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MBT™-210/E

**DIGITAL
SOLDERING /
DESOLDERING
STATION**



**SERVICE /
MAINTENANCE
MANUAL**

MBT™-210/E

**MANUAL NO. 5050-0223
REV. A**

GENERAL INFORMATION

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GENERAL INFORMATION

INTRODUCTION

This manual will assist the technician in performing preventive maintenance, corrective maintenance and temperature calibration on the MBT-210 and MBT-210E units. If you should encounter any difficulty correcting a unit malfunction, contact PACE Customer Service.

The PACE MBT-210 and 210E feature quick-recovery, closed loop temperature control with LED readout of Set and Operating temperatures and a quick start vacuum system. The "SR-3" "Safety Rated" designation on the front panel assures the user that the MBT-210/E meets or exceeds all applicable DOD-2000 and WS6536 specifications as well as other PACE standards for high quality repair. These specifications and standards are as follows:

- **Temperature Control:** Closed loop with 3 digit LED display of set and operating temperatures ($^{\circ}\text{F}$ or $^{\circ}\text{C}$).
- **Idle Tip Temperature Stability:** Within $\pm 10^{\circ}\text{F}$ ($\pm 5.5^{\circ}\text{C}$) of set point independent of line voltage fluctuations.
- **AC Leakage:** Less than 2 mV rms.
- **Tip-to-ground Impedance:** Less than 2 ohms (Tip to AC power cord ground pin).
- **Transient Levels:** Less than 500 mV. peak, out to 100 MHz. All zero power switching used.
- **Static Control:** All metal chassis with earth ground terminal and static dissipative handpiece.
- **Desoldering/Soldering Tool Holders:** Tool holders are non-heat sinking, protect personnel from burns and do not apply excess mechanical stress on handpieces.

SPECIFICATIONS

- **Power requirements:** MBT-210—Domestic version operates on 100-115 VAC, 50/60 Hz, 150W, 1.3 amp maximum.
MBT-210E—Export version operates on 220-240 VAC, 50 Hz, 150W, 0.65 amp maximum.
- **Handpiece Tip Temperature: Settings—** 600 $^{\circ}\text{F}$ (316 $^{\circ}\text{C}$) nominal, min.
— 900 $^{\circ}\text{F}$ (482 $^{\circ}\text{C}$) nominal, max.
- **Display:** Indicates Set and Operating Temperatures ($^{\circ}\text{F}$ or $^{\circ}\text{C}$) for Soldering Iron and Extractor, with one degree of resolution.

GENERAL INFORMATION

PARTS IDENTIFICATION

TABLE 1. MBT SYSTEMS (MBT-210/210E) PARTS IDENTIFICATION

- VARIABLE TEMPERATURE CONTROL (EXTR)—provides variable temperature control for the Extractor Handpiece Tip temperature.
- VARIABLE TEMPERATURE CONTROL (IRON)—provides variable temperature control for the Soldering Iron Tip temperature.
- MAIN POWER SWITCH—controls input power within MBT System.
- PRESSURE CONTROL—air control for hot-air jet mode.
- VACUUM FITTING—vacuum flow for solder removal.
- OUTPUT POWER RECEPTACLE (EXTR)—connects power from MBT System to the Extractor Handpiece.
- OUTPUT POWER RECEPTACLE (IRON)—connects power from MBT System to the Soldering Iron Handpiece.
- VISIFILTER® —collects and prevents foreign matter from entering the Motor Pump.
- EXTRACTOR HANDPIECE—tool used for solder extraction, and hot-air jet mode (reflows solder connections and shrinks tubing).
- VACUUM CONTROL SWITCH—Extractor Handpiece “ON/OFF” switch activates Motor Pump.
- EXTRACTOR TIP—heats and extracts solder from joints.
- HEATER ASSEMBLY—provides heat to Extractor Tip.
- HOT CUBBY—conveniently stores Extractor and Soldering Iron Handpieces.
- EARTH GROUND TERMINAL—provides a ground between the MBT System and PCB, thus preventing static charge from damaging sensitive components.
- AC POWER RECEPTACLE—provides AC power to MBT System from AC outlet through Power Cord.
- POWER CORD—provides main power from AC outlet to AC Power Receptacle.
- LINE FUSE (F1)—provides overload protection for MBT System.
- SOLDERING IRON HANDPIECE—tool used for soldering functions.
- TEMPERATURE DISPLAY—provides a three (3) digit readout of the Extractor/Soldering Iron Tip temperature.
- DISPLAY SWITCH—selects Extractor or Soldering Iron Tip temperature for Temperature Display.
- SET TEMPERATURE BUTTONS—when depressed, display set idling/operating temperature of the Extractor or Soldering Iron to adjust for desired operating temperature.
- °C/°F SWITCH—selects Centigrade or Fahrenheit readout on Temperature Display.
- FOOT PEDAL RECEPTACLE—an input for optional Foot Pedal actuation of vacuum.

Figure 1 identifies the controls and indicators required for operation on the MBT System(s) (MBT-210/210E). Refer to Table 1 and Figure 1 for location and identification of each part.

GENERAL INFORMATION

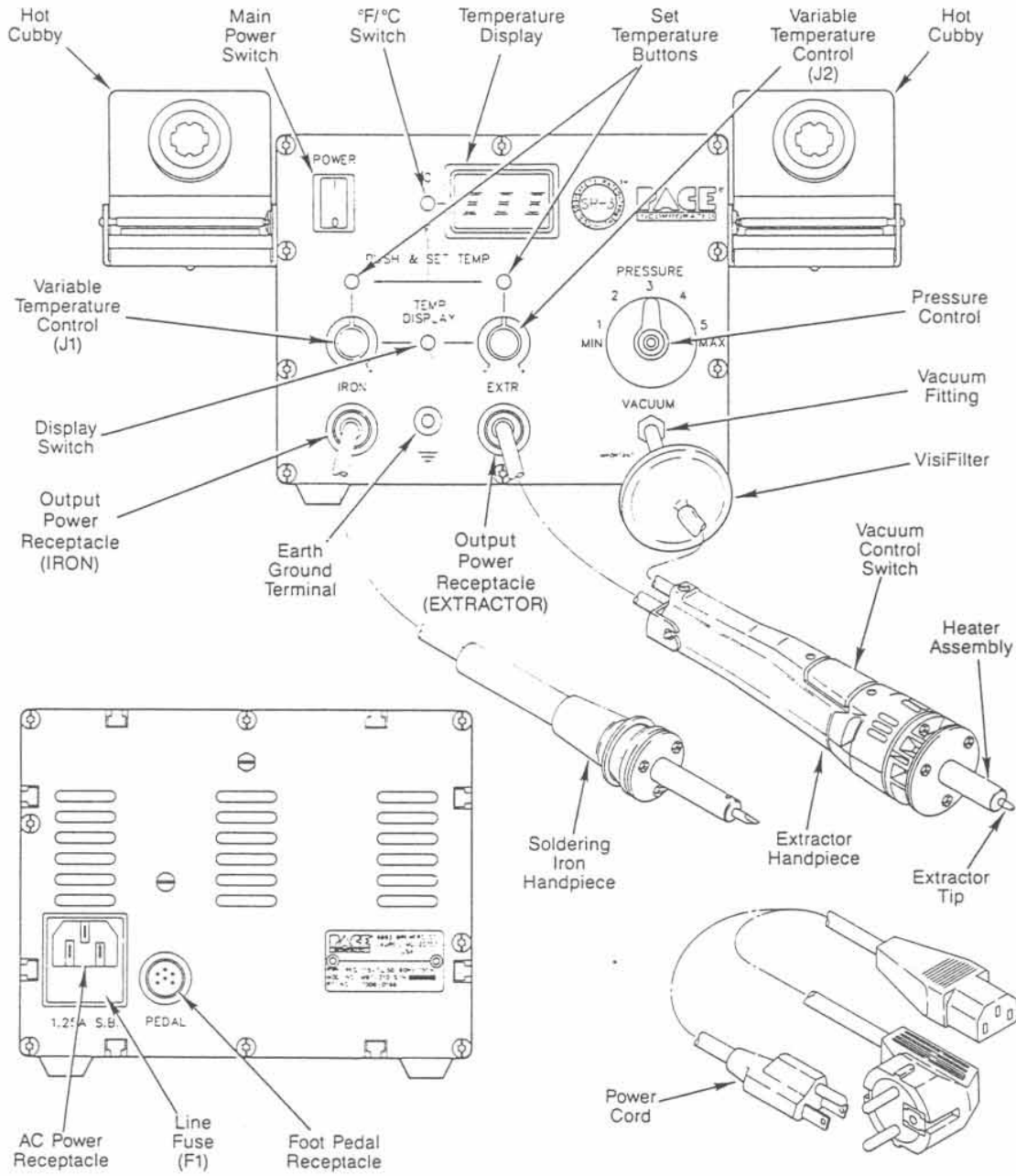


FIGURE 1. PACE MBT SYSTEM (MBT-210/210E) PANEL IDENTIFICATION

REPAIR

REPAIR PROCEDURE

The "MBT-210/E 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. This REPAIR section and the following technical documentation sections are broken down into the following segments.

1. SERVICE HINTS—Gives helpful servicing hints for facilitating repair.
2. CORRECTIVE MAINTENANCE—A guide for resolving malfunctions caused by improper maintenance or handpiece failure.
3. TROUBLESHOOTING FLOW CHARTS—Easy to follow charts which enable the technician to determine the source of a malfunction down to an assembly (e.g. Main PC Assembly) level.
4. DISASSEMBLY/REASSEMBLY—Enables the technician to disassemble and reassemble the unit properly.
5. HANDPIECE MAINTENANCE—Enables the technician to properly replace defective heater assemblies on both the Extractor and Soldering Iron.
6. SCHEMATICS—Contains electronics schematics, wiring diagrams and line drawings.

IMPORTANT: IN ORDER TO ACHIEVE 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. Read the Service Hints which give information on operation and troubleshooting.
2. Locate the "SYMPTOM" in the CORRECTIVE MAINTENANCE segment which best describes the malfunction of the failed MBT-210/E unit. Check each point described under "SOLUTION" in order of listing.
3. If the malfunction has not been corrected at this point, locate the "TROUBLESHOOTING FLOW CHART" which best describes the malfunction of the failed MBT-210/E unit.
4. If the cause for the malfunction has not been determined at this point, call PACE CUSTOMER SERVICE for assistance.

SERVICE HINTS

1. **VACUUM FAILURES:** Failures of this nature are caused by failures of either the unit or Extractor handpiece. Remove the vacuum hose from the unit vacuum 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 vacuum port, check vacuum level at the end of the glass solder collection chamber (chamber must be checked cold).
2. **POOR SOLDER EXTRACTION:** These types of failures are generally resolved using the Corrective Maintenance guide.
3. **HEATING, DISPLAY and MOTOR MALFUNCTIONS:** Can be caused by defective handpiece receptacle connections. Visually inspect the receptacle pins. If any of the metal pins are pushed back in the receptacles, the receptacle in question must be repaired or replaced. Receptacles, pins and wiring harness are listed in the parts section located on Table 4, page 34. Replace these parts by disassembling the unit through level 1 (page 14) and using the front panel illustration shown on page 17.

