CSC

Pro Hard Drive Workstations

CORPORATE SYSTEMS CENTER

Pro Hard Drive Workstation Features

Congratulations on your purchase. The Professional Hard Drive Workstation is a stand-alone hardware package used to duplicate, test, format and repair hard disk drives. The Pro offers these features:

- **Full drive duplication ability.** Any drive can be copied, producing a perfectly identical backup copy. System builders can use the unit to quickly install identical drives and pre-load software. Forensic copy modes and bit-by-bit duplication ensure accurate copies are made.
- **Full drive test capability.** Up to 9 drives can be connected and tested simultaneously. Test reports can be sent to any standard parallel interface printer.
- **Forensic copy and DOD erase.** The Pro will quickly copy disks for forensic applications and erase disks to government specifications.
- **Full reformatting and re-certification capability.** Any SCSI or IDE drive can be reformatted. Defects can be automatically erased using re-allocation and sector sparing commands.
- **Support for all SCSI drives** including: SCSI-I, SCSI-II, SCSI-III, wide SCSI, and SCA
- **Support for all IDE drives** including: IDE, Enhanced IDE, and Ultra DMA mode drives (IDE drives are accelerated using Mode-4 transfers)
- **A totally self-contained workstation** including drive power supply, LCD panel, and push buttons. No connection to a PC is required. Both portable and desktop models are available, and the information in this manual applies to both models.

Package Contents

1. The Pro Hard Disk Workstation Chassis
2. Two SCA Adapters (permit connections to 80 pin and 68 pin SCSI drives)
3. Two notebook adapters (permit duplication of notebook hard drives)
4. A 40 pin 2 connector IDE drive connection cable
5. A 50 pin narrow SCSI drive connection cable
6. A 68 pin Wide SCSI drive connection cable
7. Drive power supply "Y" connection cable
8. A Centronics style parallel printer cable
9. Power Cord

Quick Setup

1. Remove the Pro from its shipping carton. Save the carton and protective foam in case the Pro ever requires service.
2. Make sure that the front-panel power switch is in the OFF position.
3. Attach the power cord.
4. Ensure that nothing blocks either the ventilation slots on the bottom of the chassis or the fan on the rear panel of the chassis.
5. Connect the IDE and/or SCSI drive cables to the two connectors located on the right-rear corner of the chassis. The cables are keyed so that they cannot be installed backwards.
6. Connect the drive power supply "Y" connection cable to the jack located on the top of the Pro.

7. Place the hard drives to be tested or duplicated on the anti-static pad on top of the unit. If you are attaching two IDE drives, set the jumpers on the first drive to "master" and the second drive to "slave". If you are attaching multiple SCSI drives, be sure that *only the last drive* on the SCSI chain is terminated and each drive has a different SCSI ID.
8. Switch the power ON. The Pro will perform a quick internal self test.
9. Using the setup menu, select the appropriate IDE, SCSI, and printer configuration options as described below.
10. Select the appropriate duplication or test function from the menus described below.

Front Panel Display and Controls

The Pro is controlled using the three front-panel buttons: ↑ up, ↓ down and ↵ enter. The up and down buttons scroll through menus and options. The enter button selects a command or changes an option. Pressing the up and down buttons simultaneously stops the current option.

Physical Specifications

Desktop Line Voltage	100-127 or 200-240VAC user selected
Portable Line Voltage	100-127 or 200-240VAC set at factory
Frequency	50–60 Hz Single Phase
Power Consumption	245 Watts Maximum

Desktop Dimensions	5 x 12.25 x 13.25 in.
Desktop Weight	15.3 lbs w/ accessories
Portable Dimensions	6 x 9.1 x 11.5 in.
Portable Weight	8.3 lbs w/ accessories

Compatible Peripherals

IDE Hard Drives:	IDE, E-IDE, UDMA, 2.5" notebook IDE
SCSI Hard Drives:	SCSI-I, SCSI-II, Wide, Narrow, Standard, Ultra, SCA, LVD
Printers:	IBM style Centronics Parallel interface with character text output.

Attaching a Printer for Test Reports

Connect any standard character based dot matrix, ink jet, or laser printer to the printer port using a DB-25 to 34-pin Centronics printer cable.

Using the setup menu, select "Print Report After Test" and press the Enter button to enable the printer port. An x appears next to the option when the port is enabled. Use "Save Modified Setup Options" to permanently save this configuration in non-volatile memory.

Set the printer to standard ASCII character based mode. Disable the graphics, Post-Script, and PCL options on the printer. If you are using a laser printer, select automatic form feed, or use the form feed button to manually advance the paper to preview test reports. The Pro will issue a form feed command at the end of the Test Drive command.

