GRiD

GRiD 1660

GRiD 1660
User's Guide

The FCC wants you to know ...

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the *FCC Rules*. These limits are designed to provide reasonable protection against harmful radio and TV interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does interfere with radio or television reception, which you can tell by turning the equipment off and on, you are encouraged to try to correct the interference. Use one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the radio/TV.
- Use different outlets for the equipment and the radio or TV.

Shielded cables must be used with this equipment. If you add or replace any cables, the new cables must have shielding capabilities equal to or higher than those provided by the dealer.

Consult a GRiD Systems Center or an experienced radio/TV technician if the problem still exists.

10 9 8 7 6 5 4 3 2 1

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INTRODUCTION

Your GRiD 1660 Notebook Computer gives you the computing power of a desktop computer, yet it also provides the portability you need to work on your documents almost anywhere. The 1660's compact, lightweight design makes the computer ideal for working at home, at the office, at school, or as you travel. You can power the computer from the supplied rechargeable battery or any standard AC outlet, using the supplied AC adapter/charger.

FEATURES

Your computer includes the following features:

- High-speed 80386SL, 25 MHz processor
- 2 1/2-inch, 120 MB hard disk drive
- 3 1/2-inch, 1.44 MB diskette drive
- 2 MB standard memory — expandable up to 20 MB
- 64 KB RAM Cache
- VGA black-and-white backlit LCD screen with 640 x 480 resolution and a maximum 16-level grayscale (64-level grayscale in Mode 13)
- Rechargeable battery
- Built-in pointing device (micro trackball)
- MS-DOS 5.0 and Windows 3.1 installed on the hard disk
- Resume function that lets you turn off the computer while running a program and return to the same point in the program the next time you turn on the computer
- 84-key keyboard with 101-key emulation and separate cursor control keys
- Automatic power-saving control functions
- Support for an 80387SX or 80387SL math coprocessor
- Serial and parallel ports that let you connect devices such as a printer and external floppy drive

(*FEATURES — cont.*)

- Additional ports that let you connect an external VGA monitor, an external keyboard, and a PS/2-type mouse
- Support for a 2400-bps/V.42bis/FAX internal modem (optional)
- 200-pin bus that lets you connect a docking station

CONVENTIONS

This manual uses the following methods of notation to identify various information, text you type, keys you press, and what you see on the computer screen.

Note: Precedes detailed information about a certain section or procedure.

Caution: Precedes information that might help prevent damage to the computer, computer programs, or your documents. This notation also precedes information that tells you when to use extra care for a specific computer function.

Warning: Precedes information that warns you about specific conditions that might cause personal injury.

ENTER Key names that appear in small, heavy, capital letters represent keys you press.

CTRL+C Two or more keys separated by a plus sign represent a *key combination*. To use a key combination, press and hold down the first key. Then, press the other key(s).

`dir` ENTER Characters you type look different from regular text. In this example, you must press **ENTER** after you type the MS-DOS command **`dir`**. With most programs, you can type uppercase or lowercase letters.

`A:\` Characters that appear on the screen also look different from regular text, like the example shown here.

BEFORE YOU BEGIN

Your GRiD 1660 Notebook Computer includes the following items. When you unpack the computer, confirm that all items are present. If any item is missing, contact your GRiD sales representative.

- Computer
- AC Adapter/Charger
- Rechargeable Battery
- Six 1.44 MB Windows Diskettes
- Three 720 KB MS-DOS 5.0 Diskettes
- One 720 KB Utilities Diskette
- GRiD 1660 User's Guide
- Windows Documentation

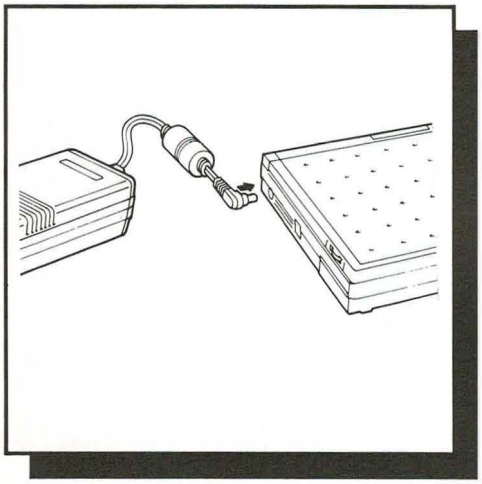
GETTING STARTED

CONNECTING POWER

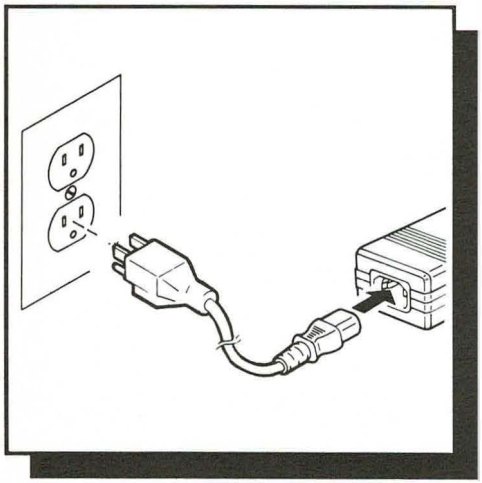
You can power the computer from the supplied AC adapter/charger or from the rechargeable battery.

Using the AC Adapter/Charger

You can use the computer right away with AC power. To attach the AC adapter/charger, follow these steps.



1. Plug the adapter/charger's DC plug into the computer's **DC IN 22.8 V** jack (on the computer's left side).



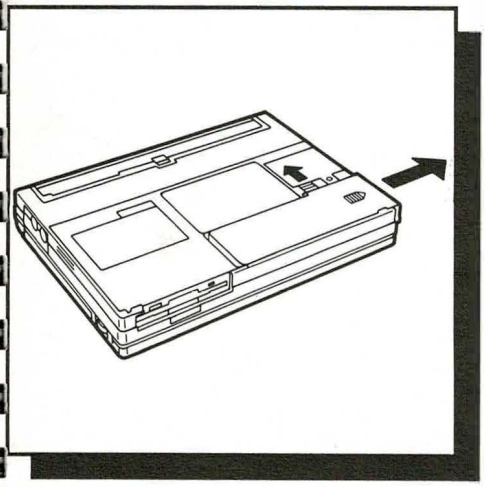
2. Insert the power cord's inlet plug into the adapter/charger's inlet socket.
3. Insert the AC plug into a standard, grounded AC outlet.

Caution: Using an AC adapter/charger other than the one supplied with the computer might damage the battery or the computer.

Note: It is normal for the adapter/charger to become warm during use.

Precautions for Battery Use

- To prevent damaging the battery, the computer interrupts charging if the temperature is outside the range of about 40°F to 100°F (4°C to 38°C). Charge the battery only within this range.
- Never expose the computer to extreme heat or cold. Do not leave the computer in direct sunlight or in another hot area (such as inside a car) for a long period of time, and do not expose the battery to an open flame.
- Do not connect the battery's negative and positive terminals to each other.
- To save battery power, turn off the computer when you finish using it with the battery.
- If you plan not to use the computer with the battery for more than about a week, remove the battery.
- Eventually, the battery loses its ability to maintain a charge. When this occurs, replace the battery with the same type of battery (nickel metal hydride). Then, fully charge the new battery before you use it.
- Be careful not to drop the battery. Doing so could short-circuit the battery or damage its insulation, which could result in overheating or a fire.
- Do not touch or bend the battery terminals in the computer's battery cavity. Dirty or damaged terminals could reduce the battery's performance.



Removing the Battery

To remove the battery, follow these steps:

1. Turn off the computer and disconnect the AC adapter/charger.
2. Turn the computer upside down.
3. Slide and hold down the battery release button. While you hold down the button, slide the battery in the direction of the arrow and lift out the battery.
4. Turn the computer right side up.

Recharging the Battery

When the computer's **BATT** indicator is red, recharge the battery. To do so, connect the AC adapter/charger to the computer as described in "Using the AC Adapter/Charger." The **BATT** indicator turns orange and charging begins. When the battery is at least 90% charged, the indicator changes to green.

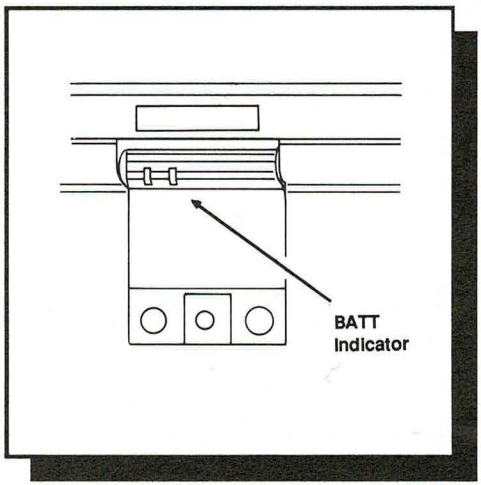
Charging time depends on the following conditions:

- If the computer is off, the battery charges in about 2 hours.
- If the computer is on, the battery charges in 2 to 5 hours.
- If you installed an optional docking station, the battery charges in 3-5 hours.

Battery Status Indicator

The computer's **BATT** (battery) indicator (on the computer's center hinge) shows you the battery's status when the computer is on. The following table describes each indication.

BATT Indicator	Meaning
Off	The computer is being powered from only the battery or the battery is too low to light the indicator.
Orange	The battery is charging. (AC power is connected.)
Green	The battery is at least 90% charged.
Flashing orange	The computer is being powered from an AC outlet, and the battery is not installed, improperly installed, or might be defective.
Red * (See next page.)	The battery has less than 10 minutes of power left.
Flashes red	There might be a problem with the battery and/or its charging circuit.



* **Caution:** When the **BATT** indicator changes to red, the battery can supply power for about 10 more minutes. The computer sounds a beep the last 2 minutes of this 10-minute period. At the end of 2 minutes, the computer enters the suspend mode if you set the Battery Low Suspend option to *YES* on the advanced setup menu. (See "Using the Setup Program.")

  If the **BATT** indicator is red, save any files on the computer's hard disk. Then, connect the AC adapter/charger and recharge the battery. If this is not possible, install a spare, fully-charged battery. Before you install the spare battery, save all data, enable the resume function, turn off the computer, and replace the battery. (See "Using Resume.") Then, turn the computer back on and resume operation.

Note: Your computer includes a battery utility program that can show you the battery's remaining power. See "Appendix D - Battery Utility."

OPERATION

PRECAUTIONS

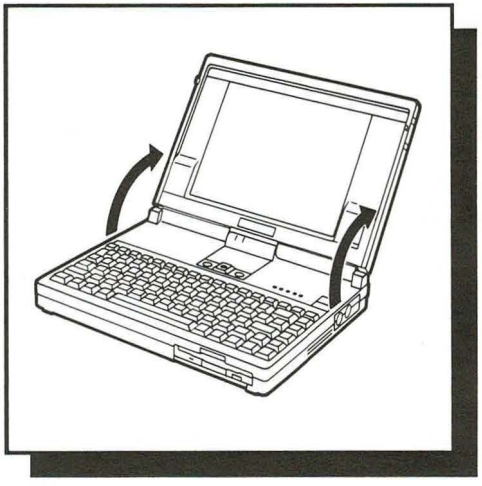
Before you use the computer, read and follow the information below:

- Do not store or use the computer in locations exposed to extreme heat or cold. The ideal ambient temperature range during use is 40°F to 100°F (4°C to 38°C).
- Do not store or use the computer in areas where there is high humidity or excessive dust.
- Do not place drinks or other liquids near the computer.
- Avoid suddenly moving the computer from a cold location to a warm one. Doing so might cause condensation to form on the hard disk drive, damaging the computer. If you must suddenly move the computer from a cold area to a warm area, allow about 2 hours for any condensation to evaporate before you use the computer.
- Do not expose the computer to severe vibrations or impacts.
- Do not place heavy objects on top of the computer.
- Do not place the computer on a couch, cushioned chair, rug, or similar surface. Doing so prevents proper dissipation of heat.
- Do not try to disassemble the computer.
- Do not allow small children to play with the computer.
- Do not hold the computer by the LCD panel when the panel is open.
- Do not hold the computer by the battery compartment if the battery is removed.

STARTING THE COMPUTER

Follow these steps to start the computer.

1. Pull the latches on both sides of the computer toward you, and raise the display panel.
2. Press and hold down **POWER** for about 1 second to turn on the computer. After a few seconds, the computer displays the Windows screen.
3. Tilt the screen to a comfortable viewing angle, and adjust the contrast control (at the lower right corner of the display).



Note: Windows™ 3.1 is installed on the computer's hard disk. For more information, refer to Windows documentation.

UNDERSTANDING THE DRIVES

Your computer has a hard disk drive and a diskette drive.

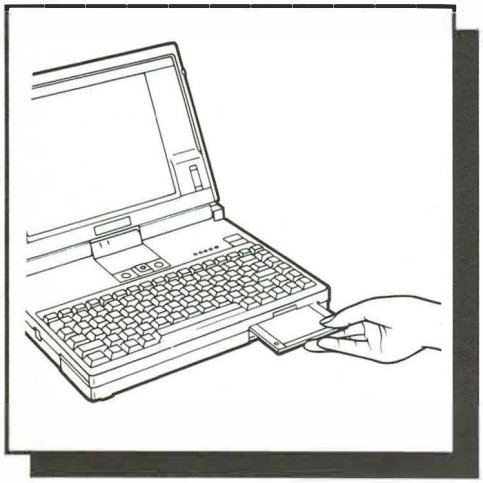
The hard disk drive (usually called Drive C) can store about 120 million bytes of information. The hard disk can store much more information than a diskette, and the computer takes less time to find information on the hard disk than on a diskette.

The diskette drive (usually called Drive A) uses 3 1/2-inch diskettes. You can use either double-density diskettes that can hold up to 720 KB of information or high-density diskettes that can hold up to 1.44 MB of information.

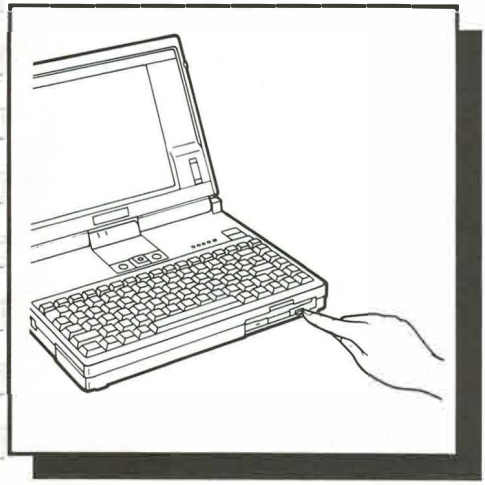
Caution: When the **DISK** or diskette drive indicator is on, the computer is reading from or writing to the hard disk or diskette. To prevent losing or distorting information, do not turn off the computer when either of these indicators is on.

Using the Diskette Drive

You can use the computer's diskette drive to copy files and make backups of hard disk files. See "Backing Up Information." You can also use the diskette drive to copy programs from a diskette to the hard drive.



To insert a diskette, slide it label side up and metal plate first into the diskette drive's slot until the diskette locks into position.



To remove a diskette from the drive, press the drive's eject button and pull out the diskette.

Note: When you format a diskette, be sure you format it for the correct capacity (720 KB or 1.44 MB).

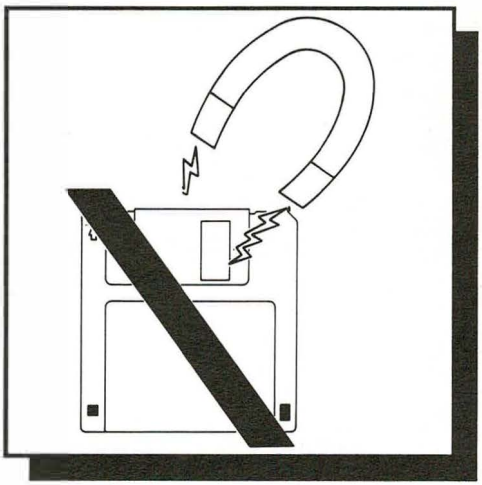
Cautions:

- To prevent damage to the diskette drive, remove the diskette from the drive before you move the computer.
- Do not remove a diskette when is the diskette drive indicator is on.

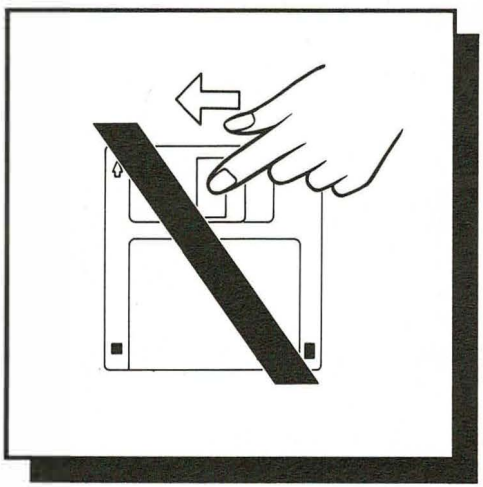
Caring for Diskettes

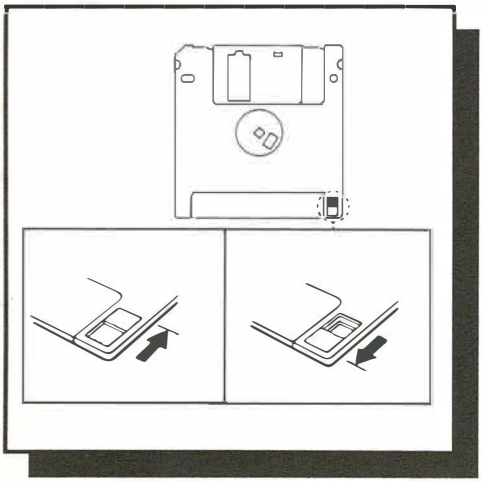
To protect diskettes (and the information they contain) from damage, follow these guidelines:

- Handle diskettes carefully. A scratch, small dent, or dust can destroy information on a diskette.
- Do not use damaged diskettes.
- Keep diskettes out of direct sunlight and away from excessive heat.
- Keep diskettes away from cigarette ashes, dust, and other small particles.
- Keep diskettes away from magnetic fields (such as transformers, AC motors, magnets, TVs, and radios).



- Handle diskettes with the metal shutter closed. Never touch the material inside the diskette.





Write-Protecting a Diskette

Diskettes have a special window that prevents information from being overwritten, erased, or stored on the diskette.

To enable writing, editing, and storing information on a diskette, close its window.

To write-protect a diskette, open its window.

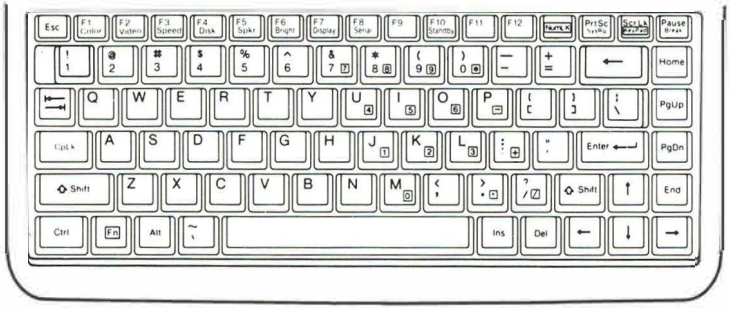
Note: The write-protect window does not prevent information on the diskette from being lost because of exposure to a magnetic field or a bulk diskette eraser.

USING THE KEYBOARD

Your computer has 84 keys that can emulate most of the functions of a standard 101-key keyboard. The keyboard consists of four sections — typewriter keys, control keys, arrow (cursor) keys, and special keys. The functions of most of these keys depend on the program you use.

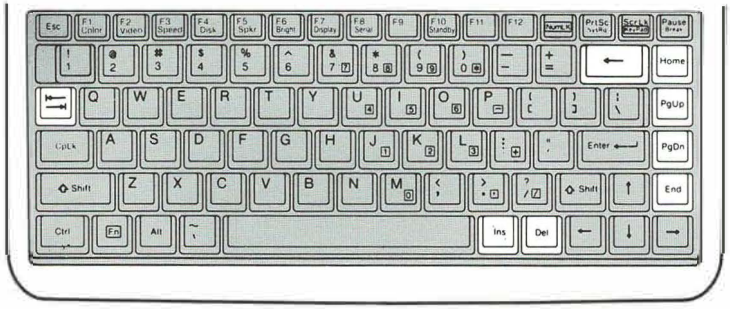
Typewriter Keys

The typewriter keys include the letters and numbers on the keyboard and are similar to keys on a standard typewriter.



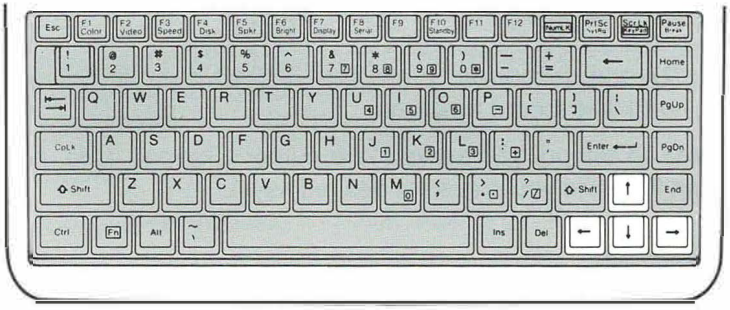
Control Keys

You use some control keys to move to a different place in a document. For example, pressing **PGUP** moves the document to the previous page. Other control keys move the cursor or delete or insert text at the current cursor position. For example, pressing the tab key moves the cursor to the next tab position.



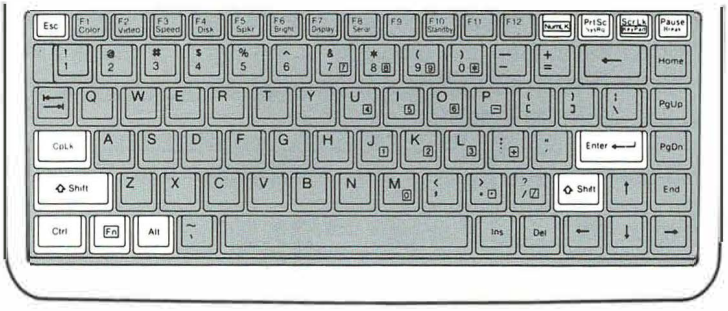
Arrow (Cursor) Keys

The cursor keys move the cursor up, down, to the left, and to the right.



Special Keys

The special keys control the operation of the computer or programs you use. For example, pressing **PRTSC/SYSRQ** sends to the printer the information currently on the screen.



