System-wide;****
0040 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A *****
0050 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A *****
0060 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 0D 0A 3B *****;.*
0070 20 20 20 20 53 79 73 74 65 6D 2E 49 6E 69 74 3A * System.Init.*
0080 20 47 52 69 44 20 53 65 72 76 65 72 20 62 6F 6F * GRiD Server boot
0090 74 20 63 6F 6E 66 69 67 75 72 61 74 69 6F 6E 0D *t configuration.*
00A0 0A 3B 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A *.;*****
00B0 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A *****
00C0 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A 2A *****
00D0 2A 2A 2A 0D 0A 0D 0A 3B 20 20 20 20 47 65 74 20 ****....; Get *
00E0 74 68 65 20 63 61 72 64 20 6E 75 6D 62 65 72 20 *the card number *

```

The four-digit numbers at the left of each row in Figure 9-6 are the byte count (in Hexadecimal) of the first character in that row. Thus the first character in the second row (Hex 00) is byte number 0010 (Hex) in the file. Next, the hexadecimal representation of each byte in the file is provided, with 16 bytes displayed in each row. To the right, the ASCII representation of each byte is displayed (non-printable characters are represented by periods).

### GS.Activate

The GS.Activate utility activates a new device and adds it to the list of currently active devices. "Activating" a device consists of associating a device name that you specify with the appropriate device driver file and device address, and then loading that device driver into the file processor memory. In normal circumstances, this utility is executed from the System.Init configuration file to load drivers for second-and-following 2101 and 2102 GPIB disks (the first GPIB disks are activated automatically by the operating system). During troubleshooting, it may be desirable to use this utility to manually load a GPIB disk driver.

The syntax of the GS.Activate utility is:

```
GS.Activate device <ActiveDevice> as <NewDeviceName> [M] <Address>
```

For example,

```
GS.Activate device 'Hard Disk' as 'Extra Hard Disk' 12
```

allows another disk to use the already-active "Hard Disk" device

driver (which is part of the file processor operating system and is not a separate file), and adds to the active device table another GPIB disk whose name is "Extra Hard Disk" and whose address is 12. This extra disk can be accessed at the "#" prompt (in a Copy command, for example) by referring to the device 'Extra Hard Disk'.

Another example of the command is:

```
GS.Activate device '2701-0000000111a' as '2701-0000000222a' M 1
```

This command allows a second 2701 disk (DSK 1, tracking number 222) to use the already-active 2701 driver (DSK 0, tracking number 111) and adds the second 2701 to the active device table. The "M" is necessary to tell the system that the new device is a mass storage (peripheral bus) device; the address (1) is the position of the disk in the daisy-chain string.

NOTE: Normally all 2701 and 2703 disks are activated when the system is first started. This command is only used when a disk has been deactivated and you wish to manually activate it. When additional 2701 or 2703 disks are activated using this method, you must use the Alias utility to activate the second name by which the system knows the disk ('1), as follows:

```
Alias '1' '2701-0000000222a'
```

See the description of the Alias utility for more information.

## GS.Deactivate

The GS.Deactivate utility is used to remove a device driver from file processor memory and the active device table. One possible application of this utility is when you want to prevent access to a 2701 Disk Unit, yet still leave it connected to GRiD Server and turned on. This might occur if your backup procedure requires copying one 2701 to another. The syntax for GS.Deactivate is as follows:

```
GS.Deactivate '<Device>
```

For example, to remove the DSK1 device from the active device table, the command is:

```
GS.Deactivate '1
```

When deactivating a device, you must deactivate all names by which it is known to the system (use the Ladt utility to determine the names). For example, to deactivate DSK1, in addition to the above command you must also deactivate the volume name containing the tracking number with the following command (assuming a tracking number of "222"):

```
GS.Deactivate ''2701-0000000222a'
```

The GS.Do utility lets you execute a prearranged sequence of commands contained in a file of Kind Com. The GS.Do utility reads the commands from the file and presents them to the system as if you were typing them at the "#" prompt. The GS.Do utility thus saves you time and effort by letting you create "canned," reusable command sequences.

GS.Do is the program that the GRiD Server operating system runs at start up to execute the System.Init configuration file. This is the normal application for the utility.

### Creating a Command File

Creating a command file is normally done using the GRiDWrite text editor, typically either standalone on your computer or while connected to GRiD Server via GRiDLink.

#### ▶ TO CREATE A COMMAND FILE

1. Enter GRiDWrite directly (rather than via a file of Kind Text).
2. Type each command with any required parameters on its own line.
3. End each line with a RETURN. Be sure that the last line in the file ends with a RETURN.
4. Write the file to a new file of Kind Com in Server Subjects.

Comments can be included in the file by placing each comment on its own line and making the first character a semicolon (;).

### Additional Capabilities of the GS.Do Utility

The GS.Do utility has a number of additional capabilities that can be used to expand the usefulness of command files. These capabilities, which are typically used only during specialized testing, include:

- o Macro expanders (to pass values at execution)
- o Looping (via a WHILE construct)
- o Conditional execution (via an IF-ELSE-END construct)
- o Displaying messages on the screen (via WRITE and WRITELN)
- o Accepting input from the keyboard (via READ)

- o Ending the command file (via EXIT)
- o Suppressing the listing of commands on the screen (via NOLIST)

Each of these additional capabilities are described in the following sections.

**Macro-Expanders** As described thus far, command files have been commands that are sequentially executed by the GS.Do utility. By adding macro-expanders to a command file, you can vary the way the GS.Do utility operates at the time you execute it.

A macro-expander works very much like a variable. You can enter any legal value or string in place of the macro when you invoke the GS.Do utility. You signify a macro to the GS.Do utility by placing a number sign (#) in the command file and following the sign with a sequential number. Thus the first macro is always "#1," followed by "#2," etc. The maximum number of macros per file is five; each macro can be up to 32 characters in length. A given macro can be used in more than one location in a command file.

For example, suppose you wanted a command file that would allow you to specify the titles for a catalog of the Programs directory in Software Subjects. The command file to do this contains the following:

```
Cat '0''Software Subjects''Programs'#1*
```

To execute the file (called "Find-Com-") and catalog all files whose names start with "GRiD", the command is:

```
GS.Do Find GRiD
```

The GS.Do utility substitutes "GRiD" for #1 when executing the command, so that the command becomes:

```
Cat '0''Software Subjects''Programs'GRiD*
```

**Looping** Looping in a command file can be done through the use of the WHILE construct. The syntax is:

```
#WHILE <Expression>
  <Statement>
  <Statement>
  ...
#END
```

where "expression" represents a Boolean expression in the same manner as Pascal. Certain predefined variables are allowed within the expression, as follows:

```
ERRORCODE - Error returned from previous command (integer)
CONFIRM   - True if READ response is Confirm; False otherwise
TRUE      - Represents the value "1"
```

FALSE - Represents the value "0"

For example, to loop a program, the command file could contain:

```
;This loops forever
#WHILE TRUE
    Time
#END
```

or,

```
;This asks for input and loops based on the result
#WRITE ('Confirm to exit. ');
#READ
#WHILE NOT CONFIRM
    Status
    #WRITE ('Confirm to exit. ');
    #READ
#END
```

or,

```
;This example loops until an error occurs in program "Test"
Test
#WHILE ERRORCODE = 0
    Test
#END
```

**Conditional Execution** Through the use of the IF-ELSE-END construct, you can execute commands in a command file conditionally. The syntax of the IF-ELSE-END construct is:

```
#IF <Expression>
    <Statement>
    <Statement>
    ...
#ELSE
    <Statement>
    <Statement>
    ...
#END
```

where "expression" is the same as in the Looping section above. The IF's can be nested to perform a number of operations and continue only when the result of each operation is correct.

**Displaying Messages on the Screen** To display a message on the screen, use the WRITE and WRITELN statements. The syntax is:

```
#WRITE ('<String>')
#WRITELN ('<String>')
```

The text within the single quotes is displayed on the screen, even

if NOLIST is in effect (see below). The WRITE statement leaves the cursor at the end of the string; the WRITELN statement adds a carriage return and line feed to the end of the string.

**Keyboard Input** The keyboard can be read to determine if Confirm has been pressed. This is done with the READ statement, whose syntax is simply:

```
#READ
```

When GS.Do executes the READ statement, it does a one-character read of the keyboard. The variable CONFIRM is set to TRUE if Confirm was pressed, or FALSE if any other key was pressed.

**End Processing** The command file can be exited before GS.Do reaches the normal end of the file by executing the EXIT statement. The syntax is simply:

```
#EXIT
```

**Supressing or Listing Commands on the Screen** By default, all commands are displayed on the screen. To disable this option, use the NOLIST statement. This prevents all text generated within the command file from being sent to the screen except for that from WRITE and WRITELN. The LIST command re-establishes echoing to the screen. The syntax of the two commands is:

```
#NOLIST  
#LIST
```

## GS.MediaFormat

The GS.MediaFormat utility is used to format (totally erase) a 2701 Disk Unit or a partition of a 2703 Disk Unit. All new GRiD Server disks shipped from GRiD are already formatted, so this utility is not used very often. Two possible cases where it is used include (a) when a 2703 disk is being re-partitioned, and (b) when disk errors (e.g., "102: Bad Sector on disk") prevent full or normal use of a disk. In the latter case, formatting the disk can sometimes eliminate the errors. In order to run GS.MediaFormat, the system must be started without executing System.Init-Com- (see the Starting the System Without Executing the System.Init-Com- File section above).

The syntax for the GS.MediaFormat utility is:

```
GS.MediaFormat '<Device> <TrackingNumber>[<PartitionLetter>]
```

The format of the device parameter depends on the state of the disk. If the disk has just been freshly partitioned, a typical device parameter is "1 Volume 1," "1 Volume 2," etc. If the disk has

previously been formatted, then a typical device parameter is "1" (for a 2701) or "1A" (for a 2703). Use the Ladt utility to determine the correct device parameter.

The tracking number is found on the bottom of the disk; only the numeric portion is used (three or four digits). For 2703 disks, the partition letter is assigned starting with "A" to match the device parameter (volume 1 is partition "A," volume 2 is partition "B", etc.). All 2701 disks are designated as "A". The tracking number and partition letter are used to form the volume name for each 2703 partition or 2701. Note that each partition of a 2703 must be individually formatted.

For example, to format the first partition of a newly-partitioned 2703 whose tracking number is 222, the command is:

```
GS.MediaFormat '1 Volume 1' 222A
```

NOTE: This utility cannot be used to format floppy disks or 2101 Hard Disk Systems for use on GRiD Server. To format floppy disks or 2101's, use the GRiD-OS Initialize Media program on a workstation.

▶ TO RUN THE GS.MEDIAFORMAT UTILITY

1. Restart the system without executing the System.Init-Com-file (see the Starting the System Without Executing the System.Init-Com- File section above).
2. At the file server "#" prompt, enter the command using the syntax shown above (for example):

```
GS.MediaFormat '1a 111a
```

3. The utility displays a message asking you to Confirm that the correct volume name is being used on the correct partition. Note that the utility automatically recognizes whether the disk is a 2701 or a 2703.

**CAUTION:** Formatting a disk erases all files on the disk. Be sure that you are not erasing any valuable data!

4. When you Confirm, the utility begins formatting the disk. If the disk is not partitioned, a hard format is done, followed by a soft format. If the disk is partitioned, only a soft format is done. The messages reporting a soft format are:

```
Hard Format: In progress
Hard Format not done on partitioned disk
Soft Format: In progress
```

To indicate the progress of the soft format, a series of periods (.) is displayed during formatting. Each period represents one track (17 pages, or 8704 bytes); about 1200 periods are displayed for a 10MB partition. Formatting 10MB takes about 32 minutes.

NOTE: Very rarely, error messages may occur during the format process. More than one or two "Read" or "Write" errors indicate a media problem; one or more "Compare" errors indicate a hardware problem with the disk controller.

5. When the format is complete, the utility ends with the message, "Format: Complete".

NOTE: The message, "Warning: 230: Device already active" at the end of a format is normal when you are formatting an already partitioned disk; the message can be ignored.

6. If you are formatting a newly-partitioned 2703 disk, the system must be restarted to enter the disk's new volume name into the active device table and delete the old volume name from the table. This must be done every time the utility is run (for each partition); you cannot successfully format several partitions in a row without restarting the system. Once a disk has been formatted with a normal volume name, this restriction is eliminated, since the correct name stays in the table.

## GS.MediaPartition

The GS.MediaPartition utility is used to partition a 2703 Disk Unit (36MB formatted capacity) into two, three, or four separate volumes. The 2703 Disk Units must be partitioned because the maximum volume size that the GRiD Server operating system can address is 32MB.

When new 2703 disks are shipped from GRiD, they are already partitioned into two 18MB partitions, and each partition is already formatted. Thus the GS.MediaPartition utility is not used very often. The only time it is needed is when the intended application requires larger partitioning (i.e., a very large database that requires a 30MB partition). Since partitioning destroys ALL data on the disk, it is normally only done when the disk is first installed.

A 2701 disk could be partitioned with GS.MediaPartition; however, there is no reason to do it.

The syntax for the GS.MediaPartition utility is:

```
GS.MediaPartition '<Device> [P1] [P2] [P3] [P4]
```

The device parameter is any name by which any part of the disk is currently known. For example, when partitioning a newly-received 2703 disk, you can use either "1A" or "1B" as the device. Note that this example assumes that the 2703 is the second disk on the system (DSK1). If you are working with a one-disk system, you can start the system from the boot diskette and run GS.MediaPartition from the floppy, referencing the disk as device "0A" or "0B".



P1, P2, P3, and P4 are partition sizes in megabytes. If all four parameters are omitted, GS.MediaPartition partitions the disk into two 18MB partitions (the default). If you enter any partition parameters, GS.MediaPartition adjusts the last parameter to make the total sum 36MB, the capacity of the disk.

For example, if you enter the command:

```
GS.MediaPartition '1A 10 10 10 10
```

the utility adjusts the size of the fourth partition to be 6MB rather than 10 ( $10 + 10 + 10 + 6 = 36$ ). If you enter only one parameter, the utility makes the first partition (the last parameter) as large as it can while trying to achieve 36MB; this results in two partitions: one of 32MB, and one of 4MB.

When selecting partition sizes, you should remember that the system automatically allocates new users and devices to the partition with the most available space. This means that if you partition a disk into unequal partitions, the larger partition is used for all new users and devices until the available space remaining equals the available space of the smaller partition, at which time the system begins spreading out new users and devices. See the section on "Administering GRiD Server Disk Space" in Chapter 5 for more information.

#### ▶ TO RUN THE GS.MEDIAPARTITION UTILITY

1. Restart the system without executing the System.Init-Com-file (see the Starting the System Without Executing the System.Init-Com- File section above).
1. At the file processor "#" prompt, enter the command using the syntax shown above, (for example):

```
GS.MediaPartition '1A 9 9 9 9
```

2. The utility displays a table similar to the example below, indicating how the disk is to be be partitioned, and then asks you to Confirm for it to proceed.

Partition	MBytes	Pages
1	9	18432
2	9	18432
3	9	18432
4	9	18432

3. If you press ESC, the utility is aborted and you can try again with different parameters. If you Confirm, the utility hard formats and partitions the disk as requested. Hard formatting and partitioning a 2703 disk takes several minutes.

4. When the utility is done, you must restart the system to replace the old partition information from the active device table with the new partition information.
5. After restarting the system, run the Ladt utility to see the partition names. Their format is: "1 Volume 1," "1 Volume 2," etc.
6. Before the disk can be used, each partition must be soft formatted and volume labeled with the GS.MediaFormat utility (see the GS.MediaFormat section of this chapter).

## GS.MediaRepair

The GS.MediaRepair utility is used to repair or recover damaged files on a 2701 or 2703 Disk Unit. A variety of incidents can corrupt a disk's data format and thereby destroy or damage files. Examples include:

- o A power failure during file access.
- o System malfunctions or other unknown situations that result in errors 200, 201, or 232 (see Appendix A for a summary list of all error codes).
- o Interrupting a compiler while developing a program.

The GS.MediaRepair utility searches out compromised storage areas, repairs them when possible, and writes a report describing its activities. The checks performed by GS.MediaRepair include:

- o Verifying that page zero on the disk is not damaged.
- o Identifying physically defective areas on the disk.
- o Checking that every file has all of its pages, and that a corresponding directory entry exists.
- o Checking that every directory entry has a corresponding file.
- o Recreating "lost" files and directories (those that do not appear in any directory).
- o Rebuilding the disk bit map (used to keep track of free space).

When you run GS.MediaRepair, you must start the system without executing System.Init.

Also, you should not run GS.MediaRepair on the disk from which you started the system. This means that for a one-disk system, you should start the system from boot diskette and run GS.MediaRepair from the floppy.

The syntax for the GS.MediaRepair utility is:

```
GS.MediaRepair '<Device>' [<ListFilePathname>]
```

where <Device> is actually the partition (such as 0, 0a, 1, 1a, 1b, etc.; use LADT to find the device name).

The report produced by GS.MediaRepair can be fairly lengthy (60KB is typical for 10MB of average-length files). For this reason, GS.MediaRepair allows you to specify an optional list file. Since the complete report does not fit into GRiDTerm's 32KB screen buffer, writing the report to a list file eliminates the necessity of watching the screen while the utility executes. The only restriction is that the list file cannot be written on the device you are repairing.

For example, to repair DSK1 and write the report directly to a GRiD Server printer (not spooled, because the system has not been started normally at this point), you can use the following two commands (see the GS.Activate utility description below for more information):

```
GS.Activate EpsonFX80-Printer- as 'Printer' 21
```

```
GS.MediaRepair '1' 'Printer'
```

Alternatively, for a system with one 2703 Disk Unit, the report could be written to another partition of the 2703 with the following command:

```
GS.MediaRepair '0a' '0b'Repair'Report-Text-
```

NOTE: The list file directory ("Repair" in the above example) must already exist; GS.MediaRepair does not create a new directory. (Use AddSubject to create a new directory.)

Because GS.MediaRepair rebuilds the disk unit's bit map, you must always restart the system after running the utility.

The length of time GS.MediaRepair takes to run depends on how many files are on the disk being repaired, and the size of the disk or partition. A 10MB disk with 500K of data on it takes about nine minutes to repair; the same 10MB disk totally full of data takes about 20 minutes to repair. Other execution times can be proportioned from these values.

### Interpreting GS.MediaRepair's Output

When GS.MediaRepair runs, the following things happen:

1. The utility prints a header line identifying the date and time when it was run.
2. If the utility cannot read physical page zero or the main directory page, the message "Unrecoverable error condition -

Repair process terminated" is produced, and the utility stops. If this occurs, run GS.MediaFormat on the disk after transferring any usable data to another device.

3. The utility operates in four phases. During Phase One, every file and directory on the disk is examined. A message is printed as each file or directory is checked. Each message is prefixed by an arrow whose length is reflective of the file's position (depth) in the directory structure. The formats of normal ("Everything's OK") messages for directories and files are:

```
-----> Verifying subject : <DirectoryName>  
-----> Verifying Title : <FileName>, kind: <kind>
```

4. During Phase One, various error messages may be reported on the following conditions:
  - o Removed subject or title. GS.MediaRepair has removed the directory entry for a file or directory found to have an invalid format. The file itself may be recovered in Phase Two.
  - o Repaired title, missing n page(s). GS.MediaRepair found a file with "n" missing pages and has concatenated what is left of the file. The file is damaged and should be checked after the utility has completed.
5. In Phase Two the remaining free areas on the disk are examined for stray files and directories. Normally there are no messages issued in this phase, other than the "Phase Two" identifier. If there are problems, error messages may be reported on the following conditions:
  - o Added subject or title. GS.MediaRepair found a stray file on the disk. If the file name matches that of a file removed in Phase One, the file is added with that name. If the name does not match anything else on the disk, GS.MediaRepair names the file "?UnknownN," where "N" is a sequence number. The file's Kind is changed to Text so that you can examine it with GRiDWrite.
  - o Rebuilding subject. GS.MediaRepair found a damaged directory and rebuilds it (generally without loss of data).
  - o Recreating lost subject. GS.MediaRepair found some files that were complete, but not in any directory. A directory is created and the files are placed in it; the directory is named "?UnknownN" (where "N" is a sequence number).
  - o Rebuilding orphan title. GS.MediaRepair found a nameless (and probably incomplete) file. The utility creates a directory called "OrphanFiles" and enters the nameless file into it, using the name "?UnknownN" (where "N" is a sequence number). The file's Kind is changed to Text so that you can examine it with GRiDWrite.

6. The utility completes its housekeeping tasks in Phases Three and Four. Additional messages may be issued similar to those in Phase Two.
7. The utility completes with the message "Successful completion". If you do not see this message, the disk is still in an unrepaired condition. Run GS.MediaRepair again.

A shortened sample of a normal report produced by GS.MediaRepair is shown in Figure 9-7 below.

Figure 9-7: Sample GS.MediaRepair Output

```
MediaRepair CLI Version

MediaRepair                6/24/84   8:38 am

Phase One
=> Verifying subject : 2701-0000000112a
==> Verifying subject : Programs"Subject"
===> Verifying Title : eSystemErrors, kind: Text
===> Verifying Title : AddSubject, kind: Run
===> Verifying Title : AdminManager, kind: Run
===> Verifying Title : Alias, kind: Run

.

