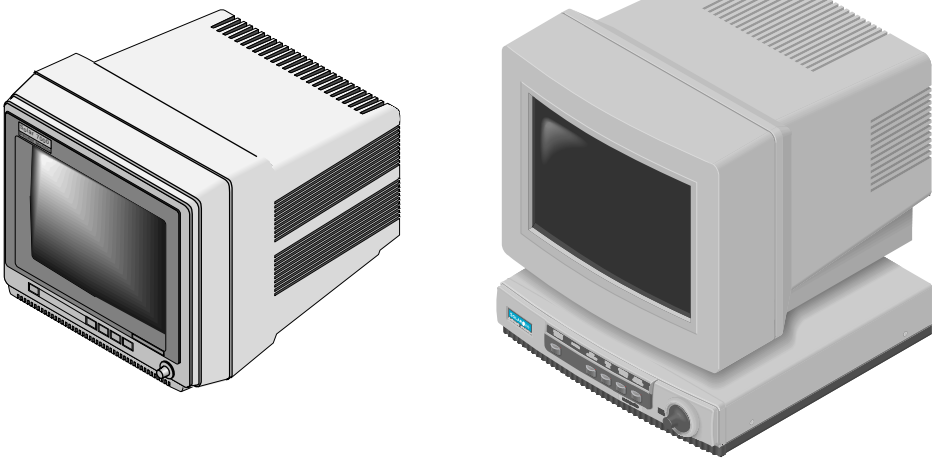
Solar® 7000/8000/SolarView Patient Monitor

Field Service Manual

414993-001 Revision H



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A GE Medical Systems Company

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1 INTRODUCTION

Manual Information

Revision History

Each page of this manual has a revision letter, located at the bottom of the page, that identifies its update level. This may be important if you have different updates to a manual and don't know which is the most current.

For the initial release, all pages have the revision letter A. For the first update of the manual, any changed pages receive the revision letter B. For the second update, any changed pages receive the revision letter C. The latest letter of the alphabet added corresponds to the most current revision. Notice, however, that some pages may skip revision letters, for example, jump from revision A to revision C because they did not change in revision B.

Revision History

Revision	Date	Comment
A	28 March 1995	Initial release of this manual.
B	3 October 1995	Added references to Solar 8000 processing unit
C	1 March 1996	Minor corrections
D	15 May 1996	Added references to SolarView remote display controller
E	23 September 1996	Added references to Corometrics TMSS and updated upper assembly
F	17 June 1998	Added information for revised Service Mode Menu and updated upper assembly
G	1 September 1999	Removed "Updating Software" from the manual and added UL information.
H	13 January 2000	Added PRN-50 component to Chapter 2, "Equipment Overview", removed references to Corometrics, and updated Chapter 6, "Configuration" to reflect Reviewing Event Logs.

Manual Purpose

This manual supplies technical information for service representatives and technical personnel so they can maintain the equipmnet to the assembly level. Use it as a guide for maintenance and electrical repairs considered field repairable. Where necessary the manual identifies additional sources of relevant information and technical assistance.

See the operator's manual for the instructions necessary to operate the equipment safely in accordance with its function and intended use.

For parts lists and schematic diagrams of the PCB assemblies, order the Solar 7000/8000/View Monitor Data Manual, PN 414993-007.

Intended Audience

This manual is intended for service representatives and technical personnel who maintain, troubleshoot, or repair this equipment.

Safety Information

Responsibility of the Manufacturer

GE Marquette Medical Systems is responsible for the effects of safety, reliability, and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE Marquette.
- The electrical installation of the relevant room complies with the requirements of the appropriate regulations.
- The equipment is used in accordance with the instructions for use.

Intended Use

Follow the directives stated below when using this device.

- This device is intended for use under the direct supervision of a licensed health care practitioner.
- This device is not intended for home use.
- Federal law restricts this device to be sold by or on the order of a physician.
- Contact GE Marquette Medical Systems for information before connecting any devices to the equipment that are not recommended in this manual.
- Parts and accessories used must meet the requirements of the applicable IEC 601 series safety standards, and/or the system configuration must meet the requirements of the IEC 60601-1-1 medical electrical systems standard.
- Periodically, and whenever the integrity of the device is in doubt, test all functions.
- The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:
  - use of the accessory in the PATIENT VICINITY; and
  - evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 60601-1 and/or IEC 60601-1-1 harmonized national standard.
- If the installation of the equipment, in the USA, will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

Equipment Symbols

The following symbols appear on the equipment.

NOTE: Some symbols may not appear on all equipment.

ATTENTION: Consult accompanying documents before using the equipment.

In Europe, this symbol means dangerous or high voltage. In the United States, this symbol represents the caution notice below:

To reduce the risk of electric shock, do NOT remove cover (or back). Refer servicing to qualified personnel.

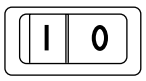
Defibrillator-proof type CF equipment; type CF equipment is specifically designed for applications where a conductive connection directly to the heart is established. The paddles indicate the equipment is defibrillator proof.

Defibrillator-proof type BF equipment; type BF equipment is suitable for intentional external and internal application to the patient, excluding direct cardiac application. Type BF equipment is type B equipment with an F-type isolated (floating) part. The paddles indicate the equipment is defibrillator proof.

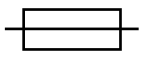
Type B equipment; type B equipment is suitable for intentional external and internal application to the patient, excluding direct cardiac application.

Equipotentiality

Alternating current (AC)



Power; **I** = ON; **O**= OFF



Fuse

Where used, indicates to press to open.

Classified by Underwriters Laboratories Inc. with respect to electric shock, fire, mechanical and other specified hazards, only in accordance with UL 2601-1, CAN/CSA C22.2 No. 601.1, IEC 60601-1, and, if required, IEC 60601-2-27, IEC 60601-2-30, IEC 60601-2-34, IEC 60601-1-1.

Warnings, Cautions, and Notes

The terms danger, warning, and caution are used throughout this manual to point out hazards and to designate a degree or level or seriousness. Familiarize yourself with their definitions and significance.

Hazard is defined as a source of potential injury to a person.

DANGER indicates an imminent hazard which, if not avoided, will result in death or serious injury.

WARNING indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.

CAUTION indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/property damage.

NOTE provides application tips or other useful information to assure that you get the most from your equipment.

Service Information

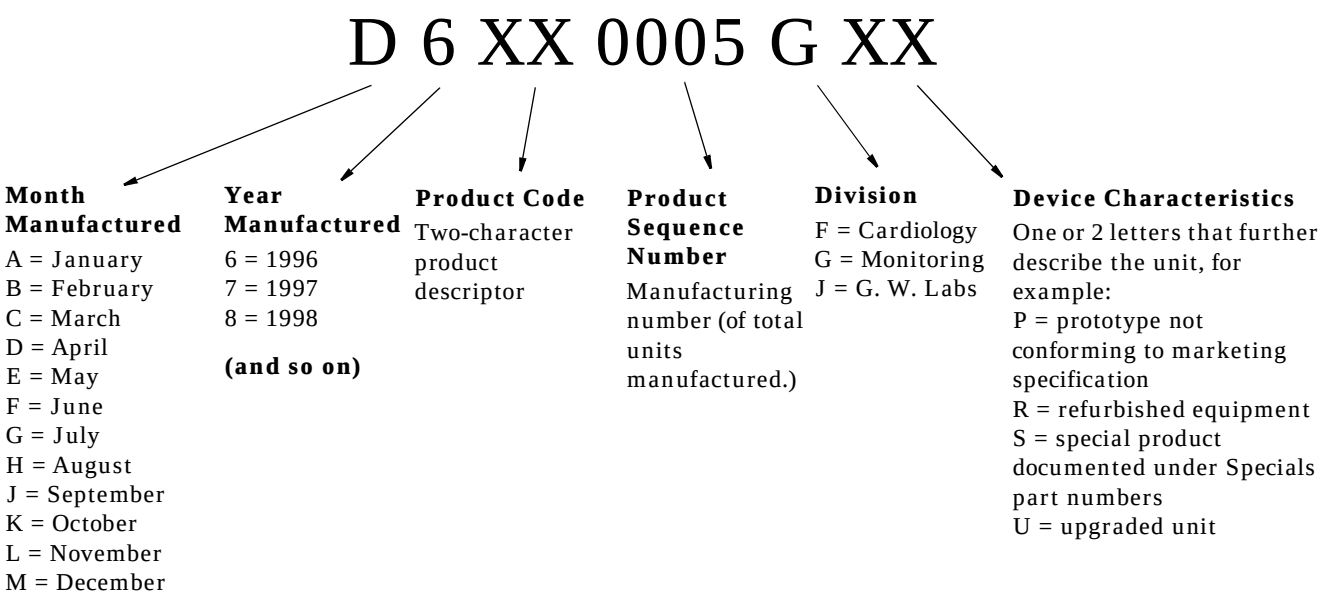
Service Requirements

Follow the service requirements listed below.

- Refer equipment servicing to GE Marquette Medical Systems' authorized service personnel only.
- Any unauthorized attempt to repair equipment under warranty voids that warranty.
- It is the user's responsibility to report the need for service to GE Marquette Medical Systems or to one of their authorized agents.
- Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.
- Regular maintenance, irrespective of usage, is essential to ensure that the equipment will always be functional when required.

Equipment Identification

Every GE Marquette Medical Systems device has a unique serial number for identification. A sample of the information found on a serial number label is shown below.



Warranty

1 year.

2 EQUIPMENT OVERVIEW

System Components

What is a Solar 7000/ 8000 Patient Monitoring System?

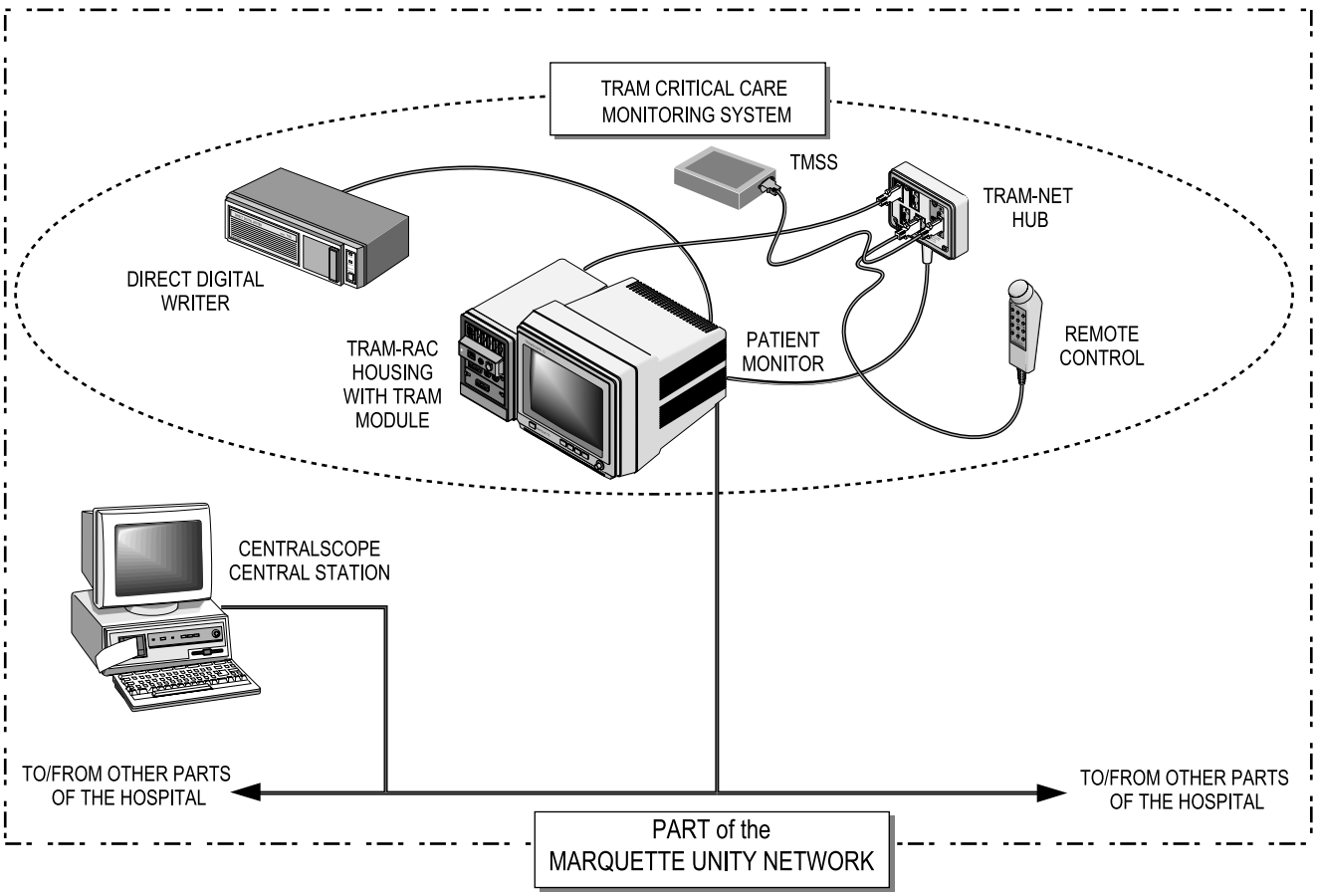
The Solar 7000/8000 patient monitoring system is designed to monitor electrocardiographic, hemodynamic, respiratory, and pulmonary parameters in the intensive care, coronary care, and operating room environments of a hospital.

The Solar 7000/8000 patient monitoring system operates with the Marquette Unity Network or as a system itself. At the patient's bed, the Solar 7000/8000 patient monitoring system permits connection of many peripheral devices from the Solar 7000/8000 monitor.

All Solar 7000/8000 Patient Monitoring Systems include a patient monitor, at least one patient parameter monitoring module, and one or more of the following items:

- Tram-rac housing (Tram remote acquisition case),
- DDW (direct digital writer),
- remote control,
- remote display,
- SolarView remote display, or
- TMSS (Trend Memory Storage System)

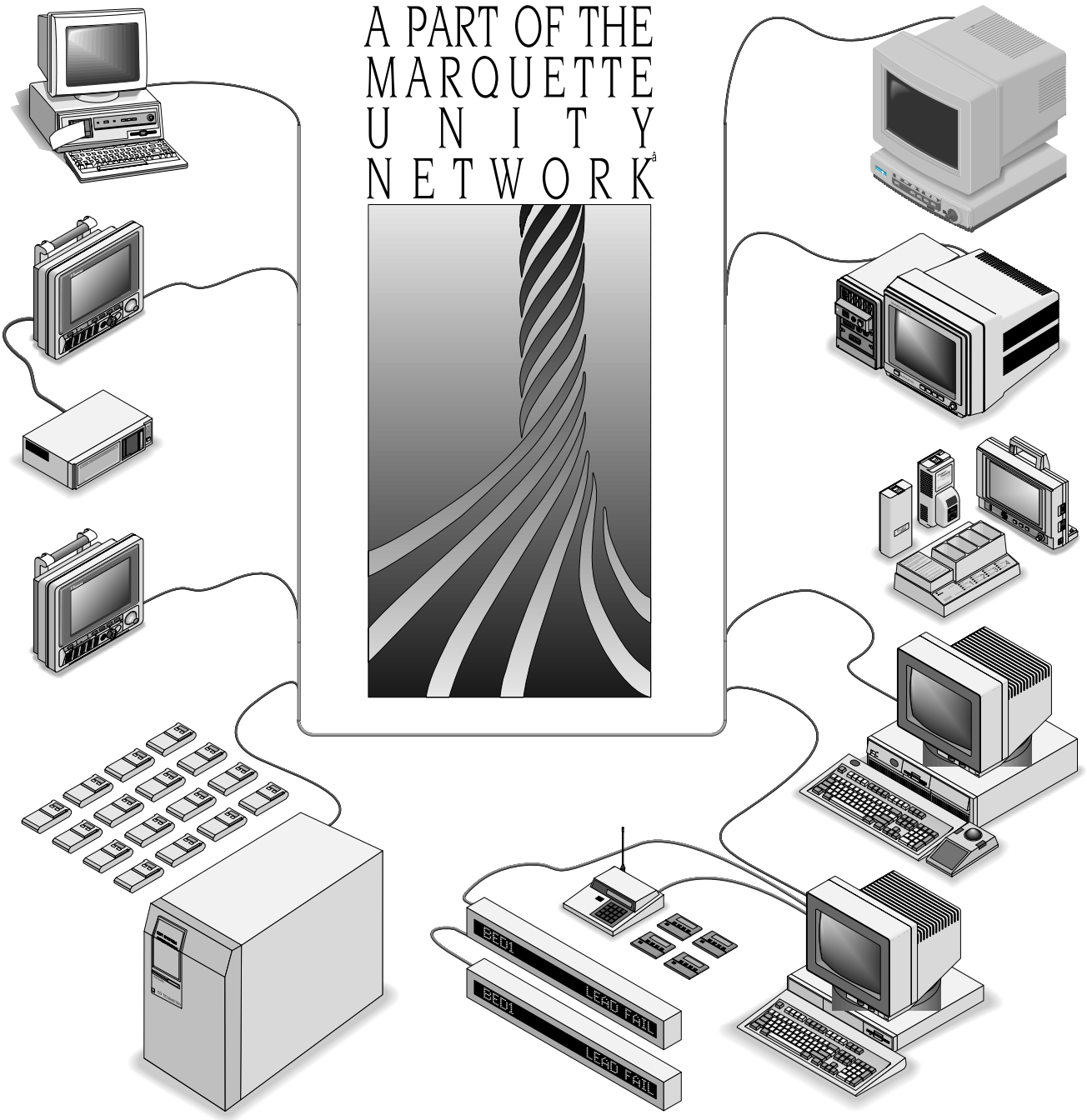
Shown below is an example of a Solar 7000 patient monitoring system.