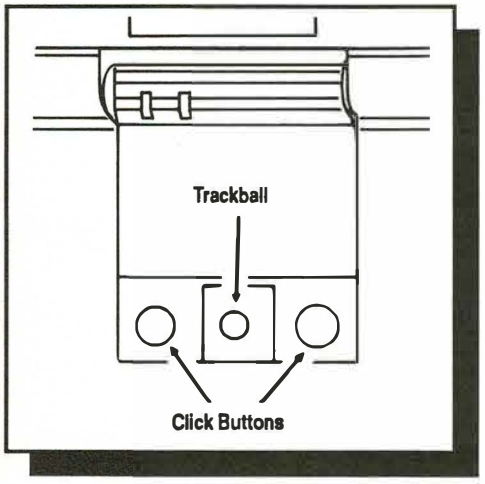
NUMERIC KEYPAD

The keyboard's numeric keypad area is similar to a calculator keypad. Press **FN+KEYPAD** to activate the numeric keypad area. The **KEYPAD** indicator lights. If the **NUMLK** indicator is not on, press **NUMLK**. The values of the keys on the numeric keypad area are 0-9, decimal (.), plus (+), minus (-), multiplication (*), and division (/). Press **FN+KEYPAD** again to return to the normal keyboard functions.

Note: To temporarily activate the numeric keypad area, hold down **FN** while you press the desired keys.

You can also use the keyboard's numeric keypad area to emulate other keypad functions of a standard 101-key keyboard. If you turn off the **NUMLK** indicator while the keypad is active, the numeric keypad area provides alternate cursor keys, **HOME**, **END**, **PGUP**, **PGDN**, **INS**, and **DEL**. Some programs require you to use these alternate keys instead of the separately provided keys. See the diagram to the right for the alternate functions. Press **NUMLK** to switch between numeric key entry and the alternate functions.

Indicator Status	Result
KEYPAD ON **NUMLK ON**	**Numbers** — (with **SHIFT** held down, alternate function keys)
KEYPAD OFF **NUMLK OFF**	**Letters** — (with **SHIFT** held down, shift characters)
KEYPAD ON **NUMLK OFF**	**Alternate Functions** — (with **SHIFT** held down, numbers)
KEYPAD OFF **NUMLK ON**	**Letters** — (with **SHIFT** held down, shift characters)



USING THE MICRO TRACKBALL

Your computer has a built-in micro trackball that you can use as a pointing device if you do not have a mouse. As you spin the trackball with your fingertips, the cursor moves in the direction of the trackball's motion. The click buttons to the left and right of the trackball emulate the left and right buttons on a standard mouse. You can change the trackball's sensitivity by using the MOUSECON.COM command. See "MS-DOS Quick Reference."

Cautions:

- Operate the trackball and click buttons gently.
- Avoid using the trackball with dirty hands. The trackball might not operate correctly if it gets dirty.
- Do not place heavy items on the trackball and click buttons.

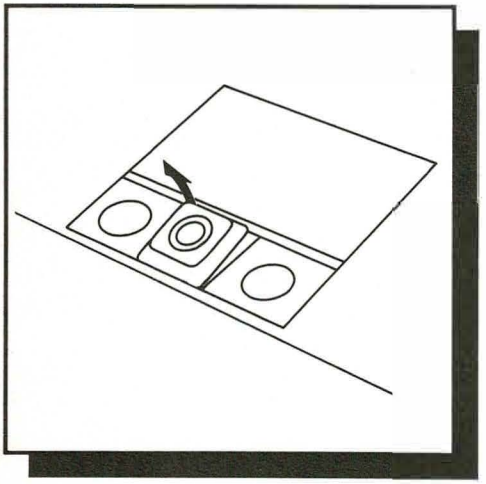
Note: The trackball remains active if you connect a PS/2-type mouse. However, if you want to use a serial mouse, you must run Set1660 and set the Trackball/Mouse option to *Disabled*.

Cleaning the Trackball

If the trackball gets dirty, it might not operate properly. Follow these steps to remove and clean the trackball.

Cautions:

- Do not use chemical solvents to clean the trackball.
- After you remove the trackball cover, do not touch any metal parts in the computer.



1. Insert the blade of a small, flat-blade screwdriver or a similar tool into the slot between the top left corner of the trackball cover and the computer. Then, carefully pry up and remove the cover, starting with the left side.

   Note: Be careful not to break the tabs on the cover.

2. Remove the trackball from the compartment.
3. Clean the trackball with soap and water. Then, rinse the trackball with water and thoroughly dry the trackball with a clean, soft cloth.
4. Replace the trackball and its cover.

   Note: The cover fits only one way.

SETTING AND USING A PASSWORD

You can protect your computer from unauthorized use by setting a password. If you set a password, you must enter it each time you turn on or restart the computer.

To set, change, or disable a password, type the following:

```
setpass
```

The password screen appears. This screen provides all the information you need to set a password, change an existing password, or disable the password.

Once you set or enable a password, you must enter the exact password each time you turn on or restart the computer to have access to your files or programs. When you turn on the computer and Resume is not active, or, if you restart the computer, the message `enter password` appears on the screen. Enter your password at this prompt. When you turn on the computer and Resume is active, a tone that starts at a low pitch and rises to a higher pitch sounds. When you hear this tone, enter your password.

You have three tries to enter the correct password. If you enter a third incorrect password after you restart the computer, the computer automatically restarts. If you enter a third incorrect password after you turn on the computer when Resume is active, the computer re-enters the suspend mode. If you forget your password, call the GRiD Resource Center at 1-800-654-GRID (4743) for assistance.

USING RESUME

The resume feature lets you turn off the computer while running an application and return to the same point in the application the next time you turn on the computer. This saves you from reloading the application and helps you conserve battery power.

Your computer comes with the Resume feature turned off. You can enable Resume by running the setup program (Set1660) or the power program (Powr1660) and setting Resume to *ON*.

Cautions:

- The Resume feature works only if you turn off the computer with the **POWER** button or if the suspend mode feature automatically turns off the computer.
- The Resume feature might not work with some applications, so be sure to save all information to a diskette or the computer's hard disk before you turn off the computer, even if Resume is on.

The length of time Resume remembers your place within an application depends on how much RAM your computer has and on the condition of the computer's battery. (See "Installing Extra RAM.") The following chart shows the typical memory times under various conditions.

Amount of RAM	Memory Time with a Fully Charged Battery	Memory Time with a Discharged Battery
2 MB	1 Week	1 Hour
4 MB	6 Days	1 Hour
8 MB	5 Days	1 Hour

Notes:

- The main battery powers the resume function by periodically recharging the backup battery. When the main battery is not connected and the backup battery loses power, the resume function does not work. To help prevent losing information, we suggest you keep the main battery connected when you use the resume function and regularly save your work to the hard disk. Also, enable the resume function before you replace the main battery.
- The computer might not recognize an external device after the computer resumes operation. If this occurs, re-initialize the device.
- To erase the resume function's memory, restart the computer by pressing the recessed **RESET** button or the key combination **CTRL+ALT+DEL**.
- The resume function does not work with a docking station.

CUSTOMIZING YOUR COMPUTER

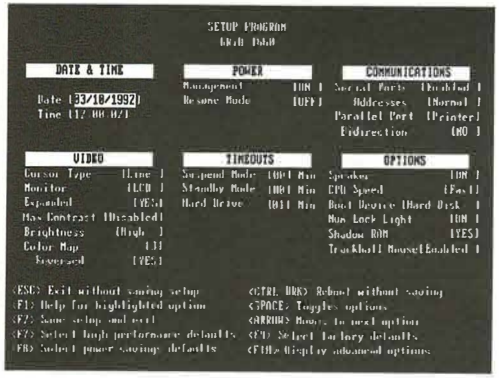
This section tells you how to customize your computer using the provided setup and power programs.

USING THE SETUP PROGRAM

Your computer's setup program (Set1660) lets you set specific operation parameters for the computer. This gives you control over various power-management functions, communication settings, video settings, and other functions. The setup program includes two sections — basic setup and advanced setup. The basic setup menu includes parameters you might want to change on a regular basis. The advanced setup menu includes parameters that let you control advanced computer functions such as the suspend and standby mode inactivity triggers and the cache memory. You normally do not need to change these parameters.

Running the Basic Setup Program

To run the basic setup program, type **`set1660`**. Then, press **ENTER**. The basic setup menu appears.



To allow access to the advanced setup menu, type **`set1660 /a`**. Then, press **ENTER**. The basic setup menu appears with the **<F10>** option at the bottom right of the screen. See "Running the Advanced Setup Program."

The chart on the next page shows the parameters on the basic setup menu and each parameter's default setting.

Parameter	Default Setting
DATE & TIME	
Date	Valid Date
Time	Valid Time
POWER	
Management	ON
Resume Mode	OFF
COMMUNICATIONS	
Serial Ports	Enabled
Addresses	Normal
Parallel Port	Printer
Bidirection	YES
Floppy*	B: 1.44MB 3.5"
VIDEO	
Cursor Type	Line
Monitor	LCD
Expanded	YES
Max Contrast	Disabled
Brightness	High
Color Map	1
Reversed	YES
TIMEOUTS	
Suspend Mode	00 Min
Standby Mode	08 Min
Hard Drive	04 Min
OPTIONS	
Speaker	ON
CPU Speed	Fast
Boot Device	Hard Disk
Num Lock Light	ON
Shadow RAM	YES
Trackball, Mouse	Enabled

* This parameter appears only when you select *Floppy* as the parallel port device.

The following information describes the function of each parameter.

Date and Time — lets you set the date and time for MS-DOS.

Management — saves battery power by allowing the computer to dynamically lower its CPU speed when there is no keyboard or disk activity.

Note: The computer might require more time to perform internal calculations (such as those for large spreadsheets or similar applications). To operate the computer at a fixed speed (12.5 MHz or 25 MHz), set Management to *OFF*.

Resume Mode — lets you turn the resume feature on or off. See "Using Resume."

Serial Ports — lets you turn the serial ports on or off.

Addresses — assigns the serial port and modem addresses. You can choose the normal addresses (COM1 as the serial port and COM2 as the modem port), or you can swap the addresses.

Parallel Port — lets you select a printer or an external diskette drive as the computer's parallel port device.

Bidirection — lets you select bidirectional (*YES*) or unidirectional (*NO*) printer operation if you select *Printer* as the parallel port device.

Floppy — lets you assign the drive letter and storage volume description of an external diskette drive if you select *Floppy* as the parallel port device. If you assign the diskette drive as Drive A, the computer automatically reassigns the internal diskette drive as Drive B.

Cursor Type — lets you select a line or block type cursor.

Monitor — lets you set the computer to use the built-in LCD screen, an external VGA CRT monitor, or both simultaneously.

Expanded — in the VGA mode, lets you choose between the normal display character set and an expanded set that is slightly taller than normal and uses the entire LCD screen.

Max Contrast — when enabled, provides maximum contrast between the foreground and background and lets you press **FN+ALT+F1** to switch between normal and reverse video. When disabled, you can press **FN+F1** to switch between 6 shades of gray for each screen (normal and reverse). Choose the setting that looks best with the application(s) you use.

Notes:

- When Max Contrast is enabled, it might be difficult to distinguish between similar colors for some applications.
- When Max Contrast is enabled, it has no effect on an external monitor.

Brightness — lets you set the brightness of the computer screen. You can select a low, medium, or high setting.

Color Map — lets you select any one of six color map settings to get the best display for the programs you use. You can also change the color map from MS-DOS. See "Using Colormap."

Reversed — lets you set the computer to display a black foreground on a white background. The normal setting displays a white foreground on a black background.

Note: This setting affects only the LCD screen and does not affect an external monitor.

Suspend Mode — lets you select the number of minutes of video RAM, port, and hard drive inactivity before the computer enters the suspend mode. You can select 00, 10, 20, 30, 40, 50, or 60 minutes. You must set the Resume Mode parameter to *ON* for the suspend mode to have any effect. The computer never enters the suspend mode if you select *00*.

Note: If you enable the suspend mode when Resume is off, the setup program automatically enables Resume.

Standby Mode — lets you select the number of minutes of system inactivity before the display and hard drive turn off. You can select 00, 1, 2, 4, 8, 16, 32, or 64 minutes. Press any key to turn these components back on. The computer never enters the standby mode if you select *00*.

Note: If the computer enters the standby mode and you connected an external VGA monitor, the monitor stays on even though the built-in LCD turns off.

Hard Drive — lets you select the number of minutes of hard drive inactivity before the hard drive turns off. You can select 00, 1, 2, 4, 8, or 16 minutes. The hard drive does not turn off if you select *00*.

Speaker — lets you turn the computer's speaker on or off.

CPU Speed — lets you select the computer's processing speed. You can select *Fast* (25 MHz) or *Slow* (12.5 MHz).

Boot Device — lets you select whether the computer starts up (boots) from the hard disk or a floppy diskette.

Note: You can override this setting by pressing **F** (floppy disk) or **H** (hard disk) within 2 seconds after the beep sounds during start up.

Num Lock Light — lets you set the **NUMLK** indicator to automatically turn on when you turn on the computer. See "Numeric Keypad Area."

Shadow RAM — assigns part of the RAM between 640 KB and 1 MB as *Shadow* RAM. If you set Shadow RAM to *NO*, the computer uses 384 KB for extended memory. If you set Shadow RAM to *YES*, part of this memory shadows the machine BIOS and the rest of it is used as extended memory. This might result in slightly faster performance.

Trackball, Mouse — lets you enable or disable the built-in trackball and mouse port.

The information below explains the menu options:

ESC — press to exit the setup program without saving any changes you made. The MS-DOS prompt appears.

F1 — press to display the help screen for the highlighted parameter. This screen describes the available options for the parameter and shows its factory default.

F2 — press to save any changes you made, exit the setup program, and restart the computer so that the changes can take effect.

F7 — press to select the default settings for the high-performance parameters, which allow the computer to operate at its optimum level. You can still change the settings as needed.

F8 — press to select the default settings for all power-saving parameters, which allow the computer to save battery power by operating at the most efficient level. You can still change the settings as needed.

CTRL-BRK — press to restart the computer without saving any changes you made.

SPACE — press to toggle between the options for the highlighted parameter.

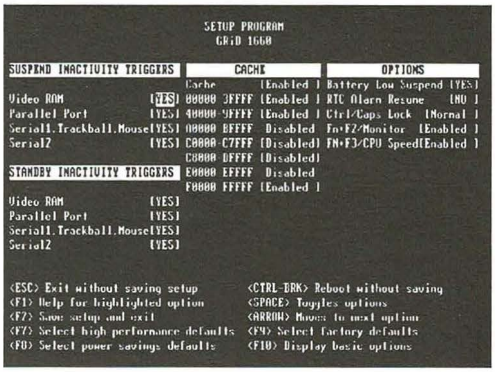
ARROW — press the arrow keys to highlight the parameters.

F9 — press to select the factory default settings for all paramters. You can still change the settings as needed.

F10 — press to display the advanced setup options screen. This key appears only when you type **`set1660 /a`** to run the setup program.

Running the Advanced Setup Program

The computer's advanced setup program lets you set parameters that control various timeout, power-management, and memory-allocation parameters. To run the advanced setup program, type **set1660 /a**. Then, press **F10** to display the advanced setup menu.



Note: You can press **F10** to toggle between the basic and advanced setup menus.

The chart below shows the advanced setup menu parameters and each parameter's default setting.

Parameter	Default Setting
SUSPEND MODE INACTIVITY TRIGGERS	
Video RAM	YES
Parallel Port	YES
Serial 1, Trackball, Mouse	YES
Serial 2	YES
STANDBY MODE INACTIVITY TRIGGERS	
Video RAM	YES
Parallel Port	YES
Serial 1, Trackball, Mouse	YES
Serial 2	YES
CACHE	
Cache	Enabled
00000 – 3FFFF	Enabled
40000 – 9FFFF	Enabled
A0000 – BFFFF	Disabled
C0000 – C7FFF	Enabled
C8000 – DFFFF	Disabled
E0000 – EFFFF	Disabled
F0000 – FFFFF	Enabled
OPTIONS	
Battery Low Suspend	YES
RTC Alarm Resume	NO
Ctrl/Caps Lock	Normal
FN+F2/Monitor	Enabled
FN+F3/CPU Speed	Enabled

The following information describes the options on the advanced setup menu:

Suspend and Standby Mode Inactivity Triggers — let you set the computer to monitor the activity of the computer's video RAM, the parallel port and serial ports, the micro trackball, and the mouse. For example, if you set the Trackball option to *YES*, the computer enters the suspend or standby mode after the number of minutes of inactivity you select on the basic setup menu. Any trackball activity resets the suspend and standby mode timers. If you set the Trackball option to *NO*, you disable the resetting of the timers. This is also true for the other devices listed above.

> **Caution:** Setting inactivity trigger options to *NO* might interrupt modem transmissions.

Cache — lets you enable or disable the cache memory of the computer. Select *Enabled* to improve the performance and power savings capability of the computer. Select *Disabled* to correct problems with drivers, programs, or hardware (such as adapter cards in the docking station). You can also enable or disable all but two specific cache ranges. The following information describes each range and its use:

00000-3FFFF (0KB to 256KB) and *40000-9FFFF* (256KB to 640KB) — Enabling these ranges of conventional memory improves the overall performance of the computer.

A0000-BFFFF (640KB to 768KB) — You cannot enable this cache range.

C0000-C7FFF (768KB to 800KB) — This range holds the video BIOS. Enabling this range can cause conflicts when software writes to this area or if the video BIOS operates incorrectly while it runs in the cache memory. When you set Shadow RAM to *NO* in basic setup, the computer automatically disables this range and you cannot enable it.

C8000-DFFFF (800KB to 896KB) — This range is reserved for adapters.

E0000-EFFFF (896KB to 960KB) — You cannot enable this cache range.

F0000-FFFFF (960KB to 1024KB) — This range contains the system BIOS. When you set Shadow RAM to *NO* in basic setup, the computer automatically disables this range and you cannot enable it.

Battery Low Suspend — lets you set the computer to enter the suspend mode when battery power becomes low. Select *YES* to enable this function. Select *NO* to disable the function.

RTC Alarm Resume — lets you set the computer to exit the standby mode and resume operation if an alarm for the real-time clock occurs. Set this option to *NO* if you do not want the computer to resume operation if an alarm occurs.

Note: Separate software is required to set the alarm.

Ctrl/Caps Lock — lets you switch the positions of the keyboard's **CTRL** and **CAPS LOCK** keys. Select *Normal* if you want these keys to function as they are labeled on the keyboard. Select *Swapped* if you want to switch the functions of the labeled keys. If you select *Swapped*, be sure you switch the keycaps.

FN+F2/Monitor — lets you toggle between the built-in LCD screen and an external monitor by pressing the key combination **FN+F2**, if you select *Enabled*. Select *Disabled* to disable this key combination.

Note: This key combination might not operate if the system is in the 80386 protected mode (Windows enhanced mode, for example).

FN+F3/CPU Speed — lets you toggle between two CPU speeds (12.5 MHz and 25 MHz) by pressing the key combination **FN+F3**, if you select *Enabled*. Select *Disabled* to disable this key combination.

USING THE POWER PROGRAM

The power program lets you temporarily change the power-management parameters without restarting the computer. These parameters let you do the following:

- Turn power management on or off
- Enable or disable the serial ports
- Set the hard drive timeout
- Set the standby mode timeout
- Turn Resume on or off
- Set the suspend mode timeout

Note: The power program settings are valid only for the current operating session. If you restart the computer by pressing **RESET** or **CTRL+ALT+DEL**, or if you press **POWER** to turn off the computer when Resume is not enabled, the computer returns to the setup program settings.

To run the power program, follow these steps:

1. Exit any application you are running.
2. If you are not in Drive C, type the following:

   c: ENTER

3. Select the DOS directory by typing the following:

   cd \dos ENTER

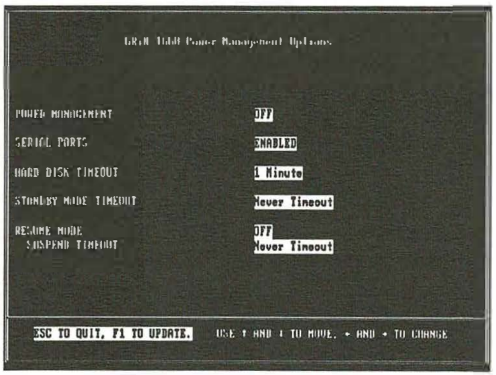
4. At the prompt, type the following:

   powr1660 ENTER

   The Powr1660 program screen appears.

   Use the up and down arrows to select the parameter you want to change. Then, press the left and right arrows to choose the setting for the parameter.

5. Press **F1** to immediately activate the changes. If you do not want to activate the changes, press **ESC**.



USING COLORMAP

The utilities diskette has a color map utility that lets you make the computer's display more readable for certain applications. You can choose from six different color map settings.

To display the current color map, type the following:

`colormap` **ENTER**

To change the color map setting, type `colormap`, followed by the desired color map setting (1-6). Then, press **ENTER**.

Notes:

- The color map setting you select using the COLORMAP command replaces the setting you select using Set1660.
- You can also create custom color maps using the CMAP1660 command. See "Appendix C-Color Map Utility."

USING KEY COMBINATIONS

You can also control computer functions by using *key combinations*. To use a key combination, press and hold down the keys in the sequence indicated. For example, pressing and holding down **FN** and then pressing **F7** turns off the computer's LCD and backlight. Pressing any key turns the LCD and backlight back on.

Special Key Combinations

The following key combinations have special significance to the computer's processor or screen.

FN+F1 (Color)	Lets you select from various color maps when Max Contrast is disabled in Set1660. Choose the setting that works best with the software you are using. **Note:** The color map you select with this combination updates the computer's CMOS.
FN+ALT+F1 (Reverse)	Switches between normal and reverse video if you enable Max Contrast.

FN+F2 (Video) Lets you select the built-in screen, an external monitor, or both.

Note: This key combination might not operate if the system is in the 80386 protected mode (Windows enhanced mode, for example).

Power Management Key Combinations

If you need to pause your work, you can put one or more computer functions in a standby mode to conserve battery power.

FN+F3 (Speed) Switches the processor speed between fast (25 MHz) and slow (12.5 MHz). At the fast setting, the **POWER** indicator is green. At the slow setting, the indicator is orange.

Note: If you disable the CPU speed control option in the advanced setup menu, this key combination does not work.

FN+F4 (Disk) Turns off the hard disk drive motor. The next time the computer accesses the drive, it automatically turns back on.

FN+F5 (Spkr) Turns off the internal speaker. Press **FN+F5** again to turn the speaker back on.

FN+F6 (Bright) Changes the backlight brightness setting. Press and hold down **FN**. Then, repeatedly press **F6** to step through the three stages of backlight brightness (low, medium, and high).

FN+F7 (Display) Turns off the LCD and its backlight. Press any key to turn the LCD and backlight back on.

FN+F8 (Serial) Disables the serial port and modem. Press **FN+F8** again to enable the port and modem.

FN+F10 (Standby) Turns off the hard disk drive motor, the LCD and its backlight, and slows the CPU speed. Pressing any key turns the LCD and backlight back on. As you continue your work, the hard disk drive turns on the next time you need it and the CPU returns to the normal speed.

Notes:

- These key combinations might not operate with some programs.
- If you use the computer for serial port transfers, using the function keys might disrupt communication.

MEMORY USE

Your computer comes standard with 2 megabytes (MB) of RAM (random access memory). The first 640 kilobytes (KB) is called conventional memory. The 384 KB between 640 KB and 1024 KB is called *reserved* memory. You can allocate part of the reserved memory (128 KB) as Shadow RAM. The computer allocates the remaining reserved memory as extended memory (memory above 1 MB).