NOTE: When replacing receptacle connector pins, use the following tools.

1. AMP PIN REMOVER #91136-1
2. AMP crimping tool #90363-1-E

4. **HEATING CONTROL CIRCUITS:** Must be checked under load (with handpieces plugged in). The outputs are obtained by switching triacs on and off. The voltage level to the handpiece does not change when adjusting the Heat Control Knobs. Temperature level is achieved by varying the number of "on" cycles that voltage is applied as opposed to the number of cycles "off". 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.
5. **HEATING FAILURES (NO HEAT):** Usually caused by defective handpiece heaters. Use the guide shown on Table 3, page 20 to test the handpiece.
6. **MOTOR ACTIVATION PROBLEMS:** May be caused by a defective handpiece switch or receptacle connection. Plug the Extractor into the auxiliary foot control receptacle located on the rear of the unit. If the motor pump can be activated at that point, check the handpiece output receptacles. If the pump will not activate, check the handpiece switch using the guide listed on Table 3, page 20.
7. **DISPLAY PROBLEMS:** May be caused by either handpiece or unit failures. Check handpiece using Table 3, page 20. If no display is present on the unit, plug one of the calibration assemblies (if available), into the unit. If the display turns on, a handpiece failure has occurred.

REPAIR

Most malfunctions are caused by improper maintenance. Refer to the table shown below to clear these malfunctions. If corrective maintenance does not clear the malfunction refer to the troubleshooting guides shown on pages 10 through 13.

CORRECTIVE MAINTENANCE

TABLE 2

SYMPTOM	POSSIBLE CAUSE	SOLUTION
POOR SOLDER EXTRACTION—The operator notices that solder joints are not being completely removed	Restrictions or leaks	<ol style="list-style-type: none"> 1. Check to insure that glass chamber is properly seated against the front seal. 2. Glass chamber filter clogged. Replace if necessary. 3. Replace tip. 4. Check "S" baffle for proper positioning. 5. Check for damaged or kinked vacuum hose. Replace if necessary. 6. Replace Visifilter if discolored.
NO POWER TO UNIT	Blown Fuse.	Replace Fuse. Check for shorted Soldering Iron or Extractor heater. Refer to Table 3, page 20.
	Broken Power Cord.	Replace Power Cord.
NO VACUUM—Heating function normal. Motor operates	Clogged glass chamber	Clean chamber and replace filter.
	Clogged tip	Replace tip.
	Broken visifilter	Replace Visifilter.
	Improper visifilter or hose connections	Fit connection properly.
	Hole, kink or obstruction in line	Replace or unkink hose. If the Extractor hose is not the problem, disassemble the unit thru Level 1 and check internal hoses and internal motor filter.

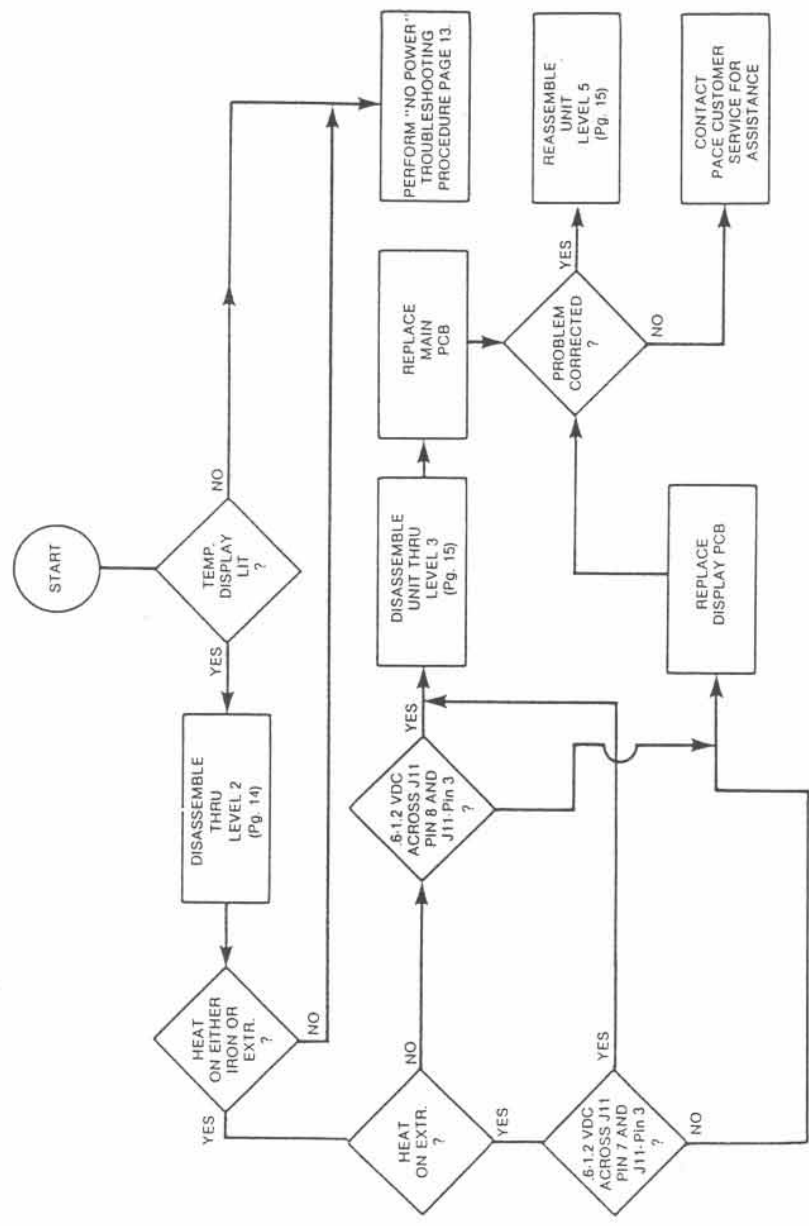
REPAIR

CORRECTIVE MAINTENANCE (cont.)

SYMPTOM	POSSIBLE CAUSE	SOLUTION
NO VACUUM-Heating function normal. Motor does not operate.	Extractor not plugged into "EXTR" receptacle.	Plug extractor in "EXTR". Motor will not run in IRON receptacle.
	Control circuit inoperative.	Plug Extractor into foot control receptacle. If motor does not run, refer to page 12 "Troubleshooting/Motor Malfunction".
	Handpiece Shell screws loose.	Tighten screws. Refer to figure 12 page 22.
	Dirty Extractor switch	Clean switch. Refer to figure 12 page 22.
EXTRACTOR Heater does not heat. Vacuum function normal.	Defective Cord and Switch Assembly	Replace. Refer to figure 12 page 22.
	Defective heater	Refer to Table 3, page 20.
SOLDERING IRON No heat.	Defective Control Circuit.	Refer to "Heat Output Troubleshooting", page 10.
	Defective heater	Refer to Table 3, page 20.
NO TEMPERATURE DISPLAY—	Defective Control circuit.	Refer to "Heat Output Troubleshooting," page 10.
	Handpiece unplugged/ improperly installed.	Plug handpiece into Heat Control Receptacle.
	Sensor in Handpiece defective.	Check sensor in both handpieces. Refer to Table 3, page 20.
	Defective Control circuit.	Refer to "Heat Output Troubleshooting", page 10.

REFER TO THE CORRECTIVE MAINTENANCE SECTION, PAGE 8, FOR RESOLUTION OF SYSTEM MALFUNCTION BEFORE PERFORMING THIS PROCEDURE. INSURE THAT BOTH EXTRACTOR AND SOLDERING IRON HAVE BEEN CHECKED USING FIGURE 10, PAGE 20.

REFER TO PAGES 16, 17, 28 AND 29 FOR TEST POINT LOCATIONS



TROUBLESHOOTING

REPAIR

FIGURE 2. HEAT OUTPUT

TROUBLESHOOTING

REFER TO PAGES 16, 17, 28 AND 29 FOR TEST POINT LOCATIONS

REFER TO THE CORRECTIVE MAINTENANCE SECTION, PAGE 8, FOR RESOLUTION OF SYSTEM MALFUNCTION BEFORE PERFORMING THIS PROCEDURE. INSURE THAT BOTH EXTRACTOR AND SOLDERING IRON HAVE BEEN CHECKED USING FIGURE 10, PAGE 20.

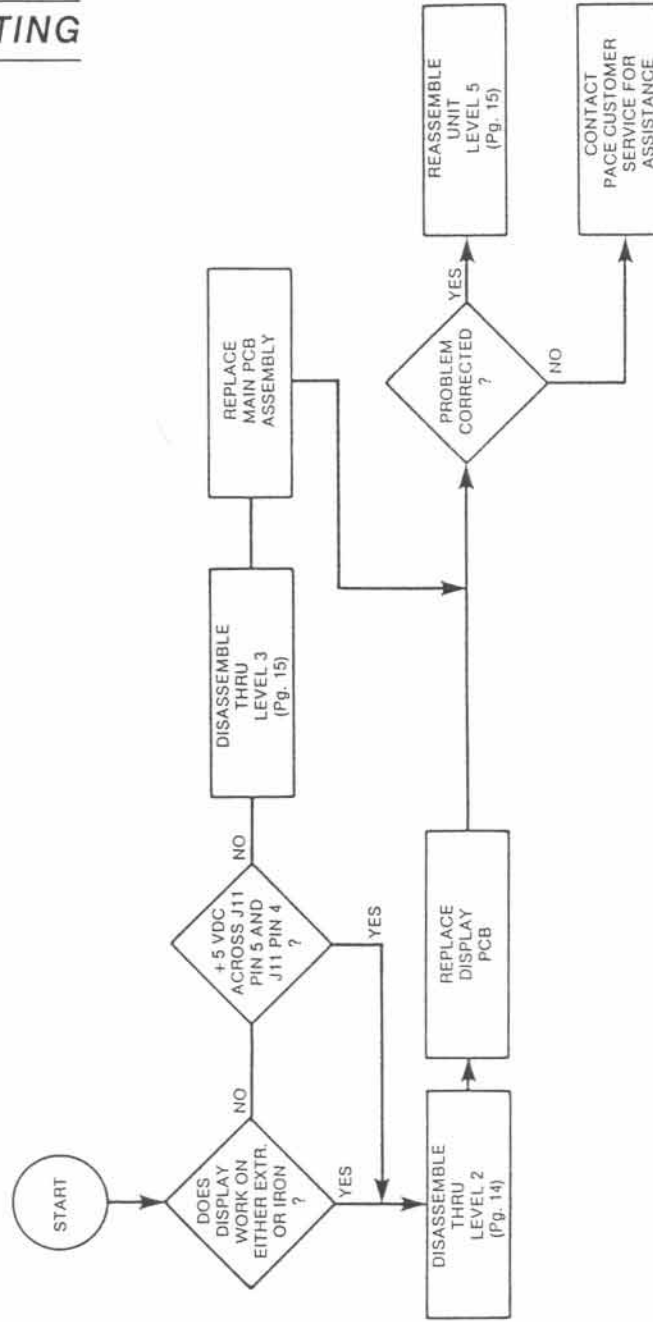


FIGURE 3. TEMPERATURE DISPLAY

REPAIR

TROUBLESHOOTING (cont.)