What is the Marquette Unity Network?

The Marquette Unity Network is a comprehensive communication network which unifies GE Marquette Medical Systems patient monitoring and data management equipment into an integrated hospital-wide system. It creates an extended communication system for efficient information sharing among operating rooms intensive care units, the emergency room, and other care and diagnostic areas. Information entered anywhere on the network, via any input device, is available anywhere else on the network. This is accomplished through the Ethernet communication hardware in the patient monitor.

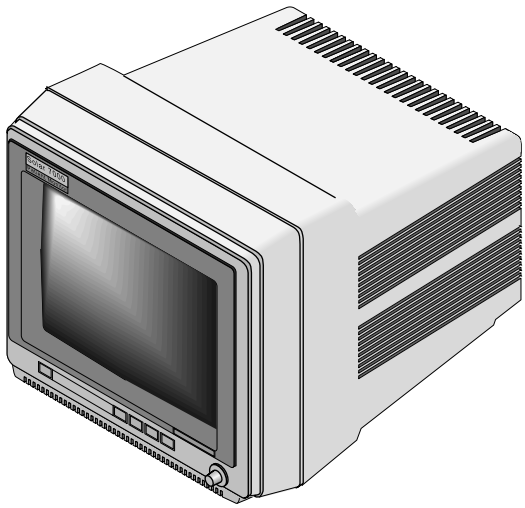
An example of part of a Marquette Unity Network is shown below.



What is a Solar 7000 Patient Monitor?

The Solar 7000 patient monitor is the center of the Solar 7000 Patient Monitoring System. It is an intelligent terminal, containing the display, all of the user controls, and processors to communicate with patient monitor peripherals and analyze patient data. It is capable of displaying up to eight different waveforms at one time. System software may be updated by a laptop computer at the monitor or through the Marquette Unity network using a central station.

Shown below is a Solar 7000 patient monitor.



What is a Solar 8000 Patient Monitor?

The Solar 8000 patient monitor consists of a Solar 8000 processing unit with a compatible display purchased from GE Marquette Medical Systems or another vendor. (For details about the GE Marquette display, refer to the 15-Inch Medical-Grade Color Display Service Manual, pn 414993-056.)

The processing unit is the center of the Solar 8000 Patient Monitoring system. It provides the user controls, processors to communicate with various patient monitoring modules contained in a Tram-rac housing, and analyzes patient data. It is capable of displaying up to eight different waveforms at one time on a compatible display. System software may be updated using a laptop computer connected to the Solar 8000 processing unit or from a central station on the Marquette Unity Network. Shown below is a generic display and a Solar 8000 processing unit.

What is a SolarView Remote Display Controller?

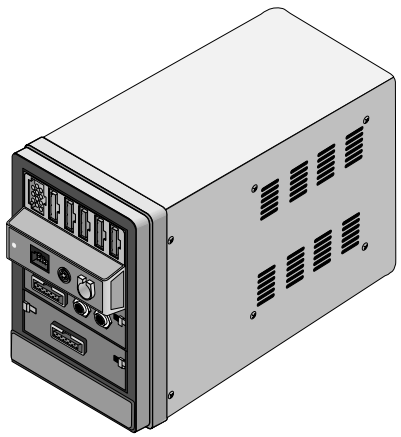
A SolarView remote display controller resembles a Solar 8000 processing unit, but it is not connected to a Tram-rac housing with patient monitoring modules. It consists of a SolarView remote display controller with a compatible display purchased from GE Marquette Medical Systems or another vendor. (For details about the GE Marquette display, refer to the 15-Inch Medical-Grade Color Display Service Manual, pn 414993-056.) The controller is connected to the Marquette Unity network and may be configured to display any patient waveforms broadcasted on the network for better visibility as either a remote, full-view display or as an in-room, telemetry display. System software may be updated using a laptop computer connected to the SolarView remote display controller or from a central station on the Marquette Unity Network. Shown below is a generic display and a SolarView remote display controller.

What is a Tram-rac Housing?

The Tram-rac housing (remote acquisition case) acquires patient data for the patient monitor. *The Tram-rac Housing Service Manual*, pn404183-096, has more information. There are two Tram-rac housings available for the monitor:

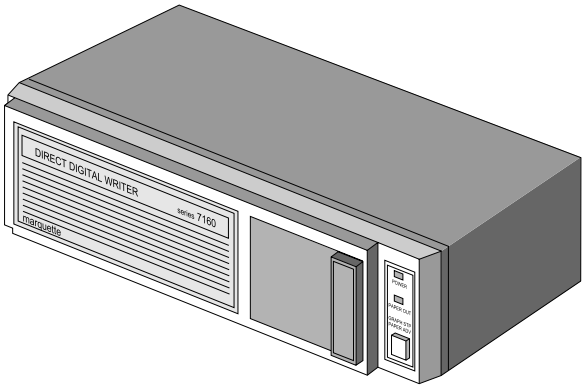
- Tram-rac 2 housing, which holds a single Tram module, and
- Tram-rac 4A housing, which holds a Tram module and two additional Series 7000 input modules.

Shown below is a Tram-rac 4A housing with a Tram module, Series 7000 BP/dual temperature module, and single Series 7000 BP module inserted.



What is a DDW?

A Direct Digital Writer (DDW) allows patient data to be printed on a paper strip. Any parameter or trace that can be monitored at the patient monitor can also be printed on the DDW. Graphs are initiated automatically when an alarm has been violated, or they can be initiated manually at the patient monitor.

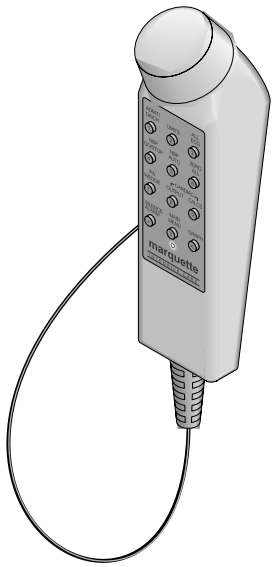


What is a PRN 50 Digital Writer?

A PRN 50 Digital Writer thermally records patient data on a paper strip. Any parameter or trace that can be monitored on a patient monitor can be graphed by the writer. Graphs are initiated automatically when an alarm has been activated, or they can be initiated manually from a monitor.

What is a Remote Control?

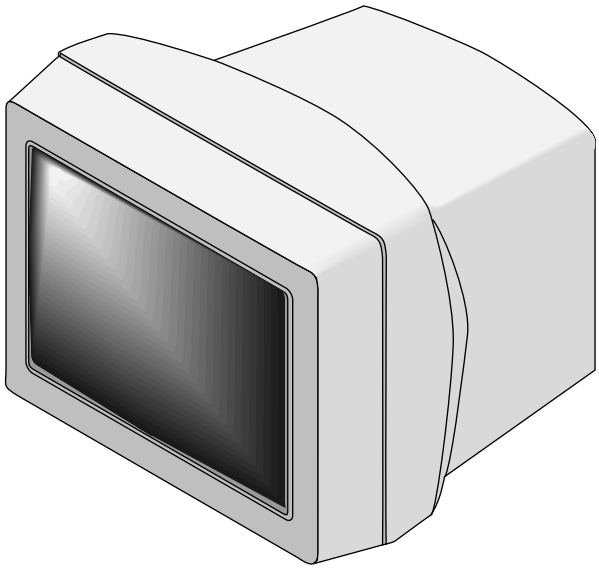
The remote control duplicates all patient monitor controls on a portable component with a Trim Knob control. It allows the user to operate the patient monitor from across a room. The twelve hard keys are configured for adult, neonatal, or operating room applications. For more details about the remote control, refer to the *Modular Patient Monitor Accessories Service Manual*, pn 404183-150.



What is a Remote Display?

NOTE: An adapter, pn 405947-002, is required for cable, pn 405360-00X, to the remote display.

A color or monochrome secondary display may be attached directly to the Solar 7000 patient monitor to display up to eight patient monitor waveforms for better visibility. It is connected to the video out (RMT VID) connector at the back of the monitor. For details about the remote display, refer to the *Patient Monitor Accessories Service Manual*, pn 404183-150.

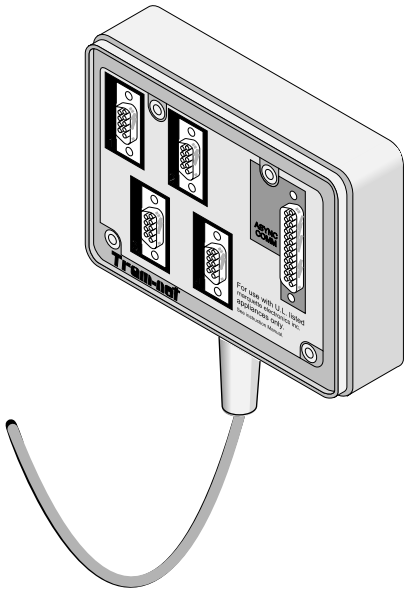


What is a Tram-net Hub Assembly?

If a patient monitor is connected to more than one peripheral device, the Tram-net hub assembly is used. It connects the communication processing capabilities inside the patient monitor to other equipment, much like what a multiple outlet power strip does for ac power. Peripherals can be connected to the Tram-net hub assembly via serial cabling. The Tram-net hub assembly extends the patient monitor with a cable of up to 1.3 meters (4 feet) long.

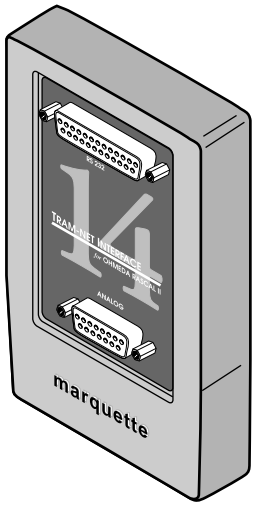
Note that a 25-pin D-type connector at the rear of the patient monitor is marked TRAM-NET or ASYNC COMM. This connector handles both Tram-net and async signals. One end of the Tram-net hub assembly connects to this connector. At the other end of the Tram-net hub assembly, the signals are separated into async and four Tram-net connectors. The 25-pin red color coded connector handles async for communication only with an async-only. The four 9-pin blue color coded connectors are for extending the Tram-net network (blue label). More details about Tram-net communication will be covered later in this chapter.

Shown below is a Tram-net hub assembly. For details about the Tram-net hub assembly, refer to the *Modular Patient Monitor Accessories Service Manual*, pn 404183-150.



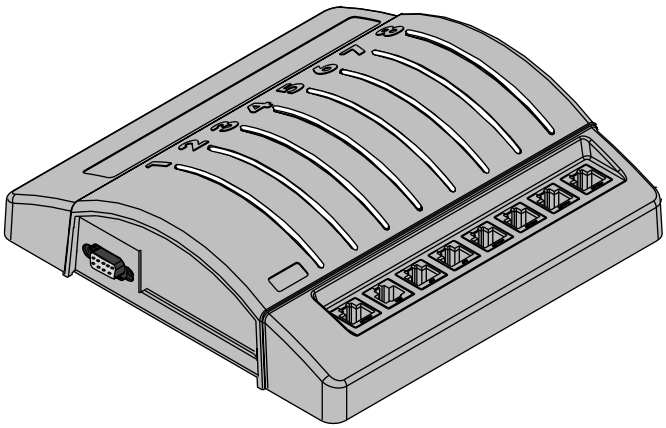
What is a Tram-net Interface?

The Tram-net interface adapter connects a specific device to the Solar 7000/8000 patient monitoring system using Tram-net communication. Each adapter is preprogrammed at the factory to interface with a specific device manufactured by a company other than GE Marquette Medical Systems. In most cases, the Tram-net interface adapter requires a Tram-net hub to connect with the Tram-net communication network. For more details about the Tram-net interface adapter, refer to the *Modular Patient Monitor Accessories Service Manual,* pn 404183-150.



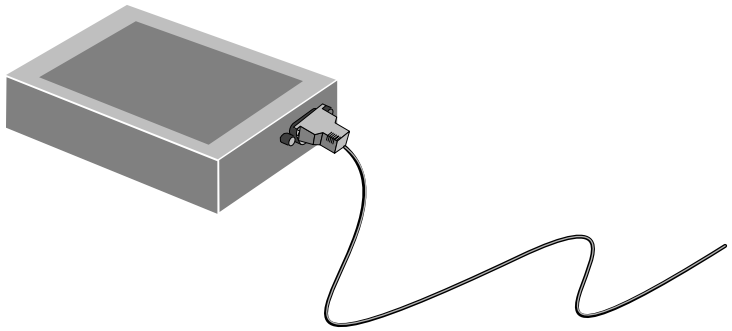
What is an Octanet Connectivity Device?

The Octanet Connectivity Device acquires digital data from eight individually isolated serial ports. The data is collected from up to eight of devices not manufactured by GE Marquette Medical Systems. The Octanet Connectivity Device processes the patient data from the peripheral devices and transmits the formatted data to the Solar patient monitor. For more details about the Octanet Connectivity Device, refer to the *Octanet Connectivity Device Service Manual,* pn 418264-003.



What is a TMSS?

The Trend Memory Storage System (TMSS) is an optional device that stores up to 24 hours of trend data for the CRG Plus display—six hours at a time. This feature is available with V3 software or later. The stored CRG data is used in the overall analysis of a patient. Analyzing trend waveforms permits the ability to view both subtle and dramatic changes in the patient's vital signs. It also enables the clinician to correlate changes of one parameter with respect to another. For more details about the TMSS, refer to the *Model 7024 Product Manual,* pn 13703AA-000.



