

# Planar Clean Screen™ PC User's Manual



Model Numbers C3012T and C3013T



# **PLANAR CLEAN SCREEN™ PC**

## **Integrated Computer with LCD Color Display**

# **USER'S MANUAL**

Model Numbers C3012T and C3013T  
Document Part Number 025000500

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# REGULATORY INFORMATION

## U.S. Federal Communications Commission (FCC) Requirements

The Planar Clean Screen PC has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

If this equipment does cause harmful interference to radio or television reception, which can be detected by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from the circuit to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

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# WARRANTY INFORMATION

Planar Advance, Inc. (Planar) warrants that the goods sold hereunder will be free of defects in materials and workmanship, and such goods will substantially conform to the specifications furnished by Planar, and to any drawings or specifications furnished to Planar by the Buyer if approved by Planar. This warranty shall be effective only if Planar receives notice of such defect or nonconformance during the period of the warranty. Planar's sole and exclusive liability for breach of warranty shall be, at Planar's option, to repair or replace the Planar product(s) with refurbished units or provide a credit to buyer in the amount of the purchase price.

## Commencement of Warranty

The warranty period begins on the date of shipment.

## Duration of Warranty

The goods sold hereunder are warranted for a period of two years from date of shipment unless otherwise agreed to by Buyer and Planar. No extension of the warranty will be given during the time the goods are in Planar's possession.

## Place of Repair or Replacement

In order to obtain service under this warranty, Buyer must notify Planar of the defect before expiration of the warranty period and request a “Return Material Authorization Number.” If the configuration has been modified in any manner, the product must be returned to its original configuration before any warranty service will be performed by Planar. No goods are to be returned to Planar without prior authorization. Buyer will be responsible for packaging and shipping the defective goods to the Planar Service Facility located at Beaverton, Oregon, with shipping charges prepaid.

## Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from (a) improper or inadequate maintenance by Buyer; (b) unauthorized modification of the goods; (c) operation of the goods outside of the environmental specifications of the goods; (d) neglect, misuse, or abuse of the goods; or (e) modification or integration with other goods not covered by Planar’s warranty when such modification or integration increases the likelihood of damage to the goods.

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## Technical Assistance

The warranty set forth above shall not be enlarged, diminished or affected by, and no obligation or liability shall arise from Planar, any authorized dealer, or any other person’s rendering of technical advice, assistance, or services in connection with the buyer’s order of the goods furnished hereunder. The Buyer is not relying on Planar’s skill or judgment to select or furnish suitable goods.

## Installation

Planar makes no warranty with respect to any installation of Planar’s product(s) by Planar, any authorized dealer, or any other person.

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# INSTALLATION GUIDE

## Before You Begin

Installing and setting up your Clean Screen PC is very straight forward. But before you get started, there are some things you should know.

## What's in the box?

Each box will contain a Planar Clean Screen *head* (that is, the integrated computer and LCD display), six Torx drivers (sizes: T10, T15, T20, T25, T27, T30), the external power supply, and the power cord. Remove the equipment carefully and inspect for damage. Immediately notify the shipping company if damage has occurred. Set aside the packing material for possible future use.

## What's in the *IS Manager's Kit*?

This manual and several 3.5" diskettes with all the display drivers necessary to install your Clean Screen PC to various Microsoft operating systems. (If you ordered your Clean Screen PC with a preloaded OS, then the drivers will already be installed on the hard disk.) The *IS Manager's Kit* is sold separately from the Clean Screen PC. If you need to purchase additional kits, please call (503) 614-4100. Together, the Clean Screen shipping box and the *IS Manager's Kit* contain everything you need for installation and setup.

## What's in this manual?

This manual is an advanced guide for installation and setup. It is intended for Information Services Department professionals. We are not going to tell you things you already know about PCs. We will cover what is unique about a Planar Clean Screen PC and what you need to know to successfully install and set them up. We encourage you to look through the entire manual before you begin. Even if you don't need all the information right now, it is good to know where it is for later reference.

## What if I'm missing something?

If something is missing from the box, please contact us at (503) 614-4100 or 1-800-893-8885.

There are, however, several other items you may need. In this manual we will assume you already have the *IS Manager's Kit*, standard Planar mounting equipment for the Clean Screen, and a Planar 3.5" external floppy drive (for loading any necessary drivers). If you are missing any of these, please check with your department. If necessary, you can contact us for more information or to order these parts.

<b>Clean Screen Mounts and Accessories</b>	<b>P/N</b>
12" wall mounted swing arm	M3S12
Flush wall mount system (for head and keyboard cabinet)	M3WC0
Flush wall mount system (head only)	M3FHM
Roll stand only	M3POLE
Roll stand with batteries (not for use with the C3013T product)	M3POLE-PS
Batteries	CBATT
<i>IS Manager's Kit</i>	C3DOC
<i>IS Manager's Kit, TOUCH</i>	C3DOC-TS
Keyboard cabinet with keyboard and mouse	M3W00
External floppy drive	C3FLOP

## Safety Instructions

Your Planar Clean Screen PC has been designed, assembled, and inspected to ensure both the highest quality product and greatest level of safety for the user. To maintain both quality and safety, you must follow the instructions in the manual and the following safety guidelines.

1. Read the safety and installation guidelines carefully.
2. Keep the manual handy for future reference.
3. Install and use the Clean Screen only on a sturdy surface and in stable surroundings.
4. Use the Clean Screen in dry environments only.
5. Do not block vents or other slots on the Clean Screen housing.
6. Use only the power supply module included with the Clean Screen.
7. Use and maintain the safety ground plug set (power cord) included with the unit.
8. After the Clean Screen has been installed, secure all electrical cords out of the way to prevent the unit from being pulled off the table or other accidental damage.
9. Turn off and unplug the Clean Screen before removing the Clean Screen's back housing to access internal user serviceable parts.
10. Avoid placing the Clean Screen or any of its cables on or near heat sources.
11. Clean Screen and its power supply meet the UL2601 standard for cleaning in a hospital environment. Please see **Chapter Six: Care and Cleaning** for details.
12. Before cleaning, or if the unit becomes wet for any reason, it is always best to disconnect the unit from its power source.
13. Practice caution when moving the Clean Screen to a different location. Use original packaging whenever possible.
14. If the Clean Screen does not power-up when the power is switched on, refer to the **Troubleshooting** section of this manual in **Appendix C** and follow the directions. If the Clean Screen still does not work, immediately disconnect it from its power source and contact a qualified service technician.



**If this device is used in a medical facility, any application software used on the Clean Screen PC must be in the language of the user.**

## Front Panel

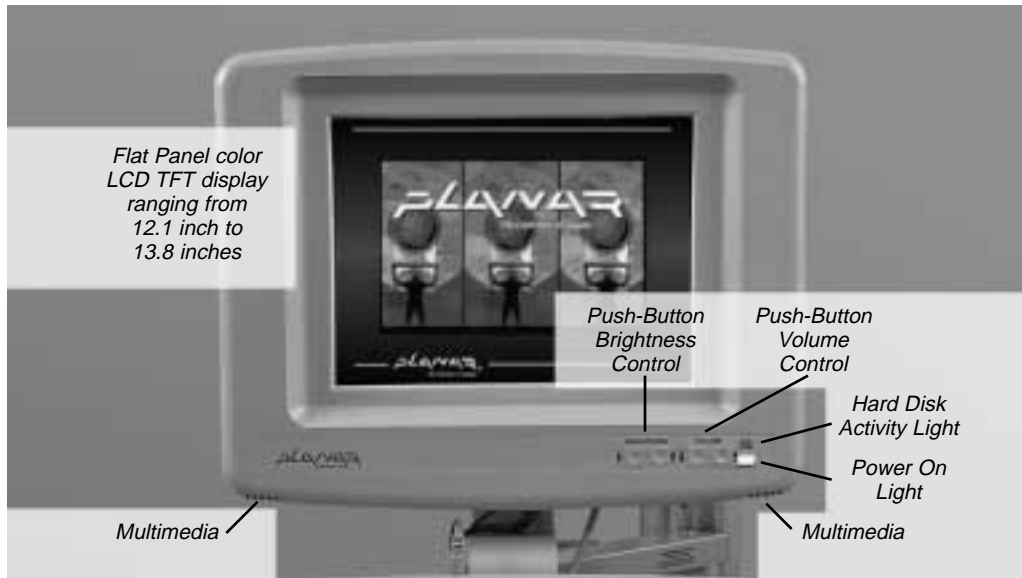


Figure 1

## Connections (Bottom)

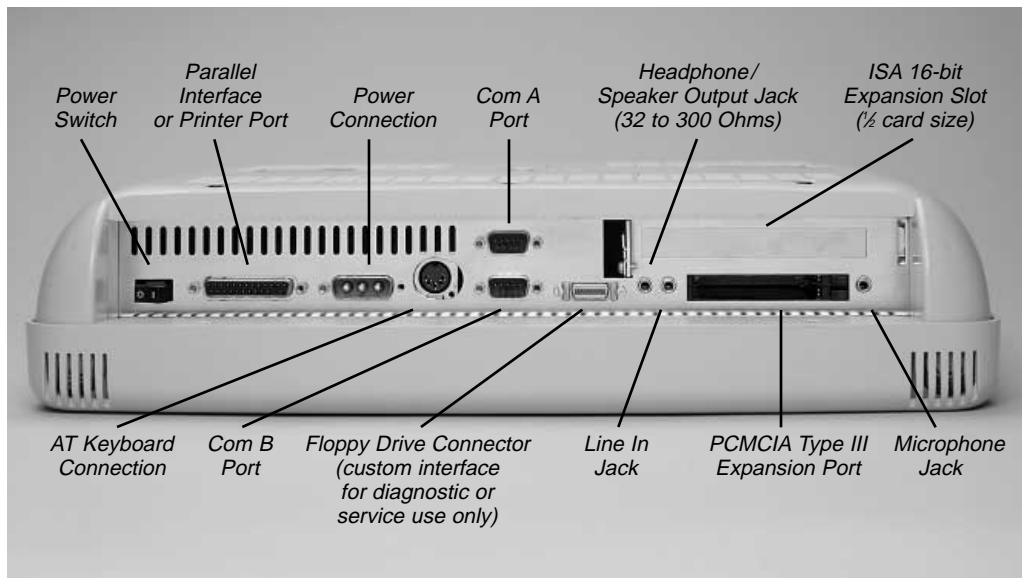


Figure 2

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# Chapter One: The Installation Express

If you are an experienced technician and have already installed Clean Screen PCs before, then check out **Chapter One: The Installation Express**. It covers the major steps. If you are the least bit unsure of any step, please resume reading the rest of the manual.

1. Review the *Before You Begin* section of the manual — especially its *Safety Instructions*.
2. Unpack the Clean Screen PC and save the packing.
3. If you need to open the unit to install an ISA adapter card, then read **Chapter Three: Hardware Installation and Replacement** for details.
4. Connect the keyboard and peripherals. If you need any help, refer to **Chapter Four: System Setup**.
5. Before connecting the power, make sure the power switch is in the off (O) position. Connect the power.



**To prevent damage to the Clean Screen ensure correct orientation of the power connector before plugging it into the unit. Always secure the connector in place before turning on the Clean Screen.**

---

6. Turn on the unit.
7. Press <F2> immediately when prompted to enter the *CMOS Setup*. The screens are self-explanatory.
8. If your system was purchased without an operating system, you will need to use a boot disk to create disk partitions and format the HDD before installing your operating system.
9. Load any drivers necessary for your system from the *IS Manager's Kit*. Follow the **Readme.doc** and other information on the disks.
10. Load your application software.
11. You may want to read the rest of the manual. There are many helpful details about your new Clean Screen PC, especially in the **REFERENCE GUIDE** section.

---

# Chapter Two: The Clean Screen PC

## Welcome

Thank you for purchasing Planar's Clean Screen color LCD personal computer, an IBM® compatible PC integrated with a full color LCD VGA display. The Clean Screen PC combines Pentium® performance with state of the art display technology to offer the most advanced, rugged, and lightweight PC system commercially available.



Figure 3 — Planar Clean Screen with keyboard cabinet.

