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MBT 250, MBT 220 SYSTEMS



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SERVICE MANUAL



MANUAL NO. 5050-0352

REV. B

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*Systems for Development, Production
and Repair of Electronic Assemblies*

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PACE Incorporated has provided training on all of its products since 1958 as well as advanced technology training in all aspects of hand soldering, rework and repair.

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GENERAL INFORMATION

INTRODUCTION

This manual will assist the technician in performing preventive maintenance and corrective maintenance on the MBT 250 and MBT 220 systems. If you should encounter any difficulty correcting a system malfunction, contact the PACE Service Department at TEL. (888) 535-7223 (toll-free), FAX (301) 483-7030.

The power source incorporates the highly responsive SensaTemp (closed-loop) temperature control system which provides up to 197 watts of total power to the three output channels (see Power Management, Page 9). Microprocessor controlled circuitry allows the user to quickly configure the system to their requirements and easily recalibrate the system to maintain accuracy and peak performance. Accessory SensaTemp handpieces and special use tips, allow the user to remove and replace a wide variety of component configurations.

Current production motor operated systems have an "A" (e.g., PPS 85AE) designation after the numerical digits of the power source model number to indicate that the system contains the Auto Snap-Vac feature; earlier versions did not. All air operated ("V") systems contain the Auto Snap-Vac feature.

The MBT 250 and MBT 220 systems are available in either the 115 VAC version, 100 VAC version or 230 VAC version. The systems include the Power Source with a selection of accessories and functional aids. These systems are as follows:

MBT 250 & MBT 220 SYSTEMS - Consists of PPS 85 (115 VAC, 60 Hz Version) Power Source (with integral motor pump for Vacuum & Air Pressure), plus a selection of SensaTemp handpieces and accessories.

MBT 250J & MBT 220J SYSTEMS - Consists of PPS 85J (100 VAC 50/60 Hz Version) (with integral motor pump for Vacuum & Air Pressure) Power Source, plus a selection of SensaTemp handpieces and accessories.

MBT 250E & MBT 220E SYSTEMS - Consists of PPS 85E (230 VAC 50 Hz Version) Power Source (with integral motor pump for Vacuum & Air Pressure), plus a selection of SensaTemp handpieces and accessories.

MBT 250V & MBT 220V SYSTEMS- Consists of PPS 85 (115 VAC 50/60 Hz Version) Power Source (with integral motor pump for Vacuum & Air Pressure), plus a selection of SensaTemp handpieces and accessories.

MBT 250VJ & MBT 220VJ SYSTEMS - Consists of PPS 85J (100 VAC 50/60 Hz Version) Power Source (with integral motor pump for Vacuum & Air Pressure), plus a selection of SensaTemp handpieces and accessories.

MBT 250VE & MBT 220VE SYSTEMS - Consists of PPS 85E (230 VAC 50 Hz Version) Power Source (with integral motor pump for Vacuum & Air Pressure), plus a selection of SensaTemp handpieces and accessories.

GENERAL INFORMATION

SPECIFICATIONS

POWER REQUIREMENTS

- PPS 85** - Version operates on 97-127 VAC, 50/60 Hz.
185 Watts, 1.6 Amp max, 100% Duty Cycle, Motor on.
- PPS 85J** - Version operates on 99-110 VAC, 50/60 Hz.
150 Watts, 2.5 Amp max, 100% Duty Cycle, Motor on.
- PPS 85E** - Version operates on 196-253 VAC, 50 Hz.
212 Watts, 0.92 Amp max, 100% Duty Cycle, Motor on.
- PPS 85V** - Version operates on 97-127 VAC, 50/60 Hz.
185 Watts, 1.6 Amp max, 100% Duty Cycle
- PPS 85VJ** - Version operates on 99-110 VAC, 50/60 Hz.
150 Watts, 2.5 Amp max, 100% Duty Cycle
- PPS 85VE** - Version operates on 196-253 VAC, 50 Hz.
212 Watts, 0.92 Amp max, 100% Duty Cycle

PHYSICAL PARAMETERS

- Size:** 13.5 cm H x 16.5 cm W x 26 cm D (5.3"H x 6.5"W x 10.25"D)
- Weight:** 4.5 Kg. (10 Lbs.)

ENVIRONMENTAL REQUIREMENTS

- Operating Temperature:** 0°C to 50°C (32°F to 120°F)
- Storage Temperature:** -40°C to 100°C (-40°F to 212°F)

VACUUM AND AIR

Measurements at front panel of power source.

- Vacuum Rise Time:** Evacuates 33 cc (2 cubic inch)
volume to 25 cm Hg. (10 in. Hg.) in 150 ms.
- Maximum Vacuum:** 51 cm Hg. (20 in. Hg.) (nominal)
- Pressure:** .48 Bar (7 P.S.I.) (nominal, **MAX** setting)
- Air Flow:** 9 SLPM (0.32 SCFM) maximum

GENERAL INFORMATION

SHOP AIR INPUT REQUIREMENTS (air operated systems)

Pressure:	5.48 Bar (80 p.s.i.) recommended 6.17 Bar (90 p.s.i.) maximum
Air Flow:	4.53 SLPM (1.6 SCFM) minimum

NOTE

The system must be connected to a clean, dry, filtered air supply. Connection to air supplies with moisture or contaminants will affect system performance and may cause damage to the air venturi system.

TEMPERATURE SPECIFICATIONS

Tip Temperature Range:	38°C to 482°C (100°F to 900°F) nominal (see note).
Digital Readout Resolution:	±1° (°C or °F)
Tip Temperature Stability:	±1.1°C (2°F) at Idle from Set Tip Temperature.

NOTE

Actual minimum and maximum Operating Tip Temperatures may vary depending on handpiece & tip selection.

EOS/ESD

Tip-To-Ground Resistance:	Less than 2 ohms (except on Soft Ground Systems which have a 1 meg ohm resistor in series with earth ground).
AC Leakage:	Less than 2 millivolts RMS from 50Hz to 500Hz (except on Soft Ground Systems).

GENERAL INFORMATION

PARTS IDENTIFICATION

Listed below is a description of the system power source parts. Use figures 1 & 2 as a guide.

1. **CH 1 POWER RECEPTACLE** - Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to handpiece connected to Channel 1 (CH 1).
2. **CH 2 POWER RECEPTACLE** - Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to handpiece connected to Channel 2 (CH 2).
3. **CH 3 POWER RECEPTACLE** - Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to handpiece connected to Channel 3 (CH 3).
4. **POWER SWITCH** - Turns system ON ("1") and OFF ("0"); controls input power to the system.
5. **AUTO SNAP-VAC (or SNAP-VAC) PORT** - Quick connect fitting which provides quick-rise vacuum for Sodr-X-Tractor or ThermoPik handpieces.
6. **CONTROLLABLE PRESSURE PORT** - Quick connect fitting with adjustable valve which provides variable air flow for Mini ThermoJet handpiece (in Hot Jet Mode) and Sodr-X-Tractor handpiece.
7. **DIGITAL READOUT** - Provides a three digit display of the Current Channel (channel with illuminated LED; CH 1, CH 2 or CH 3) temperature information. This includes: Operating Tip Temperature in Temperature Display Mode (normal operation), TIP OFFSET CONSTANT in Tip Offset Mode, Set Tip Temperature in Tip Set Mode and other information (see further) in Calibration (CAL) Mode.
8. **°F/°C KEY** - Selects °F or °C display of Set and Operating Tip Temperatures and TIP OFFSET CONSTANTS.
9. **°F LED** - Illuminates when Set and Operating Tip Temperatures, and TIP OFFSET CONSTANTS are displayed in °F.
10. **°C LED** - Illuminates when Set and Operating Tip Temperatures, and TIP OFFSET CONSTANTS are displayed in °C.
11. **CH 1 LED** - Illuminates when Channel 1 (CH 1) is the "Current Channel" i.e., the channel (with connected handpiece\tip) whose temperature information is displayed on the digital readout.
12. **CH 2 LED** - Illuminates when Channel 2 (CH 2) is the "Current Channel" i.e., the channel (with connected handpiece\tip) whose temperature information is displayed on the digital readout.
13. **CH 3 LED** - Illuminates when Channel 3 (CH 3) is the "Current Channel" i.e., the channel (with connected handpiece\tip) whose temperature information is displayed on the digital readout.

GENERAL INFORMATION

14. **CH SELECT KEY** - Selects the Current Channel (among "Active Channels" i.e., those with a connected handpiece).
15. **TIP SET KEY** - Allows the operator to adjust the Set Tip Temperature for the handpiece\tip combination connected to the Current Channel. Places the system in the Tip Set Mode.
16. **TIP SET LED** - Flashes when **TIP SET** Key is pressed indicating that the system is in Tip Set Mode.
17. **TIP OFFSET KEY** - Allows the operator to adjust the TIP OFFSET CONSTANT for the handpiece connected to the Current Channel. Places the system in the Tip Offset Mode.
18. **TIP OFFSET LED** - Flashes when **TIP OFFSET** Key is pressed indicating that the system is in Tip Offset Mode. Remains illuminated (not flashing) in Temperature Display Mode (normal operating mode) when a TIP OFFSET CONSTANT of greater than "3" for °C ("6" for °F) is entered.
19. **SCROLL UP KEY** - Increases the Set Tip Temperature (in Tip Set Mode) and the TIP OFFSET CONSTANT (in Tip Offset Mode) in one, then ten degree increments. Also used in "CAL" (Calibration) Mode.
20. **SCROLL DOWN KEY** - Decreases the Set Tip Temperature (in Tip Set Mode) and the TIP OFFSET CONSTANT (in Tip Offset Mode) in one then ten degree increments. Also used in "CAL" (Calibration) Mode.
21. **EARTH GROUND RECEPTACLE** - provides positive earth ground to which a ground cable can be connected from the workpiece or work surface as part of a static control program.
22. **TIP & TEMPERATURE SELECTION SYSTEM CHART HOLDER** - Holds PACE's Tip & Temperature Selection System Charts which enable the operator to accurately set and display the true, correct operating tip temperature for any handpiece\tip configuration.
23. **AC POWER RECEPTACLE/FUSE HOLDER** - Receptacle for providing power to the system from AC outlet through power cord. Also location of Fuse (F1) which protects system from overcurrent conditions.
24. **CAL/SET KEY LOCK (optional)** - In the "LOCK" position, Set Tip Temperatures and TIP OFFSET CONSTANTS cannot be changed. In addition, the system cannot be put into "CAL" Mode. In the "UNLOCK" position, all system functions operate normally.
25. **FOOT PEDAL RECEPTACLE** - Input for Foot Pedal (optional) which actuates vacuum or pressure to the air-operated handpieces.
26. **FUSE** - Provides overload protection for MBT system.

GENERAL INFORMATION

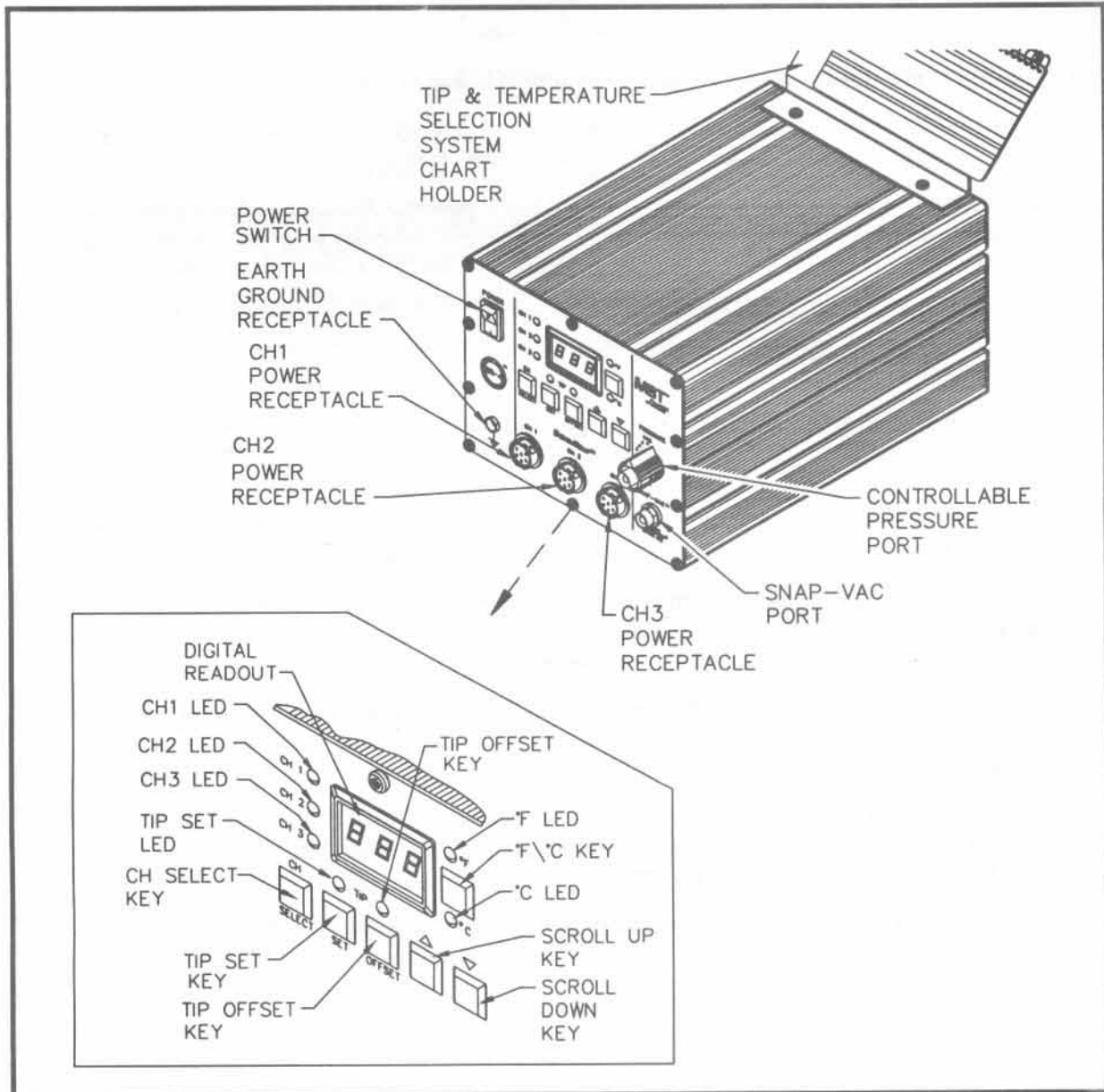


Figure 1. Parts Identification, Front View

GENERAL INFORMATION

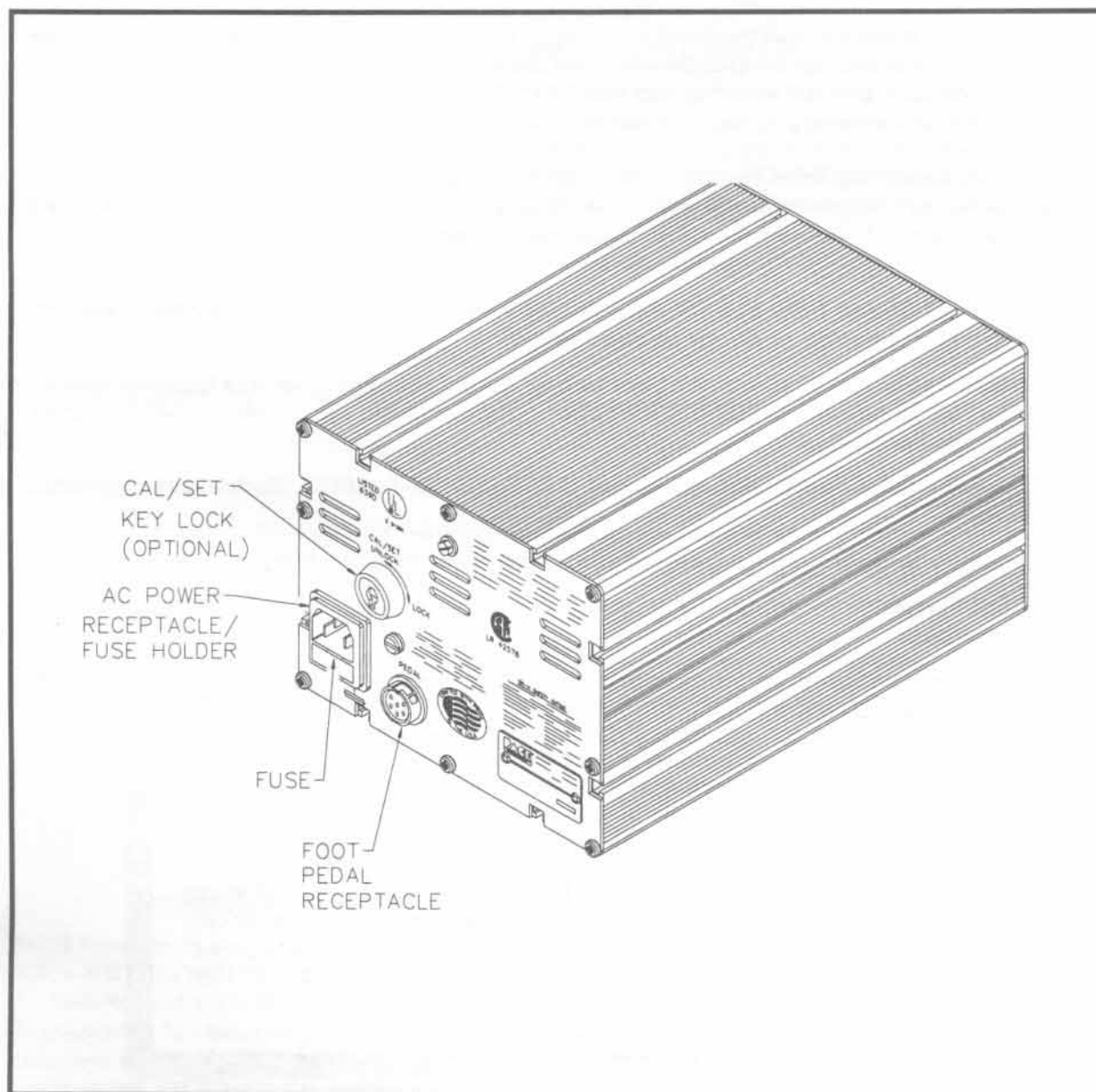


Figure 2. Parts Identification, Rear View

GENERAL INFORMATION

CAPABILITIES

All capabilities are dependent upon the use of the appropriate Functional Accessories or Work Aids. Available SensaTemp handpieces and their associated assembly and repair functions are listed below. An Operations and Maintenance Manual is provided separately with each TT-65, TJ-70 and TP-65 handpiece which describes the applications and recommended procedures for that particular tool.

SP-2A Sodr-Pen Soldering Iron - Provides a wide range of SMD and thru-hole installation and removal capability as well as unsurpassed thermal performance on heavy, multilayer thru-hole assemblies at safe, lower working temperatures. A wide variety of 3/16" shank, quick change thru-hole and SMD tips (for chip components, SOTs, SOICs and other components) are available.

SP-1A Sodr-Pen Soldering Iron - Uses 1/8" shank tips and features a slimmer, more compact heater than the SP-2 Sodr-Pen for easier access on densely populated assemblies.

SX-70 Sodr-X-Tractor handpiece - Air handpiece ideal for thru-hole desoldering on extra high mass multilayer boards. Also ideal for removal of TSOP & TQFP surface mount components and for "Flo" desoldering during surface mount land preparation.

TT-65 ThermoTweez handpiece - Performs removal of PLCC (J Leaded), LCCC (leadless) and other surface mount devices.

TP-65 ThermoPik handpiece - Air handpiece performs removal of Flat Pack, QFP & PQFP surface mount devices.

DTP-80 Dual ThermoPik handpiece - Air handpiece performs removal of large Flat Pack, QFP, PQFP & BGA surface mount devices.

TJ-70 Mini ThermoJet handpiece - Air handpiece. Focused hot air reflow handpiece used for installation of all types of surface mount devices.

NOTE

The MBT 250 & MBT 220 products feature PACE'S unique SensaTemp closed loop temperature management system which will function only with the SensaTemp handpieces listed above. Do not attempt to use any other handpiece. Likewise, use SensaTemp handpieces on only those systems with a SR-3 or SR-4 rating (marked on Front Panel of power source). These include other MBT systems (MBT 101, MBT 201 and higher) and all ST series systems.