REFER TO THE CORRECTIVE MAINTENANCE SECTION, PAGE 8, FOR RESOLUTION OF SYSTEM MALFUNCTION BEFORE PERFORMING THIS PROCEDURE. INSURE THAT BOTH EXTRACTOR AND SOLDERING IRON HAVE BEEN CHECKED USING FIGURE 10, PAGE 20.

REFER TO PAGES 16, 17, 28 AND 29 FOR TEST POINT LOCATIONS

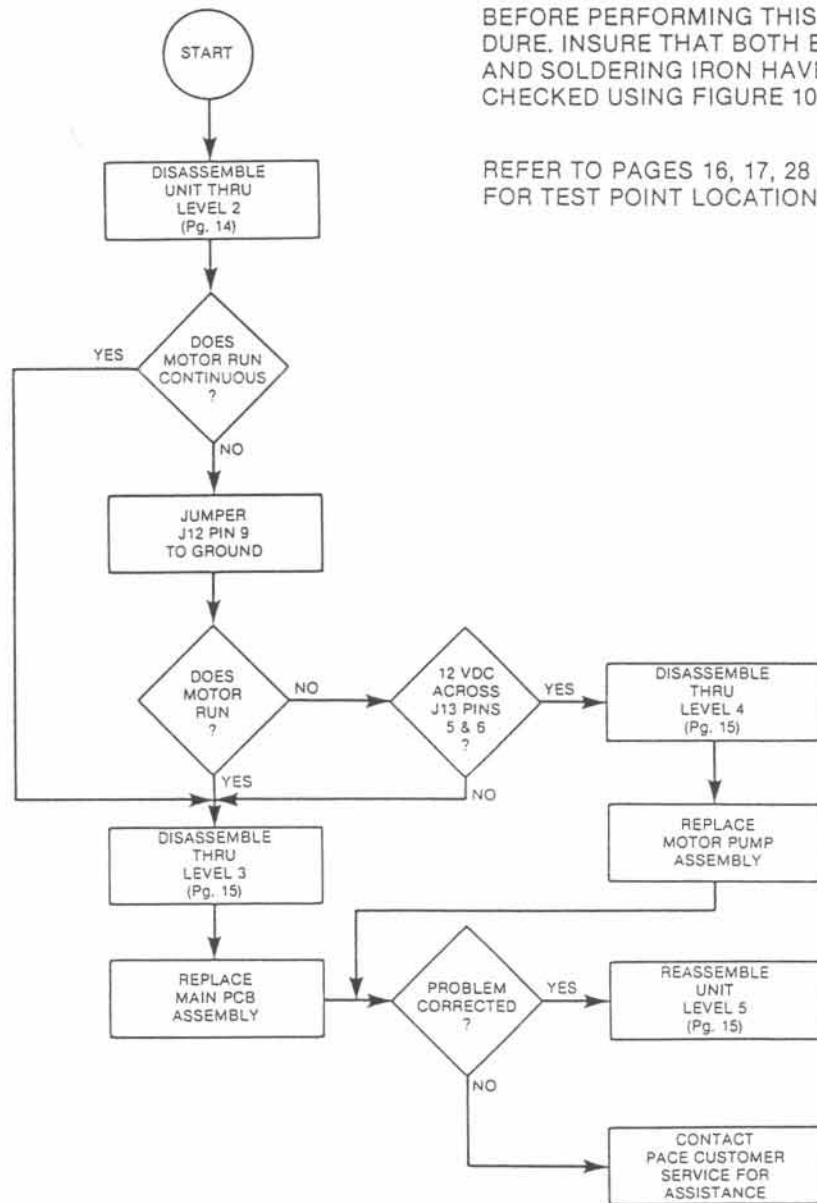
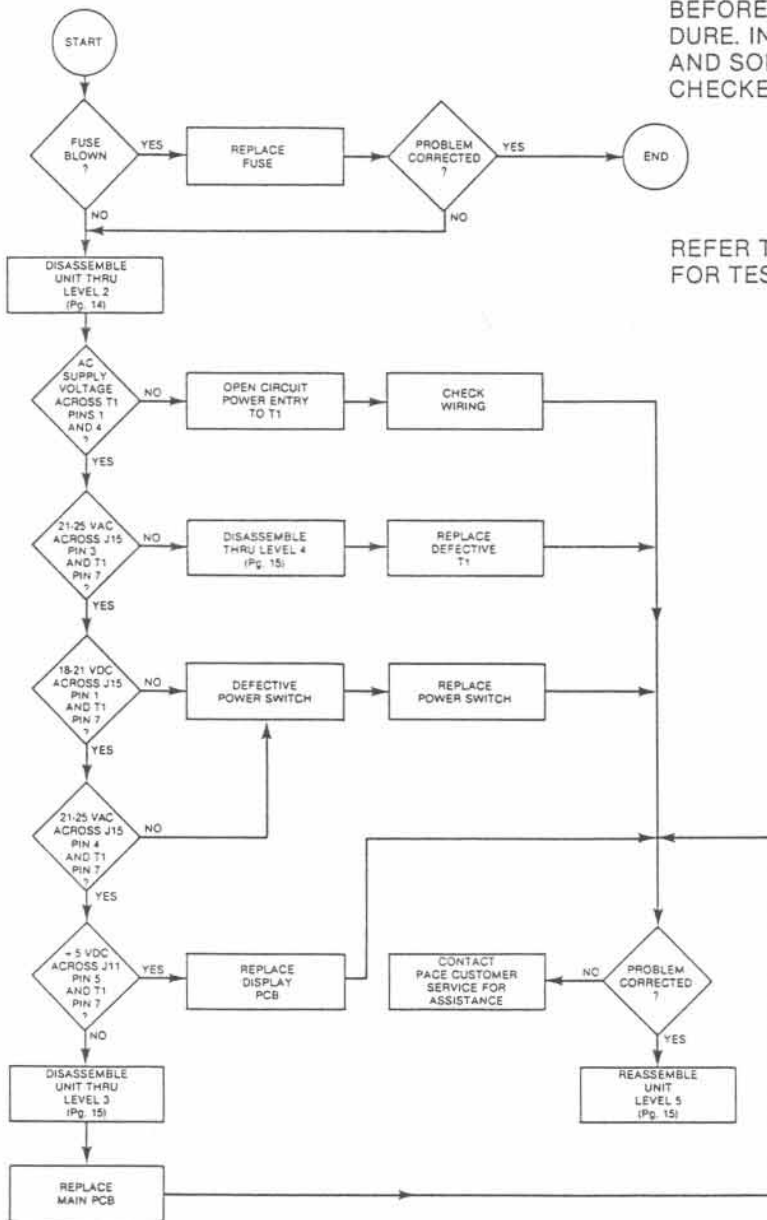


FIGURE 4. MOTOR MALFUNCTION

TROUBLESHOOTING (cont.)

REFER TO THE CORRECTIVE MAINTENANCE SECTION, PAGE 8, FOR RESOLUTION OF SYSTEM MALFUNCTION BEFORE PERFORMING THIS PROCEDURE. INSURE THAT BOTH EXTRACTOR AND SOLDERING IRON HAVE BEEN CHECKED USING FIGURE 10, PAGE 20.



REFER TO PAGES 16, 17, 28 AND 29 FOR TEST POINT LOCATIONS

FIGURE 5. NO POWER

DISASSEMBLY / REASSEMBLY

To disassemble the MBT-210/E unit for servicing, perform the following procedure step by step, in sequence using the exploded illustrations on pages 36-37, as a guide. The procedure is separated into "Levels" of repair to assist the technician in determining the extent of disassembly required for repair of the unit malfunction.

NOTE: Do not disassemble the unit any further than required for repair.

LEVEL 1—FRONT PANEL ASSEMBLY REMOVAL

1. Place the unit on a suitable work surface.
2. Using a flat blade screwdriver, remove the 10 Front Panel mounting screws.
3. Pull the Front Panel forward 3 inches.

PERFORM STEPS 4 THRU 8 TO REMOVE FRONT PANEL FOR PART REPLACEMENT ONLY. DO NOT REMOVE WHEN PERFORMING TROUBLESHOOTING PROCEDURE.

4. Locate the Power Switch on the Front Panel. The four (4) wires attached to the switch run to a white five pin plug which is connected to the Main PC Board. Disconnect the white plug from the PC board.
5. Locate the two (2) clear plastic hoses which are attached to the Front Cover. Note the routing of the plastic hoses. It is extremely important for these hoses to be placed in the same position when reassembling the unit to insure proper vacuum and pressure levels. Disconnect the two hoses.
6. Disconnect the flat ribbon cable from the Main PC Board.
7. Disconnect the red ten (10) pin plug from the Main PC Board.
8. Set the Front Panel assembly aside.

LEVEL 2—REAR PANEL ASSEMBLY REMOVAL

9. Reposition the unit with the rear of the unit facing forward.
10. Using a flat blade screwdriver, remove the hex head screw and the eight (8) Rear Panel mounting screws.
11. Pull the Rear Panel forward 2 inches and lay face down on the work surface.

PERFORM STEPS 12 THRU 14 TO REMOVE REAR PANEL FOR PART REPLACEMENT ONLY. DO NOT REMOVE WHEN PERFORMING TROUBLESHOOTING PROCEDURE.

12. The wiring from the auxiliary foot control receptacle runs to a red three (3) pin plug which connects to the Main PC Board. Disconnect this plug from the Main PC Board.
13. Disconnect the white and the white/black wires from the Power Entry Module.
14. Set the Rear Panel assembly aside.

DISASSEMBLY / REASSEMBLY

LEVEL 3—MAIN PC BOARD REMOVAL

15. Remove the Main PC Board by carefully sliding it out through the front of the unit. Insure that the clear plastic hoses are held down and prevented from interfering with the tall components on the PC board.
16. Set the Main PC Board aside.

LEVEL 4—MOTOR PUMP/TRANSFORMER ASSEMBLY REMOVAL

17. There are four (4) mounting screws with locking nuts which secure the Motor Pump/Transformer assembly to the chassis. Two are located on the front base of the unit and two are located on the rear base. Loosen each of the four locking nuts. Slide the nuts and screws out of the unit.
18. Slide the Motor Pump/Transformer assembly out of the chassis.

LEVEL 5—REASSEMBLY

19. Reassemble the assemblies removed in reverse order of the disassembly procedure. Insure that the following precautions are taken in the process.
 - a) When reinstalling the Motor Pump/Transformer assembly, insure that the assembly plate edge is positioned flush with the rear of the chassis.
 - b) When reconnecting plugs make certain that they are aligned and oriented properly (refer to figure 6, page 16).
 - c) Insure that when reattaching the two wires to the Power Entry Module the white wire is connected to the terminal marked "N" and the white/black wire is connected to the terminal marked "L".
 - d) When reinstalling the Front Panel assembly, insure that the two plastic hoses are attached to the proper fittings and do not kink when the Front Panel is screwed down to the chassis. Refer to figure 6, page 16.