Technical Specifications

Display Specifications	
Item	**Description**
Size	Solar 7000 Monitor: 12-inch (measured diagonally) Solar 8000 Processing Unit: Display is ordered separately and may vary. SolarView Remote Display Controller: Display is ordered separately and may vary.
Type	Solar 7000 Monitor: High-definition Raster scan for waveforms and alphanumerics
Resolution	Solar 7000 Color Monitor: 1024 pixels wide by 512 pixels high Solar 7000 Monochrome Monitor: 1024 pixels wide by 512 pixels high
Traces	Solar 7000 Monitor: Number of traces: 1 to 8 Solar 7000 Monitor: Number of seconds/trace: 6.5 at 25 mm/sec
Phosphor	Solar 7000 Color Monitor: P22 Solar 7000 Monochrome: Monitor: P218
Sweep Speed	Solar 7000 Monitor: 25 mm/sec (meets all ANSI/AAMI specifications)
Frequency Response	Limited by input response of data acquisition device
Linearity	Solar 7000 Monitor:1% of picture height
Waveform Display Options	■ Full ■ Individual ■ CRG Plus
Information Window	Display all non-real time information without obstructing the display of real-time information
Display Organization	Prioritized by parameter

Processing Specifications	
Item	**Description**
Main Processor	Motorola MC68EN360, 32-Bit, 25 MHz
Graphics Processor	Texas Instrument TMS34010, 16-Bit, 46.7 MHz
Tram-net Communication Processor	Intel 82596CA, 32-Bit, 25 MHz
LAN (Ethernet) Communication Processor	Integrated into the Motorola MC68EN360 processor

Alarm Specifications	
Item	**Description**
Classification	Patient status alarms have 4 levels: ■ Crisis ■ Warning ■ Advisory ■ Message System alarms have 2 levels: ■ Warning ■ Advisory
Alarms Notification	Audible and visual, dependent on level
Display of Alarm Information	All limits are viewable and graphable
Silencing	Only current alarm for 1 minute Alarm pause: ■ 5 minutes in adult ICU mode ■ 3 minutes in neonatal mode ■ 5 minutes, 15 minutes, or permanent alarm pause in OR mode
Continuous Display of Limits	All parameters, one set of limits

Control Specifications	
Item	**Description**
Trim Knob Control	Single control operation of all display functions
Five Hard Keys	■ Display On/Off ■ Silence Alarm ■ Graph Go/Stop ■ NBP Go/Stop ■ Zero All

Environmental Specifications	
Item	**Description**
Power Requirements	Solar 7000 Color Monitor: ■ 110 ± 11 VAC, 50/60-Hz, single phase ■ 120 ± 12 VAC, 50/60-Hz, single phase ■ 220-230 ± 22 VAC, 50/60-Hz, single phase ■ 240 ± 24 VAC, 50/60-Hz, single phase Solar 7000 Monochrome: Monitor and Solar 8000 Processing Unit ■ 110 ± 20 VAC, 50/60-Hz, single phase ■ 220-230 ± 40 VAC, 50/60-Hz, single phase
Power Consumption	Solar 7000 Color Monitor: 200 W (180 W for a Tram-rac housing with power supply connected) Solar 7000 Monochrome Monitor: 120 W (100 W for a Tram-rac housing with power supply connected) Solar 8000 Processing Unit: 100W (maximum) SolarView Remote Display Controller: 25W (maximum)
Low Voltage Shutdown	Solar 7000 Color Monitor: 88 VAC/106 VAC/196 VAC/214 VAC Solar 7000 Monochrome Monitor: 85 VAC/170 VAC Solar 8000 Processing Unit: 90 VAC/190 VAC SolarView Remote Display Controller: 90 VAC/190 VAC
Cooling	Solar 7000 Color Monitor: Forced convection Solar 7000 Monochrome Monitor and Solar 8000 Processing Unit: Natural convection
Heat Dissipation	Solar 7000 Color Monitor: 680 Btu/hr (200 W) Solar 7000 Monochrome Monitor: 409 Btu/hr (120 W) Solar 8000 Processing Unit: 100 Btu/hr (30W) SolarView Remote Display Controller: 50 Btu/hr (15W)
Operating Conditions	
■ Ambient Temperature	Solar 7000 Monitor: 10°C to 35°C (50°F to 95°F) Solar 8000 Processing Unit: 10°C to 40°C (50°F to 104°F) SolarView Remote Display Controller: 10°C to 40°C (50°F to 104°F)
■ Relative Humidity	Solar 7000 Monitor: 15% to 95% (noncondensing) Solar 8000 Processing Unit: 15% to 95% (noncondensing) SolarView Remote Display Controller: 15% to 95% (noncondensing)
Storage Conditions	
■ Temperature	Solar 7000 Monitor: –10°C to 50°C (14°F to 122°F) Solar 8000 Processing Unit: –40°C to 70°C (–40F° to °158F) SolarView Remote Display Controller: –40°C to 70°C (–40F° to °158F)
■ Relative Humidity	Solar 7000 Monitor: 0% to 95% (noncondensing) Solar 8000 Processing Unit: 15% to 95% (noncondensing) SolarView Remote Display Controller: 15% to 95% (noncondensing)

Physical Specifications	
Item	**Description**
Height	Solar 7000 Monitor: 31.1 cm (12.3 in) Solar 8000 Processing Unit: 8.1 (3.2 in) SolarView Remote Display Controller: 8.1 (3.2 in)
Width	Solar 7000 Monitor: 33.4 cm (13.5 in) Solar 8000 Processing Unit: 33.6 cm (13.3 in) SolarView Remote Display Controller: 33.6 cm (13.3 in)
Depth	Solar 7000 Color Monitor: 55.2 cm (21.7 in) Solar 7000 Monochrome Monitor: 39.9 cm (15.7) Solar 8000 Processing Unit: 34.9 cm (13.8 in) SolarView Remote Display Controller: 34.9 cm (13.8 in)
Weight	Solar 7000 Color Monitor: 22 kg (48 lb) Solar 7000 Monochrome Monitor: 13.3 kg (29.4 lb) Solar 8000 Processing Unit: 5.4 kg (12.0 lb) SolarView Remote Display Controller: 5.4 kg (12.0 lb)
Minimum Enclosure Requirements (Interior)	Height: 10.7 cm (4.2 in) Width: 38.9 cm (15.3 in) Depth: 51.8 cm (20.4 in)

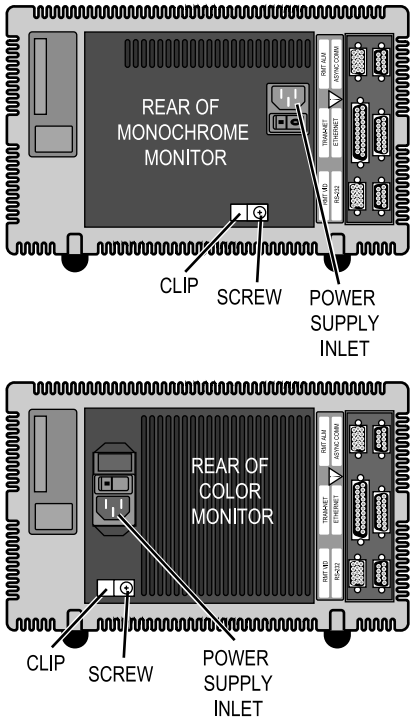
Certification	
Item	**Description**
Safety Standards	Solar 7000 Monitor: ■ UL544 Listed ■ UL Listed for CSA C22.2 No. 125 ■ IEC 60601-1 Certified ■ CE Marking for the 93/42/EEC Medical Device Directive (Refer to operator's manual for CE Marking specifics.) Solar 8000 Processing Unit and SolarView Remote Display Controller: ■ UL 2601-1 Classified ■ UL Classified for CAN/CSA C22.2 No. 601.1 ■ IEC 60601-1 Certified ■ CE Marking for the 93/42/EEC Medical Device Directive (Refer to operator's manual for CE Marking specifics.)

Classification	
Item	**Description**
Type of protection against electrical shock	Class I Equipment
Degree of protection against electrical shock	Type B Applies Part
Degree of protection against harmful ingress of water	Ordinary Equipment (enclosed equipment without protection against ingress of water)
Degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide	Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
Method(s) of sterilization or disinfection recommended by the manufacturer	Not Applicable
Mode of operation	Continuous operation

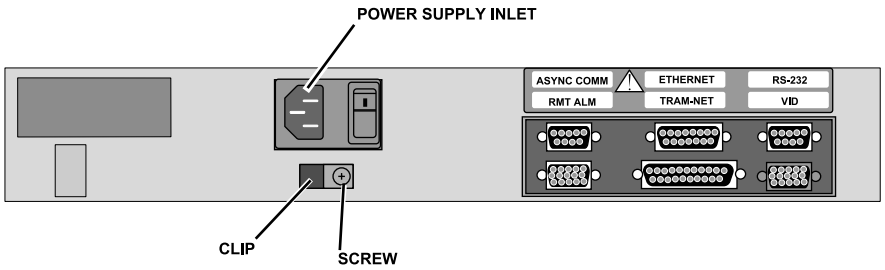
Preparation for Use

Power Connection

For the Solar 7000 monitor, connect the power cord to the power supply inlet and anchor the cord with the restraining clip and screw.

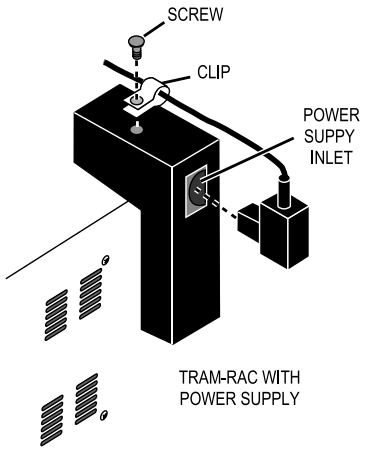


For the Solar 8000 processing unit or SolarView remote display controller, connect the power cord to the power supply inlet and anchor the cord with the restraining clip and screw.



Tram-rac Housing Connection

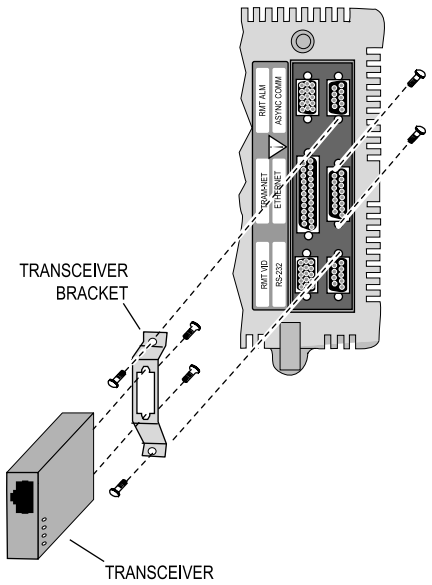
If a Tram-rac power supply is used, connect the power cord as shown below.

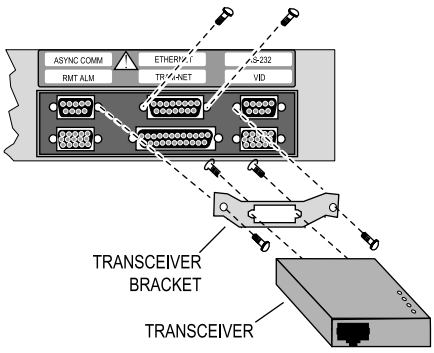


Marquette Unity Network Connection

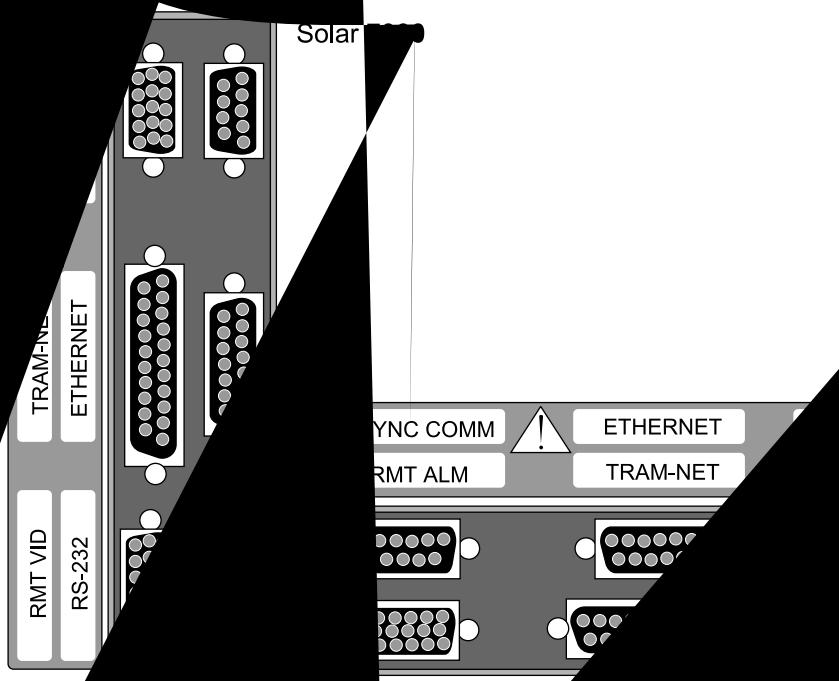
For the Solar 7000/8000 monitor or SolarView remote display controller, connect the Marquette Unity network to the Ethernet connector with kit, pn 414292-001, as shown below.

1. Remove four jackscrews from connectors shown.
2. Install two screws from kit to secure ETHERNET connector to chassis.
3. Install two screws to connect transceiver bracket to transceiver.
4. Use two jackscrews removed earlier to mount transceiver and bracket to ETHERNET connector.





patient monitor or SolarView remote display
munication connectors to accomodate your



nects to a
rView re

es
ith many bedside peripherals, i.e. Tram-net hub,
ing, or remote control. SolarView remote display
es not use this function.

NET is the Marquette Unity Network connection that
des faster hospital wide communication.

emote alarm (RMT ALM) provides relay contact closure for “Level I” alarms to an alarm annunciator.

- For the Solar 7000 monitor, remote display (RMT VID) connects to a secondary remote display. For the Solar 8000 processing unit or SolarView remote display controller, video (VID) connects to the local display.
- RS-232 is for future use.

WARNING

Connect devices solely manufactured by GE Marquette Medical Systems directly to the Marquette Unity Network. Contact MMS—Technical Support before connecting equipment from other manufacturers.

What Error Data is Useful?

When troubleshooting a monitor, the parameters displayed below will be of interest.

Definition of Parameters	
Name	**Description**
Process Name	is the name of the software task that was operating when the event/problem occurred.
Error Code	is a code for the type of event/problem that occurred.
Severity	indicates the impact of the event/problem on the system.
Date	is the date the event/problem occurred.
Time	is the time the event/problem occurred.
Error Number	is a sequential number that is used to identify each event/problem.

For some categories of Tram-net network errors, two additional lines are added to the error log entry.

Definition of Parameters	
Name	**Description**
Network Error	identifies that a network error occurred.
Channel Number	identifies the network channel exhibiting the error.

What Do Error Codes Mean?

The error log contains more than just operating system errors. Many events that have an impact upon the system are also entered into the log. The 700-series of error codes are really system initiated events. Listed below are some of the event/error codes you might find useful.

Definition of Parameters	
Error Code	**Description**
400-4FF	Network errors were detected.
703	Diagnostic tests were completed.
70B	Internet address was changed. The network address for the monitor was changed. This should only be done by qualified service personnel.
70C	Video test was completed. This test should only be performed by qualified service personnel.
70D	Rear power switch was turned off.
70E	Time was changed from this monitor. This helps determine how the system-wide time may have been altered.
70F	Date was changed from this monitor. This helps determine how the system-wide date was altered.
710	Incompatible software was detected. If the main processor software finds that the software operating on the communication software incompatible, it turns off the communication (network) controller and enters this data into the error log. When the monitor won't "talk" to the network, looking for this entry in the error log is one part of the troubleshooting process.
714	Incompatible TRAM module software was detected. If the main processor software finds the software revision in the TRAM is incompatible, it turns off communication with the TRAM and enters an error log. Refer to the software compatibility listing in the SOFTWARE REVISION window.