Note that the Pro is not compatible with printers that require a Windows, PCL, PJL, or Post Script driver. See the compatibility section at the end of this manual for a list of compatible printers.

Attaching IDE Drives

When two drives are connected to the IDE cable, one drive must be configured as a master, and the other drive must be configured as a slave. This usually involves adding or removing a jumper on the slave drive. When a single IDE drive is connected to the system, it must be configured as a master. The "slave present" jumper should be disabled if only one IDE drive is connected, or enabled if two are connected.

Some IDE drives have a "Single Drive" jumper marked "SD", and this jumper must be enabled for the drive to operate properly as a master drive.

Master/Slave control jumpers on IDE drives are typically labeled "M/S". Slave Present jumpers on IDE drives are typically marked "SP".

Attaching 2.5" Notebook Drives

When two drives are connected to the IDE cable, one drive must be configured as a master, and the other drive must be configured as a slave. This involves adding or removing a jumper on 2.5" notebook drive adapter board. When a single notebook drive is connected to the system, it must be configured as a master.

Please refer to the figure below for proper orientation of the adapter board:

Warning: Notebook drives are not "keyed". Be extremely cautious when mating the adapter board to notebook drives. Incorrect orientation will cause damage to the notebook adapter, and possibly to the drive as well. The adapter card should project above the metal surface on the top of the drive, not below it.

The four jumper pins located below the IDE interface connector correspond to the four master/slave jumper pins located on the drive. Check the drive manufacturer's documentation for the appropriate master and slave settings, as these jumper settings vary.

Attaching SCSI Drives

When more than one drive is connected to the SCSI cable, each drive must be set to a different, unique address. Acceptable

addresses for SCSI drives are zero to six. Address seven is reserved for the Drive Pro's internal SCSI controller.

Wide drives may be connected using the SCA adapter and a short 68 pin to the drive. Attach the included 50 pin cable between the SCA adapter and the Drive Pro. Use the second "Y cable" to power the SCA adapter.

SCA drives may be connected using the SCA adapter and the included 50 pin cable. Mate the SCA drive directly to the adapter, and connect the 50 pin cable between the adapter and the Drive Pro. Use the second "Y cable" to power the SCA adapter.

Important Note Regarding SCSI Termination!

The SCSI drive on the farthest end of the cable must have the termination option enabled. All other drives should have termination disabled or terminating resistors removed. To remove the terminators from the SCA adapter, pull gently on the three terminators to avoid damaging the pins below them.

Attaching SCA Drives

As with the SCSI drives described above, each SCA drive must be set to a different, unique address. Acceptable addresses for SCA drives used on the Pro are zero to six. Address seven

is reserved for the Drive Pro's internal SCSI controller. Addresses 8-15 are not supported on the Pro.

When connecting SCA drives, use the included 50 pin cable to connect the two SCA adapters to the Drive Pro. Use the second "Y cable" to power the SCA adapter. The power LEDs (marked D3) on both SCA adapters should be illuminated. Both drive access LEDs (marked D4) should flash during duplication.
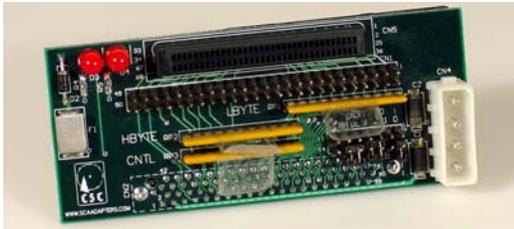
Pay particular attention to the location of "pin 1" which corresponds to the red stripe on the side of the ribbon cable. The location of this pin is shown on the right side above and marked on the SCA adapter.

Three terminators are provided with this board, HBYTE (SCSI high byte), LBYTE (SCSI low byte), and CNTL (SCSI control signals).

The HBYTE terminator must be installed when testing and copying wide 68 pin or 80 pin SCA drives.

Install terminators on the last SCA at the end of the cable to enable termination. Remove terminators from all other SCA adapters to disable termination. The Pro is terminated internally. Mate the SCA drive directly to the adapter securely.

Connecting 68 Pin Wide SCSI Drives

To use the SCA adapter to connect 68 pin wide drives to the Pro, connect a 50 pin cable between the Pro and the adapter. Remove the LBYTE and CNTL terminators on the adapter. Connect one end of the 68 pin cable to the adapter, and the other end and center connectors to the drives. Disable termination on all drives –except- the drive at the end of the cable. Termination on the last drive must be enabled.

Important Note Regarding SCA Termination!

The SCA adapter on the farthest physical end of the cable (from the Pro) must have all terminators installed. The other adapter must have all terminators removed.