DISASSEMBLY / REASSEMBLY

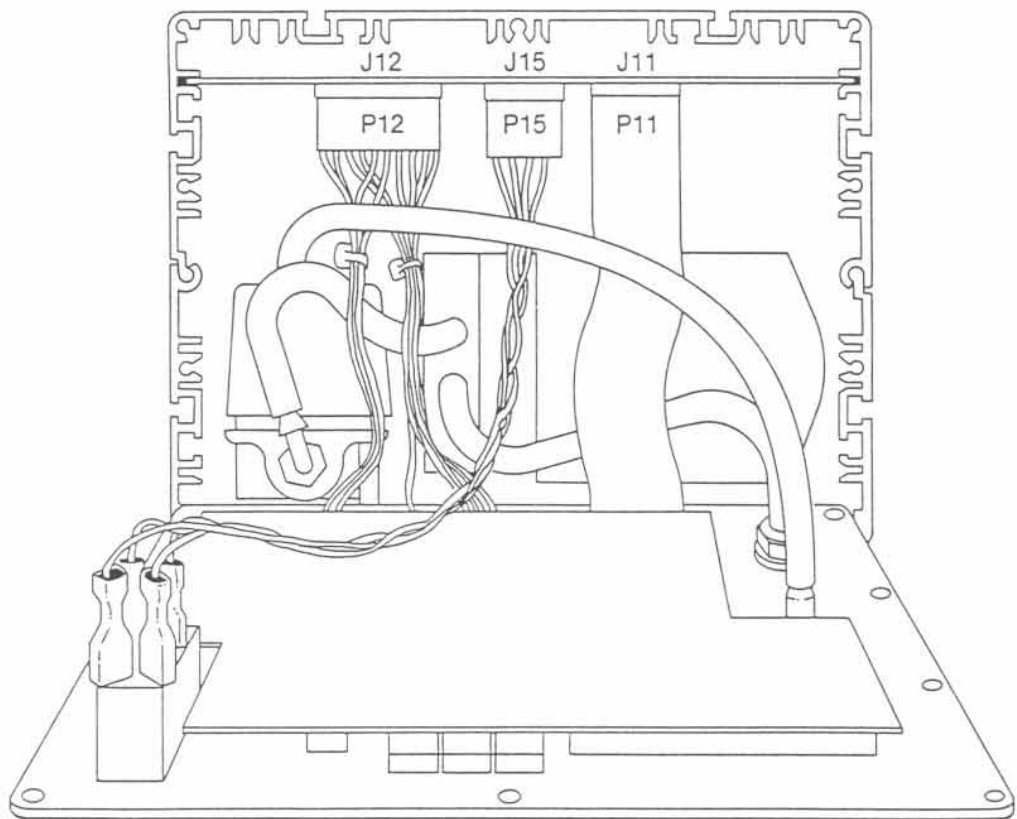


FIGURE 6. FRONT PANEL HARNESS & HOSE ROUTING

DISASSEMBLY / REASSEMBLY

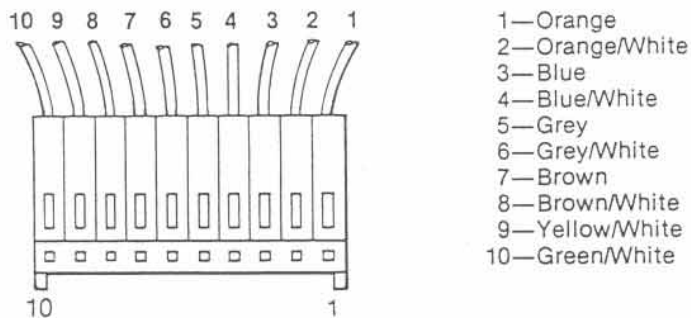
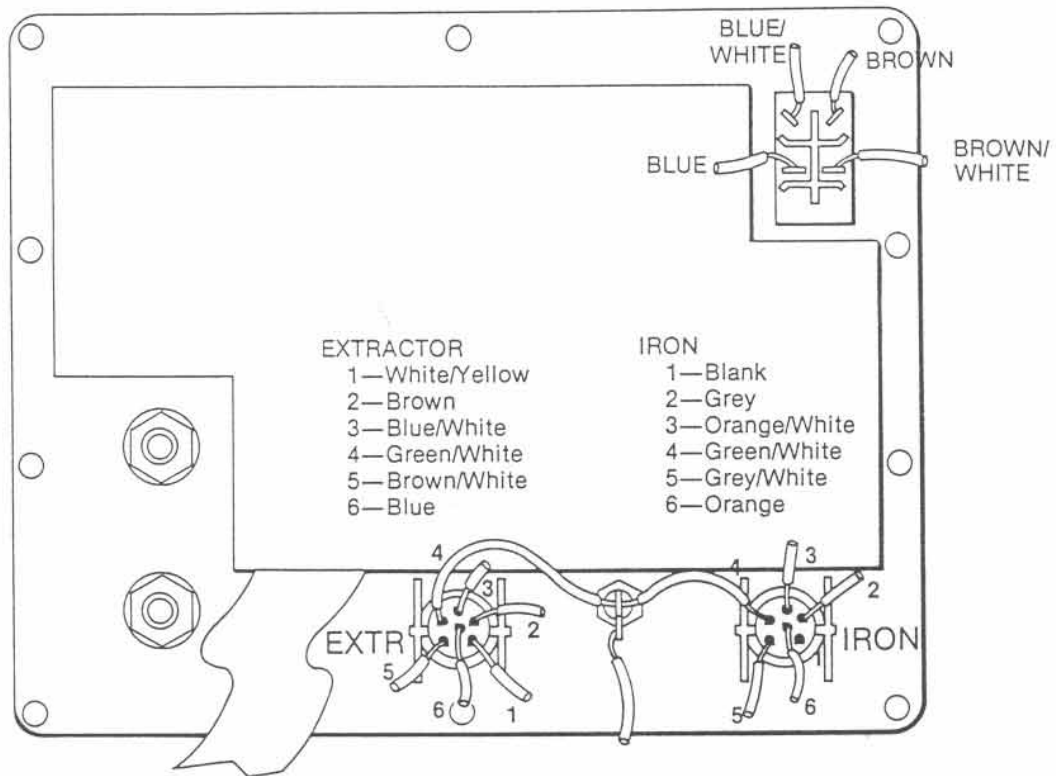


FIGURE 7. FRONT PANEL OUTPUT POWER WIRING

REPAIR

HANDPIECE MAINTENANCE

REPLACEMENT FOR JAMMED OR BROKEN EXTRACTOR TIPS

There may be an occasion when the Extractor Tip breaks off in the Heater Assembly, or due to oxide build-up, the Tip will be immovable. If this happens, perform the following steps:

- disconnect Extractor Handpiece Power Cord and Vacuum Hose from Micro Bench Top System.
- remove the End Cap Assembly and Glass Chamber.
- using Tip Tool, loosen the Heater set screw (1/4 turn). (Refer to Figure 8).

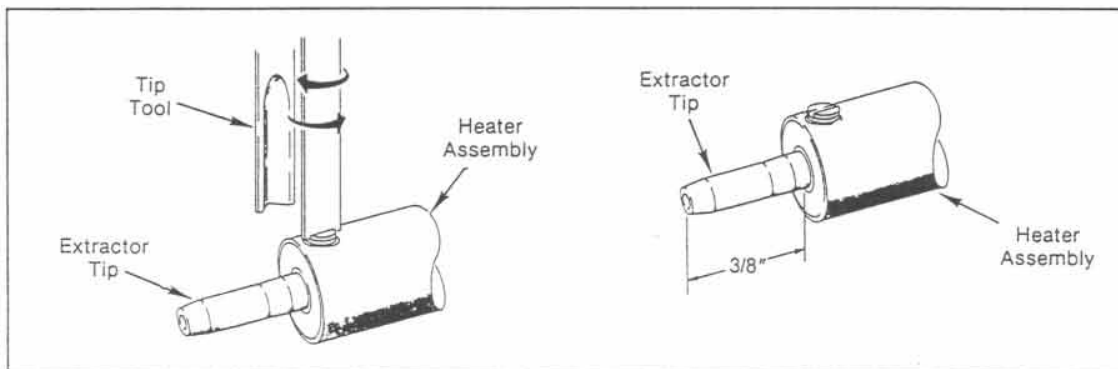


FIGURE 8. EXTRACTOR/SOLDERING IRON TIP REPLACEMENT

REPAIR

- while holding Extractor, insert a steel rod (slightly less than 1/8" diameter) into rear of Handpiece through the Heater Assembly to ram broken Tip from Heater Tube (refer to Figure 9). (NOTE: The Heater should be "HOT" for ease of removal).

CAUTION

Be careful not to touch the "HOT" Heater Assembly while removing the Tip. Never hold Extractor above eye level for inspection of clogged Tip.

- using Tip Tool, insert new Tip into Heater Assembly. (NOTE: Tip should protrude approximately 3/8" beyond the Heater body).
- tighten set screw with Tip Tool. (NOTE: Be careful not to overtighten).

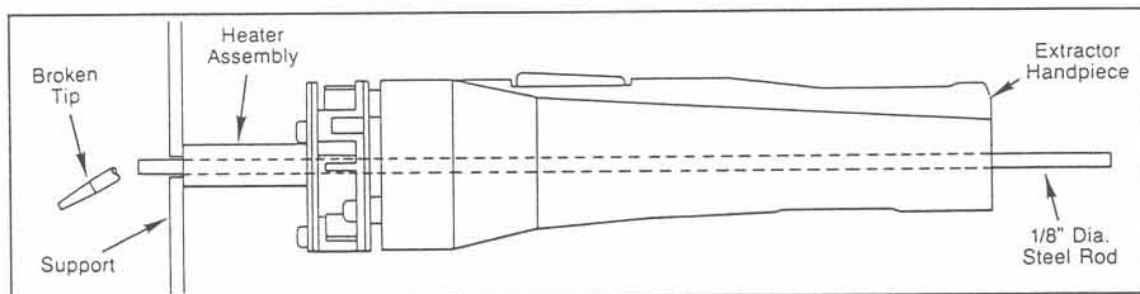


FIGURE 9. REPLACEMENT OF JAMMED OR BROKEN EXTRACTOR TIPS

REPAIR

HANDPIECE MAINTENANCE

Use Table 3 and Figure 10 to determine the condition of your Extractor and/or Soldering Iron assembly. Unplug the Handpieces from the Power Source. Use a voltmeter to check resistance across the Handpiece connector plug pins as outlined in the "Checkout Procedure" column.