NOTE: The monitor may be referred to as a display or scope in the error code descriptions.

What Does Severity Imply?

Severity is a measure of how the event/error affected the system. There are three levels of severity.

Definition of Parameters	
Levels	**Description**
Continue	the event/error was logged, the task may have or may not have been finished, but the system was able to go on. Most log entries will have a severity of CONTINUE.
Fatal	the event/error was such that the task is not able to go on. Recovery was not possible. This always is followed by a WARM START.
Forced Restart	the system was restarted by a known condition (internet address change, video test, etc).

Transferring Error Logs

General

The following procedure describes how to copy the patient monitor and parameter module error logs and then transfer them to a diskette at the Centralscope central station. To transfer error files from a Clinical Information Center (CIC), refer to the *Marquette Prism Information Field Service Manua*l, pn 419897-002.

The Centralscope or CIC central station can perform their normal patient data display tasks and act as remote terminals. The remote terminal function is very useful for retrieving, viewing, and saving error logs from any GE Marquette patient monitoring equipment communicating on the Marquette Unity Network. Through a series of menus a device, such as a monitor, another central station, or parameter module, can be selected in any Care Unit. Then a device error log for a particular day may be chosen.

Once the desired error log is selected it can be copied over the network to a floppy diskette in the central station's floppy diskette drive. Since the error logs are text files they can be read into other computers and read using most text editors or word processing applications.

To transfer error files from a Centralscope central station, use the following procedure.

CAUTION

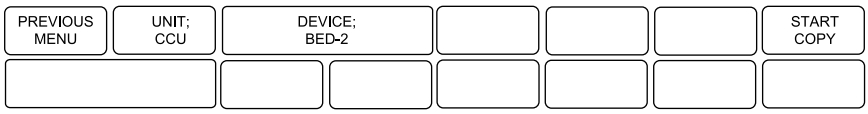
This procedure is intended for use by service personnel with advanced troubleshooting skills. Do not "experiment" with these commands! The consequences of misuse include loss of patient data, corruption of the central station operating software, or disruption of the entire Marquette Unity Network.

Access the COPY LOGS Menu

1. Select the following menu options beginning with the Centralscope central station MAIN MENU:

   CENTRAL SETUP
   SERVICE
   Enter password: MEI CS 123
   COPY LOGS

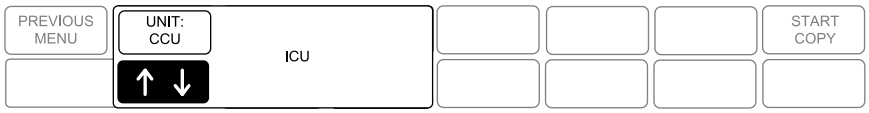
2. The COPY LOGS menu is displayed.



Select the Care Unit

To specify the Care Unit, select the UNIT: button.

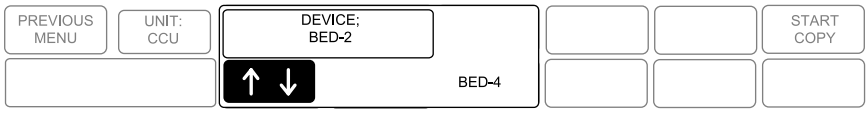
Rotate the trim Knob control to change the displayed Care Unit name. When the desired Care Unit name is displayed press the Trim Knob control.



Select the Monitoring Device

To specify a monitoring device, select the DEVICE: button.

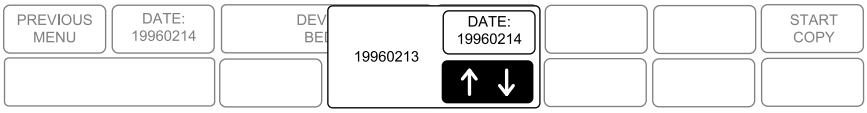
Rotate the Trim Knob control to change the displayed device name. Note that only monitoring devices within the previously selected Care Unit are shown. When the desired monitoring device name is displayed press the Trim Knob control.



Select the Error Log Date

The final selection is to pick the date of the error logs to be copied to the floppy diskette.

1. Rotate the Trim Knob control to change the error log date. Note that one of the selections is ALL, which will retrieve all stored error logs from the specified device. When the desired date is displayed press the Trim Knob control.

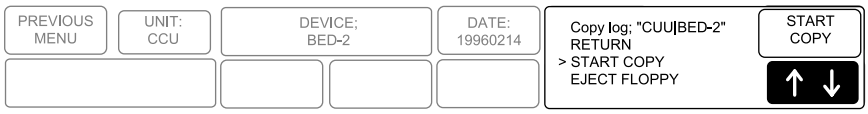


2. Once the Care Unit, device, and date have been specified the final step is to begin copying the error logs to the floppy diskette.
3. Insert a PC-formatted, high-density floppy diskette into the floppy diskette drive of the central station.

Copy Error Logs

Once the START COPY button is selected a new display is shown that confirms the file source device. The other options are to eject the floppy diskette or to start the copying process.

Rotate the Trim Knob control to select the desired function. Then press the Trim Knob control to start.



Once the copy function begins the START COPY button changes to show the function: “copying.”

Eject Floppy

When selected this option just causes a floppy diskette to be ejected from the central station's disk drive.

NOTE

If the floppy diskette does not eject, a thin tool such as a straightened paper clip can be inserted in the small round hole under the disk slot. By pressing on the mechanical release bar inside the drive the floppy diskette can be forcibly ejected.

Reviewing Event Logs

This procedure describes how to review the event logs of a monitor.

WARNING

This procedure is intended for use by service personnel with advanced troubleshooting skills.

Accessing Event Logs

Some of the information recorded in the event logs is useful for field troubleshooting. The details included here will serve as an introduction to the event logs and provide basic information about what you can learn from them.

At the monitor, execute the following menu sequence, starting from the MAIN menu:

MONITOR SETUP
SERVICE MODE
Password
Enter day and month from monitor screen with leading zeros. (July 4 = 0407)
REVIEW ERRORS

Select the VIEW SCOPE EVENTS option to scroll through the log of events.

The event log in a monitor holds 500 events that can be accessed by turning the Trim Knob control. You may select PRINT to print out an event.

To clear all the events in the error log, select CLEAR SCOPE EVENTS menu option. Be aware that once the clear menu option is executed, all selected events in memory are erased.

What Does an Event Log Contain?

The event log holds 500 events and as each event occurs, the event information is stored in the log. Subsequent events are stored sequentially as they occur. After the first 500 events are recorded, the next event detected overwrites the oldest event in the log.

A sample monitor event log display appears as follows:

```
MSK9-STT2          10-JAN-2000 16:28
 0000 01/10/2000 12:19:50 38   1
      Date/Time Change
 0001 01/10/2000 14:17:22 5    0
      Admit
 0002 01/10/2000 14:46:01 2    0
      Application End
 0003 01/10/2000 14:46:02 6    0
      Discharge
 0004 01/10/2000 16:25:29 100  0
      Octanet Normal Connect
 0005 01/10/2000 16:25:30 3    a0104
      Cable On
 0006 01/10/2000 16:25:30 3    b0106
      Cable On
 0007 01/10/2000 16:25:42 13   6
      Cable Off Retry

 DATA OFF SCREEN. ROTATE TRIM-KNOB TO VIEW
```

For each event the index, date, and time are shown. These are followed by the event code, event-specific data and a textual description of the event code.

For your notes

7 UPPER LEVEL ASSEMBLY

Solar 7000 Disassembly Guidelines

General

Two versions of the Solar 7000 monitor are available: color or monochrome. Follow the guidelines described when disassembling your version monitor. You will require a standard set of hand tools.

PCB Assemblies

Observe the following guidelines when working on all PCB assemblies:

- Take precautions against electrostatic discharge damage.
- Handle all PCB assemblies by their edges.
- Generally, use 60/40 low melting point solder. Use high melting point silver solder when working on the surface mounted components.
- Use a heatsink when soldering any phototransistors, photodiodes, or optical isolators.
- Repair breaks in PCB tracks by bridging with wire from pad to pad. Do not lay solder across the breaks. (The heat from the soldering iron may cause the track to detach from the PCB.)
- After soldering, clean excess flux from the PCB assembly.

- If you replace the main processor, remove the serial EEPROM U9 and insert it into the replacement main processor PCB. The serial EEPROM must stay with the unit.

Hardware

- Before disassembly, note the positions of any wires or looms (cables), marking them if necessary to ensure that they are replaced correctly.
- Gray ribbon cables have retainer clips holding them in the connector.
- Save and set aside all hardware for re-assembly.

Opening the Unit for Service

Use these step-by-step disassembly instructions when you need to remove various PCB assemblies from the monitor assembly.

WARNING

Make sure the monitor is not monitoring a patient, because monitoring will be interrupted.

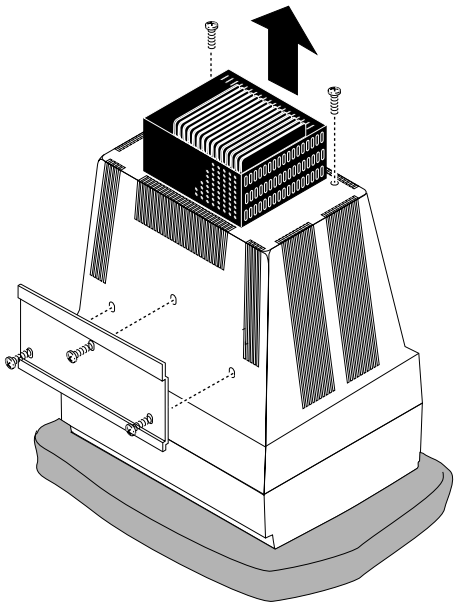
First, turn the unit OFF at the rear power switch and disconnect the AC power cord and all communication cables.

WARNING

Due to possible high voltage present, use an insulated screwdriver at all times when making adjustments.

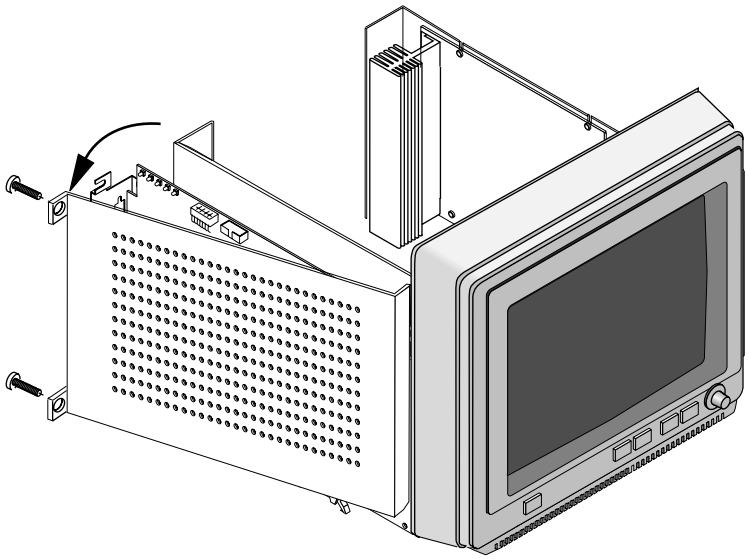
Disassembly

1. Lay the unit on its front display on either foam or other soft material. *Do not* apply excessive pressure on the Trim Knob control.
2. Remove the five screws at the rear as shown.
3. Lift the bezel directly up.



Main Processor PCB Removal

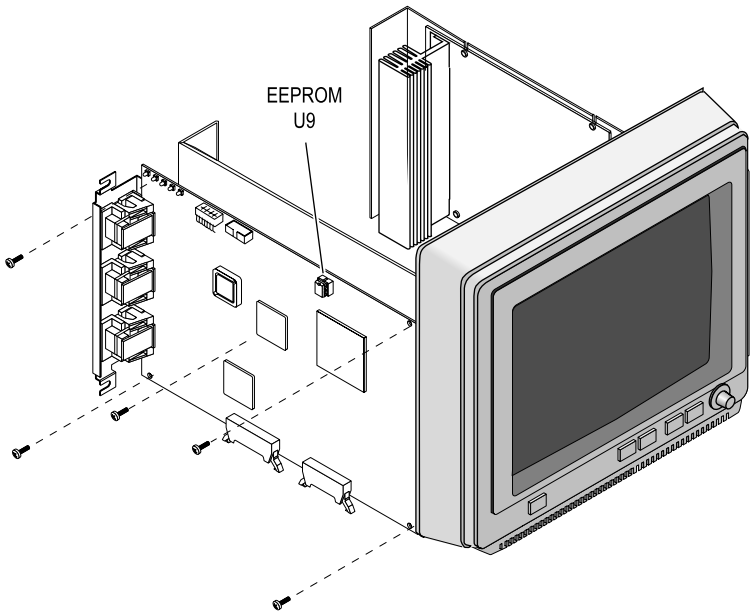
1. Remove two screws at the rear of the monitor to release the shield over the main processor PCB.



WARNING

When you reassembly the unit, *do not* replace the shield backwards! You will short out the battery, damage boot code, and render the unit useless.

2. Disconnect all harnesses from the main processor PCB.
3. Remove five screws attaching the main processor PCB.
4. Remove the serial EEPROM U9 and insert it into the replacement main processor PCB. The serial EEPROM must stay with the unit.



Mono CRT Controller or Color Deflection PCB Removal

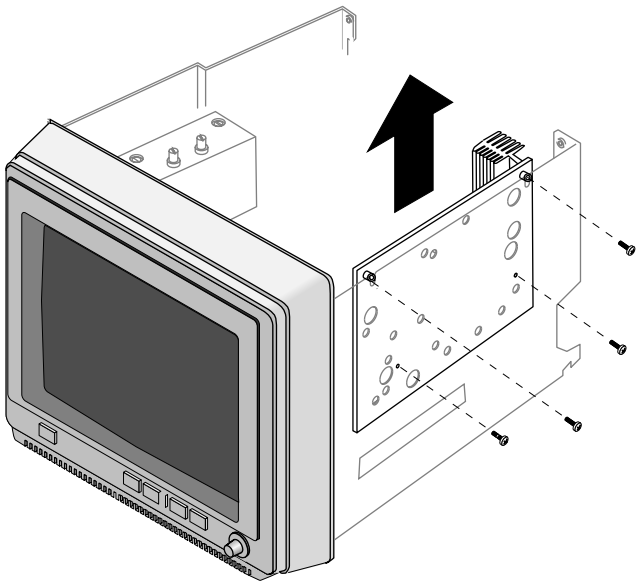
Do the following to remove the mono CRT controller or color deflection PCB.

1. Remove all attaching harnesses.
2. Remove four attaching screws and lift.

WARNING

To avoid electrical shock, do not touch the large heatsink connected to the deflection PCB, pn 404642-00X, while the unit is ON.

Due to high voltage on either PCB, use an insulated screw driver at all times while making adjustments.

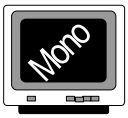


Power Supply Removal

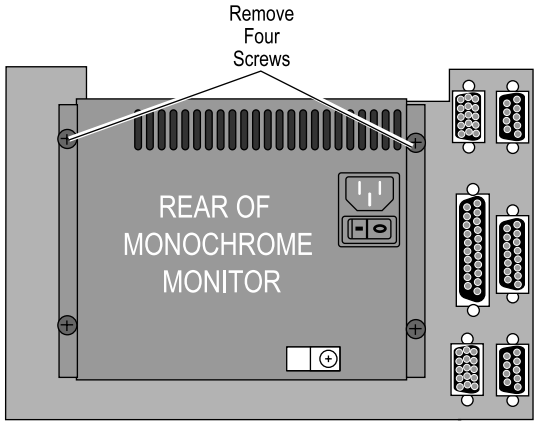
Do the following to access the power supply.

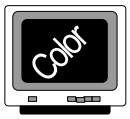
WARNING

Beware of ac line voltage at the power module. When rear power switch is OFF, ac line voltage is still present. Use an insulated screw driver at all times when making adjustments.