GENERAL INFORMATION

POWER MANAGEMENT

IMPORTANT POWER MANAGEMENT NOTE

The MBT 250 and MBT 220 systems will perform nominally when using any combination of handpieces with a total of 197 Watts or less. When using 2 TT-65 ThermoTweez or DTP-80 Dual ThermoPik handpieces on the system, PACE recommends that the operator leave the third Power Receptacle vacant to insure optimum performance.

MAX. POWER

1. SP-2A Sodr-Pen Soldering Iron 54 Watts
2. SP-1A Sodr-Pen Soldering Iron 37 Watts
3. SX-70 Sodr-X-Tractor handpiece (air handpiece)..... 48 Watts
4. TT-65 ThermoTweez handpiece 74 Watts (37 Watts each heater)
5. TJ-70 Mini ThermoJet handpiece (air handpiece) 75 Watts
6. TP-65 ThermoPik handpiece (air handpiece) 43 Watts
7. DTP-80 Dual ThermoPik handpiece 74 Watts (37 Watts each heater)

NOTE

Although 2 air handpieces can be powered up and idle at set temperature simultaneously, only one may have its air hose attached to the unit and operate at a time. In addition, any other combination of handpieces with a total of 197 Watts or less will perform nominally (add the Wattage designations on the heater flange(s) of each handpiece to calculate total Watts). For example, you may want to have two or more SP-2A Sodr-Pens with different tips powered up at one time for convenience.

PACE recommends the purchase of a ST series system power source which can be used in conjunction with a MBT 250 or MBT 220 system. For example, you may want to power a TJ-70 Mini ThermoJet, SP-2A Sodr-Pen and a SX-70 Sodr-X-Tractor handpiece on your MBT 250A, and power a TT-65 ThermoTweez handpiece on your ST 20-TT system to suit your particular application. If you require assistance in the use of this product for your particular application, contact your local authorized PACE dealer or call PACE Technical Support at Tel. (toll free)1-888-535-PACE (7223) or FAX (301) 604-8782.

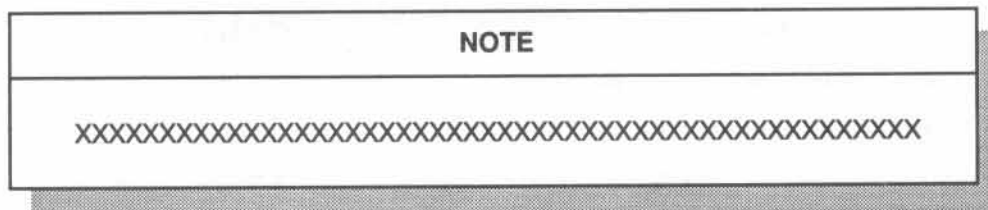
SAFETY

The purpose of this "SAFETY" section is to inform users of the heading guidelines used in this manual to indicate special Notes, Cautions, Warnings or Dangers. Also included are recommended precautions which must be observed when operating or servicing this product.

HEADING GUIDELINES

PACE adheres to the following Heading Guidelines (based on OSHA guidelines) when listing special information or precautions to be taken. Especially important are all procedures and practices which, if not strictly observed, could result in injury or loss of life.

These "NOTES", "CAUTIONS", "WARNINGS" and "DANGERS" are inserted in this manual whenever deemed necessary. They appear in a blocked off form with double outline and a shaded background to highlight the information as shown below.



NOTE

Used to indicate a statement of company recommendation or policy. The message may relate directly or indirectly to the safety of personnel or protection of property. NOTE is not associated directly with a hazard or hazardous situation and is not used in place of "CAUTION", "WARNING" or "DANGER".

CAUTION

Used to indicate a hazardous situation which may result in minor or moderate injury. May also be used to alert personnel to conditions, procedures and practices which, if not observed, could result in damage to or destruction of the product or other equipment.

WARNING

Used to define additional information that if not closely followed might result in serious damage to equipment and represent a potential for serious personnel injury.

DANGER

Defines additional information that if not closely followed might result in severe personnel injury or death. Danger is not used for property damage unless personal injury risk is present.

PRECAUTIONS

The following are general safety precautions which personnel must understand and follow when using or servicing this product. These precautions may or may not be included elsewhere in this manual.

USEAGE PRECAUTIONS

CAUTIONS

1. SensaTemp handpiece heaters and installed tips are hot when handpiece is powered on. **DO NOT** touch either the heater or tip. Severe burns may result! Always store handpiece in the appropriate Tip & Tool Stand when not in use.
2. Always use this system in a well ventilated area. A fume extraction system such as those available from PACE are highly recommended to help protect personnel from solder flux fumes.
3. Exercise proper precautions when using materials (e.g., solder paste). Refer to the Material Safety Data Sheet (MSDS) supplied with each chemical and adhere to all safety precautions recommended by the manufacturer.

NOTES

1. The standard solder collection chamber in the PACE Sodr-X-Tractor is made of glass. Never remove this chamber using pliers. Breakage of the chamber may result. Always remove using the procedures recommended by PACE in the associated handpiece manual.
2. The front end (heater end) of the solder collection chamber in the PACE Sodr-X-Tractor is hot when the handpiece is in use. When removing the chamber for cleaning, grip the chamber at the rear seal. Never touch the front end of the chamber with bare hands. Allow the chamber to cool before cleaning.
3. Always store any connected handpiece in the appropriate Tip & Tool Stand.

SAFETY

SERVICING PRECAUTIONS

DANGERS

POTENTIAL SHOCK HAZARD - Repair procedures performed on this product should be performed by qualified service personnel only. Line voltage parts will be exposed when equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the power source.

NOTES

Refer to the MBT 250, MBT 220 Operation & Maintenance Manual (P/N 5050-0380) for complete information on system operation.

To insure continued peak performance, use genuine PACE replacement parts.

QUICK REFERENCE

The Quick Reference Chart shown below may be used as a guide for quickly changing any particular parameter stored within the MBT 250/220 system. Locate the parameter you wish to change in the column marked "ACTION" and follow the simple instructions given under "Procedure". Remember that if the system is equipped with a Key Lock feature, the switch must be turned to the **UNLOCK** position before making any changes.












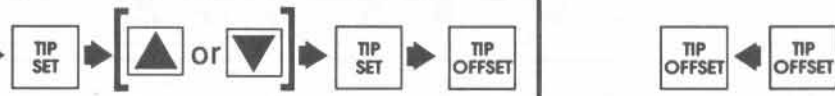
ACTION	PROCEDURE
SELECT CURRENT CHANNEL	PRESS KEY → 
CHANGE SCALE °F/°C READOUT	PRESS KEY → 
ADJUST TIP OFFSET CONSTANT	PRESS KEYS →  → [ or ] → 
ADJUST SET TIP TEMPERATURE	PRESS KEYS →  → [ or ] → 

TABLE 1. QUICK REFERENCE CHART

QUICK REFERENCE

ACTION	PROCEDURE
ENTER CALIBRATION (CAL) MODE	<p>PRESS & HOLD POWER ON RELEASE AFTER 3 SECONDS</p> 
SET DEFAULT TEMP SCALE (°F/°C) **	<p>PRESS KEYS → TIP SET → [F / °C] → TIP SET → TIP OFFSET</p>
CHANGE LOWER TEMP LIMIT **	<p>PRESS KEYS → TIP SET → TIP SET → CH SELECT → TIP SET → [▲ or ▼] → TIP SET → TIP OFFSET (PRESS TWICE)</p>
CHANGE UPPER TEMP LIMIT **	<p>PRESS KEYS → TIP SET → TIP SET → CH SELECT → TIP SET → TIP SET → [▲ or ▼] → TIP SET</p>
AUTO TEMP SETBACK **	<p>PRESS KEYS → TIP SET → [▲ or ▼] → TIP SET → TIP OFFSET</p> 
AUTO POWER DOWN **	Automatically enabled or disabled with AUTO TEMP SETBACK feature.

** SYSTEM MUST BE IN CALIBRATION (CAL) MODE.

TABLE 1. QUICK REFERENCE CHART CONTINUED

QUICK REFERENCE









ACTION	PROCEDURE
MANUAL SETBACK ON ALL ACTIVE CHANNELS	<p>PRESS & HOLD RELEASE AFTER 1 SECOND</p> <p> +  →  + </p>
EXIT SETBACK ON ALL ACTIVE CHANNELS	<p>PRESS & HOLD RELEASE AFTER 1 SECOND</p> <p> +  →  + </p>

TABLE 1. QUICK REFERENCE CHART CONTINUED



CALIBRATION

This "Calibration" section provides the information necessary to calibrate the system power source (in Calibration Mode) and measure the tip temperature of SensaTemp handpieces.

POWER SOURCE

With the system power source In the Calibration (CAL) Mode, you can:

1. Change the Upper and Lower Temperature limits for each Channel independently.
2. Set the Default Temperature scale to °F or °C as desired.
3. Enable or disable the Auto Temperature Setback/Power Down features.
4. Calibrate your system to assure continued accuracy and peak performance using the optional Calibration Kit (see "Replacement Parts" section of this manual).

KEY LOCK OPTION

1. An optional Key Lock feature is available from PACE which prevents unauthorized alteration of Temperature and Offset settings or Calibration of the system. Check the rear panel of the system Power Source. If the Key Lock feature is present there will be a Key Lock switch located in the upper left portion of the panel. Use the key to turn the switch to the **UNLOCK** position. If the feature is not present, there will be a round plastic filler plug present at that location.

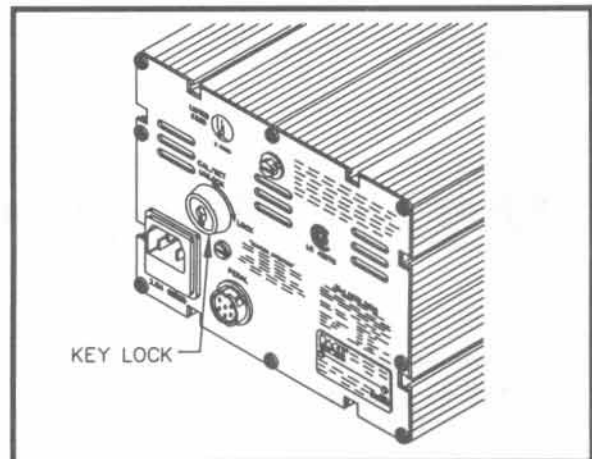


FIGURE 3. KEY LOCK OPTION

IMPORTANT

THE KEY LOCK SWITCH MUST BE TURNED TO THE **UNLOCK** POSITION TO ALTER ANY OF THE DATA STORED IN MEMORY OR TO CALIBRATE THE SYSTEM.

CALIBRATION

ENTERING CALIBRATION (CAL) MODE

2. Place **POWER** Switch in the "OFF" ("0") position.

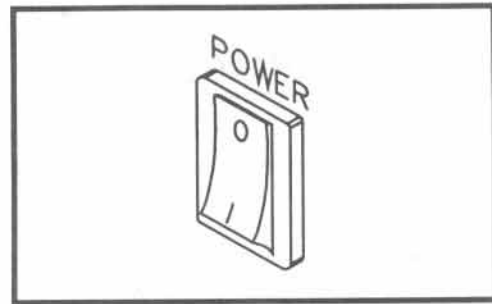


FIGURE 4. POWER OFF

3. Press and hold the **TIP SET** and Scroll Down Keys together.

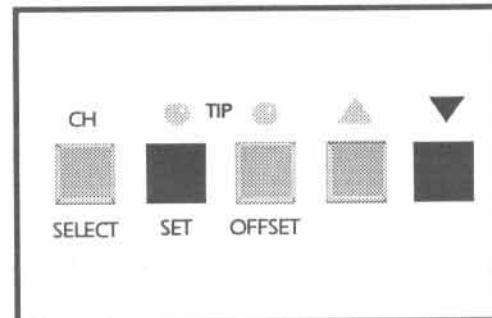


FIGURE 5. CALIBRATION ENTRY

4. Place **POWER** Switch in the ON ("1") position. All of the system LEDs will light. The Temperature Display will read "888" and change to read "1-3" (latest revision level at the time of this printing; earlier versions are "1-1" & "1-2").

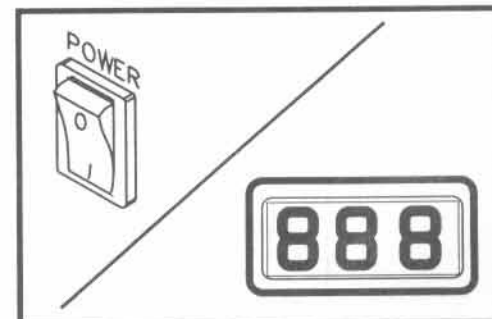


FIGURE 6. POWER ON

CALIBRATION

5. Release the **TIP SET** and Scroll Down Keys. The Digital Readout will now display "CAL" and only the three Channel LEDs will remain lit signifying that the system is now in Calibration (CAL) Mode.



FIGURE 7. DIGITAL READOUT "CAL"

°F/°C READOUT DEFAULT

6. Press and release the **TIP SET** Key. The Digital Readout will display "S - X" (X = "-" or 1-9). Either the °F or °C LED will be on. This is the default temperature scale of the Digital Readout (e.g., if the °C LED is on, the Digital Readout will display Tip Temperatures and TIP OFFSET CONSTANT values in °C).

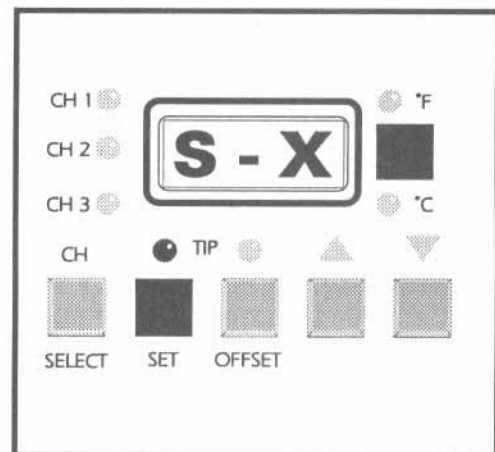


FIGURE 8. DIGITAL READOUT "S - X"

7. Press and release the °F/°C Key to change the default. Each subsequent press and release of the key will change the default.

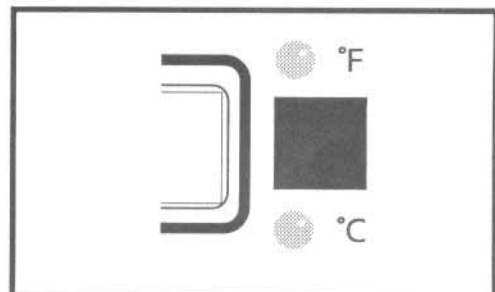


FIGURE 9. CHANGE TEMPERATURE DEFAULT

CALIBRATION

AUTOMATIC SETBACK

- As received from the factory, "S - -" will be displayed indicating that the Automatic Temperature Setback is turned off. A "1" thru "9" appearing on the right side of the Digital Readout indicates time to Automatic Setback in increments of 10 minutes. For example, "S-3" would indicate that any Active Channel will set back its handpiece's Set Tip Temperature to 177°C (350°F) after 30 minutes of handpiece inactivity (non-use). To change the time period or turn the Automatic Temperature Setback feature off or on, use the Scroll Keys. Press the Scroll Up Key to increase the time period and/or enable the feature. Press the Scroll Down Key to decrease the time period or disable the feature.

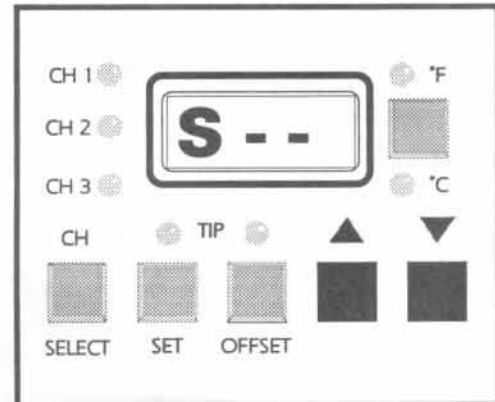


FIGURE 10. DIGITAL READOUT "S - -"

- Press the **TIP SET** Key to store the °F/°C default and Automatic Temperature Setback time value in system memory. The Digital Readout will revert to "CAL" and only the CH 1 LED will remain lit.

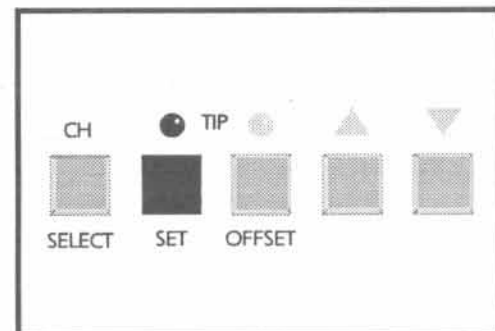


FIGURE 11. PRESS TIP SET KEY

AUTOMATIC POWER DOWN

10. The Automatic Power Down feature operates when (and only when) the Automatic Temperature Setback feature is enabled. No additional steps are necessary. For example, power to all channels is turned off 90 minutes after the last Active Channel's Tip Temperature is set back. For additional information on this feature, refer to the "Automatic Power Down" section of this manual.

CHANNEL SELECTION

11. The CH 1 LED is now on signifying that Channel 1 is ready for calibration. Perform steps 12 through 21 to calibrate. Change channels as directed and repeat these steps for each channel.

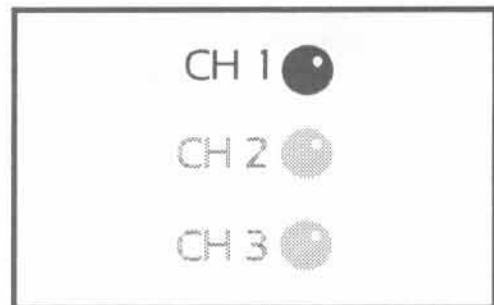


FIGURE 12. CHANNEL 1 CURRENT CHANNEL

CALIBRATION

TEMPERATURE LIMITS

NOTE

All temperature limits are entered and stored in system memory in degrees F.

A) LOWER TEMPERATURE LIMIT SETPOINT

12. Press and release the **TIP SET** Key. The Digital Readout will now display "L-X" (X = 1-9). This is the stored value of the Lower Temperature Limit in increments of 100°F. For example, "L-5" is displayed, the Lower Limit is 500°F.

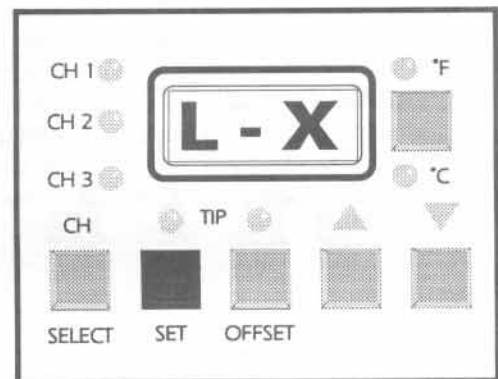


FIGURE 13. LOWER TEMP. LIMIT

13. Press Scroll Keys as necessary to increase (Scroll Up Key) or decrease (Scroll Down Key) the Lower Temperature Limit value.

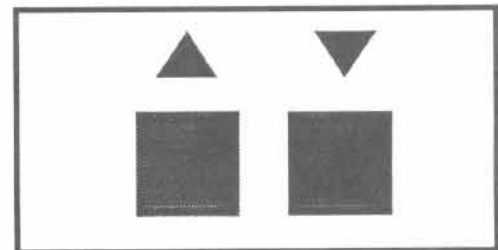


FIGURE 14. CHANGE LOWER TEMP. LIMIT

14. Press and release the **TIP SET** Key to store the displayed value into memory.

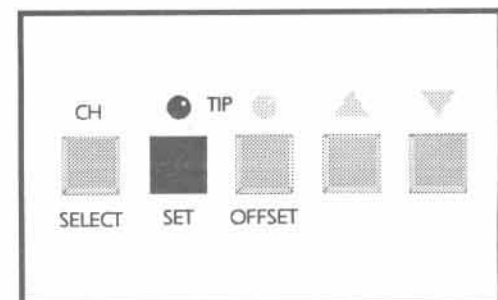


FIGURE 15. PRESS TIP SET KEY

CALIBRATION

B) UPPER TEMPERATURE LIMIT SETPOINT

15. The Digital Readout now displays "H-X" (X = 1-9). This is the stored value of the Upper Temperature Limit in increments of 100°F.