When you set Shadow RAM to *YES* in the setup program, you allocate 128 kilobytes of the reserved memory as Shadow RAM. This enables the computer to read the system ROM (read-only memory) and/or video BIOS (basic input-output system) at a high speed, increasing the video processing speed or the speed of the entire system.

USING EXTENDED MEMORY AS EXPANDED MEMORY

Some programs require EMS (Expanded Memory Specification) memory to run properly. You can allocate some of the extended memory as expanded memory by using the EMM386 program, located in the C:\DOS directory. To enable EMM386.EXE, you must update the computer's config.sys file.

First, make a backup of the config.sys file by typing the following at the **c:** prompt:

```
copy config.sys config.old ENTER
```

This creates a second copy of the config.sys file. Use the file named *config.old* as the backup file and edit the file named *config.sys*.

To update the config.sys file, type **edit c:\config.sys** at the **c:** prompt. Then, press **ENTER**. The Edit program starts and the following list appears:

```
DEVICE=C:\DOS\SETVER.EXE

DEVICE=C:\DOS\HIMEM.SYS

DOS=HIGH

FILES=10
```

Insert the following line between **DOS=HIGH** and **FILES=10**:

```
DEVICE=C:\DOS\EMM386.EXE 256
```

Note: The number 256 in the line above is the default value (in kilobytes) for the amount of memory the computer allocates as EMS memory. You can enter any number that is a multiple of 16, from 16 to the amount of available memory. If you enter a number that is not a multiple of 16, the computer rounds down the number to the nearest multiple of 16.

The list should now look like this:

```
DEVICE=C:\DOS\SETVER

DEVICE=C:\DOS\HIMEM.SYS

DOS=HIGH

DEVICE=C:\DOS\EMM386.EXE 256

FILES=10
```

Press **ALT**, press **F** to select the file menu, select the save command, and press **ENTER**. Then, exit the EDIT program and restart the computer. Type **mem** at the DOS prompt to check the computer's memory status. Confirm that the amount of EMS memory matches the amount you entered in the line you added to the config.sys file.

RESERVED MEMORY MAP

The computer maps the items in the reserved memory as follows:

A0000–BFFFF — Video Memory

C0000–C7FFF — VGA BIOS

C8000–DFFFF — Unoccupied

E0000–E7FFF — Phantom copy of VGA BIOS

E8000–F3FFF — Diagnostics

F4000–FFFFF — System BIOS

ADDING OPTIONS

You can get even more from your computer by adding options such as a RAM card, a modem card, a mouse, a printer, an external VGA monitor, and a docking station. The serial port, parallel port, VGA monitor port, RAM card slot, and docking station (AT BUS) port are under the back cover.

To open the back cover, pull it down from the center. You also can slightly elevate the back of the computer by folding the cover back under the computer as far as it can go until it locks into place. This is necessary if you connect a docking station.

Note: When you add an optional device to the computer, be sure you disable the resume function and turn off the computer.

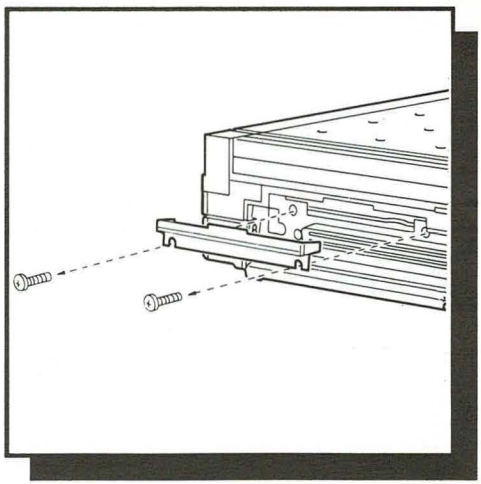
INSTALLING EXTRA RAM

Your computer comes standard with 2 MB of RAM. However, your computer's RAM card slot lets you install an additional RAM card to expand the memory. Follow these steps to install the RAM card:

1. Open the display panel and turn on the computer.
2. Run the setup program (Set1660) and disable the resume function.
3. Turn off the computer and close the display panel.
4. Open the back cover. Then, remove the two screws on the RAM card slot cover and remove the cover.

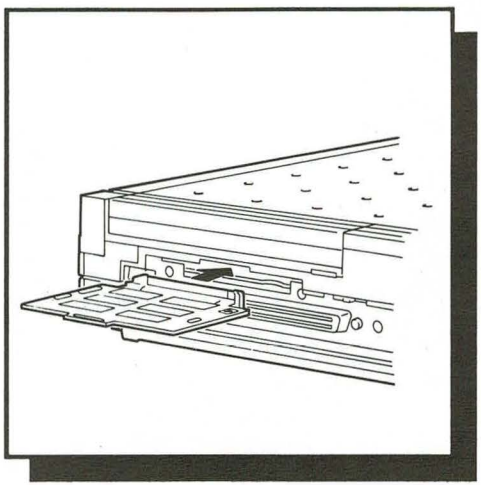
   Note: Be sure you keep the cover and screws for Step 6.

   Caution: Take care not to drop the screws in the holes on the panel.

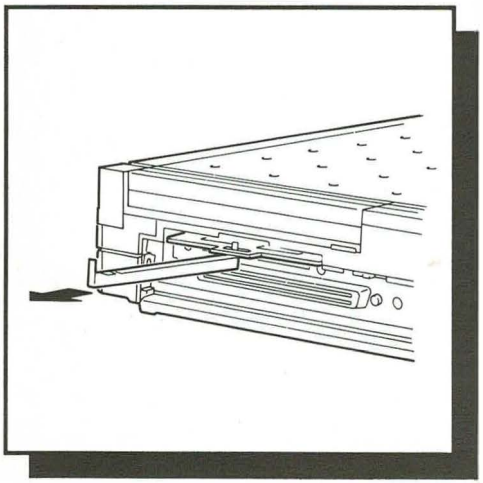


5. Hold the RAM card so that the letter **A** on the card faces the top of the computer. Then, with the card's connector end forward, firmly plug the card into the RAM card slot.

   Caution: Do not try to force the card into the slot. Doing so might damage the computer.
6. Replace the RAM card slot cover and secure it with the two screws you removed earlier.
7. Close the back cover.
8. Turn the computer back on. Then, run the setup program and press **F2** to save the settings. To enable the resume function, set Resume to *ON*.



Removing the RAM Card



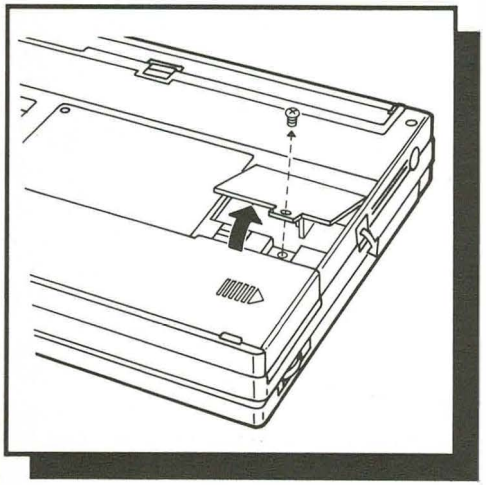
To remove the RAM card, follow these steps:

1. Follow Steps 1-4 in the previous section to remove the RAM card slot cover.
2. Insert the slot cover's front edge into the RAM card's tab hole.
3. Keep the slot cover horizontal and slowly pull it toward you.

   Caution: Do not try to pry the RAM card out of the slot. Doing so could damage the card and the computer.
4. If you want to install a different RAM card in the slot, follow Steps 5-7 in the previous section.

INSTALLING AN INTERNAL MODEM CARD

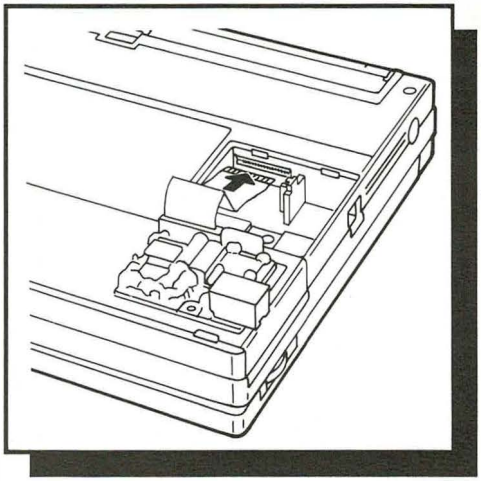
Caution: Do not remove the computer's modem cover unless you install a modem card. Doing so could allow dust or moisture in the modem compartment and possible damage the computer.



Follow these steps to install an internal modem card:

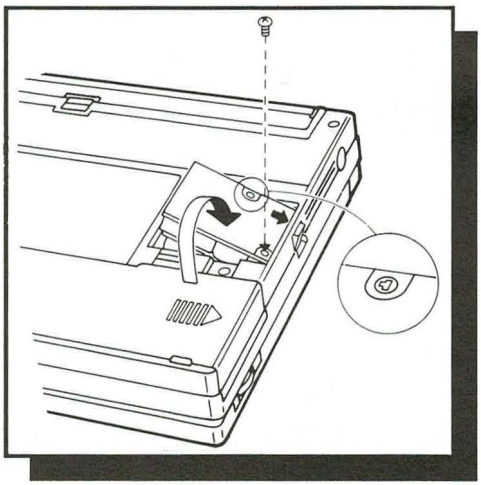
1. Set Resume to *OFF* in the setup program. Then, press **F2** to save the change, turn off the computer, and close the display panel.
2. Turn the computer upside down and place it on a flat surface.
3. Remove the screw on the modem cover. Then, remove the cover.
4. Remove the phone jack cover tab by pushing out the cover from the inside of the computer.

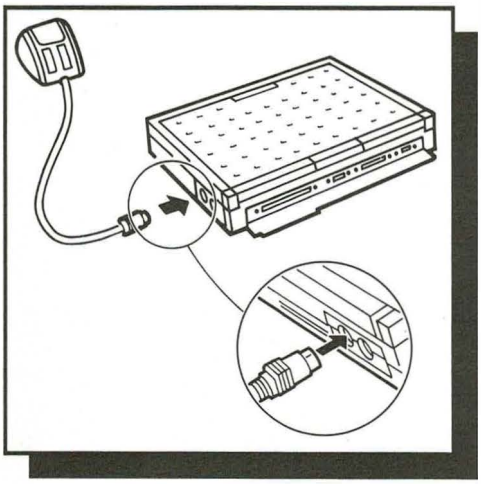
5. Position the modem as shown and insert the modem's cable connector into the computer's modem cable slot. Be sure you properly seat the cable connector in the slot.
6. Turn over the modem, folding the ribbon cable so that it lies flat under the modem.



7. From the inside of the modem compartment, align the modem's phone jack with the compartment's phone jack hole. Then, place the modem in the computer.
8. Adjust the modem so that it aligns with the support post inside the compartment. Then, secure the modem to the computer with the provided screw.

   Note: The modem might come with two screws. Only one of these screws is necessary.
9. Replace the modem cover and secure it with the screw you removed earlier.





CONNECTING A MOUSE

You can connect a PS/2-type mouse to the computer. Follow these steps:

1. Turn off the computer.
2. Connect the mouse to the **MOUSE** port on the computer's right side.
3. Turn the computer back on.

You can also connect a non-PS/2-type mouse to the computer's serial port. However, if you do so, you must also do the following:

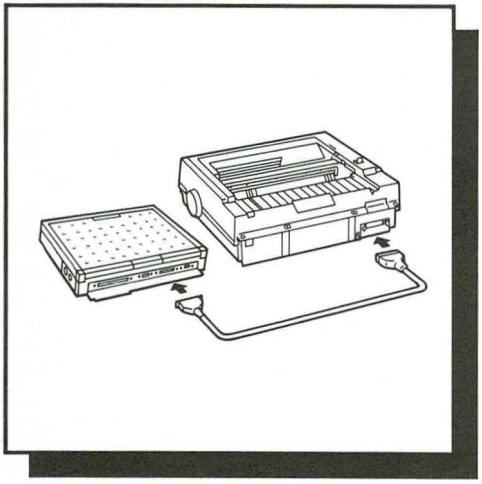
- Run the Set1660 program and set the Trackball/Mouse option to *Disabled*.
- Install the mouse driver software specifying the COM port. See "MS-DOS Quick Reference."

Note: You cannot use the built-in trackball or a PS/2 mouse if the Trackball/Mouse option in Set1660 is set to *Disabled*.

CONNECTING A PRINTER

You can connect a printer to the computer's parallel port. After you connect a printer, run the setup program and select the necessary settings. Follow these steps to connect a printer:

1. Prepare the printer for parallel operation according to its user's guide.
2. Turn off the computer.
3. Pull down the computer's back compartment.
4. Connect the printer cable's DB-25 connector to the computer's **PARALLEL** port.
5. Connect the printer cable's other end to the printer.
6. Turn on the computer first. Then, turn on the printer.



You can use the printer with most applications. Be sure your software is set up to work with the printer. Check your software's documentation and your printer's user's guide for more information about setting up and using the printer. Also, see "Customizing Your Computer" in this manual for information about setting the computer's parallel port for either unidirectional or bidirectional operation.

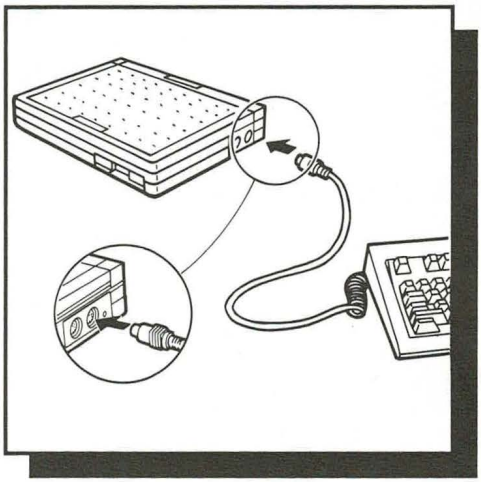
Notes:

- Turn off the printer when you turn off the computer.
- You can also connect an optional external diskette drive to the parallel port.

CONNECTING AN EXTERNAL KEYBOARD

You can connect an external keyboard (PS/2-type) to the computer. To connect the keyboard, follow these steps:

1. Turn off the computer.
2. Connect the keyboard's mini-DIN connector to the **EXT KB** (external keyboard) port on the right side of the computer.
3. Turn the computer back on.



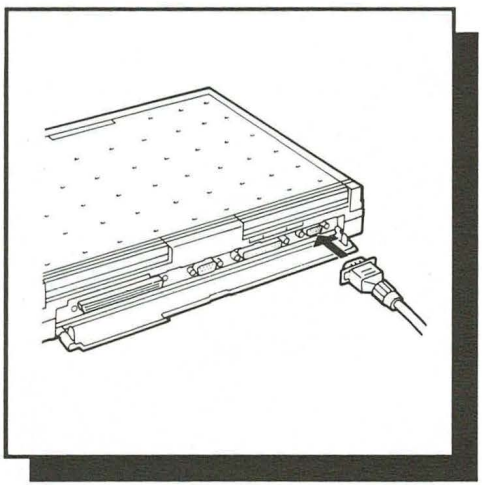
Notes:

- The **EXT KB** jack does not support a PS/2-type mouse.
- You can use both the computer's keyboard and an external keyboard at the same time with the computer.

CONNECTING AN EXTERNAL VGA MONITOR

You can connect an external VGA monitor to the computer. To do so, follow these steps:

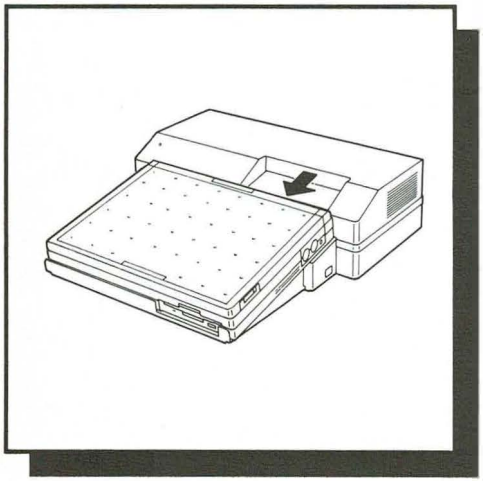
1. Turn off the computer. Then, pull down the computer's back cover.
2. Attach the monitor's cable to the **VGA** port inside the port compartment.
3. Turn the computer back on.



Notes:

- You can use the setup program to make the monitor selection.
- You can switch between the LCD screen and the external VGA monitor or you can select both for a simultaneous display by pressing **FN+F2**. (The key combination **FN+F2** does not work with some software.)

CONNECTING TO A DOCKING STATION



You can connect the computer to a docking station that supports one full-size AT option card and one half-size AT-compatible option card. For more information, see the docking station's installation manual.

Caution: Turn off the computer's power before you connect a docking station.

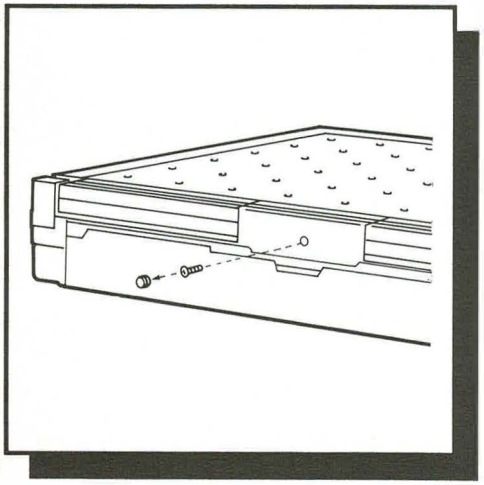
Notes:

- Disable the resume function before you connect a docking station.
- Resume does not work with a docking station. If you enable resume and try to use a docking station, the computer automatically restarts.

INSTALLING A MATH COPROCESSOR

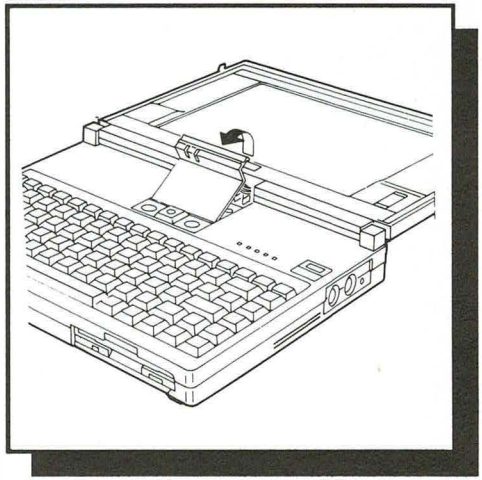
Some programs, such as some spreadsheet programs, take considerable time to run. You can install a 25 MHz 80387SX or 25 MHz 80387SL math coprocessor (PLCC 68-pin), which often makes these types of programs run faster. To install a math coprocessor, follow these steps:

Caution: Be sure you touch a grounded metal object before you handle the coprocessor.



1. Disable the resume function. Then, turn off the computer and remove the battery.
2. Carefully use a pointed object, such as a straight pin, to remove the rubber plug on the back of the computer. Then, remove the screw you expose.

3. Open the display panel fully as shown. Then, remove the cover.

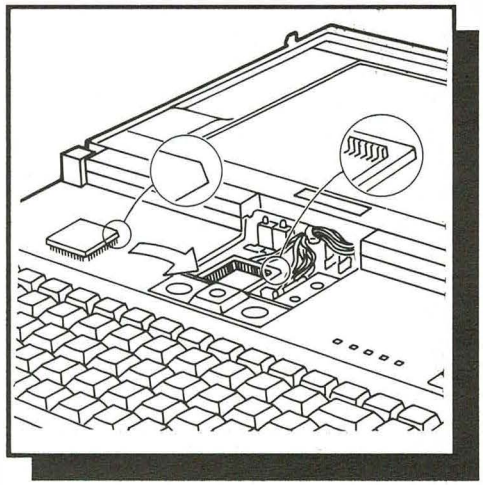


4. Carefully install the coprocessor straight down into the socket so that the coprocessor's slanted corner aligns with the socket's inside slanted corner.

   Cautions:

   - Be sure you correctly position the coprocessor. Once you install it, you must use a special chip-extraction tool to remove the coprocessor.
   - Be sure you install the coprocessor correctly. Incorrect installation might damage the coprocessor and computer.

5. Replace the cover and secure it with the screw you removed earlier. Then, replace the rubber plug.



USING MS-DOS

MS-DOS is an operating system that manages your computer's operations and conveys your instructions to the computer. How much you need to know about the MS-DOS operating system depends on how you plan to use your computer. If you plan to use advanced operating system features or create your own applications, you need to become quite familiar with MS-DOS.

HOW MS-DOS STORES INFORMATION

If you want to learn more about how your operating system works, you need to know how MS-DOS organizes and stores information.

About Files

Your computer stores all information on the diskette in *files*. A file is a collection of information. These are the main types of files:

- **System files** contain operating system information that manages the computer's operations.
- **Application files** contain information that causes the computer to perform a task or set of tasks.
- **Data files** contain information you enter, such as the documents and spreadsheets you create with software.

Creating Filenames

Following is a complete list of acceptable characters for filenames:

- Uppercase letters A through Z
- Lowercase letters a through z
- Decimal digits 0-9
- Symbols $ & # % ' ( ) @ – { } ! _~'

When you create filenames and subdirectory names, you can use up to eight characters. MS-DOS ignores any characters after the eighth. For example, MS-DOS regards both *Accounts1* and *Accounts2* as *Accounts*. If you save both files, MS-DOS writes over the first file with the second, destroying the first file. Also, MS-DOS does not distinguish between upper and lowercase letters.

You cannot use the following special MS-DOS device names for filenames:

aux	**com1**	**com2**	**com3**
con	**lpt1**	**lpt2**	**com4**
lpt3	**nul**	**prn**	**Clock$**

The following examples are **valid** filenames:

mydata1	**SAMPLE**
1.TST	**$100GIFT**
records.art	**'HELP'.fil**
XXX.XX	**File#1.txt**
10%SALES	**par@64.gam**

The following examples are **invalid** filenames:

his*hers — The asterisk is not a valid character for filenames.

.DATA — The period is valid in a filename only when it separates the filename from its extension.

regionsales — Filenames have a maximum of eight characters. MS-DOS uses only the first eight characters you enter.

COST+INT — The plus symbol is not a valid character.

CON.dat — CON is a word reserved by MS-DOS.

Filename Extensions

Any filename or directory can contain an *extension*, which further identifies the file. An extension appears at the end of a filename, preceded by a period.

Extensions can have up to three characters and can include the same characters allowed in filenames. If you try to give extensions more than three characters, MS-DOS uses only the first three.

If you include an extension in a filename, you must use that extension whenever you specify the file.

Note: Some applications automatically assign an extension to a filename.

Looking Inside Files

TYPE is a command that lets you examine files that consist of text characters. For instance, to view the joe.sls file, type:

```
type joe.sls ENTER
```

The file contents appear on the screen. If there are too many lines in the file to fit on the screen, use **CTRL+S** or **CTRL+PAUSE** to stop the screen from scrolling. Press any key to resume scrolling.

If you use TYPE to display a file that is not a text file, the computer displays meaningless data.