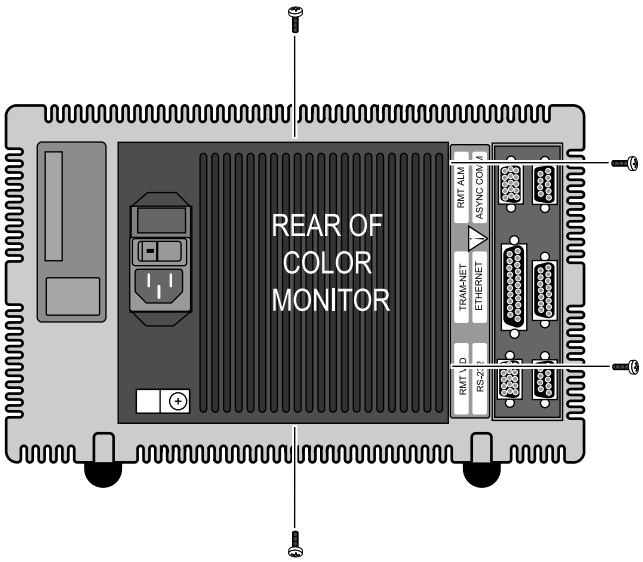


For the monochrome monitor, remove the bezel first and then the four screws attaching the power supply cover.

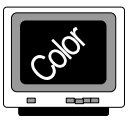




For color monitors, the bezel does not have to be removed to access the power supply. Remove the four recessed screws to remove the power supply cover.s



Color CRT Controller PCB Removal



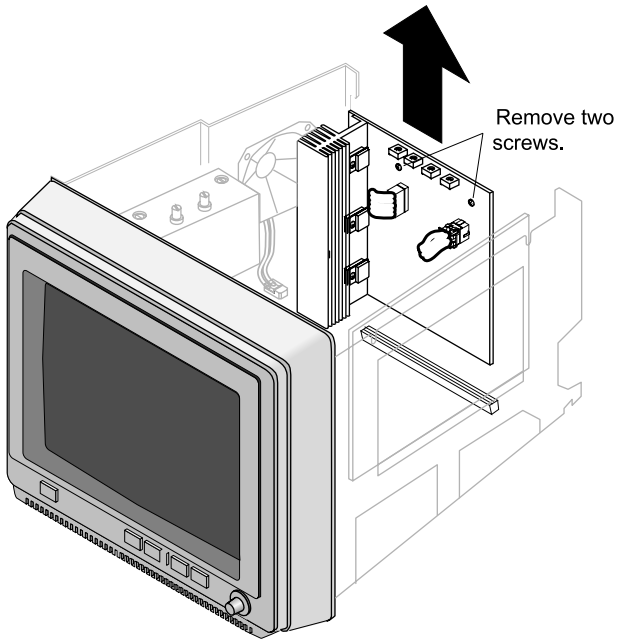
For color monitors only, do the following.

WARNING

To avoid electrical shock on color units, do not touch the large heatsink connected to the nearby deflection PCB, pn 404642-00X, while the unit is ON.

Due to high voltage on either PCB, use an insulated screw driver at all times while making adjustments.

1. Remove attaching harness.
2. Remove two screws and lift the color CRT controller PCB.



Ordering Parts for Solar 7000

The parts lists and assembly drawings in this chapter supply enough detail for you to order parts for the assemblies considered field serviceable. If you require additional information, schematics, or troubleshooting assistance, contact Tech Support.

To order parts, contact Service Parts at the address or telephone number listed on the "How to Reach Us...," page found in Chapter 1: "Introduction" of this manual.

Commonly Replaced Assemblies

The tables below list the most commonly replaced assemblies ordered in the service spare circuit board kits. See the operator's manual for a complete list of accessories and expendable supplies.

NOTE: If you replace the main processor, remove the serial EEPROM U9 and insert it into the replacement main processor PCB. The serial EEPROM must stay with the unit.

Color Monitor Spare Kit, PN 415194-001	
Item	**Part Number**
Main Processor PCB	800678-002
Color CRT Controller PCB	404641-009
Color Deflection PCB	404642-005
Color Power Supply	800974-001
High-Voltage Power Supply (Color)	406896-002

Monochrome Monitor Spare Kit, PN 415193-001	
Item	**Part Number**
Main Processor PCB	800678-002
Mono CRT Controller PCB	401550-006
Monochrome Power Supply	408102-001
High-Voltage Power Supply (Monochrome)	6116-007

Fuse Part Numbers

The monochrome monitor does not have replaceable fuses.

For the color monitor, read the fuse rating at the rear of monitor to select correct fuse replacement. Use a single blade screwdriver to pop out of the panel above the AC main outlet to access the fuses.

WARNING

To avoid electric shock, always turn OFF unit and remove power cord from AC main outlet before replacing fuses.

Color Monitor Fuses	
Description	**Part Number**
Fuse, 2.0A Slow Blow	1908-504
Fuse, 4.0A Slow Blow	1908-506

Solar 7000 Labels

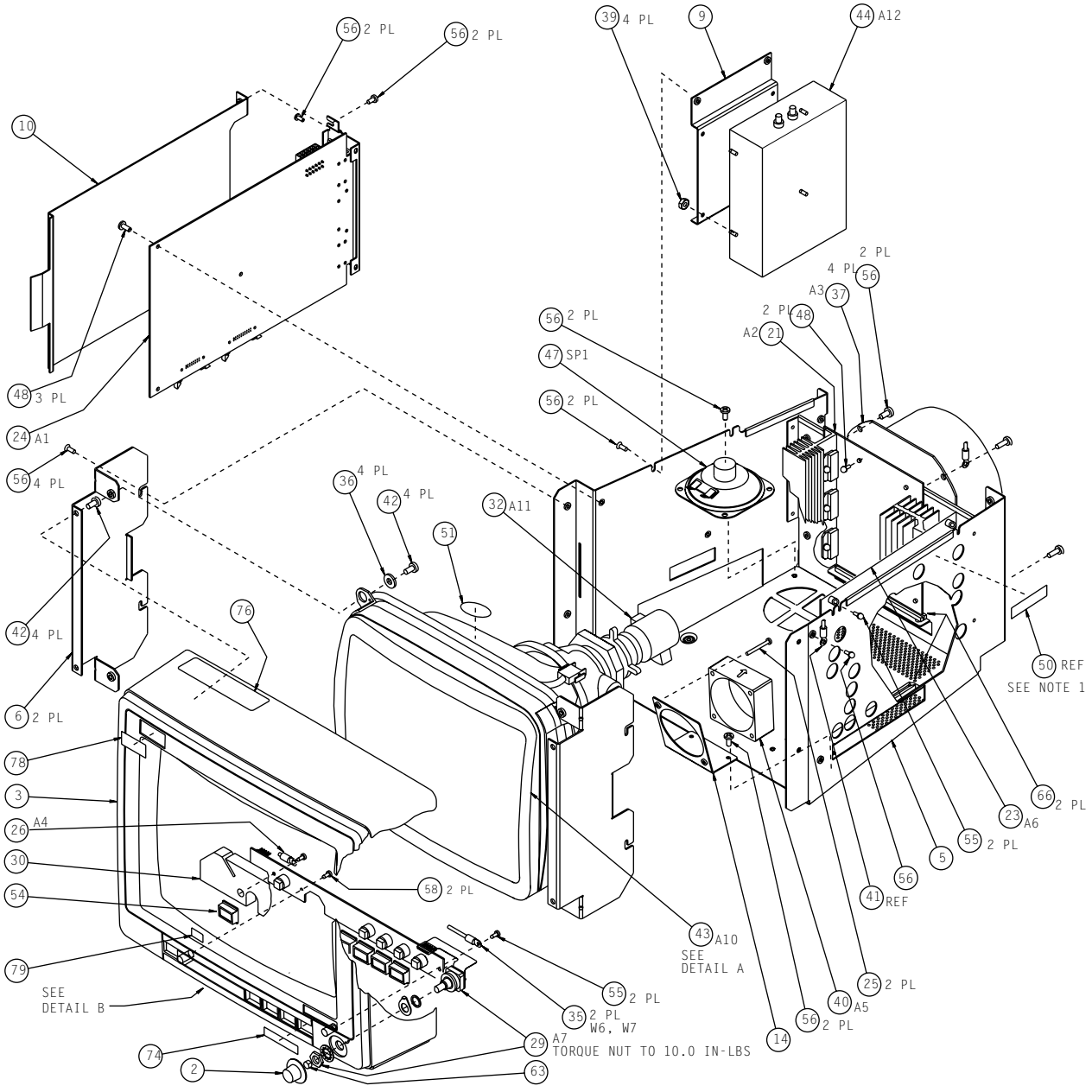
The list of labels given below are determined by destination and are not included in the part lists included in this chapter. To reference item numbers, refer to the exploded views provided later in this chapter. Your model will not use all the labels listed.

Monitor Labels

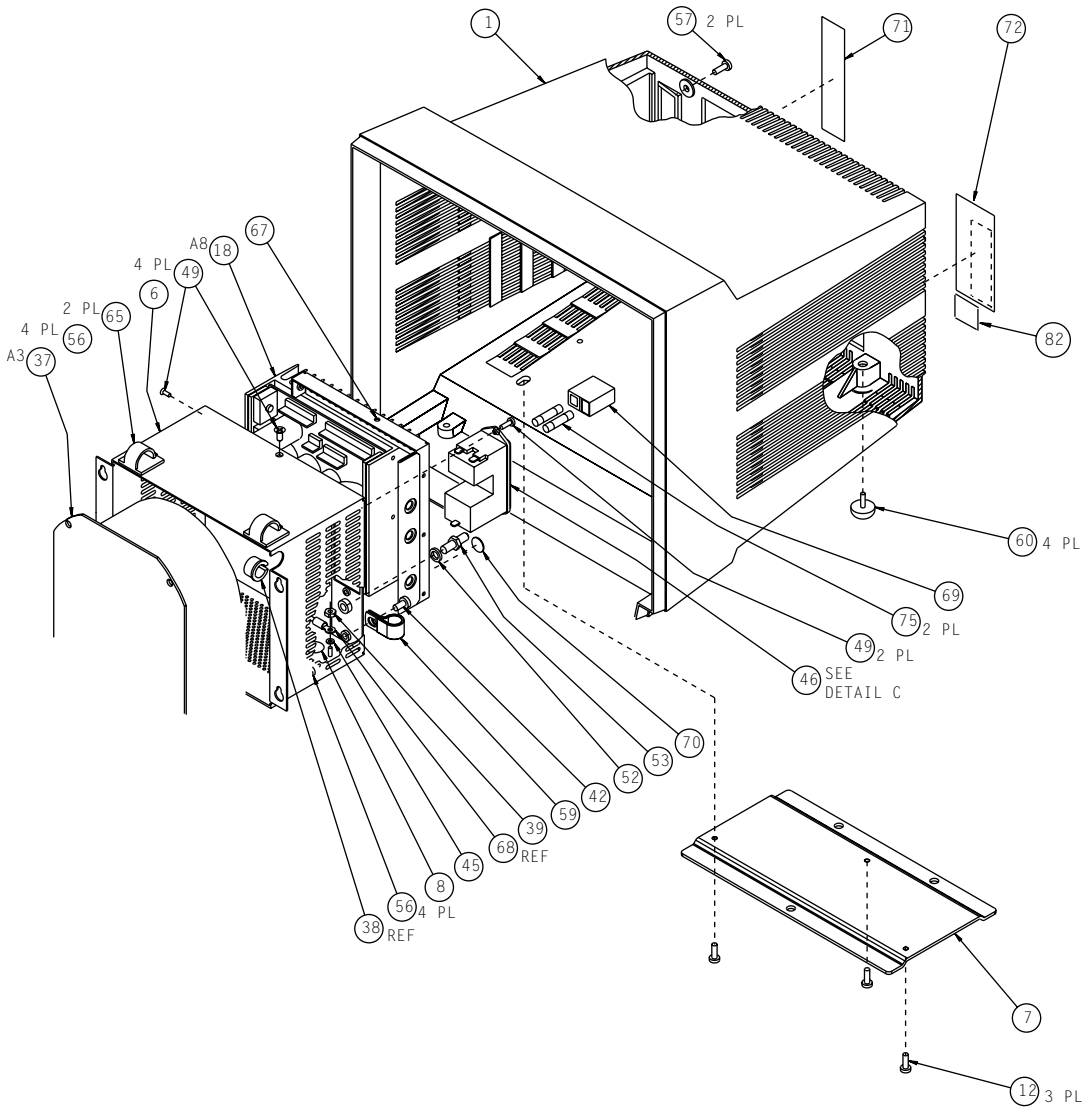
Mono Item	Color Item	Description	Part Number
60	–	Domestic Monochrome Fuse Ratings Label	414938-001
60	–	International Monochrome Fuse Ratings Label	414938-002
61	76	Risk of Explosion	415043-001
62	77	Serial Number Label	404525-001
63	79	English Keycap Label Set	414909-001
63	79	German Keycap Label Set	414909-002
63	79	French Keycap Label Set	414909-003
63	79	Swedish Keycap Label Set	414909-004
63	79	Spanish Keycap Label Set	414909-005
63	79	Italian Keycap Label Set	414909-006
63	79	Dutch Keycap Label Set	414909-007
64	80	German NBP Value ID	408793-001
65	74	GE Marquette Label	414908-001
65	74	GE Marquette Company Label	414908-002
66	78	Solar 7000 Front Label	414907-001
66	78	Solar 7000N Front Label	414907-002
71	59	Rear Communication Label	414494-001
–	72	Domestic Color UL Fuse Ratings Label	414495-001
–	72	International Color Ruse Ratings Label	414495-002
69	82	CE Mark Label	408230-008

Exploded View (Color) PN 900618-001H

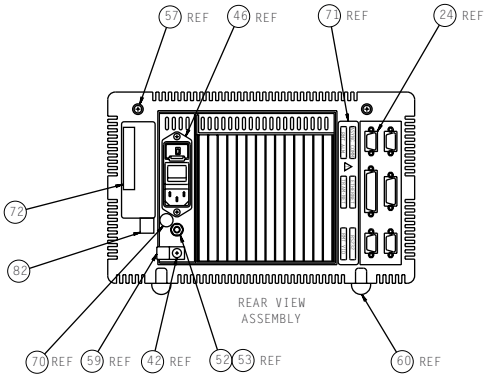
1 of 3

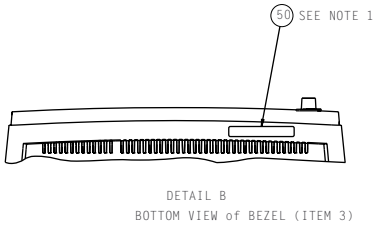


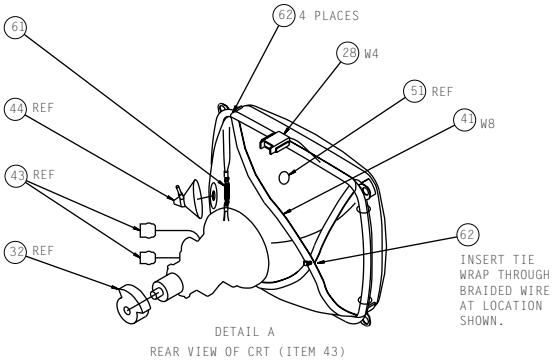
2 of 3

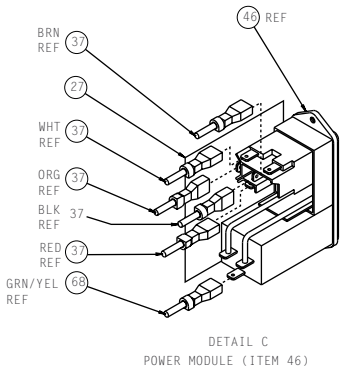

1
57 2 PL
71
72
82
67
A8 18
4 PL 49
6
2 PL 65
4 PL 56
A3 37
60 4 PL
69
75 2 PL
49 2 PL
46 SEE DETAIL C
70
53
52
42
59
39 REF
68
45
8
56 4 PL
38 REF
7
12 3 PL

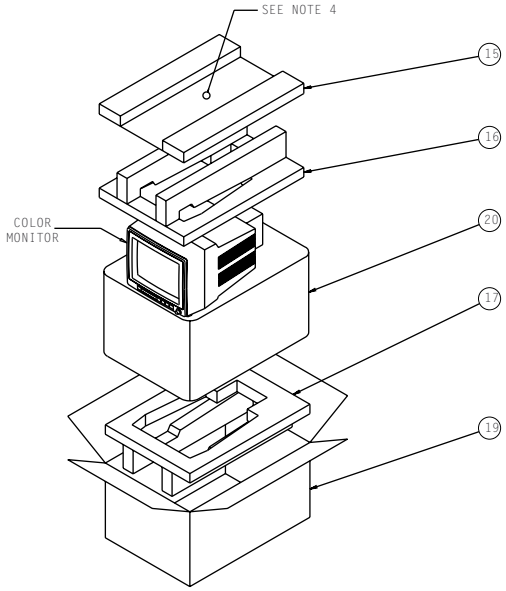
3 of 3











NOTES:

1. LABEL (ITEM 50) TO BE MARKED: "SOLAR 7000 C", SERIAL NUMBER AND APPROPRIATE BARCODE.
2. LABEL (ITEM 77) TO BE MARKED AS FOLLOWS: "DIE IN DIESEM GERAT ENTSTEHENDE RONTGENSTRAHLUNG IST AUSREICHEND ABGESCHIRMT BESCHLEUNIGUNGSSPANNUNG < 20K"
4. LOOSE ITEMS MAY BE SHIPPED WITH THE UNIT IF SPACE PERMITS OR PACKAGED AND SHIPPED SEPARATELY.
5 . APPLY LABEL (ITEM 80) TO BEZEL NEXT TO NBP VALUE ID BLOCK.