FIGURE 16. UPPER TEMP. LIMIT

16. Press Scroll Keys as necessary to increase (Scroll Up Key) or decrease (Scroll Down Key) the Upper Temperature Limit value.

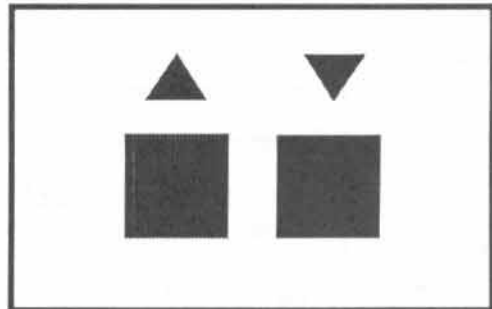


FIGURE 17. CHANGE UPPER TEMP. LIMIT

CALIBRATION

B) UPPER TEMPERATURE LIMIT SETPOINT CONT'D

17. Press and release the **TIP SET** Key to store the displayed value into memory. The Digital Readout will now display "C-1".

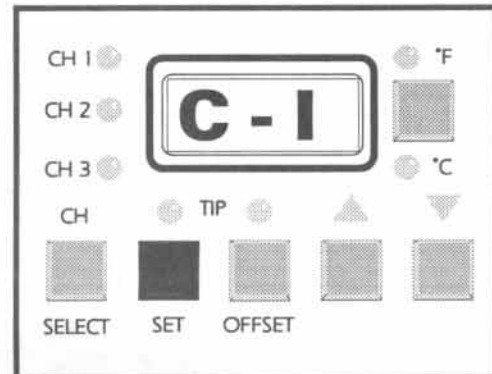


FIGURE 18. "C-1" DISPLAY

NOTE

If you do not have PACE P/N 6993-0133 Calibration Kit or if you do not wish to recalibrate for Digital Readout accuracy, press the **TIP OFFSET** Key and perform steps 12 through 17 to set Upper and Lower Temperature Limits for Channel 2: Repeat for Channel 3. After all channels have been calibrated, you may exit the Calibration Mode by pressing and releasing the **TIP OFFSET** Key again.

18. Disconnect the handpiece from the Current Channel's Power Output Receptacle and insert the "C-1" Calibration Module.

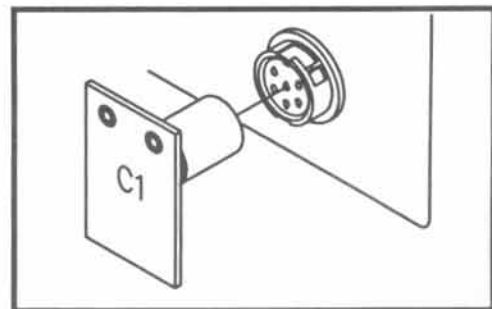


FIGURE 19. INSERT "C-1" MODULE

CALIBRATION

DIGITAL READOUT ACCURACY

19. Press and release the **TIP SET** Key. The Digital Readout will flash "---" to indicate that the system microprocessor controlled temperature sensing and display circuitry is recalibrating one aspect of the system circuitry. "C-2" will now be displayed.

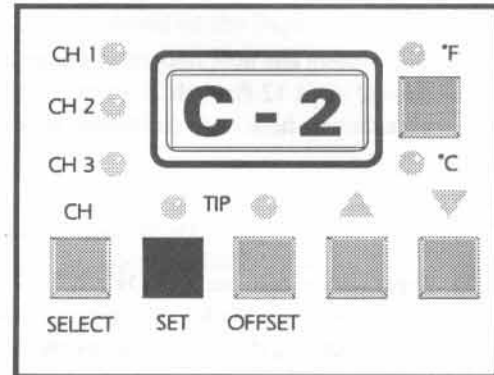


FIGURE 20. "C-2" DISPLAY

20. Remove the "C-1" Calibration Module and insert the "C-2" Calibration Module.

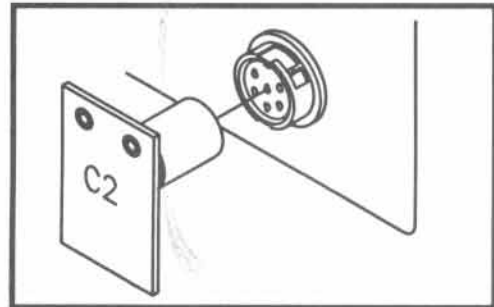


FIGURE 21. INSERT "C-2" MODULE

21. Press and release the **TIP SET** Key once again. The Digital Readout will flash "---" to indicate that the system microprocessor controlled temperature sensing and display circuitry is recalibrating another aspect of the system. "CAL" will now be displayed, indicating that calibration of this channel is complete.



FIGURE 22. DIGITAL READOUT "CAL"

CALIBRATION

DIGITAL READOUT ACCURACY CONT'D

22. The system has now stepped to the next Active Channel. Repeat steps 12 through 21 to calibrate this channel. If all channels have been calibrated, proceed to step 23.

23. Press and release the **TIP OFFSET** Key two times to exit Calibration Mode. All values, features and defaults entered during the calibration are now stored in memory and all Set Tip Temperatures are turned "OFF". All Channel Tip Temperature Offset values are set to the default value of "3" for °C ("6" for °F).

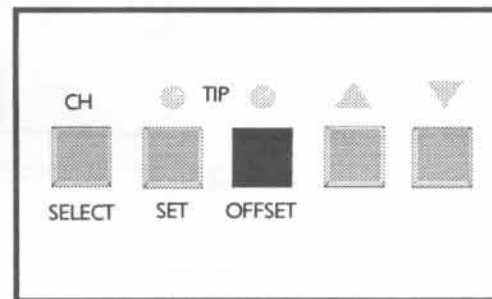


FIGURE 23. EXIT CALIBRATION MODE

DIGITAL READOUT MESSAGE CODES

Listed below are Message Codes and a description of each which may be displayed on the Digital Readout during the calibration procedure.

DISPLAY MESSAGE	DESCRIPTION
C-1 OR C-2	Indicates system is ready to process Digital Readout accuracy calibration for a particular channel using the appropriate calibration module.
CAL	Indicates that system is in the Calibration Mode.
E-5	Input to control circuitry unstable. Indicates that no calibration module is connected to the channel being calibrated or the incorrect module has been inserted.
E-6	Loose connection. Calibration input is out of range. Normally occurs if incorrect calibration module is inserted.
H-X (X = 1 thru 9)	Indicates the Current Channel is ready to accept new Upper Temperature Limit setpoint X (X times 100°F).
L-X (X = 1 thru 9)	Indicates the Current Channel is ready to accept new Lower Temperature Limit setpoint X (X times 100°F).
OFF	This channel setpoint is below Lower Temperature Limit setpoint.
S--	Indicates that the Automatic Temperature Setback (and Power Down) feature is disabled (turned off).
S-X	Indicates that the Automatic Temperature Setback (and Power Down) feature is enabled (turned on) and will set each channels' Set Tip Temperature back after X times 10 minutes of handpiece inactivity (non-use).
--- (flashing)	Indicates that the system circuitry is proceeding with calibration using the proper calibration module (C-1 or C-2).

REFER TO "CORRECTIVE MAINTENANCE" SECTION FOR OTHER ERROR CODES

TABLE 2. DIGITAL READOUT MESSAGE CODES

CALIBRATION

TIP TEMPERATURE MEASUREMENT

If there is a requirement to check the actual tip temperature of a SensaTemp handpiece, perform the following procedure for attaching a thermocouple wire to the handpiece tip. A Process Monitor is available from PACE which will provide a temperature readout and can perform a variety of additional tests such as Tip to Ground resistance and vacuum checks.

A thermocouple may be attached to a tip by spot welding a thermocouple wire onto the end of the tip or by embedding the wire into a drilled hole at the tip end. Either method will produce accurate results.

MATERIALS REQUIRED

1. **PACE Process Monitor or Temperature Meter**
2. **Soldering Iron Tip.** Listed below are the available tips PACE uses (with and without embedded thermocouples).
 - a) Use PACE part number 7021-0004-P1 tip with embedded thermocouple or tip only part number 1121-0337 on handpieces with 4.76 mm (3/16 inch) heater bore.
 - b) Use PACE part number 7021-0003-P1 tip with embedded thermocouple or tip only part number 1121-0130 on handpieces with 3.18 mm (1/8 inch) heater bore.

NOTE

When using tips with embedded K type thermocouples supplied by PACE with a K type temperature meter, a PACE part number 1332-0164-P1 RCA to Omega style, K type, thermocouple adapter must be used.

The following items are needed if you are NOT using the PACE part number 7021-0003-P1 or 7021-0004-P1 embedded tips.

3. **Thermocouple**, 30 AWG ("K" type when using Process Monitor or type compatible with Temperature Meter)
4. **Copper Wedge** (used when embedding thermocouple) or 16 AWG Bare Copper Wire (1.22 mm (.048 inch) O.D.)
5. **Drill Bit** (used when embedding thermocouple), 1.5 mm (.059 inch) diameter

SPOT WELDING PROCEDURE

1. Place the thermocouple end onto the tip just past the tinned end (approximately 6.35 mm (.25 inch)).
2. Spot weld the thermocouple to the tip. Check to insure that the thermocouple is properly attached to the tip.

EMBEDDING PROCEDURE

1. Drill a 1.5 mm (.059 inch) hole just past the tinned end of the soldering tip (approximately 6.35 mm (.25 inch) when using one of the recommended PACE tips). Drill to a depth of 2.54 mm (.100 inch).
2. Place the end of the thermocouple wire into the hole. Ensure that the end of the wire bottoms out in the hole.
3. Wedge the thermocouple into place using the copper wedge or bare copper wire. The thermocouple should be wedged as air tight as possible.

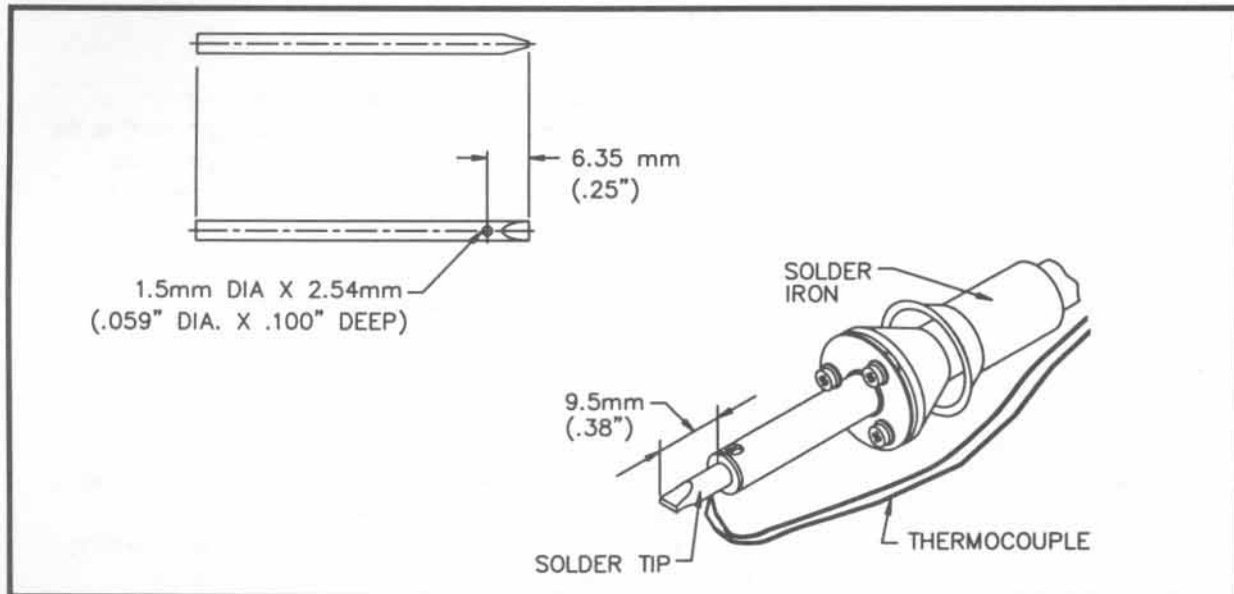


FIGURE 24. THERMOCOUPLE ATTACHMENT

TIP TEMPERATURE TEST

1. Install the tip into the handpiece to be tested with the end of the tip properly seated. The recommended PACE tips are shown extending out of the heater 9.5mm (3/8 inch).
2. Connect the free end of the thermocouple wire to the PACE Process Monitor (or temperature meter).
3. Apply power to the handpiece and allow temperature to stabilize.

REPAIR

REPAIR PROCEDURE

The "REPAIR" section of this manual provides the technician with the information necessary to determine the source and take the necessary steps to correct the malfunction of a unit. In order to perform the most expedient repair, the technician must follow the process listed below step by step, in order. Failure to do so will make the repair much more difficult.

1. PERIODIC MAINTENANCE - No periodic or special maintenance is required on these systems.
2. SERVICE HINTS - Read these helpful hints which give information on operation and troubleshooting.
3. CORRECTIVE MAINTENANCE - A guide for resolving malfunctions caused by improper maintenance or handpiece failure. Locate the "Symptom" in the "Corrective Maintenance" section which best describes the malfunction of the failed unit. Check each point described under "Solution" in order of listing.
4. DISASSEMBLY/ASSEMBLY - Contains Disassembly/Assembly instructions which enables the technician to disassemble and assemble the unit properly.
5. FLOW CHARTS & WIRING DIAGRAMS - Easy to follow Flow Charts and Wiring Diagrams & Schematics which enable the technician to determine the source of a malfunction down to an assembly (e.g., Main PCB Assembly) level. Locate the Flow Chart which best describes the malfunction of the failed unit. Follow the instructions on the Flow Chart and perform the checks indicated to determine the source of the malfunction.
6. PACE SERVICE DEPARTMENT - If the cause for the malfunction has not been determined at this point, call the PACE Service Department at TEL:(888) 535-7223 (toll-free), FAX (301) 483-7030.

DANGER

POTENTIAL SHOCK HAZARD - Repair Procedures are to be performed by qualified service personnel only. Removal of the power source panels exposes line voltage parts. Service personnel must insure that the AC Power Cord is disconnected prior to disassembly.

REPAIR

SERVICE HINTS

1. **FUSE FAILURES:** Failures are usually caused by shorts in the handpiece. Always check each connected handpiece using the "Heater Assembly Checkout Procedures" table before replacing the fuse.

NOTE
Insure that the replacement fuse is the proper value for the power source. Refer to the "Power Source Replacement Parts" table.

2. **VACUUM FAILURES:** Failures of this nature can be caused by either the unit or the handpiece. Remove the Air Hose (and attached VisiFilter) from the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port and check for vacuum at the port. If sufficient vacuum is present, the malfunction exists in the handpiece. Further, if vacuum is sufficient at the port, check the vacuum level at the end of the glass solder collection chamber (Sodr-X-Tractor handpieces only, chamber must be checked cold). Take the applicable steps shown following.
 - a) **Handpiece Failures:** Replace VisiFilter if necessary; clean heater bore and replace tip, check air hose for holes and ensure that glass solder collection chamber (Sodr-X-Tractor handpieces only) is properly seated against heater seal.
 - b) **Unit Failures:** Remove the unit front panel (see "Disassembly/Assembly"). Check internal hosing for kinks and replace internal VisiFilter (attached to pressure port on motor pump assembly).
3. **HEATING CONTROL CIRCUITS:** Must be checked under load (with handpiece/s plugged in). The output(s) are obtained by switching triacs on and off. The voltage level to the handpiece(s) does not change when adjusting the Variable Temperature Control knob(s). Temperature level is achieved by varying the number of AC cycles that the voltage is applied. The control circuit of the unit varies the duty cycle of voltage application as required to achieve and maintain the set temperature of the handpiece.
4. **HEATING FAILURES:** Usually caused by defective handpiece heaters. In normal operation, if the Digital Readout on the front panel of the power source is displaying the tip temperature of the handpiece, the temperature displayed should closely match the Set Tip Temperature. If the temperature displayed is room temperature, the handpiece heater assembly is probably defective. Refer to the "Heater Assembly Checkout Procedures" table.

CORRECTIVE MAINTENANCE**VISIFILTER ELEMENT REPLACEMENT**

Follow the procedure listed below to replace the VisiFilter element when it becomes clogged or discolored.

1. Disconnect the handpiece air hose by gently turning and pulling the coupled Fittings.
2. Disconnect the Visifilter and hose assembly from the Power Source by gently turning and pulling the male Fitting inserted into the **AUTO SNAP-VAC** Port.
3. Disconnect VisiFilter from both attached 1 inch air hoses by gently turning and pulling the VisiFilter while holding each of the hoses.
4. Separate the 2 plastic housing halves of the VisiFilter in the following manner.
 - a) Grasp the VisiFilter in the palm of the hand with the Male Nib (air hose connection) marked "FLOW IN" facing you.
 - b) Pull against one of the Wing Tabs while pulling on the Male Nib with the free hand to open the interconnection of the plastic housings at that Wing Tab.
 - c) Pull against the second Wing Tab while pulling on the Male Nib to open the remaining interconnection and separate the plastic housings.
5. Remove the old or discolored Element and discard.
6. Insert the replacement VisiFilter Element into the housing marked "FLOW IN". Center the Element in the housing well.
7. Squeeze the 2 plastic housing halves together using 4 plastic Bumps on the housing marked "FLOW OUT" as pressure points. The 2 plastic housings will snap together and lock the VisiFilter Element in position.
8. Reconnect the 1 inch air hoses (removed in step 3) to the VisiFilter.

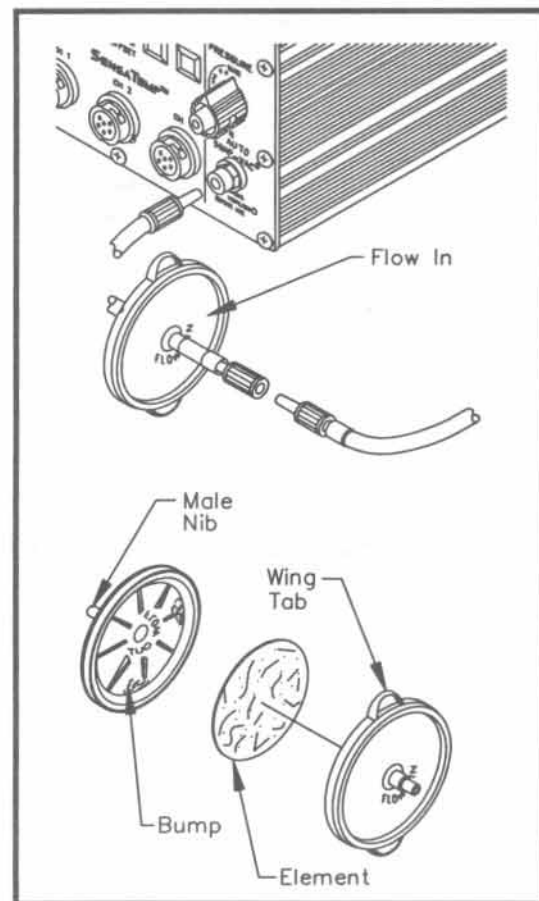


Figure 25. VisiFilter Element Replacement

REPAIR

HANDPIECES

The following "Heater Assembly Checkout Procedures" (Table 4) are applicable to all PACE SensaTemp handpieces except for the TT-65 ThermoTweez & DTP-80 Dual ThermoPik handpieces. Refer to the respective handpiece manuals for troubleshooting procedures pertinent to those handpieces. Use the Digital Readout Message Codes ("E-1", "E-2", "E-3" or "E-4") listed on Table 4 (under "POWER SOURCE") as a guide to pinpointing any malfunction associated with the handpiece.

Perform the "Heater Assembly Checkout Procedures" shown below with the handpiece (and heater) at room temperature. If the handpiece is warm, resistance reading will be different from those shown in the table below.

Symptom	Checkout Procedure	Cause	Solution	Heater Specifications
No heat	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications". If resistance is high -	Open Heater	Replace heater assembly.	SX-70 = 8 - 10 ohms
	Check resistance - Pin 3 to Pin 6. If circuit reads open -	Open Sensor	Replace Heater Assembly.	SP-1A = 10 - 12 ohms SP-2A = 8 - 10 ohms
Handpiece overheating	Check resistance - Pin 3 to Pin 6. If less than 105 ohms - -	Shorted Sensor	Replace Heater Assembly.	TP-65 = 9 - 11 ohms
Fuse blows when unit is turned on.	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is low - -	Solder short in Handpiece.	Remove Short. Replace Heater Assembly & Fuse F1.	TJ-70 = 6 ohms
		Shorted Heater	Replace Heater Assembly & Fuse F1.	
No Ground on Tip.	Check resistance - Pin 4 to a NEW Tip. Resistance should be less than 2 ohms. If not - -	Oxidation buildup in Heater Bore.	Clean heater bore with proper wire brush.	
		Defective Heater	Replace Heater Assembly.	