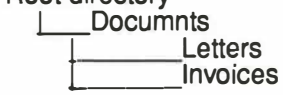
About Directories

All files reside in *directories*. A directory is a storage space for your files. When you format a diskette, you create one directory called the *root* directory. On your MS-DOS system diskette, the root directory contains all command and system files. When you start up your computer using MS-DOS, you are automatically in (operating from) the root directory.

You can create other directories using the *md* command. The new directory is a *subdirectory* of the directory you are in when you create the directory. For example, if you create a subdirectory named *Documnts*, it resides in the root directory and your disk organization looks like this:

Root directory
|___Documnts

You can now store files in the Documnts subdirectory. If you change your current directory to the Documnts directory using the *cd* command, then make two more subdirectories called *Letters* and *Invoices*, your directory looks like this:



In each subdirectory you can save files with related information. For example, save your letters in the Letters subdirectory of Documnts and save your invoices in the Invoices subdirectory of Documnts.

Your computer uses a shorter way of referring to subdirectories and files. The computer always refers to the root directory as \. The computer refers to files and subdirectories of the root directory as the names of those files or subdirectories, preceded by \. In the above example, we refer to the Documnts directory as \Documnts. To refer to the next level of subdirectory or a file in \Documnts, add a \, then the name of the file or subdirectory — for example, \Documnts\Letters.

Viewing a Directory

To view the contents of the current directory, type the following:

dir ENTER

If a diskette contains more filenames than can appear on the screen at one time, all but the last 22 filenames scroll off the top of the screen. You can control the scrolling by using any of these three methods:

- Press **CTRL+S** to stop the screen from scrolling. (Press any key to restart the scrolling.)
- Use the /P switch with the DIR command. The /P switch tells MS-DOS to display only 23 lines of the directory at one time. Press the space bar to display another screen. To use the /P switch, type the following:

  dir /p ENTER

- Use the /W switch to display the files in five columns. To use the /W switch, type the following:

  dir /w ENTER

ENTERING MS-DOS COMMANDS

You type MS-DOS instructions, or *commands*, at the system prompt (`C:\>` or `A:\>`), which tells you that MS-DOS is ready to accept commands. A command consists of one word. A *command line* consists of one or more commands and their associated parameters and switches. A command line can have a maximum of 127 characters, including any combination of uppercase or lowercase letters. *Parameters* and *switches* are special information you include with a command. They provide information to the command, or they determine how the command operates.

You must enter MS-DOS commands exactly as given. Your computer carries out MS-DOS commands exactly as you enter them. If you mistype a command, MS-DOS gives you an error message.

Press **ENTER** after you enter the MS-DOS command. For example, to clear the screen, type:

```
cls ENTER
```

If you notice a typing mistake before you press **ENTER,** do one of the following:

- Backspace to the mistake, and retype to the end of the line.
- Press **ESC** and retype the command. The system prompt does not reappear. After you retype the command, press **ENTER** to execute it.

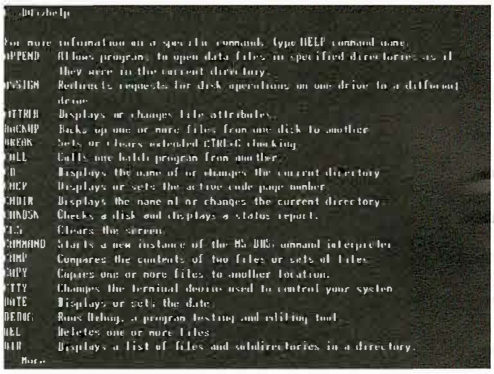
USING ON-LINE HELP

Your GRiD 1660 has an on-line MS-DOS Help program that provides information about MS-DOS commands. The Help program provides information in two different forms — a summary of what each command does, and a more detailed listing of the syntax and options for each command.

To use the Help program, type the following:

help ENTER

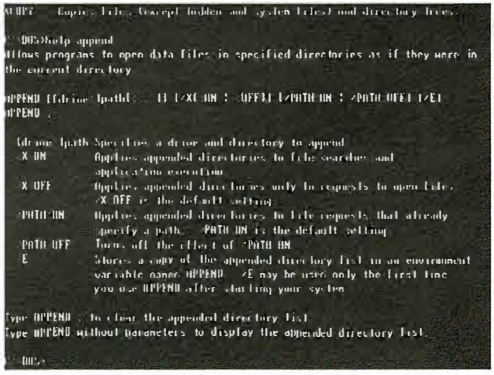
The first screen of general information appears. Press any key to display additional screens of information.



To display more detailed information about a particular command, type **help** plus the name of the command. For example, to see information about the APPEND command, type the following:

help append ENTER

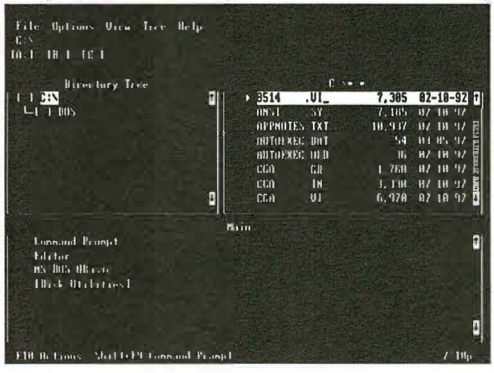
The screen to the right appears. The information shown on this screen is also included in "MS-DOS Quick Reference" in this manual.



USING THE MS-DOS SHELL

The MS-DOS Shell helps you run programs and use MS-DOS commands. To run the MS-DOS Shell, type the following:

```
dosshell ENTER
```



The MS-DOS shell's main screen appears.

Note: Add the DOSSHELL command to the autoexec.bat file if you want to load the shell each time you turn on the computer.

- Use a mouse or press **ALT** and the arrow keys to select a menu. To choose a program or command, highlight the program or command name and press **ENTER.**
- Press the tab key to move from one window to another.
- Use the arrow keys to select items within a window.

For on-line help for the MS-DOS shell, press **F10**. Then, select *Help* and press **ENTER**. Or, you can press **F1** for help information about the currently highlighted topic.

SPECIAL KEYS

The following keys and key combinations have special significance to MS-DOS.

SPACE BAR — Moves the cursor (the flashing underline or block character displayed on the screen) one space to the right and adds a space to a line.

CTRL — Lets you give commands to your computer by pressing only two or three keys. Press and hold down **CTRL**. Then, while you hold down **CTRL**, press the other keys.

BACKSPACE — Moves the cursor left one character and erases the character in that position.

CTRL+C or **CTRL+BREAK** — Stops the execution of an MS-DOS command or an application that uses MS-DOS functions. If the application does not access MS-DOS, the application does not recognize this key combination. (The computer might take a few seconds to recognize the key combination.)

CTRL+PRTSC or **CTRL+P** — Sends each character of output to the printer. Press the combination again to stop print echo.

PRTSC — Sends the current display to the printer.

ESC — Terminates the current line without processing the command. The cursor moves down one line and returns to the left margin. Although the system prompt does not appear, the system is ready for a command.

ENTER — Executes a command and begins processing the command line you type. Pressing **ENTER** also causes a carriage return and line feed. (The cursor moves down one line and returns to the left margin.)

CTRL+J — Ends the current line, and moves the cursor to the next line without processing the line. Press **ENTER** to execute the command line when it is complete.

CTRL+ALT+DEL — Resets your computer the same as if you had turned it off and then on again.

CTRL+S or **PAUSE** — Stops scrolling information on the screen to let you view it. Press any key to resume scrolling.

MS-DOS EDITING KEYS

MS-DOS provides several keys and key combinations to help you edit an MS-DOS command line. These keys act on the command line in the last-command memory, or *template*. Press **F3** to display the template. You can execute the command line again by pressing **ENTER**, or you can use the following keys to edit the command line in the template.

ENTER — Enter line. Makes the new line the new template and executes the command line.

ESC — Voids the new line without affecting the template.

INS — Insert character. Goes into the insert mode so that you can insert characters into the template. Press **F3** to end the insert function.

DEL — Delete character. Erases the next character from the template. The character is skipped and is not copied to the command line.

F1 — Copy character. Copies the next character from the template and displays it on the command line.

F2 (*character*) — Copy to character. Copies all characters in the template up to the specified character and displays the characters on the command line.

F3 — Display template. Redisplays the entire template.

F4 (*character*) — Delete to character. Deletes all characters up to the character indicated. These characters are skipped and not copied to the command line.

F5 — Replace template. Makes the line you type the new template but does not execute the command.

F6 or **CTRL+Z** — End-of-file. Puts an end-of-file marker in the template.

BACKING UP THE HARD DISK

Making backups of hard disk files is very important. Because the storage capacity of a hard disk is so much greater, loss of data can result in the loss of thousands of hours of work.

You can use the BACKUP command to make copies of one or more directories or of the entire hard disk. For example, if you have a subdirectory named *Mystuff* in the root directory of the hard disk, you can use the BACKUP command to copy the subdirectory to a diskette. With a formatted diskette in Drive A, type the following:

```
backup c:\mystuff a: /s ENTER
```

Note: Unless you specify otherwise, using this method causes MS-DOS to erase any files currently on the diskette used for the hard disk backup. Be sure you use a newly formatted diskette or a diskette that contains files you do not want to keep.

To accomplish the same backup without erasing files currently on the diskette, add the /a switch to the command. The /a switch causes the BACKUP command to add the new files to any existing files on the diskette. In MS-DOS, a switch is always preceded by a slash (/) symbol. The same command with the /a switch is:

```
backup c:\mystuff a: /s/a ENTER
```

The /s switch, used in the previous command, instructs MS-DOS to back up all the files in a directory and all the directories and files that branch from that specified directory.

You can use the BACKUP command with the /s switch to back up the entire hard disk to diskettes. Before you use this command, use the FORMAT command to prepare enough diskettes to hold all the files you want to back up. To back up everything on Drive C, type:

```
backup c:\ a: /s ENTER
```

The backward slash (\) is an abbreviation for the root directory of any disk. This command line instructs MS-DOS to copy all files from the root directory of Drive C (the hard disk) to the diskette in drive A. Because all directories branch from the root directory, BACKUP copies all the files in all the disk directories. For more information on BACKUP and its switches, see the "MS-DOS Quick Reference" section in this manual.

RESTORING BACKUPS TO THE HARD DISK

Use the RESTORE command to copy one or more backed up directories from a diskette to the hard disk. Use RESTORE only for those directories that were copied to the diskette with the BACKUP command.

To restore the directory Mystuff from the diskette in Drive A back to the hard disk (Drive C), type:

```
restore a: c:\mystuff\*.* /s ENTER
```

To restore all the files that were backed up from all directories of Drive C, insert the first backup diskette into Drive A and type:

```
restore a: c: /s ENTER
```

The /s switch instructs MS-DOS to copy all files and directories that were saved on diskettes with the BACKUP command. If the backup required more than one diskette, MS-DOS prompts you to change diskettes during the restore procedure.

For more information about RESTORE and its options, see the "MS-DOS Quick Reference" section in this manual.

Caution: The **DISK** indicator lights whenever the computer accesses the hard disk. Do not turn off the computer when the **DISK** indicator is on. The data on the hard disk could be lost or distorted.

MS-DOS QUICK REFERENCE

ASSIGN

Redirects requests for disk operations on one drive to another.

Assign [*x*[:]=*y*[:][...]]

Assign /status

x Specifies the drive letter to reassign.

y Specifies the drive that *x*: will be assigned to.

/STATUS Displays current drive assignments.

Type ASSIGN without parameters to reset all drive letters to original assignments.

ATTRIB

Displays or changes file attributes.

Attrib [**+R** | **-R**] [**+A** | **-A**] [**+S** | **-S**] [**+H** | **-H**] [[*drive*:][*path*]*filename*] [**/S**]

+ Sets an attribute.

- Clears an attribute.

R Read-only file attribute.

A Archive file attribute.

S System file attribute.

H Hidden file attribute.

/S Processes files in all directories in the specified path.

BACKUP

Backs up one or more files from one disk to another.

Backup *source destination-drive:* [**/S**] [**/M**] [**/A**] [**/F**[:*size*]] [**/D:***date*[**/T:***time*]] [**/L**[:[*drive*:][*path*]*logfile*]]

source Specifies the file(s), drive, or directory to back up.

destination-drive: Specifies the drive to save backup copies onto.

/S Backs up contents of subdirectories.

/M Backs up only files that have changed since the last backup.

/A Adds backup files to an existing backup disk.

/F:[*size*] Specifies the size of the disk to be formatted.

/D:*date* Backs up only files changed on or after the specified date.

/T:*time* Backs up only files changed at or after the specified time.

/L[:[*drive*:][*path*]*logfile*] Creates a log file and entry to record the backup operation.

BREAK

Break [ON | OFF]

Type BREAK without a parameter to display the current BREAK setting.

CALL

Calls one batch program from another.

Call [*drive*:][*path*]*filename* [*batch-parameters*]

batch-parameters Specifies any command-line information required by the batch program.

CD

Cd [*drive*:][*path*]

Cd[..].. Specifies that you want to change to the parent directory.

Type CD *drive*: to display the current directory in the specified drive.

Type CD without parameters to display the current drive and directory.

CHCP

Displays or sets the active code page number.

Chcp [*nnn*]

nnn Specifies a code page number.

Type CHCP without a parameter to display the active code page number.

CHDIR

Displays the name of or changes the current directory.

Chdir [*drive*:][*path*]

Chdir[..]

CHKDSK

Checks a disk and displays a status report.

Chkdsk [*drive*:][[*path*]*filename*] [/F] [/V]

[*drive*:][*path*] Specifies the drive and directory to check.

filename Specifies the file(s) to check for fragmentation.

/F Fixes errors on the disk.

/V Displays the full path and name of every file on the disk.

Type CHKDSK without parameters to check the current disk.

CLS

Clears the screen.

Cls

CLK1660

Keeps the system time correct after a suspend/resume cycle.

To enable this command, add the following line to the computer's config.sys file:

device=[*drive*:][*path*]**clk1660.exe**

COMMAND

Starts a new instance of the MS-DOS command interpreter.

Command [[*drive*:]*path*] [*device*] [**/E:***nnnnn*] [/P] [/C *string*] [/MSG]

[*drive*:]*path* Specifies the directory containing Command.com file.

device Specifies the device to use for command input and output.

/E:*nnnnn* Sets the initial environment size to *nnnnn* bytes.

/P Makes the new command interpreter permanent (can't exit).

/C *string* Carries out the command specified by string, and then stops.

/MSG Specifies that all error messages be stored in memory. You need to specify /P with this switch.

COMP

Compares the contents of two files or sets of files.

Comp [*data1*] [*data2*] [**/D**] [**/A**] [**/L**] [**/N=***number*] [**/C**]

data1 Specifies location and name(s) of first file(s) to compare.

data2 Specifies location and name(s) of second files to compare.

/D Displays differences in decimal format. This is the default setting.

/A Displays differences in ASCII characters.

/L Displays line numbers for differences.

/N=*number* Compares only the first specified number of lines in each file.

/C Disregards case of ASCII letters when comparing files.

To compare sets of files, use wildcards in *data1* and *data2* parameters.

COPY

Copies one or more files to another location.

Copy [**/A** | **/B**] *source* [**/A** | **/B**] [*+ source* [**/A** | **/B**] [**+ ...**]] [*destination* [**/A** | **/B**]] [**/V**]

source Specifies the file or files to be copied.

/A Indicates an ASCII text file.

/B Indicates a binary file.

destination Specifies the directory and/or filename for the new file(s).

/V Verifies that new files are written correctly.

To append files, specify a single file for *destination*, but multiple files for *source* (using wildcards or file1+file2+file3 format).

CTTY

Changes the terminal device used to control your system.

Ctty *device*

device The terminal device you want to use, such as COM1.

DATE

Displays or sets the date.

Date [*date*]

Type DATE without parameters to display the current date setting and a prompt for a new one.Press **ENTER** to keep the same date.

DEBUG

Runs Debug, a program testing and editing tool.

Debug [[*drive:*][*path*]*filename* [*testfile-parameters*]]

[*drive:*][*path*]*filename* Specifies the file you want to test.

testfile-parameters Specifies command-line information required by the file you want to test.

After Debug starts, type ? to display a list of debugging commands.

DEL

Deletes one or more files.

Del [*drive:*][*path*]*filename* [**/P**]

Erase [*drive:*][*path*]*filename* [**/P**]

[*drive:*][*path*]*filename* Specifies the file(s) to delete.Specify multiple files by using wildcards.

/P Prompts for confirmation before deleting each file.

DISKCOMP

Compares the contents of two floppy disks.

Diskcomp [*drive1*: [*drive2:*]] [**/1**] [**/8**]

/1 Compares the first side of the disks.

/8 Compares only the first eight sectors of each track.

DISKCOPY

Copies the contents of one floppy disk to another.

Diskcopy [*drive1*: [*drive2*:]] [**/1**] [**/V**]

/1 Copies only the first side of the disk.

/V Verifies that the information is copied correctly.

The two floppy disks must be the same type.

You may specify the same drive for *drive1* and *drive2*.

DIR

Displays a list of files and subdirectories in a directory.

Dir [*drive*:][*path*][*filename*] [**/P**] [**/W**] [**/A**[[:]*attributes*]] [**/O**[[:]*sortorder*]] [**/S**] [**/B**] [**/L**]

[*drive*:][*path*][*filename*] Specifies drive, directory, and/or files to list.

/P Pauses after each screenful of information.

/W Uses wide list format.

/A Displays files with specified attributes.

attributes	**D**	Directories	**R**	Read-only files
	H	Hidden files	**A**	Files ready for archiving
	S	System files	**-**	Prefix meaning "not"

/O List by files in sorted order.

sortorder **N** By name (alphabetic) **S** By size (smallest first)

E By extension (alphabetic) **D** By date & time (earliest first)

G Group directories first-Prefix to reverse order

/S Displays files in specified directory and all subdirectories.

/B Uses bare format (no heading information or summary).

/L Uses lowercase.

Switches may be preset in the DIRCMD environment variable. Override preset switches by prefixing any switch with - (hyphen) — for example, /-W.

ECHO

Displays messages, or turns command-echoing on or off.

Echo [ON | OFF]

Echo [*message*]

Type ECHO without parameters to display the current echo setting.

EDIT

Starts the MS-DOS Editor, which creates and changes ASCII files.

Edit [[*drive*:][*path*]*filename*] [/B] [/G] [/H] [/NOHI]

[*drive*:][*path*]*filename* Specifies the ASCII file to edit.

/B Allows use of a monochrome monitor with a color graphics card.

/G Provides the fastest update of a CGA screen.

/H Displays the maximum number of lines possible for your hardware.

/NOHI Allows the use of a monitor without high-intensity support.

EDLIN

Starts Edlin, a line-oriented text editor.

EDLIN [*drive*:][*path*]*filename* [/B]

/B Ignores end-of-file (CTRL+Z) characters.

EMM386

Turns on or off EMM386 expanded memory support.

Emm386 [ON | OFF | AUTO] [W=ON | W=OFF]

ON | OFF | AUTO Activates or suspends EMM386.EXE device driver, or places it in auto mode.

W=ON | OFF Turns on or off Weitek coprocessor support.

ERASE

Deletes one or more files.

Del [*drive*:][*path*]*filename* [/P]

Erase [*drive*:][*path*]*filename* [/**P**]

[*drive*:][*path*]*filename* Specifies the file(s) to delete. Specify multiple files by using wildcards.

/P Prompts for confirmation before deleting each file.

EXE2BIN

Converts .EXE (executable) files to binary format.

Exe2bin [*drive1*:][*path1*]*input-file* [[*drive2*:][*path2*]*output-file*]

input-file Specifies the .EXE file to be converted.

output-file Specifies the binary file to be created.

EXIT

Quits the COMMAND.COM program (command interpreter).

Exit

EXPAND

Expands one or more compressed files.

Expand [*drive*:][*path*]*filename* [[*drive1*:][*path1*]*filename*[...]] *destination*

[*drive*:][*path*]*filename* Specifies the location and/or name of a file or set of files to be expanded. You cannot use wildcards.

destination Specifies the new location and/or name of an expanded file or set of files.

Destination can be a drive letter and colon, directory name, filename, or combination. The destination can only be a filename if you have specified a single filename for the source filename parameter. To expand multiple files to a different directory and keep the original filenames, specify only a directory as the destination.

FASTOPEN

Decreases the amount of time needed to open frequently used files and directories.

Fastopen *drive*:[[=]**n**] [*drive*:[[=]**n**][...]] [/**X**]

drive: Specifies the hard disk drive you want Fastopen to work with.

n Specifies the maximum number of file locations Fastopen retains in its filename cache.

/X Creates the filename cache in expanded memory.

FC

Compares two files or sets of files and displays the differences between them.

Fc [**/A**] [**/C**] [**/L**] [**/LB***n*] [**/N**] [**/T**] [**/W**] [*/nnnn*] [*drive1*:][*path1*]*filename1*
[*drive2*:][*path2*]*filename2*

Fc /B [*drive1*:][*path1*]*filename1* [*drive2*:][*path2*]*filename2*

/A Displays only first and last lines for each set of differences.

/B Performs a binary comparison.

/C Disregards the case of letters.

/L Compares files as ASCII text.

/LB*n* Sets the maximum consecutive mismatches to the specified number of lines.

/N Displays the line numbers on an ASCII comparison.

/T Does not expand tabs to spaces.

/W Compresses white space (tabs and spaces) for comparison.

/nnnn Specifies the number of consecutive lines that must match after a mismatch.

FDISK

Configures a hard disk for use with MS-DOS.

Fdisk

FIND

Searches for a text string in a file or files.

Find [**/V**] [**/C**] [**/N**] [**/I**] *"string"* [[*drive*:][*path*]*filename*[...]]

/V Displays all lines NOT containing the specified string.

/C Displays only the count of lines containing the string.

/N Displays line numbers with the displayed lines.

/I Ignores the case of characters when searching for the string.

"*string*" Specifies the text string to find.

[*drive*:][*path*]*filename* Specifies a file or files to search.

If a pathname is not specified, FIND searches the text typed at the prompt or piped from another command.

FOR

Runs a specified command for each file in a set of files.

For *%variable* **IN** (*set*) **DO** *command* [*command-parameters*]

%variable Specifies a replaceable parameter.

(*set*) Specifies a set of one or more files. Wildcards may be used.

command Specifies the command to carry out for each file.

command-parameters Specifies parameters or switches for the specified command.

To use the FOR command in a batch program, specify *%%variable* instead of *%variable*.

FORMAT

Formats a disk for use with MS-DOS.

Format *drive*: [**/V**[:*label*]] [**/Q**] [**/U**] [**/F:***size*] [**/B** | **/S**]

Format *drive*: [**/V**[:*label*]] [**/Q**] [**/U**] [**/T:***tracks* **/N:***sectors*] [**/B** | **/S**]

Format *drive*: [**/V**[:*label*]] [**/Q**] [**/U**] [**/1**] [**/4**] [**/B** | **/S**]

Format *drive*: [**/Q**] [**/U**] [**/1**] [**/4**] [**/8**] [**/B** | **/S**]

/V[:*label*] Specifies the volume label.