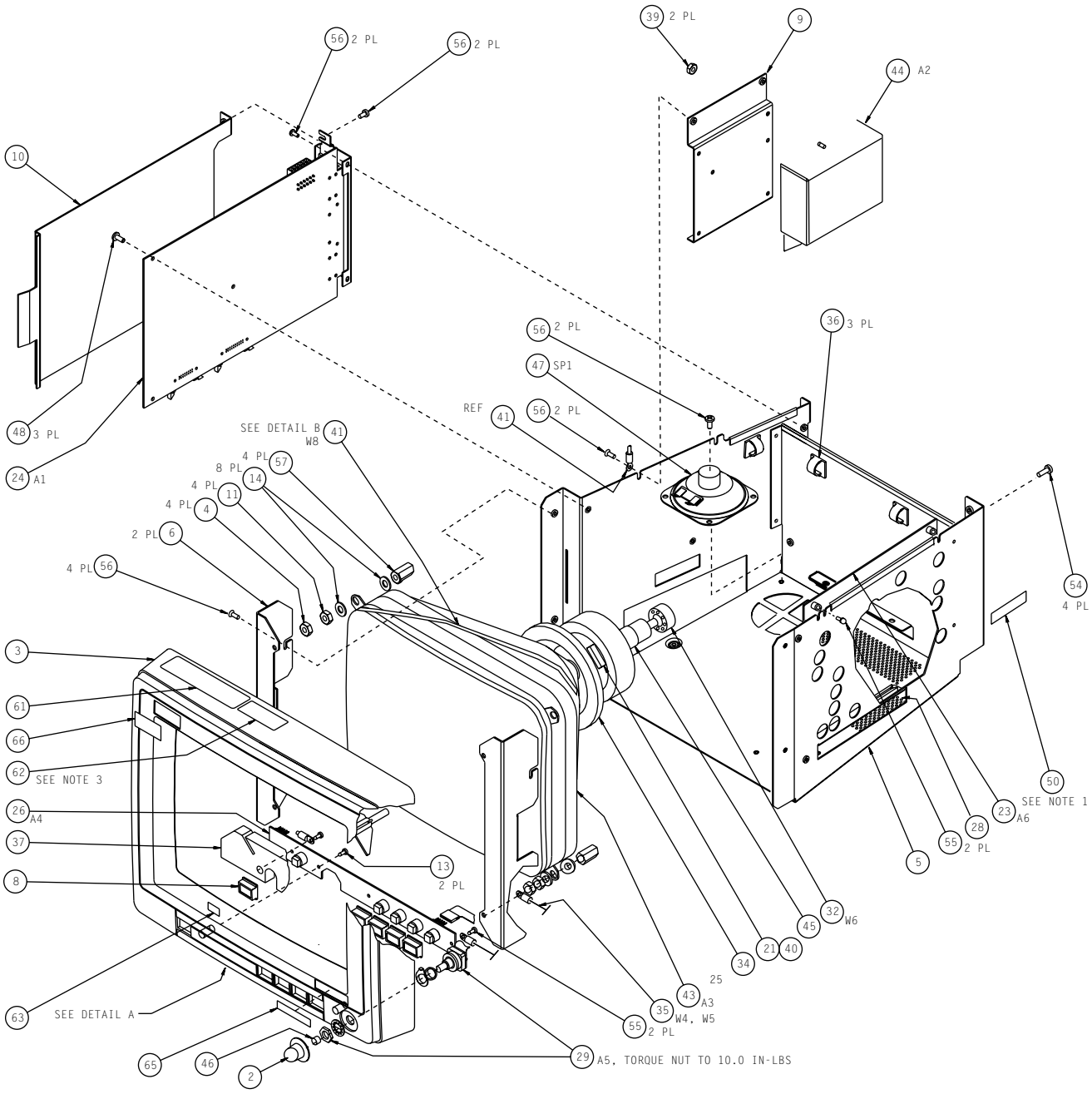
Parts List PN 900618-001H

Item	Reference Designation	Color Monitor Parts List	Part Number	Qty
1		Housing Solar 7000	400616-003	1
2		Knob, Rotary	58111-007	1
3		Bezel, Solar 7000, Color	414918-001	1
4		Tie Warp, 8-Inch	4535-002	1
5		Chassis Assembly	413600-002	1
6		Mounting Bracket, CRT	405382-002	2
7		Mounting Plate	400613-005	1
8		Label, Icon, Ground	70437-005	1
9		Bracket, High Voltage Supply	413589-002	1
10		PCB Cover	413594-001	1
11		Housing, Low-Voltage Power Supply	405101-001	1
12		Screw, Captive, Phillips, 6-32 x 1/2	414106-001	3
13		Screw, FLH, Phillips, SST, 4-40 x 5/16	4505-410	3
14		Bracket, Fan	413599-001	1
15		Insert, Corrugated	406662-001	1
16		Insert, Foam Top	406664-001	1
17		Insert, Foam Bottom	406664-002	1
18	A8	Low-Voltage Power Supply	800974-001	1
19		Shipping Carton	415117-001	1
20		Bag, Anti-Static	405183-001	1
21	A2	Color CRT Controller PCB	404641-009	1
22		Solar 7000/8000/View Patient Monitor Field Service Manual (not Shown)	414993-001	1
23	A6	Color Deflection PCB	404642-005	1
24	A1	Main Processor PCB	800678-002	1
25		Screw, PNH, Phillips, 4-40 x 1-1/4	4502-440	2
26	A4	Keycap PCB	800058-003	1
27		Insulator, Power Module	406904-001	1
28	W4	Degauss Coil	405305-001	1
29	A7	Trim Knob Control Assembly	414642-001	1
30		Keycap Gasket	404392-001	1
31	W3	Harness, CRT Controller PCB-to-Main Processor PCB	414548-001	1
32	A11	CRT Socket Assembly	408099-001	1
33	W2	Harness, Speaker-to-Deflection PCB	414526-001	1
34	W5	Harness, CRT Controller PCB-to-Deflection PCB	405785-002	1
35	W6, W7	Harness, Keycap PCB-to-Ground	402302-001	2
36		Washer, Flat	403335-001	4
37	A3	Transformer Assembly	406488-001	1

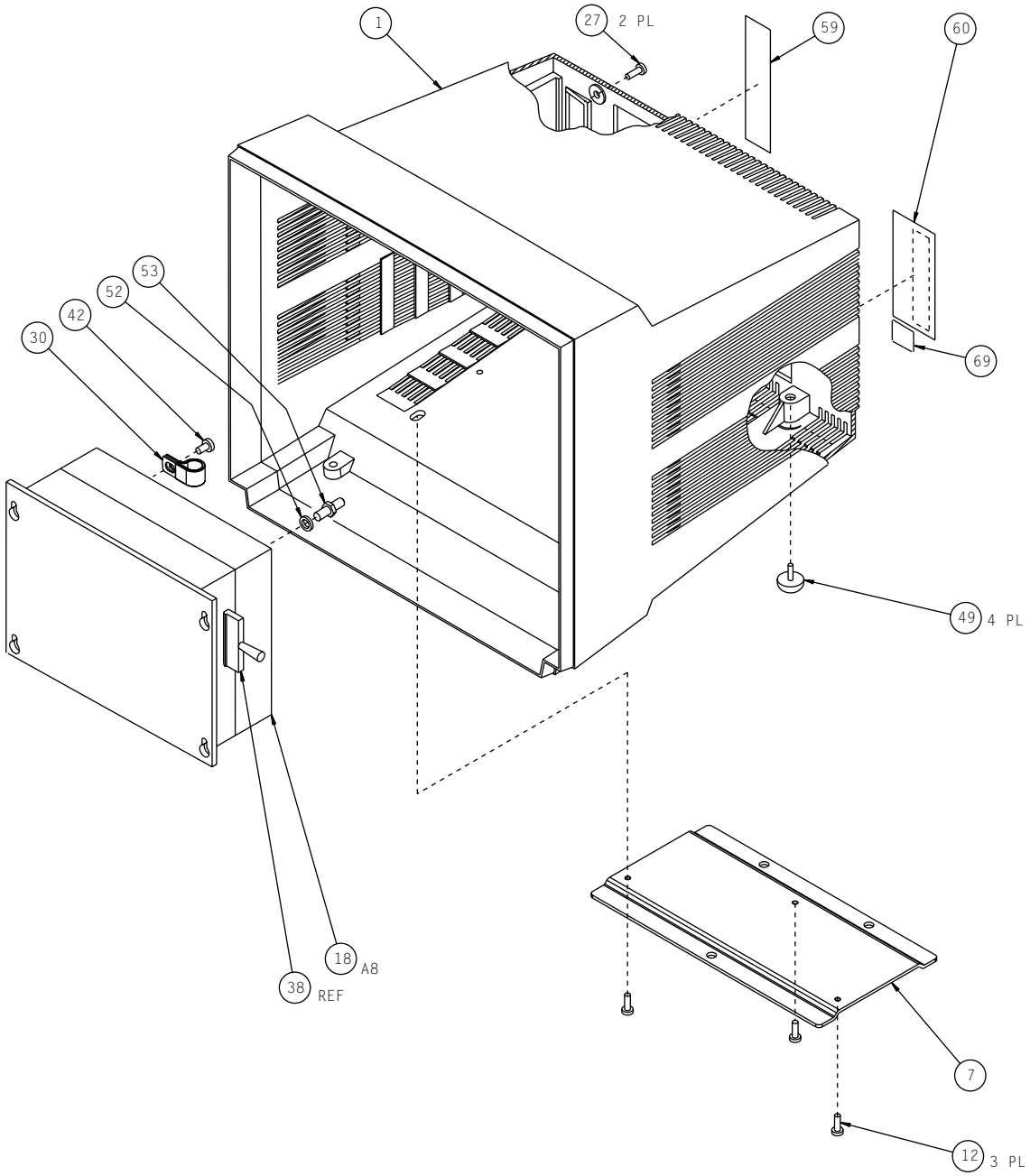
Item	Reference Designation	Color Monitor Parts List	Part Number	Qty
38	A9	Cable Assembly, Low-Voltage Power Supply-to-Main Processor PCB	414604-001	1
39		Nut, Keps, Hex, 6-32	4521-706	5
40	A5	Fan Assembly	414527-001	1
41	W8	Cable Assembly, Color CRT	405739-001	1
42		Screw, PNH, Phillips, 10-32 x 3/8	45018-906	9
43	A10	Yoke Cable Assembly and Color CRT	405834-003	1
44	A12	High-Voltage Power Supply	406896-002	1
45		Washer, Lock, External No. 6	4520-306	1
46	S1	Power Line Conditioner	406445-001	1
47	SP1	Speaker, 3-Inch, 8 Ω	1663-300	1
48		Screws, BDGH, Phillips, 6-32 x 1/4	45074-608	5
49		Screws, FLH, Phillips, SST, 4-40 x 1/4, Black	4776-404	8
50		Label, Blank	404525-006	2
51		Label, Icon, High-Voltage	70437-001	1
52		Washer, Lock, Serrated	400041-001	1
53		Plug, Equipotential	400040-001	1
54		Keycap Kit	414841-001	1
55		Screws, PNH, Phillips, 4-40 x 1/4	45000-404	4
56		Screws, PNH, Phillips, 6-32 1/4	45000-604	23
57		Screws, PNH, Phillips, 8-32 x 1/2	4502-812	2
58		Screws, BDGH, Phillips, 4-40 x 1/4	45074-408	2
59		Cable Clamp	4528-106	1
60		Foot, W/Threadlock	418987-001	4
61		Spring, Extender	4552-002	1
62		Tie Warp	4535-001	5
63		Spring Clip, D-Type	4556-001	1
64		Tie Wrap, Kurly-Lok	406447-001	2
65		Cable Clip	405558-004	2
66		PCB Guide	401867-002	2
67		Rear Panel, Power Supply	406093-001	1
68	W1	Cable Assembly, Power Module-to-Safety Ground	406489-001	1
69		Fuse Holder	406448-001	1
70		Label, Icon Equipotential	70437-002	1
81		Modular Patient Monitor Accessories Service Manual (Not Shown)	404183-150	1
83		Screw, PNH, Phillips, 8-32 x 3/8	405318-008	4