Table 3. Heater Assembly Checkout Procedures

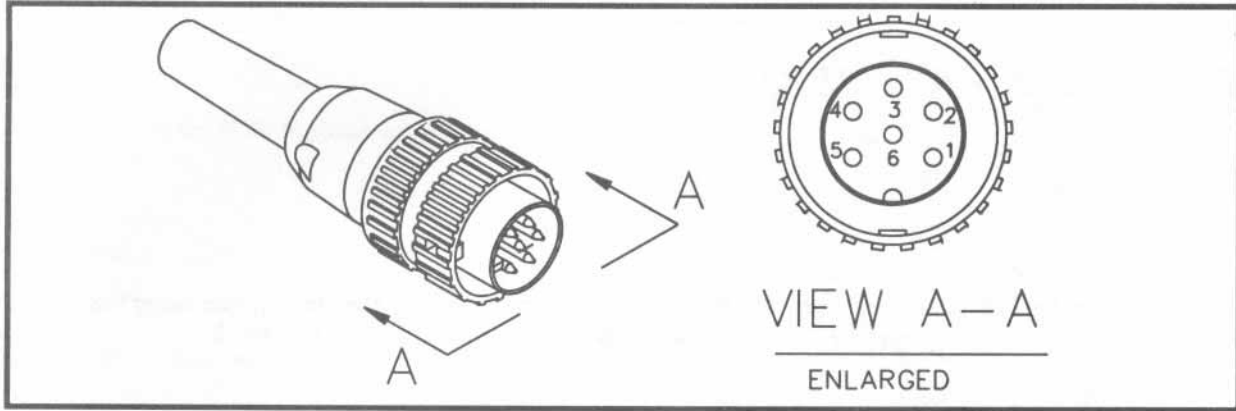


Figure 26. Connector Plug Wiring

POWER SOURCE

Most malfunctions are simple and easy to correct. Refer to the table shown below to clear these malfunctions.

Symptom	Probable Cause	Solution
Digital Readout is blank. No LEDs on. No motor.	Blown Fuse (F1)	Replace Fuse F1 located on rear of Power Source in the AC Receptacle.
	Defective handpiece.	Disconnect all handpieces. Check each handpiece using the applicable handpiece manual or Table 5 of this publication.
E-1 displayed on Digital Readout.	No handpiece connected to power source.	Plug handpiece into CH 1, CH 2 OR CH 3.
	Open sensor in handpiece.	Refer to handpiece Operation Manual for Corrective Maintenance procedures.
E-2, E-3, E-4 or room temperature displayed on Digital Readout.	Defective handpiece.	Disconnect the handpiece connected to the current channel (channel displayed on Digital Readout). Check the handpiece using the applicable handpiece manual or Table 5 of this publication.
Insufficient AUTO SNAP-VAC (vacuum) or air pressure.	Filter(s) and/or handpiece(s) require corrective maintenance.	Refer to applicable handpiece manual(s) for instructions on performing proper "Corrective Maintenance" procedures.

Table 4. Corrective Maintenance, Power Source

REPAIR

DISASSEMBLY/ASSEMBLY

DISASSEMBLY

To disassemble the unit for servicing, perform the following procedure step by step, in sequence using the illustration as a guide. The procedure directs the technician to remove the unit from the chassis.

DANGER

POTENTIAL SHOCK HAZARD The following procedures are to be performed by qualified service personnel only. Removal of the power source from its chassis exposes line voltage parts. Service personnel must insure that the AC power cord is disconnected prior to disassembly.

1. Place the power source on a suitable work surface. Insure that the power cord has been disconnected from the back of the power source.

2. Remove the 10 front panel mounting screws.

3. Pull the front panel forward 3 inches.

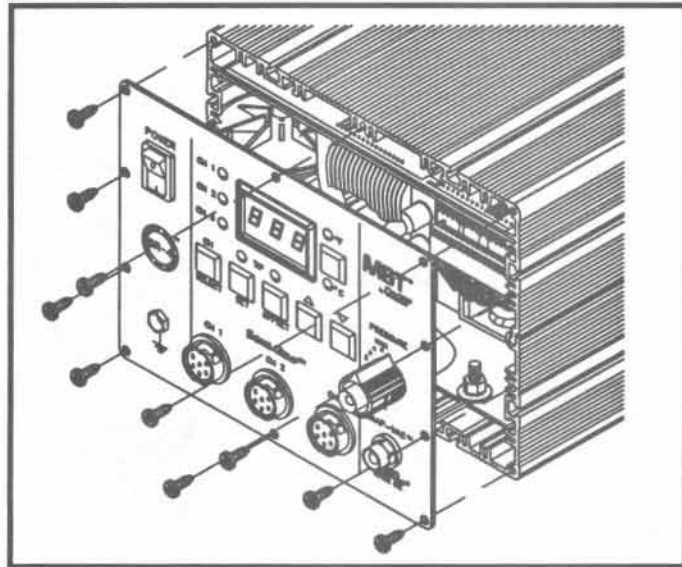


FIGURE 27. REMOVING FRONT PANEL

4. Reposition the power source with the rear of the unit facing forward.

5. Remove the single hex head screw and the 8 rear panel mounting screws.

6. Pull the rear panel forward 2 inches and lay face down on the work surface.

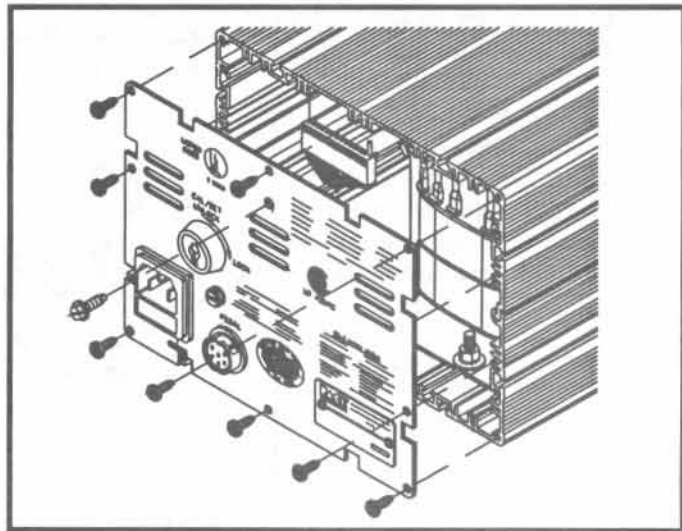


FIGURE 28. REMOVING REAR PANEL

REPAIR

7. Take note of all cabling attached to the PC Board (both front & rear) and unplug each connection.
8. Remove the 2 air hose connections on the front panel assembly.
9. Remove the PC Board by carefully sliding it out through the rear of the Case.
10. Set the PC Board aside.
11. There are 4 Mounting Screws with Locking Nuts which secure the Transformer Assembly to the Case. Two are located on the front base of the unit and 2 are located on the rear base. One rear Mounting Screw secures Green grounding wires. Loosen each of the 4 Locking Nuts. Remove the Green wires and slide the nuts and screws out of the unit.
12. Slide the Transformer Assembly out of the front of the Case.

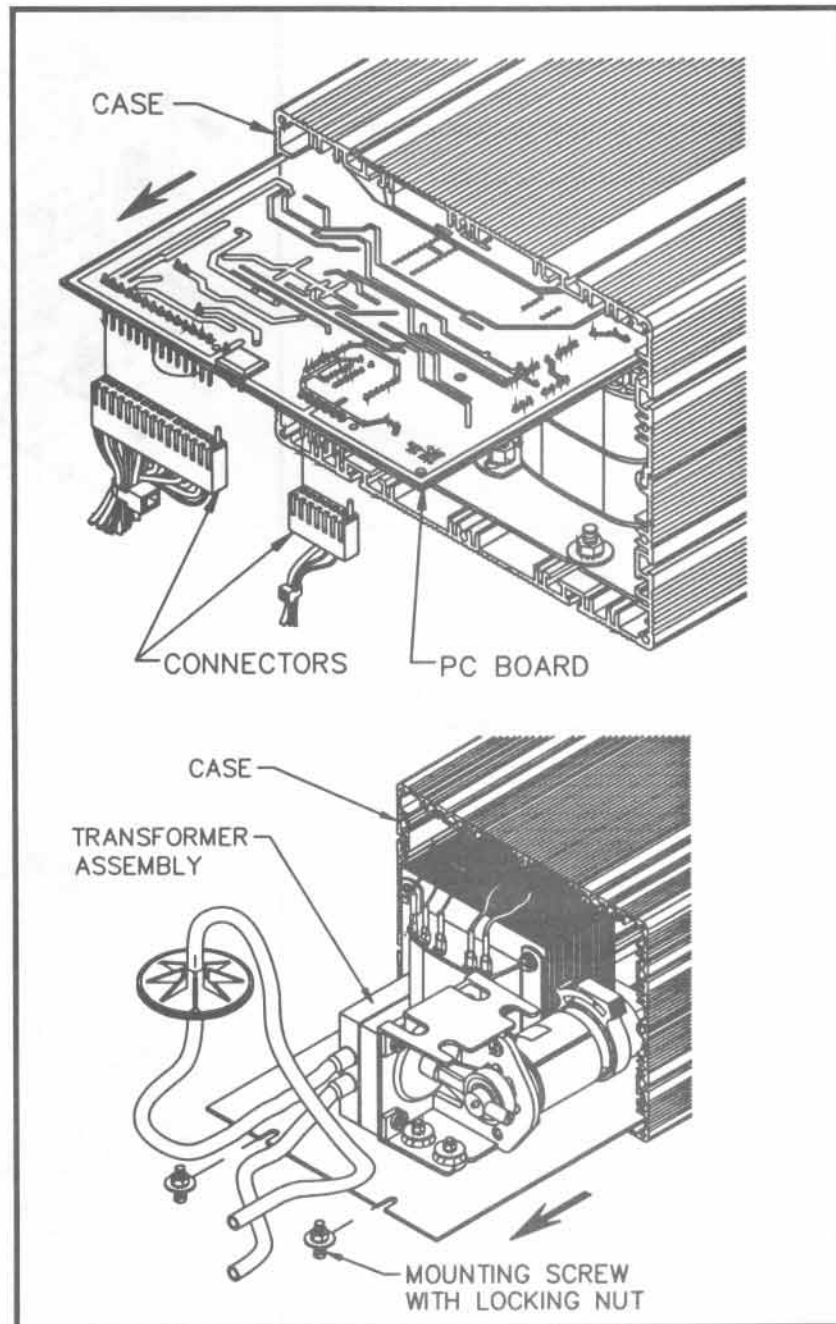


FIGURE 29. REMOVING PC BOARD & TRANSFORMER ASSEMBLY

13. Carefully place the PC Board on top of the transformer assembly and reconnect panel cabling and hoses removed in steps 7 and 8 (see Figure 29). Check to insure that the PC Board is not shorting to the transformer or motor pump assembly.
14. The unit can now be connected to the house AC supply to troubleshoot system.

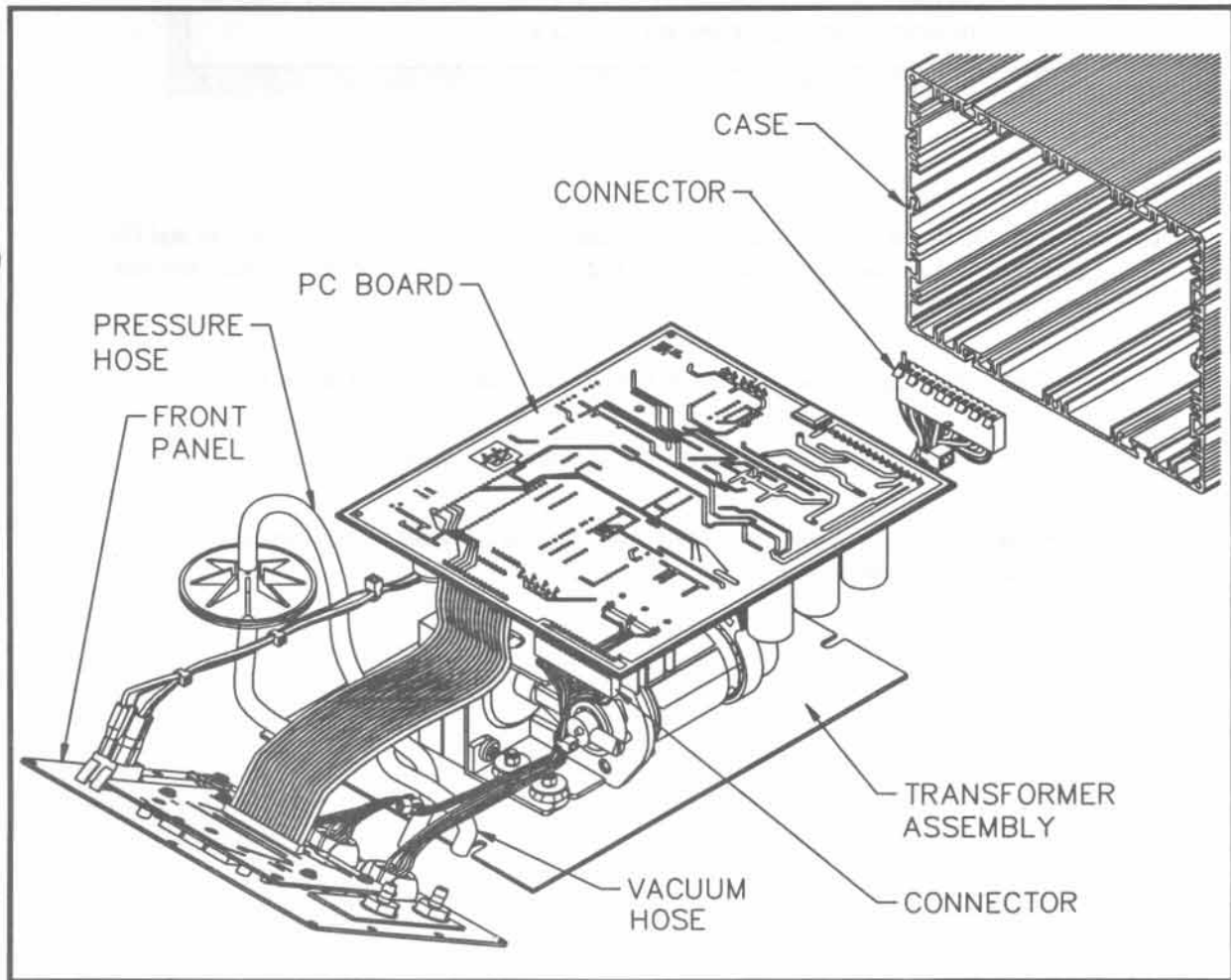


FIGURE 30. ASSEMBLING UNIT OUTSIDE OF CASE

REPAIR

ASSEMBLY

1. Disconnect the AC power cord.

DANGER

POTENTIAL SHOCK HAZARD Insure that the AC power cord is disconnected before proceeding to step 2.

2. Disconnect the PC Board, air hose and panel connections. Slide the transformer assembly and PC Board back into the case and reconnect in reverse order of the removal procedure Insure that the following precautions are taken in the process.
 - a) Insure that the rear edge of the transformer assembly plate is flush with the rear of the case.
 - b) When reconnecting cabling, insure that all wiring connections are correct.
 - c) When reinstalling the front panel assembly, insure that the air hoses are attached and do not kink when the panel is screwed to the case.
3. Check unit for proper operation.

FLOW CHARTS

The flow charts shown on the following pages should be used to determine the source of a malfunction down to an assembly level. Locate the flow chart which best describes the malfunction.

REPAIR

NO POWER

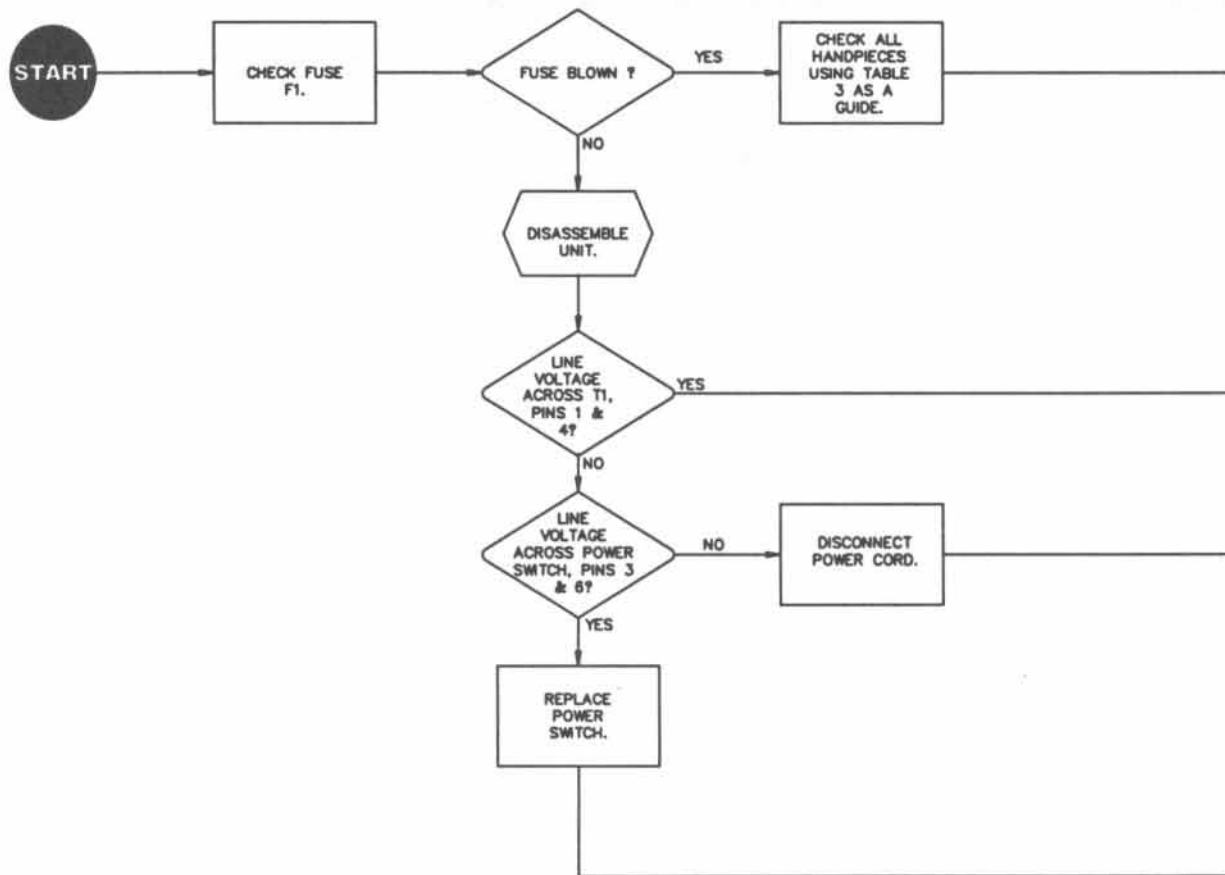
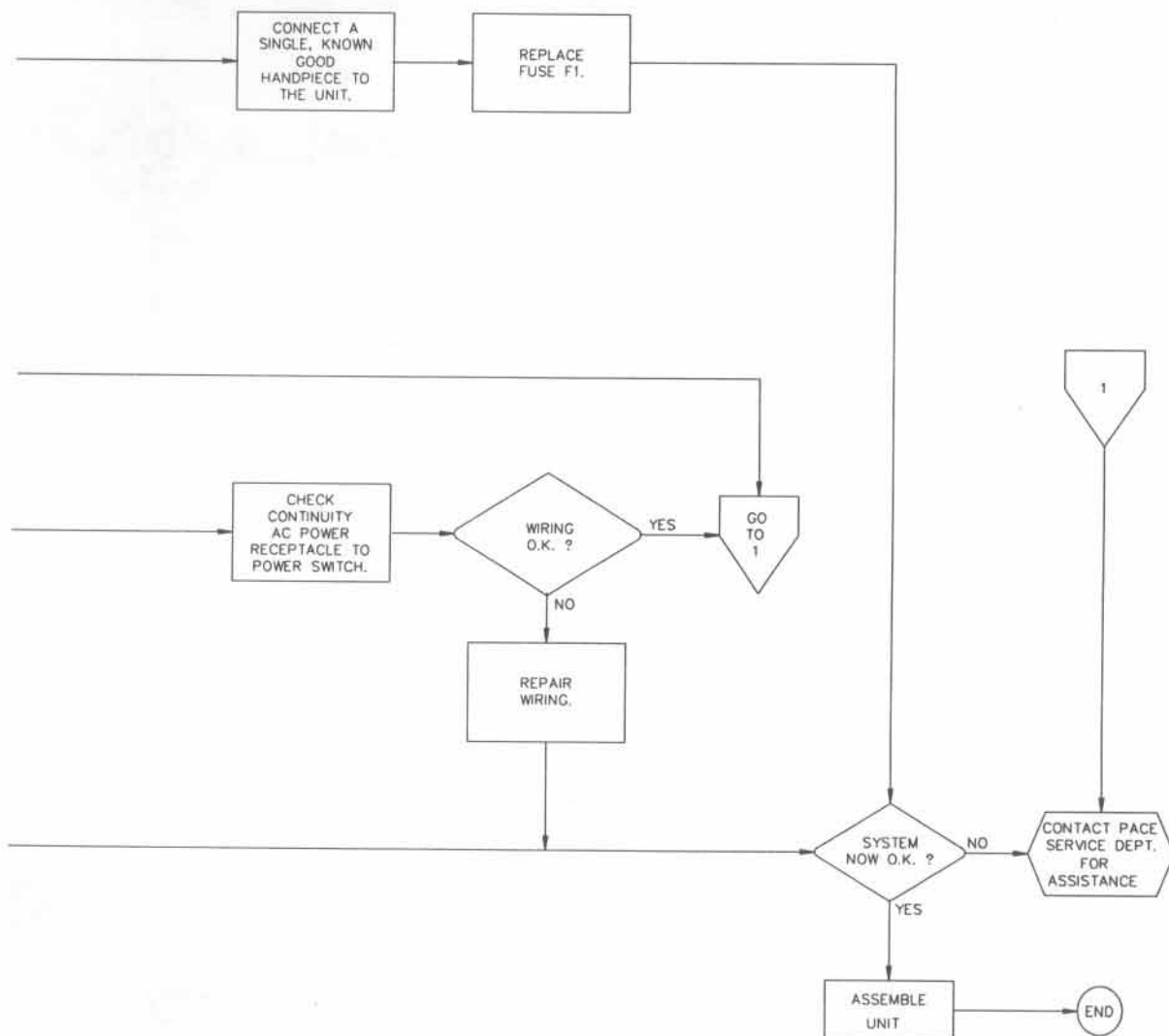