## Clean Screen Facts

The Clean Screen is an IBM compatible PC integrated with a color LCD screen. It supports Pentium microprocessors of 75 MHz to 200 MHz and up to 128 MB of memory and has a 2.5" IDE Hard Disk. The unit includes either a 12.1" with 800 x 600 resolution or 13.8" with 1024 x 768 resolution Flat Panel AMLCD display. The unit has one parallel port (LPT1), one AT keyboard port, one PCMCIA Type III expansion port and one 16 bit ISA format ½-card size expansion port. There are two externally available high speed serial ports (COM A and COM B). Sound Blaster™ compatible sound is provided by built-in speakers or through an external headphone/speaker jack. The entire unit is rated to withstand shocks of up to 50 g, meets the UL2601 standard for safety, and is powered by a single external power supply *brick*. Standard mounting options for the Clean Screen include wall mounts, swing arms, and mobile carts.

The processor, chipset, cache, DRAM, real-time clock, and BIOS reside on a RadiSys EPM-1 daughter board. This board can be easily replaced for repair or upgrade. The BIOS allows for power reduction by disabling the display and disk drive power when no activity is detected.

Touch screen support is optional. If your unit has a touch screen, please refer to the manual included on the disk with the touch screen drivers and **Appendix D** of this manual.

The Clean Screen PC does not include an integrated floppy disk. There is provision for externally accessing a floppy disk drive through a custom connector. This is for diagnostic and service use only.

## Front Panel

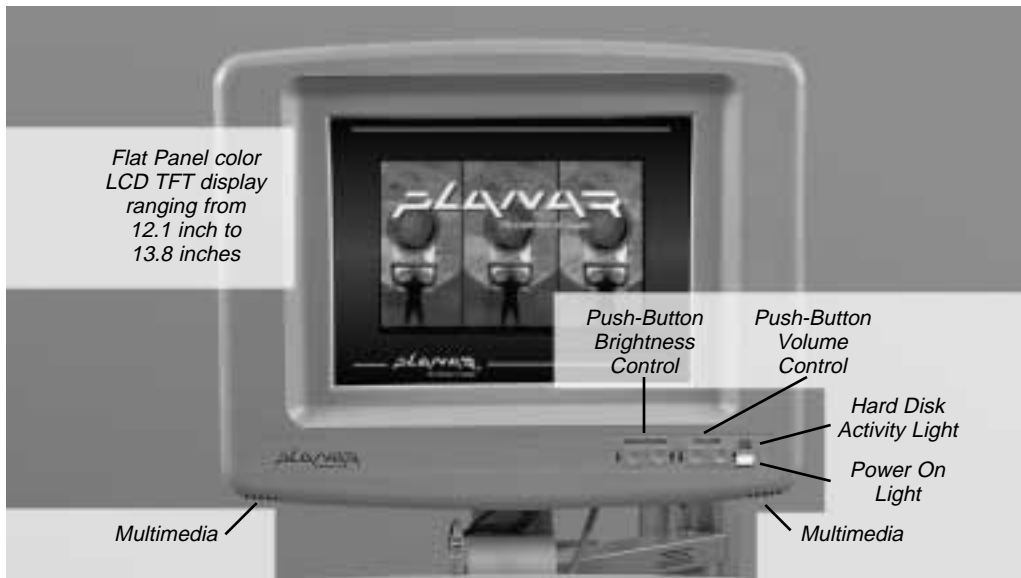


Figure 4

## Connections (Bottom)

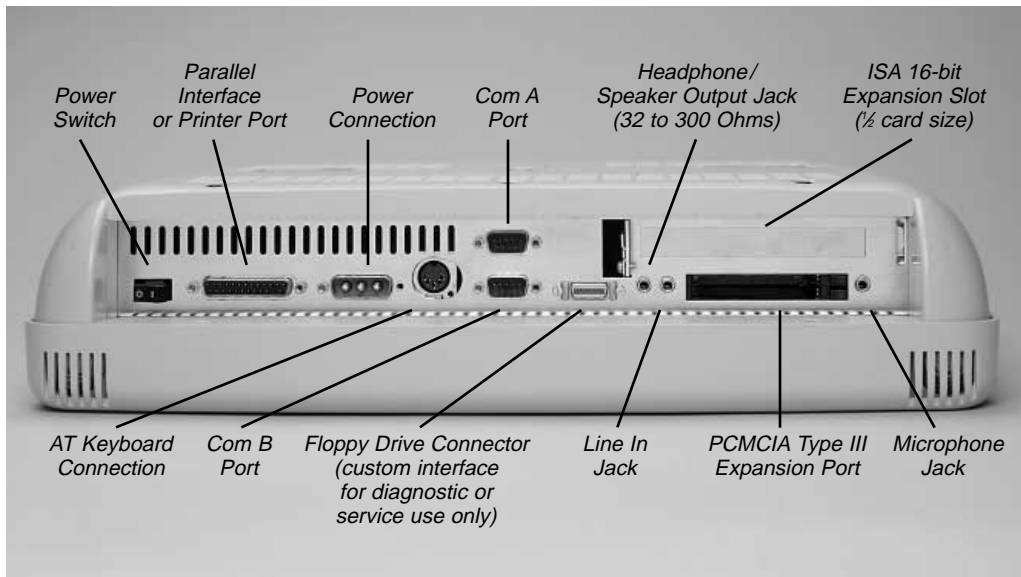


Figure 5

## Back Housing

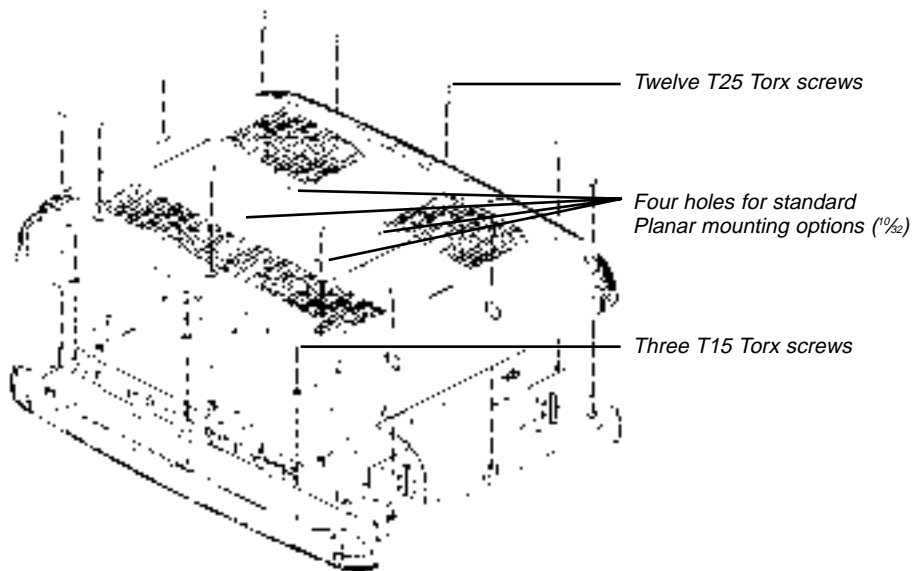


Figure 6 — Remove the back housing to gain access to the unit.

## Inside

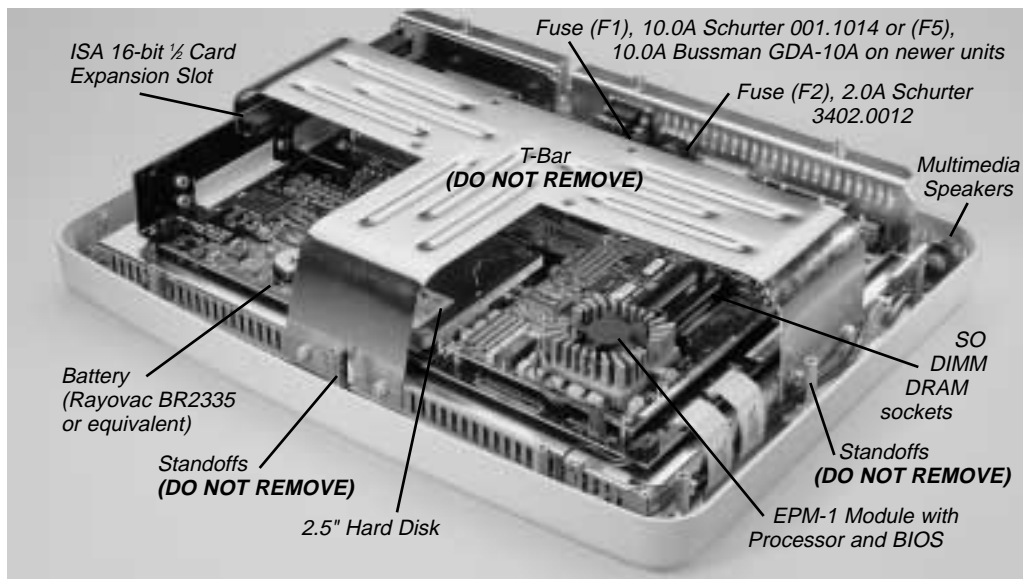


Figure 7



**Do not remove the T-Bar or the standoffs.**

**Their removal is not necessary to install or replace the ISA card, battery, hard disk, memory, or EP-1 module. The display unit contained beneath the motherboard uses high voltages. The display unit is not field serviceable and its connections are easily damaged.**

---



**Static sensitive equipment.**

**Use proper grounding procedures while working inside the Clean Screen.**

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# Chapter Three: Hardware Installation and Replacement

This chapter refers to installing or replacing options within the Clean Screen itself. Instructions on installing the Clean Screen onto a standard Planar mounting option will come with the mounting equipment itself.

## Removing the Back Housing

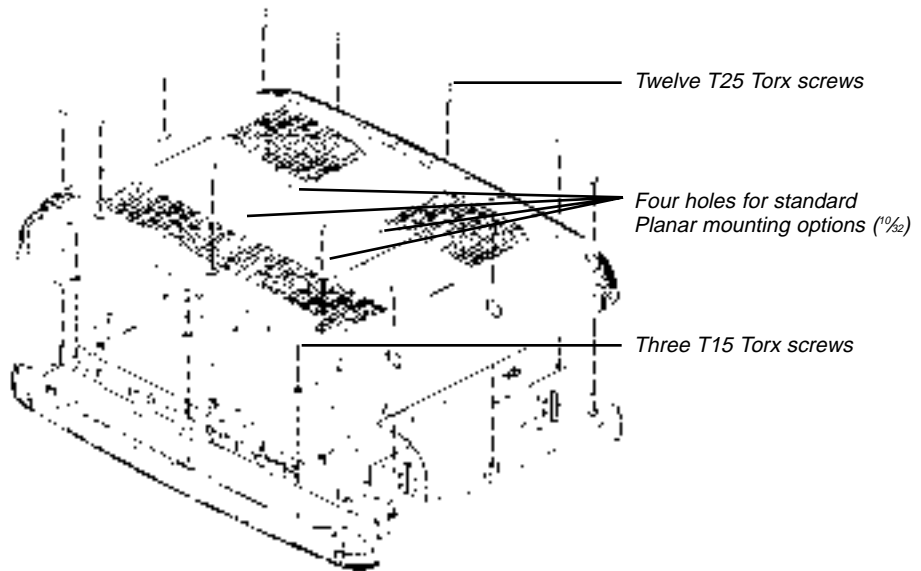


Figure 8



**Power down unit first and disconnect it from the power source.**

---

1. Power down unit first and disconnect it from the power source.
2. Use a static-free workstation.
3. Place Clean Screen face down on a secure flat surface, using a cloth or other non-abrasive material to protect the display.
4. Remove the twelve attachment screws from the back housing using a T25 torx driver.
5. Remove the three attachment screws from the back housing located near the connector ports using a T15 torx driver.
6. Remove the back panel itself by gently lifting the bottom back edge first.