/Q Performs a quick format.

/U Performs an unconditional format.

/F:*size* Specifies the size of the floppy disk to format (such as 160, 180, 320, 360, 720, 1.2, 1.44, 2.88).

/B Allocates space on the formatted disk for system files.

/S Copies system files to the formatted disk.

/T:*tracks* Specifies the number of tracks per disk side.

/N:*sectors* Specifies the number of sectors per track.

/1 Formats a single side of a floppy disk.

/4 Formats a 5.25-inch 360K floppy disk in a high-density drive.

/8 Formats eight sectors per track.

GOTO

Directs MS-DOS to a labeled line in a batch program.

Goto *label*

label Specifies a text string used in the batch program as a label.

You type a label on a line by itself, beginning with a colon.

GRAFTABL

Enables MS-DOS to display an extended character set in graphics mode.

Graftabl [*xxx*]

Graftabl /STATUS

xxx Specifies a code page number.

/STATUS Displays the current code page selected for use with GRAFTABL.

GRAPHICS

Loads a program that can print graphics.

Graphics [*type*] [[*drive*:][*path*]*filename*] [**/R**] [**/B**] [**/LCD**] [**/PRINTBOX:STD** | **/PRINTBOX:LCD**]

type Specifies a printer type (see *User's Guide and Reference*).

[*drive*:][*path*]*filename* Specifies the file containing information on supported printers.

/R Prints white on black as seen on the screen.

/B Prints the background in color for COLOR4 and COLOR8 printers.

/LCD Prints using LCD aspect ratio.

/PRINTBOX:STD | **/PRINTBOX:LCD** Specifies the print-box size, either STD or LCD.

HELP

Provides help information for MS-DOS commands.

Help [*command*]

command Displays help information on that command.

IF

Performs conditional processing in batch programs.

If [NOT] ERRORLEVEL *number command*

If [NOT] *string1==string2 command*

If [NOT] EXIST *filename command*

NOT Specifies that MS-DOS should carry out the command only if the condition is false.

ERRORLEVEL *number* Specifies a true condition if the last program run returned an exit code equal to or greater than the number specified.

command Specifies the command to carry out if the condition is met.

string1==string2 Specifies a true condition if the specified text strings match.

EXIST *filename* Specifies a true condition if the specified filename exists.

INTERLNK

Add the interlnk.exe device driver to the config.sys file to redirect requests for operations on one or more Interlnk client drives or printer ports to one or more drives or printer ports on the Interlnk server.

device=[*drive*:][*path*]**interlink.exe** [**/drives**:*n*] [**/noprinter**] [**/com**[:][*n*|*address*]] [**/lpt**[:][*n*|*address*]][**/auto**] [**/noscan**] [**/low**] [**/baud**:rate][**/v**]

[*drive*:][*path*] Specifies the location of the Interlnk.exe file.

/drives:*n* Specifies the number of redirected drives. The default is 3. If you specify 0, Interlnk redirect only printers.

/noprinter Specifies that printers not be redirected when you install Interlnk.exe

/com[:][*n*|*address*] Specifies a serial port. The *n* parameter specifies the number of the serial port. The *address* parameter specifies the address of the serial port.

/lpt[:][*n*|*address*] Specifies a parallel port. The *n* parameter specifies the number of the LPT port. The *address* parameter specifies the address of the LPT port.

/auto Installs the Interlnk.exe device driver in memory only if the client can establish a connection with the server when the client starts up.

/noscan Installs the Interlnk.exe device driver in memory, but prevents establishing a connection between client and server.

/low Loads the Interlnk.exe device driver into conventional memory, even if the upper memory is available.

/baud:*rate* Sets a maximum baud rate for serial communication. Valid values for *rate* are 9600, 19200, 38400, 57600, and 115200. The default is 115200.

/v Prevents conflicts with a computer's timer. Specify this switch if you have a serial connection between computers and one of them stops running when you use Interlnk to access a drive or printer port.

INTERSVR

Provides serial or parallel file transfer capabilities via redirected drives.

Intersvr [*drive*:[...]] [/**X**=*drive*:[...]] [/**LPT**[:][*n* | *address*]] [/**COM**[:][*n* | *address*]] [/**BAUD**:*rate*] [/**B**]

drive: Specifies the drive(s) to redirect. (By default, all drivers are redirected.)

/**X**=*drive*: Specifies the drive(s) to exclude.

/**LPT**[*n*] Specifies a port to scan. (/LPT scans all LPT ports.)

/**LPT**[*address*] Specifies a port address to scan.

/**COM**[*n*] Specifies a port to scan.

/**COM**[*address*] Specifies a port address to scan.

/**BAUD**:*rate* Sets a maximum serial baud rate.

/**B** Displays the Interlnk server screen in black and white.

/V Prevents conflicts with a computer's timer. Specify this switch if you have a serial connection between computers and one of them stops running when you use Interlnk.

Intersvr /RCOPY Copies Interlnk files from one computer to another, provided that the computer's serial ports are connected with a 7-wire null-modem cable.

JOIN

Joins a disk drive to a directory on another drive.

Join [*drive1*: [*drive2*:]*path*]

Join *drive1*: **/D**

drive1: Specifies a disk drive that will appear as a directory on *drive2*.

drive2: Specifies a drive to which you want to join *drive1*.

path Specifies the directory to which you want to join *drive1*. It must be empty and cannot be the root directory.

/D Cancels any previous JOIN commands for the specified drive.

Type JOIN without parameters to list currently joined drives.

KEYB

Configures a keyboard for a specific language.

Keyb [*xx*[,[*yyy*][,[*drive*:][*path*]*filename*]]] [**/E**] [**/ID:***nnn*]

xx Specifies a two-letter keyboard code.

yyy Specifies the code page for the character set.

[*drive*:][*path*]*filename* Specifies the keyboard definition file.

/E Specifies that an enhanced keyboard is installed.

/ID:*nnn* Specifies the keyboard in use.

LABEL

Creates, changes, or deletes the volume label of a disk.

Label [*drive*:][*label*]

LOADFIX

Loads a program above the first 64K of memory, and runs the program.

Loadfix [*drive*:][*path*]*filename*

Use LOADFIX to load a program if you have received the message "Packed file corrupt" when trying to load the program in low memory.

LOADHIGH

Loads a program into the upper memory area.

Loadhigh [*drive*:][*path*]*filename* [*parameters*]

Lh [*drive*:][*path*]*filename* [*parameters*]

parameters Specifies any command-line information required by the program you want to load.

MD

Creates a directory.

Mkdir [*drive*:]*path*

Md [*drive*:]*path*

MEM

Displays the amount of used and free memory in your system.

Mem [/PROGRAM | /DEBUG | /CLASSIFY]

/PROGRAM or **/P** Displays status of programs currently loaded in memory.

/DEBUG or **/D** Displays status of programs, internal drivers, and other information.

/CLASSIFY or **/C** Classifies programs by memory usage. Lists the size of programs, provides a summary of memory in use, and lists largest memory block available.

MIRROR

Records information about one or more disks.

Mirror [*drive*:[...]] [**/1**] [**/T***drive*[*-entries*][...]]

Mirror [**/U**]

Mirror [**/PARTN**]

drive: Specifies the drive for which you want to save information.

/1 Saves only the latest disk information (does not back up previous information).

/T*drive* Loads the deletion-tracking program for the specified drive.

-*entries* Specifies maximum number of entries in the deletion-tracking file.

/U Unloads the deletion-tracking program.

/PARTN Saves hard disk partition information to a floppy disk.

MKDIR

Creates a directory.

Mkdir [*drive*:]*path*

Md [*drive*:]*path*

MODE

Configures system devices.

Printer Port

MODE LPT*n*[:] [**COLS=***c*] [**LINES=***l*] [**RETRY=***r*]

Serial Port

MODE COM*m*[:] [**BAUD=***b*] [**PARITY=***p*] [**DATA=***d*] [**STOP=***s*] [**RETRY=***r*]

Device Status

MODE [*device*] [**/STATUS**]

Redirect Printing

MODE LPT*n*[:]=**COM***m*[:]

Prepare Code Page

MODE *device* **CP PREPARE=**((*yyy*[...]) [*drive*:][*path*]*filename*)

Select Code Page

MODE *device* **CP SELECT=***yyy*

Refresh Code Page

MODE *device* **CP REFRESH**

Code Page Status

MODE *device* **CP** [**/STATUS**]

Display Mode

MODE [*display-adapter*][,*n*]

MODE CON[:] [**COLS**=*c*] [**LINES**=*n*]

Typematic Rate

MODE CON[:] [**RATE**=*r* **DELAY**=*d*]

MORE

Displays output one screen at a time.

More [*drive*:][*path*]*filename command-name* | **MORE**

[*drive*:][*path*]*filename* Specifies a file to display one screen at a time.

command-name Specifies a command whose output will be displayed.

MOUSE

Displays information about the mouse driver and tells you the installation status of the driver. The following switches let you change the status:

/1 Instructs the computer to check the COM 1 port for a mouse

/2 Instructs the computer to check the COM 2 port for a mouse

out Removes the mouse driver from memory if possible.

MOUSECON

Lets you adjust the mouse sensitivity while you run an application program. After you install the mouse driver, type **mousecon**. Then, press **CTRL+ALT**+left mouse button to display the mouse control panel.

NLSFUNC

Loads country-specific information.

Nlsfunc [[*drive*:][*path*]*filename*]

[*drive*:][*path*]*filename* Specifies the file containing country-specific information.

PATH

Displays or sets a search path for executable files.

Path [[*drive*:]*path*[;...]]

Path ;

Type PATH ; to clear all search-path settings and direct MS-DOS to search only in the current directory.

Type PATH without parameters to display the current path.

PAUSE

Suspends processing of a batch program and displays the message "Press any key to continue...."

Pause

PRINT

Prints a text file while you are using other MS-DOS commands.

Print [/**D:***device*] [/**B:***size*] [/**U:***ticks1*] [/**M:***ticks2*] [/**S:***ticks3*] [/**Q:***qsize*] [/**T**] [[*drive*:][*path*]*filename*[...]] [/**C**] [/**P**]

/**D:***device* Specifies a print device.

/**B:***size* Sets the internal buffer size, in bytes.

/**U:***ticks1* Waits the specified maximum number of clock ticks for the printer to be available.

/**M:***ticks2* Specifies the maximum number of clock ticks it takes to print a character.

/**S:***ticks3* Allocates the scheduler the specified number of clock ticks for background printing.

/**Q:***qsize* Specifies the maximum number of files allowed in the print queue.

/**T** Removes all files from the print queue.

/**C** Cancels printing of the preceding filename and subsequent filenames.

/**P** Adds the preceding filename and subsequent filenames to the print queue.

Type PRINT without parameters to display the contents of the print queue.

PROMPT

Changes the MS-DOS command prompt.

Prompt [*text*]

text Specifies a new command prompt.

Prompt can be made up of normal characters and the following special codes:

$Q = (equal sign)

$$ $ (dollar sign)

$T Current time

$D Current date

$P Current drive and path

$V MS-DOS version number

$N Current drive

$G (greater-than sign)

$L (less-than sign)

$B | (pipe)

$H Backspace (erases previous character)

$E Escape code (ASCII code 27)

$_ Carriage return and linefeed

Type PROMPT without parameters to reset the prompt to the default setting.

QBASIC

Starts the MS-DOS QBasic programming environment.

Qbasic [**/B**] [**/EDITOR**] [**/G**] [**/H**] [**/MBF**] [**/NOHI**] [[**/RUN**] [*drive*:][*path*]*filename*]

/B Allows use of a monochrome monitor with a color graphics card.

/EDITOR Starts the MS-DOS Editor.

/G Provides the fastest update of a CGA screen.

/H Displays the maximum number of lines possible for your hardware.

/MBF Converts the built-in functions MKS$, MKD$, CVS, and CVD to MKSMBF$, MKDMBF$, CVSMBF, and CVDMBF, respectively.

/NOHI Allows the use of a monitor without high-intensity support.

/RUN Runs the specified Basic program before displaying it.

[[*drive*:][*path*]*filename*] Specifies the program file to load or run.

RD

Removes (deletes) a directory.

Rmdir [*drive*:]*path*

Rd [*drive*:]*path*

RECOVER

Recovers readable information from a bad or defective disk.

Recover [*drive*:][*path*]*filename*

Recover *drive*:

REM

Records comments (remarks) in a batch file or CONFIG.SYS.

Rem [*comment*]

RENAME

Renames a file or files.

Rename [*drive*:][*path*]*filename1 filename2*

Ren [*drive*:][*path*]*filename1 filename2*

Note that you cannot specify a new drive or path for your destination file.

REPLACE

Replaces files.

Replace [*drive1*:][*path1*]*filename* [*drive2*:][*path2*] [**/A**] [**/P**] [**/R**] [**/W**]

Replace [*drive1*:][*path1*]*filename* [*drive2*:][*path2*] [**/P**] [**/R**] [**/S**] [**/W**] [**/U**]

[*drive1*:][*path1*]*filename* Specifies the source file or files.

[*drive2*:][*path2*] Specifies the directory where files are to be replaced.

/A Adds new files to destination directory. Cannot use with /S or /U switches.

/P Prompts for confirmation before replacing a file or adding a source file.

/R Replaces read-only files as well as unprotected files.

/S Replaces files in all subdirectories of the destination directory. Cannot use with the **/A** switch.

/W Waits for you to insert a disk before beginning.

/U Replaces (updates) only files that are older than source files. Cannot use with the **/A** switch.

RESTORE

Restores files that were backed up using the BACKUP command.

Restore *drive1*: *drive2*:[*path*[*filename*]] **[/S] [/P] [/B:***date***] [/A:***date***] [/E:***time***] [/L:***time***] [/M] [/N] [/D]**

drive1: Specifies the drive where the backup files are stored.

drive2:[*path*[*filename*]] Specifies the file(s) to restore.

/S Restores files in all subdirectories in the path.

/P Prompts before restoring read-only files or files changed since the last backup (if appropriate attributes are set).

/B Restores only files last changed on or before the specified date.

/A Restores only files changed on or after the specified date.

/E Restores only files last changed at or earlier than the specified time.

/L Restores only files changed at or later than the specified time.

/M Restores only files changed since the last backup.

/N Restores only files that no longer exist on the destination disk.

/D Displays files on the backup disk that match specifications.

RMDIR

Removes (deletes) a directory.

Rmdir [*drive*:]*path*

Rd [*drive*:]*path*

SET

Displays, sets, or removes MS-DOS environment variables.

Set [*variable*=[*string*]]

variable Specifies the environment-variable name.

string Specifies a series of characters to assign to the variable.

Type SET without parameters to display the current environment variables.

SETVER

Sets the version number that MS-DOS reports to a program.

Display Current Version Table

Setver [*drive*:*path*]

Add Entry

Setver [*drive*:*path*] *filename n.nn*

Delete Entry

Setver [*drive*:*path*] *filename* **/DELETE** [**/QUIET**]

[*drive*:*path*] Specifies location of the SETVER.EXE file.

filename Specifies the filename of the program.

n.nn Specifies the MS-DOS version to be reported to the program.

/DELETE or **/D** Deletes the version-table entry for the specified program.

/QUIET Hides the message typically displayed during deletion of version-table entry.

SHARE

Installs file-sharing and locking capabilities on your hard disk.

Share [**/F:***space*] [**/L:***locks*]

/F:*space* Allocates file space (in bytes) for file-sharing information.

/L:*locks* Sets the number of files that can be locked at one time.

SHIFT

Changes the position of replaceable parameters in a batch file.

Shift

SORT

Sorts input and writes results to the screen, a file, or another device.

Sort [**/R**] [*/+n*] [*drive1*:][*path1*]*filename1* [[*drive2*:][*path2*]*filename2*]

[*command* |] **Sort** [**/R**] [*/+n*] [[*drive2*:][*path2*]*filename2*]

/R Reverses the sort order; that is, sorts Z to A, then 9 to 0.

/+n Sorts the file according to characters in column *n*.

[*drive1*:][*path1*]*filename1* Specifies a file to be sorted.

[*drive2*:][*path2*]*filename2* Specifies a file where the sorted input is to be stored.

command Specifies a command whose output is to be sorted.

SUBST

Associates a path with a drive letter.

Subst [*drive1*: [*drive2*:]*path*]

Subst *drive1*: **/D**

drive1: Specifies a virtual drive to which you want to assign a path.

[*drive2*:]*path* Specifies a physical drive and path you want to assign to a virtual drive.

/D Deletes a substituted (virtual) drive.

Type SUBST with no parameters to display a list of current virtual drives.

SYS

Copies MS-DOS system files and command interpreter to a disk you specify.

Sys [*drive1*:][*path*] *drive2:*

[*drive1*:][*path*] Specifies the location of the system files.

drive2: Specifies the drive the files are to be copied to.

TIME

Displays or sets the system time.

Time [*time*]

Type TIME with no parameters to display the current time setting and a prompt for a new one.Press **ENTER** to keep the same time.

TREE

Graphically displays the directory structure of a drive or path.

Tree [*drive*:][*path*] [**/F**] [**/A**]

/F Displays the names of the files in each directory.

/A Uses ASCII instead of extended characters.

TYPE

Displays the contents of a text file.

Type [*drive*:][*path*]*filename*

UNDELETE

Restores files which have been deleted.

Undelete [[*drive*:][*path*]][*filename*] [**/LIST** | **/ALL**] [**/DT** | **/DOS**]

/LIST Lists the deleted files available to be recovered.

/ALL Undeletes all specified files without prompting.

/DT Uses only the deletion-tracking file.

/DOS Uses only the MS-DOS directory.

UNFORMAT

Restores a disk erased by the FORMAT command or restructured by the RECOVER command.

Unformat *drive*: **[/J]**

Unformat *drive*: **[/U] [/L] [/TEST] [/P]**

Unformat /PARTN [/L]

drive: Specifies the drive to unformat.

/J Verifies that the mirror files agree with the system information on the disk.

/U Unformats without using MIRROR files.

/L Lists all file and directory names found, or, when used with the /PARTN switch, displays current partition tables.

/TEST Displays data but does not write changes to disk.

/P Sends output messages to printer connected to LPT1.

/PARTN Restores disk partition tables.

VER

Displays the MS-DOS version.

VERIFY

Tells MS-DOS whether to verify that your files are written correctly to a disk.

Verify [ON | OFF]

Type VERIFY without a parameter to display the current VERIFY setting.

VOL

Displays the disk volume label and serial number, if they exist.

Vol [*drive*:]

XCOPY

Copies files (except hidden and system files) and directory trees.

Xcopy *source* [*destination*] **[/A | /M] [/D:***date***] [/P] [/S [/E]] [/V] [/W]**

source Specifies the file(s) to copy.

destination Specifies the location and/or name of new files.

/A Copies files with the archive attribute set, doesn't change the attribute.

/M Copies files with the archive attribute set, turns off the archive attribute.

/D:*date* Copies files changed on or after the specified date.

/P Prompts you before creating each destination file.

/S Copies directories and subdirectories except empty ones.

/E Copies any subdirectories, even if empty.

/V Verifies each new file.

/W Prompts you to press a key before copying.

APPENDIX A - INTERNAL MODEM

INTRODUCTION

Your 2400-bps/V.42bis/FAX internal modem is a full-featured, Hayes-compatible modem that is custom designed to take full advantage of your laptop computer. In addition to standard high-speed operation, it features Microcom Networking Protocol classes 2-5 for error detection, correction, and data compression. The modem also supports CCITT V.42 error correction and V.42bis data compression. You can add optional fax software to use the modem to send and receive facsimile transmissions with your computer. Take a few minutes to read this section, and familiarize yourself with your modem and its many uses.

Your modem is a valuable tool that can save you time and money when you need to send or receive vital information. You do not have to be a computer expert to use your modem. Communications software handles all of the commands for your modem.

Your modem's features include:

Hayes Compatibility — lets you use a wide variety of software to automatically control your modem's settings.

High Speed — so that you can send and receive data at up to 2400 bps (effectively much faster with data compression) and faxes at 9600 bps.

Direct Connection — lets you plug your computer directly into the phone line.

Pulse (Rotary) or Touch-Tone Dialing — lets your modem dial on any telephone line.

Fax Send/Receive — supports the Group 3 Class I standard with a transmission rate of 9600 bps.

Hayes Autosync — lets you work within a 3270 environment.

This manual provides general information about your modem, explains how to connect the modem to the telephone line, gives troubleshooting information, and provides a quick reference to direct modem commands. Refer to the manuals that come with your software for specific communications applications and instructions.

HOW YOUR MODEM WORKS

The following explanation about how your modem works might make you more comfortable in using the device.

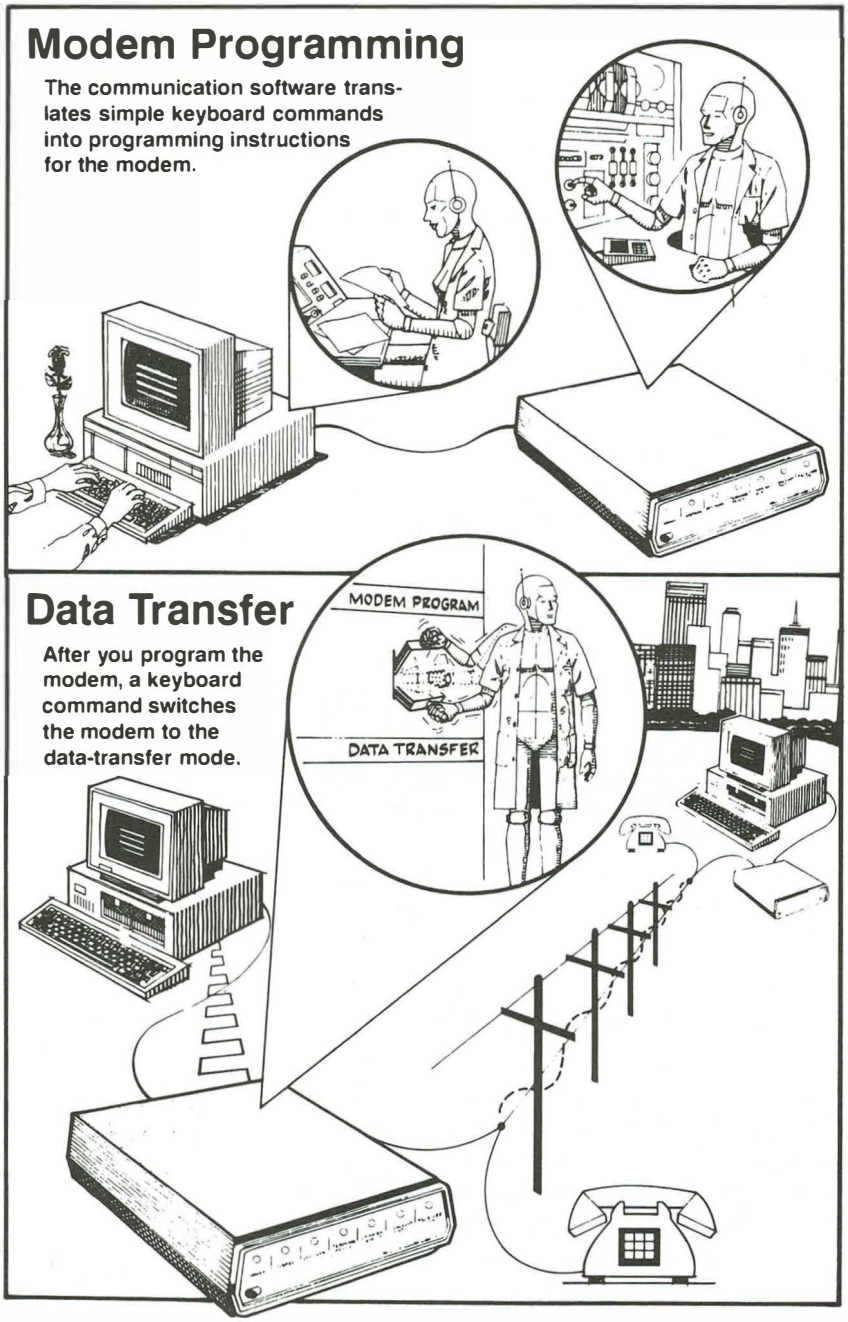
Before a modem can work, you must also have communications software that converts characters you type into information the modem understands. This software prompts you for information it needs, such as the telephone number to dial and the modem's communication speed. Then, it automatically generates the modem commands to dial the telephone number and connects to the computer service at the other end.