Terminator Orientation

Pin 1 on a terminator is marked with a small vertical line. When installing terminators in the SCA adapter, pin 1 must be inserted near the letters "RP" on the circuit board.

Drive Handling Precautions

Don't risk damaging a drive by connecting it with the power turned on. Damage to the drive or the Pro may result. Switch the power off first, then connect and double-check the cabling. Be sure all cables are oriented correctly before switching the power on. Turn power on only after double-checking connections. The Pro performs a power-up self-test. This allows time for drives to spin up and become ready. Use caution when handling drives to prevent damage from static electricity.

Identifying Attached Drives

The Pro uses a consistent numbering system to identify drives. The first number indicates the drive interface. A zero indicates SCSI port, and a one indicates IDE. The next number indicates the address of the drive. On the right is the manufacturer and model of the drive (as reported by the drive). All properly attached drives are visible when using the Display Drive Information command.   Be extremely cautious when identifying drives prior to copying and testing. An incorrectly selected source or target drive could result in loss of data.

Navigating the Menu System

The symbols ↑↓ and ↵ are used in the menus and commands. The Enter button is represented by the symbol ↵. Pressing ↵ activates a command or changes an option.

Status is displayed while the Pro is performs a write or compare operation. The primary status display shows a progress bar and indicates the percentage of completion. Elapsed time in hours, minutes, and seconds is displayed during format operations.

Most operations can stopped by pressing and holding both the ↑ and ↓ keys simultaneously. Some operations may take an extended period of time to cancel, so please be patient. Canceling during certain critical operations may cause the attached drives to lock up, and require cycling of power. Canceling requests made during a format or re-certify operation are not recommended, and will be ignored by the Pro until after the operation is completed.

Display Drive Information Option

The Pro will automatically display the drive information for all attached drives shortly after it is powered up. The Pro will beep once for each drive detected. If more than one drive is detected, all of the following options will appear.

If only one drive is detected, functions such as **Copy a Disk** will be removed from the menus.

You may also select **Display Drive Information** in the main menu to display the manufacture's part number, size in megabytes (1MB=1,000,000 bytes), firmware revision, number of logical blocks, number of cylinders, number of heads and target SCSI ID of any attached drive.

The first letter on the screen is S for an SCSI drive, and I for and IDE drive. The following number is 0 for a master IDE drive, or 1 for a slave IDE drive. The following number is the detected SCSI ID for SCSI drives.

A number such as "512 BPS" will be displayed in the center of the screen. This is the number of bytes-per-sector reported by the drive. The industry standard is 512 bytes per sector for PC applications.

Note: All disk drive manufactures define a megabyte as 1,000,000 bytes, while memory manufacturers define a megabyte as 1,048,576 bytes. Some Microsoft products use the 1,048,576 definition when referring to disk capacity.

Copy a Disk Option

Select A Source Drive

The **Select A Source Drive** option selects the drive to be copied from. If only one drive is attached, an error message will display.

Select A Destination Drive

The **Select A Destination Drive** option is used to select the target drive to be copied *to.* When more than one drive is connected to the system, the Pro will display each drive as you scroll through the menu. Select a target by pushing the Enter button when the drive ID displayed. If only two drives are attached, the destination is selected automatically.

A letter preceding the drive ID indicates the drive interface. An "S" indicates SCSI, and an "I" indicates IDE. The next number is the drive address. For SCSI drives, this is SCSI ID number. For IDE drives, a zero indicates master and a one indicates slave.

If the drives being copied are different sizes, a warning message will appear. Please read the warnings about copying dissimilar drives before pressing ↵ to continue.

An estimated time-to-copy will appear on the display before the duplication process begins.

Start Forensic Copy

The **Start Forensic Copy** option will duplicate an entire drive, checking for errors during the duplication process. An automatic forensic verification will be performed after the copy is complete. If a printer is attached, a chain of custody report is printed and any errors detected are recorded.

Start Standard Copy

The **Start Standard Copy** option will duplicate an entire drive, checking for errors during the duplication process.

Compare Disks

The **Compare Disks** option is used to thoroughly compare the contents of the source drive to a previously written destination drive. An error message is displayed when data does not match.

Format and Erase Menu

Select the **Format and Erase Menu** to reformat and erase defects on any attached drive. This option will repair any defects caused by normal wear. Mechanical damage to the media or drive mechanism may not be repairable.

Format Menu

The **Format Menu** allows you to low-level-format a SCSI or IDE drive. Select this option to quickly erase the data on a single drive, or on all attached drives. The **Format Disk** option is used to perform a low-level format on a disk drive. If the **Certify After Format** option in the Setup menu is turned on, the Pro will repair the disk by reassigning any defective sectors that it finds. Any data present on the drive will be destroyed when performing a low-level format.