## Installing an ISA Adapter Card

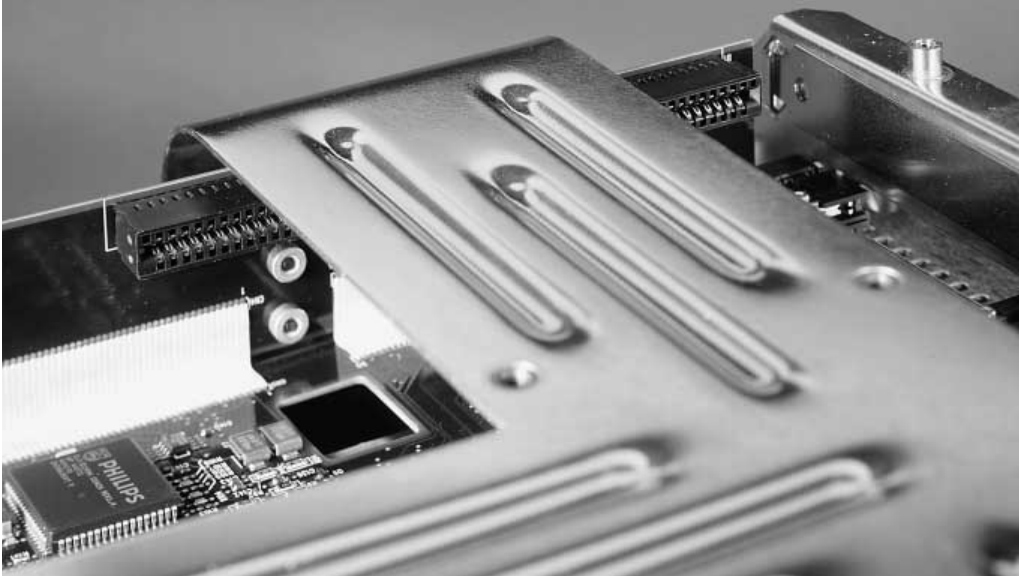


Figure 9



**Do not remove the T-Bar or standoffs.**

1. Remove the back housing as above.
2. Remove the blank metal spacer from the ISA panel slot using the T10 torx driver.
3. Locate the ISA connection beneath the T-Bar.
4. Turn the ½-card size ISA board upside down as you orient it toward the connection and the ISA panel slot.
5. Slide the card under the T-Bar, into the ISA connector and the ISA panel slot.
6. Tighten the torx screw on the ISA panel slot.

## Installing Memory

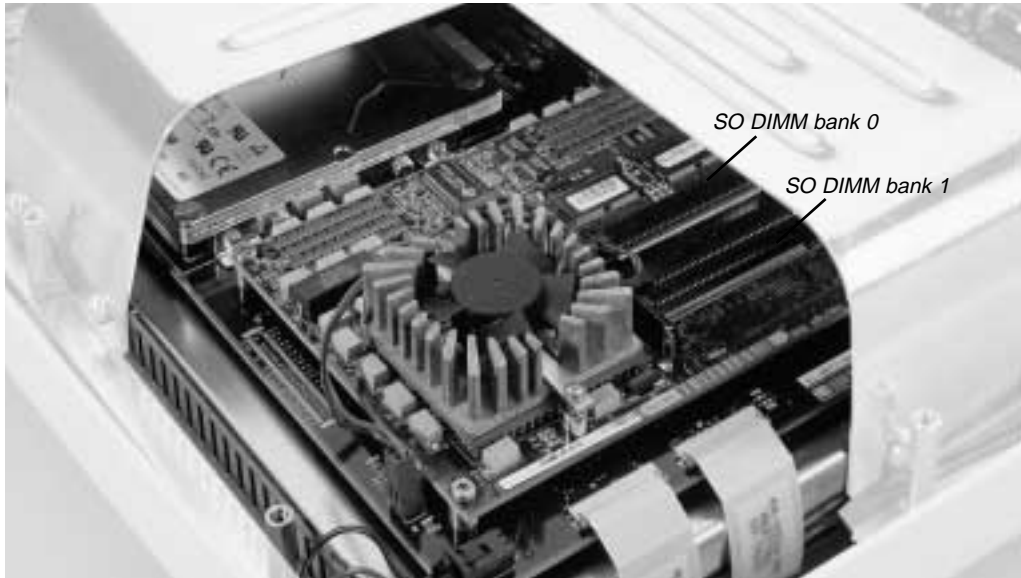


Figure 10



**Do not remove the T-Bar or standoffs.**

---



**Each SO DIMM bank is wired in parallel and requires two modules. You can fill one bank or both. But you should never put just one DIMM module in a bank: the unit will malfunction.**

---

### To remove an SO DIMM module

1. Remove back housing as above.
2. Placing your hands on both sides of the T-Bar, gently open both side catches simultaneously (apply pressure to the plastic part of the catch, not the metal spring).
3. The SO DIMM module will pop up.
4. Remove the SO DIMM module.

### To install a SO DIMM module

1. Remove back panel as above.
2. Placing your hands on both sides of the T-Bar, gently insert the SO DIMM module into an empty socket. Ensure correct orientation using the module notch located next to the contacts. In Bank 0 the module orientation notch will face toward the processor. In Bank 1 the module orientation notch will face away from the processor.
3. Push the module down gently until the side catches snap into place, coaxing them if necessary.

**Technical Note:** The SO DIMM module will only insert one way into the socket; do not force it. If you meet with resistance, check the orientation of the module.

## Replacing the Hard Disk Drive

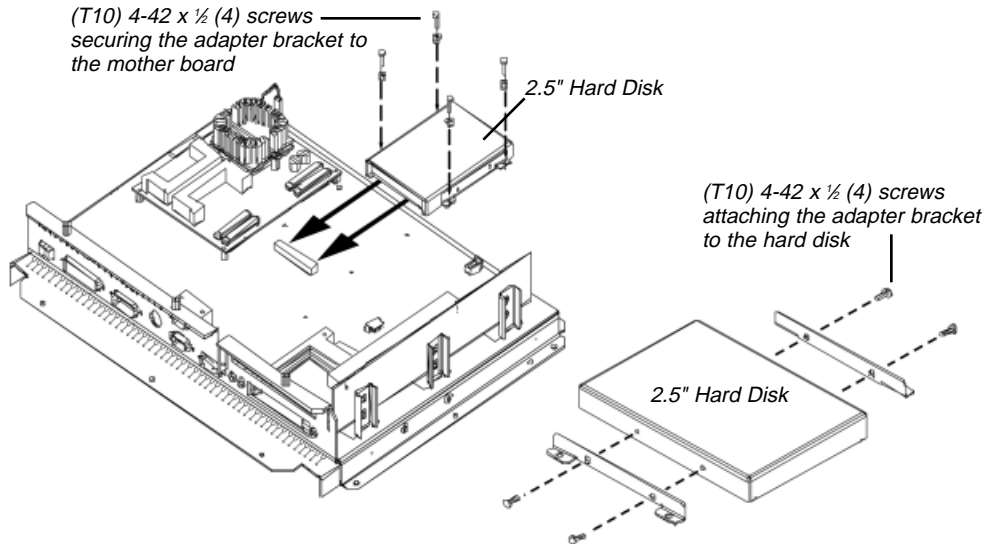


Figure 11

### Removing the existing hard disk

1. Remove the back housing as above.
2. Locate the hard disk under the T-Bar.
3. Remove the four screws that secure the hard disk bracket to the main board.
4. Gently slide the hard disk back toward the top of the Clean Screen to detach it from its connector.
5. Lift and remove the hard disk.

### Installing the new hard disk

1. Remove the screws holding the adapter bracket to the old hard disk.
2. Remove the adapter bracket.
3. Attach the adapter bracket to the new 2.5" hard disk.
4. Gently slide the hard disk under the T-Bar and into its connector.
5. Replace the screws that secure the bracket to the main board.

## Replacing the Battery

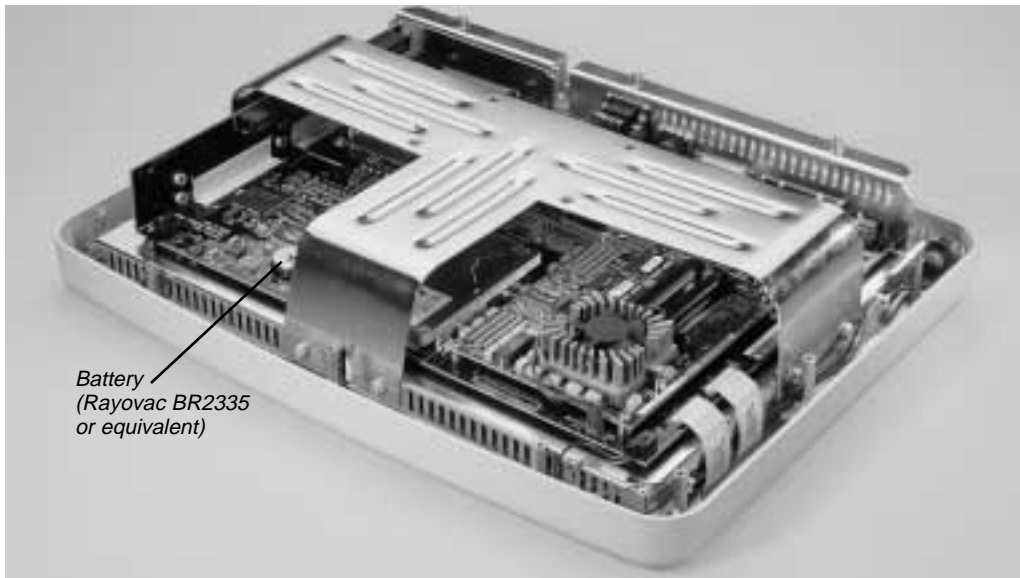


Figure 12

**Battery:** Rayovac BR2335 or equivalent.

1. Remove the back housing as above.
2. Gently pulling up on the battery bracket, remove the old battery.
3. Slide in a new battery.
4. Upon startup, the system defaults will load. Enter *Setup* and go to the *Exit* menu to restore the CMOS settings saved in your flash memory. See **Chapter Five: BIOS Setup** for details.

**Technical Note:** Before removing the battery you must ensure the CMOS is backed up in flash memory. See **Chapter Five: BIOS Setup**.

## Replacing the Fuses

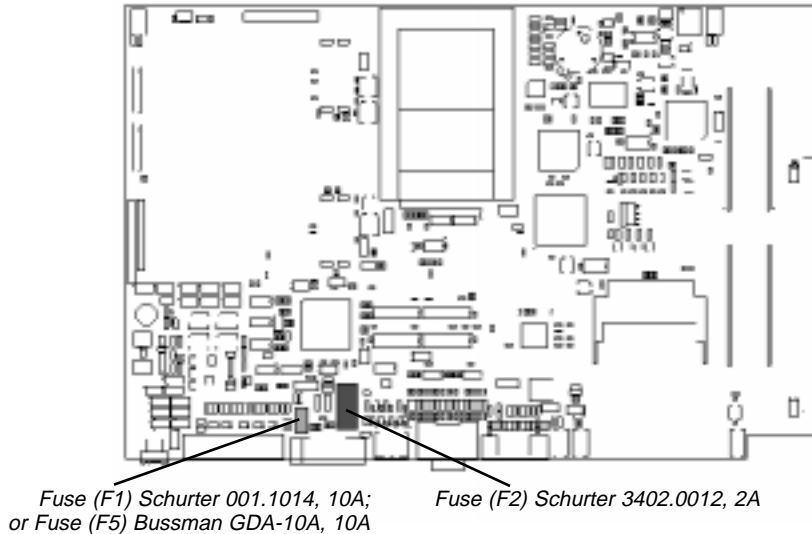


Figure 13



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**Use only the fuses specified below to prevent damage to the Clean Screen.**

---

**Fuses:** **F1** Schurter 001.1014, 10 A  
**F2** Schurter 3402.0012, 2 A  
**F5** Bussman GDA-10A, 10 A

1. Remove the back housing as above.
2. Using a small (jeweler type) flat screwdriver, gently pry up on the fuse.
3. To remove an F2 fuse, gently pry the metal bracket at either end and then lift the fuse out.
4. Snap in a new fuse that meets the above specifications.

**Technical Note:** The F1 fuse used in earlier products has been replaced by the F5. Depending on your product version, you will have either an F1 or an F5, but not both.

## Mounting the Clean Screen

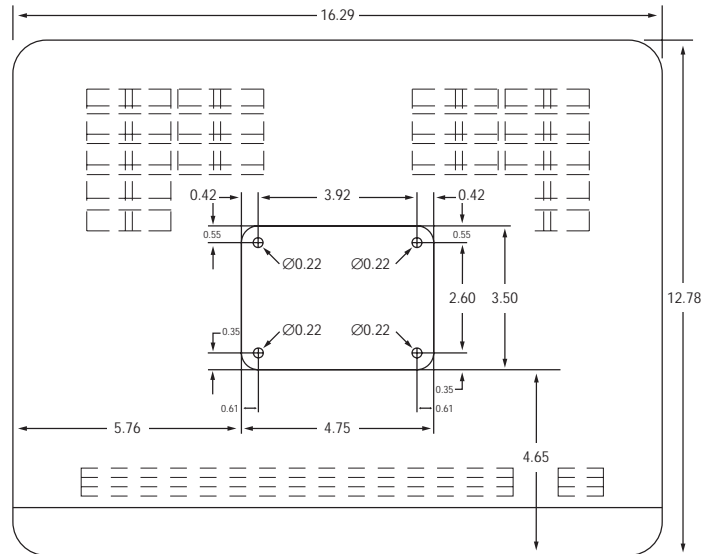


Figure 14 — The back of the Clean Screen, showing the location of mounting holes.