Exploded View (Mono) PN 900619-001K

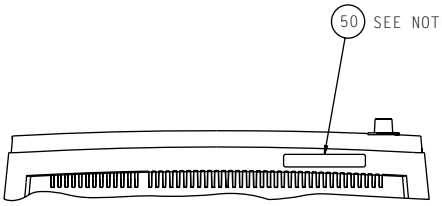
1 of 3



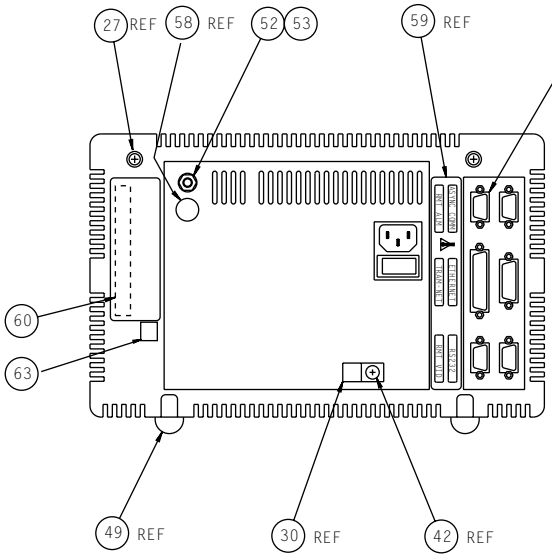
2 of 3



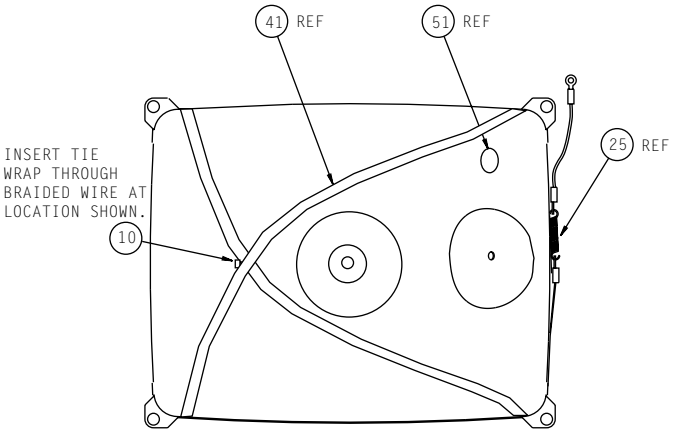
3 of 3



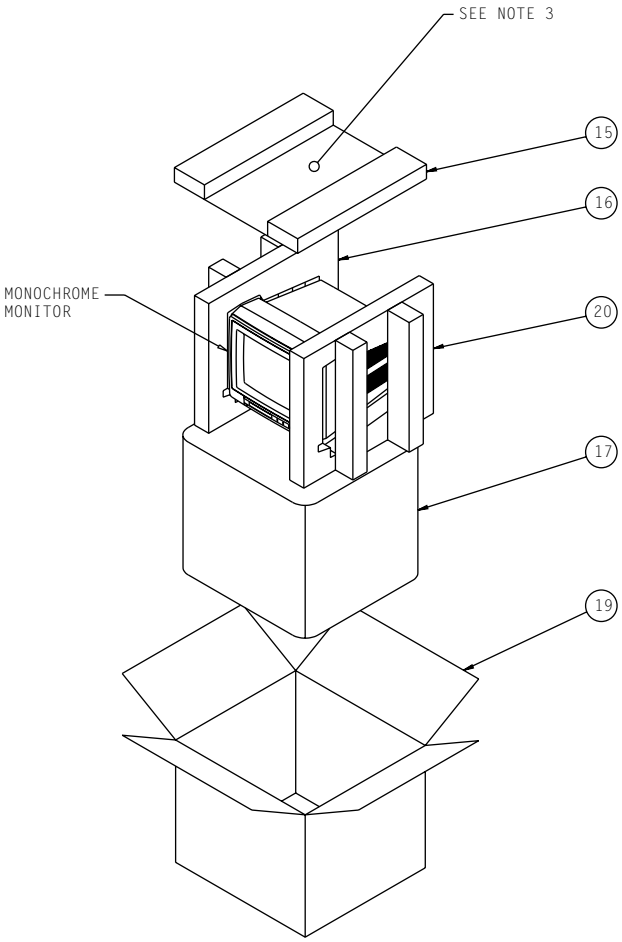
DETAIL A
BOTTOM VIEW OF BEZEL (ITEM 3)



REAR VIEW
ASSEMBLY



DETAIL B
REAR VIEW OF CRT (ITEM 43)



NOTES:

1. LABEL (ITEM 50) TO BE MARKED: "SOLAR 7000", SERIAL NUMBER AND APPROPRIATE BARCODE.

3. LOOSE ITEMS MAY BE SHIPPED WITH THE UNIT IF SPACE PERMITS OR PACKAGED AND SHIPPED SEPARATELY.

Parts List PN 900619-001K

Item	Reference Designation	Monochrome Monitor Parts List	Part Number	Qty
1		Housing Solar 7000	400616-003	1
2		Knob, Rotary	58111-007	1
3		Bezel, Solar 7000, Monochrome	414919-001	1
4		Nut, Keps, Hex, 10-32	4644-710	4
5		Chassis Assembly	413600-002	1
6		Mounting Bracket, CRT	413602-001	2
7		Mounting Plate	400613-005	1
8		Keycaps	414841-001	1
9		Bracket, High-Voltage Supply	413598-002	1
10		PCB Cover	413594-001	1
11		Nut, Hex 10-32	4644-110	4
12		Screw, Captive, Phillips, 6-32 x 1/2	414106-001	3
13		Screw, BDGH, Phillips, 4-40 x 1/4	45074-408	2
14		Washer, Flat, SST, No. 10	4520-010	8
15		Insert, Corrugated	405045-001	1
16		End Cap Insert, Foam, Left	404854-002	1
17		Bag, Anti-Static	405183-001	1
18	A8	Low-Voltage Power Supply	408102-002	1
19		Shipping Carton	415118-001	1
20		End Cap Insert, Foam, Right	404854-001	1
21		Permanent Magnet, Ceramic	405593-001	1
22		Solar 7000/8000/View Patient Monitor Field Service Manual (Not Shown)	414993-001	1
23	A6	Mono CRT Controller PCB	401550-006	1
24	A1	Main Processor PCB	800678-002	1
25		Spring Extender	4552-002	1
26	A4	Keycap PCB	800058-003	1
27		Screw, Phillips, SST, 8-32 x 1/2	45000-812	2
28		PCB Guide	401867-002	1
29	A5	Trim Knob Control Assembly	414642-001	1
30		Cable Clamp	4528-106	1
31	W3	Harness, CRT Controller PCB-to-Main Processor PCB	415548-001	1
32	A11	Harness, CRT-to-CRT Controller PCB	80681-005	1
33	W2	Harness, Speaker-to-Deflection PCB	414526-001	1
34	A7	Cable Assembly, Yoke	88491-008	1
35	W4, W5	Harness, Keycap PCB-to-Ground	402302-001	2
36		Cable Clip	405558-004	3
37		Keycap Gasket	404392-001	1

Item	Reference Designation	Monochrome Monitor Parts List	Part Number	Qty
38	A9	Cable Assembly, Low-Voltage Power Supply-to-Main Processor PCB	414605-001	1
39		Nut, Keps, Hex, 6-32	4521-706	5
40		Adhesive, Hot Melt	406201-002	1
41	W8	Cable Assembly, Monochrome CRT	405739-001	1
42		Screw, Phillips, 10-32 x 3/8	45018-906	1
43	A3	12-Inch CRT, Monochrome, Flat Profile	416821-001	1
44	A2	High-Voltage Power Supply	6116-007	1
45		Tape, Hardware	403949-001	AR
46		Spring Clip, D-Type	4556-001	1
47	SP1	Speaker, 3-Inch, 8 Ω	1663-330	1
48		Screws, BDGH, Phillips, 6-32 x 1/4	45074-608	3
49		Foot, W/Threadlock	418987-001	4
50		Label, Blank	404525-006	2
51		Label, Icon, High-Voltage	70437-001	1
52		Washer, Lock, Serrated	400041-001	1
53		Plug, Equipotential	400040-001	1
54		Screw, PNH, Phillips, 6-32 x 3/8	45000-606	4
55		Screw, PNH, Phillips, 4-40 x 1/4	45000-404	4
56		Screw, PNH, Phillips, 6-32 1/4	45000-604	12
57		Standoff, Hex, 1-1/2	415145-001	4
58		Label, Icon Equipotential	70437-002	1
68		Modular Patient Monitor Accessories Service Manual (Not Shown)	404183-150	1
70		Tie Wrap	4535-001	1
71		Screw, PNH, Phillips, 8-32 x 3/8	405318-008	4

Revisions to the Solar 7000 Assemblies

The baseline revision for the Solar 7000 monochrome assembly is pn 900618-001H and pn 9000619-001K for the color assembly as presented in this chapter.

To convert the baseline part list to an earlier revision, change all part numbers, descriptions, and quantities as indicated in the revision history table below starting with the baseline revision at the end of the table and working backwards to the revision of your assembly.

PN 900618-001 Revision History

Rev	Item	Ref Design	Description	Revision's Part Number	Qty	Baseline Part Number	Qty
A			Initial Production Release				
B	29	A7	Trim Knob Control Assembly	406273-001	1	414642-001	1
C			Documentation change that does not affect the manual.				
D	24	A1	Main Processor PCB	800678-001	1	800678-002	1
	26	A4	Keycap PCB	800058-001	1	800058-003	1
	31	W3	Harness, CRT Contoller PCB-to-Main Processor PCB	414528-001	1	415548-001	1
E	62		Tie Wrap	4535-001	4	4535-001	5
F	57		Screw, Phillips, 8-32 x 1/2	45000-808	2	4502-812	2
G	5		Chassis Assembly	413600-001	1	413600-002	1
	9		Bracket, High-Voltage Supply	413598-001	1	413598-002	1
H	60		Foot, Rubber	401493-004	4	418987-001	4
	83		Screw, PNH, Phillips, 8-32 x 3/8	Not Used		405318-005	4

PN 900619-001 Revision History

Rev.	Item	Ref.	Description	Old Part No.	Qty	New Part No.	Qty
A			Initial Production Release				
B	29	A5	Trim Knob Control Assembly	406273-001	1	414642-001	1
C			Documentation change that does not affect the manual.				
D	24	A1	Main Processor PCB	800678-001	1	800678-002	1
	26	A4	Keycap PCB	800058-001	1	800058-003	1
	31	W3	Harness, CRT Contoller PCB-to-Main Processor PCB	414528-001	1	415548-001	1
E	70		Tie Wrap	Not Used		4535-001	1
F	27		Screw, Phillips, 8-32 x 1/2	45000-808	2	4502-812	2
G	5		Chassis Assembly	413600-001	1	413600-002	1
	9		Bracket, High-Voltage Supply	413598-001	1	413598-002	1
	41	W8	Cable Assembly, Monochrome CRT	407718-001	1	416820-001	1
	43	A3	12-Inch CRT, Monochrome, Flat	401606-001	1	416821-001	1

PN 900619-001 Revision History							
Rev.	**Item**	**Ref.**	**Description**	**Old Part No.**	**Qty**	**New Part No.**	**Qty**
H	18	A8	Low Voltage Power Supply	408102-001	1	408102-002	1
J	41	W8	Cable Assembly, Monochrome CRT	416820-001	1	405739-001	1
K	49		Foot, Rubber	401493-004	4	418987-001	4
	71		Screw, PNH, Phillips, 8-32 x 3/8	Not Used		405318-005	4

Solar 8000/View Disassembly Guidelines

General

Follow the guidelines described when disassembling Solar 8000 processing unit or SolarView remote display controller. You will require a standard set of hand tools.

PCB Assemblies

Observe the following guidelines when working on all PCB assemblies:

- Take against electrostatic discharge damage.
- Handle all PCB assemblies by their edges.
- Generally, use 60/40 low melting point solder. Use high melting point silver solder when working on the surface mounted components.
- Use a heatsink when soldering any photo-transistors, photodiodes, or optical isolators.
- Repair breaks in PCB tracks by bridging with wire from pad to pad. Do not lay solder across the breaks. (The heat from the soldering iron may cause the track to detach from the PCB.)
- After soldering, clean excess flux from the PCB assembly.

- If you replace the main processor, remove the serial EEPROM U9 and insert it into the replacement main processor PCB. The serial EEPROM must stay with the unit.

Hardware

- Before disassembly, note the positions of any wires or looms (cables), marking them if necessary to ensure that they are replaced correctly.
- Gray ribbon cables have retainer clips holding them in the connector.
- Save and set aside all hardware for re-assembly.

Opening the Unit for Service

Use these step-by-step disassembly instructions when you need to remove various PCB assemblies from the monitor assembly.

WARNING

Make sure the monitor is not monitoring a patient, because monitoring will be interrupted.

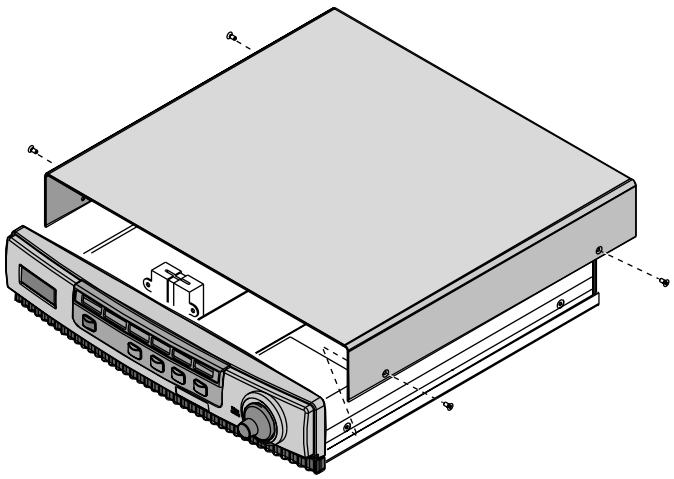
First, turn the unit OFF at the rear power switch and disconnect the AC power cord and all communication cables.

WARNING

Due to possible high voltage present, use an insulated screwdriver at all times when making adjustments.

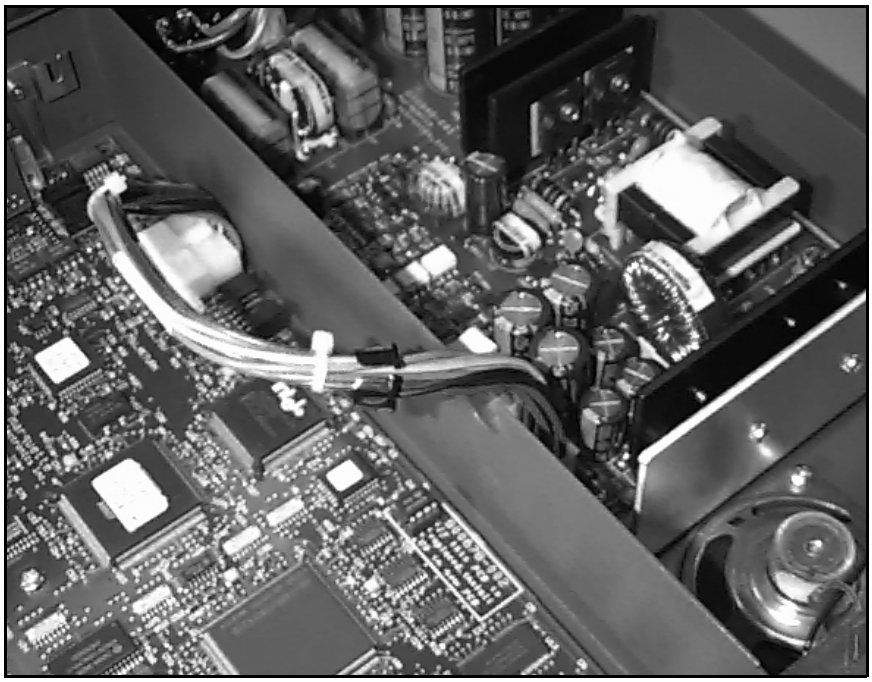
Disassembly

1. Remove the four screws attaching cover as shown.
2. Lift the cover directly up.

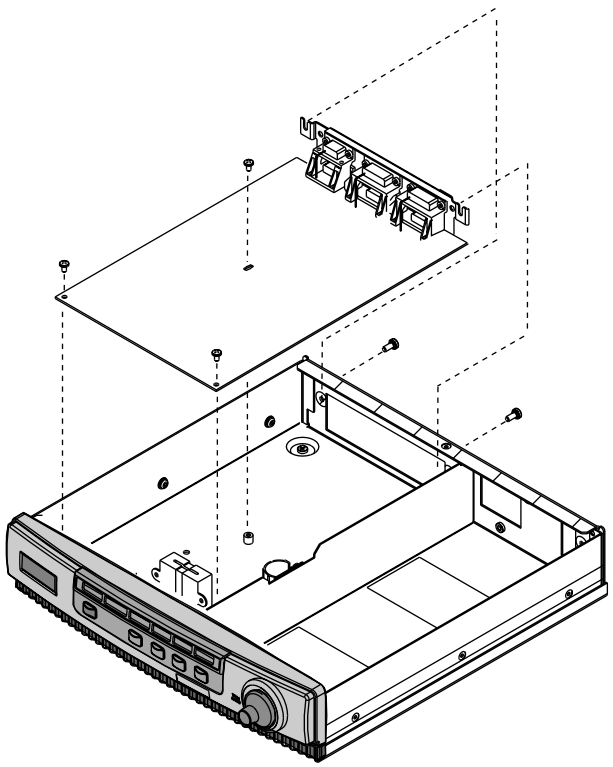


Main Processor PCB Removal

1. Squeeze and pull the harness clip from the chassis as shown below.



2. Disconnect J7 harness from the main processor PCB and remove five screws attaching the PCB.
3. After removing the PCB, disconnect harness J1 and J8.
4. Remove the serial EEPROM U9 and insert it into the replacement main processor PCB. The serial EEPROM must stay with the unit.