FIGURE 31. NO POWER FLOW CHART

REPAIR



REPAIR

HEAT OUTPUT

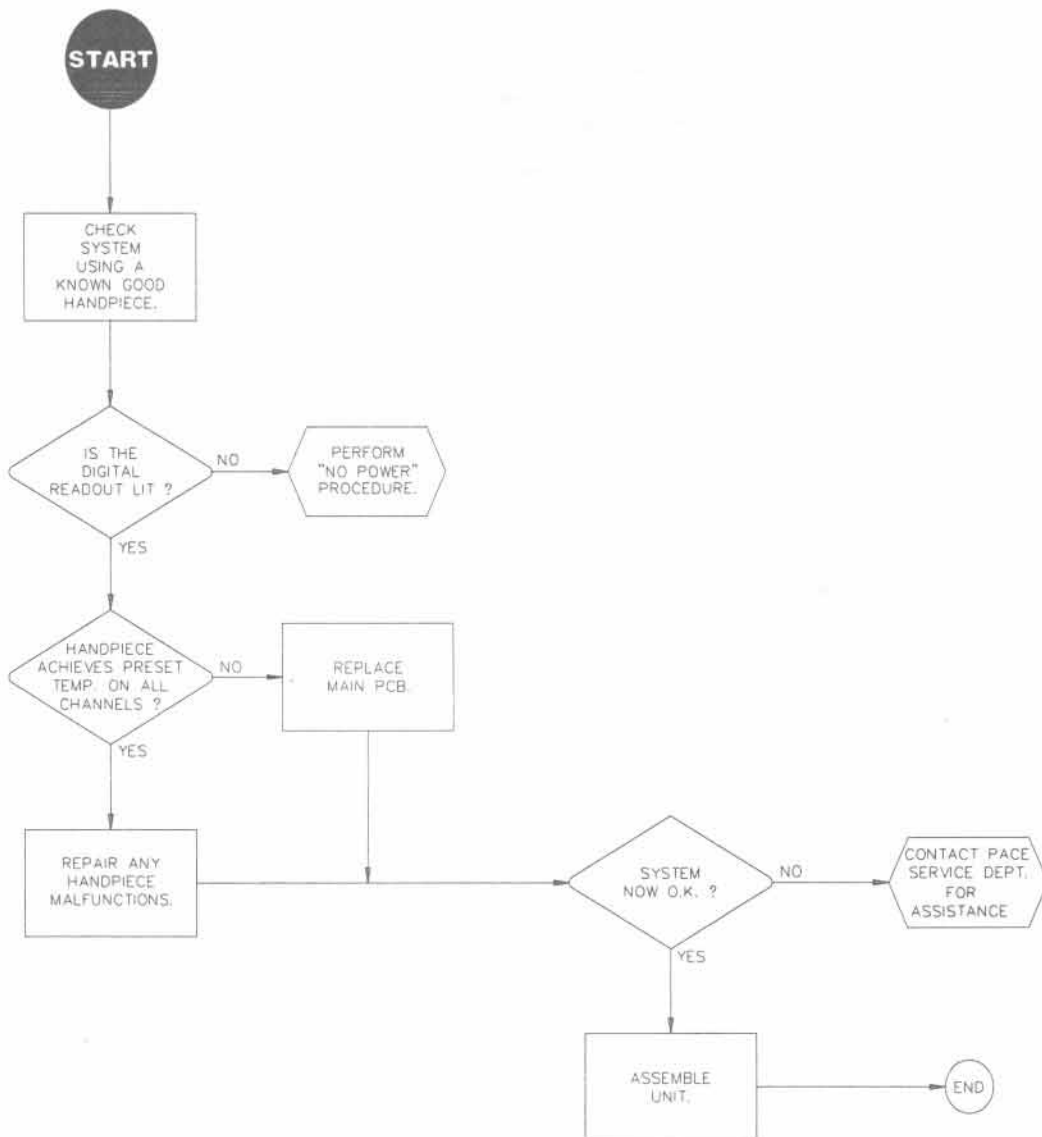


FIGURE 32. HEAT OUTPUT FLOW CHART

MOTOR MALFUNCTION

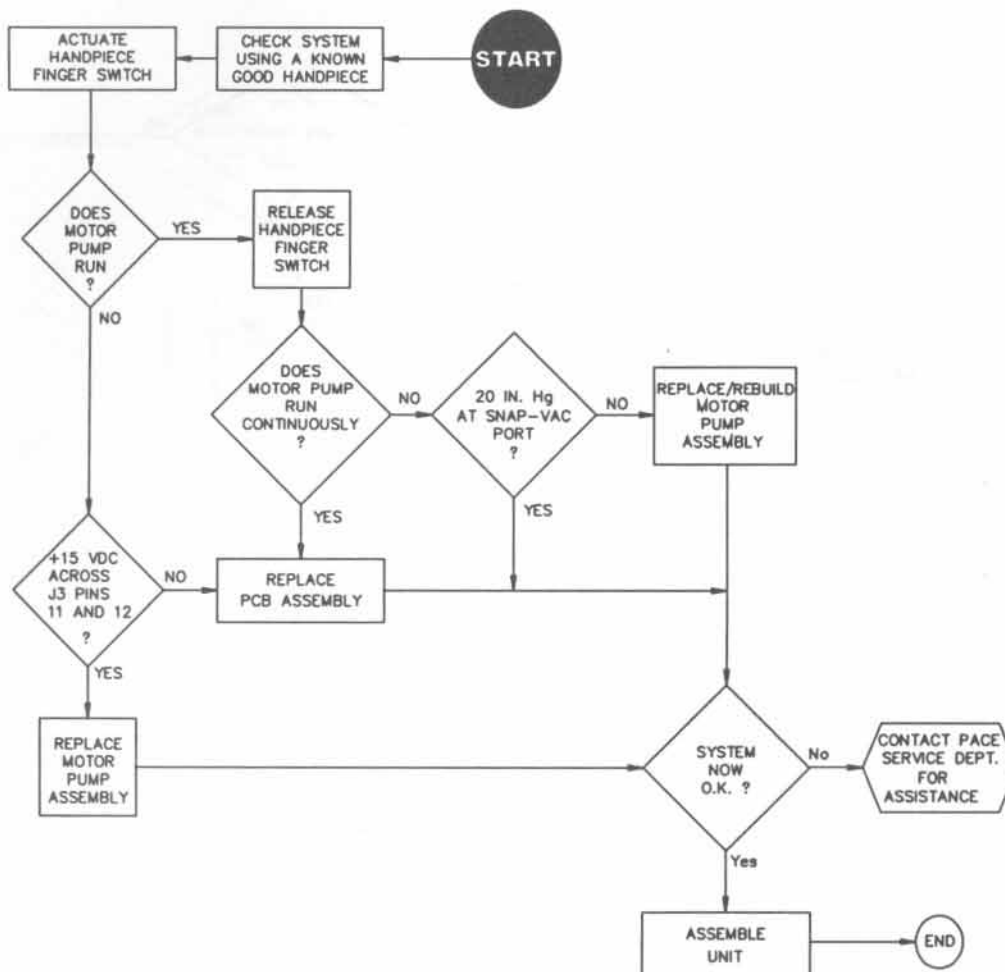


FIGURE 33. MOTOR MALFUNCTION FLOW CHART

REPAIR

DIGITAL READOUT MALFUNCTION

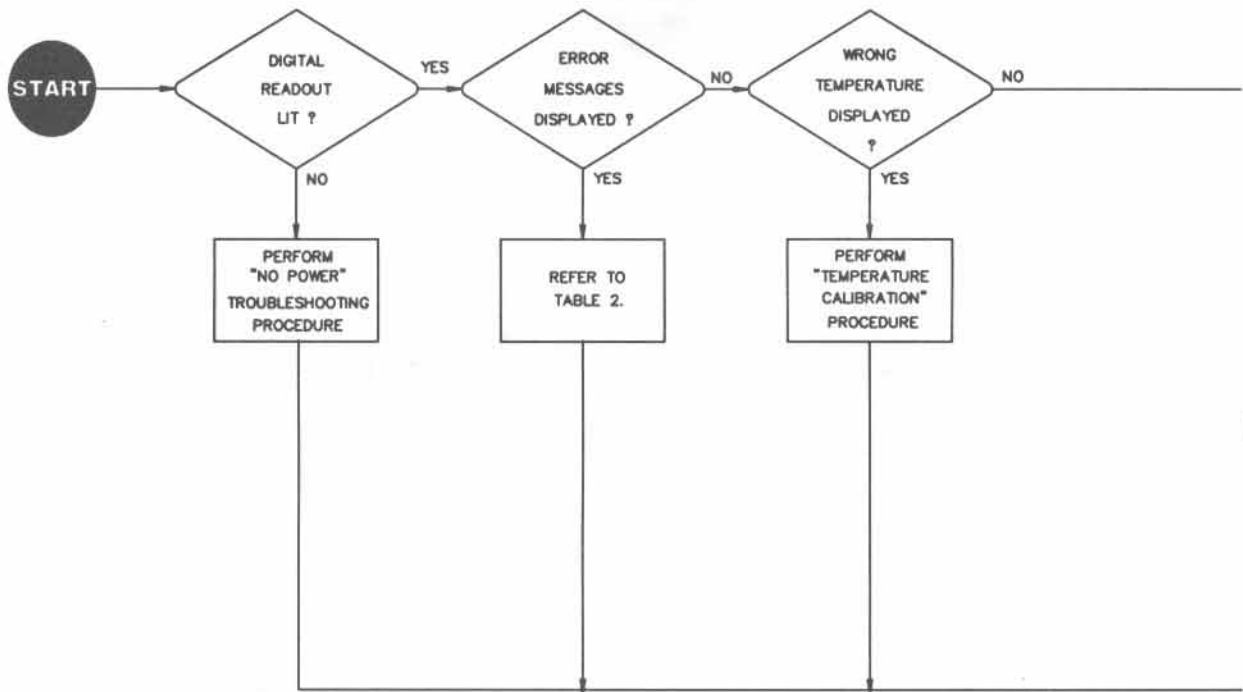
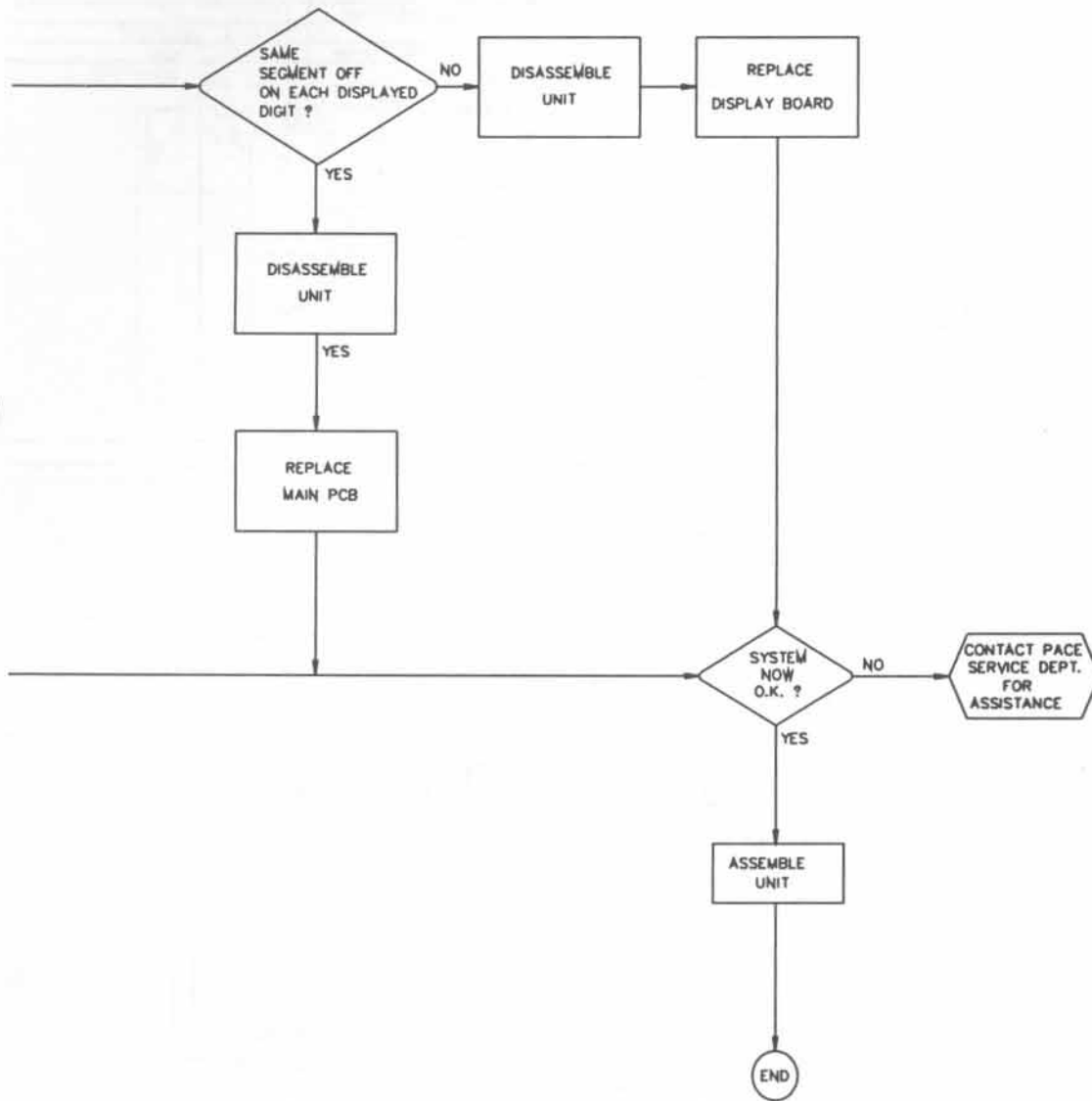