Quick Erase Menu

The **Quick Erase Menu** allows you to rapidly erase the data on a hard drive. Select this option to quickly erase data on a single drive or on all attached drives.

The **Quick Erase a Disk** option quickly removes the first and last 20 Megabytes of data on the disk. This is much faster than erasing the entire disk, and is useful for remove partition data and directories quickly.

DOD-5220-22M Menu

The **DOD Erase Menu** is used to thoroughly erase a disk to government specifications. This time-consuming process involves several writes to the disk from various directions with random

data. This process is not approved for higher level classified data. Drives containing classified data must be physically destroyed.

If a printer is attached, the DOD erase function will print an erasure report after completion.

Test A Disk Option

Select **Test A Disk** to perform a comprehensive drive qualification. The **Test A Disk** option first low-level formats the disk if **Format Drive During Test** is selected in the Setup Menu. The drive is then certified using the **Recertify/Repair A Disk** function if **Recertify Defects During Test** is selected in the Setup Menu. Next, a seek time test is performed. A series of data integrity tests are then performed. If a printer is connected, a report is printed showing all tests and results. This standard, full-length test is an exhaustive test, which may take several hours. If the **Short Test Mode** option is enabled in the **Options Setup** Menu, the test will be abbreviated and will take approximately 25% of the time required for a full-length test.

Test a Disk may be used to test individual drives, or all drives attached to the Pro.

The **Exercise A Disk** option is located within the **Test a Disk Menu.** It is used to test specific functions of a drive. Test results can be sent to an attached printer. The **Exercise A Disk**

function only report errors - it does not reassign bad sectors.

Select A Drive

The **Select A Drive** option is used to select the drive that will be tested.

Select Test Type

The **Select Test Type** option is used to select the type of test that will be performed. The seek algorithm used in each of the tests is set using the **Select Seek Type** option below.

Read Only - Reads the data from each track on the disk. This is a non-destructive test, but it does not thoroughly test the operation of the drive.

Write, then 1 Read Pass - Writes a track and then reads it back once. If no errors are encountered, the Pro proceeds to the next track. If an error is encountered, it is reported on the printer.

Write One Pass, Read 7 Passes - Writes a track and then reads it back seven times. If no errors are encountered, the Pro proceeds to the next track. If an error is encountered, it is reported on the printer.

Write Only - Writes a track without reading it back. If no errors are encountered, the Pro proceeds to the next track. If an error is encountered, it is reported on the printer. This option is useful for diagnosing problems with a drive. If the drive passes the **Write Only** test, but fails the **Read Only** test, the problem may be located in the read circuitry.

Select Seek Type

The **Select Seek Type** option is used to tell the Pro which seek algorithm to use when testing a drive. The options are:

Random - seeks to a random track and tests it. This test runs continuously regardless of how the **Continuous Excercise Mode** option is set.

Sequential - starts at track zero and tests the drive sequentially out to its outermost track. The test ends when the drive reaches the last track. If the **Continuous Excercise Mode** option is enabled the Pro will automatically restart the test at track zero.

Butterfly - tests track zero first, and then steps out to test the outermost track next. It then steps back and tests

track one, then stepping out to test the next-to-outermost track. This operation continues until the whole disk has been tested. If the **Continuous Excercise Mode** option is enabled the Pro will automatically restart the test at track zero. The butterfly seek is the most rigorous seek test.

Start Exercise . . .

The **Start Exercise…** option starts the test using the selected parameters. The test continues until either the whole drive has been tested or until the user interrupts the test. Errors are reported on the printer if the **Print Report After Test** option is enabled.

Options Setup Menu

The **Options Setup Menu** is used to set parameters that affect the operation of the Pro. Several of these options can be toggled On or Off. An option is On (enabled) when an "x" appears before it. The setup options are:

Abort on Error

Aborts the current operation whenever a read, write, or seek error is encountered. **Abort on Error** has precedence over **Stop on Error.**

Stop on Error

Pauses the current operation whenever a read or write error is encountered. You then have the option of continuing or aborting the operation. If neither **Abort on Error** nor **Stop on Error** are checked, the Pro ignores errors. Disable both options for data recovery applications.

Certify After Format

The **Certify After Format** option instructs the Pro to repair any media defects that are found by reassigning the bad tracks. The **Certify After Format** option is only used during **Format A Disk** and **Test A Disk** operations.

Continuous Exercise Mode

The **Continuous Exercise Mode** option instructs the Pro to loop and continuously repeat the selected **Exercise A Disk** test.