Imagine a telephone operator inside your computer that takes the information you specify, and then sets the proper switches and pushes the correct buttons to dial and connect to the modem in the receiving computer. When the connection is made, the imaginary operator throws one last imaginary switch that causes your computer to begin communicating with the other computer.

Your modem switches from the *command* (or modem program) mode to the *communications* (or data transfer) mode. Of course, for all of this to work, you must tell your computer to call another computer that has a modem connected.

Now the communications software takes on a new job. It displays everything your modem receives from the computer you called, and sends everything you type to the modem. Then, the modem transmits this information to the other computer. The communications software can also send and receive entire files.

A modem lets you sit down at your computer and communicate with literally thousands of other computers, all across the country.


Modem Programming
The communication software translates simple keyboard commands into programming instructions for the modem.
Data Transfer
After you program the modem, a keyboard command switches the modem to the data-transfer mode.
MODEM PROGRAM
DATA TRANSFER

AT COMMAND SET

In most cases, you do not need to learn the modem command set. Instead, you learn to use your own communications software and let the software control the modem. You must use a communications software package, such as Crosstalk or Procomm Plus, to put your modem in the terminal mode. Most commercially available packages not only put the computer in the terminal mode, but also take direct control of the modem. The AT command set is nevertheless documented here for special cases when you might need to directly control the modem. The AT command sets that your modem supports include EIA-578 (Class 1) industry standard Hayes and Microcom command set extensions for MNP operation.

The AT commands described in this manual are available to you whenever the computer is in the terminal mode and the modem is in the command state, regardless of what communications software you are running.

Putting the Modem in the Command State

When the computer is in the terminal state and your communications software is running, the software intercepts any keyboard entries. To issue commands directly to the modem, you must set the modem to the command state. To put the modem in the command state from the on-line state, enter the escape command. The default escape command is three plus signs (+++). The first + must be separated from any previous keystroke by at least 1 second, and the last + must be separated from any following keystroke by at least 1 second.

Issuing Modem Commands

Modem commands are given according to a simple syntax. Once the computer is in the command state, give the modem a command by typing the command characters on a single line and then pressing **ENTER**. Prefix all commands with the letters, *AT* or *at*, which get the modem's attention. The escape sequence (+++) and the repeat previous command (A/) are the only exceptions — you send these commands without the AT prefix and **ENTER**. You can enter modem commands in all uppercase letters or all lowercase letters. The modem ignores spaces between characters. If you make a typing error, press the backspace key and enter the correct character.

CONNECTING THE MODEM TO THE PHONE LINE

Before you can use your modem, you must connect it to the telephone line.

1. Plug one end of a modular telephone cable into the modular telephone jack on the back of the computer.
2. Plug the cable's other end into a modular telephone jack. (The telephone company refers to this jack as USOC type RJ-11.)

TROUBLESHOOTING

If you have problems with your modem (garbled data, intermittent errors, and so on), check to see that:

- The phone connection is clean and noise-free
- No one is talking on the telephone line
- The phone and all extensions are on-hook
- The operation speed is correct for the modem you are using and the modem with which you are communicating
- The modem is not connected to a cellular telephone network

If you still cannot transmit data, disconnect your modem to see if the phone line is operating correctly. If it is, the trouble is probably in your modem. Contact the GRiD Resource Center at 800-654-GRID (4743) for assistance or possible repair.

In the unlikely event that your modem causes problems on the telephone line, the telephone company can disconnect your service. If advance notice is not practical, the telephone company notifies you as soon as possible and advises you of your right to file a complaint with the FCC.

Also, the telephone company can change its lines, equipment, operations, or procedures that could affect the operation of this modem. The telephone company notifies you of these changes in advance, so that you can take the necessary steps to prevent interruption of your telephone service.

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When the computer is in the terminal state and your communications software is running, the software intercepts any keyboard entries. To issue commands directly to the modem, you must set the modem to the command state. To put the modem in the command state from the on-line state, enter the escape command. The default escape command is three plus signs (+++). The first + must be separated from any previous keystroke by at least 1 second, and the last + must be separated from any following keystroke by at least 1 second.

Issuing Modem Commands

Modem commands are given according to a simple syntax. Once the computer is in the command state, give the modem a command by typing the command characters on a single line and then pressing **ENTER**. Prefix all commands with the letters, *AT* or *at*, which get the modem's attention. The escape sequence (+++) and the repeat previous command (A/) are the only exceptions — you send these commands without the AT prefix and **ENTER**. You can enter modem commands in all uppercase letters or all lowercase letters. The modem ignores spaces between characters. If you make a typing error, press the backspace key and enter the correct character.

Command Line

A command line can contain up to 40 characters. You can send one or more commands to the modem on the same command line. The modem does not count the AT prefix and the carriage return at the end of the command line as part of the 40 characters.

On-Line State

The modem goes on-line after it connects with a remote computer. When the modem is on-line, the computer can transmit and receive data.

Factory Configuration

The modem's configuration is defined with AT commands and S-registers. You can recall command settings from three areas: factory configuration, active configuration, and user profiles. The factory configuration reflects the settings that meet most communication needs. You can reconfigure these factory settings (sometimes called default settings) for specific operating conditions. You can save most parameters to nonvolatile memory. Some, however, are nonstorable and you must reconfigure each individually following each reset.

To restore the factory default settings, use **AT&F**; to display the active configuration and user profiles, use **AT&V**.

Note: The modem port is factory set to Com 2. Set the communications software to operate with Com 2. To change the modem's port to Com 1, use the computers setup program.

LIGHTNING

Your modem has built-in protection circuits to reduce the risk of damage from surges in telephone line current. These protection circuits meet or exceed FCC requirements. However, lightning striking the telephone lines can damage the modem.

Lightning damage is not common. Nevertheless, if you live in an area that has severe electrical storms, we suggest you unplug your modem during storms to reduce the possibility of damage.

THE FCC WANTS YOU TO KNOW

We have designed your modem to conform to federal regulations, and you can connect it to most telephone lines. However, each modem (and each device, such as a telephone) that you connect to the telephone line draws power from the telephone line. We refer to this power draw as the device's *ringer equivalence number*, or REN. The REN for your computer's modem is 4B. This code is also on the label inside the modem compartment cover.

If you use more than one device on the line, add all the RENs. If the total is move than five, your telephones might not ring. In rural areas, a total REN of three might impair ringer operation.

Your modem complies with Part 68 of *FCC Rules*. You must, upon request, provide the FCC registration number and the REN to the phone company. Both numbers are on the modem.

Note: You must not connect your modem to:

- Coin-operated systems
- Party-line systems
- Most electronic key telephone systems

This modem complies with Part 15 of the *FCC Rules*. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifying or tampering with your modem can cause a malfunction and might invalidate the modem's warranty and void your FCC authorization to operate the modem. If your modem is not operating as it should, contact the GRiD Resource Center at 800-654-GRID (4743). Our personnel can assist you and arrange for service, if needed. If the trouble is harming the telephone lines, the telephone company might ask you to disconnect your modem until you have resolved the problem.

CANADIAN DEPARTMENT OF COMMUNICATIONS (DOC) NOTICE

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before you install this equipment, be sure that it is permissible to connect the equipment to the local telecommunications company's facilities. You must also install the equipment using an acceptable connection method. In some cases, the company's inside wiring associated with a single-line individual service can be extended using a certified connector assembly (telephone extension cord). Be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations the user makes to this equipment, or equipment malfunctions, can give the telephone company cause to request that the user disconnect the equipment.

Ensure for your own protection that the electrical ground connections of the power utility and telephone lines are connected to an internal metallic water pipe system, if present. This precaution can be particularly important in rural areas.

Caution: Do not attempt to make such connections yourself. Contact the appropriate electric inspection authority or electrician, as appropriate.

Load Number

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop which is used by the device to prevent overloading. The termination on a loop can consist of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100B.

The modem has been assigned a Load Number of 29.

ERROR CORRECTION AND COMPRESSION (MNP AND V.42 LAPM PROTOCOLS)

Your modem can provide an error-free communications link when you connect to another modem that supports either the MNP4 or V.42 LAPM protocol. The hardware flow control (\Q3) uses the modem serial interface to control the flow of data. The signals used are RTS (request to send) and CTS (clear to send). Software flow control (\Q1) uses flow control characters (XON and XOFF) in the data stream. Both the modem and communications software need to be set to use the same kind of flow control. As factory configured, this option is disabled. To enable this feature, you should send the modem the following command before you dial the other system:

AT\N7\Q1 or **AT\N7\Q3**

Your modem can also provide an effective data transfer rate at higher than 2400 bps. To do this, the modems transmit a compressed form of the data and decompress the data upon receipt. The modem you connect to must support V.42bis or the MNP5 protocol to take advantage of data compression. As factory configured, this option is disabled. To enable this feature, you should enable error correction as explained above and send the modem the following command before you dial the other system:

AT%C1\J0

Then, set your communications software to 19,200 bps. The modem automatically adjusts its communications rate to the highest supported by the other modem, and communicates with your software at the rate you set. The speeds do not have to be the same when you set \J0. Data compression is not effective when you send or receive files that have been software compressed.

If your software does not expect modem return codes, you can monitor the progress of the connection to see which protocols are in effect by sending the modem the following command:

ATW1

COMMAND SET

This section describes the AT command set for the V.42bis/FAX modem. This modem provides the Hayes standard AT command set for auto dialing, Microcom Networking Protocol (MNP) AT command subset, and Class 1 Fax (EIA-578) command set.

AT (attention command)

Unless otherwise noted, all modem commands must begin with the characters AT. (The AT prefix must be either all uppercase or all lowercase.) These characters stand for *attention*, and they tell the modem that subsequent characters constitute a command to the modem rather than data to be transmitted. The AT command set lets you combine commands on a line. After you press **ENTER**, the modem executes the commands in the order they appear.

Example: AT *command characters*

AUTOMATIC DIALING COMMANDS

D (dial command)

Instructs the modem to dial the number specified by subsequent digits. You do not need to enter spaces, hyphens, or parentheses; if present, the modem ignores them. Valid dial string characters are 0-9, #, *, A, B, C, and D. You can use the following options with the Dial command: P T , ; " ! W @ R S=n

Example: ATD4085551212

P (pulse dialing command)

Instructs the modem to use pulse dialing. You can enter this alone or with a dial command. Pulse dialing is the default when you first power the modem.

Example: ATP
Example: ATDP4085551212

T (Touch-Tone dialing command)

Instructs the modem to use touch-tone dialing. You can enter this alone or with a dial command.

Example: ATT
Example: ATDT4085551212

, (pause command)

Each comma you insert in a dial command causes a 2-second delay (or the value of register S8) at that point in the dial sequence. Enter a pause when you need to dial part of a number, wait for dial tone or signal of some sort, and then resume dialing. In the example, a 4-second delay is inserted after dialing 9 to get an outside line.

Example: ATD9,,4085551212

; (return to command state after dialing)

Makes the modem dial the number and return to the command state (the OK prompt) without hanging up. Ordinarily, the modem goes on-line as soon as it connects. When the modem is on-line, you can only issue the escape command. When you end a dial command with a semicolon (;), the modem dials the number, but does not go on-line when the connection is made.

Example: ATD4085551212;

! (flash switch hook command)

Makes the modem "flash" the switchhook* for 1/2 second, then "release" the switch hook before continuing to dial. On some telephone systems, you can use this command to transfer a call to another line. The example below transfers a call and hangs up. (The H command is discussed in the following section.)

Example: ATD!1507;H

W (wait for second dial tone command)

Makes the modem wait for a second dial tone at this point in the dial command before dialing remaining digits. Use this command to access a service that requires you to dial an access number, wait for a dial tone, and then dial another number or enter a code. You can use the W command only when the result code command currently in effect is X3 or higher. You can use the W command more than once in a single dial command.

Example:
ATD9501022W04085551212W8645
5478853064

* The term switchhook refers to the mechanism your telephone uses to distinguish between a raised and a lowered receiver. On most desktop telephones, the switchhook is the two buttons on which the handset rests. On a wall-mounted phones, the switchhook is the bracket from which the receiver hangs when the phone is not in use.

@ (wait for silence command)

Makes the modem wait for 5 seconds of silence at the other end of a completed call before dialing any remaining digits. Use this command when you need to wait for a recorded message to complete before entering digits in response to that message. To use the @ command, set the result code command to X3 or higher. You can use the @ command more than once in a single dial command. In the example below, assume that the @ command corresponds to a recorded message asking you to enter your access code. The dialing operation stops while the message plays. Five seconds after the message completes, the modem dials the access code digits.

Example: ATD4085553825@32863

R (reverse frequency command)

Reverses the modem's originate and answer frequencies. This is necessary when you want to call an originate-only modem. The R command can immediately precede or follow the dialed number.

Example: ATDR4085551212
Example: ATD4085551212R

DS=*n* (dial stored number)

Dials the stored number, where n is location 0-3. See &Zn=x command for information on storing a number.

Example: ATDS=2

A/ (repeat last command)

Causes the modem to repeat the last command. Do not precede this command with the AT (attention command), or terminate it with the **Return** key. In the example, A/ is used to redial a phone number.

Example: ATD4085551212
NO CARRIER
A/

Any key — While the modem is dialing, pressing any character key causes the modem to cancel the call.

MODEM OPERATION COMMANDS

+++ (escape command) — Use this command to place the modem in the command state. Do not precede the escape command with the AT (attention) command, or terminate it with the **Return** key. The first + must be separated from any previous keystroke by at least 1 second, and the last + must be separated from any following keystroke by at least 1 second. Otherwise, the modem interprets the three + signs as part of the data stream instead of the escape command. You must enter the + signs with less than 1 second between each one. Use the ATO command to go back to the on-line state.

Example: *data [1 sec. pause]+++* [1 sec. pause] *command keystrokes*

A (manually answer) — Forces the modem to go off hook in answer mode. Use this command to manually answer a call. You must enter this command last on a command line.

B*n* (CCITT/Bell mode) — Selects either CCITT or Bell standard for 300 and 1200 bps operation. At 2400 bps, the modem selects CCITT V.22bis. At 300 and 1200 bps, you can choose either standard to match the standard the remote system uses.

ATB0 — Selects CCITT V.21/V.22 standard.

ATB1 — Selects Bell 103/212A standard (factory setting).

C1 (normal transmit carrier switching) Some modems use the C command to control the transmit carrier. The C0 option is not valid for the V.42bis/FAX modem.

E*n* (command-state echo command) Turns local echo off or on for modem commands.

ATE0 Turns off local echo. In this state, the modem does not echo commands you type to the computer.

ATE1 Turns on local echo (factory setting).

F1 (on-line state echo command) Some modems use the **F** command to disable character echo in the on-line state. The F0 option is not valid for the V.42bis/FAX modem.

H*n* (on/off hook command) Causes the modem to go on-hook or off-hook.

ATH0 Causes the modem to hang up or go on-hook (factory setting).

ATH1 Causes the modem to go off-hook (same as picking up the telephone handset).

I*n* (identification command) The modem uses I*n* to identify the modem code and status of the ROM.

ATI0 Displays the product ID code.

ATI1 Performs checksum on ROM and displays result.

ATI2 Performs checksum on ROM and displays status, either OK or ERROR.

L*n* (speaker volume) Sets the speaker volume to a medium level.

ATL0, ATL1 Low speaker volume.
ATL2 Medium speaker volume (factory setting).
ATL3 High speaker volume.

M*n* (speaker control command) — The number you enter to replace *n* determines when the modem's built-in speaker is on and when it is off. The four possible values are shown below.

ATM0	Speaker OFF.
ATM1	ON through dialing and carrier detect; OFF at connection (factory setting).
ATM2	ON continuously, even during data transmission.
ATM3	ON after last digit dialed, until carrier detect; OFF at connection.

O*n* (on-line command) — Switches modem from command state to on-line state.

ATO0	Takes the modem from the command state back to the on-line state when a connection is still open.
ATO1	Also returns modem to on-line state and initiates equalizer retrain sequence (at 2400 bps).

Q*n* (quiet command) — This command determines whether or not the modem returns result codes.

ATQ0	Causes the modem to return codes (factory setting).
ATQ1	Causes the codes to be suppressed.
ATQ2	Causes the codes to be returned in the originate mode only.

S*r*=*n* (register command — Sets register *r* to value *n*. Use this command to change the values stored in any of the modem's registers. (It is unlikely that you will need to do this — do not change register values unless you are sure of what you are doing.) The general form of the register command is shown below. In an actual command, you replace *r* with the register number and *n* with the value to be set (from 0-255). The registers and their values are listed in Table 1.

ATS*r* = *n*

Table 1. Modem Registers and Values

Register Number	Function	Default Value
0	Sets number of rings before automatic answering.	0
1	Counts and stores number of times the phone rings. Reverts to 0 if no ring occurs for 8 seconds.	0
2	Sets ASCII value of escape code sequence character. A value greater than 127 disables escape sequence.	43 (+)
3	Sets ASCII value of carriage return <CR> character.	13
4	Sets ASCII value of line feed character.	10
5	Sets ASCII value of backspace character.	8
6	Sets number of seconds modem waits for dial tone. Used when X0, X1, or X3 commands are in effect.	2
7	Sets number of seconds modem waits for carrier tone.	30
8	Sets duration of delay generated by comma (,) dial modifier.	2
9	Sets length of time, in tenths of a second, carrier signal must be present for modem to recognize signal and turn on DCD (data carrier detect). Prevents ring or busy signal from being mistaken as carrier.	6
10	Sets duration, in tenths of a second, that modem waits after loss of carrier before hanging up.	14
11	Sets duration, in milliseconds, of spacing between touch-tones during dialing.	95
12	*Reserved*	
13	*Reserved*	

14	*Reserved*	
15	*Reserved*	
16	*Reserved*	
17	*Reserved*	
18	Sets duration, in seconds, of modem diagnostic tests. When a test is active for this length of time, modem automatically terminates the test. 0 disables the timer. The range is 0-255.	0
19	Bit-mapped synchronous options: Bit 1: 0–BSC protocol, 1–SCLC protocol Bit 2: 0–SDLC Address detect off, 1–on Bit 4: 0–SDLC Mark, 1–Flag All other bits ignored.	
20	Contains the synchronous character in BSC mode (32 hex, default), or the SDLC address character in SDLC mode (0, default).	
21	*Reserved*	
22	*Reserved*	
23	*Reserved*	
24	*Reserved*	
25	Delay to DTR (in 100ths of a second). The modem ignores a change in DTR state (ON or OFF) that persists for less than this value. The range is 0-255.@COL 3/3 = 5	
26	*Reserved*	
27	*Reserved*	
214	Sets the maximum V.42bis string length and determines the largest string that can be represented by a given V.42bis code. The range is 6-250. Set the value to a lower number if the modem encounters an incompatibility problem. The suggested setting is 64.	250

S*r*? To display the value stored in register *r*, use the command ATS*r*?, where *r* is the register number that you want to query.

Example: ATS8?

V*n* (verbose command) Determines whether result codes are displayed as numbers or text. See Table 2 for codes and messages.

ATV0 Causes codes to display as numbers.

ATV1 Causes codes to display as text (factory setting).

W*n* (negotiation progress code command) You can enable an additional set of result codes with the W command. These result codes report the progress of the negotiation phase in the error-correction and compression mode. These codes report the carrier speed and the error-correction protocol. For example, both 77 and PROTOCOL: LAP-M indicate that the error-correction protocol is V.42 LAP-M. See Table 2 for codes and messages.

ATW0 The modem does not report negotiation progress. The modem reports the serial port connect rate on connection.

ATW1 The modem reports negotiation progress. When a reliable link is established, the modem can report a different CARRIER rate and CONNECT rate.

ATW2 The modem does not report negotiation progress. The modem reports the modem (carrier) connect rate on connection (factory setting).

X*n* (result code command)

Every operation the modem performs has one of several possible results. The modem reports the actual result of each operation in the form of a result code from 0 to 80. Each result code has an associated text message. Whether or not a particular result code appears on the screen depends on the result code command (see Table 3). Your choice of a result code set also determines whether or not certain modem functions are enabled, as explained later in this section. The factory setting is X4.

The result codes and their associated messages are shown in Table 2.

Table 2. Result Codes

Code	Message	Connection Indicated
0	OK	Command executed
1	CONNECT	Connection at 300/1200/2400 bps if X0 is set; otherwise, connection at 300 bps
2	RING	Ring signal detected
3	NO CARRIER	Carrier signal not detected, or lost
4	ERROR	Invalid command, checksum, error in command line, or command line exceeds 40 characters
5	CONNECT 1200	Connection at 1200 bps
6	NO DIAL TONE	No dial tone detected
7	BUSY	Busy signal detected
8	NO ANSWER	No silence detected when dialing a system not providing a dial tone (replaces NO CARRIER if an @ is present in the dial string)
10	CONNECT 2400	Connection at 2400 bps

11	CONNECT 4800	Connection at 4800 bps (serial port speed)
12	CONNECT 9600	Connection at 9600 bps (serial port speed)
14	CONNECT 19200	Connection at 19200 bps (serial port speed)
20	CONNECT/REL	Reliable (MNP or V.42 LAP-M) connection with connection speed suppressed (X0)
22	CONNECT 1200/REL	Reliable (MNP or V.42 LAP-M) connection at 1200 bps
23	CONNECT 2400/REL	Reliable (MNP or V.42 LAP-M) connection at 2400 bps
24	CONNECT 4800/REL	Reliable (MNP or V.42 LAP-M) connection at 4800 bps
26	CONNECT 9600/REL	Reliable (MNP or V.42 LAP-M) connection at 9600 bps
27	CONNECT 19200/REL	Reliable (MNP or V.42 LAP-M) connection at 19200 bps
40	CARRIER 300	Carrier detected at 300 bps
46	CARRIER 1200	Carrier detected at 1200 bps
47	CARRIER 2400	Carrier detected at 2400 bps
66	COMPRESSION :CLASS 5	MNP Compression negotiated
67	COMPRESSION :V.42bis	V.42bis compression negotiated
69	COMPRESSION: NONE	No compression negotiated
70	PROTOCOL: NONE	Asynchronous mode
77	PROTOCOL: LAP-M	V.42 LAP-M error correction negotiated
80	PROTOCOL: ALT	MNP error correction negotiated

Table 3 lists the result code commands and indicates which result codes are reported according to which command is in effect.