Power Supply Removal

Do the following to remove the power supply.

WARNING

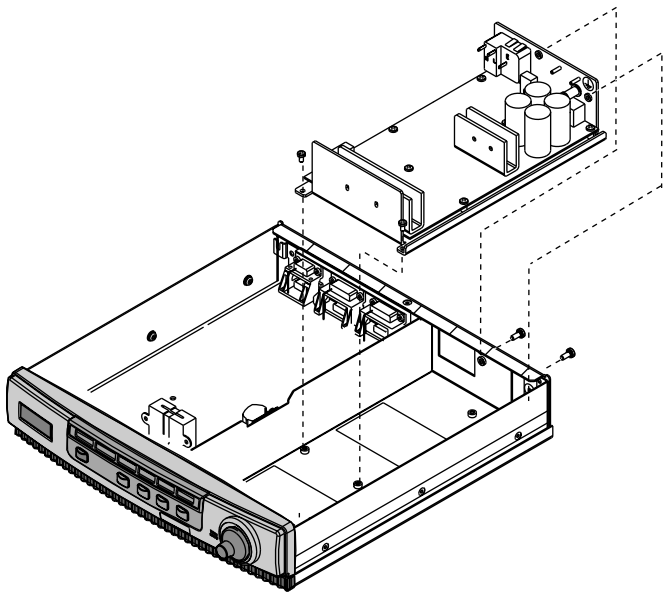
Beware of AC line voltage at the power module. When rear power switch is OFF, AC line voltage is still present. Capacitors C1-C4 may remain fully charged up to 30 seconds. Use an insulated screw driver at all times when making adjustments.

1. Verify power cord is disconnected.
2. Remove one end of the harness from the power supply assembly to the main processor PCB.

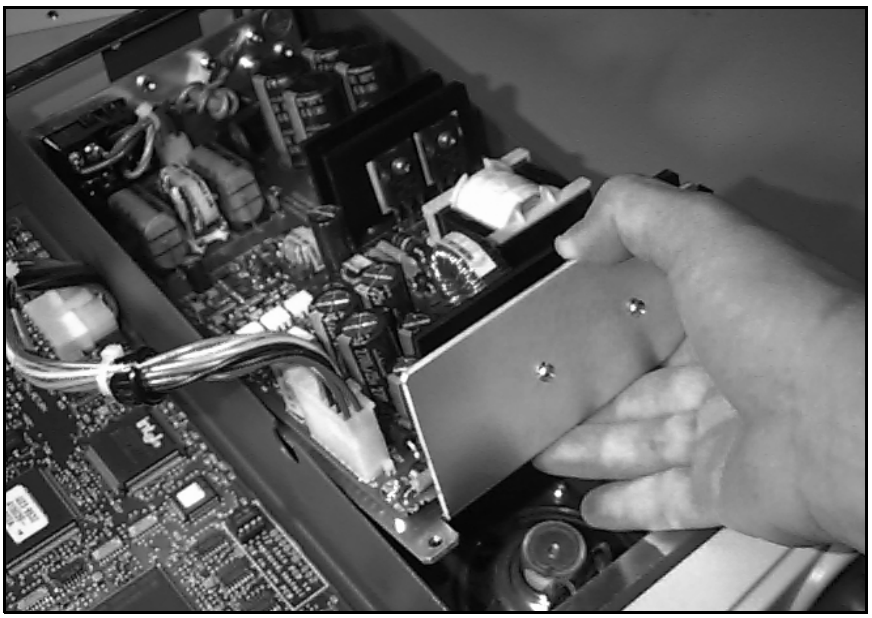
CAUTION

Keep circuit board mounted to metal sub-chassis at all times to avoid stressing solder joints and surface mount components.

3. Remove four recessed screws attaching the power supply assembly.



4. For easier removal, first tip the power supply towards the front of the unit up at a 45° angle.
5. Pull power supply out towards front of unit as shown below.



CAUTION

Fluorinated and chlorinated cleaning agents may seriously damage the aluminum electrolytic capacitors in this assembly.

Ordering Parts for Solar 8000/View

The parts lists and assembly drawings in this chapter supply enough detail for you to order parts for the assemblies considered field serviceable. If you require additional information or PCB schematics and parts lists, order the *Solar 7000/8000/View Data Manual*, pn 414993-007. For troubleshooting assistance, contact Tech Support.

To order parts, contact Service Parts at the address or telephone number listed on the "How to Reach Us...," page found in Chapter 1: "Introduction" of this manual.

Commonly Replaced Assemblies

The table below lists the most commonly replaced assemblies in the Solar 8000/View monitor. See the operator's manual for a complete list of accessories and expendable supplies.

NOTE: If you replace the main processor, remove the serial EEPROM U9 and insert it into the replacement main processor PCB. The serial EEPROM must stay with the unit.

PCB Assemblies	
Item	**Part Number**
Main Processor PCB	800678-002
Power Supply Assembly (Contains PCB pn 800948-001)	415838-001

Subassemblies	
Item	**Part Number**
Trim Knob Control Assembly	414642-001
Speaker	413246-001
Keycap Assembly	414925-002

Fuse Part Numbers

The fuses used in the Solar 8000 processing unit or SolarView remote display controller are listed below. Read fuse rating on rear of the unit to select correct fuse replacement. Refer to disassembly procedure presented earlier in this chapter to remove cover. The fuses are easily accessible on the power supply assembly, pn 415838-001.

WARNING

To avoid electric shock, always turn OFF unit and remove power cord from outlet before replacing fuses.

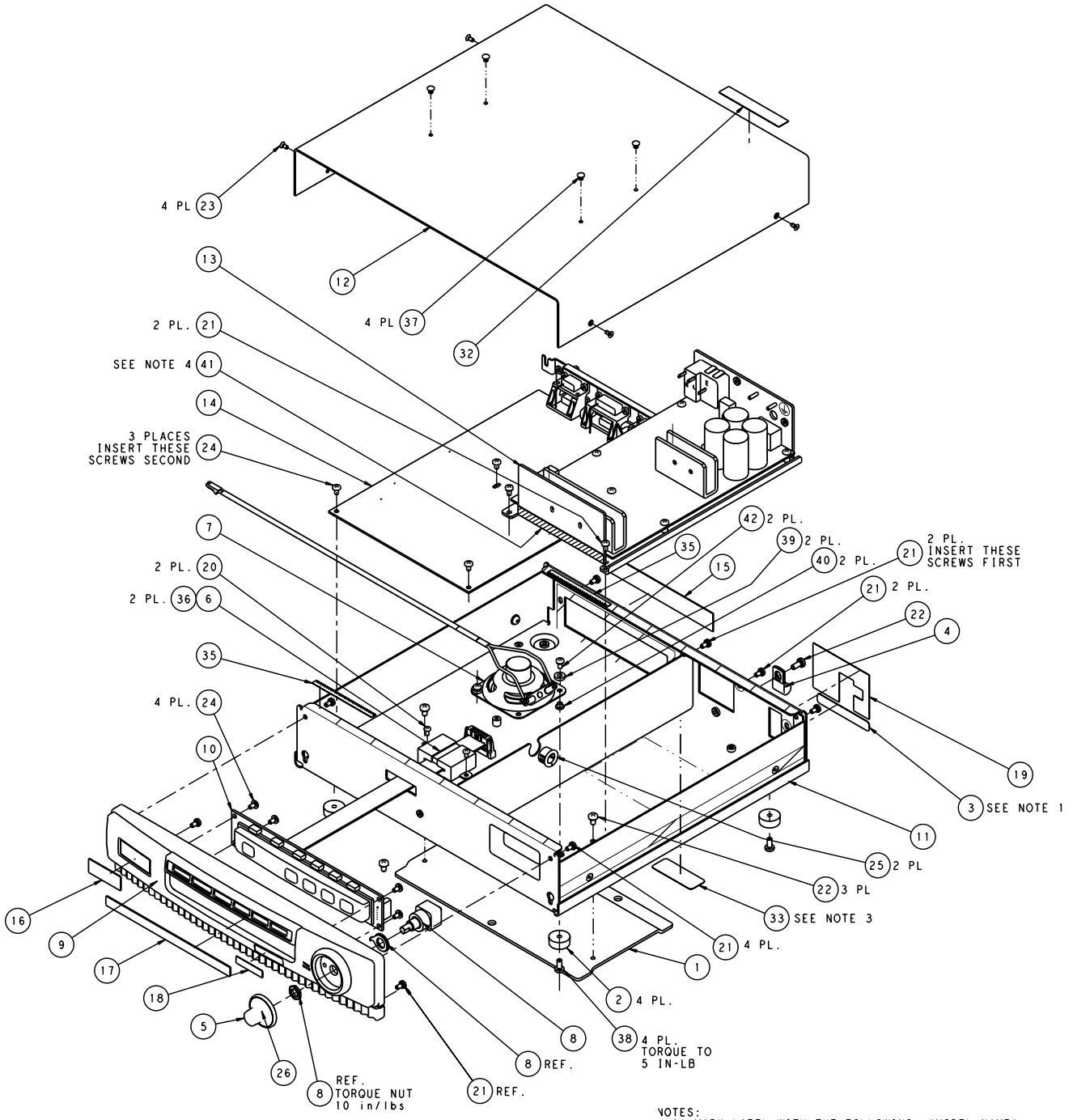
Fuses		
Description	**Part Number**	**Qty**
Fuse, 4.0A Slow Blow	1908-506	2

Solar 8000/View Labels

The list of labels given below are determined by destination and are not included in the part lists included in this chapter. To reference item numbers, refer to the exploded views provided later in this chapter. Your model will not use all the labels listed.

Solar 8000/View Processing Unit Labels		
Item	**Description**	**Part Number**
15	Rear Communication Label	415854-001
16	Solar 8000 Front Label	415487-001
16	Solar 8000N Front Label	415487-002
16	SolarView Front Label	415487-003
17	English Keycap Label Set	415690-001
17	German Keycap Label Set	415690-002
17	French Keycap Label Set	415690-003
17	Swedish Keycap Label Set	415690-004
17	Spanish Keycap Label Set	415690-005
17	Italian Keycap Label Set	415690-006
17	Dutch Keycap Label Set	415690-007
17	SolarView Keycap Label Set	417051-001
18	GE Marquette Label	415852-001
18	GE Marquette Company Label	415852-002
19	Fuse Ratings Label	415853-001
32	Label, Prescription Device	415043-002
34	Power Cord	80274-006

Exploded View PN 900691-001J



NOTES:
1) MARK LABEL WITH THE FOLLOWING; "MODEL NAME", SERIAL NUMBER, AND APPROPRIATE BARCODE.
2) LOOSE ITEMS MAY BE SHIPPED WITH THE UNIT IF SPACE PERMITS OR PACKAGED AND SHIPPED SEPARATELY.
3) LOCATE ITEM 33 APPROXIMATLY AS SHOWN. LABEL SHOULD BE ORIENTED SO THAT THE LABEL CAN BE READ WHEN VIEWING BOTTOM OF THE UNIT WITH THE POWER SWITCH POSITIONED AT THE TOP.
4) APPLY ITEM 41 TO ITEM 13 IN THE APPROXIMATE LOCATION SHOWN. TAPE MUST COVER RADIUSED EDGE OF HEAT SINK.

Parts List PN 900691-001M

Item	Reference Designation	Solar 8000 Parts List	Part Number	Qty
1		Mounting Plate	400613-005	1
2		Foot, Rubber	418987-001	4
3		Label, Serial	404525-006	1
4		Cable Clamp	4528-106	1
5		Trim Knob	406080-001	1
6		Ferrite Bead, Split	417198-001	2
7		Speaker Assembly	421378-001	1
8	SW1, W4	Switch Assembly, Rotate	414642-001	1
9		Bezel, Solar 8000	414924-001	1
10	A3, W3	Keycap Assembly	414925-002	1
11		Chassis, Solar 8000	415765-001	1
12		Cover, Solar 8000	415766-001	1
13	A2	Power Supply, Solar 8000	415838-001	1
14	A1	Main Processor PCB	800678-002	1
20		Screw, Sems, Phillips 4-40 x 1/4	45074-408	2
21		Screw, Sems, Phillips 6-32 x 1/4	45000-604	12
22		Screw, Sems, Phillips, 8-32 x 1/4	45000-804	4
23		Screw, FLH, 4-40 x 1/4, Gray	4776-833	4
24		Screw, BDGH, 6-32 x 1/4	45074-608	7
25		Bushing, Split, Heyco	4579-251	2
26		Spring Clip	4556-001	1
27	W1	Harness, Power Supply	415735-001	1
29		Shipping Box (Not Shown)	422774-001	1
30		Box Insert (Not Shown)	2001621-001	2
31		Service Manual, Solar 7000/8000/View (Not Shown)	414993-001	1
33		Label, UL-2601	416338-002	1
35		Gasket, EMC	415484-001	2
36		Clip, Ferrite Bead	417061-001	2
37		Screw, BDGH, Nylon, 6-32 x 3/16	417734-001	4
38		Screw, PNH, Phillips, 8-32 x 3/8	405318-008	4
39		Spacer	409628-001	2
40		Washer	4538-476	2
41		Tape, Kapton, 1/2 inch wide	4835-001	.4
42		Screw, PH 6-32 x .375	405318-004	2
43		Bag, Antistatic (Not Shown)	99014-001	1

Revisions to the Solar 8000/View Assembly

The baseline revision for the Solar 8000/View assembly is pn 900691-001J as presented in this chapter.

To convert the baseline part list to an earlier revision, change all part numbers, descriptions, and quantities as indicated in the revision history table below starting with the baseline revision at the end of the table and working backwards to the revision of your assembly.

PN 900691-001 Revision History

Rev	Item	Ref Design	Description	Revisions's Part Number	Qty	Baseline Part Number	Qty
A			Initial Production Release				
B	33		Label, UL-2601	Not Used		416338-002	1
C	35		Gasket, EMC 12.3L	Not Used		415484-001	2
D	10	A3, W3	Keycap Assembly	414925-001	1	414925-002	1
E			Documentation change that does not affect the manual.				
F	6		Ferrite Bead	407759-001	1	417198-001	2
	36		Clip, Ferrite Bead	Not Used		417061-001	2
	37		Screw, BDGH, Nylon, 6-32 x 3/16	Not Used		4691-002	4
G	37		Screw, BDGH, Nylon, 6-32 x 3/16	4691-002	4	417734-001	4
H	7		Speaker	413246-001	1	413246-002	1
J	2		Foot, Rubber	401493-004	4	418987-001	4
	38		Screw, PNH, Phillips, 8-32 x 3/8	Not Used	4	405318-005	4
K	38		Screw, PNH, Phillips, 8-32 x 3/8 Added torque to drawing	Not Used	4	405318-005	4
L	28	W2	Harness, Speaker	413334-001	1	Deleted	
	39		Spacer	409628-001	2	Added	
	40		Washer	4538-476	2	Added	
	41		Tape, Kapton	4835-001	.4	Added	
	42		Screw, PH 6-32 x .375	405318-004	2	Added	
M	29		Shipping Box	415488-001	1	422774-001	
	30		Box Insert	415489-001	2	2001621-001	
	43		Bag, Antistatic	99014-001		Added	