Print Report after Test

The **Print Report After Test** option instructs the Pro to print a report on the printer when it is through with a **Format A Disk**, **Test A Disk**, or **Exercise A Disk** options.

Reassign Defects on IDE Drives

The **Reassign Defects on IDE Drives** option instructs the Pro to automatically re-allocate bad sectors on IDE drives using the IDE reassign command. The default setting is off.

Short Test Mode

The **Short Test Mode** abbreviates the test process for faster operation. The short test mode is approximately four times faster than the standard, exhaustive full-length factory style test. The default setting is on.

Format Drive During Test

The **Format Drive During Test** option instructs the Pro to automatically low level format the entire disk when the **Test A Drive** or **Test All Attached Drives** options are selected. The default setting is on.

Recertify Defects During Test

The **Recertify Defects During Test** option instructs the Pro to automatically re-certify the entire disk when the **Test A Drive** function is used. The default setting is on.

Enable Boot Sector Fix

The **Enable Boot Sector Fix** option, when set, applies to IDE drives which have been copied from a smaller drive. These drives will have the partition table of the smaller drive copied onto them, after a successful copy. This table will have incorrect settings of drive geometry from the smaller drive. This option enables the correction of the boot sector partition table entries to the proper drive geometry and media size. If a FAT16 partition is copied, and the partition table needs to be updated to be correct, a prompt is issued after a successful copy: **Fix Boot Sector?** If selected, the boot sector is then fixed with the geometry of the target drive. This option should be disabled if you were copying to a larger drive for an image backup of a smaller drive, so that it could later be recopied back to the original drive size. The default setting is on.

SCSI/IDE Interface Setup

The **SCSI/IDE Interface Setup** options should not be changed unless you are familiar with the specific type of interface supported by your drives.   No setting changes are required for compatibility with most modern drives.

Note! Disabling some factory options will significantly reduce performance.

SCSI Disconnect Mode

The **SCSI Disconnect Mode** option is used to is used to improve performance when copying between SCSI drives. If both the source and destination drives support Disconnect, turn this option on. The default is on.

SCSI Synchronous Transfer Mode

The **SCSI Synchronous Transfer Mode** option is used to is used to improve performance when copying SCSI drives. If both the source and destination drives support synchronous operation, turn this option on. All SCSI-II and newer drives should support synchronous transfers. The default is on. Disabling synchronous transfers limits SCSI performance to a maximum of 5MB/sec.

IDE Drive Multiple Mode

The **IDE Drive Multiple Mode** option used to improve performance when copying between IDE drives. If both the source and destination drives support multiple mode, turn this option on. multiple mode transfers move several blocks of data simultaneously to

increase performance on IDE drives. Some non-enhanced IDE drives may not support multiple mode data transfers. To test, repair, or format these older drives, disable the **IDE Drive Multiple Mode** option in the setup menu. The default is on.

IDE Drive Fast PIO Mode

The **IDE Drive Fast PIO Mode** option is used to improve performance when copying IDE drives. If both the source and destination drives support Fast PIO Mode, turn this option on. Some older IDE drives may not support Fast PIO (enhanced speed) data transfers. To test, repair, or format these older drives, disable the Fast PIO option in the Setup menu. The default is on.

Set Options to Default Values

The **Set Options to Default Values** option will restore all of the Pro options the commonly used factory default settings. The system will then use these configuration options the next time that it is powered up. If your unit appears to be performing abnormally, please try the following:

1. Restoring all settings to factory default values with **Set Options to Default Values.**

2. Save the default settings by selecting **Save Modified Setup Options**.
3. Power the unit off and back on.

Save Modified Setup Options

Selecting **Save Modified Setup Options** instructs the Pro to save the selected configuration in non-volatile memory. The system will then use that configuration the next time that it is powered up.

Display System Software Version

This option displays information about the revision of the firmware and release date. This information is helpful when calling CSC for technical support. The drive Pro must be returned to CSC when software and hardware upgrades are required.

Repairing Drives

To repair IDE and SCSI drives, select the **Recertify/Repair A Drive** option in the main menu, or use the **Test A Drive** option with the **Recertify Defects During Test** and **Format Drive During Test** options selected. The Pro will automatically scan the disk for defects, and reassign any defects that can be repaired. Note

that the Pro is only able to repair media defects that are a result of normal wear. Excessive defects or serious mechanical problems may not be repairable. Older IDE drives may have the compatibility limitations described below.

IDE Drives below 540MB

IDE hard drives with capacities below 540 megabytes generally do not support defect reassignment. The Pro may be unable to eliminate defects on drives that do not conform to the enhanced IDE standards for defect management.