FIGURE 34. DIGITAL READOUT MALFUNCTION FLOW CHART

REPAIR



REPAIR

PPS 85 WIRING DIAGRAM

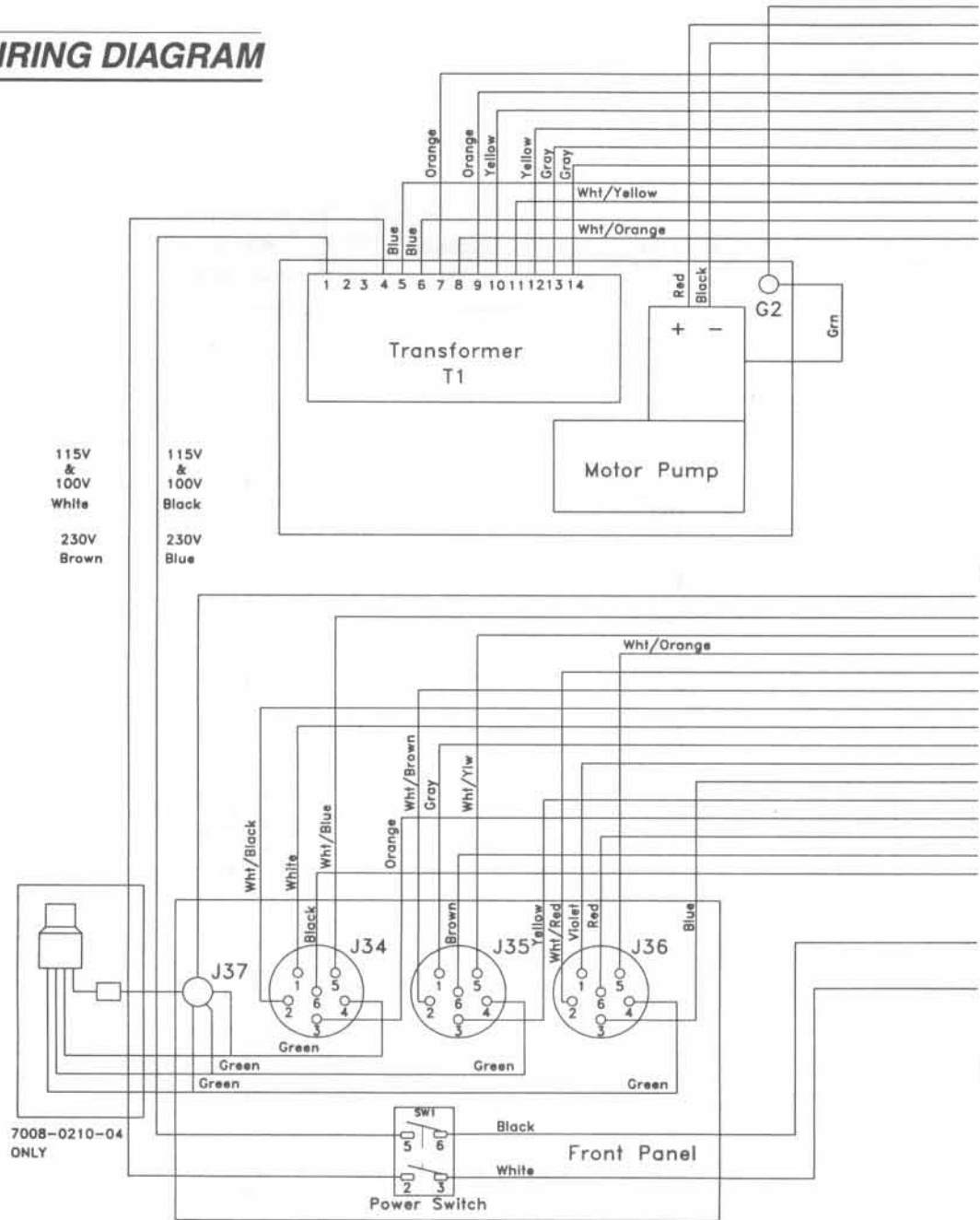
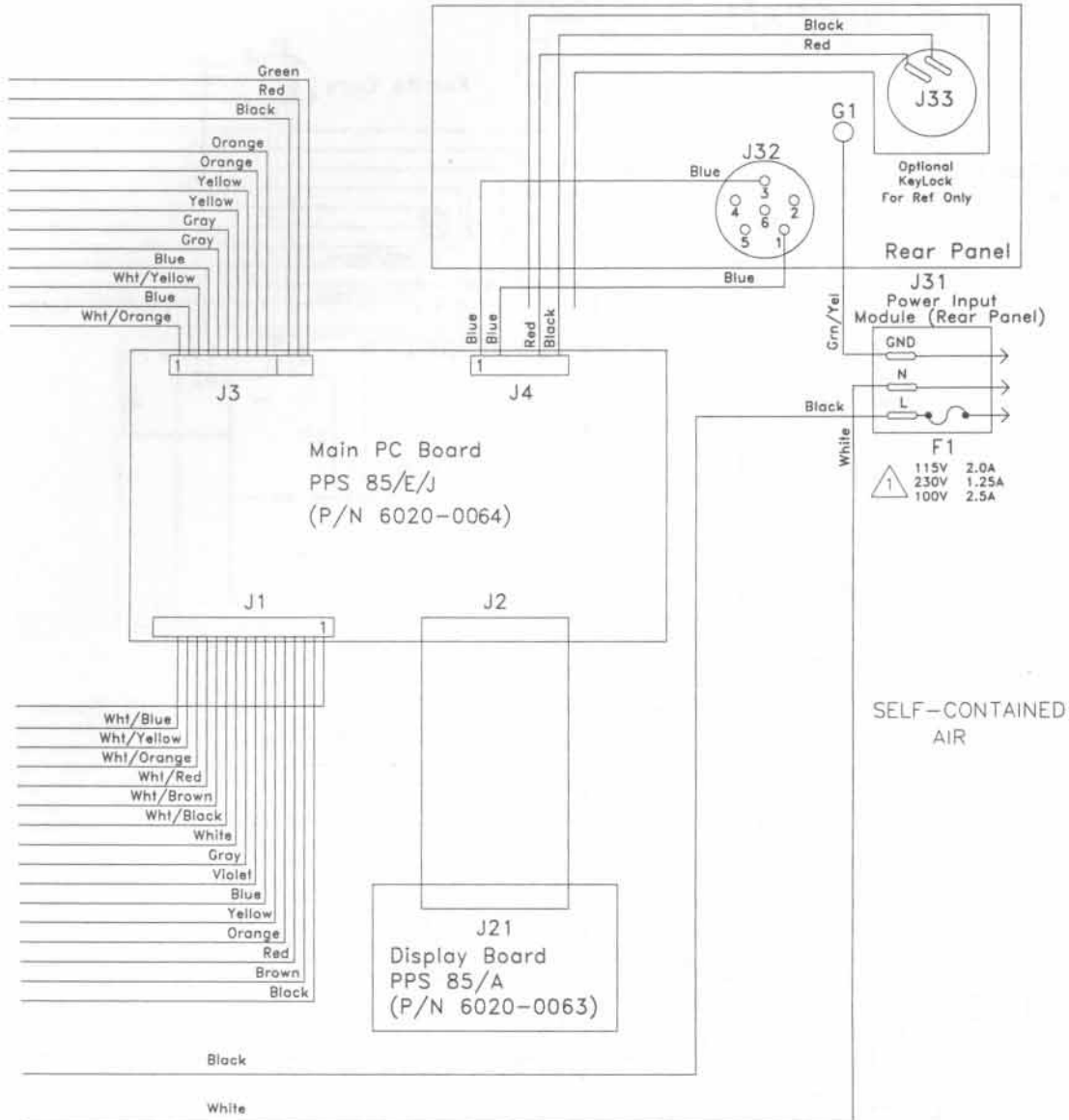


FIGURE 35. PPS 85 POWER SOURCES WIRING DIAGRAM

REPAIR



If you have any questions or notice any discrepancies between this wiring diagram and the wiring in your PACE power source, contact the PACE Service Department for assistance.

REPAIR

PPS 85A WIRING DIAGRAM

Note: Motor Pump on PPS85A units. Solenoid and interface board on 85V units.

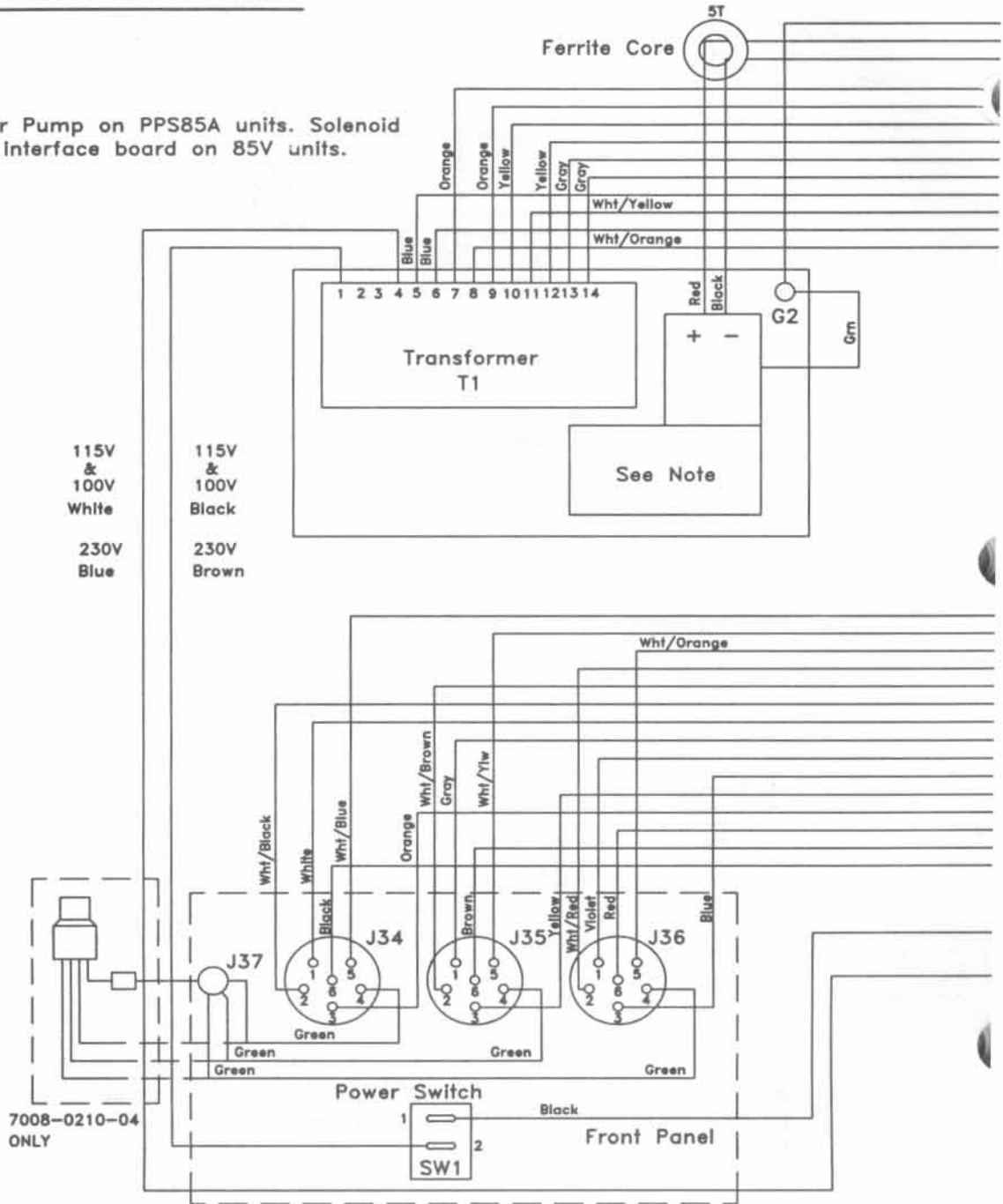
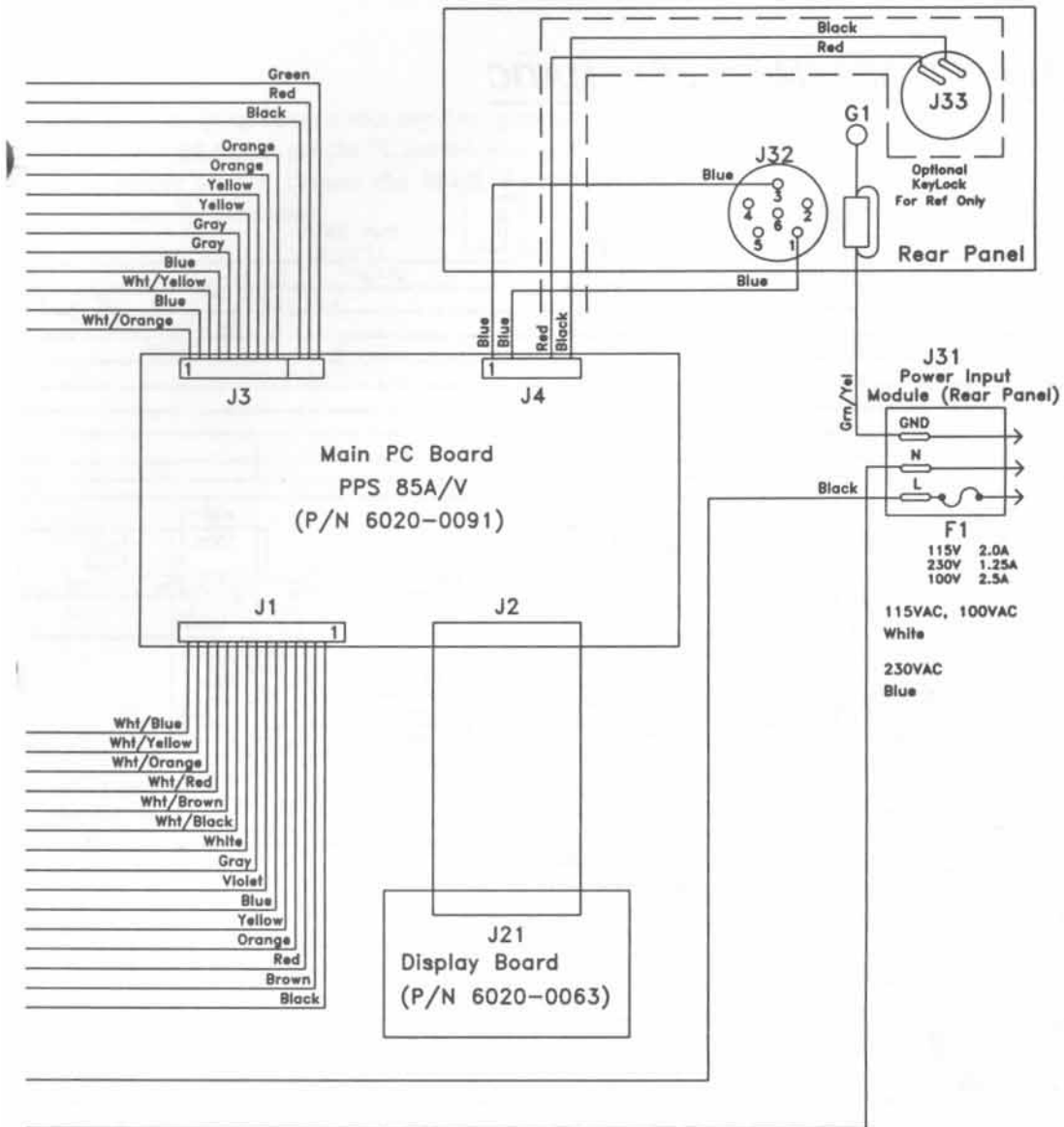


FIGURE 36. PPS 85A POWER SOURCES WIRING DIAGRAM



If you have any questions or notice any discrepancies between this wiring diagram and the wiring in your PACE power source, contact the PACE Service Department for assistance.

REPAIR

PPS 85 MAIN PCB ASSEMBLY SCHEMATIC

Sheet 1 of 3

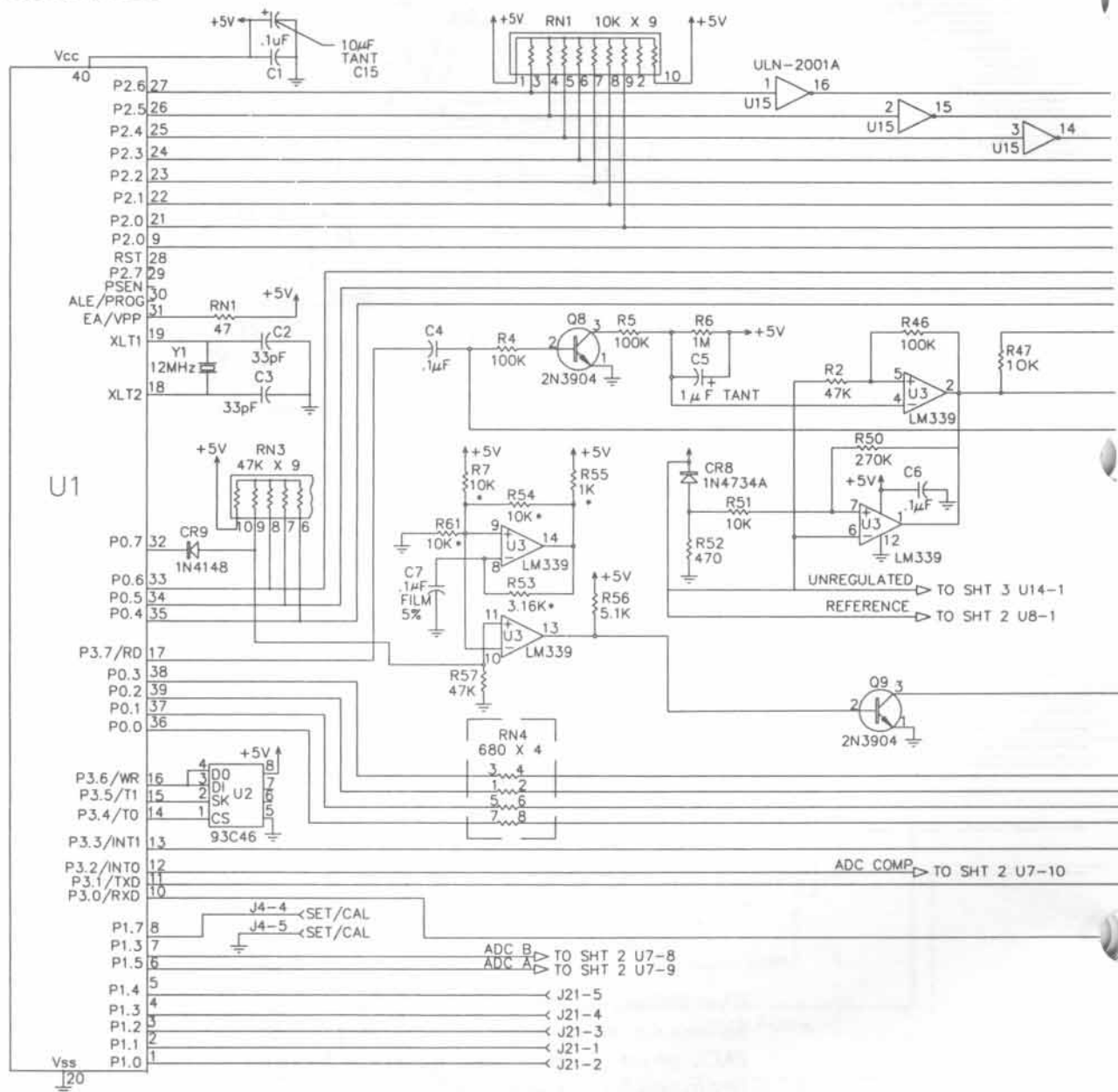
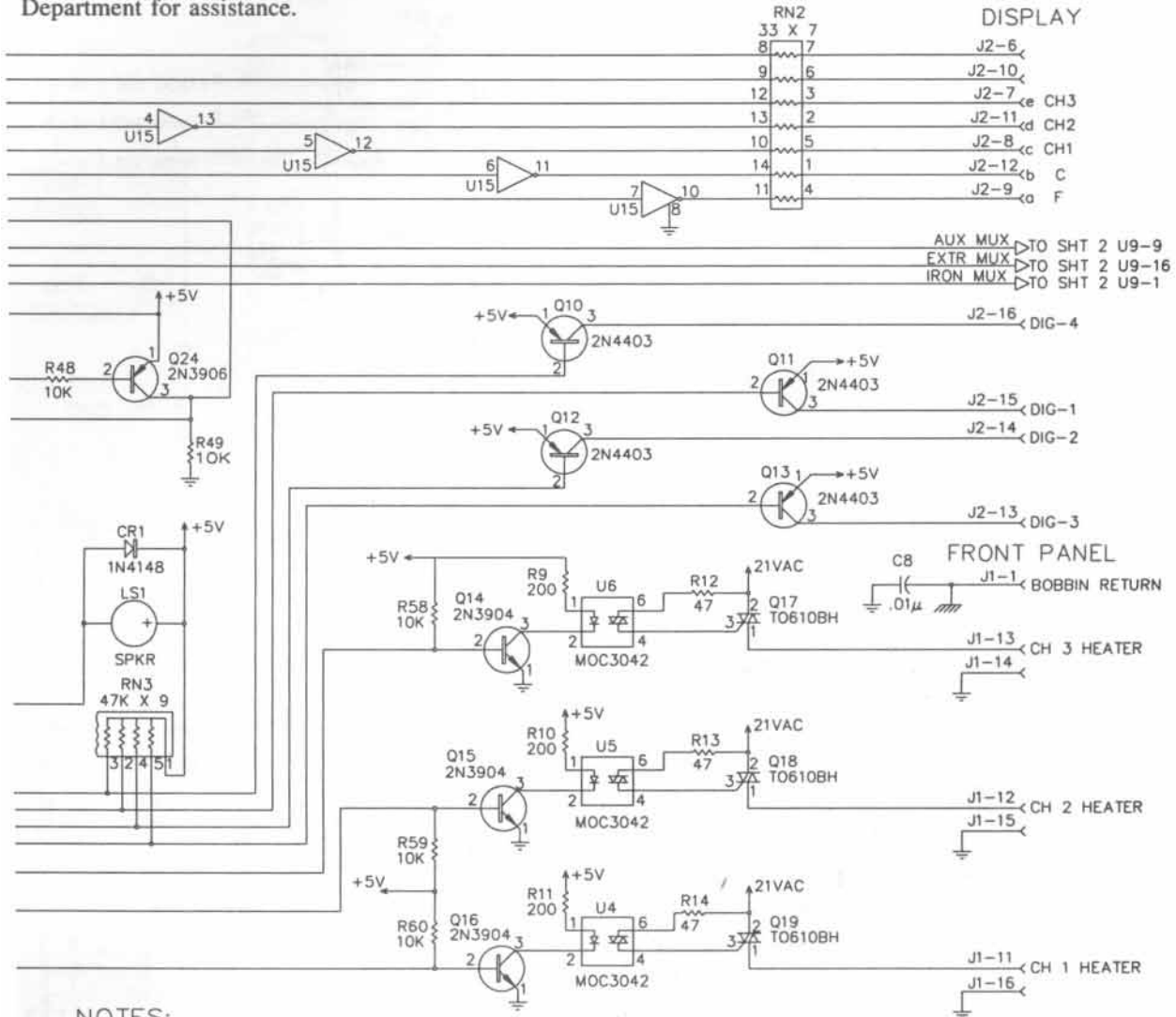