TABLE 3. HEATER ASSEMBLY CHECKOUT PROCEDURES

SYMPTOM	CHECKOUT PROCEDURE	CAUSE	SOLUTION
No heat or temperature, Display does not change	Check resistance—Pin 2 to Pin 5. Resistance should be 12 ohms. If not →	Open Heater	Replace Heater assembly.
No heat or temperature, Display is blank	Check resistance—Pin 3 to Pin 6. Resistance should be 110 ohms. If not →	Open sensor	Replace Heater assembly.
Heater full on, temperature does not work. Temperature Display does not change	Check resistance—Pin 3 to Pin 6. Resistance should be 110 ohms at room temperature. If resistance is low →	Shorted sensor	Replace Heater assembly.
Fuse blows when unit is turned on.	Check resistance—Pin 2 to Pin 5. Resistance should be 12 ohms. If not →	Shorted Heater	Replace Heater assembly.
Motor does not run	Check resistance—Pin 1 to Pin 4 with switch closed. Resistance should be less than 500 ohms with switch activated. If not →	Dirty or defective switch	Disassemble using page 23 and figure 12 as a guide. Clean switch. Replace cord and switch assembly if necessary.

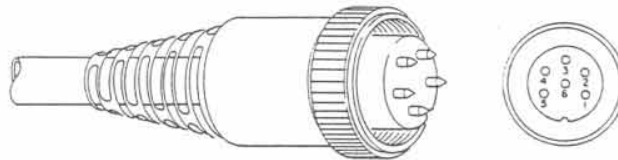


FIGURE 10. EXTRACTOR/SOLDERING IRON HANDPIECE CONNECTOR PLUG

HANDPIECE MAINTENANCE

EXTRACTOR HEATER REPLACEMENT

When replacement of the Extractor Heater becomes necessary (refer to Table 3. Heater Assembly checkout), proceed with the following steps.

- disconnect Extractor Handpiece Power Cord and Vacuum Hose from MBT System.
- remove End Cap Assembly and Glass Chamber (refer to Figure 6).
- remove three (3) screws on the Heater Assembly flange (refer to Figure 11), let Heater Assembly hang loose. (NOTE: *DO NOT* pull Heater Assembly from Handpiece at this time).
- using Tip Tool or needle nose pliers, disconnect the five (5) leads plugged into the Cord and Switch Assembly (refer to Figure 6). Remove defective heater Assembly from Handpiece.
- using Tip Tool or needle nose pliers, carefully plug the three (3) color coded leads of the new Heater Assembly into the color coded receptacles of the Vacuum Control Switch board.
- plug "tan" leads into the remaining receptacles of the Vacuum Control Switch board.
- attach Heater Assembly to Handpiece using the previously removed screws, (NOTE: Make certain that the five (5) leads are against the Extractor Handpiece sides and out of the way. Visually inspect through Extractor Handpiece ports).
- replace Glass Chamber, sliding along the bottom inside edge of the Extractor Handpiece ramps. Ramps will align the Glass Chamber with the front seal and properly seat in place.

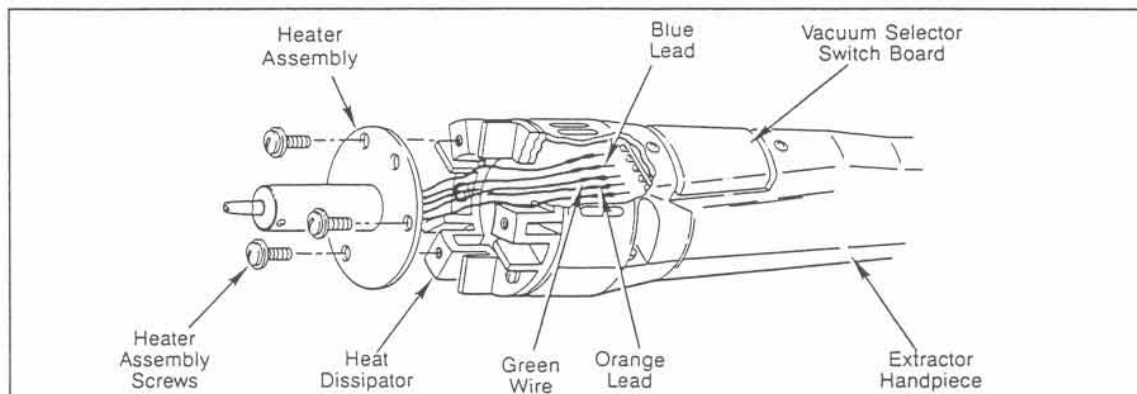


FIGURE 11. EXTRACTOR HANDPIECE HEATER ASSEMBLY REPLACEMENT

HANDPIECE MAINTENANCE

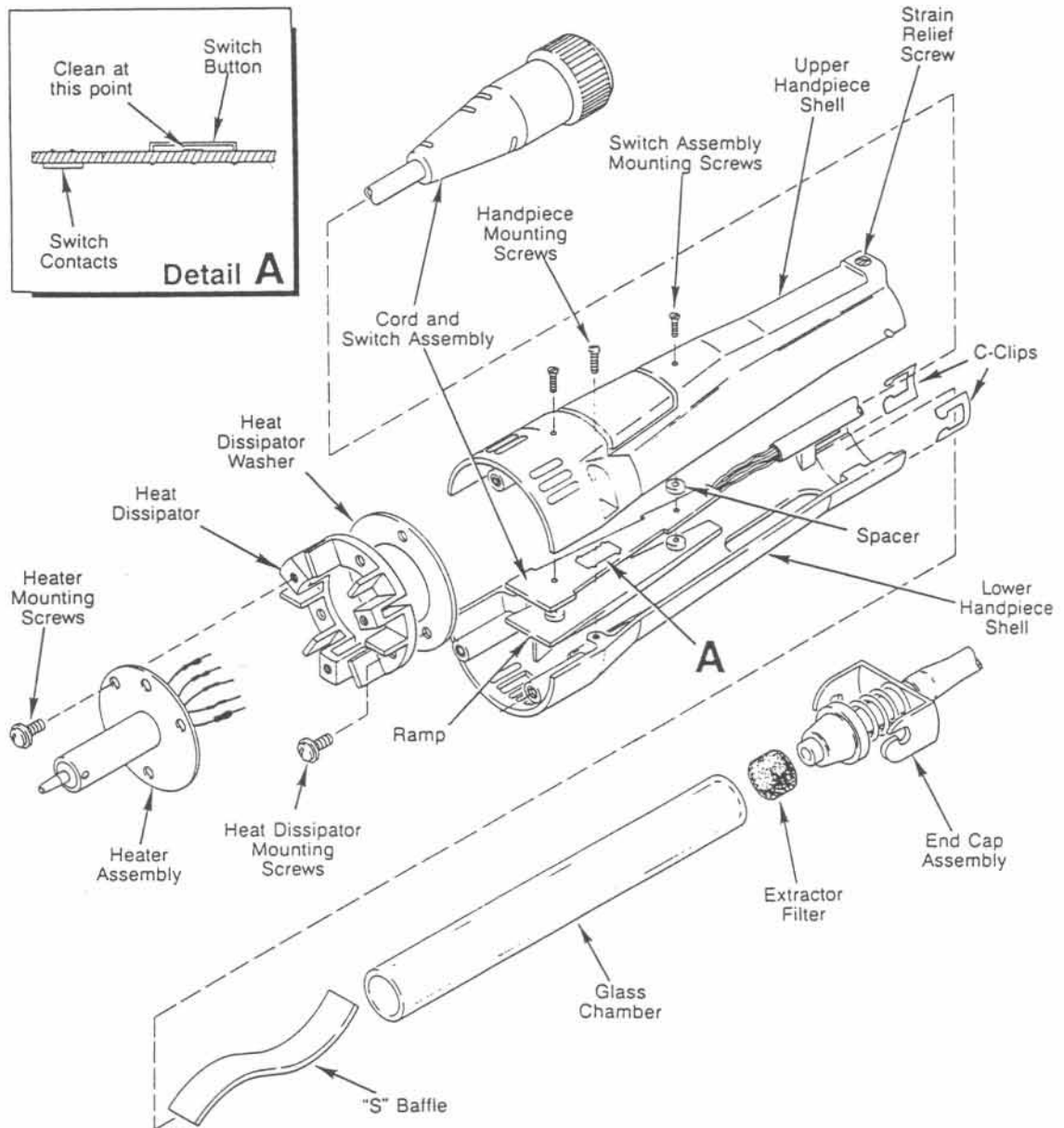


FIGURE 12. CLEANING AND REMOVAL/REPLACEMENT OF CORD AND SWITCH ASSEMBLY

HANDPIECE MAINTENANCE

EXTRACTOR DISASSEMBLY

If a problem occurs with the Extractor Handpiece, tighten the Handpiece screws. If the problem is still present, perform the following procedures for cleaning and/or removal/replacement of the Cord and Switch Assembly (refer to Figure 12).

- disconnect the Extractor Handpiece Power Cord from Power Source.
- remove the End Cap Assembly and Glass Chamber from Extractor Handpiece.
- remove the three (3) Heater Mounting Screws from Extractor Handpiece. (NOTE: DO NOT pull Heater Assembly from the Handpiece at this time),
- using Tip Tool or Needle Nose Pliers, disconnect the five (5) leads plugged into the PC Board of the Cord and Switch Assembly,
- remove the Heater Assembly at this time,
- remove the three (3) Heat Dissipator Mounting Screws from Handpiece,
- set Heat Dissipator and Heat Dissipator Washer aside at this time,
- remove C-Clips from rear of Handpiece,
- remove two (2) Handpiece Mounting Screws from Handpiece,
- remove Lower Handpiece Shell,
- remove the two (2) Switch Assembly Mounting Screws,
- remove the Cord and Switch Assembly from the Upper Handpiece Shell. (NOTE: DO NOT discard or lose Spacer),
- loosen Strain Relief Screw,
- remove Cord and Switch Assembly by sliding to rear of Upper Handpiece Shell, lifting gently on the Cord,
- clean switch on PC Board of Cord and Switch Assembly by brushing solvent between the contact points,
- reassemble the Handpiece in reverse order. (NOTE: The five (5) Heater Assembly wires are color coded to match with colored markings over Heater Wire Receptacles on PC Board of the Cord and Switch Assembly. Insure that the spacer is reinstalled with the Cord and Switch Assembly. Failure to do so will cause Handpiece to short when Switch is activated. Internal damage to electronic circuitry will result.
- plug "tan" leads into remaining receptacles of PC Board of the Cord and Switch Assembly,
- plug Extractor into Power Source and activate Switch. (NOTE: If Switch does not work, replace Cord and Switch Assembly).

HANDPIECE MAINTENANCE

SOLDERING IRON HEATER REPLACEMENT

When replacement of Soldering Iron Heater becomes necessary (refer to Table 3. Heater Corrective Maintenance), proceed with the following steps:

- disconnect Soldering Iron Handpiece Power Cord from MBT System.
- loosen Strain Relief Screw. (NOTE: Screw is located under label. Lift end of label to expose screw).
- remove three (3) screws from Heater flange and let Heater hang loose, refer to Figure 13.
- gently push Power Cord through Handpiece to expose connectors.
- using Tip Tool or needle nose pliers, disconnect the five (5) leads from Soldering Iron Power Cord (refer to Figure 13). Remove Heater Assembly from Handpiece.
- using Tip Tool or needle nose pliers, carefully plug the three (3) color coded leads (orange, blue and green) into matching color coded receptacles of the Soldering Iron Power Cord.
- plug "tan" leads into remaining receptacles of the Soldering Iron Power Cord.
- grasp and pull Power Cord back through Handpiece, tighten strain Relief Screw and replace label.
- attach Heater Assembly using the previously removed screws.