IDE Drive CHS Support (Non-LBA drives)

Older IDE drives may not offer Logical Block Address (LBA) support. These older drives are called Cylinder, Head, and Sector (CHS) drives. Drives without LBA support may not be compatible with all features of the Pro. If an older CHS drive is detected, the Pro will display a warning message, and several menu items will be disabled.

Copying Between Different Size Drives

The Pro is designed to clone identical drives. Duplication between different sized drives is not recommended. Compatibility problems can occur when copying between different sized drives. Copying a file system from a 9GB drive to a 47GB drive, for example, will yield a 47GB drive with a partition structure that is intended for a 9GB drive. It is best to copy identical drives whenever possible.

When this is not possible, both the preformatted source drive and the destination drive should be formatted in LBA mode. All SCSI drives are formatted in LBA mode. IDE drives may need a motherboard CMOS setting enabled before formatting to select LBA mode.

The integrity of the partition sector can damaged when copying between different sized drives. This is because the system places the partition sector at Cylinder 0, Track 0, Sector 0, Maximum head. If the number of sectors per track or the number of heads in a given system installation changes, the location of the partition sector will also change. If the partition sector cannot be located, the destination drive will be unusable.

It is safe to copy from a smaller source drive to a larger target drive, and then back to a smaller

target drive *of identical size to the original source drive.*

Copying Between SCSI and IDE

Although the Pro is able to copy entire drive images from one interface to another, the resulting duplicate drive may not be usable unless it's size exactly matches that of the original drive. Software drivers may also need to be reconfigured for different interfaces. For example, Microsoft operating systems use different software drivers for different drive interfaces.

Data Recovery using Automatic Retries

The Pro is a popular tool for data recovery applications. Many damaged or weak hard drives copy reliably using the automatic error recovery system built into the Pro. To copy a weak drive, deselect the **Stop on Error** option in the Setup menu. Be patient - thousands of retries may be necessary to recover a weak drive.

Data Recovery Tips & Tricks

Hard drives use a mechanical servo system, which must position the recording heads to within millions of an inch. As a drive wears over time, mechanical parts in the headstack and spindle warp, loosen, and bend. In general, hard drives are less reliable when exposed to heat. Many data recovery services seal drives in a moisture proof bag, and then cool them in a refrigerator or freezer before attempting to recover data. Some data recovery labs place an ice-pack on top of the source drive to improve its reliability. This is often enough to make a marginal drive work long enough to copy the entire disk.

Another technique frequently used by data recovery services is the "board swap". This involves replacing the defective drive's control

board with a known good unit. To successfully accomplish a board swap, an exactly identical model and revision of drive must be used. The Pro is a popular tool for data recovery applications.

Printer Compatbility

The Pro is compatible with most parallel interface **text printers**. It is **not compatible** with USB printers or printers that require a Windows driver such as a PCL, PJL and PostScript printers. The list below includes a partial list of compatible printers:

- Apple Dot Matrix
- Apple Imagewriter, high-resolution
- C.Itoh M8510
- Canon BJ-100/200/210/240
- Canon BJC-600 and BJC-4000
- Canon LBP-8II
- Canon LIPS III
- DEC LA50 dot matrix
- DEC LA70 dot matrix
- DEC LA75 Plus dot matrix
- DEC LA75 dot matrix
- DEC LJ250
- DEC LN03
- Epson AP3250 & ESC/P 2 printers
- Epson Color Dot Matrix, 24 pin
- Epson Color Dot Matrix, 9 pin
- Epson Dot Matrix, 24 pin
- Epson Dot Matrix, 9 pin, hi-res
- Epson Dot Matrix, 9 pin, med-res
- Epson Dot Matrix, 9 pin
- Epson Stylus 800 & ESC/P 2 printers
- Epson Stylus Color
- HP DesignJet 650C
- HP DeskJet 550C/560C/6xxC series set to Text Mode
- HP LaserJet III* set to Text Mode
- HP LaserJet Plus
- HP LaserJet
- IBM 3853 JetPrinter

- Imagen ImPress
- Mitsubishi CP50
- NEC P6/P6+/P60
- Okidata Microline 182
- Ricoh 4081 laser printer Set to Text mode
- StarJet 48
- Tek 4693d color printer, 2 bit mode Set to Text
- Tektronics 4695/4696 inkjet plotter
- Xerox XES printers

SCSI and IDE Error Codes

The error codes listed below may be encountered during operation. To save space on the display, uncommon errors may be referred to using these code numbers.

In general, the Pro will attempt to continue operation when an error has been encountered, particularly if the **Abort on Error** and **Stop on Error** switches are disabled. Some of these error codes are reported by the drive, and their exact usage may vary between manufacturers.