===> Verifying Title : UFSConfig Model, kind: Database Index A
===> Verifying Title : UFSManager, kind: Run
===> Verifying Title : VolumeName, kind: Run
===> Verifying Title : Work, kind: Run
Phase Two
Phase Three
Phase Four

Successful completion
```

#### Cleaning Up After GS.MediaRepair

If any "?UnknownN" files were created by GS.MediaRepair, examine each one with GRIDWrite and decide whether to save or delete it.

Occasionally a file recovered by GS.MediaRepair is incompletely repaired. The result is that GS.MediaRepair alternately removes and adds the file each time you run the utility. In some cases you may be able to delete the file using HDelete; in other cases you may have to isolate it and rename the directory it is in (to something like "zzzBadFiles") so that it is placed at the end of the Cat listing. The file is deleted if you reformat the disk with GS.MediaFormat.

## GS.SetTime

The GS.SetTime utility is used to set GRiD Server's internal clock to the correct time and date. The current time and date are used in three ways on GRiD Server:

- o The current time is displayed in the 1701's front-panel in the format HH:MM:SS.
- o Whenever you create or modify a file on GRiD Server, the file is stamped with the current time and date. You can examine the time-and-date stamp with the Show Characteristics of a File item on any Management Tool's CODE-T menu, with the Display or Print Titles item on GRiDManager's CODE-T menu, or with the Cat utility.
- o Whenever an error is entered into the System Error Log file, it is stamped with the current time and date. This time-and-date stamp is visible when you execute the diagnostic processor's Log command, or when you list the System Error Log-Text- file.

It is good practice to maintain the GRiD Server clock setting at approximately the correct time and date, just as you do with your own watch. The clock in GRiD Server is not an extremely high-accuracy device; you can expect the clock to run slightly slow or fast (a gain or loss of one or two minutes a month is typical; a gain or loss of five minutes a month is the maximum normal variation).

### ▶ TO RUN THE GS.SETTIME UTILITY

1. At the "#" prompt, type "GS.SetTime", then Confirm or press RETURN.
2. GS.SetTime prompts you to set the hour, minutes, and am/pm. Use the CTRL-LeftArrow key (to decrease the value) or the CTRL-RightArrow key (to increase the value) to select the correct hour, then Confirm. Use the same keys to set the minutes, then Confirm. Finally, use the same keys to set am/pm, then Confirm.

NOTE: Holding down the CTRL-LeftArrow and CTRL-RightArrow keys causes GS.SetTime to speed very rapidly through the possible settings (e.g., 1 through 12 for the hour). All the settings wrap around (e.g., 1 to 12 and then back to 1 again). If you hold down the keys too long, GS.SetTime continues to speed through settings even after you have released the keys. Be patient and wait, it eventually stops. A light touch on the keys prevents you from overshooting your desired value.

3. GS.SetTime prompts you to set the day of the week. Use the same keys as in Step 2 above to set the day of the week, then Confirm.

4. GS.SetTime prompts you to set the month, day, and year. Use the same keys as in Step 2 above to set each of the three values, Confirming after each value.
5. GS.SetTime prompts you to set the clock. Confirming at this point causes GS.SetTime to set the system clock to the values you have selected, and to update the 1701 front-panel display. The seconds begin incrementing from zero at the moment you Confirm. The time offset from the factory clock setting is stored in the User file in the Programs subject of the Server Subjects device.

NOTE: If you realize you made an error in setting a value on a previous line and want to start over, press ESC. Alternatively, you can continue setting the rest of the values, Confirm to set the clock, and then run GS.SetTime again, changing only the incorrect value.

6. If you are running the optional GRiDmail programs, you must reboot the system in order for GRiDmail Post Office to use the new time.

You can check your setting when you are done by running the Time utility. At the "#" prompt, simply type "Time", then Confirm or press RETURN. The Time utility displays the current time and date setting. Figure 9-8 illustrates the user dialog with the GS.SetTime utility, and the result of running the Time utility.

Figure 9-8: GS.SetTime and Time Utilities

```
#GS.SetTime
Set hour and minutes - 9:15 am
Set day of the week - Thursday
Set month, day, year - February 15, 1987
Confirm to set clock
Clock is set
*
#Time
9:15:09 a.m., Thursday February 15, 1987
```

#### GS.UpdateBootCode

The GS.UpdateBootCode utility copies the low-level system startup program ("boot code") to a floppy disk so that GRiD Server can be started from that disk. This is particularly important for floppy disks, since the GRiD-OS and the GRiD Server boot codes are different. A floppy that has been formatted using the GRiD-OS Initialize Media program cannot be used to start GRiD Server, even if it has all the right files on it. You must run GS.UpdateBootCode

on the floppy before it can be used to start GRiD Server.

The syntax for GS.UpdateBootCode is:

```
GS.UpdateBootCode '<Device>
```

For example, to copy the boot code to a floppy disk in a 2102 Portable Diskette Drive attached to GRiD Server, you type:

```
GS.UpdateBootCode 'C
```

## HCompare

HCompare is an enhanced version of the Compare utility. Like Compare, it is used to compare two files to determine if their contents are identical. Because HCompare handles multiple levels of directories (subjects) and the files in those directories, it can be used to compare all the files on one disk with all the files on another disk with a single command. You may find this useful when using UAFChangeDevice to move a user or device from one disk to another.

The syntax for HCompare is:

```
HCompare <FirstDirectoryPathname> <SecondDirectoryPathname> [!]
```

The utility compares in turn each file found in the first directory to the file with the same title in the second directory. HCompare displays the following messages that describe the results of the comparison you request:

If a file in the first directory is identical in length to the corresponding file in the second directory, and all bytes in the file in the first directory are identical to the bytes in the corresponding file in the second directory, the utility displays the word "Identical."

If a file in the first directory is a different length than the corresponding file in the second directory, the utility displays the message "Different lengths".

If a file appears in the first directory and does not appear in the second directory, HCompare displays the message "File not found."

The message "Files are different at location xxxx" indicates that a file in the first directory and its corresponding file in the second directory are the same length but not all of the bytes in the first file are identical to the bytes in the second file. Eight bytes from each file are displayed, starting at the point of discrepancy (i.e., at the first byte that does not match).

If you do not specify the optional "!" parameter, the program terminates with the first non-identical comparison. If you specify the "!" parameter, the program continues and when all the files in



the first directory have been compared, HCompare displays a final message indicating the number of differences it found.

You can cancel HCompare at any time by pressing CODE-ESC.

## HCopy

The HCopy utility is a very powerful file copy program. The "H" in the name stands for "hierarchial," meaning that the utility operates on any directory level of the file system structure and affects all the files and directories under the specified directory, as well as the specified directory itself. This is quite different from the "Copy" utility, which only copies files from one directory to another.

The utility expects parameters that specify a directory pathname, not a file name. The utility cannot operate on a single file; it operates only on directories containing files.

The syntax for HCopy is as follows:

```
HCopy <SourceDirectoryPathname> <DestinationDirectoryPathname> [!]
```

For example, the following command copies the entire Marketing group of the ACME company with all its group and user directories and files to a backup 2101:

```
Hcopy '0'ACME'Marketing' 'W'MarketingBackup'
```

Note, however, that the users' files are not accessible via a GRiD-OS computer attached to the 2101, since you are copying the three levels below the Group level (User/Subject/Title), while the GRiD-OS file system can only read the top of the three directory levels (User). To access the files on this backup device, you must HCopy them back into the GRiD Server file system.

Another example of an application for HCopy is copying all of one 2701 disk (DSK0, for example) to another 2701 disk (DSK1, for example) for backup. The command to do this is:

```
HCopy '0' '1'
```

This copies the entire file system, including all of the directories and all of the files, from DSK0 to DSK1 at about 150KB per minute. Note, however, that if you execute this command, the disk tracking number that appears in the User Authorization File copied from DSK0 to DSK1 does not match the physical tracking number of DSK1. This means that while DSK1 is a valid data file backup, you cannot access the GRiD Server devices on DSK1 without either modifying DSK1's tracking number with the VolumeName utility or running the UAFChangeDevice utility and changing the UAF file.

HCopy overwrites a password-protected destination file, even if the source and destination passwords are different. This means that if

you are using HCopy for backup purposes, you can directly overwrite an old backup (although you still have the problem of old files that are on the backup disk but not on the current disk). HCopy also creates any and all directories it needs on the destination device; this means that you can copy from a higher-level directory on the source device to a lower-level directory on the destination device without having to create the additional intermediate directories on the destination device first.

HCopy does not honor the "?" parameter that is available with the regular Copy utility; this means that you must copy everything within the specified pathname or nothing. However, HCopy does recognize CODE-ESC, so you can cancel a copy (after the current file copy is completed). Like regular Copy, HCopy gives an indication of whether it is overwriting a file on the destination device by its use of the words OVER and TO in describing the destination file.

If you include the "!" parameter when you issue the HCopy command, HCopy continues copying even if it encounters errors, and upon completion of the copy operation, it displays a completion message that indicates how many files were incompletely copied. HCopy stops as soon as the first error is encountered if the "!" parameter is omitted.

## HDelete

The HDelete utility is a very powerful and potentially destructive file deletion program. The "H" in the name stands for "hierarchical," meaning that the utility operates on any directory level of the file system structure and affects all the files and directories under the specified directory, as well as the specified directory itself. This is quite different from the "Delete" utility, which only deletes files under one directory.

The utility expects parameters that specify a directory pathname, not a file name. The utility cannot operate on a single file; it operates only on directories that contain files.

The syntax for HDelete is as follows:

```
HDelete <DirectoryPathname> [!]
```

For example, the following command deletes all files and directories within the Company ACME on DSK0:

```
HDelete 'O'ACME'
```

The deletion includes all users with their subjects and files, all group subjects directories and related files, the company subjects directory and related files, and the company directory itself. A form of HDelete is used by AdminManager to delete user files when requested by the AdministratorSentry program.

Another example of a command is:

HDelete '1'

This command deletes everything on DSK1. This command illustrates how potentially destructive HDelete can be; with one command an entire disk can be wiped out. HDelete does not recognize the "!" parameter that is available with the regular Delete utility; this means that it does not prompt you for file deletions one at a time. You cannot selectively delete files within the specified pathname; you must either leave them all or delete them all. The deletion starts immediately after you press RETURN. However, HDelete does recognize CODE-ESC, so you can cancel a deletion (after the current file deletion is completed).

Another example of an application for HDelete is deleting a spooled printer directory where a password-protected file is "stuck" in the queue (this condition can be identified by continuous error 27's in the System Error Log file). The command to rectify this situation is (assuming a spooled printer called "Narrow Printer"):

```
HDelete '0'Printer Queue'Narrow Printer'
```

This deletes all files in the Narrow Printer queue (including any locked or password protected files, without knowing the passwords), as well as the Narrow Printer directory itself. Note that once this command has been executed, you must recreate the Narrow Printer directory with the AddSubject utility.

The "!" is an optional parameter. If you include it, HDelete continues to delete files even if it encounters errors, and displays a completion message that indicates how many files were not deleted. If you omit this parameter, HDelete terminates as soon as it encounters an error.

Ladt

The Ladt utility Lists the Active Device Table. This utility is a useful tool for determining what devices (particularly disks and printers) are active in the system. The utility lists both the device names known to the operating system and the names that the user sees (always different). The syntax for Ladt is:

```
Ladt [0] [0]
```

When the command is executed without the optional parameters, a list like that shown on the right side of Figure 9-9 is produced. With the optional parameters, a list like that shown on the left side of Figure 9-9 is produced. Table 9-3 identifies each entry in Figure 9-9 (plus some additional entries that you may see on your own system); these entries are representative of a large system including both a 2701 and 2703 disk, two 2101 disks, one 2102 disk, and two printers.

NOTE: The "B" in Figure 9-9 (which stands for "Boot Device" rather

than "Bubble Memory") immediately follows the disk from which the system was started ("0" in this case). This knowledge can be useful during troubleshooting; for example, if the "B" appeared after "1a," then you know that the system was started from partition "a" of DSK1.

Figure 9-9: Ladt Listing With and Without Optional Parameters

Hard Disk	Hard Disk
w	Floppy Disk
Floppy Disk	Portable Floppy
f	c
Portable Floppy	Name Device
c	n
Name Device	GPiB
n	BB
GPiB	CI
BB	CO
CI	2701-0000000112a
CO	0
2701-0000000112a	B
0	2703-0000000095a
B	2703-0000000095b
2703-0000000095a	2703-0000000095c
2703-0000000095b	2703-0000000095d
2703-0000000095c	1A
2703-0000000095d	1B
1A	1C
1B	Wide Printer
1C	Narrow Printer
Wide Printer	Hard Disk Volume 1
Narrow Printer	Extra Floppy Disk
Hard Disk Volume 1	Server Subjects
Extra Floppy Disk	Backup Portable Floppy
Server Subjects	Backup Floppy 2
Backup Portable Floppy	Bakcup Disk 2
Backup Floppy 2	Backup Floppy 1
Bakcup Disk 2	Backup Disk 1
Backup Floppy 1	
Backup Disk 1	

Entry in Ladt Listing	Identification
0	Alias for DSK0
1A	Alias for partition A of DSK1
1B	Alias for partition B of DSK1
2701-0000000111a	2701 disk volume name (tracking number 111)
2703-0000000222a	2703 disk partition volume name (t/n 222, partition A)
2703-0000000222b	2703 disk partition volume name (t/n 222, partition B)
B	"Boot device" (system startup device)
Backup Disk 1	Name seen by user for first 2101 (winchester disk)
Backup Disk 2	Name seen by user for second 2101 (winchester disk)
Backup Floppy 1	Name seen by user for first 2101 (floppy disk)
Backup Floppy 2	Name seen by user for second 2101 (floppy disk)
Backup Portable Floppy	Name seen by user for 2102 portable floppy
BB	"Byte Bucket" (used for testing)
C	Alias for 2102
CI	Console In (diagnostic computer keyboard)
CO	Console Out (diagnostic computer screen)
EpsonFX100	Name seen by user for EpsonFX100 printer
EpsonFX80	Name seen by user for first EpsonFX80 printer
EpsonFX80B	Name seen by user for second EpsonFX80 printer
Extra Hard Disk	Second 2101 Hard Disk System
F	Alias for first 2101 Floppy Disk
Floppy Disk	2101 Hard Disk System (floppy disk)
GPIB	General term (not an addressable device)
Hard Disk	First 2101 Hard Disk System (winchester disk)
Hard Disk Volume 1	First 2101 (partitioned for GR1D-OS and MS-DOS)
N	Alias for Name Device
Name Device	RAM-based pseudo-device storing system information
Narrow Printer	Name seen by user for EpsonMX82 Printer
Portable Floppy	2102 Portable Diskette Drive
Server Subjects	Name seen by user for system software ('b'Programs')
W	Alias for first 2101
Wide Printer	Name seen by user for EpsonMX100 Printer
VfsVipcLink	Allows applications to sign on to the file system

Table 9-3: Identification of Typical Entries in Ladt Listing

More than one peripheral disk drive can have the same volume name. If you have given two disk drives the same volume name, both names are placed in the active device table (ADT) and are listed when you issue the Ladt command. The second of the two drives, i.e., the drive that is farther down the peripheral bus chain, is indicated by "D1" (indicating duplicate one) following the volume name, e.g., '2701-0000000123a' and '2701-0000000123a D1'. If a third drive had the same volume name, it would be indicated with "D2", and so on.

Each disk unit can be accessed by the volume name listed, including the duplicate indicator, if any, or by its position number (0-7) on the peripheral bus chain. The volume name on the disk itself is not changed to indicate the duplication.

## LineEdit

LineEdit is a line editor that can be used to make minor changes to text files quickly and easily while you are connected to the file processor. An example of when LineEdit might be used is to uncomment (remove the ";" from) a line in the System.Init configuration file. Clearly this change could also be made by disconnecting from the diagnostic port, signing on with GRiDLink, bringing the file into GRiDWrite, making the change, saving the file, signing off GRiDLink, and reconnecting to the diagnostic port. It is precisely this long sequence of steps that the use of LineEdit can avoid.

LineEdit must be used to edit an existing file. It has one limitation: the Insert Characters and Erase Characters commands are limited to operating on line lengths of 80 characters or less (though the Substitute command can replace longer lines).

The syntax of the LineEdit utility is:

```
LineEdit <Pathname>
```

where "Pathname" is the complete name of the file to be edited (including the Kind).

LineEdit's prompt is an asterisk (\*). At the prompt, LineEdit responds to CODE-? with the commands menu shown in Figure 9-10. The following procedures describe how to use these commands.

Figure 9-10: LineEdit Commands (CODE-?) Menu

Erase characters	Code-C, Code-E
Insert characters	Code-C, Code-I
Erase lines	Code-E
Insert lines	Code-I
List lines	Code-L
Quit	Code-Q
Substitute line	Code-S
Cancel	Code-Esc

### ▶ TO USE THE LIST LINES (CODE-L) COMMAND

1. Press CODE-L.
2. LineEdit prompts you with a request for the line numbers to be listed. Confirming at this point lists all lines in the file with their line numbers. Entering two numbers separated by any kind of non-numeric character and then Confirming lists the lines within the range. For example, "20-30," "5 10," and "1 through 99" are all valid.

▶ TO USE THE CHANGE LINE (CODE-C) COMMAND

1. Press CODE-C.
2. LineEdit prompts you with a request for the number of the line you want to change.
3. Enter the line number.
4. LineEdit prints out the specified line.
5. Use the space bar to move to position the cursor in the text.
6. Use Code-E to erase text in the line, or use CODE-I to insert text into the line; then confirm to stop inserting or deleting characters.
7. Use the space bar to continue positioning the cursor or Confirm a second time to reach the end of the line.
8. Use CODE-Q to save the changes to the line.

▶ TO USE THE SUBSTITUTE (CODE-S) COMMAND

1. Press CODE-S.
2. LineEdit prompts you for the line number of the line to be substituted. Enter a number and Confirm.
3. LineEdit displays the line and prompts you for a new (replacement) line. Type the new line and Confirm.

▶ TO USE THE INSERT (CODE-I) COMMAND

1. Press CODE-I.
2. LineEdit prompts for the line number of the line before which you want to insert lines. Enter a number and Confirm.
3. LineEdit prompts you with "New:" to enter a new line. Enter a line and Confirm.
4. LineEdit continues to prompt you for new lines. When you are through inserting new lines, press ESC to return to the LineEdit "\*" prompt.
5. All of the new lines that you entered are inserted before the line you specified in step 2. The new lines are numbered sequentially and all following lines are renumbered.

➤ TO USE THE ERASE (CODE-E) COMMAND

1. Press CODE-E.
2. LineEdit prompts for the line(s) you want to erase. Enter a number or a range of numbers separated by any non-numeric character (e.g., 20-30) and Confirm.
3. LineEdit erases the requested lines and returns you to the LineEdit "\*" prompt.

▶ TO USE THE QUIT (CODE-Q) AND CANCEL (CODE-ESC) COMMANDS

1. Press CODE-Q.
2. LineEdit prompts you to Confirm and save your changes. Confirm to save, or press CODE-ESC to cancel your editing session.

Figure 9-11 illustrates an example LineEdit editing session. The file being edited is the System.Init configuration file; the edits (for illustrative purposes only) are 1) changing the system name, and 2) removing the comment character (;) on the UAFDelete line.



Figure 9-11: Example LineEdit Editing Session

```

*LineEdit System.Init~com~
CODE-L -----> *List lines: 5-15
                    5 ; Set the disk cache parameters
                    6 SetCache 32 6
                    7
                    8 ; Recover file space of deleted users
                    9 ; UAFDelete
                   10
                   11 ; Start automatic disk backup
                   12 ; AutoBackup AutoBackupConfig~Text~
                   13
                   14 ; Set the system name
                   15 SystemName 'GRiDServer'

-----

CODE-S -----> *Substitute line: 15
                    15 SystemName 'GRiD Server'
                    New: SystemName 'Fred'

-----

CODE-C -----> *Change line: 9
                    9 ; UAFDelete
CODE-E,SPACE, ---> Edit: UAFDelete
CONFIRM,CONFIRM   12 UAFDelete

-----

CODE-Q -----> *
                  Confirm to save changes and quit
                  *

```

### Prefix

The Prefix utility is used to change the default device and directory in file processor commands. When you first sign on to the file processor, the default device and directory is always 'B'Programs', where "B" is the device from which you started the system (the boot device). "B" is usually '0', but it can be any device containing the GRiD Server system software ('0b', '2', 'C', etc.).

The term "default device and directory" means that whenever you reference a file at the file processor "#" prompt, the system tries to find the file in question on the default device, in the default directory, unless told to look elsewhere. This combination of device and directory is referred to as a "prefix".

You can override the default prefix by explicitly typing another prefix before a file name (e.g., if the default prefix is '0'Programs', you can reference a file on the 2102 Portable Diskette

in a directory called ConfigFiles by prefixing the file name with 'C'ConfigFiles'). To reset the prefix to a different device-directory pair, you use the Prefix utility.

The syntax of the Prefix utility is:

```
Prefix [['<Device>']<DirectoryName>']
```

One application of the Prefix utility occurs during the GRiD Server updating process. Typically the system is started from the 2102 Portable Diskette Drive, then GRiD Server Floppy #1 is copied to DSKO. After the copy is complete, the following command is issued:

```
Prefix 'O'Programs'
```

The effect of this command is to tell the file processor to look in the Programs directory of DSKO for all further commands, rather than continuing to look in the Programs directory of Floppy #1. This allows you to remove Floppy #1 from the 2102 and use the Copy utility on DSKO to copy the rest of the update floppies. While the same result could be accomplished by explicitly prefixing the Copy command with 'O'Programs', using the Prefix utility to make the change greatly reduces the chance of error.

Note that the device is optional when specifying a new prefix. If you do not include a device name, the new prefix becomes the specified directory combined with the previously prefixed device. Thus, if the current prefix is 'O'Programs', typing the following command changes the default prefix to 'O'ConfigFiles':

```
Prefix ConfigFiles
```

Note also that the entire new prefix itself is optional. If you enter just the command "Prefix," the utility responds with the current prefix, for example:

```
Prefix is 'b'Programs
```

The "B" in the response stands for the "boot" (startup) device; see the Ladt utility description for more information.

## Rename

The Rename utility is used to change the name of a file or a directory. One common application of this utility is to rename System.Init-Com~ to some other name (e.g., System.Init-Save~) so that it is not executed at startup. Another possible application occurs during troubleshooting, when it is sometimes desirable to rename the current Programs directory to some other name (e.g., XPrograms) and then create a new Programs directory and corresponding files.

NOTE: Make sure your prefix is set to some other Programs directory (e.g., 'C'Programs') before you do this.

The syntax of the Rename utility is:

```
Rename <SourcePathname> <DestinationPathname>
```

The utility does not accept wildcards. As an example of its use, the command to rename System.Init-Com- as System.Init-Save- is:

```
Rename System.Init-Com- System.Init-Save-
```

If, as in this example, you are renaming a file currently in the default device and directory (prefix), you do not need to specify the device and directory on the source pathname. If you want to rename a title that exists under a different device and directory, you must specify the complete pathname for the source file. For example, if the copy of System.Init that you want to rename is on a floppy in the 2102 Portable Diskette, the command is:

```
Rename 'C'Programs\System.Init-Com- System.Init-Save-
```

In this example, note that the Rename utility automatically uses the same prefix that was specified on the source file for the destination file. In fact, you cannot use the Rename utility to move a file across subject or device boundaries. When renaming a file, the destination device and directory must always be the same as the source device and directory. Explicitly typing the destination device and directory are thus optional.

Rename can be used to rename a file at a deeper directory level than that shown in the example above. For example, to change the name of a text file called "Temp" to "OldData", where the file is in the Test subject of user Johnson's User Subjects, and where Johnson is in the Executive group of the ACME company, the command is:

```
Rename 'O'ACME'Executive'Johnson'Test'Temp-Text- OldData-Text-
```

### Renaming Directories

To rename a directory, you must deal directly with the directory itself (a file of Kind Subject). For example, to rename the Programs directory to XPrograms, the command is:

```
Rename 'O'Programs-Subject- XPrograms-Subject-
```

Another (shorter) form of this command that is valid in this particular case is as follows:

```
Rename 'O'Programs 'O'XPrograms
```

The Rename utility interprets the absence of a final back-quote as meaning that you want to deal with the directory file itself rather than the files under the directory. Leaving off the back-quote causes Rename to add ~Subject~ to the end of each pathname.

You do not need to know the directory password to rename a directory at the level immediately below the device level. However, you cannot rename a directory at a lower level (e.g., the Programs directory under the Software Subjects directory). Call the GRiD Resource center for assistance if you need to do this.

## SectorCopy

This program copies sectors from one peripheral bus device to another. It is used by the AutoBackup software to perform the backup of a peripheral bus disk, and the System Administrator uses this program when it is necessary to restore data manually from disk or tape.

A backup disk contains the exact image of all of the sectors on the source disk from which it was copied including the volume name.

A backup tape contains an exact image of all of the sectors on the source disk from which it was copied including the volume name. You cannot copy a specific file from a backup tape to an active disk. If you must recover disk data from a backup tape, you must use SectorCopy to copy the entire image of the disk from the tape to the recovery disk, completely overwriting the current contents of that disk.

To restore all of the data from a backup tape to a disk, you must restart the system without executing System.Init and invoke SectorCopy at the file processor "#" prompt on the diagnostic port, as described in the next sections.

The syntax for SectorCopy is