Planar offers a variety of mounting options. If you are using one of these, please refer to the instructions included with your mounting hardware. If you are providing your own mounting hardware please follow these simple guidelines:

1. Use the drawing above to create a template for greater accuracy in locating the mounting holes on your hardware.
2. Mount the Clean Screen in such a way as to NOT block the rear cooling vents. Planar recommends a minimum of 1" rear clearance.
3. Use only mounting hardware that complies with OSHA, NFPA, and local as well as county building codes.
4. Ensure the weight or load limit of the mount is 3 times the weight of the Clean Screen, or approximately 42 pounds.
5. Follow and comply with the vendor's mounting instructions.
6. Use four (4)  $\frac{10}{32} \times \frac{1}{2}$ " stainless steel screws. If the thickness of the material you are mounting to requires the use of longer screws, simply add that thickness to the  $\frac{1}{2}$ " screw length. Do not use any screw that will protrude more than  $\frac{3}{8}$ " into the back of the Clean Screen.

# Chapter Four: System Setup

Attach the keyboard and all peripherals before you power up the unit. All connections are made at the bottom of the unit. If you have not yet attached the Clean Screen PC to a standard mounting bracket, then lay the unit face down before you attach the keyboard and peripherals. Be sure to use a non-abrasive cloth or other material to protect the face plate.

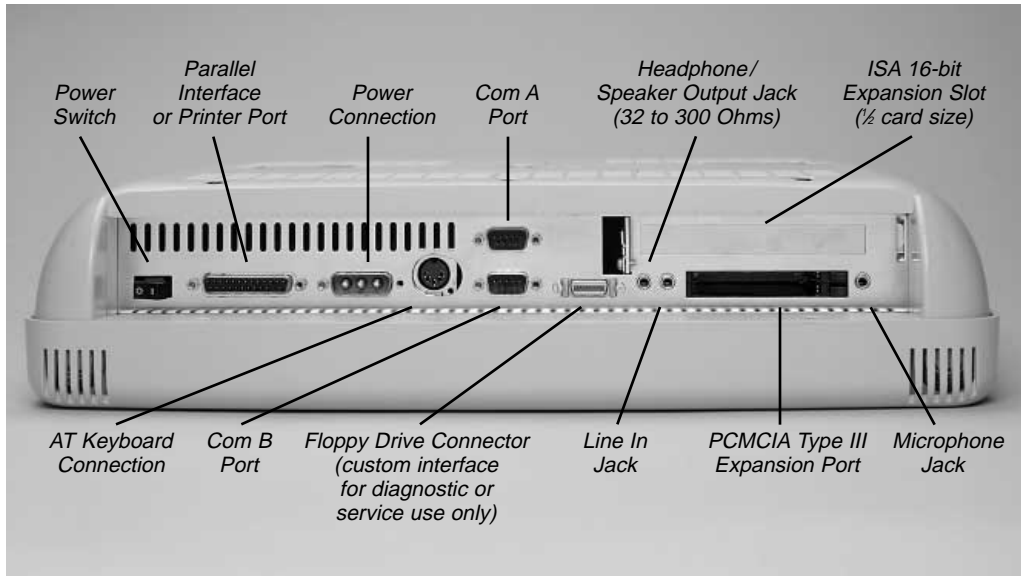


Figure 15

## Connecting the Keyboard

Your Clean Screen can use any AT style keyboard.

## Connecting Peripherals

### Mouse

The Clean Screen PC uses a serial type mouse. COM A is the default.

### Printer

The parallel port can be used for connecting a local printer.

## PCMCIA Port

The Clean Screen allows the connection of one Type III PCMCIA Expansion Card or the use of two Type I or Type II PCMCIA Expansion Cards.

## Floppy Drive Connector

Please note that this is NOT a standard floppy drive connection. The Clean Screen is not designed for regular use with an external floppy drive. The connector will only allow use of a Planar 3.5" external floppy drive and is intended only for diagnostic and service use. If you need to load drivers for your operating system or other programs, you will need to obtain the correct drive. See *What if I'm missing something?* in the **Before You Begin** section.





---

**If this device is used in a medical facility, any operating systems or programs used are required to be in the user's language.**

---

## Power Supply

If you will be using AC power, you will need to use the AC power supply adapter that was packed with your Clean Screen. If you will be using a Planar mounting stand with batteries, you will use its power connector.

## Power Cord Selection

The Clean Screen AC power supply adapter has been provided with a "Hospital Only" or "Hospital Grade" type cord and plug. The plug has NEMA 5-15 approval. In the event it becomes necessary to replace the power cord, it is important to select a "Hospital Only" or "Hospital Grade" type cord and plug.

## Headphones or External Speakers

Please note that when you use headphones or external speakers, the internal speakers are automatically disconnected. You may use headphones or speakers with an impedance of 32–300  $\Omega$ .

## Powering Up the Clean Screen PC

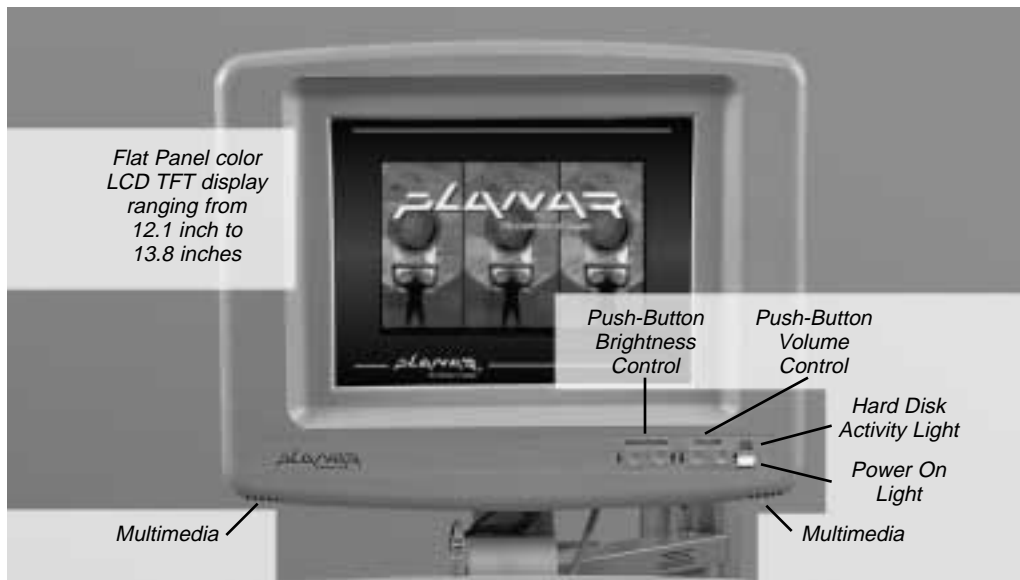


Figure 16 – Operating unit with keyboard.

## Power On

Once the keyboard, mouse, power, and all peripherals have been connected, use the power switch located beneath the power-on indicator to power up the unit.



---

**Always power down the unit before you connect or disconnect any peripheral.**

---

## Setup (<F2>)

When the screen first writes, press <F2> on the keyboard to enter the *CMOS Setup* menu. Refer to the next chapter for details.

## Driver Overview

If you ordered the Clean Screen PC with an operating system pre-loaded, then the display drivers will already be loaded on the hard disk. Otherwise you will need to check the floppy disks that came with the *IS Manager's Kit* for the appropriate drivers. You will find documentation and instructions in the **Readme** files stored on the disks.

## Front Panel Controls

### Push-Button Brightness Control

Adjust Screen Brightness by pressing the up or down arrow buttons until the most legible setting is reached. Further adjustments are possible through the display driver software, refer to the **Readme** file located on the display driver diskette.

### Push-Button Volume Control

Adjust the volume of the internal multimedia speakers or headphones by pressing the up or down arrow buttons. Further adjustments are possible through the sound driver software, refer to the **Readme** file located on the sound driver diskette.

---

## Chapter Five: BIOS Setup

The *Setup* program customizes the way the Clean Screen PC uses the hardware features of its BIOS (Basic Input/Output System). The *Setup* data is stored in CMOS and guides the computer every time it is turned on. A special feature of the Clean Screen PC is its ability to also store the *Setup* information in flash memory, so *Setup* information can be recovered by the system should the CMOS become corrupted. See the *Exit* menu section for details.

### Entering the BIOS Setup Program

When you first boot up the Clean Screen PC, there is a short-time window during which a message is displayed telling you to *Press F2 to enter Setup*. Press and hold <F2> to enter *Setup*.

### Setup Screens

The *System BIOS Setup* menus are the standard Phoenix NuBIOS 4.05 (with plug-and-play and PCI support) screens with RadiSys extensions. A legend at the bottom of each screen provides information for the user to manipulate setup options.

Use the up and down arrow keys to move the cursor from field to field, and the right and left arrows to move from menu to menu. If the arrow keys are used to leave a menu and then return, the active field is always at the beginning of the menu. Fields with a triangle to the left are sub-menu headings; pressing <enter> when the cursor rests on one of these headings opens that sub-menu. Within the sub-menu, most fields allow the user to flip through that fields available choices by pressing the <+> and <-> keys. Once the desired entry has been selected, use the up or down arrow to move the cursor to the next field.

There are four menus: *Main*, *Advanced*, *Power*, and *Exit*. Note that item specific *Help* is provided whenever an item is selected. In this manual we will only detail the more important sub-menus and choices.

## Main Menu

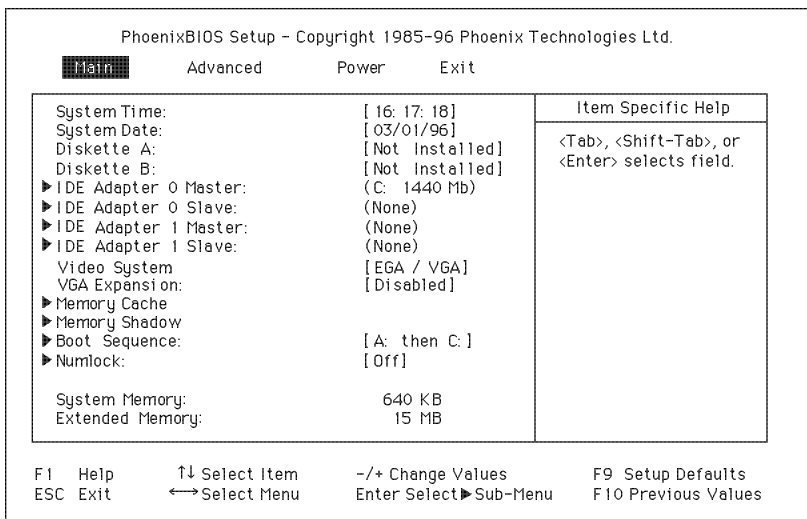


Figure 17 — Main BIOS Setup menu.

The first screen you'll see is the **Main** menu.

### System Time and System Date

These values are changed by moving to each field and typing in the desired entry. The TAB key moves from hours to minutes to seconds, or from months to days to years.

### Diskette A and Diskette B

These fields identify the type of floppy disk drive installed as the A or B drives. Possible settings are *Not Installed*; *360 KB, 5\_*; *720 KB, 3\_*; *1.2 MB, 5\_*; *1.44 MB, 3\_*. **The BIOS defaults to Not Installed for drives A and B.** You will need to define drive A if you are using an external floppy disk.

### IDE Adapter Master and IDE Adapter Slave Sub-Menus

These fields are headings for menus that allow entering complete disk drive information. Usually, if your hard disk has not been defined, you will press <enter> at the **IDE Adapter 0 Master** sub-menu. There you can select *Autotype Fixed Disk* to allow the system to detect the drive type automatically. The entry in the **Main** menu shows the drive selected.