Error Code	Description
1	Error Allocating SRB
50	Request Still In Progress
51	Request Completed Ok
52	Error Request Aborted
111	Error Command Timeout - Drive did not complete an operation (besides format) with 2 minutes.
113	Error Message Rejected - Drive sent an error message to the Pro at the wrong time.
114	Error During Bus Reset - Drive encountered a SCSI bus error - check cables, ID, and termination.
115	Error Bus Parity Error - Drive encountered a SCSI bus error - check cables, ID, and termination.
116	Request Sense Failed - The Pro was unable to get basic drive information from the drive.

117 Target Didn't Respond to Selection Error – Check SCSI IDs.

118 Data Under/Over run - Drive did not send a proper amount of data. Check block size.

119 Error Bus Free Error - Drive encountered a SCSI bus error - check cables, ID, and termination.

120 Error Phase Error - Drive encountered a SCSI bus error - check cables, ID, and termination.

126 Bad Scatter/Gather List Error – A SCSI drive does not support mult-target copy and test feature. Restart with one drive attached.

178 Invalid Error Request

179 Invalid Host Adapter - Reset drive ID jumpers - drive is set to ID 7 or ID 15. Use IDs 0-6 only.

180 Invalid Error Target

200 Command Completed OK

202 Check Condition - Drive encountered a serious internal error.

208 Target Is Busy - Drive had an error coming ready.

216 Intermediate Status

232 Command Aborted - Drive did not complete a command sent by the Pro.

234 Command Terminated - Drive opertion was cancelled by the Pro.

240 Target Queue Full

274 Invalid SRB - Drive could not interpret a standard SCSI command.

275 Transfer Buffer Alignment Error

279 Adapter is Busy Error - Could be caused by multiple drives fighting for the SCSI Bus.

280 Transfer Buffer Too Large

281 Invalid Path Error

500 End Of Media Error

1000 No Sense Data Received

1001 Recovered Data with ECC

1002 Not Ready - Drive Inaccessible

1003 Medium - Disk Media Error or too many defects to Re Allocate

1004 Hardware Error on Drive PCB

1005 Illegal Request – Drive was unable to complete a command requested by the Pro.

1006 Unit Attention – Drive generated an error during execution of a command and requested attention from the Pro Workstation.

1007 Write Protect - Check drive WP jumpers. Check media on removable drives.

1008 Blank Check

1009 Vendor Unique

1010 Copy Aborted

1011 Aborted Command – Drive was unable to complete a command requested by the Pro.

1012 Equalization Error

1013 Volume Overflow

1014 Miscompare detected by drive Hardware

1015 Last command failed on drive.

2000 No Additional Sense – No error explanation was provided by the drive hardware.

2001 I/O Process Terminated

2002 No Seek Complete – Drive was unable to seek - probably a serious servo error or major media damage.

2003 Write Fault - Drive was unable to ready itself to write data to the disk.

2004 LUN Not Ready - Check SCSI ID, and termination.

2005 LUN Doesn't Respond To Selection - Check SCSI ID and termination.

2006 No Reference Position – Caused by a servo error, drive will not operate.

2007 LUN Multiple Peripherals Selected - Multiple drives have the same ID! Check jumpers.

2008 LUN Parity Error - Multiple drives have the same ID! Check jumpers

2009 Track Following Error - Drive experienced a problem tracking servo bursts on the media. Unable to seek.

2010 Error Log Overflow - Drive has too many defects to reallocate.

2012 Write Error - Drive was unable to write data to the disk.

2016 CRC Error - Drive detected an error on a sector while reading or writing.

2017 Unrecovered Read Error - Drive tried to recover from a read error (bad sector) but failed.

2018 ID Address Mark Not Found - Drive was unable to locate a sector header on the disk.

2019 Data Address Mark Not Found - Drive was unable to locate the start of a sector on the disk.

2020 Record Not Found - Drive was unable to locate a track for sector.

2021 Positioning Error - Servo error on drive, probably a mechanical problem or seriously damaged media.

2022 Data Synchronization Error

2023 Recovered Data

2024 Recovered Data with ECC - Drive found an error, but successfully recovered from it.

2025 Defect List Error - Drive can't interpret the updated defect list.

2026 Parameter List Length Error - Drive didn't understand a sequence of commands sent by the Pro.

2027 Synchronous Data Transfer Error - Drive was unable to switch into faster synchronous SCSI mode.

2028 Defect List Not Found - Drive has lost it's internal list of defective sectors.

2029 Miscompare - Drive detected data error. Reassign sectors using the Pro's Recertify option.

2030 Recovered ID with ECC - Drive was able to recover from an error finding a sector by using an Error Correcting Code

2032 Invalid Command Op Code

2033 Logical Block Address Out Of Range - Number of available blocks on the drive has been reduced.

2034 Logical Unit Not Supported

2036 Invalid Field in CDB - Drive does not detect valid SCSI commands for some reason.

2037 Logical Unit Not Supported - Drive has problems with SCSI ID - choose an ID 0-6 only.

2038 Invalid Field In Parameter List

2039 Write Protected - Drive does not allow data to be written to it - check WP jumper.

2040 Ready Transition

2041 Reset Occurred - Drive has reset itself during operation. Check and confirm that power connectors are mechanically secure.