```
SectorCopy '<SourceDeviceNumber>' '<DestinationDeviceNumber>'
```

where:

<SourceDeviceNumber>

is an integer in the range 0 to 7 representing the position of the 2801 tape unit on the peripheral bus chain.

<DestinationDeviceNumber>

is an integer in the range 0 to 7 representing the position of the recovery disk unit on the peripheral bus chain.

Restart the system without executing the System.Init-Com~ file (see the Starting the System Without Executing the System.Init-Com~ File section above). Remember to use the DisplayTapeLabel utility first.

SectorCopy issues the message "SectorCopy: Tape retention in progress" and then the message "SectorCopy: Copy in progress". SectorCopy takes about ten minutes to restore data to a 2701 disk, and about forty minutes to restore data to a 2703 disk. It issues a

"%done" message periodically to indicate the progress of the copying. When the entire disk image has been restored to the destination disk, SectorCopy issues the message "SectorCopy: Copy complete".

You must restore a backup of a 2703 disk to another 2703 disk; if you attempt to restore the image of a 2703 disk to a 2701 disk, SectorCopy issues the error message "SectorCopy: Source is LARGER than destination!" to warn you. A backup of a 2701 disk can be restored to a 2703 disk but the restored disk will only have as much available space as the original source disk (i.e., if you restore the contents of a 10 megabyte disk to a 40 megabyte disk, you will have only 10 megabytes of usable space on the 40 megabyte disk). To recover the full 40 megabytes of space on the 2703 disk, you must run GS.MediaPartition and GS.MediaFormat.

If SectorCopy detects an error when writing to a disk it will attempt to finish restoring all data to the disk. If it successfully restores the remainder of the data, it writes error 233 (invalid bit map) to the ErrorLog file as a permanent record, and displays a message requesting that you run GS.MediaRepair (see the GRiD Server Administrator's Guide) before using the recovery disk. Other messages may also be logged when an error occurs during the execution of SectorCopy (see Appendix A and Appendix D of this manual).

## Status

The Status utility displays current memory utilization information for the processor card on which it is being run. This utility is used exclusively in troubleshooting situations, and even then only rarely. To run the utility, simply type "Status" and Confirm or press RETURN. The utility returns an information display similar to the one shown in Figure 9-12. The only lines of any real interest in the display are "Current prefix" and "Total free bytes" (the latter indicates the available memory on the card).

Figure 9-12: Processor Card Memory Utilization (Status) Information

```
current prefix: `b`Programs
total free bytes: 24704
number of free blocks: 15
largest free block: 20384
total allocated bytes: 172432
number of allocated blocks: 264
largest allocated block: 65535
```

## Time

The Time utility displays the current date and time setting of GRiD Server's internal clock. To run the utility, simply type "Time" and Confirm or press RETURN. The utility returns one line of information in the format:

```
10:09:47 p.m., Tuesday February 7, 1987
```

## UAFChangeDevice

The UAFChangeDevice utility allows you to change the disk volume field in the User Authorization File for a user or for a device. This is necessary when you move a user or device to another disk (refer to Chapter 5 of this manual for more information). Note that this utility can only be used when the GRiD Server system has been started normally. The syntax for UAFChangeDevice is:

```
UAFChangeDevice <'OldVolumeName'> <'NewVolumeName'> ['UAFKey']
```

OldVolumeName is the fully qualified GRiD Server peripheral disk volume source name for the user or device, enclosed in single quotes and preceded by a backquote (`), e.g., '`2701-0000000003a`'.

NewVolumeName is the fully qualified GRiD Server peripheral disk destination volume name for the user or device enclosed in single quotes and preceded by a backquote (`), e.g., '`2701-0000000005a`'.

UAFKey is an optional parameter and is the User Authorization File key, if any, of the record to be changed. You do not specify a key if you are replacing an entire peripheral disk and you want all User Authorization File entries with the "OldVolumeName" to change to the "NewVolumeName." It must be entered exactly, in one of two forms:

- o If you are changing the peripheral disk volume name for a company, group, or user, the key is in the form 'Company Name'Group Name'User Name.
- o If you are changing the peripheral disk volume name for a device, the key is in the form 'Device Name.

For example, if you want to change the peripheral disk volume name for a user where the Company Name is BellCo, the group name is Marketing, and the User Name is Smith, the key would be 'BellCo'Marketing'Smith.

If you wanted to change the peripheral disk volume name for the Group Subjects device where the Company Name is BellCo and the group name is Marketing, the key would be 'BellCo'Marketing'Marketing.

If you wanted to change the peripheral disk volume name for the Company Subjects device where the Company Name is BellCo, the key would be 'BellCo'BellCo'BellCo.

If you wanted to change the peripheral disk volume name for the Software Subjects device, the key would be ''Software Subjects' (notice that there are single quotes (') surrounding the name because of the imbedded space).

Figure 9-13 shows an example of using the UAFChangeDevice utility.

Figure 9-13: UAFChangeDevice Example

```
*UAFChangeDevice `2703-0000000222a' `2703-0000000222b' `Software Subjects'
Compressing User Authorization File

Successful completion of UAF Change Device
*
```

#### VolumeName

The VolumeName utility is used to change the volume name on a 2701 or 2703 disk. The volume name is the name in the active device table in the format 270X-0000000NNNP, where "X" is 1 or 3, "NNN" is the tracking number of the disk, and "P" is the partition letter. Under normal circumstances, a disk's volume name is applied during the formatting process (see the GS.MediaFormat utility description for more information) and is never changed.

One of the special circumstances where it is necessary to change the volume name on a disk occurs when you are starting (recovering) the system from a backup peripheral disk made with the HCopy utility. In this case, the User Authorization File (UAF) on the backup disk includes the volume name (tracking number) of the original (failed) disk. In order to access the devices on the backup disk, the volume name in the UAF must match the volume name on the disk. Since you cannot change the UAF, you must temporarily change the volume name on the disk to match the original (failed) disk. Once the original disk is repaired and back on line, you should change the volume name on the backup disk back to its original value.

The syntax for the VolumeName utility is:

```
VolumeName '<Device> [<'VolumeName'>]
```

The volume name parameter is in the format "270X-0000000NNNP", where:

X = "0" or "3", depending on the model of the disk  
NNN = the disk tracking number (on the bottom of the disk)  
P = the partition letter ("A" for 2701, "A" - "D" for 2703)

Note that because of the "-" character in the volume name, the name must be surrounded with single quotes.

For example, to give DSK1 a volume name of "2701-0000000222A," the command is:

```
VolumeName '1 '2701-0000000222A'
```

If you run the VolumeName utility with a device but no volume name specified, the utility returns the current volume name of the device.

NOTE: When changing the volume name for a 2703, you must run the VolumeName utility for each partition.

When you run the VolumeName utility to change a volume name, it displays a confirmation of your change back to you. After running the utility, you must restart the system so that the changed volume name is entered into the active device table.

## Work

The Work utility is used to specify the device to be used for temporary work files by the language compilers and the Linker during program development. This utility can be used both on GRiD Server and under GRiD-OS; it is most commonly used from within GRiDDevelop to specify a GRiD Server device as the work device when doing program development under GRiD-OS.

The syntax for the Work utility is:

```
Work ['<Device>']
```

For example, when used from GRiDDevelop, a command such as the following assigns the work device to GRiD Server (assuming the system name is "GRiD Server"):

```
Work 'GRiD Server:Shared Subjects'
```

Although you must specify a particular GRiD Server device from GRiD-OS's point of view, from GRiD Server's point of view the device used is always the startup disk (normally DSK0), unless specified otherwise with the Work utility on the file processor. Thus, the Work utility on GRiD Server specifies which GRiD Server disk is used for work files by GRiD-OS.



For example, to make DSK1 the work device, the command is:

```
Work '1
```

Be careful to specify a valid device (e.g., '1a for a partitioned disk); the utility does not return an error if you specify an invalid device (you only see the error when you try to access the device).

If you type just "Work" without any parameters, the utility returns the current setting of the work device.

Depending on your particular system configuration, you may want to insert a Work command into System.Init to set the work device automatically to the disk with the most free space.

## CHAPTER 10: TROUBLESHOOTING

This chapter provides troubleshooting information you can use in case of difficulty with your GRiD Server. The chapter includes information in two basic categories:

- o Observing system startup, including interpreting error messages and watching System.Init execute.
- o Troubleshooting the eight basic kinds of system failures that can occur on a GRiD Server system.

### HOW TO USE THE INFORMATION IN THIS CHAPTER

This chapter presents information aimed at helping a GRiD Server System Administrator identify and resolve a problem with the system. This chapter is mostly concerned with error messages and conditions affecting the operation of the system as a whole, rather than problems experienced by only one user.

For information on error messages that an individual GRiD Server user may see on his computer's screen, refer to the GRiD Server User's Guide for GRiD-OS Users and the GRiD Server MS-DOS User's Guide. For information on error messages that you may see while running the AdministratorSentry and GRiDspool Manager programs, see Appendix B. For information on error messages that you may see while running file processor utilities, see Appendix C. For information on error messages that can appear in the System Error Log-Text- file, see Appendix D.

If you have made a configuration change, and the system no longer works properly, review the "concepts" information and the

quick-reference procedures in Chapter 4. The information in Chapter 4 may be more specific to your problem than the general procedures in this chapter. This chapter is aimed at resolving problems not caused by something you changed.

## Watching System.Init Execute

Watching System.Init execute via the diagnostic port during system startup is useful for gathering information during troubleshooting. To do this, you must be connected to the diagnostic port as detailed in Chapter 8. Start the system normally, then type EXEC when the star prompt ("\*") is displayed on the diagnostic console. This prompt is displayed after the card test(s) are completed. After typing EXEC and pressing RETURN, wait for the continue/cancel prompt (see Chapter 3). At the prompt, press RETURN to continue processing System.Init. Note that the system continues to initialize if EXEC was not typed when the "\*" prompt was displayed.

Figure 10-1 shows the additional information that can be obtained via this method. The numbered items in the figure are explained below.

- ① Confirmation of SetCache settings.
- ② Dots to indicate UAFDelete's activity (each dot represents one directory).
- ③ Verification of the system name.
- ④ Version number and confirmation of startup of AdminManager.
- ⑤ Dots to indicate UAFActualDisk's activity (each dot represents one user or device).
- ⑥ Version number and confirmation of startup of VFSManager.
- ⑦ Confirmation of which cards were started up.
- ⑧ Verification of GRiDNetwork Manager startup.
- ⑨ Verification of GRiDspool Manager startup.
- ⑩ Version number of GS.Executive and C3FS program.

NOTE: Sometimes errors displayed during System.Init execution are in Hex; try converting to decimal if the number you see is not recognizable (e.g., 66 is not in Appendix A, but when converted to decimal, it is 102, which is in Appendix A).

Figure 10-1. Result of Watching System.Init Execute

```
*boot
Confirm to boot system from system disk
```

```
SYSTEM RESET
0D TEST DONE
1F TEST DONE
2C TEST DONE
3A TEST DONE
```

```
.
.
.
*exec
```

```
Press RETURN to continue processing System.Init
<or>
```

```
Press ESCAPE to cancel System.Init
```

```
Continuing processing...
```

```
*****
; System.Init: GRiD Server boot configuration
*****
```

```
① — ; Set the disk cache parameters
      SetCache 32 6
```

```
Buffers allocated is : 032
Fetch limit is      : 006
; Recover file space of deleted users
UAFDelete
```

```
② — .....
```

```
; Start automatic disk backup
; AutoBackup AutoBackupConfig-Text-
```

```
③ — ; Set the system name
      SystemName 'GRiD Server'
```

```
; Example of how to start second 2101 disk system
; GS.Activate device 'Hard Disk' as 'Extra Hard Disk' 12
; GS.Activate device 'Floppy Disk' as 'Extra Floppy Disk' 13
```

```
; Start admin manager
AdminManager 200
④ — Version 12.2.0 of AdminManager
```

```

; Verify disk space information
UAFActualDisk
.....

5 —————

; Start VFS manager
VFSManager VFSConfig-Database-
6 ————— Version 12.2.0 of VFSManager

; Boot other cards
Bootcards
DP From Version 3.0
Sending OS to remote card 2
Sending OS complete
Waiting for remote OS to initialize
Remote OS initialized
Booted C3CS in slot 2
7 ————— Sending OS to remote card 3
Sending OS complete
Waiting for remote OS to initialize
Remote OS initialized
Booted C3AS in slot 3
:
:

8 ————— ; Configure the communications cards
>2 'GRiDNetwork Manager'

; Start the GRiDMail Broadcast manager on the
; application processor, usually in slot 3
; >3 'BroadcastManager'

; Start the GRiDMail Post Office on the
; application processor, usually in slot 3
; >3 'GRiDMail Post Office'

9 ————— ; Start Spool manager
; 'GRiDSpool Manager'

; End of System.Init-Com~ file

```

Commands:

```

PROGRAM - Start 'PROGRAM' on this card
!PROGRAM - Start 'PROGRAM' in background
>nPROGRAM - Start 'PROGRAM' on remote card n
SignOn - Gain access to this card
SignOff - Lock access to this card
Password - Change access password
Code-D - Display last line typed
Code-Q - Quit this session of GS.Executive
Code-U - Display memory usage on this card

```

Code-Esc - Cancel this session of GS.Executive

10

Version 12.2.0 of GS.Executive

Version 12.2.0 of C3FS

#

## OVERALL TROUBLESHOOTING APPROACH

Whenever any part of the GRiD Server system suddenly stops working (e.g., all users suddenly start seeing error 701: Server not responding, and no users can sign-on to the system; or, one or more of the printers suddenly stops printing), your first action should be to restart the system. The GRiD Server system includes diagnostic programs that are executed at startup; key information about what is wrong with the system can be obtained by watching the system start up. For this reason, you should usually go to the "Observing System Startup" section of this chapter first.

If restarting the system does not eliminate the problem, and no helpful new information is gained in the process, your next action should be to decide which of the eight basic categories of system failure best represents your problem, and then go to the appropriate section under "System Troubleshooting".

The information in the "System Troubleshooting" section addresses several different levels. The initial troubleshooting steps under each kind of possible failure are easily done. As you get further into each troubleshooting procedure, the required level of experience with the system increases (i.e., more experience is required using the diagnostic port utilities). If you reach a point at which you cannot figure out what to do next, call the GRiD Resource Center for help.

### "SYSTEM RESET" Message

When the "SYSTEM RESET" message appears in the front-panel display on the main unit, the system is beginning its startup process. If you have a 1702 Expansion Unit, the word "GRID" in its front-panel display indicates that the unit is operating.

### "INITIALIZING" Message

When the "INITIALIZING" message appears, the system has begun its startup process. With the system configured as it leaves the GRiD factory, there should be no error messages listed in the System Error Log-Text- file or the diagnostic error log during normal startup.

If any errors occur during execution of the diagnostics taking place during startup, the error messages are written to the diagnostic

processor error queue. If, during the first startup of the GRiD Server system, the "INITIALIZING" message alternates every five seconds with the "ATTENTION" message, connect a workstation to the diagnostic port and inspect the the diagnostic error queue to find out which errors are causing the "ATTENTION" light to appear.

## "FATAL" and "ERR" Messages

When the power-on diagnostic programs fail, two kinds of error messages can appear in the diagnostic processor error queue. In both cases, the messages indicate a failure in the GRiD Server hardware, and you should call a GRiD representative for assistance.

The error message formats are as follows:

```
?D FATAL nn  
sc ERR nn tt
```

The "FATAL" error is issued by the diagnostic program on the diagnostic processor (DP) card. The question mark means that the DP could not determine which slot it was in before the error occurred; the "D" indicates the diagnostic processor. The error is fatal because the DP cannot continue with the startup process after the error occurs.

The non-fatal "ERR" error can be issued by any processor card. As in the "TEST DONE" messages, "s" is the slot number, and "c" is the card type. The numeric code "nn" indicates the type of error; "tt" is an internal numeric code for hardware service technicians. The possible values of "nn" are listed in Table 10-1 below. The types of cards on which each error can occur are also listed in the table (D - diagnostic processor, F - file processor, C - communication processor, and A - application processor).

All error messages in the diagnostic processor error queue are in a circular queue. New messages are added to the end of the queue, which means that as errors accumulate, you see a mixture of new and old messages. The way to look at all of the error messages in the diagnostic error queue is to issue the diagnostic processor Log command (see Chapter 8 for details). In fact, it is always better when troubleshooting to watch error messages via the diagnostic port in "real time."

NOTE: Because the "FATAL" and "ERR" errors are produced by hardware and occur before the operating system has started, these errors are never written to the system error log text file.

Error	Meaning Card	Types
-----	-----	-----
01	RAM read/write	D,F,C,A
02	Common RAM read/write error	D,F,C,A
04	MultiBus interrupt error	D,F,C,A
05	Interval timer error	F,C,A
06	Baud clock error	C
07	8087 error	A
08	8087 interrupt error	A
09	Transmitter error	C
10	Transmitter error	C
11	Transmitter error	C
12	Transmitter error	C
13	DMA1 RAM read/write error	C
14	DMA2 RAM read/write error	C
15	DMA1 interrupt error	C
16	DMA2 interrupt error	C
17	GPIB bus error	F
18	Real time clock not set	D
19	Real time clock not running	D
20	DP not in slot zero	D
21	ROM checksum error	D,F,C,A
23	1701 reset button stuck or disconnected	D
22	Unknown card type	?
50	Card is dead	F,C,A

Table 10-1: Power-On Diagnostic Program Error Codes

### "MINI" and "BOOT" Messages

After the power-on diagnostics have successfully run, the diagnostic processor error queue can show either the "MINI" and/or "BOOT" messages. Both of these messages indicate that the system is having difficulty starting up. If you see "MINI" and/or "BOOT" messages, and the system does not begin starting up within 30 seconds of completing the power-on diagnostics, see the "System Won't Complete Startup" section in this chapter.

The following reference information describes in more detail what the "MINI" and "BOOT" messages actually mean. The messages are produced by the system startup program (called "boot code") that is present on the first few pages of each disk from which the system can be started. Note that the "boot code" is already present on 2701 and 2703 disks when these are shipped from GRiD; the GS.UpdateBootCode utility described in Chapter 9 can be used to copy the "boot code" to a floppy.

The format of "MINI" and "BOOT" messages is:



```
sc nnn MINId
sc nnn BOOTd
```

As in "FATAL" and "ERR" messages (see above), "s" is the slot number and "c" is the card type. The "nnn" is a numeric error code indicating the nature of the problem (see Appendix A for one-line translations). The "d" is the device from which the system is trying to start.

"MINI" messages can be either fatal or non-fatal; "BOOT" messages are nearly always fatal. For example, suppose that your GRiD Server has two 2701 disks, but that Server Subjects is only readable on the second disk (DSK1). In this case, you see the following non-fatal message:

```
1F 33 MINIO
```

The system searches for Server Subjects (specifically, the Programs directory and then the C3FS and GS.Executive programs) on the first disk. The "MINI" message indicates that the system cannot find Server Subjects (33 - file does not exist) on the first disk (DSK0, d = "0"). The system continues looking on DSK1, finds Server Subjects, and starts normally after a few seconds.

For another example, suppose that your GRiD Server has only one 2701, and that the GS.Executive program is missing. In this case you see the following fatal messages:

```
1F 033 MINIO
1F 107 BOOT1
1F 107 BOOT2
1F 107 BOOT3
1F 107 BOOT4
1F 107 BOOT5
1F 107 BOOT6
1F 107 BOOT7
1F 451 BOOTc
1F 451 BOOTf
1F 451 BOOTw
```

The error 33 on DSK0 again means that the system could not find everything it needed in Server Subjects. When this occurs, the system continues to look elsewhere for a useable Server Subjects device. The 107 errors (Device not ready) indicate that the system could not find DSK1 through DSK7, because the system only has one disk. The 451 errors (GPIB timed out) indicate that the system is trying to start up from a non-existent GPIB disk ("C" - 2102; "F" and "W" - 2101). Note that error 253 or 452 sometimes appears instead of 451, depending on several factors. All three errors are equivalent in this situation.

If the problem with the 2701 disk is a bad interface board

(hardware) rather than a missing program (software), the first error could be:

#### 1F 118 MINIO

Error 118 (peripheral bus transfer failed) indicates that there is a hardware problem with the first disk. In general, any error code in the range of 101 through 118, other than 107 (discussed above), indicates a hardware problem with the disk. Go to the "System Won't Complete Startup" section in this chapter.

NOTE: Because "MINI" and "BOOT" errors occur before the operating system has started, these errors are never written to the system error log text file.

### Other Things That Occur During Startup

During the "INITIALIZING" period, the following things also happen:

- o The first disk unit's front-panel display lights up ("DSK0") when the disk is being accessed. If additional 2701 or 2703 disks are present on the system, they are also accessed ("DSK1" through "DSK7"), but not as frequently as the first disk.

NOTE: Before a 2701/2703 disk is accessed for the first time, its display may contain random characters. This is normal.

- o If your system has a 2801 tape backup unit, the unit is accessed by the system during startup, but the front-panel display does not light up when the unit is accessed.
- o Any printers connected to the system make resetting noises.
- o Any 2101 Hard Disk Systems and/or 2102 Portable Diskette Drives attached to the GPIB are briefly activated one or more times (their access lights glow).

NOTE: If a 2102's access light stays on continuously during startup, let the system finish starting up, turn the 2102 off and then on again, then restart the system.

After the start up process is completed, the front-panel display on the main unit displays the time in the format HH:MM:SS.

### Startup Completion

After completing the initialization, the front-panel display on the main unit begins displaying the time in the format HH:MM:SS.

The total time required for the startup process depends on the number of users defined on the system and the number and size of

their files. For a very large system (e.g., 40 users and 80MB of data), This can take up to 15 minutes, depending upon the configuration, programs running, number of disks, and number of users.

#### "NO BOOT" Message

If the system has not completed starting up within ten minutes, the diagnostic processor error queue shows the following message:

OD NO BOOT

If startup has not completed because the system is very large, there is no problem. If the system normally starts up in five minutes and you see the "NO BOOT" message in the diagnostic error log after ten minutes, there is a problem. Check the diagnostic error log for errors (see Appendix D). If there are no additional errors, go to the "Watching System.Init Execute" section at the beginning of this chapter and try to determine at which program the startup process is stopping.

#### Printer Form Feed

If you have any printers configured, just before the front-panel starts flashing the time, the printers form feed (eject one page). This is caused by GRIDSpool Manager checking to see that the printers are on line; from a user's point of view the printers are ready for use. If the printers do not form feed and yet are properly connected, turned on, and on-line, it is an indication that there is a problem with either the configuration or the hardware. Go to the "Printers Do Not Work" section in this chapter.

#### GRIDLink and PhoneLink Readiness

GRIDLink and PhoneLink are ready for use after the front-panel starts flashing the time. If you try to sign on before the time appears, you get user error 701 (Server not responding) from GRIDLink and user error 401 (Modem timed out) from PhoneLink. If GRIDLink and PhoneLink do not work properly after the time appears, go to the "GRIDlink Does Not Work" or "PhoneLink Does Not Work" sections later in this chapter.

**NOTE:** If GRID Server is restarted at any time after users have signed on, the users' computers automatically sign themselves back on when the users attempt to access the system, as long as the computers have not been turned off and the GRID Server has completed its startup process. It is not necessary for a user to manually sign off and then sign back on in this situation.

' SYSTEM ERROR LOG'~TEXT~

Entries in the ' System Error Log'~Text~ file can be from any application running on GRiD Server. The system error log specifies:

- o the slot number of the card on which the error was logged
- o the card type on which the error was logged
- o text identifying the error source
- o messages about start, cancellation, and completion of initialization
- o backup completion messages
- o backup errors.

When errors appear in the ' System Error Log'~Text~ file, they are displayed in the format shown in Figure 10-2.

Figure 10-2: System Error Log Text File Sample

date	time	card #	card type	error #	alpha code and text
4/17	3:49:17	1	FS	227	12 AdminManager - ReCalculate ActualDisk Space
4/17	4:15:05	1	FS	200	12 AdminManager - ReCalculate ActualDisk Space
4/29	19:47:35	1	FS	1117	21 GRiDSpool Manager: Suberror = address
4/29	19:49:27	1	FS	1117	21 GRiDSpool Manager: Suberror = address
4/30	2:01:57	1	FS	0	0 Initialization Started
4/30	2:02:14	1	FS	0	0 Booting Done
4/30	2:27:42	1	FS	1303	0 2 Backup-> 5
4/30	2:29:48	1	FS	0	0 Initialization Started
4/30	9:04:12	1	FS	0	0 Initialization Started
4/30	9:06:01	1	FS	0	0 Initialization cancelled
4/30	9:07:23	1	FS	0	0 Initialization Started
4/30	9:32:57	1	FS	0	0 Initialization Started
4/30	9:46:30	1	FS	0	0 Initialization completed

Often, errors in this log indicate which other error logs (i.e., GRiDNetwork Manager or the optional GRiDMail error logs) to consult for more information.

' GRiDNETWORK MANAGER LOG'~TEXT~

Entries in the ' GRiDNetwork Manager Log'~Text~ are limited to transactions and errors from the GRiDNetwork Manager program. This log specifies:

- o when the GRiDNetwork Manager program was started
- o the communication configuration at time of initialization
- o which user configured GRiDNetwork Manager

This error log can also specify the following, if the optional GRiDMail software is running:

- o which remote GRiD Servers were dialed by the system (if the optional GRiDMail program is running)
- o the telephone numbers of the remote GRiD Servers dialed
- o the port on which the system dialed out
- o if the port activation failed (and why).

When errors appear in the ' GRiDNetwork Manager Log'-Text- file, they are displayed in the format shown in Figure 10-3.

Figure 10-3: GRiDNetwork Manager Log File Sample

date	time	alpha code and text
5/05/87	21:45:05	Saved configuration changes
5/05/87	21:45:42	Configuration ended
5/05/87	22:30:52	Version 12.2.0 of GRiDNetwork Manager
5/05/87	22:30:53	Communication configuration is:
5/05/87	22:30:54	2 , PhoneLink1200/2400, PhoneLink1200/2400, GRiDLink, GRiDLink
5/05/87	22:30:55	4 , PhoneLink1200, PhoneLink1200/2400, Empty, Empty

## SYSTEM TROUBLESHOOTING

GRiD Server failures can be categorized into eight basic failure modes:

- o The system is totally dead
- o The diagnostic port is dead
- o The system does not complete startup
- o There are non-fatal 2701 or 2703 disk errors
- o GRiDLink does not work
- o PhoneLink does not work
- o The printer does not work
- o The 2101 or 2102 does not work

Before using any of the troubleshooting procedures in this section, be sure you have restarted the system and observed that there are no

"ERR" or "FATAL" errors occurring (i.e., all the "TEST DONE" and "SLOT EMPTY" messages are occurring properly).

In many cases, examining the system error log can give clues as to what is wrong. Look up any errors you find in Appendix D.

Finally, in all of the procedures in this section, when you get to a point where either you find something wrong (a bad processor card, defective cable, etc.) or you cannot go any further, contact a GRiD representative for assistance.

## The System is Totally Dead

"Totally Dead" means that there is nothing on the 1701 and/or 1702 front-panel displays, and the system does not seem to work at all.

### ▶ TO TROUBLESHOOT A TOTALLY DEAD SYSTEM

1. Check that the fans on the 1701 and 1702 are running by holding a piece of paper against them to see that air is being drawn into the unit. The fans on the 1701 and 1702 are connected directly to the AC power input on the units if the fans are running, the units are getting AC power, and the fuses are functional.
2. If the fans are not running, check the fuse in each unit (see Chapter 2 for information), and check that the AC sockets into which the units are plugged are functional by plugging in something else such as a radio, clock, or lamp.
3. Check the fans the same way as in Step 1 above on all 2701 and 2703 Disk Units. Disk unit fans operate from the internal power supply rather than directly from the AC power line. If the fans are running, the units are getting AC power, and at least part of the internal power supply in each unit is functional.
4. If the fan on one or more disk units is not running, check the fuse (see Chapter 2 for information), and check that the AC sockets into which the units are plugged are functional by plugging in something else such as a radio, clock, or lamp.
5. Check if any portion of the front-panel displays on the 1701 and 1702 is on (shows anything). The presence of anything in the display means that the internal power supplies are operating. If you have the GRiD Server Hardware Service Manual, check the DC power supply voltages on all units.

6. Check that the diagnostic processor (DP) is functional by connecting to the diagnostic port (see Chapter 8) and pressing RETURN several times. If you get the "\*" prompt, the DP is operating. Note that a diagnostic processor card failure can blank the 1701 front-panel display.
7. Is the system really starting up even though the 1701 display is dead (is there normal activity on DSKO during startup and can you sign on after all the activity stops)? If so, call a GRiD representative to have the display replaced.
8. Does the system seem to start up normally but then just stop, with no messages? Go to the "System Does Not Complete Startup" section.

### The Diagnostic Port is Dead

If the diagnostic port is dead, you do not get the "\*" prompt when trying to access it (see Chapter 8 for details).

#### TO TROUBLESHOOT A DEAD DIAGNOSTIC PORT

1. Check the diagnostic computer you are using. You can check the RS-232-C port by connecting to an external modem and calling any other computer. If you are using a GRiD computer, you can check the serial port by using it with GRiDLink on a working GRiD Server. Testing the RS-232-C or serial port with a serial printer does not test every line, but it does show basic functionality.
2. Check that you have the required software in the diagnostic computer (see Chapter 8).
3. Check the diagnostic cable by switching to the "other" cable, that is, if you are using the diagnostic modem, switch to the direct connect cable (and vice versa). See Figure 2-20 for cable identification information. Note that different GRiDTerm CODE-A settings are required to use the "other" cable (see Chapter 8).
4. If all the above are functional, the diagnostic processor has failed. Call a GRiD representative for hardware service.

### The System Does Not Complete Startup

This troubleshooting procedure assumes that the power-on diagnostic programs are all functional (i.e., all the "TEST DONE" and "SLOT EMPTY" messages are occurring properly), but that the system is stopping during the startup process. "BOOT," "MINI," and/or "NO BOOT" errors may be occurring.

▶ TO TROUBLESHOOT A SYSTEM THAT DOES NOT COMPLETE STARTUP

1. Use the "Watching System.Init Execute" technique described at the beginning of this chapter as a way to determine at which program the startup process is stopping.
2. Try starting the system from the boot diskette in a 2101 or 2102 attached to the system (use the Boot F or Boot C commands at the diagnostic processor; see Chapter 8). A 2101 or 2102 disk does not have to be configured into System.Init and VFSConfig for you to start the system from it; the system automatically activates one 2101 and one 2102 for use at the diagnostic port.
3. If you cannot start the system from floppy, turn off all the peripheral bus disks (2701's and 2703's) and try again. If you still cannot start the system from floppy, the file processor has failed.
4. If you can start the system from floppy only without the peripheral bus disks attached, the file processor is functional and the problem is with the peripheral bus disks. If your system has more than one disk, move DSK0 to the end of the daisy chain and try to start the system again. If the system starts properly, the problem is in the original DSK0.
5. If you can start the system from floppy with the peripheral bus disks attached, use the file processor Cat utility to check accessibility to the peripheral bus disks (see Chapter 9).

Non-Fatal 2701 or 2703 Errors

This problem refers to a system that produces occasional ECC errors (109 or 110), CRC errors (103 or 105), invalid sector errors (102), or peripheral bus transfer errors (118), yet continues to work most of the time.

▶ TO TROUBLESHOOT NON-FATAL 2701 OR 2703 ERRORS

1. Check the peripheral bus cable connectors. A loose cable can cause a variety of spurious errors. If possible, substitute another cable.
2. Reload Server Subjects from GRiD Server Floppy Disks #1, #2, #3, and #4.
3. Back up the data on the disk to another disk or tape using SectorCopy or HCopy, then run GS.MediaFormat on the disk to reformat it (remember that this erases ALL data from the disk!). Reload the disk from the backup tape drive (if



applicable) after the format is completed. (See Chapter 5 for more information on backing up and restoring a disk.)

## GRiDLink Does Not Work

This problem includes situations where you cannot sign on, as well as those situations where GRiDLink is erratic (slow sign-on, CRC errors, unusually slow transfer rate, long pauses, etc.). This section does not directly address the situation of a new installation where GRiDLink has never worked. (See the GRiD Server Installation Guide for troubleshooting help with installation problems.)

### ▶ TO TROUBLESHOOT NON-WORKING GRiDLINK

1. Check GRiDNetwork Manager to verify the actual configuration used.
2. Use the diagnostic processor Config command to verify that all communication processors in the system are being recognized.
3. Use the Cat 'N\System'! command (see Chapter 9) to verify that each of the communication processors has successfully started.
4. Check that the cluster box cables are securely seated in their sockets. Cables may be loosened when cluster boxes located under the table holding the system are inadvertently kicked.
5. Eliminate the possibility of a defective cluster box cable by interchanging the two cables (swap both ends). While you have the cables disconnected, check the COMM connectors and the matching connectors on the cluster box very carefully for bent pins. You may need to shine a flashlight into the sockets to be sure that there are no bent pins.
6. Disconnect the GRiDLink cable (by removing all 11 wires at the cluster box) to split the problem into GRiD Server and Cable sections.
7. Connect a proven computer containing proven software with a proven outlet cable to one of the GRiDlink service outlets located inside the cluster box (see Figure 2-17 for the location of the service outlets). Run the CableTest program (see Appendix F for instructions).
8. If CableTest runs properly at the service outlet, the problem is in the GRiDLink cable. Refer to Appendix C in the GRiD Server Installation Guide for an ohmmeter-based GRiDLink cable testing procedure.

9. If CableTest does not run at the service outlet with the GRiDLink cable disconnected, the communication processor card has failed. If you have the GRiD Server Hardware Service Manual, run the communication processor diagnostic to verify this. If only one or two ports on the card have failed (a relatively common situation), reconfigure the system to use the good half of the card (temporarily eliminate PhoneLink), then call a GRiD representative for hardware service.
10. If only one GRiDLink outlet has stopped working, try a different outlet cable and try a different computer. Take the outlet box apart and check it carefully for broken solder joints, shorted connections, etc.
11. If the problem seems intermittent, it can be one computer with a bad serial port affecting all the other computers on the same GRiDLink line. Take all the computers off the GRiDLink line, then add them back one at a time until the link fails. The last one you added (the one that caused the other machines to stop functioning) is the one that is bad. Contact a GRiD representative for hardware service.
12. If the transfer rate seems slower than normal, check the system error log for CRC errors (1202). If you find any, refer to Appendix D for hints on what to do about them.
13. If applications display slowly on users' computers (e.g., GRiDManager's commands menu is displayed in three or four jerky pieces), go back to Step 6, above. Either there is a problem with the PDONE and GND lines in the GRiDLink cable (lines 10 and 11), or the communication processor has failed.

#### PhoneLink Does Not Work

The key to resolving this problem is to methodically isolate and eliminate one element at a time. This includes: the user's computer, modem, and software; the cable to the telephone line; the telephone line itself; the cable from the telephone line to the GRiD Server modem; the modem; the modem cable to the cluster box; the cluster box; the cluster box cable to the 1701 or 1702; the communication processor card with its software, and finally, the processor bus cables between the 1701 and 1702.

#### ▶ TO TROUBLESHOOT NON-WORKING PHONELINK

1. Does GRiDLink work on the same system? If it does not, go to the GRiDLink troubleshooting section first (it is easier and faster to troubleshoot). If GRiDLink does work, continue with the next step.

2. Check GRiDNetwork Manager to verify the actual configuration used.
3. Use the diagnostic processor Config command to verify that all communication processors in the system are being recognized.
4. Use the Cat 'N\System'! command (see Chapter 9) to verify that each of the communication processors has successfully started.
5. Eliminate the possibility of a problem with the user's computer, modem, and software by calling another GRiD Server (Contact the GRiD Resource Center for a number if another GRiD Server is not readily available).
6. Check the modem on GRiD Server carefully. Refer to Chapter 2 for proper switch settings; check that the modem is plugged into an active AC outlet; check that the cables to the cluster box and telephone outlet are securely connected; check that the DTR and CTS lights are on.

NOTE: If you mistakenly connect a modem to a communication port that is configured for GRiDLink, the SD light stays on, and the TR light blinks every five seconds.

7. Test the telephone line and modem by connecting the modem to the diagnostic port (use a previously-tested diagnostic modem cable). Call the modem from a proven diagnostic computer. If the modem does not answer, replace it. If you can access the diagnostic port, the telephone line, telephone cable to the modem, and the modem are all functional.
8. If your system has more than one PhoneLink modem, swap PhoneLink modem cables to eliminate the possibility of a defective cable.
9. Check that the cluster box cables are securely seated in their sockets. Cables may be loosened when cluster boxes located under the table holding the system are inadvertently kicked.
10. Eliminate the possibility of a defective cluster box cable by interchanging the two cables (swap both ends). While you have the cables disconnected, check the COMM connectors and the matching connectors on the cluster box very carefully for bent pins. You may need to shine a flashlight into the sockets to be sure that there are no bent pins.

11. If you have more than one PhoneLink cluster box, swap cluster boxes to eliminate the possibility of a defective cluster box. The PhoneLink cluster box is simply a pass-through board containing no active components; if you have only one it can be taken apart and visually inspected for broken solder joints, etc.
12. Since GRiDLink works, change the communication configuration to use GRiDLink on the PhoneLink portion of the communication processor, and use GRiDLink to test the communication processor. If GRiDLink no longer works, then the communication processor has failed. If you have the GRiD Server Hardware Service Manual, run the communication processor diagnostic to verify this. If only one or two ports on the card have failed (a relatively common situation), reconfigure the card to temporarily eliminate the least important lines, then call the GRiD Resource Center for hardware service.
13. If the problem occurs only on a 1702 Expansion Unit, check that the processor bus cables are firmly seated and that their sockets have no bent pins. Next, reconfigure the 1702 for GRiDLink to test the communication processor card. If you have the GRiD Server Hardware Service Manual, you can temporarily move the communication processor card from the 1702 into the 1701 to isolate possible problems due to the 1702 backplane.

### The Printer Does Not Work

This troubleshooting discussion assumes that the printer has been properly configured (refer to Chapter 4). For successful resolution of this problem, the hardware and software must be tested independently.

#### ▶ TO TROUBLESHOOT A NON-WORKING SPOOLED PRINTER

1. Check that the printer is properly connected, powered on, loaded with paper, and on-line.
2. Run the self-test on the printer (see the printer's operator manual). If the printer self-test passes, remove the printer from GRiD Server and connect it (with the same cable) to a GRiD computer (note that the printer hardware address may have to be changed to 21). Check for proper operation.
3. Are other devices on the GPIB functional? If not, and you have the GRiD Server Hardware Service Manual, run the GPIB diagnostic.

4. Check GRiDspool Manager to see if the printer is enabled (see Chapter 6). Try disabling it, then enabling it again.
5. Try powering the printer off and then on again (be sure to wait at least one minute for something to happen, as noted in Chapter 6).
6. Are there files in the printer queue that are not being printed? If there are, check the system error log for errors from GRiDspool Manager. Continuous error 27's mean that there a password-protected file is stuck in the queue (see Appendix D for the procedure to fix it).

### The 2101 or 2102 Does Not Work

This troubleshooting discussion assumes that the devices have been properly configured (refer to Chapter 4).

#### ▶ TO TROUBLESHOOT A NON-WORKING 2101 OR 2102

1. Run the self-test on a 2101 (press the Self-Test button on the rear panel). If it passes, remove the 2101 or 2102 (with its cable) and connect it to a GRiD-OS computer. Check for proper operation.
2. If the system was originally configured for a non-partitioned 2101, and now you have connected a partitioned 2101, the configuration must be changed. See Chapter 4.
3. If the first 2101 has been temporarily removed for use off GRiD Server, leaving only the second 2101, the second disk does not work alone. The address switches on the second disk must be reset to four (4), and it must be the same type (partitioned or non-partitioned) as the missing first disk.
4. If you have the GRiD Server Hardware Service Manual, run the GPIB diagnostic.

### ADDITIONAL TROUBLESHOOTING INFORMATION

When troubleshooting your GRiD Server system, it is useful to match up, by date and time, the AdminLog text file and the system error log. For example, many 1202 errors (CRC in received frame) in the system error log may indicate that one of the computers on the system has a failing GRiDLink port. You can match up the AdminLog file with the system error log file and check who is signed onto the GRiD Server when the errors are occurring, thus helping determine which computer has the failing port.

To access the AdminLog file, type the following command at the file processor's "#" prompt:

```
Copy '<Device>'LogFiles\AdminLog-Text-
```

Where "Device" is the position on the peripheral bus chain of the disk where the LogFiles subject resides, e.g., 1a. (See Chapter 10 for information on using AdminLog.)

The default length of the AdminLog file is 50 entries. You may change the length of the AdminLog file by adding a length parameter to the AdminManager entry in the System.Init file:

```
AdminManager N
```

where 'N' is an integer number between 0 and 65535 representing the number of entries desired in the AdminLog file.

There are five columns in the AdminLog file; date, time, action, error code, and the user identification. The date and time are the current GRiD Server time which is set by using GS.SetTime. The action column contains entries such as Signon, Signoff, Change Password, etc. The error column contains the error code which the user received, for example error 1003: Signon password invalid. If the user did not receive any error, a zero (0) is placed in the error column. The user identification column contains the company, group, and user name of the person signing on or attempting to sign on. Figure 10-4 shows a sample of entries that might be recorded in AdminLog.

Figure 10-4: Sample AdminLog File

06/12/85 17:28:13	Signoff	0	\marketing\field\Los Angeles
06/12/85 17:29:03	Signon	0	\Marketing\products\Jones
06/12/85 17:32:21	Admin Connect	0	\marketing\products\Doe
06/12/85 17:32:32	Signoff	0	\marketing\services\Bernard
06/12/85 17:33:43	UAF Delete	0	\Marketing\Services\Smith
06/12/85 17:34:46	UAF Add	1006	\Marketing\Products\Smith
06/12/85 17:36:46	Signoff	0	\Marketing\products\Jones
06/12/85 17:37:23	UAF Update	1006	\Marketing\Products\Doe
06/12/85 17:37:38	Admin Disconnect	0	\marketing\products\Doe
06/12/85 17:38:08	Signoff	0	\Marketing\Products\Doe
06/12/85 17:38:22	Signon	0	\marketing\products\Doe
06/12/85 17:39:17	Signon	0	\Marketing\Products\Jones
06/12/85 17:40:07	Admin Connect	0	\marketing\products\Doe
06/12/85 17:40:40	UAF Add	0	\2701-0000000123\marketing\products\Smith
06/12/85 17:41:22	UAF Update	0	\marketing\products\Smith
06/12/85 17:42:00	Admin DisConect	0	\marketing\products\Doe
06/12/85 18:21:04	Signoff	0	\Marketing\Products\Jones
06/12/85 18:24:20	Signon	0	\Marketing\Services\Kelly
06/12/85 18:29:17	Signoff	0	\Marketing\Services\Kelly
06/12/85 19:00:14	Signon	0	\marketing\field\Lansing
06/12/85 19:27:35	Signoff	0	\Marketing\Products\Lewis
06/12/85 19:27:51	Signon	0	\Marketing\Products\Jones
06/12/85 19:30:01	Signoff	0	\Marketing\Products\Jones
06/12/85 19:31:29	Signon	1003	\Marketing\Products\Lewis
06/12/85 19:31:39	Signon	0	\Marketing\Products\Jones

## APPENDIX A: SYSTEM ERROR CODES

This appendix provides a quick-reference list of all the numeric system error codes that can occur on a GRiD Server system. The error codes are listed in numeric order. Subsets of these error codes can appear in four places:

- o On the screen of an Administrator's computer connected to GRiD Server via GRiDLink or PhoneLink, while the Administrator is running the AdmininistratorSentry or GRiDspool Manager Programs (see Appendix B).
- o On the screen of a diagnostic computer connected to the diagnostic port (see Appendix C).
- o In the diagnostic error log, the system error log, or the GRiDNetwork Manager log (see Appendix D; for GRiDMail errors, see the GRiDMail Installation and Administration Guide).
- o On the screen of a user's computer connected to GRiD server via GRiDLink or PhoneLink (see the GRiD Server User's Guide, the GRiD Server User's Guide for MS-DOS and PC-DOS Users, and the GRiD Server User's Guide for GRiD-OS Users).

NOTE: This list was produced by editing the current version of the @SystemErrors text file which is supplied in the Programs directory of the Server Subjects device on every GRiD Server.

Error Codes:

2: Processor card memory (RAM) is full  
8: Offset exceeds physical size of allocated block  
9: Offset exceeds logical size of allocated block  
10: Memory block belongs to another process  
11: Invalid memory block  
12: Version incompatibility  
27: Make sure that password is correct or required  
29: Checksum error  
30: File locked - use GRIDManager  
31: Bad pointer  
32: File already exists  
33: File is not available  
34: Application is not available  
35: Request not supported  
36: 8087 Emulator file does not exist  
37: Incorrect Current Serial in GRIDManager Options  
38: File access denied  
39: Incorrect Current Modem in GRIDManager Options  
40: File or device can't be shared  
41: Insufficient storage space for this file  
49: Cannot run program on this machine  
99: Server requires memory upgrade  
101: Invalid drive  
102: Storage device error - invalid sector  
103: Storage device error - CRC error  
104: Storage device error - record not found  
105: Storage device error - CRC error in ID field  
106: Device write-protected  
107: Device not ready  
108: Unknown disk error  
109: Storage device error - ECC error in data  
110: Storage device error - ECC error in ID field  
111: Storage device error - no index pulse  
112: Storage device error - seek not complete  
113: Storage device error - write fault  
114: Storage device error - track zero not found  
115: Storage device error - no address mark found  
116: Storage device error - seek error  
117: Storage device error - format error  
118: Peripheral bus transfer failed - invalid state  
119: Tried to allocate cache twice  
120: Buffer count request invalid  
121: New disk cartridge may have been inserted  
128: Diskette drive not ready  
129: Invalid string  
200: Invalid file ID  
201: File data out of sequence  
205: File not open  
220: Invalid rename across volumes  
221: Bad connection  
222: File already open



225: Bad parameter  
227: Device not active  
229: Too many devices  
230: Device already activated  
231: Device not responding  
232: Invalid directory format  
233: Invalid bit map format  
234: Subject does not exist  
235: Wrong diskette in drive  
236: Diskette in wrong drive  
237: Volume not available  
238: Too many files open  
251: Process does not exist  
252: Semaphore does not exist  
253: Request timed out - try again  
254: Semaphore is busy  
300: Application damaged - get new copy  
301: Application damaged - get new copy  
302: Application damaged - get new copy  
303: Application damaged - get new copy  
304: Application damaged - get new copy  
400: Modem did not answer  
401: Modem timed out  
402: Modem lost carrier  
403: Modem parity error  
404: Modem CRC error  
405: Modem packet length error  
406: Invalid phone number - reenter number  
407: Modem device not present  
408: Modem buffer overflow  
409: Modem device not present  
450: GPIB bus error - check devices and cables  
451: GPIB timeout error - check devices and cables  
452: GPIB not responding - check devices and cables  
500: Too many attached ISAM files  
501: ISAM file is not attached  
502: ISAM file is not open  
503: ISAM file number is invalid  
504: ISAM file is already attached  
505: ISAM record format is invalid  
506: ISAM key file already exists  
507: ISAM key file doesn't exist  
508: ISAM duplicate keys are invalid  
509: ISAM key file is invalid  
510: ISAM record does not exist  
511: ISAM record was not found  
512: ISAM record(s) was deleted  
513: ISAM descriptor file is invalid  
514: ISAM column number is invalid  
515: ISAM file type is invalid  
700: Data link protocol error  
701: Server not responding  
702: Phone line was dropped due to no activity

703: Data link send timeout  
704: Data link send failure - too many retries  
705: Data link framing error  
706: Data link disconnected by server  
707: Data link was locally disconnected  
708: Data link is not running  
709: Physical connection was lost  
715: Data link I/O request invalid  
717: Data link I/O request aborted  
718: Data link connection dropped due to system error  
719: Data link connection dropped and re-connected  
720: Data link disconnected by remote  
721: Data link internal error  
722: Poll response timed out  
723: Invalid SDLC send sequence  
724: Invalid SDLC receive sequence number  
725: Frame repeatedly received and acknowledged  
726: Length error in received frame  
727: Invalid control field in frame  
730: Invalid link number  
731: Invalid station number  
732: Data link connection already established  
733: Too many stations on link  
735: Invalid data link protocol type  
740: Data link is already configured  
741: Received acknowledgement without send  
742: Invalid data link connection  
743: Received invalid acknowledgement  
745: Data link was locally disconnected  
746: Data link is not configured  
750: Too many retries on data link  
751: Buffer is too small for bisync packet  
752: Received reverse interrupt  
753: Received conversational reply  
800: Interprocess protocol error  
801: User is not signed on  
802: User is already signed on  
803: Interprocess message too long  
804: Too many interprocess connections  
805: Too many users of interprocesses  
806: Resource not found on server  
807: Process was locally disconnected  
808: Invalid IPC user  
809: No connection exists for destination process ID  
810: Sign-on request cancelled  
811: Invalid interprocess message code  
813: Sign-off incomplete - sign off again later  
815: Checksum error on intercard message  
900: VFS protocol error  
901: Invalid configuration file  
902: Too many files attached on server  
903: VfsManager internal error  
904: File system connection not found

905: Invalid authority for file access  
906: Server name not found  
907: Invalid user class - see administrator  
908: Invalid device name  
909: Device not found or not defined  
910: Open error in subject  
911: Read/write error in subject  
912: Invalid mode on attach to subject  
913: Invalid access through link  
914: Cannot update/create file in in-box  
915: Shared file not found  
916: Cannot link to a subject  
917: Invalid operation on shared file  
918: Rename to invalid file level  
919: Cannot erase - subject not empty  
920: Invalid access - file not a subject  
921: Invalid access - read only in object mode  
922: Insufficient file system resources  
923: File name too long  
924: VFS bad response type field  
925: Operation invalid on archived files  
926: Request not supported in byte mode  
927: Read only in object mode  
928: File system internal error  
929: File system request is being processed  
930: Write (read) attempt on read (write) only file  
931: Only one company, group, or user allowed  
932: Device or resource already exists  
933: Files attached - cannot delete context  
934: Cannot find context  
951: File on server in use - cannot sign off  
955: Application on server exited before signing off  
999: Out-of-sequence VFS response  
1000: User authorization field not found  
1001: Required property missing  
1002: Invalid property value  
1003: Sign-on password invalid - reenter  
1004: Internal user authorization error  
1005: User is unknown to the server  
1006: Invalid authority for transaction  
1008: User access is locked  
1014: Cannot add at this level  
1015: Company not defined  
1016: Account not defined  
1017: Already defined  
1019: Cannot add to this account  
1020: Not authorized  
1021: Admin user not found  
1025: User has exceeded allocated file space  
1026: Authorization file record not found  
1027: Update denied - record has changed  
1028: Admin function not supported  
1029: Company, group, and user not unique

1030: Insufficient authority to modify this record  
1031: User is signed onto the server  
1032: User authorization file must be updated  
1033: Invalid record in user authorization file  
1034: Illegal character in company, group, or user name  
1035: User space utilization is incorrect  
1036: System in degraded mode  
1037: User name is already in use as mail name  
1038: Cannot change context to a company or a group  
1039: Invalid length in authorization file  
1040: Internal error - field length wrong  
1041: Company or group not empty; cannot delete  
1100: Command unsuccessful - previous command in progress  
1101: Spool device already assigned  
1102: Physical device already assigned  
1103: Spool device does not exist  
1104: Physical device does not exist  
1105: Spool device not started  
1106: Improper spool user class  
1150: GRiD Server internal error  
1151: Invalid data communication configuration  
1152: AdminManager does not exist  
1160: Real time clock not set on diagnostic processor  
1161: MultiBus timeout in common RAM access  
1162: Parity error in common RAM  
1200: Loopback test successful (poll packet received)  
1201: Timeout in receiving frame  
1202: CRC error in received frame  
1203: Bad size of received frame  
1204: Overrun in receiving frame  
1205: Received frame too long  
1206: Received frame too long  
1207: No buffers available for receiving  
1208: Received out of sequence frame  
1209: Underrun in receiving frame  
1210: Send timeout in frame transmission  
1211: Received unknown frame  
1250: Comm./interprocess message internal error  
1300: Tape cartridge not in tape device  
1301: Tape device has changed state  
1302: Hardware error on tape device  
1303: Tape media error  
1304: Tape cartridge full  
1305: Unexpected tape file mark found  
1306: Physical end of tape media  
1307: Tape command aborted  
1308: Unknown tape error  
1309: Illegal request to tape  
1310: End of data on tape  
1313: Invalid source tape  
1314: Tape label verification failed  
1315: Tape trailer verification failed  
1316: Tape data path verification failed

1317: Source may not be larger than destination  
1500: Remote forms protocol error  
1510: Remote forms consistency error  
1601: Configuration entry exceeds 256 characters  
1602: Invalid configuration  
1603: Invalid slot number  
1604: Duplicate slot number  
1605: Communications card not present in specified slot  
1606: Baud rate not within the range of 100 - 19200  
1607: Syntax error  
1610: Bad property in GRiDNetwork Mgr configuration  
1611: All ports are not specified  
1612: GRiD Server name does not match  
1613: Too many GRiD Servers defined  
1614: Too many connections in GRiDNetwork Mgr  
1615: Specified protocol is not supported  
1616: No GRiD Servers specified  
1617: No communication cards available  
1618: Invalid protocol combination  
1619: No communication card in specified slot  
1620: Error in starting VIPC  
1621: GRiDNetwork Mgr Configuration in progress  
1622: Unknown command received by GRiD Network Mgr  
1623: Illegal connection name  
1624: Illegal card property  
1625: Illegal port property  
1626: Port property not found  
1627: Invalid sign-on parameters  
1628: GRiD Server is not defined in GRiDNetwork Mgr  
1629: Connection is not defined in GRiDNetwork Mgr  
1630: Port is not available  
1631: No communication cards are configured  
1632: Invalid connection  
1633: Illegal format for server address directory  
1634: GRiDNetwork Mgr is not configured  
1700: TermLink/TermLink Manager:Obtain log file  
1701: TermLink/TermLink Manager:Read/write log file  
1702: TermLink Manager already exists  
1703: TermLink Manager: Configuration not found  
1704: TermLink Manager: Read/write configuration  
1705: TermLink Manager:Config conflict with Network Manager:subError=card=  
1706: TermLink Manager: Register program name  
1707: TermLink Manager: Remote forms  
1708: TermLink Manager:Start TermLink on card n  
1709: TermLink Manager:Initialize TermLink on card n  
1710: TermLink Manager:Control TermLink on card n  
1711: TermLink Manager configuration error  
1730: TermLink: Control request nn  
1731: TermLink: Control response nn  
1732: TermLink: Initialize serial port number n  
1733: TermLink: Application signon  
1734: TermLink: Retrieve info from VFSManager  
1735: TermLink: Get current printer name

1736: TermLink: Start user process for port number n  
 1737: TermLink: Reset serial port number n  
 1738: TermLink: Read user's profile  
 1739: Printer is not available on server  
 1740: Current printer name is invalid  
 1797: TerminalForms: Log error;suberror=logToWhere  
 1798: TerminalForms: Corrupt terminal control block;suberror=conn  
 1799: TerminalForms: Allocate terminal control block  
 1800: Bad property in message from Post Office  
 1801: Invalid class or note.  
 1802: Sign-on information not received  
 1803: Mail returned - too many retries  
 2100: Session disconnecting  
 2101: Session exists  
 2102: Unknown trans msg  
 2103: Unknown class  
 2104: Trans proc death  
 2105: Connection rejected  
 2106: Illegal mail field  
 2107: Multiple mail fields  
 2108: Impossible to deliver  
 2109: No lmn or user ID  
 2110: Bad parameter  
 2111: Invalid state change  
 2112: First/last error  
 2113: Unknown function  
 2114: Previous operation interrupted  
 2115: Bad mail storage header  
 2116: Bad property format  
 2117: Bad property tag  
 2118: Bad mail handle  
 2119: Infinite credit not granted  
 2120: Three outstanding responses  
 2121: Unsupported function  
 2122: Unexpected end of file  
 2123: Change of address to local server not allowed  
 2124: No mail name  
 2125: Unknown mail server  
 2126: No change of address in effect  
 2127: Internal error  
 2128: Unknown session  
 2129: Message from unknown process  
 2130: Invalid delivery element  
 2131: Post Office closed  
 2132: Exceeded max size of local delivery fields  
 2133: No credit for packet interface  
 2134: Bad local mail name  
 2135: Distr list too large  
 2136: Unexpected end of file  
 2137: Transaction proc started  
 2138: Transaction started  
 2139: Transaction done  
 2140: Config notice

2141: Connection accepted  
2142: Service started  
2143: Mail started  
2144: Configuration loaded  
2145: Start note processing  
2146: Finish note processing  
2147: Locally delivered  
2149: Using new configuration file  
2150: Configuration file not found  
2151: New configuration file written  
2152: Error while writing new config file  
2153: Quiesce  
2154: Resume  
2155: Terminate  
2156: Using new configuration  
2157: Bytes truncated from notes file  
2158: Hop count exceeded  
2159: Unknown VIPC message  
2163: Invalid dead mail user definition  
2166: Hop count limit out of bounds - using default  
2167: Local server name in config file ignored  
2168: Remote config started  
2169: Post Office not configured  
2170: Session connected  
2171: Session terminated  
2172: Session error - semaphore  
2173: Session error - connect state  
2174: Session error - semaphore/disconnect  
2175: Session error - connect state/disconnect  
32768: Divide by zero  
32769: Integer overflow  
32774: Bounds check violation  
32775: Numeric processor detected error

APPENDIX B: ADMININSTRATORSENTRY AND GRIDSPPOOL MANAGER ERROR MESSAGES

This appendix lists all the error messages issued by the AdministratorSentry and GRiDSpool Manager programs. Those error messages with numeric codes are listed in numeric order; those error messages without numeric codes are listed in alphabetical order after the numeric error codes.

This appendix covers only error messages you may see while running the AdministratorSentry or GRiDSpool Manager programs via GRiDLink or PhoneLink. For information on error messages that you may see while running file processor utilities via the diagnostic port, refer to Appendix C. For information on error messages that can appear in the error log files, see Appendix D.

1000: User authorization field not found

What happened The User Authorization File has been damaged.

What to do Call the GRiD Resource Center.

1001: Required property value missing

What happened The User Authorization File has been damaged.

What to do Call the GRiD Resource Center.



1002: Invalid property value

What happened You attempted to add a new group or user where the name of the company and group or group and user were identical.

What to do Make the company, group, and user names unique and retry the transaction.

1004: Error accessing User Authorization File

What happened The User Authorization File has been damaged.

What to do Call the GRiD Resource Center.

1005: User is unknown to the server

What happened You attempted to query a user or change the password of a user who is not in the User Authorization File. One or more of the company, group, and user names you entered are incorrect.

What to do Check that you have correctly entered the company, group, and user names. If necessary, use the List Companies, List Groups, and List Users commands to determine the correct spelling.

1006: Invalid authority for transaction

What happened The user name with which you signed on does not have the administrative authority to accomplish the transaction you attempted. For example, in AdministratorSentry, a Company Administrator cannot add a new user with System Administrator authority or query an existing System Administrator.

What to do Sign on as a System Administrator, and retry your transaction.

1015: Company not defined

What happened You attempted to add a new group to a company that does not exist.

What to do Check that you have correctly entered the company name. Use the List Companies command if necessary to determine correct spelling.

**1016: Account not defined**

**What happened** You attempted to add a new user but the company or group you specified does not exist.

**What to do** Check that you have correctly entered the company and group names. Use the List Companies and List Groups commands if necessary to determine correct spelling.

**1017: Already defined**

**What happened** You attempted to add a company, group, or user that already exists.

**What to do** Check that you have correctly entered the company, group, and user names. Use the List Companies, List Groups, and List Users commands if necessary to verify the names of existing companies, groups, and users, then retry your transaction.

**1026: User Authorization File record not found**

**What happened** You attempted a transaction for a company, group, or user not in the User Authorization File.

**What to do** Use the List Companies, List Groups, and List Users commands to review the contents of the User Authorization File.

**1027: Update denied - record has changed**

**What happened** Between the time you made a query and time you confirmed the update or deletion of the queried information, another administrator queried and updated or deleted the same information.

**What to do** Perform the query again to get the latest copy of the information and retry your transaction.

**1028: Admin function not supported**

**What happened** An internal error was detected in the AdministratorSentry program.

**What to do** Call the GRiD Resource Center.

1029: Company, group, and user not unique

What happened You attempted to add a new group or user where the name of the company and group or group and user were identical.

What to do Make the company, group, and user names unique and retry the transaction.

1030: Invalid authority to modify this record

What happened The user name with which you signed on does not have the administrative authority to accomplish the transaction you attempted (e.g., a Company Administrator cannot update another Company Administrator).

What to do Sign on as a user with a higher administrative authority (Group Administrator, Company Administrator, or System Administrator) and retry your transaction.

1031: User is signed on - cannot delete

What happened You attempted to delete a user who is currently signed on to GRiD Server.

What to do Wait until the user signs off GRiD Server and then retry your transaction.

1032: User Authorization File must be updated

What happened You are using an out-of-date version of GRiD Server system software.

What to do Call the GRiD Resource Center.

1033: User Authorization File is damaged

What happened The User Authorization File has been damaged.

What to do Call the GRiD Resource Center.

**1034: Illegal character in company, group, or user name**

**What happened** You attempted to add a new company, group, or user with one of the following illegal characters in the name: DEL, CTRL, ~, ', or |.

**What to do** Remove the illegal character from the name and retry the transaction.

**1035: User space utilization is incorrect**

**What happened** You re-added a user who already had files on a GRiD Server disk.

**What to do** Finish adding as many users as required. Then ensure that the UAFactualDisk utility is not commented out in the System.Init file (refer to Chapter 4). Restart the system. This will ensure that the user storage utilization figure obtained through AdministratorSentry is correct.

**1037: User name is nonunique**

**What happened** An attempt was made to add a user with a name that is already in use.

**What to do** Select a different user name for the sign-on identification.

**1100: Command unsuccessful - previous command in progress**

**What happened** You attempted to give GRiDspool Manager another command before your previous command was completed.

**What to do** Wait patiently for your previous command to complete. Depending on the particular situation, it may be several minutes before GRiDspool Manager can accept another command.

1110: Invalid card number in config file

**What happened** The GRiDSpool Manager configuration file contained a card number for a card not present in the specified slot or a card that is configured for PhoneLink or GRiDLink.

**What to do** Either reconfigure GRiDSpool Manager, reassigning the serial printer to the correct card, and ensure that the GRiDNetwork Manager program has the card configured for "None".

1111: Invalid port number in config file

**What happened** The GRiDSpool Manager configuration file contains an illegal port number.

**What to do** Reconfigure GRiDSpool Manager, replacing the illegal port number with the one to which the printer is attached (0, 1, 2, 3). To verify the port number and card number, check Figure 4-27.

1112: Card cannot be used for serial printer

1113: Port cannot be used for serial printer

1114: Cannot use serial port

**What happened** The card/port/ specified for a serial printer is being used by another application.

**What to do** Reconfigure GRiDSpool Manager, specifying the correct card and port for the serial printer. To verify the port number and card number, check Figure 4-27.

1115: Configuration file not found

**What happened** Either the GRiDSpool Manager program is being started for the first time or the configuration file has been deleted. This message appears the first time GRiDSpool Manager is started.

**What to do** Ignore the message and proceed with the configuration of GRiDSpool Manager.

**1116: Serial printer is offline**

**What happened** The serial printer has gone offline.

**What to do** Check the suberror information provided with the error message. The suberror information has the format X00Y, where X is the card number and Y is the port number. Determine from the suberror information which printer is offline and make adjustments to bring it online.

**1117: GPIB Printer is offline**

**What happened** The GPIB printer has gone offline.

**What to do** Check the suberror information provided with the error message. The suberror information is a number indicating the GPIB address of the offline printer. Determine from the suberror information which printer is offline and make adjustments to bring it online.

## APPENDIX C: FILE PROCESSOR UTILITY ERROR MESSAGES

This appendix lists most of the file-system-oriented error messages that are likely to be issued by the file processor utilities. Error messages with numeric codes are listed in numeric order; those without numeric codes are listed in alphabetical order after the numeric error codes.

This appendix covers only messages you may see on your screen while running file processor utilities via the diagnostic port. For information on error messages that you may see while running the AdministratorSentry or GRiDSpool Manager programs, refer to Appendix B. For information on error messages that can appear in the error log files, see Appendix D.

Most error messages issued by file processor utilities are caused by syntax errors in the command. When you get an error message from a file processor utility, check the syntax carefully against the formats given in Chapter 9 or Appendix E. Check especially carefully for the following:

- o Missing back-quotes (the most common problem)
- o Mistyped special characters (back-quote, tilde, or vertical bar)
- o Blanks or special characters in pathnames not enclosed in single quotes
- o Unmatched single quotes
- o Missing required parameters

Whether or not the error is caused by a syntax problem, it's probably one of the common error messages listed below. Examine the command carefully, try the suggested action, and then try the command again. If you get an error message not listed below (which should happen only rarely), refer to other GRiD documentation such as the GRiD Management Tools Reference for more information.

NOTE: Only errors 2, 29, and 33 of those listed below are entered in the system error log file (' System Error Log'-Text-, see Appendix D). All other errors are reported only to the screen.

**2: Out of memory**

**What happened** There is insufficient free memory available on the file processor to execute the utility you attempted to run.

**What to do** Restart the system without executing System:Init (see Chapter 9) and try the utility again.

**27: Password protected**

**What happened** You (a) did not supply a password when one was required, (b) supplied a password when one was not required, or (c) supplied an incorrect password.

**What to do** Correct (a), (b), or (c) and try the utility again.

**29: Checksum error**

**What happened** A program file has been damaged with the result that it cannot be loaded into memory.

**What to do** Delete the damaged program file and replace it from a backup or GRiD Server Floppy Disks #1, #2, #3, or #4.

**30: File locked**

**What happened** The file you tried to copy over, rename, or delete has been locked with the Assign File Protection command in GRiDManager.

**What to do** Use GRiDManager to unlock the file and try the utility again.

**32: File already exists**

**What happened** You gave a file a name that already belongs to another file (e.g., you tried to rename a file to an existing name).

**What to do** Change the file name and try the utility again.



### 33: File does not exist

**What happened** This most common of all errors messages usually means that (a) you mistyped either the name of the utility or a file pathname in a parameter, or (b) you are prefixed to a device and directory that does not contain the utility you attempted to run.

**What to do** Check your command and your prefix, and then try the utility again.

### 38: File access denied

**What happened** You issued a Cat command referencing the Name Device ('N') without including the "!" parameter.

**What to do** Try the command again with the "!" parameter.

### 40: File can't be shared

**What happened** Either (a) you attempted to copy or rename a file to itself, or (b) another program or user has the file open and you can't access it.

**What to do** Check your pathnames and try the utility again.

### 41: Device full

**What happened** You ran out of room on the destination device during a copy or backup operation.

**What to do** Make some room and try the utility again.

### 106: Device write-protected

**What happened** You attempted to write to a floppy disk that has a write-protect tab on it.

**What to do** Remove the write-protect tab and try the utility again.

**107: Device not ready**

**What happened** You attempted to access a device that (a) is powered off, (b) is a hard disk not yet up to speed, (c) is a floppy drive with the door open, or (d) does not exist.

**What to do** Check the device, correct the condition or command, and try the utility again.

**128: Floppy disk not ready**

**What happened** You attempted to access a floppy disk drive with the door open.

**What to do** Close the door and try the utility again.

**225: Bad parameter**

**What happened** One or more of the parameters you supplied in a command is invalid.

**What to do** Refer to the utility description in Chapter 9 or the syntax summary in Appendix E to see exactly what parameters and formats the utility expects.

**227: Device not active**

**What happened** You attempted to access a device (a) that is not turned on and ready to operate, (b) whose driver has not been activated (loaded into memory), or (c) that does not exist.

This error also occurs sometimes when you try to run `GS.MediaRepair` when `System.Init` has been executed.

**What to do** In the first case, turn the device off and then on again, activate the device with the `GS.Activate` command, or correct your command and try the utility again.

In the second case, run `GS.MediaRepair` only when you have started the system without executing `System.Init`.

**230: Device already active**

**What happened** You (a) attempted to activate a device with GS.Activate that was already active, or (b) just completed formatting a disk that has already been formatted since the time it was last partitioned.

**What to do** In situation (a), use the Ladt utility to determine what devices are already active, and try the utility again. In situation (b), no action is required.

**231: Device not activated**

**What happened** The GS.Activate utility was not able to activate the device you requested, or could not find the active device you specified.

**What to do** Use the Ladt utility to determine what devices are already active. In the case of a GPIB disk, check that the physical device you are trying to activate is connected, powered on, and properly addressed. Try the utility again.

**234: Subject does not exist**

**What happened** Either (a) the directory (subject) you named does not reside on the device you specified, (b) you are trying to create two levels of directory at the same time, or (c) the utility you are using does not have the ability to create a new subject.

**What to do** Use the Cat utility to determine what directories already exist, use the AddSubject utility to add directories if necessary, and then try the utility again.

**253: Request timed out**

**What happened** The time limit for which GRiD-OS waits for a device to respond to a command was exceeded.

**What to do** Check that the device is turned on and correctly connected, activated, and configured. Turn the device off and then on again, and then try the utility again. If it is a GPIB device, attach it to a computer running GRiD-OS and verify proper operation independent of GRiD Server.

#### 451: GPIB timed out

**What happened** The time limit for which GRiD-OS waits for a GPIB device to respond to a command was exceeded.

**What to do** Check that the device is turned on and correctly connected, activated, and configured. Turn the device off and then on again, and then try the utility again. Attach the device to a computer running GRiD-OS and verify proper operation independent of GRiD Server.

#### 452: GPIB not responding

**What happened** The GPIB device to which you sent a command is not in an on-line condition.

**What to do** Check that the device is turned on, on-line, and correctly connected, activated, and configured. Turn the device off and then on again, and then try the utility again. Attach the device to a computer running GRiD-OS and verify proper operation independent of GRiD Server.

#### 1304: Tape cartridge full

**What happened** The length of the tape that you used is not within GRiD specifications.

**What to do** The tape must be able to accommodate the entire disk volume. Refer to Chapter 7.

#### 1305: Unexpected tape file mark found

**What happened** The tape backup you made is invalid because the data on the tape was incorrectly copied.

**What to do** First, make sure that the tape you chose is the one that has the data you want to restore. Second, perform the backup procedure again.

#### 1306: Physical end of tape media

**What happened** You reached the end of the tape while reading or writing data.

**What to do** Refer to Chapter 7; then obtain a tape that meets those specifications.

1309: Illegal request to tape

What happened The tape drive detected errors.

What to do First, try the backup procedure again. If the error message continues to appear, contact a GRiD representative.

1310: End of data on tape

What happened This message appears while you are trying to restore data from a tape. This data, however, was corrupted after the creation of the backup (perhaps by heat or a magnetic field).

What to do First, make sure you that the tape you chose is the one that has the data you want to restore. Then, perform the backup procedure again.

1314: Tape label verification failed

What happened As part of the backup procedure, the AutoBackup software verifies that the header label is correct. When this error code appears, the header label was found to be incorrect.

What to do First, try the backup procedure again. If the error message appears again, try another tape. If the error message continues to appear, contact a GRiD representative.

1315: Tape trailer verification failed

What happened As part of the backup procedure, the AutoBackup software verifies that the tape trailer is correct. When this error code appears, the tape trailer was found to be incorrect.

What to do First, try the backup procedure again. If the error message appears again, try another tape. If the error message continues to appear, contact a GRiD representative.

1316: Tape data path verification failed

**What happened** As part of the backup procedure, the AutoBackup software verifies the path along which the data travels. When this error message appears, there is a problem with the data path.

**What to do** Check the cable connections between the disk and the GRiD Server and try the backup procedure again. If the error message continues to appear, contact a GRiD representative.

1317: Source may not be larger than destination

**What happened** You were trying to copy data from a Model 2703 disk (40MB) to a Model 2701 disk (10MB).

**What to do** Ensure that the sizes of your source and destination disks match, and try your backup again.

**C30S exception: nnn**  
**Range check interrupt**  
**Unknown interrupt**

**What happened** The GRiD Server operating system detected an irrecoverable error. The "nnn" in the first error is a numeric error code, often 29 (Checksum error) or 31 (Bad pointer). These errors usually indicate either (a) damaged software in Server Subjects, or (b) hardware problems in the file processor. These errors can also be created (rarely) by typing illegal characters in command parameters.

**What to do** Restart the system. If the error occurs consistently, reload Server Subjects from GRiD Server Floppies #1, #2, #3, and #4. If the error persists, call the GRiD Resource Center for hardware service.

## APPENDIX D: INTERPRETING THE SYSTEM ERROR LOG

This appendix explains how to interpret the system error log. The system error log is a text file called ' System Error Log'-Text-, located in the Programs subject of the Server Subjects device. The file can be accessed with GRiDWrite, like any other text file. All users have read access to the file; only the System Administrator has write access.

If the the system error log file does not exist, it is created automatically by the GRiD Server operating system at startup. This allows you to save old system error log files for analysis by simply renaming the file and restarting the system.

### FILE STRUCTURE

The System Error Log file is a circular file containing a maximum of 300 entries. When 300 entries have been written to the file, it "wraps around" so that new entries are recorded at the beginning of the file, overwriting the oldest entries. The "logical" end of the file is marked by a line in the following format:

```
00/00 00:00:00 . . . . . The End !!!!
```

When examining the system error log, begin reading at the line immediately following the logical end of file marker, unless the file is not full, in which case the marker is at the physical end of the file.

## FILE FORMAT

Entries in the system error log file are in the following format:

```
MM/DD    HH:MM:SS    S    CT    ERROR    CODE    ALPHA
```

Each column in the file has the following meaning:

- o MM/DD is the month and day the error occurred. Depending on the use of the system and other factors, a given error file may contain errors from only a single day, or errors from as many as 30 days.
- o HH:MM:SS is the hour, minute, and second that the error occurred. Observing the time between errors (often only one or two seconds) can be helpful in interpreting the entries.
- o S is the slot number of the card reporting the error. Valid values are 0 through 7, as follows:
  - 0 - Diagnostic Processor/Common RAM
  - 1 - File Processor
  - 2 - Communication Processor
  - 3 - Optional Application Processor
  - 4 - Optional Communication Processor
  - 5 - Optional Communication Processor
  - 6 - Optional Communication Processor
  - 7 - Optional Application Processor
- o CT is the type of card that is producing the errors, as follows:
  - DP - Diagnostic Processor/Common RAM
  - FS - File Processor
  - CS - Communication Processor
  - AS - Application Processor
- o ERROR is the actual error code. Refer to the "Interpreting Error Codes" section below for more information on these codes.
- o CODE is an internal numeric code that is mostly of interest only to GRiD programmers. In a few cases covered below, the code provides additional information about the error.
- o ALPHA is either a character text description about the error and what program reported the error, or it is the text explaining the error.

## INTERPRETING ERROR CODES

The information given below should help you in interpreting the entries in the error log. In some cases, note that the "errors" are status messages that require no action at all.



**0: No error**

**What happened** The Error 0 is used during system initialization along with the "Initialization started" and "Initialization completed" messages to indicate that the system was restarted. Note that if System.Init is not executed, this message is not written to the error log. Note also that the "Initialization completed" entry may not be the last entry resulting from the restart; due to the relatively long timeout on the GPIB, any errors from GPIB devices at startup usually follow the "Booting Done" entry.

**What to do** Nothing

**2: Out of memory**

**What happened** This error could be caused by an attempt to run a file processor utility via the diagnostic port for which there was insufficient available memory. If you're sure you didn't cause the error on the diagnostic port, it may indicate hardware problems.

**What to do** If the error is occurring at the diagnostic port, start the system without executing System.Init before running the particular file processor utility. If the error occurs consistently, call the GRiD Resource Center for hardware service.

**8: offset exceeds physical size of allocated block**

**9: offset exceeds logical size of allocated block**

**10: memory block belongs to another process**

**11: Invalid memory block**

**What happened** This is an internal error.

**What to do** Contact a GRiD representative.

## 27: Password protected

**What happened** This error usually results from the UAFDelete program trying to delete a defective directory or a destroyed file of Kind Subject for which the password is not correct. (Often the trashed file can be identified by a title consisting mostly of question marks.)

This error may also result from a password-protected file being "stuck" in one of the printer queues. Note that it is only possible to put a password-protected file into a printer queue via the diagnostic port, or by explicitly copying the file to a printer queue with GRiDManager's CODE-D command. Neither case is a normal situation.

**What to do** If the error is from UAFDelete, run GS.Mediarepair to remove the trashed file.

If the error is due to the "stuck file" problem and you know the file's password, use the Delete utility to delete the file from the printer queue. If you do not know the file's password, use the HDelete utility to delete the file and the printer directory, then use the AddSubject utility to recreate the printer directory.

## 29: Checksum error

**What happened** A program file has been damaged with the result that it cannot be loaded into memory. The error is detected when the operating system tries to load the program into memory. The damaged program may be one of those started by System.Init. This error is also produced when you try to run a damaged program via the diagnostic port. In some cases, the error may be produced by an intermittent hardware failure.

**What to do** Restart the GRiD Server several times to confirm that the problem is a damaged file rather than an intermittent hardware failure. Then, find the damaged program file, delete it, and replace it from a backup or GRiD Server Floppy #1, #2, #3, or #4.

### 33: File does not exist

**What happened** This common error message is usually a result of giving an incorrect command to a file processor utility via the diagnostic port. If this is not the case, the error can come from a very wide variety of other sources. For example, the error can indicate that VFSCConfig is missing.

**What to do** Use the alpha code to narrow down the source of the error. If the error is occurring during startup and you can't eliminate it, reload Server Subjects from GRiD Server Floppy Disks #1, #2, #3, or #4 (be sure you have a backup of your unique configuration files before you start).

### 35: Request not supported

**What happened** This can indicate an internal system problem (e.g., when the spooler is confused).

**What to do** In the first case, restart the system and report the error to the GRiD Resource Center. In the second case, restart the system, and if the error occurs consistently, report it to the GRiD Resource Center.

### 38: File access denied

**What happened** This error is occasionally produced by the GRiD Spool Manager when it gets confused.

**What to do** Restart the system. If the error occurs consistently, report it to the GRiD Resource Center.

101: Invalid drive  
102: Invalid sector on disk  
103: CRC error on disk  
104: Record not found on disk  
105: CRC error in ID field on disk  
108: Unknown error  
109: ECC error in disk data  
110: ECC error in ID field on disk  
111: No index pulse from disk  
112: Disk seek not completed  
113: Disk write fault  
114: Disk track zero not found  
115: No address mark found on disk  
116: Disk seek error  
117: Disk format error  
118: Peripheral bus transfer failed - invalid state

**What happened** All of these errors indicate either a media problem or a hardware problem with a 2701 or 2703 Disk Unit. There is no indication in the error log concerning which disk is causing the problem on a multiple-disk system. The alpha text can refer to any program that accesses the disk during startup. The problem is occasionally (rarely) due to a hardware failure on the file processor card rather than the disk.

**What to do** First, tighten the peripheral bus cable connections (a variety of spurious errors can be caused by a loose cable). If this does not fix the problem, ensure that the disk is backed up as much as possible, and then run GS.MediaFormat to reformat the disk and erase all the files on it. If the errors remain after reloading the disk from the backup, call the GRiD Resource Center for hardware service.

#### 200: Invalid file ID

**What happened** This error is usually reported during startup by the UAFDelete program. The error occurs when UAFDelete tries to delete a damaged file. The error can also come from a variety of other sources, in which case the alpha code can be helpful in identifying the damaged file.

**What to do** Delete or rename the file so it is not used by the system; then copy a new version of the file there.

**205: File not open**

**What happened** This error is occasionally produced by GRiDSpool Manager when it gets confused or when the disk gets full.

**What to do** Restart the system. If the error occurs consistently, report it to the GRiD Resource Center. If caused by GRiDSpool Manager, restart the system. If caused by the disk being full, delete some files before restarting the system.

**221: Bad connection**

**What happened** This error is typically reported by GRiDSpool Manager. The error means that SpoolManager had difficulty accessing a file or device; this error usually "hangs" the spooled printer on which it occurred.

**What to do** Use the GRiDSpool Manager program (via RemoteAdministrator) to stop and restart the spooled printer on which it occurred. If the printer does not successfully restart, then restart the system. If the error occurs consistently or from a source other than GRiDSpool Manager, report it to the GRiD Resource Center.

**227: Device not active**

**What happened** This error usually means that a configured GPIB storage device was not physically present at startup. A missing 2102 Portable Diskette Drive causes one error; a missing 2101 Hard Disk System causes two errors (one for the floppy and one for the hard disk).

When paired with an error 901 (Invalid configuration file), this error means that there is a problem in VFSCfg on a GPIB device (e.g., a misspelled keyword).

This error can also mean that a 2701 or 2703 disk is missing from (or not recognized by) the system, and that the missing disk contains directories needed by AdminManager or GRiDSpool Manager.

**What to do** In the case of a missing configured device, nothing needs to be done. If you want to eliminate the error, either reconfigure the system or supply the missing device. Once this error has occurred, the

system must be restarted in order for the device to be recognized. If the error is occurring with the GPIB device attached, turn the GPIB device off and then on again, and then restart the system.

In the second case, check VFSSConfig for errors carefully (try comparing it against the "Model" file).

In the third case, use the Ladt and Cat utilities to check if all the disks are accessible and contain the proper directories (e.g., the Printer Queue).

#### 230: Device not activated

**What happened** This error is produced when you have duplicate entries in Column A (Device Name) and Column C (Device Location) of VFSSConfig.

**What to do** Correct the error condition in VFSSConfig and restart the system.

#### 234: Subject does not exist

**What happened** This error is most often reported by UAFActualDisk. It generally indicates a mismatch between the contents of the User Authorization File and the directories that exist on disk.

**What to do** In the first case, use the AdministratorSentry "List" commands and file processor utilities (AddSubject, Cat, Copy, Delete, HCopy, HDelete, and Rename) to reconcile any differences between the User Authorization File and the disk directories. You may need the assistance of the GRiD Resource Center to accomplish this.

## 253: Request timed out

**What happened** This is one of the most general system errors that GRiD Server can generate. The cause in many cases is due to hardware problems. If the card type of the error is "CS," it indicates that the communication processor in the given slot is not responding. Note that if you include entries for a 1702 Expansion Unit in the GRiDNetwork Manager program, and then do not connect a 1702, you are creating "non-responding communication processors."

This error can sometimes be caused by a GPIB disk that is not powered on, properly connected, or on-line. In a few cases the GPIB disk may have a hardware fault.

**What to do** In the first case, call the GRiD Resource Center for hardware service.

In the second case, check each GPIB device carefully. Attach the device to a computer running GRiD-OS and verify proper operation independent of GRiD Server.

300: Invalid record when loading

301: Invalid field when loading

302: Invalid base when loading

303: Invalid mod when loading

304: Invalid fixup when loading

**What happened** A program file has been damaged with the result that it cannot be loaded into memory. The error is detected when the operating system tries to load the program into memory. The damaged program may be one of those started by System.Init. This error is also produced when you try to run a file of Kind other than Run on the file processor via the diagnostic port (e.g., typing just "System Error Log-Text~" and pressing RETURN at the "#" prompt).

**What to do** Find the damaged program file, delete it, and replace it from a backup or GRiD Server Floppy Disks #1, #2, #3, or #4.

#### 402: Modem lost carrier

**What happened** Most often, a user signed off or otherwise hung up the phone when using a PhoneLink connection to the GRiD Server. The slot number indicates the communication processor card that was in use; the numeric code (a value between 0 and 3) indicates the port number on the card. This is a status message, not an error.

If the entry is accompanied by another error (402), it indicates that the PhoneLink connection was terminated due to retry errors (usually caused by a poor phone line).

**What to do** In the first case, nothing. In the second case, if poor phone lines consistently cause problems, contact the phone company.

#### 451: GPIB timed out

#### 452: GPIB not responding

**What happened** These errors are generated by a GPIB device either not connected or not responding. The most common instance of this is a GPIB disk that is powered off, temporarily disconnected, or otherwise not on-line. In a few cases, the GPIB disk may have a hardware fault.

**What to do** Put the GPIB device on-line. If it's a 2102, make sure that there's a diskette in the drive and that the door is closed (restart the system after doing this). Attach the device to a computer running GRiD-OS and verify proper operation independent of GRiD Server.

#### 505: ISAM record format is invalid

#### 508: ISAM duplicate keys are invalid

#### 509: ISAM key file is invalid

#### 510: ISAM record does not exist

#### 511: ISAM record was not found

#### 512: ISAM record was deleted

**What happened** These errors indicate internal problems in the User Authorization File.

**What to do** If one or more of these errors occurs only very infrequently, ignore them. If one or more of these errors occurs consistently and frequently, contact the GRiD Resource Center.



**601: Server resource unavailable**

**What happened** Most often, this error means that VFSManager has been unable to find AdminManager. When accompanied by error 27, the error means that the User Authorization File (UAF) has been damaged and cannot be accessed.

**What to do** In the first case, check System.Init to see that the "AdminManager" command is present, then reload a new copy of AdminManager-Run- from GRiD Server Floppy #3. If neither of these actions eliminate the error, or if the error is due to the second cause given above, call the GRiD Resource Center.

**722: Poll response timed out**

**What happened** A computer on GRiDLink was turned off or disconnected from the GRiDLink cable without signing off. This entry is written to the error log 60 seconds after the user's action. The slot number indicates the communication processor card that was in use. The numeric code on the entry indicates the communication processor port number and sign-on session number when converted to Hex (e.g., 770 decimal converts to 302 Hex, which decodes to port 3 and session 02). This is a status message, not an error.

**What to do** Nothing.

**751: Buffer is too small for bisync packet**

**752: Received reverse interrupt**

**753: Received conversational reply**

**What happened** This is an internal error.

**What to do** Contact a GRiD representative.

**800: Inter-process protocol error**

**804: Too many interprocess connections**

**What happened** There is an internal problem with GRiD Server communication software.

**What to do** Contact the GRiD Resource Center.

808: Invalid IPC user

What happened This is an internal error.

What to do Contact a GRiD representative.

901: Invalid configuration file

What happened An invalid VFSSConfig file was detected during system startup. A typical problem in VFSSConfig is that a keyword is misspelled (e.g., "NotApplicable" instead of "Not Applicable"). If the VFSSConfig problem is with a GPIB device, this error is also accompanied by an error 227 (Device not active).

What to do Examine the contents of VFSSConfig carefully (compare it against the "Model" file), correct any problems you find, and then restart the system. In some cases, it may be necessary to start over with a fresh copy of the "Model" file and redo your desired changes from scratch.

903: VfsManager internal error

What happened This is an internal error.

What to do Contact a GRiD representative.

931: Only one Company, Group, or User allowed

What happened The VFSSConfig file contains more than one device organized by Company, Group, or User.

What to do Examine the contents of the VFSSConfig carefully. Verify that it does not contain more than one device organized by Company, Group, or User. If any changes are made to the VFSSConfig file, the GRiD Server must be restarted for them to take effect.

932: Device or resource already exists

What happened The VFSSConfig file has two identical entries in the device name column.

What to do Examine the contents of the VFSSConfig carefully. Resolve duplicate entries in the device column and restart the GRiD Server.

933: Files attached - cannot delete context  
934: Cannot find context  
955: Application on server exited before signing off

What happened This is an internal error.

What to do Contact a GRiD representative.

999: Out-of-sequence VFS response

What happened VFSManager has detected an out-of-sequence condition in data received via GRiDLink or PhoneLink.

What to do Nothing. This error is self-correcting and is reported for informational purposes only.

1038: Cannot change context to a company or a group  
1039: Invalid length in Authorization file

What happened This is an internal error.

What to do Contact a GRiD representative.

1104: Physical device does not exist

What happened A configured GPIB printer was not physically present at startup.

What to do If the printer is intentionally not present, do nothing. If the printer is present and should be operational, check that it is properly connected and powered on. If this doesn't solve the problem, remove other GPIB devices connected to GRiD Server and restart the system. If this fixes the problem, check the other devices.

1150: GRiD Server internal error

What happened There is an internal problem with GRiD Server system software.

What to do Contact the GRiD Resource Center.

#### 1200: Loopback test successful

**What happened** You used the "GRiDLink Green LED Loopback Connector" to check a GRiDLink outlet. As long as the Loopback Connector is plugged into an outlet, one 1200 entry is recorded every five seconds. This is a status message, not an error.

**What to do** Nothing.

#### 1202: CRC error in received frame

**What happened** A CRC error was detected in data received via GRiDLink. The data was automatically retransmitted from the user's computer. The slot number indicates which card detected the problem. The numeric code accompanying the error indicates the communication processor port number and sign-on session number when converted to Hex (e.g., 770 decimal converts to 302 Hex, which decodes to port 3, session 02). From this information you may be able to zero in on a computer with a defective serial port. If the session number converts to Hex "FF" (i.e., numeric codes 255, 511, 767, or 1023), it means that the problem cannot be tied to any particular sign-on session; in this case the communication processor card itself is more likely to be the source of the CRC errors.

**What to do** If this error occurs only very infrequently, ignore it. If the error occurs consistently and frequently with a varying sign-on session number, try to isolate the source to a particular computer. If the error occurs consistently and frequently with a fixed sign-on session number of "FF", contact the GRiD Resource Center for hardware service.

#### 1250: GRiD Server internal error

**What happened** There is an internal problem with GRiD Server system software.

**What to do** Contact the GRiD Resource Center.

1611: All ports are not specified

What happened The GRiDNetwork Manager configuration contains invalid parameters.

What to do Reconfigure GRiDNetwork Manager. If the problem persists, contact a GRiD Representative.

1612: GRiD Server name does not match

What happened If the error is logged by GRiDNetwork Manager, then the GRiDNetwork Manager configuration contains invalid parameters. If it is logged by another application, then that application sent a message with an invalid GRiD Server name to GRiDNetwork Manager.

What to do Reconfigure GRiDNetwork Manager. If the problem persists, contact a GRiD representative.

1613: Too many GRiD Servers defined

1614: Too many connections in Network Manager

1615: Specified protocol is not supported

1616: No GRiD Servers specified

What happened The GRiDNetwork Manager configuration contains invalid parameters.

What to do Reconfigure GRiDNetwork Manager. If the problem persists, contact a GRiD representative.

1617: No Communication cards available

What happened The GRiDNetwork Manager configuration specifies a communication processor in a slot that does not contain a functioning communication processor.

What to do Reconfigure your GRiDNetwork Manager, ensuring that a communication processors exists in the slots for which they are specified.

1618: Invalid protocol combination

What happened An invalid protocol combination was specified in the GRiDNetwork Manager configuration.

What to do Reconfigure you GRiDNetwork Manager, ensuring that the protocol combination is valid. Refer to Chapter 4 for information on valid combinations.

1619: No communication card in specified slot

What happened The GRiDNetwork Manager configuration specifies a communication processor in a slot that does not have one.

What to do Reconfigure your GRiDNetwork Manager, ensuring that a communication processors exists in the slots for which they are specified.

1620: Error in starting Vipc

What happened GRiDNetwork Manager could not start the VIPC on a communication processor.

What to do Contact a GRiD Representative.

1631: No communication cards are configured

What happened No communication processor has been specified in the configuration.

What to do Reconfigure the GRiDNetwork Manager, ensuring that at least one communication processor is specified.

#### WHAT ABOUT OTHER ERRORS?

The above list is not exhaustive; a glance at Appendix A shows you that this list covers only some of the errors that can occur. However, this list does cover most of the errors that are likely to occur.

Another source of additional information about errors specific to the GRiDNetwork Manager program (errors 1611 - 1631) is the GRiDNetwork Manager error log. The format of the GRiDNetwork Manager error log is the same as the system error log; it contains additional information such as a) when GRiDNetwork Manager was started, b) the communication configuration, and 3) the user that configured the GRiDNetwork Manager.

If you find an occasional error in the log that is not in this list, look it up in Appendix A. The resulting one-line translation of the error number, combined with the information provided by the alpha text, may be enough to let you determine the source of the error. If not, call the GRiD Resource Center for assistance.

In many cases, if you see a large number of very obscure errors that are not in this appendix, it typically means that there is a hardware problem. Call the GRiD Resource Center for hardware service.

## APPENDIX E: FILE PROCESSOR UTILITIES SYNTAX SUMMARY

This appendix lists in alphabetical order the syntax descriptions of all the file processor utilities covered in Chapter 9. The page number of the description of each utility is also provided. The following conventions are used in the syntax descriptions:

- o Bent brackets (< >) are used to indicate required parameters that must be supplied by the user. Parameters must be entered in the order given in the syntax statement.
- o Square brackets ([ ]) are used to delineate optional parameters.
- o Ellipsis (...) are used to indicate optionally repeated parameters.

The terms "file pathname" and "directory pathname" appear in many of the syntax statements. The general form of a file pathname is:

```
['<Device>'<DirectoryName>'...]<FileName>[-<Kind>-]
```

The general form of a directory pathname is:

```
'<Device>' [<DirectoryName>'...]
```

### AddSubject

```
AddSubject [<DirectoryPathname>]<NewDirectoryName>
```

### Alias

```
Alias '<AlternateDeviceName>' '<CurrentlyActiveDevice>'
```

## AutoBackupTerminate

AutoBackupTerminate

## Cat

Cat [<SourcePathname>]: [<CatalogFilePathname>] [!] [+] [&]

## Compare

Compare <Pathname1> <Pathname2>

## Copy

Copy [<SourcePathname>] [<DestinationPathname>] [N] [M] [?]

## DecodeError

DecodeError <error number>

## Delete

Delete <Pathname> [!]

## DiskInfo

DiskInfo [<MinSize>] [<ReportFileName>]

## DisplayTapeLabel

DisplayTapeLabel '<Device>

## Dump

Dump <SourceFilePathname> [<DestinationFilePathname>]

## GS.Activate (Format 1)

GS.Activate <DeviceDriverFile> As <DeviceName> <Address>



GS.Activate (Format 2)

GS.Activate Device <ActiveDevice> As <NewDeviceName> [M] <Address>

GS.Deactivate

GS.Deactivate '<Device>

GS.Do

GS.Do <CommandFilePathname>

GS.MediaFormat

GS.MediaFormat '<Device> <TrackingNumber>[<PartitionLetter>]

GS.MediaPartition

GS.MediaPartition '<Device> [P1] [P2] [P3] [P4]

GS.MediaRepair

GS.MediaRepair '<Device> [<ListFilePathname>]

GS.SetTime

GS.SetTime

GS.UpdateBootCode

GS.UpdateBootCode '<Device>

HCompare

HCompare <FirstDirectoryPathname> <SecondDirectoryPathname> [!]

HCopy

HCopy <SourceDirectoryPathname> <DestinationDirectoryPathname>

HDelete

HDelete <Directory> [!]

Help

Help [<subject name>]

Ladt

Ladt [0] [0]

LineEdit

LineEdit <Pathname>

Prefix

Prefix [['<Device>']<DirectoryName>']

Rename

Rename <SourcePathname> <DestinationPathname>

SectorCopy

SectorCopy '<SourceDevice>' '<DestinationDevice>'

Status

Status

Time

Time

UAFChangeDevice

UAFChangeDevice '<OldVolumeName>' '<NewVolumeName>' ['UAFKey']

Volumename

VolumeName '<Device>' [<'VolumeName'>]

Work

Work ['<Device>]

## APPENDIX F: GRIDLINK CABLETEST PROGRAM

This appendix describes the GridLink CableTest program. Both a description of the program and complete operation and interpretation procedures are provided.

### WHAT IS CABLETEST?

CableTest can help isolate and troubleshoot problems within a GridLink network. It is a program that can be run on a Grid-OS computer attached to a GridLink outlet. The program is supplied with every Grid Server (in the Programs subject of the Software Subjects device). Once started, the program automatically connects to Grid Server and sends and receives data over the GridLink cable. A continuous report of program results and error conditions is displayed while CableTest is running (see Figure F-1). The program can be run to check either the Grid Server communication hardware alone (with the GridLink cable disconnected from the 5761 or 5762 cluster box), or the Grid Server and GridLink cable together as a system.

CableTest is not an all-encompassing cable debugging tool; if there is a problem with the cable, CableTest gives you only an indication of the nature of the problem, not a complete solution. The most informative cable troubleshooting tool is an ohmmeter (see Appendix C of the Grid Server Installation Guide for an ohmmeter-based cable testing procedure).

**NOTE:** To run CableTest for the IBM PC/XT (located on the Programs for Workstations floppy), you must set "Current typeface" to the PC80 font in the Options form in GridManager before using CableTest.

CableTest can also be used with the Model 2230 GRiDCase GRiDLink Adaptor. This file is located on the Programs for Workstations floppy, under the Programs for GRiDCase Subject.

#### WHY USE CABLETEST?

When troubleshooting a GRiDLink problem, the use of Cabletest provides several advantages over the use of GRiDManager (i.e., the normal sign-on procedure) as a method of determining the state of the GRiDLink network:

- o CableTest is faster and easier to use for testing than GRiDManager because (a) it requires fewer keystrokes, and (b) it connects to GRiD Server much faster than GRiDManager.
- o CableTest reports GRiDLink line errors so that marginal network performance can be seen directly, rather than inferred through application performance observations.
- o CableTest waits indefinitely to connect to GRiD Server, unlike GRiDManager, which has a short, fixed timeout period.

#### RUNNING CABLETEST

To run CableTest, the program must be located on a local storage medium (bubble memory, floppy disk, or hard disk) attached to your computer. When you run CableTest, you cannot be signed on to GRiD Server (CableTest automatically connects to GRiD Server). If you are signed on, CableTest informs you of that fact and terminates.

Numerous users can run CableTest at the same time; the program can be exited and restarted immediately by any user without waiting.

#### TO RUN THE CABLETEST PROGRAM

1. Connect your GRiD-OS computer to any GRiDLink outlet, using a Model 5715 or 5716 GRiDLink computer cable.
2. Using the File Form, select CableTest from the local storage medium and Confirm.

NOTE: The GRiD Server must have completed the start up procedure before this program can be run.

3. Once the program starts, the CableTest counter display screen shown in Figure F-1 appears.
4. To exit the program, press CODF-Q or CODF-ESC and Confirm.

Figure F-1: CableTest Counter Display Screen

```

SHT Timeout CRC length invdfrm invdint
PKT 0 0 0 0 0
LNG Timeout CRC length invdfrm overRun Ovrflow
PKT 0 0 0 0 0
DscnctCnt(A) XmtErr(B) CmprErr(C) BfUndrn(D) cnnctd
0 0 0 0 yes
ElapsedTime IdleTime(E) TestSucc(F) P-done:H/L(G)
0: 0:27 0 37 0/0
A: Cabletest was disconnected by server
B: Xmitted without response, possible xmt error
C: test data rcvd was different from test data sent
D: GRiD Server was out of buffers
E: Time since last time anything was received
F: Successful test Exchange

Code-Q,Code-Esc Exit
GRiDLink Version 3.2.0

```

### INTERPRETING CABLETEST'S OUTPUT

The various counters are explained as follows (refer to the numbered circles in Figure F-2):

- ① Item 1 (Elapsed Time) begins incrementing immediately when the program starts running and continues until the program is exited.
- ② Within 10 seconds the "no" in item 2 (Connected) changes to "yes." If this does not happen, the problem with the GRiDLink cable is fairly major. Check for shorts and opens (see Appendix C of the GRiD Server Installation Guide for an ohmmeter-based cable testing procedure).
- ③ Once "yes" appears in item 2, item 3 (Successful Tests) starts to increment. The counter increments very quickly at first and gradually slows down to about one per second. When a test is successful, it means that the data and clock lines in the cable (pins 2 through 9) are working properly.
- ④ If the GRiDLink cable is perfect, no counters other than item 4 (Idle Time) will increment, and it will only occasionally get up to about five seconds before returning to zero.
- ⑤ If there are problems in the cable (e.g., reversed black wires), one or more of the counters in item 5 (Transmit Errors, CRC Errors, Timeout Errors, and Length Errors) increments. Any count greater than one per 100 successful tests is an indication of a problem.



#### TimeOut

A timeout error occurs if CableTest's interrupt service routine is at the beginning or in the middle of receiving a packet and the next character does not arrive within 20ms.

#### CRC

Every packet received has a CRC character in it. If the received value does not match the computed CRC value, then a CRC error is indicated.

#### Length

For a short packet, a length error occurs if a packet longer than 4 bytes is received. For a long packet, a length error occurs if the length of the received packet does not match the length field in the packet.

#### Invdfrm (Invalid packet)

A received packet is invalid if it is not what is expected. Before the connection with GRiD Server, only initial exchange packets are valid. After the connection, only test exchange packets are valid.

#### Invdint (Invalid Interrupt)

The interrupt service routine is triggered by the first character at the beginning of any exchange. Any other interrupt is an invalid interrupt.

#### OverRun

This counter is incremented if a buffer overrun in a long packet is detected.

#### OvrFlow (OverFlow)

When a received long packet is longer than the buffer allocated for it (100 bytes for an initial exchange packet and 550 bytes for a test exchange packet), this error is incremented.



#### Cnnctd (Connected)

When the initial exchange is completed, this field changes from "no" to "yes".

#### RstrtCnt (Restart Count)

In the test exchange mode, if CableTest does not receive the next test packet within 10 seconds, it restarts itself, waits for an initial exchange packet, and increments this counter.

#### XmtErr (Transmit Error)

A short packet was received, a long packet was transmitted, and then CableTest waited for a long packet but nothing was received. CableTest assumes that its transmission to GRiD Server was not successful and increments this counter.

#### CmprErrs (Compare Errors)

When the test data received is not the same as test data sent, this counter is incremented.

#### BfUndrn (Buffer Underrun)

If GRiD Server does not have a buffer to receive a long packet, it indicates this by transmitting a short packet instead of a long packet. CableTest does not do a compare, and increments this counter.

#### ElapsedTime

The total time since CableTest was started is continuously indicated here.

#### IdleTime

The time in seconds since the last time anything was received from GRiD Server is accumulated here. If CableTest is in test exchange mode and this counter reaches 10, CableTest restarts itself and waits for an initial exchange packet. When anything is received (even something with an error), this counter is reset to 0.

### TestSucc (Test Successful)

This counter shows the number of times the test exchange was successfully completed. One successful test exchange involves receiving a short packet, transmitting data in a long packet, and receiving the same data in a long packet.

### P-done:H/L (PDONE Stuck High or Low)

During an initial or test exchange, the PDONE line (10) should be high while receiving packets, and should go low at the end. CableTest samples PDONE while receiving a long packet and waits 20ms for it to go low after receiving a long packet. If PDONE is found low before receiving a long packet, that packet is not received and the PDONE-Low counter is incremented. If PDONE does not go low at all then the PDONE-High counter is incremented. In this case the long packet may be received and compared successfully. Thus, when PDONE is stuck high, TestSucc also increments. When PDONE is stuck low, XmtErr also increments.

## APPENDIX G: TROUBLESHOOTING COMMAND SUMMARY

This appendix lists, in alphabetical order, a summary of the diagnostic processor and file processor utility commands that are particularly useful for troubleshooting a GRiD Server system.

Remember that you can use GRiDTerm's recording facility (the Record Character Stream command on the CODE-T menu) to record your troubleshooting session to a printer or into a text file. This allows you to study the results of your troubleshooting later without being on-line to the remote system.

### DIAGNOSTIC PROCESSOR COMMANDS

The following commands assume you are connected to the diagnostic port, are in transparent mode, and are at the "\*" prompt.

#### Boot

This command starts the system from the first 2701 or 2703 Disk Unit containing system software (Server Subjects). As the system starts up, the power-on diagnostic messages are displayed on the diagnostic computer's screen.

#### Boot F or Boot C

This command starts the system from a 2101 Hard Disk System floppy drive or 2102 Portable Diskette Drive connected to the GRiD Server. You must insert the "GRiD Server Boot Diskette" into the drive before using this command. When you start the system from a floppy disk, System.Init is not executed. See the GS.Activate command below for more information on the application of this command.

## Config

This command displays information describing the hardware configuration of the GRiD Server. This is useful for checking for malfunctioning cards (empty slots that should not be empty). One column shows the version number of the PROMs on each processor card, another column shows the RAM size (in 128KB) blocks on each processor card.

Conn 2 or Conn 4 or Conn 5 or Conn 6

This command connects you to a communication processor. If you type CONN 2 and then press RETURN immediately after the power-on diagnostics finish executing (at the "\*" prompt, right after the "7 SLOT EMPTY" or "7A TEST DONE" message), you can watch the communication processor in slot 2 start up. This gives you a little more information, such as:

- o Communication driver software version numbers
- o Error messages during communication processor startup
- o Indication of successful communication processor startup

## Exec

This command connects you to the file processor. If you type EXEC and press RETURN immediately after the power-on diagnostics finish executing (at the "\*" prompt, right after the "7 SLOT EMPTY" or "7A TEST DONE" message), you can watch System.Init execute on the file processor. This gives you some more information, such as:

- o Manager version numbers
- o Error messages from the GS.Activate utility
- o The program at which the system is stopping (if it is stopping)

If you press ESC at the prompt, System.Init is aborted (not executed). If you press Confirm at the prompt, then System.Init is executed.

## Log

This command lists the contents of the 1701 Main Unit front-panel display circular error queue so you can see what error caused the "ATTENTION" light to go on.

## FILE PROCESSOR COMMANDS

The following commands assume you are connected to the diagnostic port, are in transparent mode, have executed the EXEC command, have signed on, and are at the "#" prompt.

NOTE: Wherever a command includes a device name such as '0', remember that on a 2703 Disk Unit you must include the partition letter ("a" through "d") as part of the device name (e.g., '0a').

### Cat '0'

This command catalogs the highest-level device directory of DSK0 (the first 2701 or 2703). After starting the system from the Boot Diskette, this tells you if you can read the system disk. On a multiple-disk system, you can invoke CAT '1', CAT '2', etc. to see if all the other disks can be read. Using this command, you can also check for all the proper directories (Printer Queue, Software Subjects, etc.), and determine the disk they are on.

### Cat 'B'Programs'

This command lists the software in Server Subjects on the boot device (you can get the same list from the Display Titles command on GRIDManager's CODE-T menu). You can check software versions with this command by comparing length and last modified dates with a previously-printed listing. You can also check if all the software required to start the system is present on the disk.

### Cat 'C' or Cat 'F' or Cat 'W'

This command catalogs the directories (subjects) on a GPIB storage device. This verifies the operation of the GPIB interface on the file processor, and the GPIB device itself at a hardware level, since the only software involved is the GPIB driver. This can help distinguish between configuration problems and hardware problems.

### Cat 'N'Resources' !

This command lists the devices names seen by the GRID Server user. These can be compared with the Ladt list to help identify a configuration problem. The list also contains the names of the three system managers (VFS, Admin, and Spool) if they have started successfully.

Cat 'N\System' !

This command displays the names of several key communication software system modules. Look in this command's listing for "MacMgr#" and "DlcMgr#", where "#" is the slot number of the communication processor on which the software is running. (Use the diagnostic processor Config command to check the slots containing communication processors). If these module names are present, the communication processor(s) have started up properly.

Cat 'N\User Names' !

This command lists the users currently signed on to GRiD Server via GRiDLink and PhoneLink. This is useful for ensuring that no one is using the system before you restart it.

Copy 'B\LogFiles\AdminLog~Text~

This command copies the AdminLog file to the screen. AdminLog keeps track of which users sign on and at what time.

NOTE: The LogFiles Subject may not be located on device "B" (the boot device). You may have to use the Cat command to find the device that contains the LogFiles Subject before using the above command.

Copy ' System Error Log'~Text~

This command copies the system error log file to the screen. Careful study of the error log can provide a significant amount of information regarding the state of the system.

Copy System.Init~Com~ or

Copy 'b\ConfigurationFiles\NetworkManager~Configuration~ or

Copy VFSSConfig~Database~

These commands copy the configuration files to the screen so you can review them. The first two files are in text form and are easily read; the third is a database viewed as a text file, so what you see is the database control characters and the columns all run together, but you can still clearly see the configured device names and what lines are commented out (look for ";"). You can use the Display Control Characters item in GRiDTerm's CODE-O form to verify where the column breaks (tab characters) are in VFSSConfig.

Copy System.Init~Com~ '0''Printer Queue'Narrow Printer''

This command copies the System.Init file to a spooled printer called "Narrow Printer". This command, which assumes that the Printer Queue directories are on DSK0, checks that the spooler is working properly. You can tell if the file has printed after a minute or two with the Cat '0''Printer Queue'Narrow Printer'' command (no files are found if the file has printed). Note that "Narrow Printer" is just an example of a typical printer name; you must get the actual name used on the system you are troubleshooting by using the Cat '0''Printer Queue'' command to list the names of the directories in the Printer Queue, or by looking at VFSSConfig or System.Init.

Ladt 0 0

This command lists the complete active device table. From this you can tell what GPIB device drivers have been activated. You can also tell the serial numbers and the device numbers of the 2701 and 2703 Disk Units connected to the system.

## APPENDIX H: GRID SERVER COMPONENT INDEX

This appendix describes each component of the GRiD Server system, in order by model number. Table H-1, at the end of the Appendix, shows the relationships among the GRiD Server components.

### 1701 Main Unit

Each GRiD Server requires a main unit. Cards shipped in the main unit include a diagnostic processor (100266-01) and a file processor (103004-01), a communication processor (102564-01). There is also a slot available for an optional application processor (100347-01). The communication processor in the main unit can support either four GRiDLinks, four PhoneLinks, or two of each (communication processor ports can only be used in pairs). The 1701 main unit also includes a 5734 direct-connect diagnostic cable, a 5742 asynchronous auto answer modem, a 5733 diagnostic modem cable for connecting the diagnostic modem, a peripheral bus terminator (100660-00) and an AC power cord (100712-00). The GRiD Server Administrator's Guide and System Reference Manual, GRiD Server User's Guide for GRiD-OS Users, and the GRiD Server User's Guide for MS-DOS and PC-DOS Users are also included in this package.

### 1702 Expansion Unit

The expansion unit is needed only when the communications configuration requires more than the four lines supported by the main unit (see 1701 above). The expansion unit can support both GRiDLink and PhoneLink, within the restriction that the total number of GRiDLink lines in the system cannot exceed six. The 1702 includes one AC power cord (100712-00) and two processor bus cables



(100711) that connect the the expansion unit to the main unit. The 5767 communication processor and cluster box (5760, 5761, or 5762) must be ordered separately. The expansion unit can accomodate up to three communication processors and one application processor (100347-01). Only one expansion unit is allowed per GRiD Server system.

#### 2701 10-Megabyte Disk Unit

A minimum of one 2701 or 2703 disk unit is required with each GRiD Server system. Up to seven additional 2701 or 2703 disk units may be added in any combination for a system-maximum of 256 megabytes. Each 2701 comes with a 37-pin peripheral bus cable (100548-00), which can be used either between the main unit and the first disk unit or between daisy-chained disk units, and an AC power cord (100712-00). The last disk unit on the chain must have a peripheral bus terminator (100660-00), supplied with the 1701. The 2701 disk unit cannot be used on the GPIB.

#### 2703 40-Megabyte Disk Unit

A minimum of one 2701 or 2703 disk unit is required with each GRiD Server system. Up to seven additional 2701 or 2703 disk units may be added in any combination for a system-maximum of 256 megabytes. The 2703 disk unit's formatted capacity is 32 megabytes; each 2703 is partitioned at shipment into two 16-megabyte volumes. Each 2703 comes with a 37-pin peripheral bus cable (100548-00), which can be used either between the main unit and the first disk unit or between daisy-chained disk units, and an AC power cord (100712-00). The last disk unit on the chain must have a peripheral bus terminator (100660-00), supplied with the 1701. The 2703 disk unit cannot be used on the GPIB.

#### 2801 Tape Unit

The 2801 tape unit is an optional, but highly recommended, component of the GRiD Server system. It is used exclusively by the GRiD Server automatic backup software for automatic unattended backup of the contents of a peripheral bus disk (2701 or 2703), or for the recovery of a backed-up disk image (the contents of a peripheral bus disk on a backup tape). The 2801 tape unit includes a power cord, one qualified 1/4-inch 8000 BPI tape cartridge (2810), and a peripheral bus cable (100548-00).

#### 2810 45MB Tape Cartridge

The 2810 45MB tape cartridge is used excusively with the 2801 tape unit. It is a qualified, 1/4-inch, ANSI X3.55, 8000 BPI tape cartridge. One qualified tape cartridge is supplied with the 2801

unit. Additional qualified tape cartridges may be ordered from GRiD, or from the following authorized manufacturers:

<u>Manufacturer</u>	<u>Part No.</u>
Archive	Model 09C
Scotch	DC 300XL

It is recommended that you have one tape cartridge for each 2701 or 2703 disk unit on your GRiD Server system.

#### 5706 GRiDLink Two-Port Floor Outlet

The 5706 provides connections for up to two computers at one location on a GRiDLink line. The outlet is connected to the GRiDLink line via a 12-wide screw-connection terminal strip; the computer connectors are DA15S sockets.

#### 5708 GRiDLink One-Port Wall Outlet

The 5708 provides a connection for one computer at one location on a GRiDLink line. This surface-mounted outlet is connected to the GRiDLink line via a double 6-wide screw-connection terminal strip; the computer connector is a single DA15S socket. The outlet must be flush-mounted in a wall or utility box.

#### 5709 GRiDLink Terminator

The final outlet on each GRiDLink line must contain a 5709 terminator. Four 5709's are included with the 5761 cluster box; two 5709's are included with the 5762 cluster box.

#### 5713 GRiDLink Cable (1000')

The 5713 GRiDLink cable is used to connect the cluster box to all the floor or wall outlets. The cable is supplied in lengths of 1000 feet only. The cable (a special version of Beldon 9505) consists of five twisted pairs and a foil shield with drain wire. The difference between this cable and Beldon 9505 is that the black wire of each of the five pairs contains a colored tracer to simplify installation and maintenance. A teflon-insulated version of Beldon 9505 cable (Beldon 89505) is available direct from Beldon at higher cost for installations where building codes prohibit the use of PVC-insulated cable outside of conduit. The cable is connected via screw-connection terminal strips. The maximum length of a single GRiDLink line is 1200 feet; thus the sum of all the cable on the line, including the 5750 cluster box cable and all the 5715 or 5716 computer cables, must total less than 1200 feet.

#### 5715 Computer Cable (12')

The 5715 cable connects a computer to either the 5706 two-port floor outlet or the 5708 one-port wall outlet. The connector on the computer end of the cable is a 2DE19P; the connector on the outlet end of the cable is a DA15P.

#### 5716 Computer Cable (24')

The 5716 cable connects the computer to either the 5706 two-port floor outlet or the 5708 one-port wall outlet. The connector on the computer end of the cable is a 2DE19P; the connector on the outlet end of the cable is a DA15P.

#### 5733 Diagnostic Modem Cable (12')

The 5733 cable connects the 5742 modem to the diagnostic port on the 1701 main unit. When connected to the diagnostic port, the modem and cable allow remote system administration and diagnostics to be performed. The connector on the diagnostic port end of the cable is a 2DE19P; the connector on the modem end is a DB25P. The 5733 cable is included with the 1701 main unit.

#### 5734 Direct-Connect Diagnostic Cable (12')

The 5734 cable is used to connect a computer directly to the diagnostic port on the 1701 main unit. The connectors on both ends of the cable are 2DE19P's; the cable is symmetric. The cable is included with the 1701 main unit.

#### 5742 Asynchronous Auto Answer Modem

The 5742 modem can be used as either a PhoneLink modem or as the diagnostic modem. One 5742 modem is included with the 1701 main unit for use on the diagnostic port; one 5742 modem is included in the 5774 PhoneLink modem kit. No cable is included with the modem under the 5742 model number. The modem supplied is currently a USRobotics Courier 1200/2400 baud modem.

#### 5750 Cluster Box Cable (6')

The 5750 cable connects the 5760, 5761, or 5762 cluster boxes to either the 1701 main unit or 1702 expansion unit. Each cable connects a pair of ports on a communication processor to a pair of ports on a cluster box. The connectors on both ends of the 5750 cable have 40 pins. Two 5750 cables are included with the 5760, 5761 and 5762 cluster boxes.

#### 5752 PhoneLink Cable (12')

The 5752 cable connects the 5742 modem to the PhoneLink ports on the 5760 or 5762 cluster boxes. Both ends of the cable have DB25S connectors; the cable is symmetrical. One 5752 cable is included in the 5774 PhoneLink modem kit.

#### 5760 Four-PhoneLink Cluster Box

The 5760 cluster box connects four PhoneLink lines to either the 1701 main unit or the 1702 expansion unit. The 5760 has two 40-pin connectors (to the main unit or expansion unit), and four DB25S connectors (to the Phonelink modems). The 5760 includes two 5750 cluster box cables.

#### 5761 Four-GRiDLink Cluster Box

The 5761 cluster box connects four GRiDLink lines to the 1701 main unit. The 5761 has two 40-pin connectors (to the main unit), and four rubber-grommated holes for 5713 GRiDLink cables. The 5761 includes four 5709 GRiDLink terminators and two 5750 cluster box cables.

#### 5762 Two-GRiDLink/Two-PhoneLink Cluster Box

The 5762 cluster box connects two GRiDLink lines and two PhoneLink lines to either the 1701 main unit or the 1702 expansion unit. The 5762 has two 40-pin connectors (to the main or expansion unit), two DB25S connectors (to the PhoneLink modems), and two rubber-grommated holes for 5713 GRiDLink cables. The 5762 includes two 5709 GRiDLink terminators and two 5750 cluster box cables.

#### 5774 PhoneLink Modem Kit

The 5774 PhoneLink modem kit is used only with PhoneLinks. The kit includes one 5742 asynchronous auto-answer modem and one 5752 PhoneLink modem cable.

#### 5767 Communication Processor

The 5767 communication processor, which manages the communication between the GRiD Server and the computers connected to it, has four configurable ports. The four ports can support either four GRiDLink lines, four PhoneLink lines, or two of each.

## 6702 IBM PC Hardware Interface Card for GRiDLink

The 6702 IBM PC hardware interface card for GRiDLink (known as the GRiD Server-PCLink Board) enables your IBM PC or XT to connect to GRiD Server via GRiDLink.

## 100711 Processor Bus Cables

Two 100711 processor bus cables are required to connect the main unit to the expansion unit. These are included with the 1702 expansion unit.

Model	Includes	Included With
1701	5742, 5733, 5734	
1702	100711	
2701		
2703		
2801	2810	
2810		2801
5706		
5708		
5709		5761 (4), 5762 (2)
5713		
5715		
5716		
5742		1701, 5774
5733		1701
5734		1701
5750		5760 (2), 5761 (2), 5762 (2)
5752		5774
5760	5750 (2)	
5761	5709 (4), 5750 (2)	
5762	5709 (2), 5750 (2)	
5774	5742, 5752	
5767		
6702		
100711		1702

Table H-1: GRiD Server Component (Model Number) Relationships

## APPENDIX I: USING DEVELOPMENT TOOLS WITH GRID SERVER

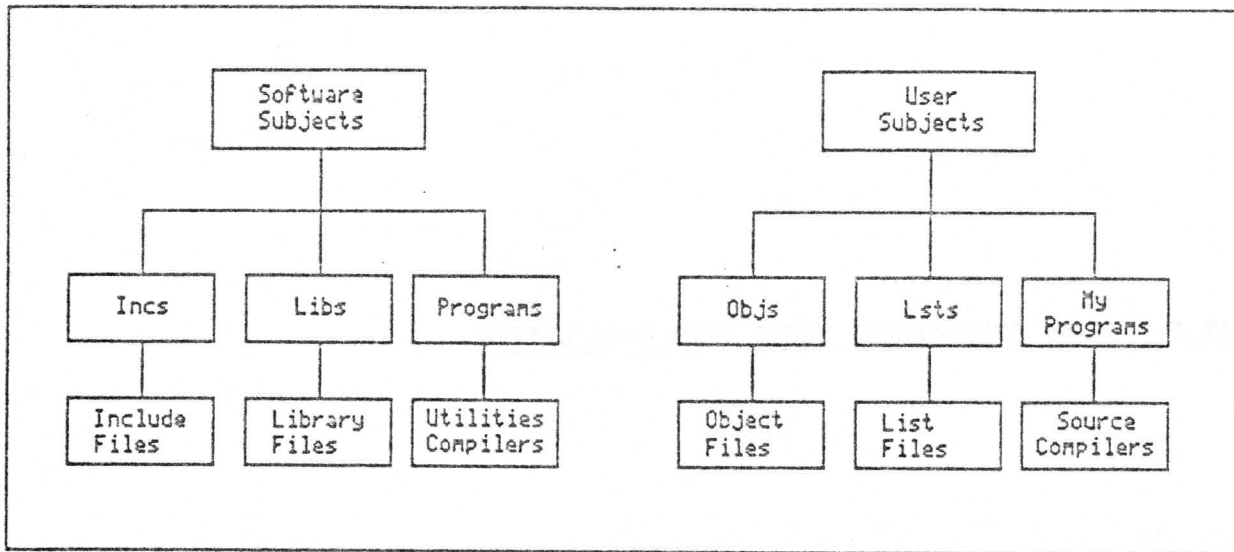
This appendix outlines the differences when you are using GRiDDevelop with files and programs on GRiD Server.

### Organization of Development Files

Figure 1-2 in the Program Development Guide shows the organization of a typical development directory on a hard disk device connected to a GRiD computer. This directory organization puts all the include files under one subject (Incs), all the library files under one subject (Libs), all the object files under the Objs subject, all source files related to a particular program under MyPrograms, and so on.

When you are using the GRiD Server for program development, the same basic organization of files within subjects applies, but the development subjects are stored on a GRiD Server disk, usually in the User Subjects devices and Software Subjects devices. Figure I-1 illustrates where the files shown in Figure 1-2 in the Program Development Guide should be located on a GRiD Server disk.

Figure I-1: Typical Development File Organization on GRiD Server



### Programming Considerations

When you are doing program development with GRiD Server, keep the following considerations in mind.

- o GRiDManager and the Alias program should be located on a local device on your GRiD computer.
- o The compilers and some utilities cannot handle pathnames longer than 45 characters. Use the Alias utility to create short names for GRiD Server devices and then use the short device names. For example, SS may be established as an alias for Software Subjects.
- o In your source files, be careful to prefix the file names of all of your include files with the appropriate device, since these files will usually be located on a GRiD Server device rather than a local device.
- o If DevelopmentExecutive or Do is used to invoke applications or utilities that reside on a GRiD Server device (e.g., Software Subjects) the fully-qualified pathname, including Kind and Subkind (if any), must be specified.

### GRiDDevelop Data Files

You use GRiDDevelop data files to specify the files that will be used during the various development activities such as editing, compiling, linking, debugging, and so on. The data file consists of tokens, file names, and command lines.



A GRiDDevelop token is defined as all characters enclosed within a pair of colons. Some of the GRiDDevelop tokens described in Chapter 2 of the Program Development Guide are used slightly differently when you are doing program development with the GRiD Server.

NOTE: These examples assume that "SS" is an alias for Software Subjects, "US" is an alias for User Subjects, and that the prefix utility has been used as explained on page I-6 below.

#### :Debug:

Each development data file can specify one Debug token. Following this token, you can specify any number of command lines, each terminated with a CR/LF. Typically, one of these command lines is an invocation of the debugger along with your program. If more than one Debug command file is needed, then multiple Debug tokens can be defined in a development data file with a Debug debugName token. When you are doing program development with GRiD Server, you should specify the Debug program in Software Subjects in your Debug or Debug debugName tokens as shown in Figures I-2 and I-3.

Figure I-2: Typical Debug Token