### Video System

This field is used to select the video type. Possible selections are: *EGA/VGA*; *CGA 80x25*; and *Monochrome*. **The default is EGA/VGA.** This field also contains the flat panel expansion token which controls the expansion ability of the VGA BIOS, ensuring that the entire display is used to show information rather than only a portion of the display.

### VGA Expansion

When enabled, forces the 800 x 600 display to write to the full screen when a VGA (640 x 480) screen is used. Not available with the 1024 x 768 display.

## **Memory Cache Sub-Menu**

The term *memory cache* refers to the technique of caching BIOS images.

## **Memory Shadow Sub-Menu**

The term *memory shadow* refers to the technique of copying information from an extension ROM into DRAM and accessing it in this alternate memory location.

## **Boot Sequence Sub-Menu**

The Boot Sequence sub-menu allows you to change the boot delay and boot sequence and disable several displays during the boot process, such as the *SETUP Prompt*, *POST Errors*, *Floppy Check*, and *Summary Screen*. Enter this sub-menu if you need to control the ability of users to boot from a floppy or if you want to prevent them from seeing the *Press F2 to enter Setup* message or other system information. Once the boot sequence has been set, it displays in this entry in the *Main* menu.

## **Keyboard Features Sub-Menu**

This menu enables or disables various keyboard features, including enabling the <NumLock> key, enabling the key click, and setting the keyboard auto-repeat rate and delay. The NumLock setting displays for this entry in Figure 17.

## **System Memory**

This field is not editable and displays the amount of conventional memory (below 1 MB). No user interaction is required.

## **Extended Memory**

This field is not editable and displays the amount of extended memory (above 1 MB). No user interaction is required.

## Boot Sequence Sub-Menu (under Main Menu)

The *Boot Sequence* sub-menu accesses *Boot Options*.

PhoenixBIOS Setup - Copyright 1985-96 Phoenix Technologies Ltd.	
Boot Options	
Boot Delay:	[0]
Boot Sequence:	[A:then C:]
SETUP Prompt:	[Enabled]
POST Errors:	[Enabled]
Floppy Check:	[Enabled]
Summary Screen:	[Enabled]

Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.

F1 Help      ↑↓ Select Item      -/+ Change Values      F9 Setup Defaults  
ESC Exit      ←→ Select Menu      Enter Select▶ Sub-Menu      F10 Previous Values

Figure 18 — *Boot Sequence* sub-menu.

### Boot Delay

This option sets the system to delay booting for a time period in seconds. It allows for long startup times on boot devices that spin up slowly, and it ranges from 0–255 seconds. **The default is 0 seconds.**

### Boot Sequence

This defines how the system treats floppy drive A when booting. Booting can occur from a floppy in the A drive or directly from the fixed disk drive. **To reduce the amount of time required to boot, the boot sequence should be set to C: only.** The options are:

1. *A: then C:* Boots from the floppy drive, or if no floppy disk is present in the A drive, boots from the C drive.
2. *C: then A:* Boots from the C drive, or if none is present, boots from the A drive.
3. *C: only:* Boots from the C drive without searching for an A drive.

**The default is A: then C:.** The selected boot sequence setting displays in the *Boot Sequence* sub-menu field in the *Main* menu (see Figure 17).

### SETUP Prompt

This option enables or disables the message *Press F2 to enter Setup*. Even if the message is disabled, the <F2> key can still be pressed at the appropriate time to enter the *Setup* menu. **The default is Enabled.**

### POST Errors

This option stops the boot process if the POST encounters errors. Otherwise, the system continues to attempt to boot despite any startup error messages that display. Note that this option only affects those errors defined at build-time to halt the system. **The default is Enabled.**

## **Floppy Check**

This option is used to enable or disable the floppy drive search during the boot. To speed up booting, the floppy check should be disabled. It is still possible to boot from the A drive even with the floppy check disabled. **The default is *Enabled*.**

## **Summary Screen**

This option is used to enable or disable a summary of the system configuration, which displays before the operating system starts to load. To speed up booting, the summary screen should be disabled. **The default is *Enabled*.**

## Advanced Menu

The Advanced menu contains settings for integrated peripherals, memory shadow, cache, and large disk access mode.

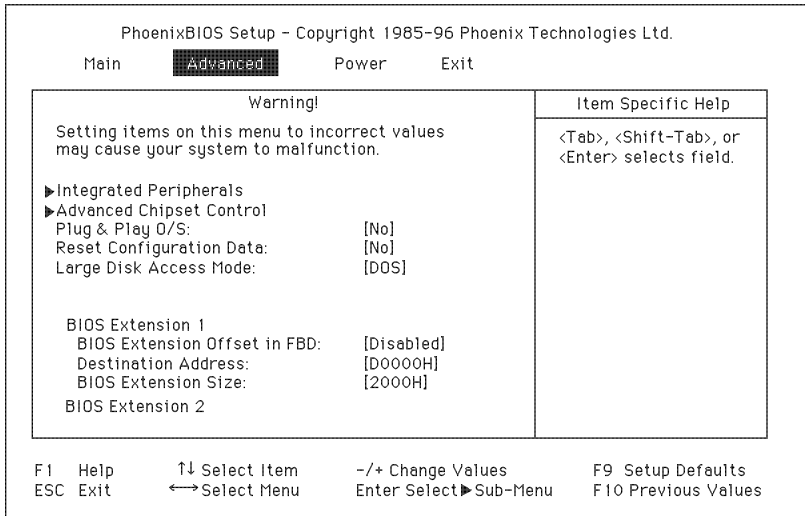


Figure 19 — Advanced menu.

### Integrated Peripherals Sub-Menu

The *Integrated Peripherals* sub-menu allows configuration of the onboard I/O ports, touch screen, and IDE controller.

### Advanced Chipset Control Sub-Menu

This option selects the *Advanced Chipset Control* sub-menu in order to configure the chipset.

### Plug & Play O/S

If enabled, this option informs the System BIOS that the operating system that will be booted supports plug-and-play. This forces the plug-and-play portion of the System BIOS to only configure motherboard devices and those peripherals that are necessary for booting (display, hard disk, etc.), the rest being left to the operating system to configure. **The default is No.**

### Reset Configuration Data

If enabled, this option clears the Extended System Configuration Data (ESCD) block residing in FBD main block #2. This is necessary the first time a system is turned on or if the ESCD becomes corrupted. **The default is No.** This option is automatically reset to *No* after the ESCD is cleared.

### Large Disk Access Mode

If you are using a hard disk larger than 528 MB and are running MS-DOS®, then set this selection to *DOS*. If you are using a different operating system, then set it to *Other*. When set to *DOS*, the System BIOS will perform cylinder/head translation, if the drive is configured in *Setup* to have more than 1024 cylinders. This allows MS-DOS systems to use hard disks up to 8 GB (1024C x 255H x 63S) in size without special drivers or LBA. **The default is DOS.**



## **BIOS Extensions**

These items control the loading (shadowing) of BIOS extensions contained in the FBD main block #3. Note that there are actually three groups of *Setup* items to control the shadowing of up to three BIOS extensions. The screen graphic only shows the first group.

### **BIOS Extension Offset in FBD**

This option selects the source address of the BIOS extension located in the FBD. The address is an offset from the base of the FBD. The offset range is between 4A000H through 5FFFFH in 8 KB increments. **The default is *Disabled*.**

### **Destination Address**

This option selects the target address of the BIOS extension. It can range from C80000H through DFFFFH in 8 KB increments. **The default is *D0000H*.**

### **BIOS Extension Size**

This option selects the number of bytes to copy from the FBD into shadow memory. BIOS extension sizes can be selected in 8 KB increments from 2000H through 10000H. **The default is *2000H*.**

## Integrated Peripherals Sub-Menu

The options in this sub-menu configure the onboard serial and parallel ports and disk controllers.

PhoenixBIOS Setup - Copyright 1985-96 Phoenix Technologies Ltd.		
Integrated Peripherals		
Item Specific Help		
COM A:	[3F8, IRQ4]	<Tab>, <Shift-Tab>, or <Enter> selects field.
COM B:	[2F8, IRQ3]	
LPT Port:	[378, IRQ7]	
LPT Mode:	[ECP]	
Diskette Controller:	[Enabled]	
Touch Panel Base Address:	[Disabled]	
Touch Panel IRQ:	[Disabled]	
Local Bus IDE adapter:	[Enabled]	
F1 Help      ↑↓ Select Item      -/+ Change Values      F9 Setup Defaults		
ESC Exit      ← Select Menu      Enter Select▶ Sub-Menu      F10 Previous Values		

Figure 20 — Integrated Peripherals sub-menu.

### COM A

This option configures the serial port labeled on the front panel as *COM A*. The choices for I/O base addresses and IRQs are: *Disabled*; *3F8H, IRQ4*; *2F8H, IRQ3*; *3E8H, IRQ4*; *2E8H, IRQ3*; and *Auto*. *Auto* causes the System BIOS to choose a base address and IRQ setting that avoids conflicting with the other ports. **The default I/O base and IRQ for this COM port is *3F8H, IRQ4*.**

### COM B

This option configures the serial port labeled on the front panel as *COM B*. The choices for I/O base addresses and IRQs are: *Disabled*; *3F8H, IRQ4*; *2F8H, IRQ3*; *3E8H, IRQ4*; *2E8H, IRQ3*; and *Auto*. *Auto* causes the System BIOS to choose a base address and IRQ setting that avoids conflicting with the other ports. **The default I/O base and IRQ for this COM port is *2F8H, IRQ3*.**

### LPT Port

This option configures the parallel port labeled on the front panel as *LPT*. The choices for I/O base addresses and IRQs are: *Disabled*; *378H, IRQ7*; *278H, IRQ5*; and *Auto*. *Auto* causes the System BIOS to choose a base address and IRQ setting that avoids conflicting with the other ports. **The default I/O base and IRQ for this LPT port is *378H, IRQ7*.**

### LPT Mode

This option sets the mode under which the LPT port operates. The selections are: *Output only*; *Bi-directional*; and *ECP*. ***ECP* is the default.**

### Diskette Controller

This option enables or disables the onboard floppy disk controller. **The default is *Enabled*.**

### **Touch Panel Base Address**

This option configures the touch panel serial port base address. The choices for I/O base addresses are: *Disabled*; *3F8H*; *2F8H*; *3E8H*; and *2E8H*. **The default is *Disabled*.**

### **Touch Panel IRQ**

This option is used to configure the touch panel serial port IRQ. The IRQ choices are: *Disabled*; *IRQ3*; *IRQ4*; *IRQ5*; *IRQ7*; *IRQ9*; *IRQ10*; and *IRQ11*. **The default is *Disabled*.**

### **Local Bus IDE Adapter**

This option enables or disables the onboard PCI bus IDE hard disk controller. **The default is *Enabled*.**

## Power Menu

The options in this menu provide control over the power management facilities. Only about half of the **Power** menu screen entries are actually visible at any one time; however, for illustrative purposes, all of the **Power** menu entries are listed and annotated below.

System BIOS Power Management supported states are: Fully On, Standby mode (partial power reduction), and Suspend mode (maximum power reduction).

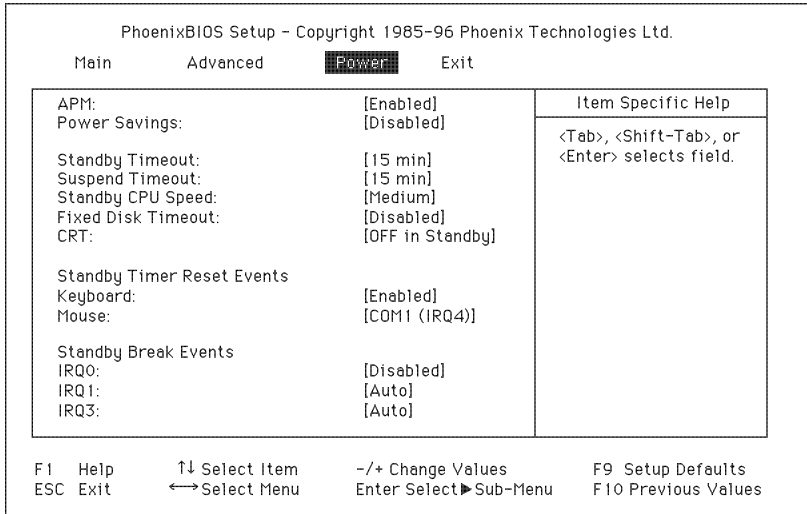


Figure 21 — Power menu.