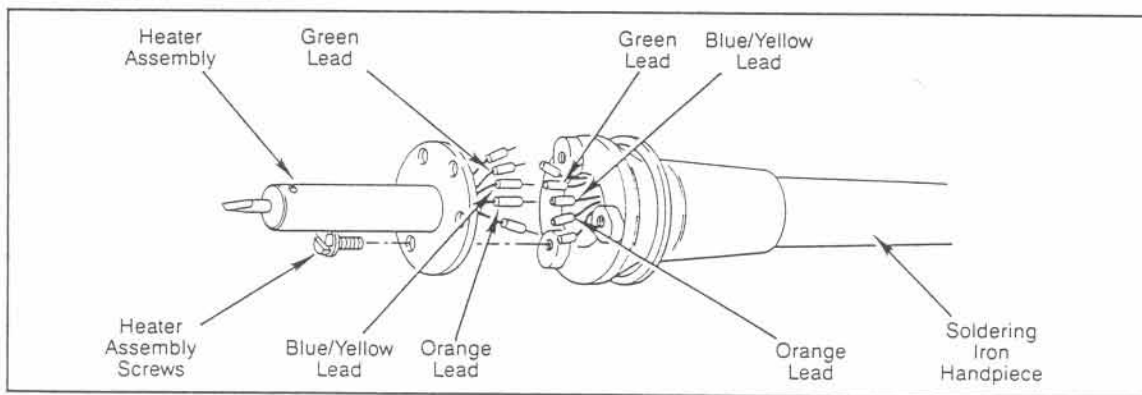
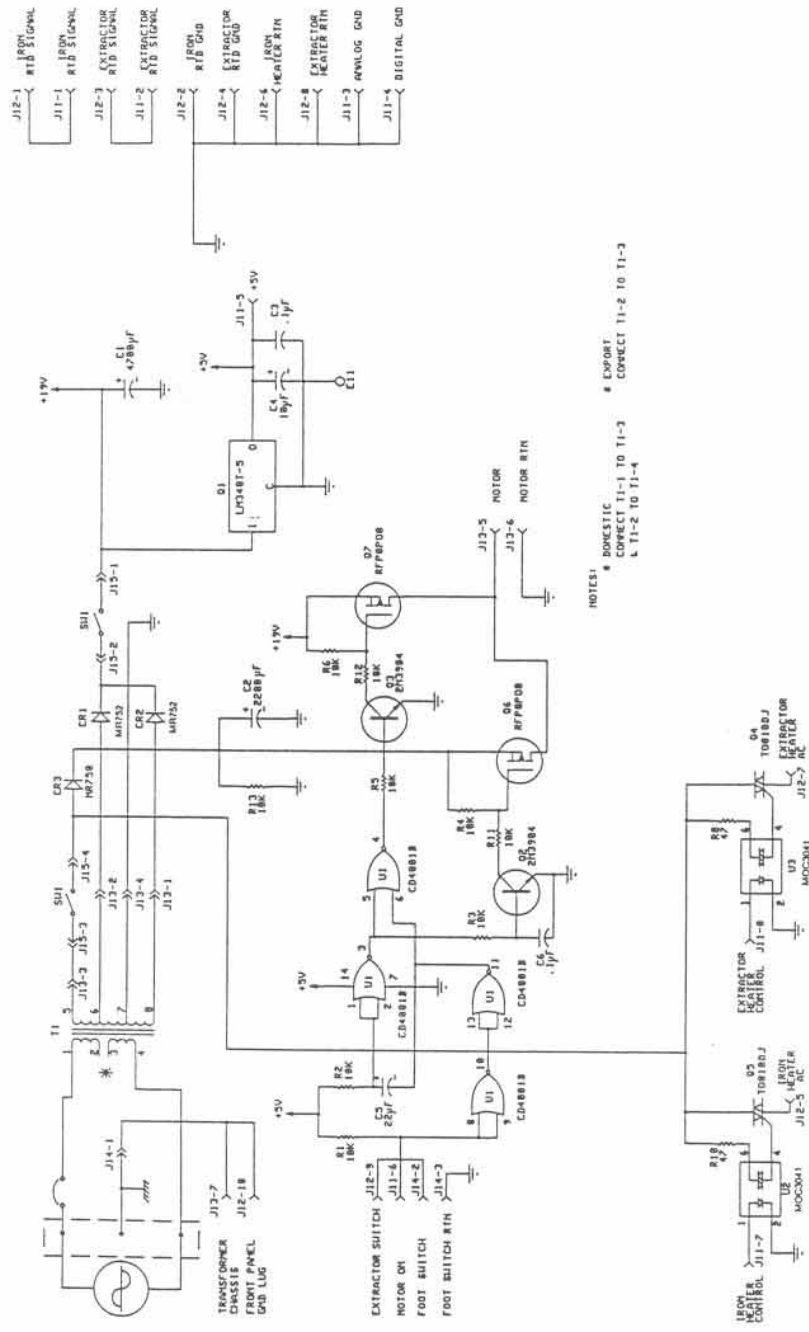


FIGURE 13. SOLDERING IRON HANDPIECE HEATER ASSEMBLY REPLACEMENT

SCHEMATICS

MAIN BOARD



NOTES:
 * DOMESTIC CONNECT T1-1 TO T1-3 & T1-2 TO T1-4
 * EXPORT CONNECT T1-2 TO T1-3 & T1-2 TO T1-4

FIGURE I4.

SCHEMATICS

DISPLAY BOARD

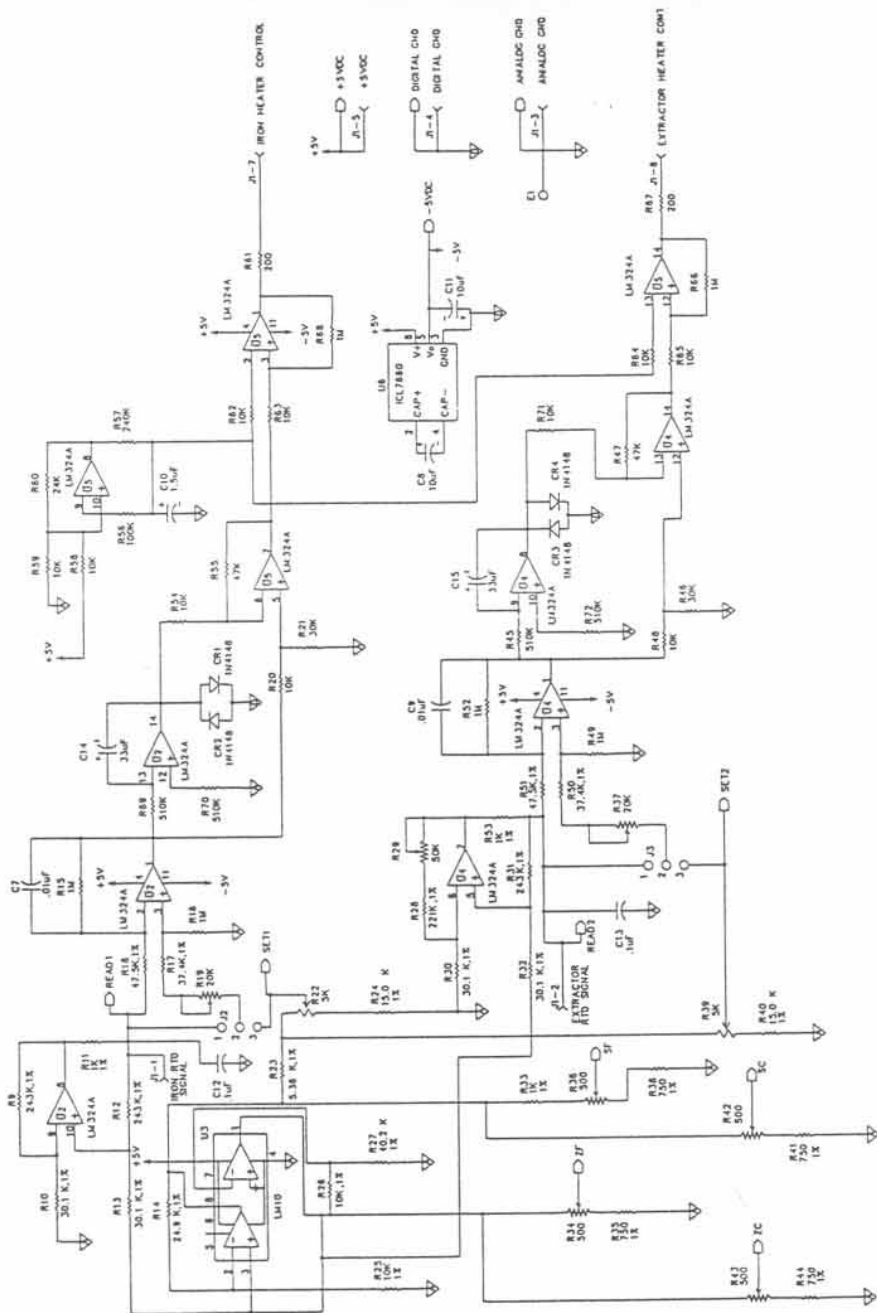


FIGURE 15.

SCHEMATICS

DISPLAY BOARD (cont.)

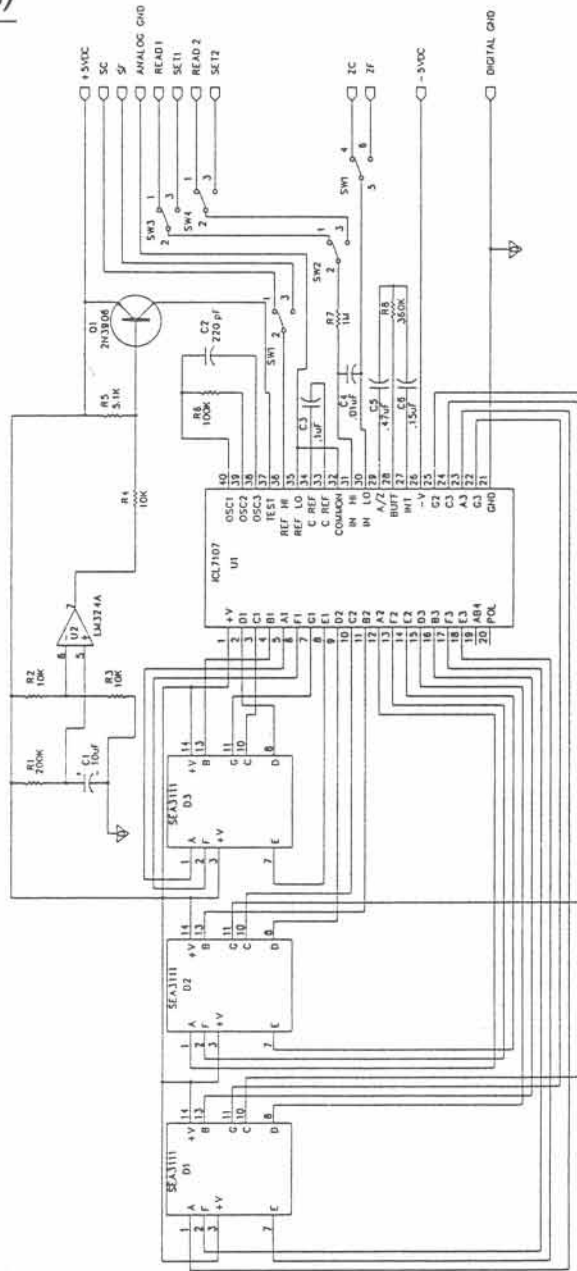


FIGURE 16.