FIGURE 37. MAIN PCB ASSEMBLY SCHEMATIC, PPS 85

If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

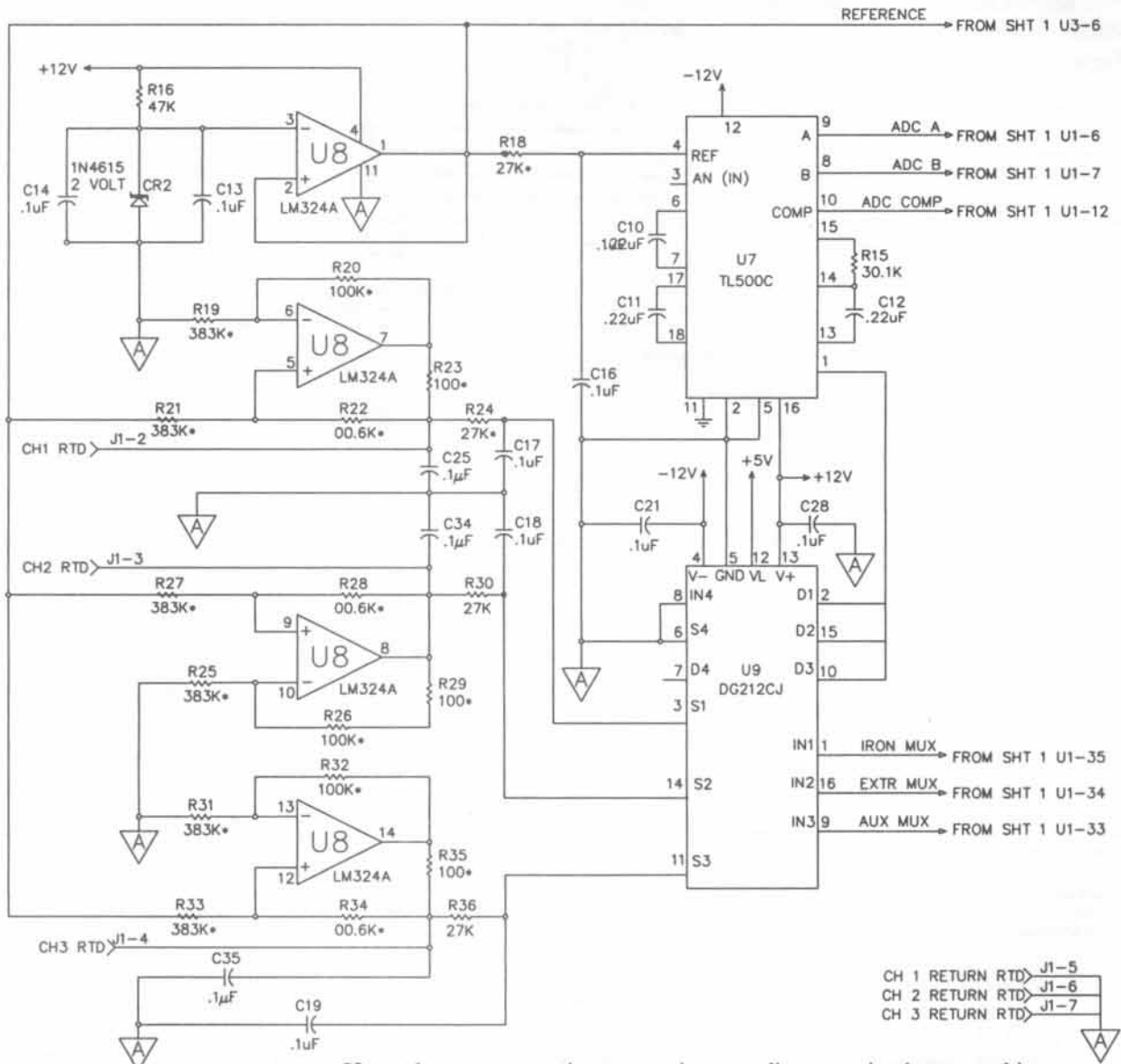


NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4 WATT, 5% CARBON FILM WITH VALUES IN OHMS.
2. * DENOTES 1/8 WATT, 1%, 50PPM, METALL FILM RESISTORS.
3. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR NETWORKS ARE 1/8W 2%.

REPAIR

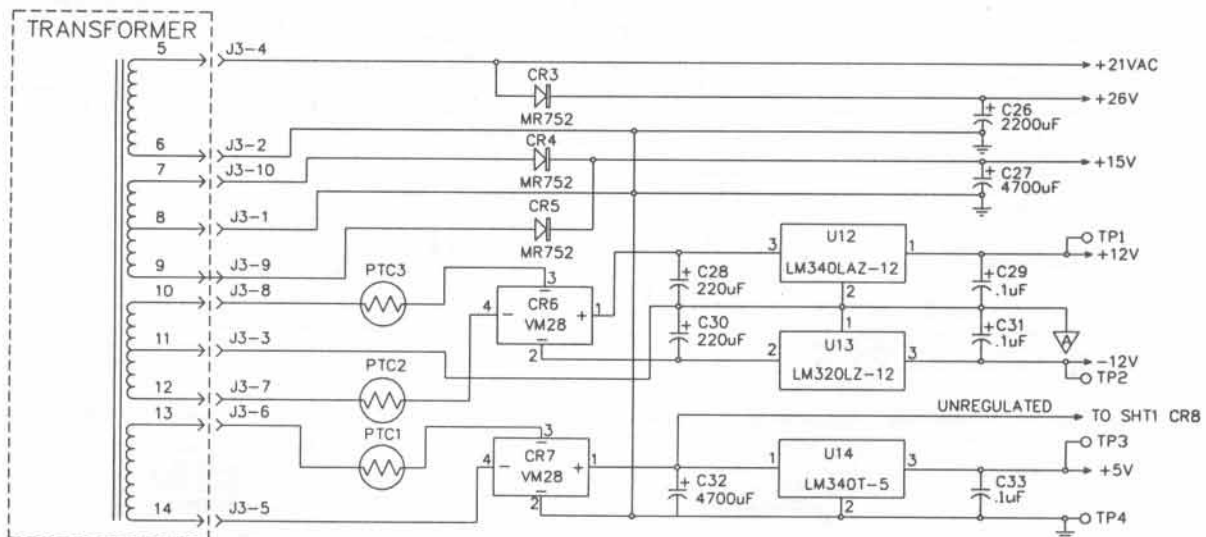
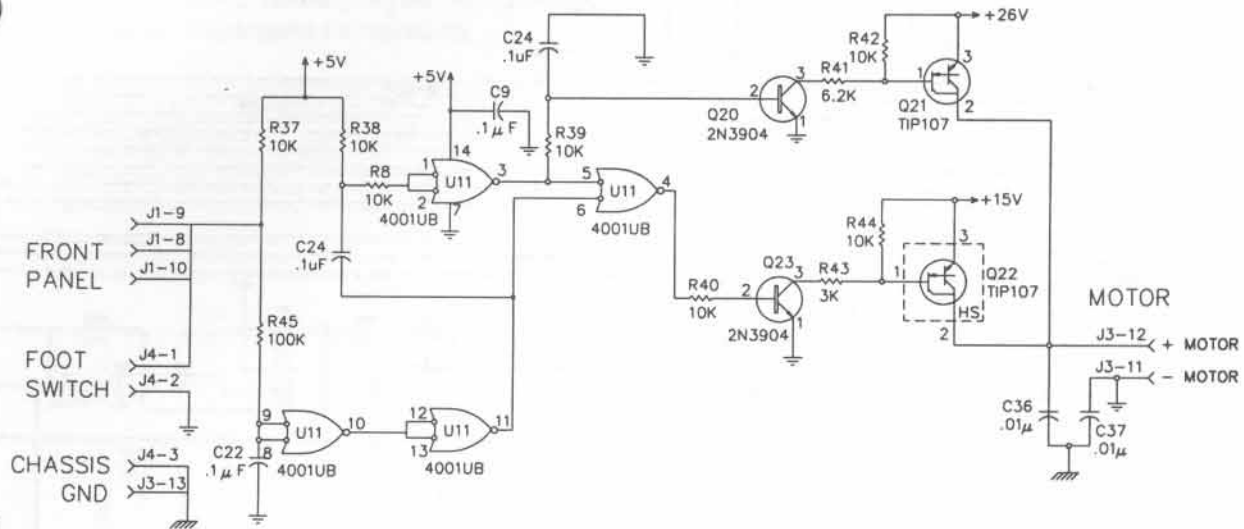
Sheet 2 of 3



If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

FIGURE 38. MAIN PCB ASSEMBLY SCHEMATIC, PPS 85 CONT'D

Sheet 3 of 3



If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

FIGURE 39. MAIN PCB ASSEMBLY SCHEMATIC, PPS 85 CONT'D

REPAIR

PPS 85A MAIN PCB ASSEMBLY SCHEMATIC

Sheet 1 of 3

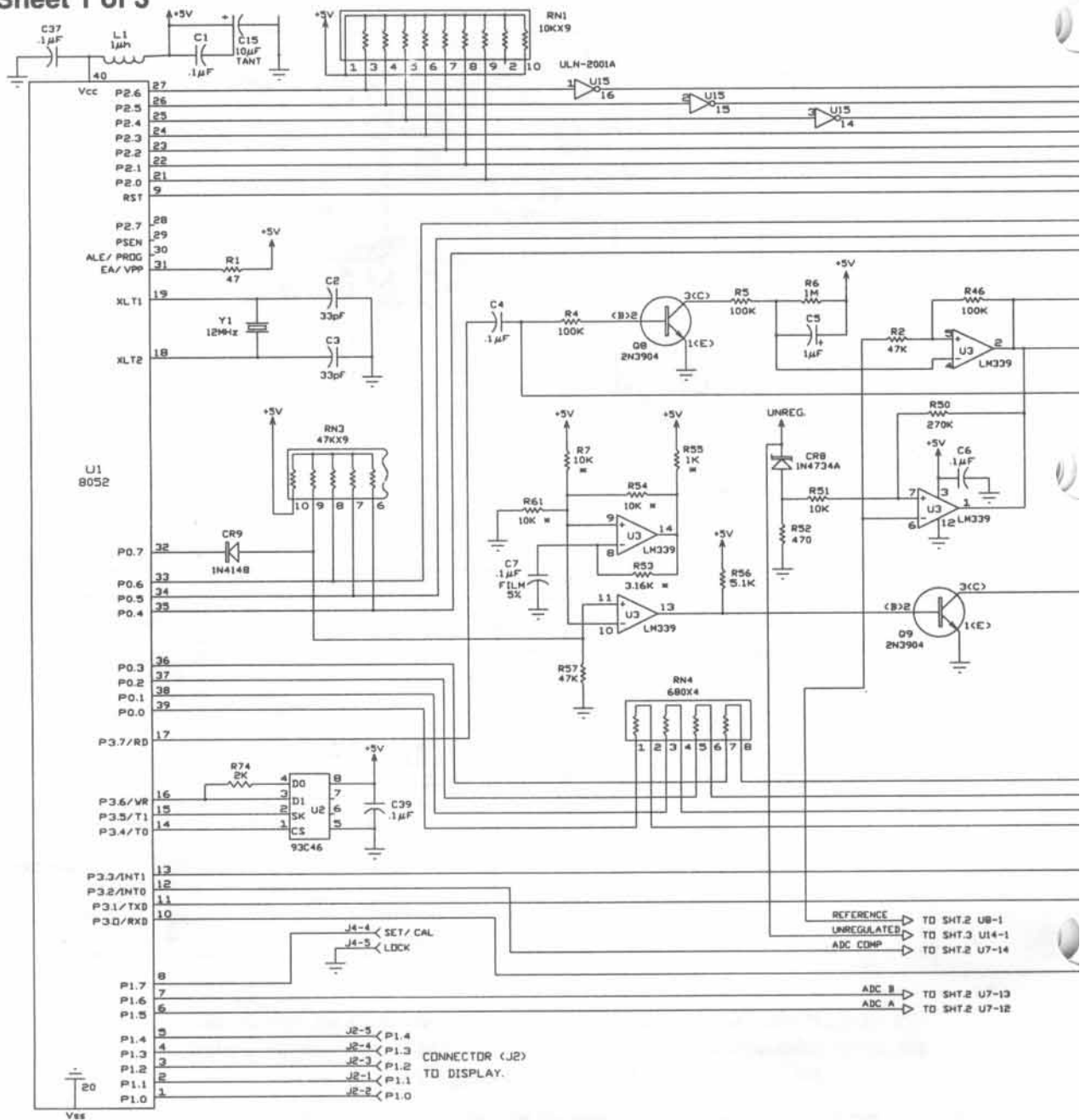
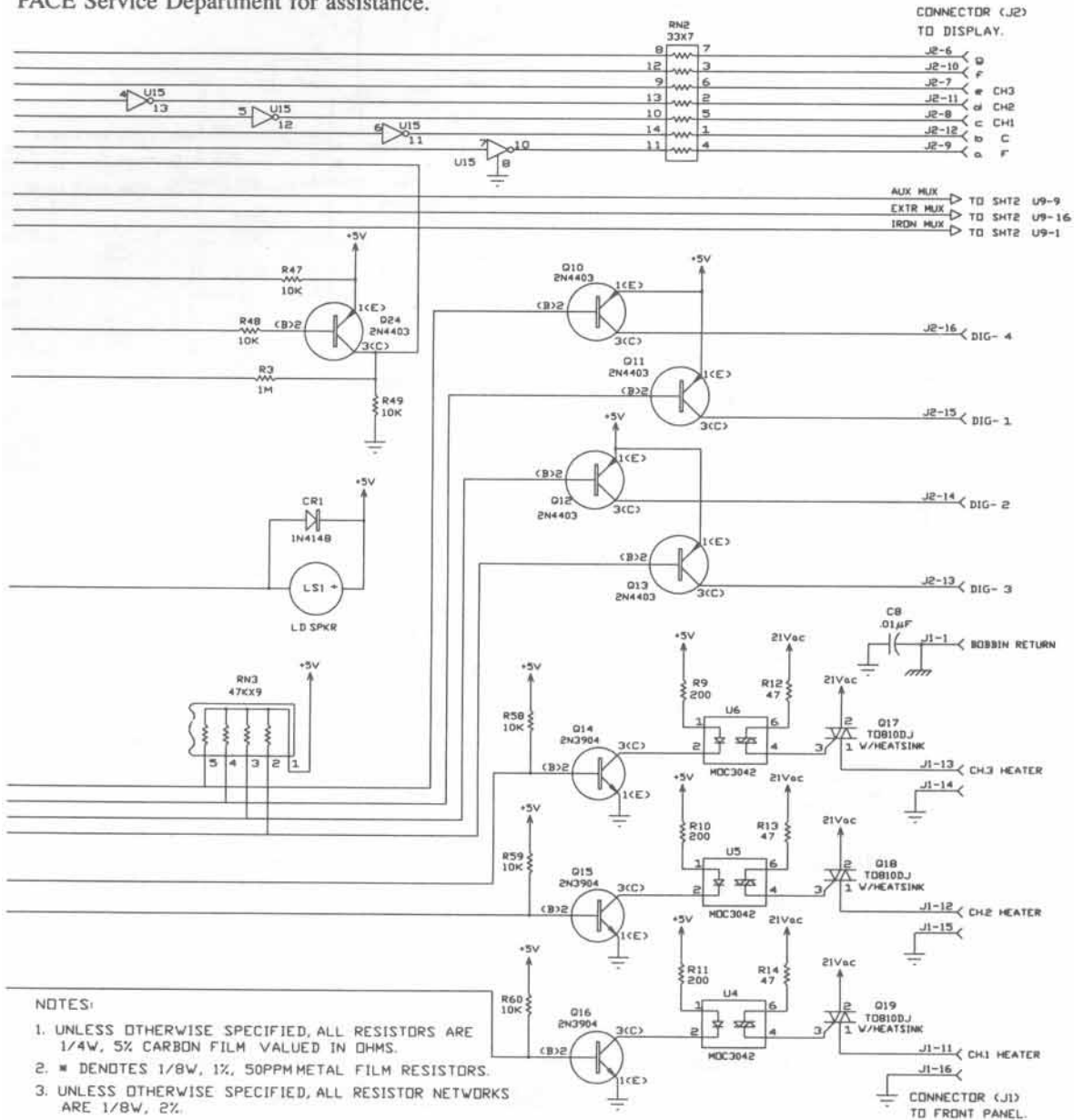


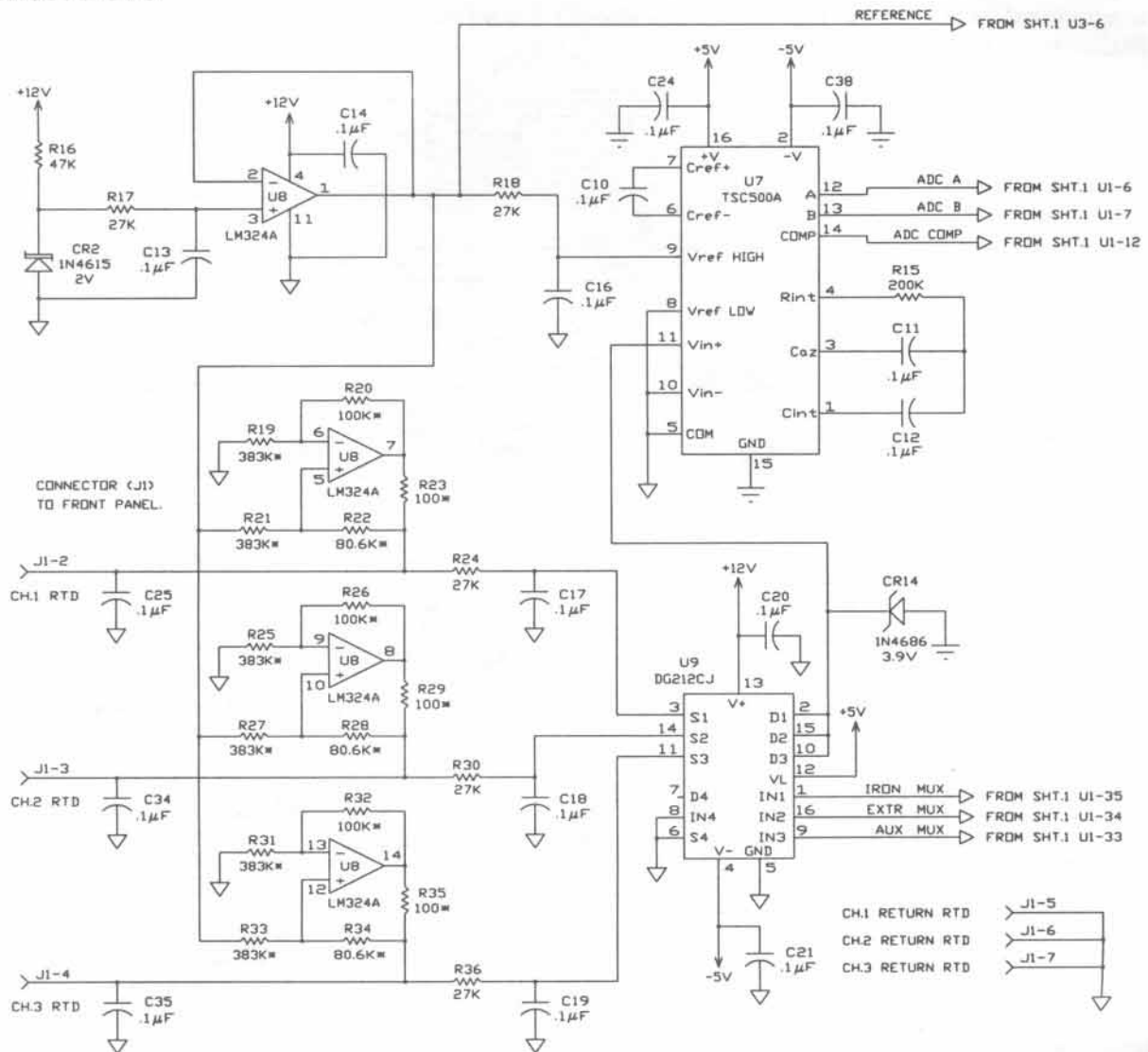
FIGURE 40. MAIN PCB ASSEMBLY SCHEMATIC, PPS 85A

If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.