### APM

This option enables or disables Advanced Power Management (APM). **The default is Disabled.**

### Power Savings

This option enables and selects the kind of power management, or it can be used to disable power management. The options are: *Disabled*; *Customize*; *Maximum Power Savings*; *Medium Power Savings*; and *Minimum Power Savings*. **The default is Disabled.**

### Standby Timeout

This option enables and sets the duration of inactivity required before the system is placed in Standby mode, or it disables Standby Timeout. The options are: *Disabled*; *2 min*; *15 min*; *30 min*; *1 hour*; *2 hours*; *3 hours*; and *4 hours*. **The default is 15 min.**

### Suspend Timeout

This option enables and sets the inactivity duration required to elapse before the system is placed in Suspend mode from Standby mode, or it disables Suspend Timeout. The options are the same as for Standby Timeout. **The default is 15 min.**

### Standby CPU Speed

This option enables or disables the changing of the CPU speed based upon the current power management state. The options are: *Disabled*; *LOW*; *MEDIUM*; *HIGH*; and *MAX*. **The default is MEDIUM.**

## Fixed Disk Timeout

This option enables and sets the duration of fixed disk access inactivity required before the system shuts off the disk drive, or it disables Fixed Disk Timeout. The options are: *Disabled*; *1 min*; *2 min*; *3 min*; *4 min*; *5 min*; *10 min*; and *16 min*. **The default is *Disabled*.**

## CRT

This option is not user accessible. It enables or disables power management of the CRT and flat panel during system entry into or exit from Standby mode. **The default is *OFF in Standby*.**

## Standby Timer Reset Events

These options determine whether activity from the specified devices will cause the Standby Timer to be reset.

### Keyboard

This option enables or disables keyboard activity to reset the Standby Timer. **The default is *Disabled*.**

### Mouse

This option enables (or disables) mouse activity to reset the Standby Timer, and it selects the IRQ that the mouse is bound to for that purpose. The options are *Disabled*; *PS/2 (IRQ12)*; *COM1 (IRQ4)*; and *COM2 (IRQ3)*. **The default is *COM1 (IRQ4)*.**

## Standby Break Events

This option enables or disables a Standby Break Event for the specified IRQ. A Standby Break Event allows the system to run at full speed for the duration of the specified IRQ. **Note that no such event is associated with IRQ2.**

IRQ	DEFAULT
0	Disabled
1	Auto
3	Auto
4	Auto
5	Disabled
6	Disabled
7	Disabled
8	Disabled
9	Disabled
10	Disabled
11	Disabled
13	Disabled
14	Disabled
15	Disabled

Table 5.1 IRQ Standby Default Table

## Standby Wakeup Events

This option enables or disables the ability of the keyboard or mouse to cause a Standby Wakeup Event—i.e., this option allows keyboard or mouse activity to return the system to full speed.

### Keyboard

This option enables or disables the Standby Wakeup Event for the keyboard. **The default is *Enabled*.**

### Mouse

This option enables or disables the Standby Wakeup Event for the mouse and selects the IRQ that the mouse is bound to for that purpose. The options are: *COM1 (IRQ4)*; *COM2 (IRQ3)*; and *Disabled*. **The default is *COM1 (IRQ4)*.**

## Exit Menu

The options in this menu allow the user to: save settings and exit, abandon changes and exit to the system, and control the backup and restoration of CMOS RAM to the FBD.

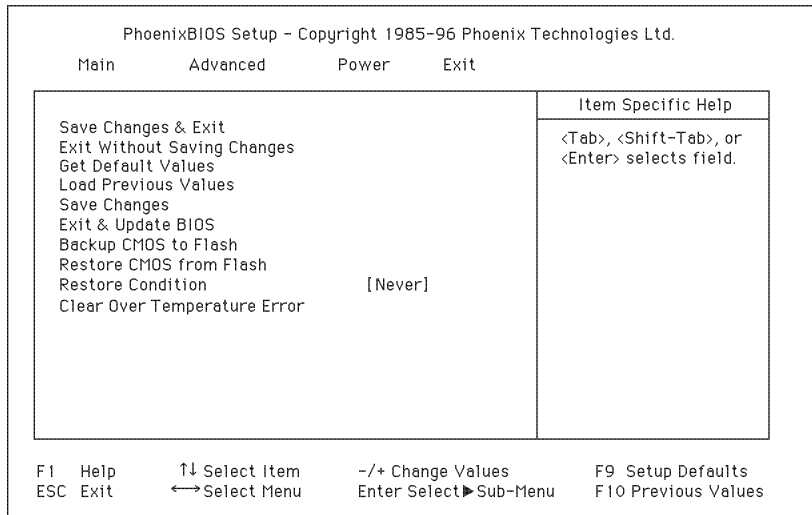


Figure 22 — Exit menu.

### Save Changes & Exit

This option saves the values that have been entered into CMOS and reboots.

### Exit Without Saving Changes

This option discards the changes just made and reverts to the state when *Setup* was entered. The system reboots with the old values.

### Get Default Values

This option resets the *Setup* values to the original default values set at the factory, before any suppliers or end users made changes.

### Load Previous Values

This option loads the previous values that were in effect before the editing session started.

### Save Changes

This option saves the edits made during a session.

### Exit & Update BIOS

This option initiates a System BIOS update.

### Backup CMOS to Flash

This option immediately saves current *Setup* settings to CMOS RAM and into FBD main block #1.

### Restore CMOS from Flash

This option immediately restores CMOS RAM and updates current *Setup* settings from FBD main block #1.

## Restore Condition

This option determines under what conditions the System BIOS will restore CMOS RAM from FBD main block #1 when booting. The restore conditions are: *Always*; *Never*; and *Bad CMOS*. **The default is *Never*.** After replacing the CMOS battery you can replace the lost information by setting this parameter to *Always* or *Bad CMOS* and then exiting and rebooting. The CMOS will be updated during the reboot. You can then reset this parameter to *Never*.

## Clear Over Temperature Error

Selecting this clears the system Over Temperature Error once <enter> is pressed. An Over Temperature Error is created when the internal temperature exceeds 50°C, preventing damage to the flat panel display. Should this condition persist, see the *Problems and Suggestions* section in **Appendix C**.



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# Chapter Six: Care and Cleaning

## Maintenance Tips

The Clean Screen PC is a well designed unit that does not require any regular maintenance. There are, however, a few tips we would like to pass along.

When installing and using the unit, make sure that nothing is blocking the vents. All circuitry generates heat in normal operation and keeping the vents unblocked is essential for trouble-free operation.

A combination of screen savers and power-saving routines will preserve the quality of the LCD screen. Set a screen saver to come on after a few minutes of inactivity. Then use the hardware **BIOS Setup** program (see **Chapter Five**) to turn off the display after a few more minutes. You will save power and protect the display.

## Cleaning Tips

The Clean Screen PC was designed to take rough treatment in busy hospitals. In addition to taking 50 g shocks, it also meets the tough UL2601 standard for safe operation. It can continue to operate even while being cleaned in a normal fashion for a hospital environment, such as with a saturated sponge or dampened, soft cloth. The UL2601 standard includes protection from standard cleaning chemicals and protection from liquids consistent with these cleaning procedures. It has an IPX-1 rating per IEC529.

### Approved cleaning solutions include:

Commercial or industrial grade general purpose cleaners (non-abrasive)

Isopropanol (70% isopropyl alcohol)

5% bleach solution (5% aqueous sodium hypochlorite)

1.6% aqueous ammonia

0.5% phenolic compounds

0.5% chlorhexidine in 70% isopropyl alcohol

Commercial or industrial grade glass cleaners



**DO NOT USE acetone or acetone based cleaners.**

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Although such cleaning should be perfectly safe, we nevertheless recommend cutting power to the unit whenever possible before cleaning. Although the Clean Screen and its power supply meet UL2601 standards, your peripherals or wall socket may not.

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# REFERENCE GUIDE

## Appendix A: Product Specifications

### General Specifications

The Clean Screen PC is an IBM compatible PC integrated with a color LCD screen. Utilizing Intel's Pentium processing power, the Clean Screen PC supports up to 128 MB of memory and can use most 2.5" IDE hard disks. The Clean Screen offers a choice of either a 800 x 600, 12.1" or 1024 x 768, 13.8" flat panel display. The unit has one parallel port (LPT1), one AT keyboard port, one PCMCIA Type III (or two Type II), and one 16-bit ISA format ½-card size expansion port. There are two external serial ports (COM A and COM B) using high speed UARTs. The unit is powered by a single, external power supply *brick*. Standard mounting options for the Clean Screen include wall mounts and swing arms. The integrated PC/display unit is rated to withstand shocks of up to 50 g. Both the unit and the power supply are UL2601 listed. They can be wiped down without interrupting operation.

In short, the Clean Screen PC provides compact, rugged, and efficient PC support to medical, industrial, and clean room applications.

### EPM-1 Module

The processor, chipset, cache, DRAM, real-time clock and BIOS reside on a RadiSys EPM-1 daughter board. This board can be easily replaced for repair or upgrade. The two Dual SO DIMM sockets support from 8–256 MB of 3.3V Fast Page mode or EDO DRAM modules. It has a 512 KB write-back L2 Cache supporting pipelined burst SRAM. Its Phoenix BIOS allows for power reduction by shutting down the display and disk drive power when no activity is detected.

### LCD Support

The standard Clean Screen color LCDs are the NEC NL8060BC31-01 12.1" 800 x 600 256k color TFT-AMLCD Panel and the Sharp LQ14X03 13.8" 1024 x 768 256k color TFT-AMLCD Panel.

### VGA/Flat Panel Graphics Controller

VGA graphics support is provided by a Cirrus Logic CL-GD7555 with 2 MB of buffer DRAM.

### PCMCIA Controller

A Cirrus Logic CL-PD6720 PCMCIA Host Adapter chip supplies the functionality of an Intel 82365SS PCMCIA interface, meeting PCMCIA 2.1/JEIDA 4.1 standards. The controller is also connected to IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ14, and IRQ15. Interrupts from PCMCIA cards or the 6720 Card Status Change circuitry may use any of these IRQs.

The PCMCIA slots support one or two Type I or II PCMCIA cards, or one Type III PCMCIA card. The PCMCIA socket will only accept 5V PCMCIA cards (no 3.3V only cards).

## External Serial Ports

A National Semiconductor PC87336 chip is used to implement the two standard PC COM ports. These COM ports are compatible with the standard 16450 and 16550 architectures. They are labeled COM A and COM B and may be configured for any of the following ports:

- COM1 (I/O address = 3F8-3FF, IRQ4) (COM A default)
- COM2 (I/O address = 2F8-2FF, IRQ3) (COM B default)
- COM3 (I/O address = 3E8-3EF, IRQ4)
- COM4 (I/O address = 2E8-2EF, IRQ3)

The serial ports cannot share the interrupts with other devices. The COM3 and COM4 I/O addresses are used for the touch screen controller, but a different IRQ is used.

## Printer Port

A National Semiconductor PC87336 implements a standard PC parallel printer port. The port meets the IEEE 1284 specification and supports ECP and EPP modes.

## Floppy Disk Drive Port

The National Semiconductor PC87336 implements a PC floppy disk port which will support one floppy disk drive. The port includes +12 V and +5 V to power the disk drive, which will be current limited by Raychem Polyfuses to 1 A max. The connector for this port is unique to the Clean Screen, so a Planar supplied drive with custom cables should be used. Only pre-formatted diskettes should be used.

## Sound Blaster Compatible Sound System

Sound Blaster™ compatible sound is provided by an ESS ES1688 sound controller using built-in speakers or through a 3.5 mm miniphone jack for headphones ranging from 32–300 Ω. 3.5 mm miniphone jacks are also provided for stereo line-level input and monaural microphone input. When a headphone is plugged into the jack the internal speakers will not be driven.

## Optional Resistive Touch Screen Controller

Optional touch screen support is provided by an ELO TouchSystems E271-COACH™ controller. If your Clean Screen has a touch screen, please refer to the manual included with the touch screen drivers. An on-board interface to resistive touch screens is incorporated into the CPU board, emulating a ELO TouchSystems E271-2201 PC-bus controller. This is accomplished by using the ELO TouchSystems E271-COACH serial controller directly connected to a 16C552 UART. The COM port address and IRQ can be set via software as a standard COM port (COM1, 2, 3 or 4), using IRQ3, 4, 5, 7, 9, 10, or 11.