SCHEMATICS

WIRING DIAGRAM

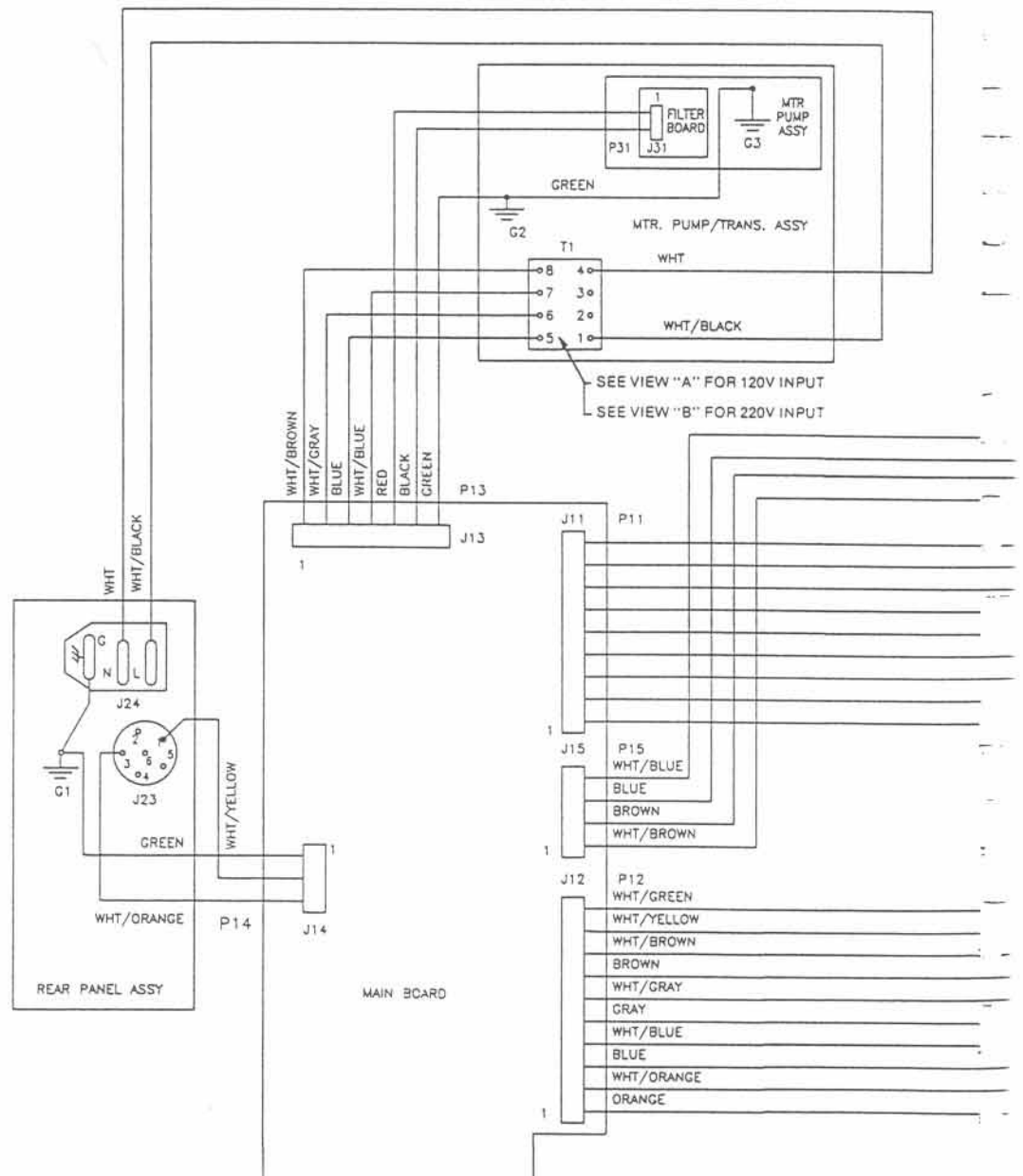
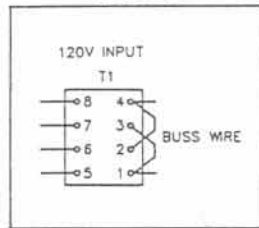


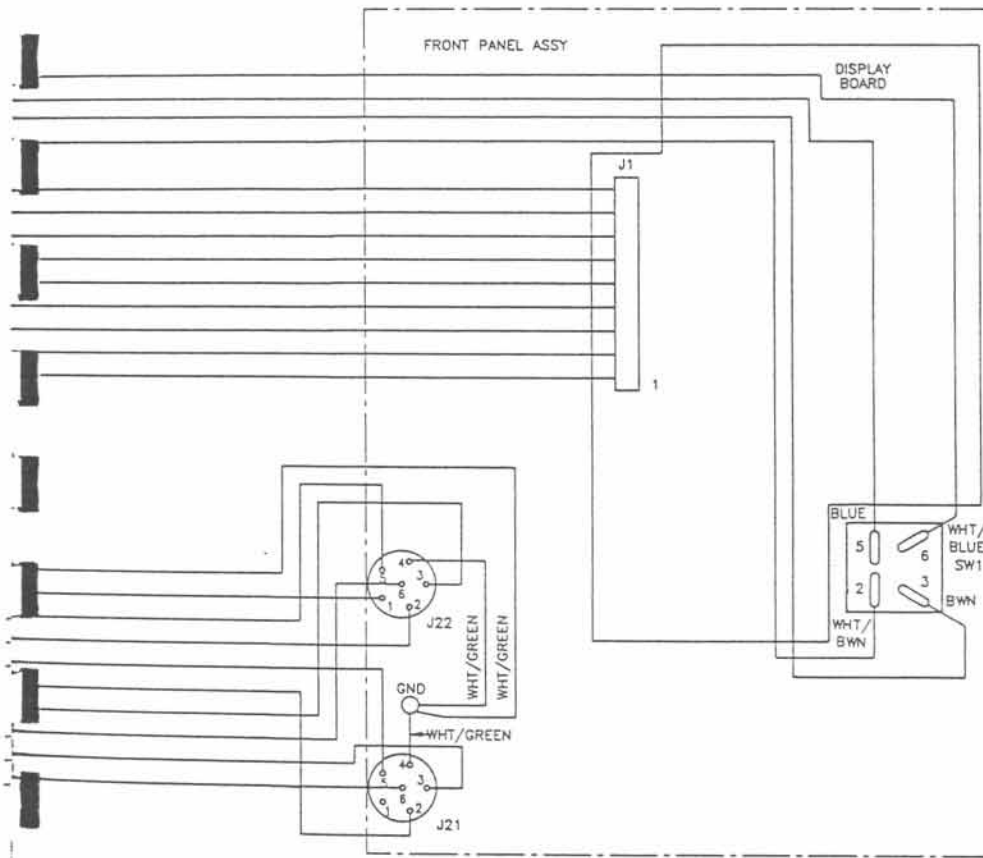
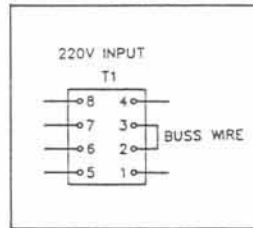
FIGURE 17.

SCHEMATICS

VIEW A



VIEW B



TEMPERATURE CALIBRATION PROCEDURE

Unit:

MBT-210 P/N 7008-0166 MBT-210E P/N 7008-0168

Equipment Required:

Digital Multimeter

Temperature Calibration Kit P/N 6993-0113

“Gain” Calibration Assembly

“Offset” Calibration Assembly

This calibration procedure is broken down into two phases. Phase 1 is to be performed for temperature calibration. Phase 2 need only be conducted if the set and read of a given channel do not match, within $\pm 1^{\circ}\text{F}$, when the iron/extractor has reached its idle temperature.

PHASE 1

1. With the unit turned off and unplugged, unscrew the front panel (10 screws). Pull the front panel out enough to expose the calibration trim pots near the left and right edge of the front panel circuit board (take care not to disconnect any cabling).
2. Turn the iron and extractor control knobs completely counter clockwise. Position the display switch to the iron channel (refer to figure 18).
3. Apply power to the unit and turn the power switch on.
4. Plug the “Gain” calibration board, *marked 57 in red ink*, (276.07 Ω resistor) into the “IRON” receptacle on the front panel (refer to figure 18).
5. Note the voltage across the calibration board test points.
6. Plug the “Gain” calibration board, *marked 57 in red ink*, (276.07 Ω resistor) into the “EXTR” receptacle on the front panel (refer to figure 18).
7. Adjust R29 (refer to figure 2) until the voltage across the calibration board test points matches the noted voltage on the “IRON” channel within $\pm .1$ mVDC.
8. Plug the “Gain” calibration board, *marked 57 in red ink*, (276.07 Ω resistor) into the “IRON” receptacle on the front panel (refer to figure 18).
9. Position $^{\circ}\text{C}/^{\circ}\text{F}$ switch to $^{\circ}\text{C}$ (refer to figure 18).
10. Adjust R42 until the display reads 482.
11. Plug the “Offset” calibration board, *marked 58 in black ink*, (218.72 Ω resistor) into the “IRON” receptacle on the front panel (refer to figure 18).
12. Read the displayed value, subtract it from 316, multiply by 2, and add 316 (i.e. $2 \times [316 - \text{Displayed Value}] + 316$). Adjust R43 until the display reads this calculated result.
13. Plug the “Gain” calibration board, *marked 57 in red ink*, (276.07 Ω resistor) into the “IRON” receptacle on the front panel (refer to figure 18).
14. The display should read 482, if it does not repeat steps 10 through 14.
15. Position $^{\circ}\text{C}/^{\circ}\text{F}$ switch to $^{\circ}\text{F}$.
16. Adjust R36 until the display reads 900.

TEMPERATURE CALIBRATION PROCEDURE

17. Plug the "Offset" calibration board, *marked 58 in black ink*, (218.72 Ω resistor) into the "IRON" receptacle on the front panel (refer to figure 18).
18. Read the displayed value, subtract it from 600, multiply by 2, and add 600 (i.e. $2 \times [600 - \text{Displayed Value}] + 600$). Adjust R34 until the display reads this calculated result.
19. Plug the "Gain" calibration board, *marked 57 in red*, (276.07 Ω resistor) into the "IRON" receptacle on the front panel (refer to figure 18).
20. The display should read 900, if it does not repeat steps 16 through 20.
21. Turn unit off and disconnect power.
22. Apply Glyptol, or a like substance, to R43, R42, R34, R36, and R29.
23. Remount front panel to main chassis (10 screws).