```
:Debug:  
`SS`Prograns`Debug MyProgram`Run` TestFile`Text`
```

Figure I-3: Typical Debug debugName Tokens

```
:Debug Use test data file #1:  
`SS`Prograns`Debug MyProgram`Run` TestFile#1`Text`  
  
:Debug Use test data file #2:  
`SS`Prograns`Debug MyProgram`Run` TestFile#2`Text`
```

#### :Enter:

Each development data file can specify one Enter token. The token is followed by a command or series of commands that are to be executed the first time the development data file is brought into memory. When you are doing program development with GRiD Server, you should use the Enter token to specify aliases for GRiD Server devices so that file names will not exceed the maximum length allowed by the compilers and other programs. Be sure that you use fully-qualified device names in your Alias commands. You should specify that the User Subjects device rather than the boot device be used as the work device (see Figure I-4 below and Chapter 9).

Figure I-4: Typical Enter Token

```
:Enter:  
  `B`Programs`Alias `SS ``GRiD Server:Software Subjects``  
  `B`Programs`Alias `US ``GRiD Server:User Subjects``  
  `SS`Programs`Work `US
```

:Exit:

Each development data file can specify one Exit token. The token is followed by a command or series of commands that are to be executed when you exit the GRiDDevelop program. When you are doing program development with GRiD Server, you should include statements in the Exit token to delete any aliases established by the Enter token. You should also include commands that reset the work and prefix devices to your computer's local device (see Figure I-5).

NOTE: The order is important in the example below, because you cannot reference a device which you have already deactivated.

Figure I-5: Typical Exit Token

```
:Exit:  
  `SS`Programs`Work `B  
  `SS`Programs`Deactivate `US  
  `SS`Programs`Deactivate `SS
```

:Link: and :Link linkName:

Each development data file can specify one Link token. Following this token, you can specify any number of command lines, each terminated with a CR/LF. Typically this includes a command line invoking the linker program and naming the files that are to be linked and the resultant output file. If more than one link file is needed (for example, when linking overlays), then you can define multiple links in a development data file with Link linkName tokens. When you are doing program development with GRiD Server, you should specify the Link program in Software Subjects, objects in User Subjects and libraries in Software Subjects in your Link or Link linkName token as shown in Figures I-6 and I-7.

Figure I-6: Typical Link Token

```
:Link:
  \SS\Programs\Link \US\Objs\Main.Pas~Obj~,
  \US\Objs\Output.Pas~Obj~,
  \US\Objs\Utilities.Pas~Obj~,
  \US\Objs\FornsInit.Pln~Obj~,
  \SS\Libs\CompactException.Asn~Obj~,
  \SS\Libs\CompactSystemCalls~Lib~ TO Test~Run~ BIND
  NOPURGE NOFASTLOAD PC(PURGE) SS(STACK(2000))
  PRINT(\US\Lsts\Test~MPI~)
```

Figure I-7: Typical Link linkName Tokens

```
:Link Root:
  \SS\Programs\Link \US\Objs\SampleRoot.Pas~Obj~,
  \SS\Libs\p86RN0~Lib~,
  \SS\Libs\p86rn1~Lib~, \SS\Libs\p86rn2~Lib~,
  \SS\Libs\p86rn3~Lib~, \SS\Libs\8087~Lib~,
  \SS\Libs\LargeSystemCalls~Lib~, \SS\Libs\DqLarge~Lnk~,
  TO SampleRoot~Lnk~ OVERLAY(Root) NOPRINT

:Link Overlay:
  \SS\Programs\Link \US\Objs\SampleOverlay1.Pas~Obj~,
  \SS\Libs\p86rn0~Lib~, \SS\Libs\p86rn1~Lib~,
  \SS\Libs\p86rn2~Lib~, \SS\Libs\p86rn3~Lib~,
  \SS\Libs\8087~Lib~ TO
  SampleOverlay1~Lnk~ OVERLAY(SampleOverlay1) NOPRINT
```

**:Listings:**

You can specify one Listing token in each development data file. The string you specify is automatically prepended to file names you have selected with the :Sources: token when those source files are compiled. When you are doing program development with GRiD Server, you should use the Listings token to specify that the file names of list files be prefixed with User Subjects and the appropriate Subject name. For example, the following Listing token specifies that list file names be prefixed with the Device-Subject name of 'User Subjects\Lsts'.

```
:Listings: 'US\Lsts'
```

**:Log File:**

You can specify one Log File token in each development data file. The pathname you specify following the token can be of Kind Database or Text and the file can be used to record or log your activities as you write, debug, and make changes to programs. When you are doing program development with GRiD Server, you should use the Log File token to specify that the log file is to be located in the appropriate subject on the User Subjects device. For

example, the following Log File token specifies that the log file be of Kind Database with a Title of DevelopLog, and that it be located in the subject MyPrograms on the User Subjects device.

```
:Log File: 'US'MyPrograms'DevelopLog-Database-
```

**:Objects:**

You can specify one Objects token in each development data file. The string you specify is automatically prepended to file names you have specified with the Sources token when those source files are compiled. When you are doing program development with GRiD Server, you should use the Objects token to specify that the file names of object files be prefixed with User Subjects and the appropriate Subject name. For example, the following Objects token specifies that object file names be prefixed with the Device-Subject name of 'User Subjects'Objs'.

```
:Objects: 'US'Objs'
```

**:Prefix:**

You can specify one Prefix token in each development data file. The string you specify is the Device-Subject name or simply the Subject name of the subject where source files reside. You can then specify a source file name in the data file by simply giving the Title of the file; the prefix you have specified is automatically prepended to the Title. When you are doing program development with GRiD Server, you should use the Prefix token to specify that source file names should be prefixed with User Subjects and the appropriate Subject name. For example, the following Prefix token specifies that source file names be prefixed with the Device-Subject name of 'User Subjects'MyPrograms'.

```
:Prefix: 'US'MyPrograms'
```

## APPENDIX J: FASTPHONELINK

This section provides information on using FastPhoneLink.

FastPhoneLink also enables you to transmit and receive data at speeds between 100 and 19,200 baud via an external modem or by directly connecting your workstation to the GRiD Server with a serial cable. System Administrators should refer to Chapter 3 of this Addendum for information on how to configure the GRiD Server for FastPhoneLink.

There are two sections in this appendix: the first is for GRiD Compass computers running GRiD-OS Version 3.1.0; the second is for GRiDCase computers running GRiD-OS Version 3.1.5.

### FASTPHONELINK FOR THE GRiD COMPASS (MODELS 110x, 112x, and 113x running Version 3.1.0 of GRiD-OS)

This procedure uses a program, SetFastPhoneLink, that sets up your workstation to transmit and receive data via an external FastPhoneLink modem.

This procedure assumes that you have the following items:

- The phone number for the GRiD Server FastPhoneLink modem
- A FastPhoneLink modem
- A GRiD Model 6100 cable to connect your modem to your workstation
- The following files in the Programs directory on a local storage device:

```

FastPhoneLink  of Kind Device
Serial         of Kind Device
SetFastPhoneLink of Kind Run
USRobotics2400 of Kind Modem

```

Duplicate these files from the Software Subjects device, Programs for GRiD Compass Subject to your local device's Programs Subject. Replace your old version files of the same name with these new ones. After duplication and replacement, reboot your system.

▶ TO USE FASTPHONELINK WHEN RUNNING GRID-OS 3.1.0

1. To use FastPhoneLink, you must be signed off GRiDLink. This is because the serial port on your Compass computer is used to connect the FastPhoneLink modem. Use a GRiD Model 6100 cable to connect your external FastPhoneLink modem to the serial port. Connect the telephone line and AC power cord as shown in the manual for your modem. Ensure that your modem is turned on.

NOTE: The U.S. Robotics Courier 2400 modem is the only FastPhoneLink modem certified by GRiD. The proper switch settings for the U.S. Robotics Courier 2400 baud modem are:

```

1, 5, 6, 7, 10 and group switch (far right) -- Off
2, 3, 4, 8, and 9                          -- On

```

2. From the Programs subject on your local device (see Figure J-1), select the SetFastPhoneLink program and press CODE-RETURN to Confirm.

Figure J-1: Select SetFastPhoneLink

29-Mar-82	GRiD Systems Corporation	11:48 am
PAR Template		Text
Parallel		Device
Pascal		Run
PC		Serial
PhoneLink		Device
Pln		Run
Print		Run
RemoteAdministrator		Run
RemotePrinter		Device
Screen.init	ScreenImage	
ScreenWatch		Run
<u>SetFastPhoneLink</u>		<u>Run</u>
Sound		Device
SpoolSentry		Run
Device	Bubble Memory	
Subject	Programs	
Title	<u>SetFastPhoneLink</u>	
Kind	Run	
Password		
Select a file and confirm or press CODE-RETURN for help		

Once you have entered the SetFastPhoneLink program, the following menu is displayed (Figure J-2):

Figure J-2: FastPhoneLink Menu

```

          Setup For FastPhoneLink
          Cancel FastPhoneLink settings
Quit      CODE-Q   Exit
Cancel    CODE-ESC Exit

Commands: Select item and confirm
Version 37.3.21 of SetFastPhoneLink
Copyright © 1986 GRiD Systems Corporation

```

3. Select the Setup for FastPhoneLink choice and press CODE-RETURN to Confirm. The following menu (Figure J-3) appears:

Figure J-3: Baud Rate and Modem Type Menu

```

300 1200 2400 4800 7200 9600 19200 External clocking
Baud rate 2400
Modem type USRobotics2400

Set Baud rate: Fill in form and confirm

```

As Figure J-3 shows, the default baud rate and modem type are already filled in for you.

4. Press CODE-RETURN to Confirm your choices. The message **Activating devices and setting Baud rate** then appears on your screen. This is followed by the return of the SetFastPhoneLink menu shown in Figure J-2, with the baud rate setting indicated at the bottom.
5. Now press CODE-Q and Confirm to exit the SetFastPhoneLink program.
6. Your Compass computer is now set up to transmit and receive data at 2400 baud via the external FastPhoneLink modem connected to your workstation.

Now select GRiDManager to sign on to your GRiD Server's FastPhoneLink modem, and begin transmitting and receiving data at 2400 baud. In the GRiDManager Sign-on form, the Modem type is set to Internal and the Baud rate is set to 1200 (see Figure J-4). The SetFastPhoneLink program, however, ensures that you transmit and receive data at 2400 baud.

Figure J-4: Sign-On Form for FastPhoneLink

Phone number	9 555 1212
Modem type	Internal
Dial type	Touch-Tone
Baud rate	1200
Voice before data	No
Wait for answer	30
Speaker volume	Medium

Sign-on file in form and confirm.

NOTE: You do not have to reboot your system to cancel the settings for your external modem and use your internal modem; simply select Cancel FastPhoneLink settings, on the SetFastPhoneLink menu (see Figure J-2).

#### FASTPHONELINK WITH THE GRIDCASE COMPUTER (Version 3.1.5 or later of GRID-OS)

This procedure uses a program, SetFastPhoneLink, that sets up your workstation to transmit and receive data via an external FastPhoneLink modem.

This procedure assumes that you have the following items:

- The phone number for the GRiD Server FastPhoneLink modem
- A FastPhoneLink modem to connect to your workstation
- A standard male-female RS-232 cable
- The following files in the Programs directory on a local storage device:

GRiDCase	of Kind	Serial
USRobotics2400	of Kind	Modem

Duplicate these files from the Software Subjects device, Programs for GRiDCase Subject to your local device's Programs Subject. Replace your old version files of the same name with these new ones. After duplication and replacement, select GRiDManager or your Sign-on file. Then select the Update Options form choices, make your choices, and press CODE-RETURN to Confirm. The message Updating choices of typeface, printers and plotters appears on your screen.

#### ▶ TO USE FASTPHONELINK WHEN RUNNING GRID-OS 3.1.5 OR LATER

1. Connect your external FastPhoneLink modem to the serial port on the back of your GRiDCase computer using a standard RS-232 cable (available from your local computer store). Connect the telephone line and AC power cord as shown in the manual for your modem.



NOTE: At the time of publication, the U.S. Robotics Courier 2400 modem is the only FastPhoneLink modem certified by GRiD. The proper switch settings for the U.S. Robotics Courier 2400 baud modem are:

- 1, 5, 6, 7, 10 and the group switch (far right) -- Off
- 2, 3, 4, 8, and 9 -- On

2. Enter GRiDManager and press CODE-0. Be sure that Current Modem is set to USRobotics2400 and that Current Serial is set to GRiDCase (see Figure J-5), and press CODE-RETURN to Confirm.

Figure J-5: Options Form

← Hayes2400External HayesExternal <b>UsRobotics2400</b>	
Current typeface	System-wide
System-wide typeface	Built-in
Current printer	HP2225Parallel
Current plotter	None
Screen frame	On
Stop for errors	Yes
Aspect ratio	Screen
Current modem	<b>UsRobotics2400</b>
Current serial	GRiDCase
Error message source	Main memory (RAM)
<b>Options: Fill in form and confirm.</b>	

3. Select Sign-on, and press CODE-RETURN to Confirm.
4. Ensure that the Connection type is PhoneLink, then fill in the Company, Group, User, and Password fields, and press CODE-RETURN to Confirm.
5. Enter the GRiD Server FastPhoneLink modem phone number and ensure that Modem type is set to Internal and that Baud rate is set to 2400 (see Figure J-6).

Figure J-6: FastPhoneLink Sign-On Form for GRiD-OS Version 3.1.5

Bits per second	300 1200 <b>2400</b> 4800 7200 9600 1920 →
Phone number	^9^555-1212
Modem type	Internal
Dial type	Touch-Tone
Baud rate	<b>2400</b>
Voice before data	No
Wait for answer	30
Speaker volume	Medium
Disconnect after	3
<b>Sign-on: Fill in form and confirm.</b>	

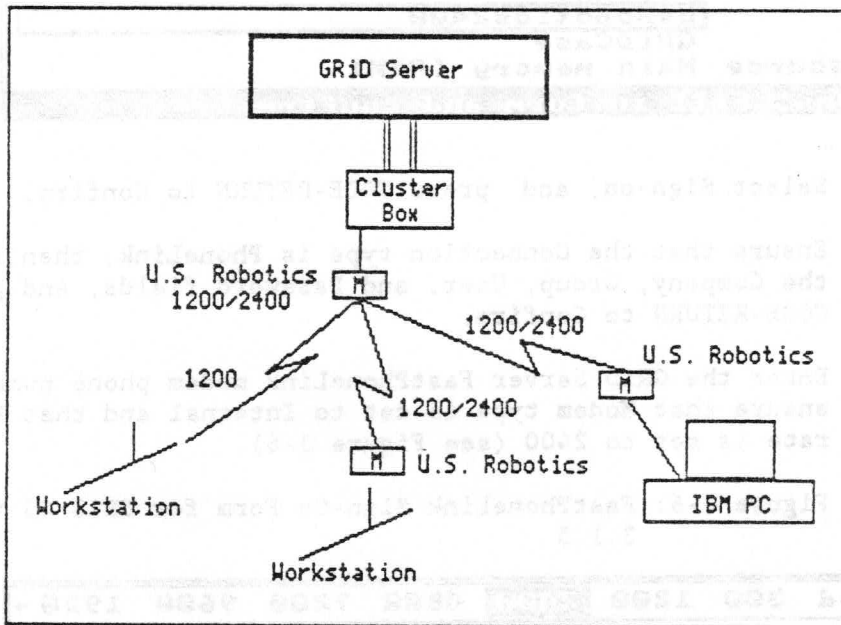
6. Press CODE-RETURN to Confirm this form. Your computer dials the phone number via the external FastPhoneLink modem and signs on to the GRiD Server at 2400 baud.

#### AUTOMATIC SPEED DETECTION FOR PHONELINK

When using the U.S. Robotics Courier 2400 modem on the GRiD Server, it is possible to receive transmissions at 1200 baud or 2400 baud using the same modem and phone line. The modem and GRiD Server automatically detect the speed of the incoming transmission and sets itself to that speed. The port must be configured for 1200/2400.

A 2400 baud port is not used to dial out to a modem that is set to 1200 baud; but the 1200/2400 baud port is used to dial out to modems set to 1200 baud as well as those set to 2400 baud (see Figure J-7).

Figure J-7: Auto Speed Detect



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