## Thermostatic Switch/Temperature Sensor

An Analog Devices AD22105 thermostatic switch supports the temperature sensor circuit on the main board to allow the system to be shut down in an over temperature condition. The switch is used to detect when the internal ambient air exceeds approximately 50°C (±3°C). When the temperature exceeds 50°C the BIOS will place the Pentium™ processor in a Standby mode. The Over Temperature Error fault can only be cleared by entering the *BIOS Setup* during power-up (refer to **Chapter 5: BIOS Setup, Exit Menu**). The switch has a built in hysteresis of approximately 4°C to prevent rapid thermal on/off cycling.

## Environmental Specifications

Operating Temperature	+10°C to +40°C
Operating Humidity	20 to 80% RH non-condensing
Operating Shock	50 g
EMI Standards Conducted Limits	FCC CFR 47, Part 15, Class A EN 55022 Class A
UL and C-UL Safety Certification (File# E186047)	
United States Standards	UL2601 and IEC 601-1-1
Canadian Standards	C22.2 No. 601.1-M90 and C22.2 No. 601.1.1-94
EC Conformity for Electrical Safety Standards	EN 60950:1992
Connectors	Commonly used external connections to be drip proof

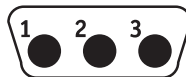
## Power Supply

The Clean Screen is available with either a low leakage UL2601 listed supply for use in North America (90–120 VAC at 57–63 Hz) or a European (200–240 VAC at 47–53 Hz) TUV listed switching power supply. The power supply has a standard IEC male power inlet adapter. An approved low leakage power cord must be used with the UL2601 listed power supply.

	North America	European
Line Voltage	90–120 VAC RMS	200–240 VAC RMS
Line Frequency	57–63 Hz	47–53 Hz
Power Output	90 W max	72 W max
Line Current	2 A max	2 A max
Safety	UL1950, UL2601, CSA22.2, 1402C	TUV—EN60950
EMI	FCC CFR 47, Part 15, Class A	VDE VFG.243 Class A

Power connector pinout:

Description	Pin
-12 VDC	1
GND	2
+12 VDC	3



# Appendix B: Programming Interface

## Memory Map

Range	CPU address	Region	Cached
0 to 640K	00000000-0009FFFF	DRAM	yes
640K to 768K	000A0000-000BFFFF	VGA memory	no
768K to 816K	000C0000-000CBFFF	Shadowed VGA BIOS	yes
816K to 896K	000CC000-000DFFFF	Unused — Available for ISA bus	BIOS Setup
896K to 1M	000E0000-000FFFFF	Shadowed System ROM BIOS	yes
1M to 8M	00100000-007FFFFF	DRAM If no DRAM, ISA memory	yes no
8M to 16M	00800000-00FFFFFF	DRAM If no DRAM, ISA memory	yes no
16M to 32M	01000000-01FFFFFF	DRAM If no DRAM, ISA memory	yes no
32M to 64M	02000000-03FFFFFF	DRAM If no DRAM, ISA memory	yes no
64M to (4.0G–512K)	04000000-FFF7FFFF	PCI bus/ISA bus alias	no
Top 512K–16K	FFF80000-FFFFBFFF	System ROM BIOS	no
Top 16K	FFFFC000-FFFFFFFF	Boot Block ROM BIOS	no

## Assigned and Available IRQs

	Keyboard Timer	Keyboard Controller	Cascade Interrupt	Com2 or Com4	Com1 or Com3	LPT	Touch Screen	Sound Blaster	Floppy Disk	Real Time Clock	Numeric Coprocessor	IDE Hard Disk	PCMCIA	Available
IRQ0	D													
IRQ1		D												
IRQ2			D											
IRQ3				D	X	X							X	
IRQ4				X	D	X							X	
IRQ5				X	X	D	X	X					X	
IRQ6									D					
IRQ7				X	X	X	X	X					X	X
IRQ8										D				
IRQ9				X	X	X	X	D					X	
IRQ10								D					X	
IRQ11				X	X	X	X	X					X	X
IRQ12	<b>NOT AVAILABLE</b>													
IRQ13											D			
IRQ14												D	X	
IRQ15								X					X	X

D indicates factory default, X indicates optional or available IRQs

## DMAs

PCS PC-compatible DMA channels:

DMA0	8-bit	IEEE1284 ECP port or Sound Blaster
DMA1	8-bit	IEEE1284 ECP port (BIOS Setup) or Sound Blaster
DMA2	8-bit	Floppy Disk Controller
DMA3	8-bit	Sound Blaster
DMA4		DMA0–DMA3 cascade
DMA5	16-bit	unassigned
DMA6	16-bit	unassigned
DMA7	16-bit	unassigned

## I/O Address List



**Never attempt to access an I/O address for which no device exists.**

I/O Address	Device
0000 to 000F	DMA controller
0020 to 0021	Interrupt controller
0040 to 0043	System timer
0060 to 0064	Keyboard controller, NMI status and control is at 0061
0070 to 0071	Real-time clock, NMI mask
0080 to 008F	DMA bank register
0094 to 009F	VGA controller
00A0 to 00A1	Interrupt controller
00B2 to 00B3	Power Management
00C0 to 00DE	DMA controller 2
00F0 to 00FF	Coprocessor
0102 to 010F	VGA controller
0220 to 022F	Sound generator
02E8 to 02EE	Serial port COM4
02F8 to 02FE	Serial port COM2
0378 to 037F	Parallel port
0388 to 038B	Sound generator
0398 to 0399	Super I/O #1
03B4 to 03DA	VGA controller
03E8 to 03EE	Serial port COM3
03F0 to 03F7	Floppy disk controller
03F8 to 03FE	Serial port COM1
0CF8 to 0CFE	PCI bus controller
46E8 to 46E9	VGA controller

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# Appendix C: Troubleshooting

## Anti-Virus Alert

Please note that you should run an anti-virus program whenever your system exhibits problems. Although the cause of the problem may not be a virus, you could save considerable time and effort if your system does turn out to be infected. Many virus programs display intermittent symptoms that seem to be restricted to the hardware, the software, or the operating system. A virus may also exhibit different symptoms at different times.

## Troubleshooting Procedure

This section provides a step-by-step troubleshooting procedure to identify a problem and locate its source.



**Turn off the system and any peripheral devices before you disconnect peripheral cables from the system. Otherwise you can permanently damage the system or the peripheral devices.**

---

1. Disconnect all external peripherals from the system, except for the keyboard.
2. Make sure the system is plugged into a properly grounded power outlet.
3. Make sure your keyboard is correctly connected to the system.
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in the floppy drive. If the operating system normally loads from a floppy diskette, insert the operating system diskette into the drive.
5. Turn on the system. If the power indicator does not light, but the system seems to be operating normally, the indicator is probably defective.
6. Monitor the power-on self test (POST) execution on the display. Each time you turn on the system, the POST checks the Clean Screen, memory, keyboard, and certain peripheral devices.

Check the following during the POST:

- a. If the POST does not detect any errors, the system beeps once and boots up.
- b. Errors that do not prevent the boot process (*non-fatal* errors) display a message that looks similar to the following:

Error Message Line 1  
Error Message Line 2  
Press <F1> to continue,  
Press <F2> for Setup,  
<Esc> to Boot

You can note the error and press <esc> to resume the boot-up process or <F2> to enter *Setup*.

- c. Errors that prevent the boot process from continuing (*fatal* errors) are communicated by a series of audible beeps. If this type of error occurs, refer to the error codes and messages listed at the end of this chapter.
7. Confirm that the operating system has loaded.

## Boot Failures

The System BIOS attempts to display an error message on the display and halts when it encounters the following error conditions.

### 1. Fixed disk error

**Causes:**

- No drive connected
- Configured for 0 cylinders
- Controller reset failed
- Drive not ready
- Track 0 seek timed out
- Drive initialization failed
- Drive recalibration failed
- Last track seek failed

### 2. CMOS checksum failed

**Causes:**

- CMOS checksum failed

### 3. Timer error

**Causes:**

- System timer (0) failed

### 4. I/O error

**Causes:**

- I/O conflicts exist for serial and parallel ports, hard disk (any or all)

### 5. Over Temperature Error

**Causes:**

- Internal temperature exceeded 50°C causing the system to shut down

### 6. Other error

**Causes:**

- Peripheral components IRQ conflicts

The System BIOS *prints* an error message *but does not halt* when it encounters the following error conditions.

### 1. RTC error

**Causes:**

- RTC lost power

### 2. CMOS error

**Causes:**

- RTC battery failed

### 3. Configuration error

**Causes:**

- User BIOS Extension Region X will exceed DFFFFH



## Problems At Initial System Startup

Problems that occur at initial start-up are usually caused by incorrect installation or configuration. Hardware failure is a less frequent cause.

- \_\_\_\_\_ Are all cables correctly connected and secured?
- \_\_\_\_\_ Are the configuration settings correct in *Setup*?
- \_\_\_\_\_ Are all drivers properly installed?
- \_\_\_\_\_ Are all jumper and switch settings on add-in boards and peripheral devices configured correctly? For the valid settings, see the documentation shipped with these devices. Ensure that there are no conflicts; for example, an add-in board and on-board peripheral sharing the same interrupt.
- \_\_\_\_\_ Are you using the supplied power supply?
- \_\_\_\_\_ Are add-in boards and the disk drive installed correctly?
- \_\_\_\_\_ Is there a keyboard attached?
- \_\_\_\_\_ Is a bootable diskette installed in drive A?
- \_\_\_\_\_ If the system has a hard disk is it properly formatted or defined?
- \_\_\_\_\_ Are all SO DIMMs installed correctly? Try reseating the SO DIMMs.
- \_\_\_\_\_ Is the operating system properly loaded? See the operating system documentation.

## Problems After the System Has Been Running Correctly

After the system hardware and software have been running correctly, new problems often indicate equipment failure. Go through the checklist below to see if the situation is one that may be easily corrected. If the problem recurs after you have checked and corrected all of these items, refer to the troubleshooting procedures (see *Troubleshooting Procedure* in this chapter).

- \_\_\_\_\_ If you are running the software from a diskette, try a new copy.
- \_\_\_\_\_ If you are running the software from a hard disk, try running it from a diskette. If the software runs correctly, there may be a problem with the copy on the hard disk. Reinstall the software on the hard disk and try again. Make sure all the necessary files are installed.
- \_\_\_\_\_ Try clearing CMOS RAM and running *Setup*.
- \_\_\_\_\_ If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- \_\_\_\_\_ A transient voltage spike, power outage, or brownout may have occurred. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and lack of system response to user commands. Reload the software and try again.
- \_\_\_\_\_ Voltage spikes can occasionally cause the heads of the disk drive to contact the disk. This can corrupt or destroy data files. If you are experiencing voltage spikes on the power line, install a surge suppressor between the power outlet and the system power cord.
- \_\_\_\_\_ Try reseating the SO DIMMs.

## Problems Running New Application Software

Problems that occur when you install or run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly. In some instances newly installed software may affect a previously installed software package. Go through the checklist below to see if the situation is one that may be easily corrected. If the problem persists after you have checked and corrected all of these items, contact the software vendor's customer service representative.

- \_\_\_\_\_ Does the system meet the minimum hardware requirements for the software? Refer to the software documentation.
- \_\_\_\_\_ Is the software an authorized copy? Unauthorized copies often do not work. Obtain an authorized copy of the software.
- \_\_\_\_\_ If you are running the software from a diskette, is it a good copy?
- \_\_\_\_\_ If you are running the software from a hard disk, is the software correctly installed? Were all necessary procedures followed and files installed?
- \_\_\_\_\_ Are the correct device drivers installed?
- \_\_\_\_\_ Are the correct video drivers installed?
- \_\_\_\_\_ Is the software correctly configured for the system?
- \_\_\_\_\_ Are you using the software correctly?

## Problems Operating Add-In Boards

Problems related to add-in boards are usually related to improper board installation or interrupt and address conflicts. Go through the checklist below to see if you can correct the problem. If the problem persists after you have checked and corrected all of these items, contact the board vendor's customer service representative.