Table 3. Result Code Commands

Command	Codes Reported									
	0	1	2	3	4	5	6	7	8	10
X0	•	•	•	•	•					
X1	•	•	•	•	•	•				•
X2	•	•	•	•	•	•	•			•
X3	•	•	•	•	•	•		•	•	•
X4	•	•	•	•	•	•	•	•	•	•

Command	Enabled by W0			Enabled by \V1			Enabled by W0 and \V1		
	11	12	14	20	22	23	24	26	27
X0				•					
X1	•	•	•	•	•	•	•	•	•
X2	•	•	•	•	•	•	•	•	•
X3	•	•	•	•	•	•	•	•	•
X4	•	•	•	•	•	•	•	•	•

				Enabled by \V1					
				Disabled by %C0					
Command	40	46	47	66	67	69	70	77	80
X0				•	•	•	•	•	•
X1	•	•	•	•	•	•	•	•	•
X2	•	•	•	•	•	•	•	•	•
X3	•	•	•	•	•	•	•	•	•
X4	•	•	•	•	•	•	•	•	•

If you do not enter a result code command, the modem assumes X4, W2, %C0 by default.

Whether reported codes appear as numbers or as messages depends on what V command is in effect, as explained earlier in this section.

Example: ATX3

Y (long-space disconnect) Controls long-space disconnect.

ATY0 Disables long-space disconnect (factory setting).

ATY1 Enables long-space disconnect.

Z*n* (reset command) Resets modem and recalls profile.

ATZ0 Recalls user profile 0.

ATZ1 Recalls user profile 1.

&C*n* (data carrier detect) Controls Data Carrier Detect (DCD). You can program the modem to keep DCD on at all times, ignoring data carrier presence or absence, or you can program it to turn on DCD when a data carrier is detected. Use this command if your computer or terminal requires DCD to be OFF at certain times.

AT&C0 DCD always ON; assumes data carrier always present (factory setting).

AT&C1 DCD tracks data carrier from the remote modem; DCD is on when data carrier is detected. Most autodial software requires you to set this option.

&D*n* (DTR control) Controls DTR transition. Positive transitions of DTR (OFF-to-ON) that occur within 5 seconds after disconnect are ignored. When AT&D2 or AT&D3 is set, DTR must be ON to autoanswer.

AT&D0 Ignores DTR; DTR is not needed for autoanswer (factory setting).

AT&D1 Enters command state when an ON-to-OFF transition of DTR is detected.

AT&D2	Hangs up and enters command state when an ON-to-OFF transition of DTR is detected. Most autodial software requires this option to be set.
AT&D3	Hangs up and resets when an ON-to-OFF transition of DTR is detected.
&F (restore factory settings)	Restores the factory settings as the active configuration. The factory settings are as follows: B1, E1, L2, M1, Q0, V1, W2, X4, Y0, &C0, &D0, &G0, &J0, &L0, &P0, &Q0, &R0, &Y0, %A000, %B2400, %C0, \C0, \G0, \H0, \J1, \K5, \N0, \Q0, \T000, \V0, \X0
&G*n* (guard tone)	Sets guard tone. Calls in the United States do not need guard tones.
AT&G0	Disables guard tone (factory setting).
AT&G1	Sets guard tone on the answering modem to 550 Hz.
AT&G2	Sets guard tone to 1800 Hz.
&J*n* (phone jack type)	Designates the type of jack with which the modem is connected to the telephone line.
AT&J0	RJ11, RJ41S, or RJ45S type phone jack (factory setting).
AT&J1	RJ12 or RJ13 type phone jack.
&L*n* (dial-up line operation)	The **&L** command sets the dial-up line operation mode.
AT&L0	Sets the line type to a dial-up line (default).
AT&L1	Sets the line type to a leased line.
&M0 (asynchronous mode)	Some modems use the **&M** command to set the communication mode. Any value other than &M0 is not valid for the V.42bis/FAX modem.

&P*n* (pulse dial ratio) Controls the off-hook (make) to on-hook (break) ratio that the modem uses for pulse dialing.

AT&P0 Pulse dial make/break ratio = 39/61 for use in the United States (factory setting).

AT&P1 Pulse dial make/break ratio = 33/67 for use in the United Kingdom.

&Q*n* (asynchronous/ synchronous mode) Selects between the asynchronous and synchronous modes.

AT&Q0 Selects the asynchronous mode. This mode is compatible with most computer services, bulletin boards, and remote connections (factory setting).

AT&Q4 Selects Synchronous Mode 4 (Hayes autosync). In this mode, the modem I/O interface operates asynchronously and the modem translates to BISYNC or SDLC protocol on the telephone line. This is compatible with systems that emulate IBM 3780 Bisync and IBM 3270, 3770, and 5250 SNA terminals. Registers 19 and 20 affect synchronous operation.

&R*n* (CTS control) Selects CTS control. This command only applies when the modem is set to synchronous mode (&Q4).

AT&R0 CTS follows RTS when online. CTS always true in command state (factory setting).

AT&R1 CTS always true.

&S*n* (assume DSR signal) Some modems use the **&S** command to indicate when the modem is connected to a communication channel and ready. Any value other than **&S0** is not valid for the **V.42bis/FAX** modem.

&T*n* (diagnostic test) This is the modem's diagnostic and test facility.

AT&T0	Ends a test in progress and returns the local and remote modems to normal operation.
AT&T1	Initiates local analog loopback. The modem should display the characters on your screen exactly as you type them.
AT&T2	Initiates local analog loopback test. Same as &T1, except data is transmitted in the higher frequency band and received in the lower frequency band. This helps identify hardware or environmental problems that affect one of the frequency bands, but not the other.
AT&T3	Lets a remote modem that does not support the CCITT V.54 standard perform a local digital loopback test with the modem.
AT&T4	Lets the modem respond to a remote caller's request to enter remote digital loopback mode (factory setting).
AT&T5	Prevents the modem from responding to a remote digital loopback request.
AT&T6	Instructs the remote modem to initiate remote digital loopback.
AT&T7	Instructs the remote modem to initiate a remote digital loopback with self-test.
AT&T8	Initiates remote analog loopback with self-test. The modem sends itself the CCITT V.54 test pattern and verifies these characters to make sure they are received correctly. It reports errors upon completion of the test.
&V (view configuration and profiles)	Displays the active configuration, user profiles, and stored telephone numbers. Do not issue this command in conjunction with other commands. Enter it on a line by itself.

&W*n* (store current configuration) Saves the storable parameters of the active configuration in memory as one of two user-defined profiles. (The &V command displays the storable parameters.)

AT&W0 Saves storable parameters of active configuration as user profile 0.

AT&W1 Saves storable parameters of active configuration as user profile 1.

&Y*n* (recall user profile) Specifies which profile is recalled on power-up. You can designate either user profile as the default to recall when the modem is powered up.

AT&Y0 Recalls user profile 0 at power-up (factory setting).

AT&Y1 Recalls user profile 1 at power-up.

&Z*n*=*x* (store phone number) Stores dial string (phone number) *x* in location *n*, where *n* is a decimal integer (0 to 3) and *x* is a string of up to 32 characters. Valid dial string characters are 0-9, dial modifiers, and (for tone dialing) A, B, C, D, #, *. The modem ignores invalid characters.

ERROR DETECTION, CORRECTION, AND DATA COMPRESSION COMMANDS

\A*n* (maximum MNP blocksize)

Sets the maximum blocksize the modem uses during a MNP reliable link. For best throughput, select a large blocksize (256 bytes). If you connect through a poor telephone connection, reducing the blocksize might improve throughput by reducing the amount of data to be retransmitted when errors occur.

AT\A0 Maximum MNP blocksize = 64 bytes.

AT\A1 Maximum MNP blocksize = 128 bytes.

AT\A2 Maximum MNP blocksize = 192 bytes.

AT\A3 Maximum MNP blocksize = 256 bytes (factory setting)

\B (send 300 mS break)

Sends a 300 millisecond break to the remote system.

%A*n* (autoreliable fallback character)

Sets the ASCII character the answering modem recognizes as the autoreliable fallback character, where *n* is a decimal integer between 0 and 127. (The factory setting is 0, meaning the autoreliable fallback character is disabled.)

In autoreliable mode, when the V.42bis/FAX modem encounters an incoming reliable fallback character from the remote system, it automatically switches to normal mode and passes the character to the serial port. Autoreliable fallback character recognition stops if the modem receives a SYN character (ASCII 22). The modem ignores the autoreliable fallback character parity bit. Note that with this command, you must set both AT\C2 and AT\N3, AT\N5, or AT\N7.

%B*n* (modem port bps rate)

When issued locally, sets the maximum modem port bps rate, where *n* = 300, 1200, or 2400. The factory setting is 2400.

\C*n* (autoreliable buffer)

Determines if the answering modem buffers the data that it receives from the remote modem during the 3-second interval in which it attempts to establish a reliable connection. Use this command when the answering modem is in autoreliable mode.

When you set AT\C1 or AT\C2, reliable and normal connections can result independent of bps rate adjust. When you set AT\C0, bps rate adjust affects the type of connection as follows: reliable and direct connections can result when bps rate adjust is on (AT\J1); reliable and normal connections can result when bps rate adjust is off (AT\J0).

AT\C0 Does not buffer data during link negotiation. Switches to normal or direct mode if SYN not detected in 3 seconds (factory setting).

AT\C1 Buffers all data on the answering modem until either 200 non-SYN characters are received or a SYN character is detected within 3 seconds. If 200 non-SYN characters are received, the modem switches to normal mode and passes the data through to the serial port. If a SYN character is detected within 3 seconds, the modem attempts to establish a reliable connection. Otherwise, the modem switches to normal mode. If the buffer fills, the modem switches to normal mode.

AT\C2 — Does not buffer data on the answering modem. Switches to normal mode upon receipt of a character defined by the AT%A command and passes that character to the serial port.

When the modem is set to autoanswer and receives calls from modems that both support and do not support MNP, use autoreliable mode and set AT\C2. This lets the modem switch to normal mode as soon as it detects a logon character (defined by the AT%A command) from a non-MNP caller, thereby eliminating the 3-second wait.

%C*n* (compression control) — Determines whether the modem tries to use data compression during reliable connections. Both modems must have this command set to AT%C1 at the time the connection is established. For the most efficient results, also set the bps rate adjust off (AT\J0).

AT%C0 — Disables data compression (factory setting).

AT%C1 — Enables V.42bis and MNP Class 5 data compression.

\G*n* (modem port flow control) — Sets the flow control method the modem uses to pace data sent from the remote modem to this modem during a normal mode connection.

Note: The reliable link has its own method of flow control and ignores the AT\G setting. However, the serial port flow control settings (AT\Q*n*) remain active during a reliable link.

AT\G0 — Disables modem port flow control (factory setting).

AT\G1 Sets modem port flow control to XON\XOFF (the modem sends an XOFF character to stop received data and sends an XON character to resume receiving data.

\H*n* (HP ENQ/ACK support) Lets the modem emulate the Hewlett-Packard ENQ/ACK protocol when an MNP reliable link is established. The modem can use flow control in addition to the ENQ/ACK protocol. Data blocks should not exceed 250 characters each.

AT\H0 Disables HP ENQ/ACK protocol (factory setting).

AT\H1 Enables HP ENQ/ACK protocol during MNP reliable link. Modem emulates terminal.

AT\H2 Enables HP ENQ/ACK protocol during MNP reliable link. Modem emulates host.

Use the HP ENQ/ACK protocol as follows:

1. Set the modem at the host to AT\H1.
2. Set the modem at the terminal to AT\H2.
3. Enable either XON/XOFF (AT\Q1) or hardware (AT\Q3) flow control on the serial port on both modems to prevent data loss.
4. Establish an MNP reliable link.

Note: HP ENQ/ACK is not supported during V.42 LAP-M reliable connection.

\J*n* (bps rate adjust) Controls the bps rate adjust feature. To retain the highest throughput, disable the bps rate adjust when you use data compression, and set the serial port speed (through your communications software) to 19200 bps.

AT\J0 Disables the bps rate adjust feature. The serial port is independent of the rate of the connection.

AT\J1 Enables the bps rate adjust feature. After a connection is made, the modem adjusts the speed of the serial port to match the speed of the connection. The serial port remains at the adjusted bps rate after the connection terminates. If your computer or terminal does not automatically change to the adjusted bps rate, you must manually change the bps rate to the new setting (factory setting).

\Kn (break control) Determines what the modem does when it receives a BREAK from the computer or remote modem. During MNP mode, the remote modem's BREAK control setting determines how this modem handles BREAK. The factory setting is \K5.

When the modem receives a BREAK from the local computer during normal or MNP operation:

AT\K0,2,4 Modem enters the command mode (waiting for AT) without sending a BREAK to the remote modem.

AT\K1 Modem clears the terminal and modem buffers and sends a BREAK to the remote modem.

AT\K3 Modem does not clear the buffers, but sends a BREAK to the remote modem.

AT\K5 Modem sends a BREAK to the remote modem in sequence with any transmitted data.

When the modem receives a BREAK from the remote modem during normal mode:

AT\K0,1 Modem clears the terminal and modem buffers and sends a BREAK to the computer.

AT\K2,3 Modem does not clear the buffers, but sends a BREAK to the computer.

AT\K4,5 Modem sends a BREAK to the computer in sequence with any data being buffered.

When the modem receives a BREAK from the computer during direct mode:

AT\K0,1,2 Modem sends a BREAK to the remote modem and enters the command mode.

AT\K3,4,5 Modem sends a BREAK to the remote modem.

Note: In LAPM mode, the modem tries to preserve the break duration when transmitting it to a remote modem. MNP cannot maintain the break duration; long and short breaks are the same duration.

\N*n* (operating mode) Selects the operating mode the modem uses while connected. The operating mode determines how the modem communicates with the remote system.

AT\N0 Sets normal mode; no error correction (factory setting). In normal mode, when bps rate adjust is OFF (\J0), the serial and modem ports can operate at different speeds. Use flow control to avoid data loss.

AT\N1 Sets direct mode. The modem does not buffer data, and ignores flow control (\G) and bps rate adjust (\J). Upon connection, the serial port always adjusts to the connect speed, regardless of the setting of bps rate adjust command. The escape code sequence is disabled in direct mode.

AT\N2 Sets reliable mode. Uses MNP to provide error detection and automatic data retransmission if an error occurs. This ensures error-free communications between your system and the remote system. The remote system must also be able to handle an MNP link. The modem tries to establish a reliable link immediately after connecting. If the attempt fails, the modem disconnects.

During an MNP link, use serial port flow control. When the modem detects a transmission error, it holds serial port data in a buffer while correcting the error. The remote system should also support flow control.

Note: Some software error-correction protocols, such as Kermit or XMODEM, might not work well with MNP and can interfere with its effectiveness. If you use a protocol through your software, it should have a large (1k) block size to minimize interference.

AT\N3 Sets autoreliable mode. This mode lets a modem communicate both with remote systems that do support and remote systems that do not support MNP links. The answering modem looks for MNP protocol characters. If it detects them within about 3 seconds, it tries to establish a reliable link connection.

When the modem is set to auto answer, you can shorten this period with the AT%A and AT\C2 commands. Set AT\C2 so the modem recognizes an incoming autoreliable fallback character. When the modem receives this character, it stops waiting for a MNP protocol character and falls back to a normal connection.

Note: Even if you set both modems to autoreliable mode, a normal connection or no connection could result due to noise on the telephone line.

If the modem does not detect incoming MNP characters, and bps rate adjust is ON (AT\J1) and autoreliable buffer is OFF (AT\C0), the modem establishes a direct connection. If bps rate adjust is OFF (AT\J0), the modem falls back to a normal connection and uses flow control, if it is enabled.

AT\N4 Sets reliable mode using V.42 LAP-M protocol. If the modem cannot establish a V.42 LAP-M link, the call is dropped.

AT\N5 Sets autoreliable mode using V.42 LAP-M protocol. If the modem cannot establish a V.42 LAP-M link, the modems establish a connection following the same parameters as documented under AT\N3.

AT\N6 Sets reliable mode using V.42 LAP-M protocol with fallback to MNP. If the modem cannot establish a V.42 LAP-M link, the modem tries to establish a MNP reliable connection. If the modems cannot establish an MNP connection, the call is dropped.

AT\N7 — Sets autoreliable mode using V.42 LAP-M protocol. If the modem cannot establish a reliable link using V.42, the modem tries MNP. If the MNP attempt also fails, the modems establish a connection following the same parameters as documented under AT\N3.

\OFF (power-off mode) — Sets the modem to the power-save mode. In this mode, the modem uses only about 2.5 milliwatts. The next character sent turns on the modem. This character is lost.

\Q*n* (serial port flow control) — Sets the serial port flow control type. If you set the serial port speed faster than the modem port speed, data from your computer or terminal enters the modem faster than the modem sends it out. The modem holds characters in a buffer and sends them out at the slower modem port bps rate. When the buffer fills, flow control instructs your computer or terminal to stop transmitting data to the modem; the modem continues to send out the characters and empty the buffer. When there is room in the buffer, flow control instructs your computer or terminal to resume transmitting data to the modem.

For reliable connections, retransmission can reduce the effective modem port speed. If this occurs, flow control prevents buffer overflow.

The modem does not use flow control during direct mode connections.

AT\Q0 — Disables flow control (factory setting).

AT\Q1 Enables bidirectional XON/XOFF flow control. Transmission is stopped by sending an XOFF character and is restarted by sending an XON character. The modem generates XON and XOFF characters at the same parity as used on the serial port. The serial port also responds to XON and XOFF characters sent to it from the local computer or terminal.

AT\Q2 Enables unidirectional hardware flow control. The modem turns CTS OFF to stop the local computer or terminal from transmitting data, and turns CTS ON to allow the local computer or terminal to resume transmitting data.

AT\Q3 Enables bidirectional hardware flow control using CTS and RTS. The modem uses CTS to start and stop data transmission from the local computer or terminal. When RTS is OFF, the modem stops transmitting data to the local computer or terminal. When RTS is ON, the modem resumes sending data.

AT\Q4 Enables unidirectional XON/XOFF flow control. The modem serial port generates, but does not respond to, XON/XOFF flow control characters. This setting lets computers transmit data that has XON/XOFF data characters. You can still set the computer to respond to XON/XOFF flow control characters sent to it from the modem during serial port flow control.

AT\Q5 Enables unidirectional hardware flow control, but also keeps CTS OFF until a connection is established.

AT\Q6 Enables bidirectional hardware flow control, but also keeps CTS OFF until a connection is established.

\T*n* (inactivity timer) Specifies the number of minutes the modem waits before automatically hanging up when data is not sent or received. The range for *n* is 0-90 with a factory setting of 0. AT\T0 disables the inactivity timer. The inactivity timer is only available during normal and reliable link connections. It is ignored when the modem is in direct mode.

\V*n* (MNP result code form) Determines whether result codes are returned to indicate a reliable link connection is in effect.

AT\V0 Disables modified MNP result codes. The modem uses the results codes listed with the ATV command. Use AT\V0 when the communications software you use does not expect to see a reliable link result code, even if a reliable connection is made (factory setting).

AT\V1 Enables modified MNP result codes. Use this setting when your software supports MNP result codes.

%V (display modem firmware version) Displays the modem firmware version.

Xn (XON/XOFF pass-through) Determines whether the modem passes XON/XOFF (DC1/DC3) codes to the computer or filters them out.

\X0 The modem filters out all XON/XOFF codes. (factory default)

\X1 The modem passes XON/XOFF codes through to the computer.

\Z (switch to normal mode) Causes the local and remote modems to switch to normal mode during a reliable link. Switching to normal mode erases all data in the buffer. **This command is for advanced use only.**

If AT\J1 and AT\C0 are set, this command forces the modem to direct mode rather than to normal mode.

CLASS 1 (EIA-578) COMMAND SET

+FCLASS? (Service Class Indication) Displays the current Class setting. The setting will be:
0 indicates a data modem
1 indicates a Class 1 fax modem

+FCLASS=? (Service Class Capabilities) Displays the Classes available. The response is a list of values separated by commas. The values are those given in FCLASS?. For example, a modem that supports data communication and facsimile Class 1 would respond: "0,1".

+FCLASS=value (Service Class Selection) Sets the Class to the values given in FCLASS?. To configure a modem for Class 1, use the command: "AT+FCLASS=1".

+FTS=<Time> (Stop transmission and pause) Causes the modem to stop any transmission. The modem waits for the specified amount of time and sends the OK result code. Time is in 10 ms intervals in the range 0-255.

+FRS=<Time> (Wait for silence) Causes the modem to listen and to report back an OK result code when silence has been present on the line for the amount of time specified. Time is in 10 ms intervals in the range 0-255.

+FTM=<MOD> (Facsimile Transmit) Causes the modem to transmit data using the modulation selected in <MOD>, which can have the values shown in Table 4).

+FRM=<MOD> (Facsimile Receive) Causes the modem to enter receive mode using the modulation specified in <MOD>, which can have the values shown in Table 4.

+FTH=<MOD> (HDLC Transmit)

Causes the modem to transmit data framed in the HDLC protocol using the modulation mode selected by <MOD>, which can have the values shown in Table 4.

+FRH=<MOD> (HDLC Receive)

Causes the modem to receive HDLC framed data using the modulation mode selected in and deliver the next received frame to the DTE. <MOD> can have the values shown in Table 4.

Table 4. <MOD> Parameter Values

Value	Modulation	Speed
3	V.21 ch.2	300
24	V.27ter	2400
48	V.27ter	4800
72	V.29	7200
96	V.29	9600

Note: To obtain a copy of the EIA-578 specification, contact the Electronic Industry Association, P.O. Box 57258, Washington, DC 20037-0258; telephone (202) 457-8734.

With the exception of +FCLASS, all Class 1 commands return an ERROR result code if issued when the modem is on-hook.

You can query all Class 1 commands that use the <MOD> parameter for the range of supported values. When the +FCLASS setting is a Class 1 FAX modem (+FCLASS = 1), the query syntax is: +(command) = ?