REPAIR

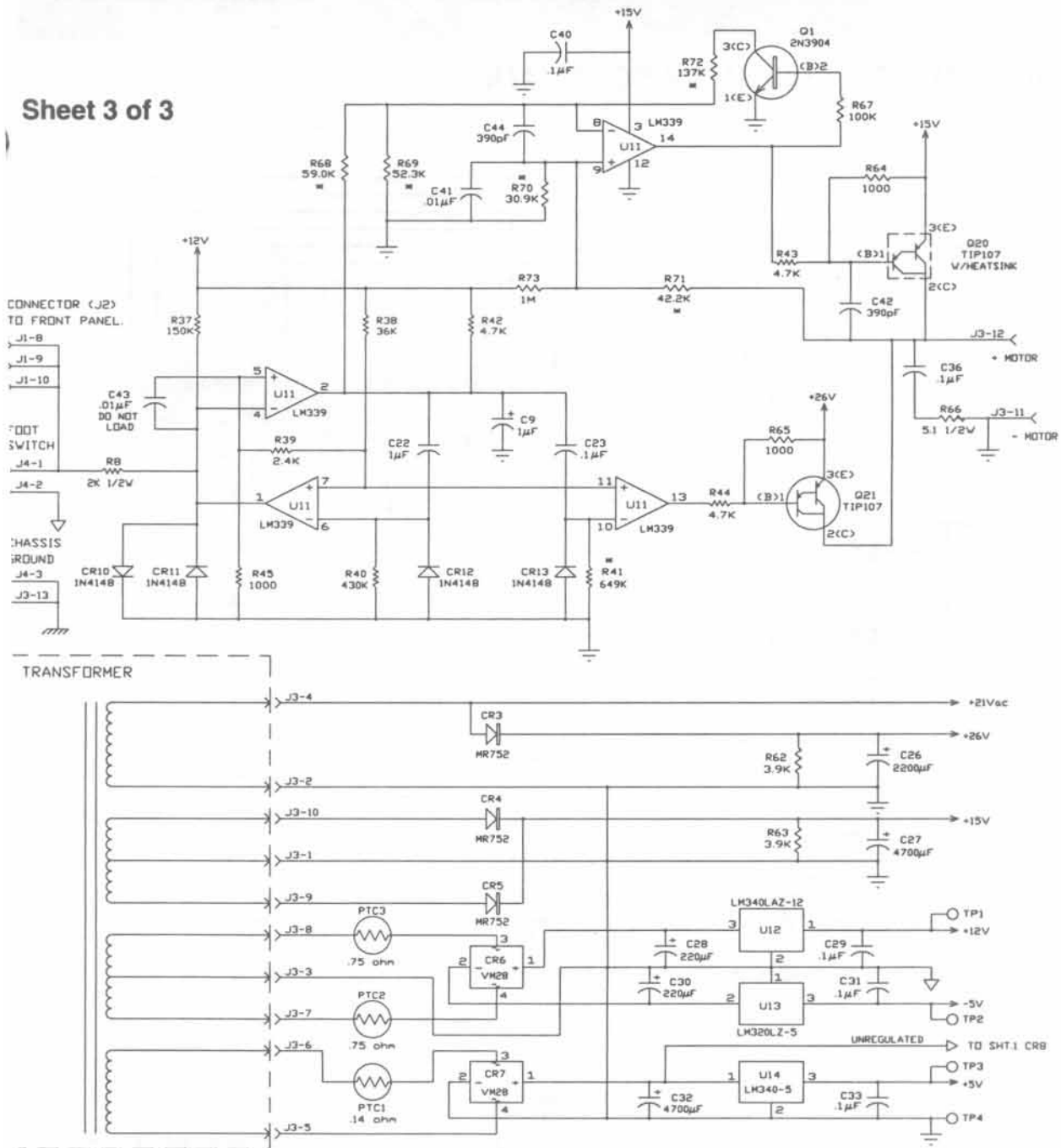
Sheet 2 of 3



If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

FIGURE 41. MAIN PCB ASSEMBLY SCHEMATIC, PPS 85A CONT'D

Sheet 3 of 3

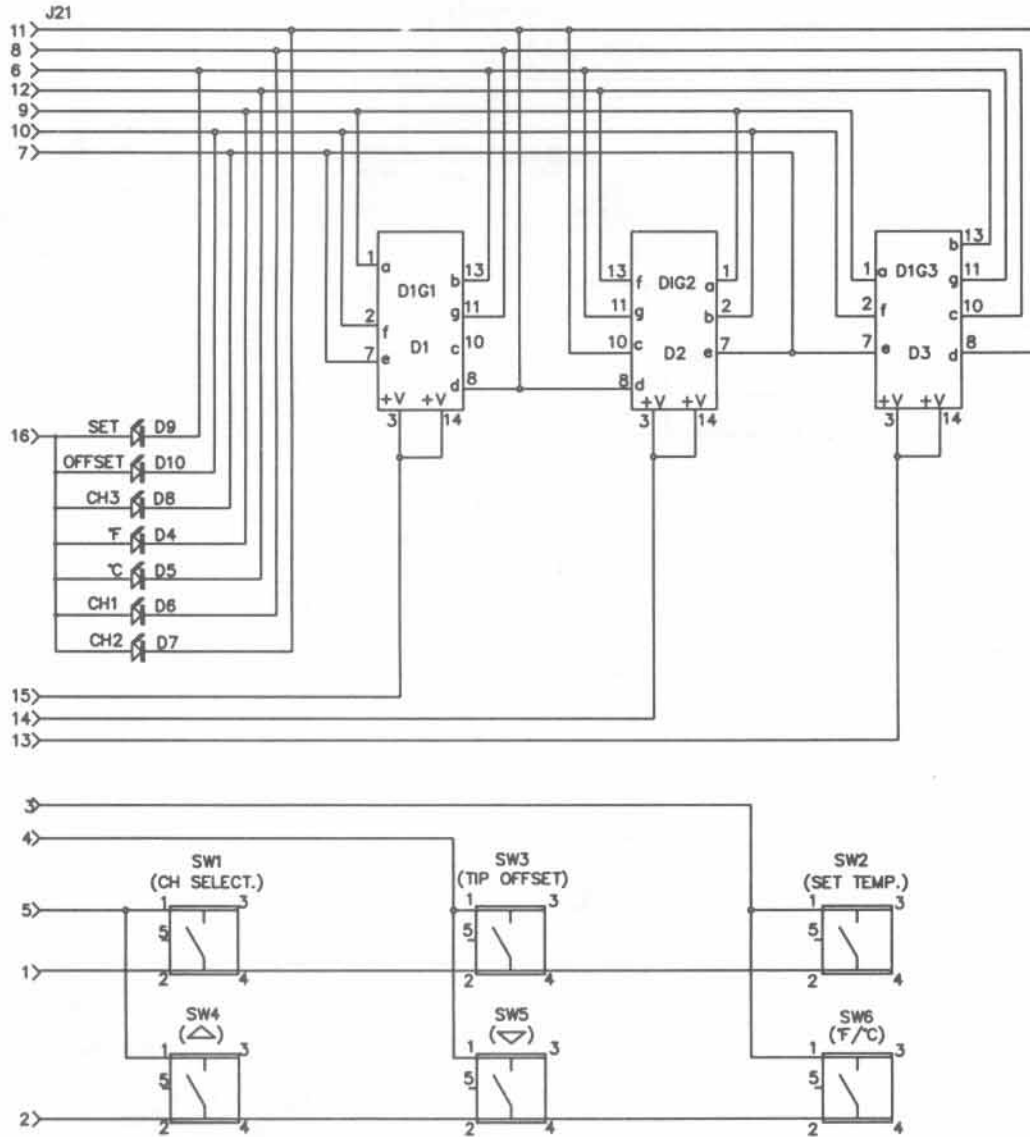


If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

FIGURE 42. MAIN PCB ASSEMBLY SCHEMATIC, PPS 85A CONT'D

REPAIR

DISPLAY PCB ASSEMBLY SCHEMATIC



If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

FIGURE 43. DISPLAY PCB ASSEMBLY SCHEMATIC

AIR HOSE ROUTING

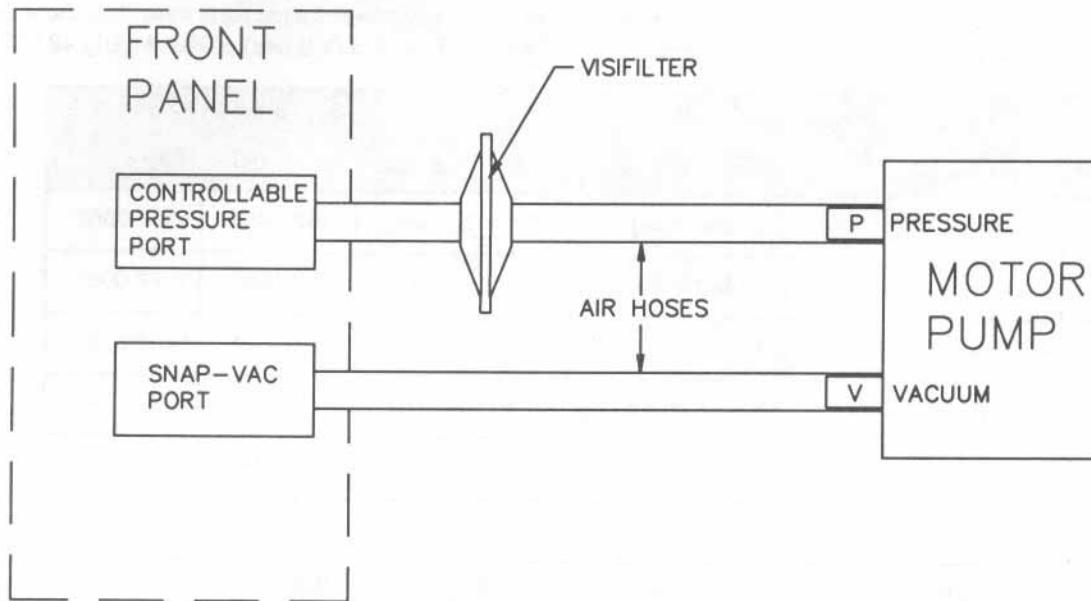


FIGURE 44. AIR HOSE ROUTING

REPLACEMENT PARTS

POWER SOURCE

Listed below are the power source replacement parts which may be ordered directly from PACE sales or through your local authorized PACE distributor. Refer to Figure 1. To obtain any power source parts other than those listed below, contact the PACE Service Department directly at Tel. # (888) 535-7223 (toll-free) or Fax # (301) 483-7030.

Item Number	Description	Part Number			
		PPS 85	PPS 85J	PPS 85E	
1	Power Switch	(double pole)	1157-0052	1157-0052	1157-0052
		(single pole)	1157-0081	1157-0081	1157-0081
2	AC Power Receptacle/Fuse Holder	1207-0151	1207-0151	1207-0151	
3	Fuse (F1),	2.0 Amp, Time Lag	1159-0247	-----	-----
		2.5 Amp, Time Lag	-----	1159-0260	-----
		1.25 Amp, Time Lag	-----	-----	1159-0217
4	Main PCB Assembly	("A" systems)	6020-0091	6020-0091	6020-0091
		(non "A" systems)	6020-0064	6020-0064	6020-0064
5	Display PCB Assembly	6020-0063	6020-0063	6020-0063	
6	Motor Pump Assembly	6993-0188	6993-0188	6993-0188	
7	Motor Pump Rebuild Kit	6993-0190	6993-0190	6993-0190	
8	Air Pressure Control Valve Assembly	1222-0081	1222-0081	1222-0081	

Table 5. Power Source Replacement Parts

REPLACEMENT PARTS

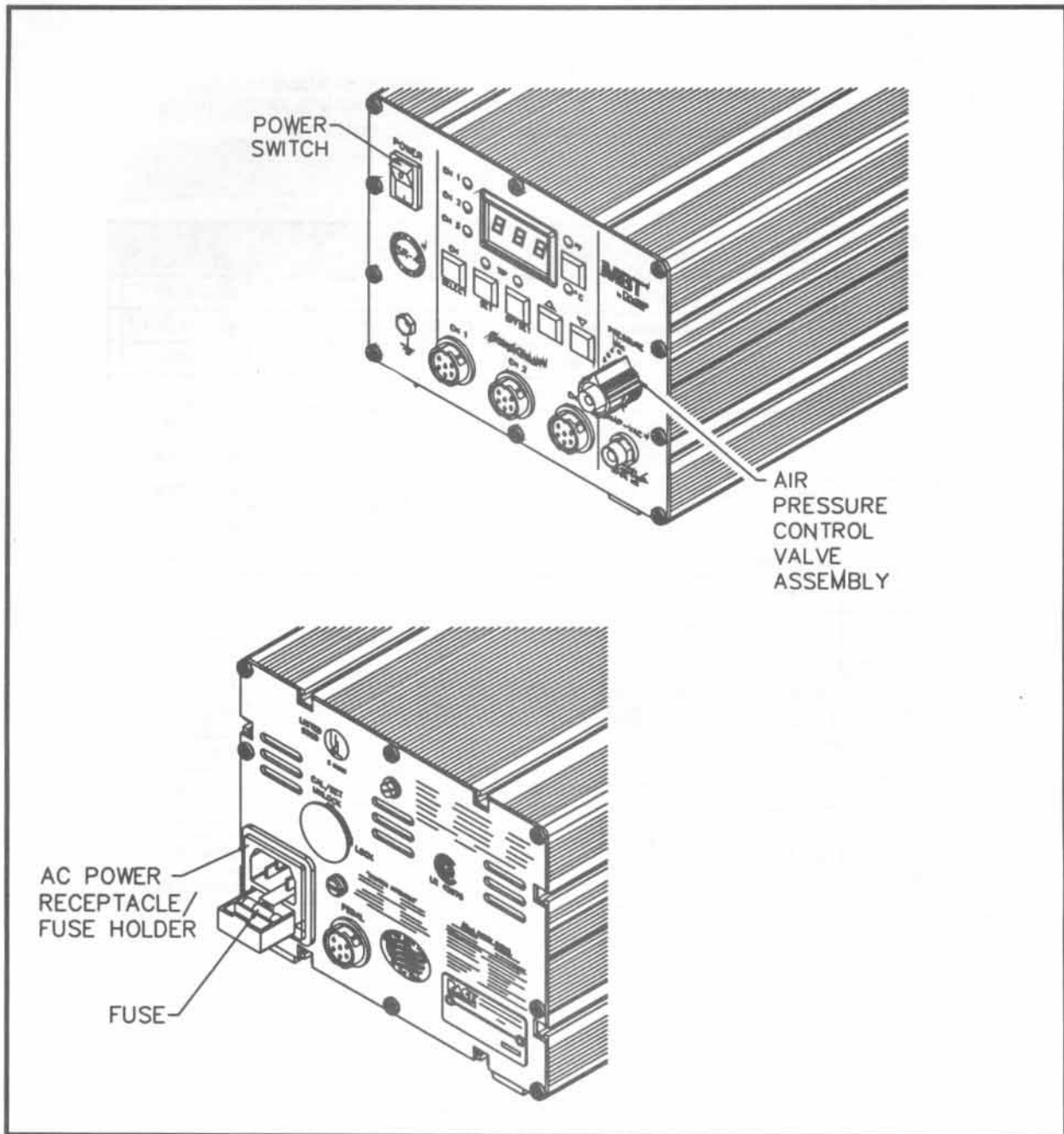


Figure 45. Power Source Replacement Parts

REPLACEMENT PARTS

ACCESSORIES

Listed below is a partial listing of available parts & accessories. For a complete, current listing of available parts & accessories, contact PACE sales or your local authorized PACE distributor.

Item Number	Description	Part Number
1	Tip Maintenance Station	6993-0138
2	Replacement Sponge for Tray (7 pieces)	4021-0007-P7
3	Fiber Cleaning Tool (for Surface Mount tips)	1100-0232
4	Replacement Fiber Filler (pkg. of 2)	1127-0013-P2
5	Sponge Cleaning Tool (for Surface Mount tips)	1100-0233
6	Replacement Sponge Filler (pkg. of 5)	4021-0006-P5
7	Cleaning Sponge, Tip & Tool Stands	4021-0008-P3
8	Tip Redi-Rak	6021-0007
9	Tip & Tool Stand Redi-Rak	6021-0008
10	Foot Pedal	6008-0115
11	Tip & Temperature Selection System Charts Booklet	5050-0251
12	Tip & Temperature Selection System Chart Holder	1257-0186-P1
13	Temperature Calibration/Set Key Lock	1273-0008-P1
14	Power Source Interlock Kit	6993-0141
15	Calibration Kit	6993-0133
16	Metric Adapter Fitting ("V" systems air line fitting)	1259-0081
17	PACE Screwdriver	1100-0230
18	One Year Consumable Kit	6550-0019
19	Service Manual	5050-0352

Table 6. Available Accessories

REPLACEMENT PARTS

HANDPIECES

Listed below is a listing of available handpieces, Tip & Tool Stands & replacement heaters. For a complete, current listing of available parts & accessories, contact PACE sales or your local authorized PACE distributor.

Item Number	Description	Part Number
SensaTemp Handpieces		
1	SP-2A Sodr-Pen	6025-0014-P1
2	SP-1A Sodr-Pen	6025-0013-P1
3	SX-70 Sodr-X-Tractor	6010-0077-P1
4	TJ-70 Mini ThermoJet	7023-0002-P1
5	TP-65 ThermoPik	7024-0001-P1
6	DTP-80 Dual ThermoPik	7029-0001-P1
7	TT-65 ThermoTweez	7025-0001-P1
Tip & Tool Stands for SensaTemp Handpieces		
8	SP Tip & Tool Stand (used with items #1 & 2 above)	6019-0043
9	SX Tip & Tool Stand (used with items #3, 4 & 5 above)	6019-0044
10	TT Tip & Tool Stand (used with item #7 above)	6019-0046
11	DTP Tip & Tool Stand (used with item #6 above)	6019-0047
12	Tip & Tool Stand Redi-Rak	6021-0008

Table 7. Available Handpieces

Item Number	Description	Part Number
Sodr-X-Tractors		
1	SX-70 Heater & Seal Assembly	6010-0077-P1
2	SX-65A Heater & Seal Assembly	6010-0073-P1
Soldering Irons		
3	SP-2A Sodr-Pen Heater Assembly	6010-0086-P1
4	SP-1A Sodr-Pen Heater Assembly	6010-0085-P1
5	IR-70 Heater Assembly	6010-0078-P1
SMT Handpieces		
6	TJ-70 Heater Assembly	6010-0084-P1
7	TP-65 Heater Assembly	6010-0081-P1
TT-65 & DTP-80 Heater Assemblies		
8	Heater Assembly With Sensor	6010-0082-P1
9	Heater Assembly Without Sensor	6010-0083-P1

Table 8. Replacement Heaters

REPLACEMENT PARTS

HANDPIECE PARTS

Listed below are the handpiece replacement parts which may be ordered directly from PACE sales or through your local authorized PACE distributor. To obtain any handpiece parts other than those listed below, contact the PACE Service Department directly at Tel. # (888) 535-7223 (toll-free) or Fax # (301) 483-7030.

Item Number	Description	Part Number
1	Glass Chamber, SX-70 Sodr-X-Tractor	1265-0009-P1
2	Silicone Rubber Chamber, SX-70 Sodr-X-Tractor	1265-0010-P1
3	VisiFilter, Fixed	1309-0020
4	VisiFilter, Replaceable	1309-0028
5	Replaceable VisiFilter Elements (available in quantities of 10, 25, 50)	1309-0027
6	Sodr-X-Tractor Filter (available in quantities of 10, 50)	1309-0018
7	Heater Set Screws	1348-0547-P10
8	Vacuum Tubing, Translucent Silicone (66" length)	1342-0001-14
9	Vacuum Tubing, Translucent Silicone (54" length)	1342-0001-13
10	Vacuum Tubing (DTP-80 only)	1342-0027
11	Hose Clamps (all except DTP-80 handpiece)	1321-0085-P6
12	Hose Clamps, DTP-80	1321-0274-P6
13	Quick-Disconnect Fitting (Male)	1259-0087
14	Quick-Disconnect Fitting (Female)	1259-0086
15	Quick-Disconnect Fitting, Male, w/vacuum release (DTP-80 only)	1259-0102
16	Cable Marker Kit (Colored Tabs for hose/cord identification)	6993-0136
17	Tip Tool	1100-0206
18	Tip & Vacuum Cup Tool (DTP-80 & TP-65)	1100-0239
19	Tip Alignment Tool, ThermoTweez	1100-0234
20	Bristle Brush	1127-0002
21	Wire Brush, 3/16" Diameter	1127-0014
22	Wire Brush, 1/8" Diameter	1127-0006
23	Tip Cleaner Kit	6993-0151
24	AdapTip	1360-0083-P1
25	Vacuum Cup Kit, (DTP-80 & TP-65)	6993-0153
26	Thermal Insulative Handpiece Sleeve (all SensaTemp Air Handpieces)	1346-0065
27	Cushion Grip Kit (TT-65 & DTP-80)	6993-0184
28	Replacement Pads for Cushion Grips (TT-65 & DTP-80)	1317-0029-P2

Table 9. Handpiece Parts