- \_\_\_\_\_ Did you install the add-in board according to the manufacturer's instructions? Check the documentation that came with the board.
- \_\_\_\_\_ Are all cables installed properly?
- \_\_\_\_\_ Check IRQ configuration.
- \_\_\_\_\_ Check memory address range.
- \_\_\_\_\_ If using an ISA legacy board that requires shared memory between C8000H—DFFFFH, run *Setup* and enable shared memory for the appropriate memory space.

## Problems Operating PCMCIA Cards

Problems related to PCMCIA cards are usually related to improper card installation or interrupt and address conflicts. Go through the checklist below to see if you can correct the problem. If the problem persists after you have checked and corrected all of these items, contact the card vendor's customer service representative.

- \_\_\_\_\_ Did you install the PCMCIA card according to the manufacturer's instructions? Check the documentation that came with the card.
- \_\_\_\_\_ Is there PCMCIA card service software loaded on the unit?
- \_\_\_\_\_ Is the PCMCIA card recognized? Is it supported by your card service software?
- \_\_\_\_\_ Has the PCMCIA driver been enabled?
- \_\_\_\_\_ Does your PCMCIA card conform to PCMCIA 2.1/JEIDA 4.1 standards? Check the documentation that came with the card.
- \_\_\_\_\_ Check IRQ configuration.
- \_\_\_\_\_ Check memory address range.

## Problems and Suggestions

Contact your service representative if the suggested actions do not solve the problem.

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### What happens

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### What to do

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Application software problems

Make sure all cables are installed correctly. Verify that your system hardware configuration is set correctly. In *Setup*, check the values against the system settings you recorded previously. If an error is evident (for example, the wrong type of drive is specified), make the change in *Setup* and reboot the system. Record your change.

Make sure the software is properly configured for the system. Refer to the software documentation for information.

Try a different copy of the software to see if the problem is with the copy you are using.

If other software runs correctly on the system, contact the vendor of the software that fails.

If you check all of the above with no success, try clearing CMOS RAM and reconfiguring the system. Make sure you have your list of system settings available to re-enter, as clearing CMOS RAM sets the options to their default values.

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Characters on-screen are distorted or incorrect

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Make sure the brightness and contrast controls are properly adjusted.

Make sure the correct display drivers have been loaded.

Make sure the display resolution is set correctly to the product you've purchased.

---

Characters do not appear on screen

---

Reboot the system.

---

CMOS RAM settings are wrong

---

If system settings stored in CMOS RAM change for no apparent reason (for example, the time of day develops an error), the backup battery may no longer have enough power to maintain the settings. Replace the battery.

---

Diskette drive light does not go on when drive is in use or is tested by POST

---

Make sure the power and signal cables for the drive are properly installed.

Check that the drive is properly configured and enabled in *Setup*.

---

Hard drive light does not go on when drive is in use or is tested by POST

---

Check that the drive is properly configured and enabled in *Setup*.

---

<b>What happens</b>	<b>What to do</b>
System does not power-up	<p>Check AC power receptacle.</p> <p>Check plug into power adapter.</p> <p>Check plug into Clean Screen head.</p> <p>Check fuses.</p>
Power-on light does not go on	If the system is operating normally, the light may be defective.
Prompt doesn't appear after system boots	See <i>Problems at Initial System Start-up</i> .
System halts before completing POST	This indicates a fatal system error that requires immediate service attention. Note the screen display and write down any beep code emitted. Provide this information to your service representative.
System over temperature error	<p>Check to see nothing is blocking the rear cooling vents.</p> <p>Check internal processor cooling fan.</p> <p>Enter <b>Setup</b> &lt;F2&gt; to <b>Exit</b> menu, select <i>Clear Over Temperature Error</i> and press &lt;enter&gt;.</p>

## Error and Information Messages

The rest of this chapter describes beep codes and error messages that you might see or hear when you start up the system.

**Note:** In all cases, if the problem persists, call your service representative.

<b>Error Message / Beeps</b>	<b>Explanation</b>
Short beep (1 → 2 → 2 → 3 times)	Hardware error. Unplug the Clean Screen and contact your Planar Customer Service Center.
Short beep (1 → 3 → 1 → 1 times)	
Short beep (1 → 3 → 1 → 3 times)	
Short beep (1 → 3 → 4 → 1 times)	
Short beep (1 → 3 → 4 → 3 times)	
Short beep (2 → 1 → 2 → 3 times)	
Short beep (2 → 2 → 3 → 1 times)	
Address Line Short	Error in the address decoding circuitry on the board.
Cache Memory Failure, Do Not Enable Cache	Cache memory is defective.
CMOS Battery Failed	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Invalid	After CMOS RAM values are saved, a checksum value is generated for error checking. The previous value is different from the current value. Run <i>Setup</i> .
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run <i>Setup</i> .
CMOS Time and Date Not Set	Run <i>Setup</i> to set the date and time in CMOS RAM.
Diskette Boot Failure	The boot disk in floppy drive A is corrupt. It cannot be used to boot the system. Use another boot disk and follow the screen instructions.
DMA Controller Error	Error in the DMA Controller.
Drive Not Ready Error	The BIOS cannot access the floppy drive. Check all the appropriate connections after the system is powered down.
Floppy Disk Controller Failure	The BIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
Floppy Drive A: Failure	The BIOS cannot access drive A. Check all the appropriate connections after the system is powered down.
Floppy Drive B: Failure	The BIOS cannot access drive B. Check all the appropriate connections after the system is powered down.

<b>Error Message</b>	<b>Explanation</b>
Gate A20 Error	Gate A20 on the keyboard controller is not working. Call for service.
Invalid Boot Diskette	The BIOS can read the disk in floppy drive A, but cannot boot the system. Use another boot disk.
Keyboard Controller Error	The keyboard controller has failed during POST.
Keyboard is Locked ... Please Unlock It	Some systems have an electronic key that enables the user to lock the keyboard.
Keyboard Stuck Key Detected	There is a key pressed down.
Master DMA Controller Error	Error in the master DMA channel.
Master Interrupt Controller Error	Master Interrupt Controller failed during POST.
Memory Size Decreased	The amount of memory on the Clean Screen is less than the amount in CMOS RAM. Run <i>Setup</i> .
Off Board Parity Error	Parity error in memory installed in an expansion slot. The format is: OFF BOARD PARITY ERROR ADDR (HEX) = (XXXX) XXXX is the hex address where the error occurred.
Slave DMA Controller Error	Error in the slave DMA channel.
Slave Interrupt Controller	Slave Interrupt Controller failed during POST.
System Memory Size Mismatch	The amount of memory on the Clean Screen is different than the amount in CMOS RAM. Run <i>Setup</i> .
Timer Channel 2 Error	Most systems include two timers. There is an error in timer 2.

## PCI Configuration Status and Error Messages

The following PCI messages are displayed as a group with bus, device, and function information.

<b>Message</b>	<b>Explanation</b>
Floppy Disk Controller Resource Conflict	The floppy disk controller has requested a resource that is already in use.
NVRAM Checksum Error, NVRAM Cleared	The ESCD data was reinitialized because of an NVRAM checksum error. Rerun the ICU.
NVRAM Cleared By Jumper	The <i>Clear CMOS</i> DIP switch has been moved to the ON position and CMOS RAM has been cleared.
NVRAM Data Invalid, NVRAM Cleared	Invalid entry in the ESCD.
Parallel Port Resource Conflict	The parallel port has requested a resource that is already in use.
PCI Error Log is Full	This message is displayed when more than 15 PCI conflict errors are detected. No additional PCI errors can be logged.
PCI I/O Port Conflict	Two devices requested the same resource, resulting in a conflict.
PCI IRQ Conflict	Two devices requested the same resource, resulting in a conflict.
PCI Memory Conflict	Two devices requested the same resource, resulting in a conflict.
Primary Boot Device Not Found	The designated primary boot device (hard disk drive, diskette drive, or CD-ROM drive) could not be found.
Primary IDE Controller Resource Conflict	The primary IDE controller has requested a resource that is already in use.
Primary Input Device Not Found	The designated primary input device (keyboard, mouse, or other, if input is redirected) could not be found.
Secondary IDE Controller Resource Conflict	The secondary IDE controller has requested a resource that is already in use.
Serial Port 1 Resource Conflict	Serial port 1 has requested a resource that is already in use.
Serial Port 2 Resource Conflict	Serial port 1 has requested a resource that is already in use.
Static Device Resource Conflict	A non-plug-and-play ISA card has requested a resource that is already in use.
Device Resource Conflict	A non-plug-and-play ISA card has requested a resource that is already in use.



## Resetting the System

To reset the system from the keyboard, press the key sequence:

<Ctrl + Alt + Del>

You can also reset the system by shutting the system power off and then powering back up. To do this:

1. Turn the power off.
2. Wait at least 20 seconds.
3. Turn the power on.
4. The system powers up and immediately begins the power-on self test (POST).

# Appendix D: Touch Screen (optional)

## CMOS Configuration

If your Clean Screen has the optional touch screen installed you will need to enter into *CMOS Setup* (press <F2>) and configure your touch screen controller.

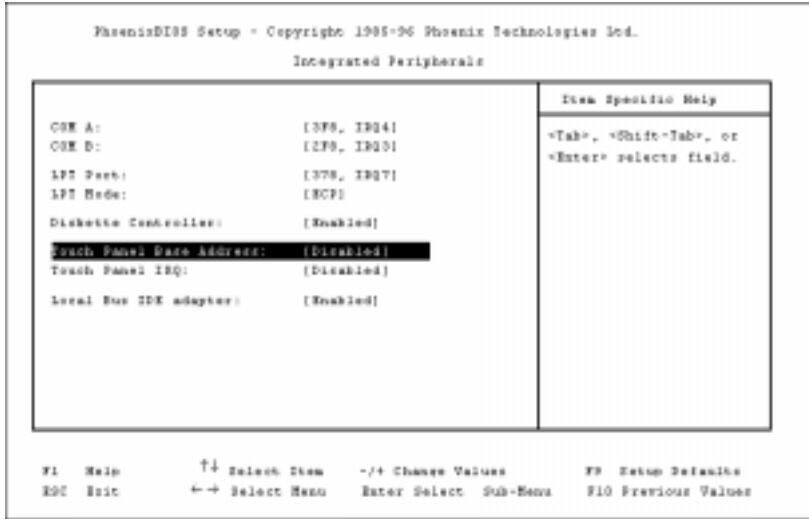


Figure D.1 — Integrated Peripherals sub-menu.

1. Select the *Advanced* menu.
2. Select the *Integrated Peripherals* sub-menu and press <enter> to move into the sub-menu.
3. Once in the sub-menu you can configure the touch panel base address and IRQ. In most cases 3E8H and IRQ7 are available. Write these down as you may need to reference them later as you run the ELO install program.
4. Exit by pressing the <escape> key.
5. Exit the *CMOS Setup*, remember to save your settings on exit.
6. After you have installed your operating system run the ELO install program following the ELO touch screen documentation included with your *IS Manager's Kit*. For additional instructions print the **!read.me!** file stored on the touch screen setup disk.

**Technical Note:** If you are unsuccessful installing the ELO drivers or if the touch screen has other problems, please contact ELO's technical support line at 423-220-4299 or <http://www.elotouch.com>.

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# Appendix E: Technical Support

## For Service

If your Clean Screen PC needs servicing, call Planar Advance Customer Service at 503-614-4126 between 8:00 AM and 5:00 PM Pacific Time, Monday through Friday.

You will need the unit's serial number and a brief description of the problem to receive a RMA number.

If a repair is required, please return the product for service using the original shipping container (if possible) and clearly mark the RMA number on the outside of the box.

Returns will not be accepted without an assigned RMA number. Include a description of the configuration at the time of malfunction, including network configuration, PCMCIA card, mouse type and drivers, cabling (if other than that supplied), software program in use, and a description of the symptoms.

In-transit damage is not covered by the warranty. We suggest you always insure your shipment. Planar will only pay for the return shipment by surface transportation. It is the responsibility of the sender to prepay transportation charges.

## For Further Information and Driver Updates

Contact the individual manufacturers either directly or on the Web. Some useful URLs are:

Planar Advance, Inc.

<http://www.planar.com>

Cirrus Logic, Inc.

<http://www.cirrus.com>

ELO TouchSystems, Inc.

<http://www.elotouch.com>

Phoenix Technologies, Ltd.

<http://www.phoenix.com>

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