V.42bis/FAX MODEM SPECIFICATIONS

Communication Modes

Asynchronous, MNP Classes 2-5, V.42 LAP-M, V.42bis, Hayes AutoSync, CCITT Group III Facsimile

Communication Rates and Communication Standards Supported

300 bps Bell 103

300 bps CCITT V.21

1200 bps Bell 212A

1200 bps CCITT V.22

2400 bps CCITT V.22 bis

2400 bps CCITT V.27 ter

4800 bps CCITT V.27 ter

7200 bps CCITT V.29

9600 bps CCITT V.29

FAX Compatibility

Group III

Error Control

Microcom Networking Protocol (MNP) Classes 2-4 and V.42 LAP-M

Data Compression

Microcom Networking Protocol (MNP) Class 5 and V.42bis

Command Set

Class 1 (EIA-578) "AT" command set

Hayes "AT" command set

Microcom "AT" command subset

Operating Modes

Full duplex at 2400 bps and below

Half duplex for Group III Facsimile

Flow Control

None, RTS/CTS, XON/XOFF (Start/Stop), Transparent XON/XOFF, HP ENQ/ACK

Call Progress Monitoring

Dial tone, busy tone, ring detect, answer tone

Dialing Capability

Command-selectable tone or pulse dialing

Command Buffer

40 characters

Receive Levels

-9 to -43 dBm

Transmit Levels

-10 dBm to -9 dBm

Carrier Detection Level

On > -43 dBm and off < -48 dBm

Line Requirements:

Two-wire switched network (standard telephone line)

Ringer Equivalence:

0.4B

Regulatory Approvals:

FCC Part 68 and Part 15

CSA/DOC

UL

APPENDIX B - DIAGNOSTICS

If you have a problem with your computer, contact the GRiD Resource Center at 1-800-654-GRID. GRiD has included a diagnostics program on the utilities diskette for you to use when asked to by the personnel at the Resource Center.

Before you run the diagnostics program, you must disable all memory managers. The easiest and most effective way to do this is to rename the config.sys file. After you run the diagnostics program, be sure you rename the file *config.sys*.

The following chart outlines a typical diagnostic test.

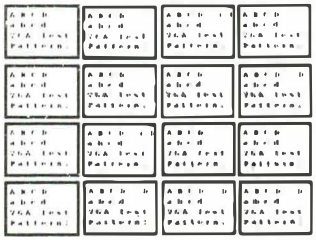
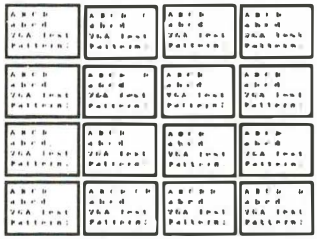
Test Procedure	Screen Displays:
1. Insert the Utilities diskette into Drive A and type **a:diag1660** and press ENTER.	`Do you want printed output? (Y/N)`

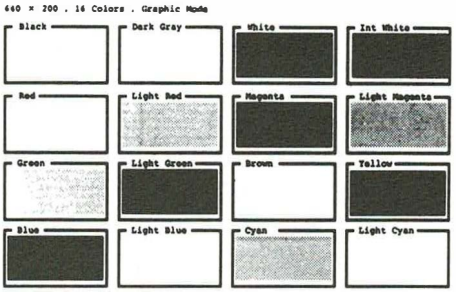
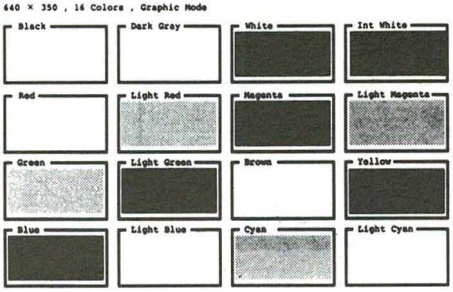
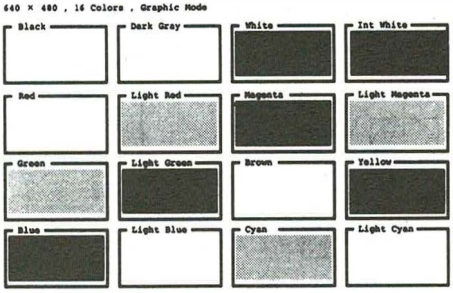
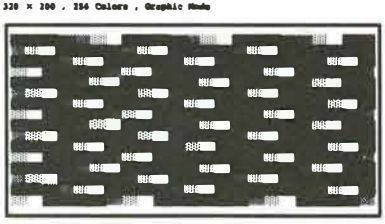
2. Press **Y** (for *Yes*) if you want printed output. Otherwise, press **N**.	`DIAGNOSTIC MENU (Ver.x.xx)`
	`1. TEST ALL DEVICES (* DEVICES)`
	`2. TEST AUTOMATICALLY (* DEVICES)`
	`3. CHANGE MENU`
	`4. EXIT`
	`* 5. MAIN BOARD`
	`* 6. xxxxKB RANDOM ACCESS MEMORY`
	`* 7. KEYBOARD`
	`8. TRACK BALL`
	`9. BATTERY`
	`* 10. 1 FLOPPY DISK DRIVE(S)`
	`* 11. 1 HARD DISK DRIVE(S)`
	`* 12. VIDEO`
	`13. 1 PARALLEL PORT(S)`
	`* 14. 2 SERIAL PORT(S)`
	
	`SELECT MENU: 1_`

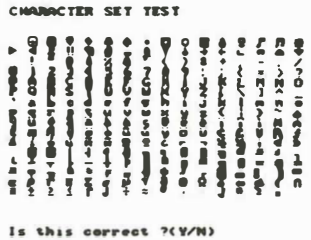
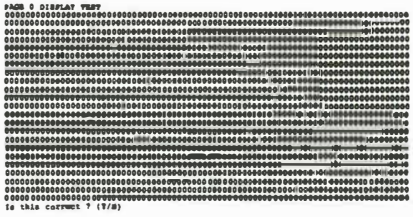
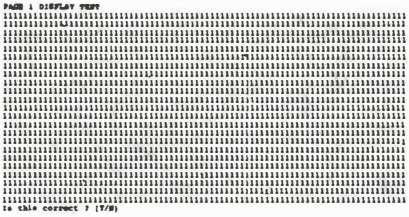
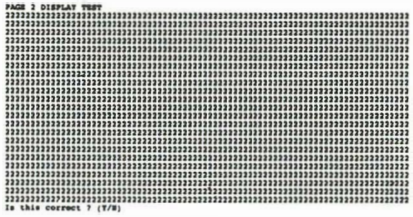
3. Press ENTER. The following tests automatically run.	`MAIN BOARD TEST`

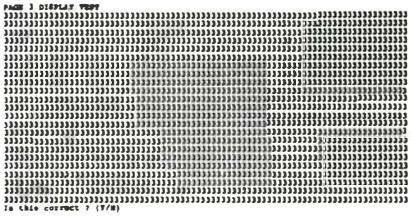
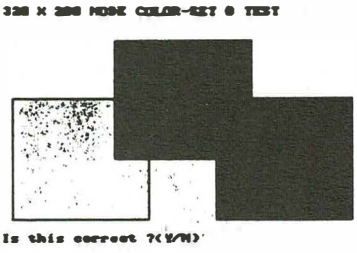
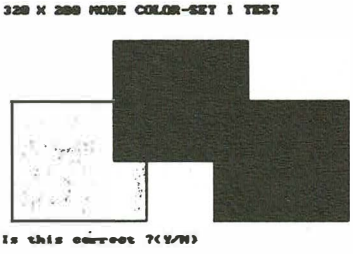
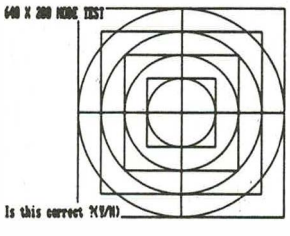
	`BASE RAM TEST`
	`CURRENT BASE RAM SIZE=640KB`
	
	`Base RAM=640KB Check OK`

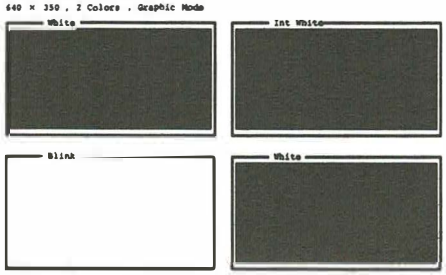
	`EXTENDED RAM TEST`
	`CURRENT EXTENDED RAM SIZE=xxxxKB`
	`EXTENDED RAM=xxxxKB Check OK`

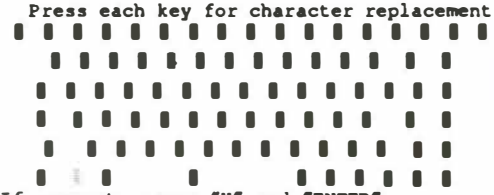
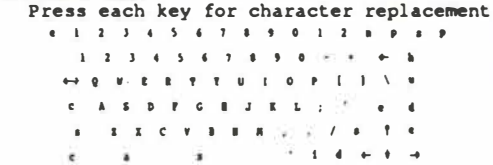
Test Procedure	Screen Displays:
	KEYBOARD RETURN CODE TEST FLOPPY DISK CONTROLLER TEST 1st FLOPPY DISK DRIVE (1.44FD) TEST Insert a floppy disk! Hit any key when ready
	HARD DISK CONTROLLER TEST 1st HDD - DRIVE TEST Count value to get SEEK COMPLETE = 0
	1st HDD - SEQUENTIAL SEEK TEST Cylinder = xxx 1st HDD - RANDOM SEEK TEST Cylinder = xxx
4. The first graphics screen appears.	
5. Press Y.	

Test Procedure	Screen Displays:
6. Press Y.	
7. Press Y.	
8. Press Y.	
9. Press Y.	

Test Procedure	Screen Displays:
10. Press Y.	
11. Press Y.	
12. Press Y.	
13. Press Y.	

Test Procedure	Screen Displays:
14. Press Y.	
15. Press Y.	
16. Press Y.	
17. Press Y.	

Test Procedure	Screen Displays:
18. Press **Y**.	
19. Press **Y**.	
20. Press **Y**.	1st serial port test (I/O address 3F8H) 1st serial port test (I/O address 3F8H) 2nd serial port test (I/O address 2F8H) 2nd serial port test (I/O address 2F8H) Test done!! Hit any key when ready_
21. Press any key.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. xxxxKB RANDOM ACCESS MEMORY • 7. KEYBOARD • 8. TRACK BALL • 9. BATTERY •10. 1 FLOPPY DISK DRIVE(S) •11. 1 HARD DISK DRIVE(S) •12. VIDEO 13. 1 PARALLEL PORT(S) •14. 2 SERIAL PORT(S) SELECT MENU: 1_

Test Procedure	Screen Displays:
22. Press **7** and **ENTER**.	KEYBOARD 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT 5. PRESS KEY TEST • 6. SCAN CODE RETURN TEST SELECT MENU: 1_
23. Press **5** and **ENTER**.	PRESS KEY TEST 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT 5. U.S.A. 6. GERMANY 7. FRANCE 8. ITALY 9. U.K. 10. SPAIN 11. SWEDEN 12. SWISS (Gr) SELECT MENU: 1_
24. Press **5** and **ENTER**.	KEYBOARD TEST Press each key for character replacement  If correct, press "Y" and "ENTER" If not correct, press "N" and "ENTER"
25. Press all keys for the keyboard test. Then, press **Y** and **ENTER**.	KEYBOARD TEST Press each key for character replacement  If correct, press "Y" and "ENTER" If not correct, press "N" and "ENTER"

Test Procedure	Screen Displays:
26. Press any key.	PRESS KEY TEST 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT 5. U.S.A. 6. GERMANY 7. FRANCE 8. ITALY 9. U.K. 10. SPAIN 11. SWEDEN 12. SWISS (Gr) SELECT MENU: 5_
27. Press **4** and **ENTER** . Then, press **4** and **ENTER** again.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. xxxxKB RANDOM ACCESS MEMORY • 7. KEYBOARD 8. TRACK BALL 9. BATTERY •10. 1 FLOPPY DISK DRIVE(S) •11. 1 HARD DISK DRIVE(S) •12. VIDEO 13. 1 PARALLEL PORT(S) •14. 2 SERIAL PORT(S) SELECT MENU: 13_
28. Press **1** **3** and **ENTER**. **Note:** Printer must be connected.	1st Printer port test (I/O address 378H) Connect printer Hit any key when ready _
29. Press any key.	Test done!! Hit any key when ready_ Printing Sample 1st Printer port test (I/O address 378H) !"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno !"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop !"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq #$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr $%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs %&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst &'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu '( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv ( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx

Test Procedure	Screen Displays:
30. Press any key.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. xxxxKB RANDOM ACCESS MEMORY • 7. KEYBOARD 8. TRACK BALL 9. BATTERY •10. 1 FLOPPY DISK DRIVE •11. 1 HARD DISK DRIVE •12. VIDEO 13. 1 PARALLEL PORT •14. 2 SERIAL PORT SELECT MENU: 14_
31. Press 14 and ENTER.	2 SERIAL PORT(S) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. 1st SERIAL PORT TEST • 6. 2nd SERIAL PORT TEST SELECT MENU: 1_
32. Press 5 and ENTER.	1st SERIAL PORT 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. RS232C CONTROLLER REGISTER R/W TEST • 6. INTERNAL LOOPBACK TEST 7. EXTERNAL LOOPBACK TEST SELECT MENU: 1_
33. Press 7 and ENTER.	1st serial port test (I.O address 3F8H) Connect loopback plug Hit any key when ready_
34. Press any key.	Test done!! Hit any key when ready_

Test Procedure	Screen Displays:
35. Press any key. Then, press **4** and **ENTER** .	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. xxxxKB RANDOM ACCESS MEMORY • 7. KEYBOARD 8. TRACK BALL 9. BATTERY •10. 1 FLOPPY DISK DRIVE •11. 1 HARD DISK DRIVE •12. VIDEO 13. 1 PARALLEL PORT •14. 2 SERIAL PORT SELECT MENU: 13_
36. Press **4** and **ENTER** to exit the diagnostics program and restart the computer.	———

APPENDIX C: COLOR MAP UTILITY

CMAP1660 loads the memory-resident program that lets you create and load custom color maps.

To run CMAP1660, type `CMAP1660` at the DOS prompt. Then press **CTRL+ALT+M** to display a window on the screen that has a list of colors and commands.

Use the up and down arrows to select a color; use the right and left arrow keys to select the color intensity.

The following keys access functions within the color map program:

S	Saves the loaded or created color map to a file. Enter the name of the color map at the prompt.
L	Loads a previously saved color map file. Enter the name of the color map at the prompt.
R	Resets the color map to the default.
Tab Key	Toggles the color map window between the right and left edge of the screen.
ESC	Removes the color map window.

CMAP1660 stays in memory and you can press **CTRL+ALT+M** at any time to invoke it. To remove the program from memory, type `CMAP1660 REMOVE`.

Note: If you have loaded another memory-resident program (such as DOS Shell) before you load CMAP1660, and then remove the first program, pressing **CTRL+ALT+M** might not work.

When you use CMAP1660 to change the color map, the change is temporary. To make the change permanent, save the color map to a file using the **S** option. Then, use the following command to load the file:

`MODC1660` *(filename)*

Note: The filename in this command is the file that contains the color map you created with CMAP1660.

You can invoke the color map at any time by using this command.

APPENDIX D - BATTERY UTILITY

The utilities diskette includes a battery utility program called GAUG1660.EXE that lets you check the remaining battery power. For the program to work accurately, the battery must be initialized. You can do this by fully charging or fully discharging the battery. If the battery is not initialized, the error message **Unknown** might appear on the gauge window.

Note: Windows does not support GAUG1660. However, you can use this utility from MS-DOS and other applications.

To enable GAUG1660, type the following at the MS-DOS prompt:

```
gaug1660 /r ENTER
```

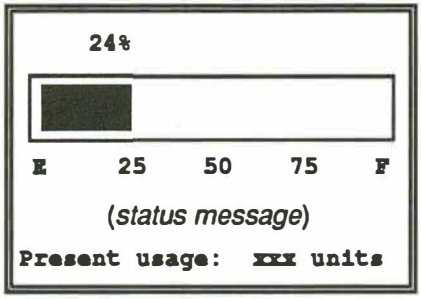
The computer displays the following messages:

```
GAUGE installed
Press CTRL+ALT+G to pop up gauge window.
```

Note: If you already use the key combination **CTRL+ALT+G** for another computer function, you can enter either of the following commands to allow alternate key combinations:

gaug1660 /r /k2 — lets you use **CTRL+SHIFT+G**
gaug1660 /r /k3 — lets you use **ALT+SHIFT+G**

After you enter **gaug1660 /r**, press **CTRL+ALT+G** (or alternate key combination) to display the following gauge window:



The value above the horizontal bar shows the approximate percentage of remaining battery power. The bar gives a visual indication of this value.

The line at the bottom of the window shows the units of power the battery is presently using. This value depends on the current power-management settings. The higher the value, the more battery power the computer is using.

Note: If you do not want to display the gauge window while you run an application, you can type the following command at the MS-DOS prompt to display the window one time only.

```
gaug1660 ENTER
```

After you enter this command, the window appears. Press **ESC** to erase the window from the screen.

The GAUG1660 program displays one of the following battery status messages:

`Power remaining` — appears when the computer runs on battery power only and AC power is not connected.

`Charging` — appears when AC power is connected and the battery is installed.

`Unknown` — appears when the battery monitoring circuit is not initialized or if the battery is not installed. You can initialize the circuit by fully charging or fully discharging the battery. The circuit requires re-initializing if you press **RESET** or if you remove the battery.

To close the gauge window, press **ESC**.

COMPUTER CARE

Your GRiD 1660 Notebook Computer is an example of superior design and craftsmanship. The following suggestions will help you care for the computer so that you can enjoy it for years.

- Keep the computer and your diskettes dry. If they get wet, wipe them dry immediately. Liquids might contain minerals that can corrode electronic circuits.
- Handle the computer gently and carefully. Dropping it can damage its circuit boards, display, and case, and can cause the computer to work improperly.
- Use and store the computer and your diskettes only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries and diskettes, and distort or melt plastic parts.
- Keep the computer and your diskettes away from dust and dirt, which can cause premature wear of parts.
- Occasionally wipe the computer with a dampened cloth to keep the computer looking like new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the computer.

Modifying or tampering with the computer's internal components can cause a malfunction amd might invalidate the computer's warranty. If the computer is not operating as it should, take it to a GRiD Resource Center. Our personnel can assist you and arrange for service, if needed.

SPECIFICATIONS

CPU ..... 80386SL-25 MHz
Coprocessor (Option): 80387SX-25 MHz or 80387SL-25 MHz
Memory:
  RAM ..... 2 MB (Expandable to 20 MB)
  External Cache RAM ..... 64 KB
  ROM ..... 128 KB
Storage:
  Hard Disk Drive ..... 2 1/2-Inch 120 MB
  Floppy Diskette Drive: ... 3 1/2-Inch 1.44MB Double-Sided,
Display:
  Type ..... Black/White LCD
  Mode ..... VGA
  Resolution ..... 640 x 480 Dots
  Character Box ..... 8 (W) x 16/19 (H) Dots
  Gray Scale ..... 16 Levels (64 Levels in Mode 13)
  Area ..... 7 13/16 x 5 7/8 Inches (198.37 x 148.77 mm)
Keyboard:
  Number of Keys 84
  101-Key Emulation
  Key Tops ..... U.S. Keyboard Layout
Input/Output:
  Ports ..... External Keyboard Jack (Mini-DIN 6-Pin)
  Parallel Port DB-25
  Serial Port DB-9
  External VGA Monitor Port DB-15
  AT Bus Port (200-Pin)
  Connectors ..... Expansion RAM Connector (50-Pin)
  Modem Connector (18-Pin for Flat Flex Cable)
Pointing Device ..... PS/2-Compatible MicroTrackball
Power Consumption ..... 22.8 V @ 1.25 A (Max.)
Temperature:
  Operating ..... 40°F to 100°F (4°C to 38°C)
  Storage ..... -40°F to 150°F (-40°C to 66°C)
Weight ..... 5.9 lbs (2.68 Kg)
Dimensions (WxHxD) ..... 1.7 x 11.7 x 8.7 Inches
(44 x 299 x 220 mm)
Software ..... MS-DOS Version 5.0
Windows 3.1
QBASIC 1.0

AC Adapter (Primary) ..... 100V to 240 VAC
AC Adapter (Secondary):
- Maximum Output Power ..... 22.8V +/- 5% @ 0.88A
  17V @ 1.25A
- Operating Temperature ..... 32°F to 104°F (0°C to 40°C)
- Weight (Excluding AC Cord) ..... 13 oz (370 Grams)
- Dimensions (HxWxD) ..... 1.5 x 2.5 x 5.5 Inches
  (39.5 x 65 x 140 mm)

Battery Pack (Nickel-Metal Hydride):
- Capacity ..... 1.45 AH (3 Hours Avg.); 14.4V (Avg.)
- Charging Time:
  - Power Off ..... Approx. 2 Hours
  - Power On (normal operation) ..... Approx. 5 Hours
- Weight ..... 1 lb (460 Grams)

USA WARRANTY

CUSTOMER OBLIGATIONS

A. CUSTOMER assumes full responsibility that this computer hardware purchased (the Equipment), and any copies of software included with the equipment or licensed separately (the Software) meets the specifications, capacity, capabilities, versatility, and other requirements of CUSTOMER.

B. CUSTOMER assumes full responsibility for the condition and effectiveness of the operating environment in which the Equipment and Software are to function, and for its installation.

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INTERNATIONAL NOTES

The following notes are for international customers:

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, dass der Gerät 1660 in Übereinstimmung mit den Bestimmungen der Vfg 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmung eingeräumt.

GRiD Systems Corporation
47211 Lakeview Boulevard
Fremont, California 94538-6599

Achtung: Zur Trennung vom Netz ist der Netzstecker aus der Steckdose zu ziehen, welche sich in der Nähe des Gerätes befinden muß und leicht zugänglich sein soll.

Diese Komponente wurde als Teil einer Zentraleinheit in Gesamtkonfiguration geprüft. Als Bildschirmarbeitsplatz, wie in ZH 1/618/10.80 beschrieben, darf sie nur als Zentraleinheit mit externer GS-geprüfter Tastatur und GS-geprüftem Monitor benutzt werden. (Der Benutzer, der dieses System integriert, ist verpflichtet, das Gesamtsystem in Übereinstimmung mit den Sicherheiteregein für Bildschirmarbeitsplätze im Bürobereich (ZH 1/618/10.80) zu bringen. Dies trifft auch für Software zu (Zitat aus: Protokoll des Fachausschusses für Verwaltung, Hamburg, Dezember 1990).

"Diese Gerät muß außerhalb des Sichtfeldes plaziert werden, da die Farbe nicht den Anforderungen von ZH 1/618 entspricht."

English Translation:

Manufacturer/Importer Certificate

We hereby certify that the GRiD 1660 complies with the RFI suppression requirements of Vfg 1046/1984. The German Postal Service was notified that equipment is being marketed. The German Postal Service has the right to retest the equipment and verify compliance.

GRID Systems Corporation
47211 Lakeview Boulevard
Fremont, California 94538-6599

Warning: Unplug the adapter from the AC outlet before you disconnect it from the computer.

This component has been tested as a central processing unit as part of a system configuration. In display work places as defined in ZH 1/618, 10.80, it is only to be used as a central processing unit with an external GS-approved monitor and keyboard. [The user who combines this component in a system configuration is obliged to make sure that the entire system complies with the "Safety regulations for display work places in the office sector" (ZH 1/618). This also applies to the software. (Quote: Protocol of Fachausschuß Verwaltung, Hamburg, Dezember 1990)]

"The device has to be located outside of the viewing field, as color does not comply w/ZH 1/618.10.80."

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