2042 Mode Parameters Changed

2043 Copy Cannot Execute Since Host Cannot Disconnect

2044 Command Sequence Error

2047 Tagged Commands Cleared By another Initiator

2048 Incompatible Medium Installed

2049 Medium Format Corrupted – Drive must be low-level formatted before continuing

2050 Defect List Update Failure – Drive was unable to update its defect list.

2055 Rounded Parameter

2057 Saving Parameters Not Supported

2058 Medium Not Present – No disk was detected (removable drives).

2061 Invalid Bits in IDENTIFY Message

2062 Logical unit Has not Self Configured Yet - Drive was unable to come ready within 35 seconds.

2063 Target Operating Conditions Have Changed

2064 Diagnostic Failure On Component - The Pro has detected a component failure on the drive PCB.

2067 Message Error

2068 Internal Target Failure

2069 Select/Reselect Failure

2070 Unsuccessful Soft Reset - Drive was unable to reset to the point where it can accept commands.

2071 Error Parity - Drive

2072 Initiator Detected Error Message Received - Drive failed - try re-testing with only 1 drive attached.

2073 Invalid Message Error

2074 COMMAND Phase – Drive failed while trying to receive a command from the Pro.

2075 DATA Phase - Drive failed while trying to transfer data to or from the Pro.

2076 Logical Unit Failed Self Configuration - Drive failed power up self-test, unable to start process.

2078 Overlapped Commands Rejected - Caused by the drives inability to support multi-drive test or copy

2083 Media Load/Eject Failed - Unable to Load a Disk
      in the Drive (removable DASD devices only)
2090 Operator Request – Test Failed Due to
      Termination by User

Technical Support

To save time and effort, please read this manual completely before calling for tech support. Start with our web site: www.corpsys.com. You may FAX questions to (408) 969-2655. To contact tech support, dial (408) 330-5595 and please have the following ready so we can better serve you:

❑   A copy of your invoice and customer number.
❑   The firmware revision level installed in the system. This information can be found using the **Display System Software Version** option. This manual was written for 7.17 software release versions.
❑   A description of the drives on your SCSI and IDE chains including the IDs for each device, which devices are terminated, and which device(s) are providing termination power.

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Limited One Year Warranty

The terms of this warranty may be legally binding. If you do not agree to the terms listed below, return the product immediately in original unopened condition for a full refund. CSC warrants the Pro hardware to be free from defects in materials and workmanship for a period of one year from the date of the CSC original invoice. The software, firmware, and accompanying written materials are provided "AS–IS" without warranty. The risk as to the results and performance of the unit is assumed by the purchaser. CSC's entire liability and exclusive remedy as to defective hardware shall be, at CSC's option, either (a) return of the purchase price (for units returned within 15 days of purchase), or (b) replacement or repair of the hardware that does not meet CSC's quality control standards and has been returned through proper RMA procedures. CSC's liability for repair or replacement is to CSC's customer *only*. No warranty service will be provided without an original invoice from CSC and an RMA number provided by technical support. Returns must be shipped prepaid to CSC. RMA authorization numbers are valid for 15 days from date of issue. This warranty does not cover products opened, modified, subjected to rough handling, or used in applications for which they were not intended. No oral advice or verbal statements made by CSC's employees, dealers, or distributors shall in any way increase the scope of this warranty. CSC makes no warranty as to merchantability or fitness for any particular purpose. Due to the wide range of hardware and software available, CSC cannot guarantee compatibility with all system configurations. CSC assumes no liability for incidental or consequential damages arising from the use or inability to use this product. This warranty gives you specific legal rights. You may also have other rights that vary from state to state. Some states do not allow the exclusion of liability for consequential damages, and some of the above limitations may not apply.

CORPORATE SYSTEMS CENTER
3310 Woodward Ave.
Santa Clara, CA 95054
Sales: (408) 588-1110 – sales@corpsys.com
Support: (408) 330-5595 – support@corpsys.com
www.proworkstation.com