PHASE 2

(Perform only if the set and read of a given channel do not match, within $\pm 1^\circ\text{F}$, when the iron/extractor has reached its idle temperature.)

1. With the unit turned off and unplugged, unscrew the front panel (10 screws).
2. Remove the two front panel knobs and the two front panel push button caps. Unscrew the retaining nuts, and separate the front panel from the front circuit board (take care not to disconnect any cabling).
3. Turn the iron and extractor control pots completely counter clockwise (refer to figure 18).
4. Plug the "Gain" calibration board *marked "57" in red ink dot* (276.07 Ω resistor), into the "IRON" receptacle on the front panel (refer to figure 18).
5. Move the shorting block on J2 pins 2 and 3 to J2 pins 1 and 2. Move the shorting block on J3 pins 2 and 3 to J3 pins 1 and 2 (refer to figure 19).
6. Using dip clips, monitor the voltage across U2 pin 1 with respect to U3 pin 4 (refer to figure 19).
7. Apply power to the unit and turn the power switch on.
8. Adjust R19 (refer to figure 19) until the monitored voltage reaches $0 \text{ VDC} \pm .1 \text{ mVDC}$.
9. Plug the "Gain" calibration board *marked "57" in red ink* (276.07 Ω resistor) into the "EXTR" receptacle on the front panel (refer to figure 18).
10. Using dip clips, monitor the voltage across U4 pin 1 with respect to U3 pin 4.
11. Adjust R37 until the monitored voltage reaches $0 \text{ VDC} \pm .1 \text{ mVDC}$.
12. Turn the unit off and unplug.
13. Move the shorting block on J2 pins 1 and 2 to J2 pins 2 and 3. Move the shorting block on J3 pins 1 and 2 to J3 pins 2 and 3.
14. Reassemble the front panel but do not mount it to the main chassis.
15. Place Glyptol or a like substance to R19 and R37.
16. Perform phase 1 calibration.

TEMPERATURE CALIBRATION PROCEDURE

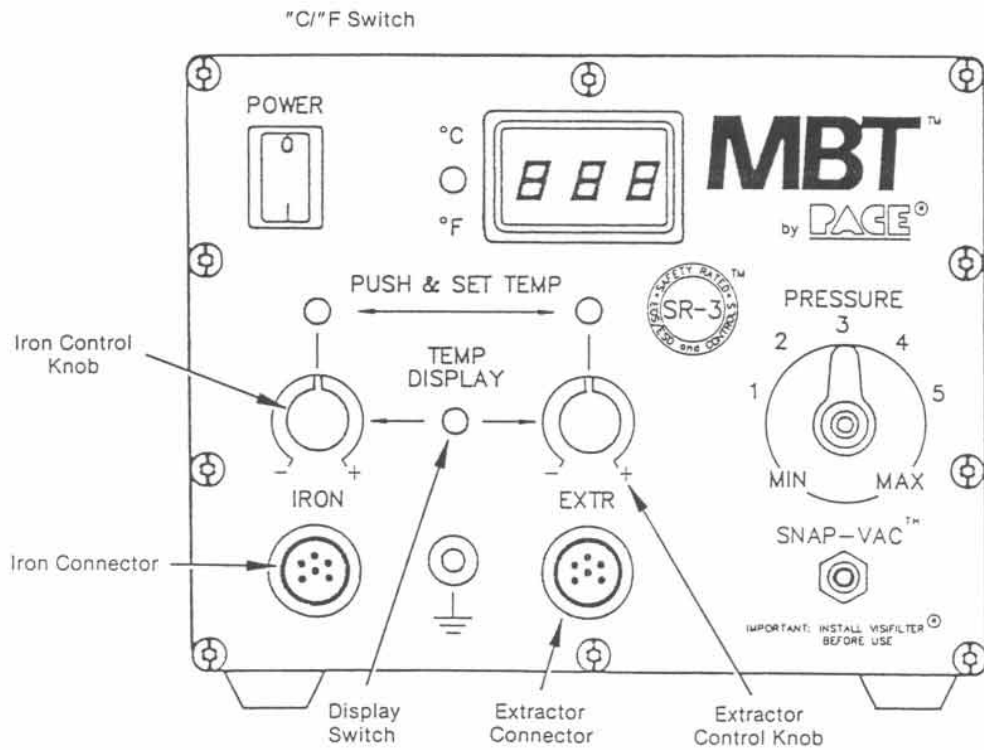


FIGURE 18.

TEMPERATURE CALIBRATION PROCEDURE

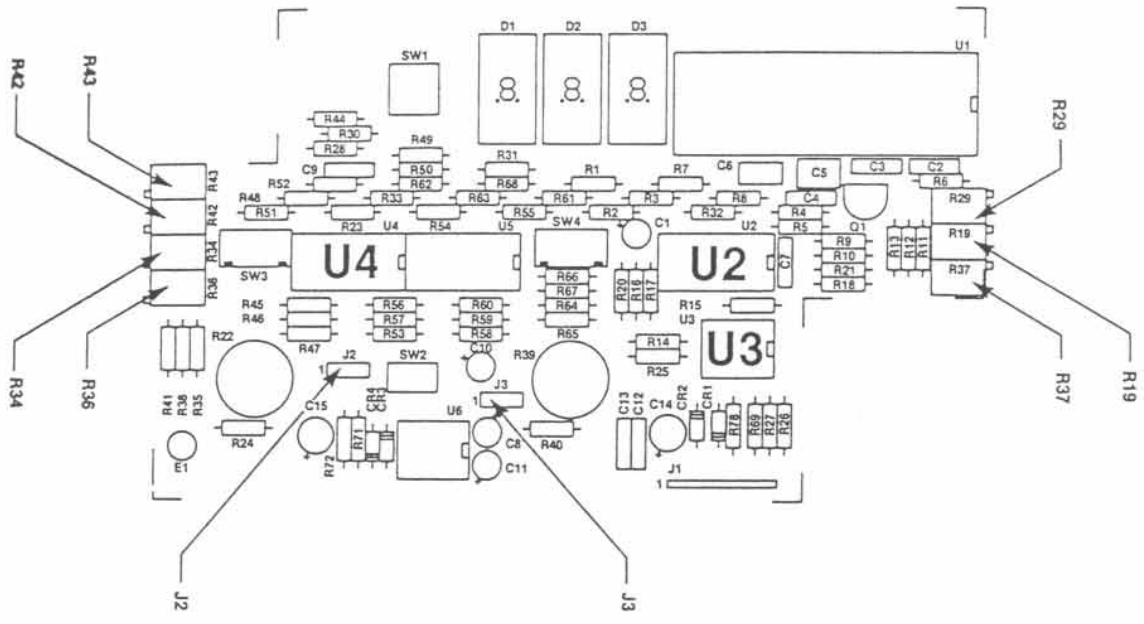


FIGURE 19.

REPLACEMENT PARTS

When ordering replacement parts for your MBT System(s) use Table 4 and Figure 20 (MBT-210/E) for locating the required part. Locate the item number in the illustration, then refer to the corresponding Table for the item number, description and PACE part number.

Refer to Table 6 and Figure 21 (SX-65 Extractor Assembly) and/or Table 7 and Figure 20 (Soldering Iron Assembly) for replacement parts of those items.

Table 8 and Figure 23 identifies the Accessory Items.

SYSTEM

LISTED BELOW ARE THE REPLACEMENT PARTS WHICH MAY BE ORDERED DIRECTLY FROM PACE SALES OR THROUGH YOUR LOCAL AUTHORIZED PACE DISTRIBUTOR.

TABLE 4.

ITEM NO.	DESCRIPTION	PACE PART NO.	
		MBT-210	MBT-210E
1	MBT SYSTEM	8007-0113	8007-0114
2	MBT Power Source	7008-0166	7008-0168
3	Hot Cubby	6019-0021	6019-0021
4	Visifilter	1309-0020	1309-0020
5	Motor Pump Filter	1309-0015-P2	1309-0015-P2
6	Power Cord	1332-0094	1332-0093
7	Vacuum Hose, 2" long	1342-0001-01	1342-0001-01
8	Vacuum Hose, 10" long	1342-0012-03	1342-0012-03
9	Vacuum Hose, 5" long (Qty. 2)	1342-0012-02	1342-0012-02
10	Main Power Switch	1157-0052	1157-0052
11	Control Knob (Qty. 2)	1222-0049	1222-0049
12	Vacuum Valve Stem	1263-0021	1263-0021
13	Pressure Control Valve Assembly	1285-0033	1285-0033
14	Fuse, 1.25A (MBT-210), .63A (MBT-210E)	1159-0217	1159-0214
15	Transformer	1192-0058	1192-0058
16	Power Entry Module	1207-0151	1207-0151
17	Motor Pump Assembly	1336-0024	1336-0024
18	Main Printed Circuit Board Assembly	6020-0051	6020-0051
19	Front Panel Assembly (w/Display Bd.)	6000-0150	6000-0150
20	✓ Housing Receptacle	1207-0114	1207-0114
21	✓ Pin (for Housing Receptacle wiring)	1207-0115	1207-0115
22	✓ Bezel	1316-0012	1316-0012

REPLACEMENT PARTS

TABLE 4 (cont.)

ITEM NO.	DESCRIPTION	PACE PART NO.	
		MBT-210	MBT-210E
23	SX-65 Extractor Assembly	6010-0060	6010-0060
24	IR-65 Soldering Iron Assembly	6025-0005	6025-0005
25	Accessory Kit	7900-0009	7900-0010
26	Operation/Maintenance Manual	5050-0207	5050-0207
27	Service/Maintenance Manual	5050-0223	5050-0223
28	Temperature Calibration Kit	6993-0118	6993-0118
	"GAIN" Calibration Assembly	6020-0057	6020-0057
	"OFFSET" Calibration Assembly	6020-0058	6020-0058

LISTED BELOW ARE PARTS WHICH ARE NOT NORMALLY REQUIRED FOR REPLACEMENT DURING THE LIFE OF THE EQUIPMENT AND ARE NOT AVAILABLE FOR SALE. UNDER CERTAIN SERVICE RELATED CONDITIONS, HOWEVER, THEY MAY BE PROVIDED THROUGH PACE CUSTOMER SERVICE. CONTACT PACE CUSTOMER SERVICE DIRECTLY AT (301) 490-9860 FOR FURTHER INFORMATION.

TABLE 5

ITEM NO.	DESCRIPTION	PACE PART NO.	
		MBT-210	MBT-210E
29	Front Panel Wire Harness	3008-0026-R	3008-0026-R
30	Display Board	6020-0052-R	6020-0052-R
31	Mounting screw, 8-32 x 1/2"L. (Qty. 18)	1405-0582-R	1405-0582-R
32	Grounding Jack	1207-0200-R	1207-0200-R
33	Button, Red	1222-0050-R	1222-0050-R

REPLACEMENT PARTS

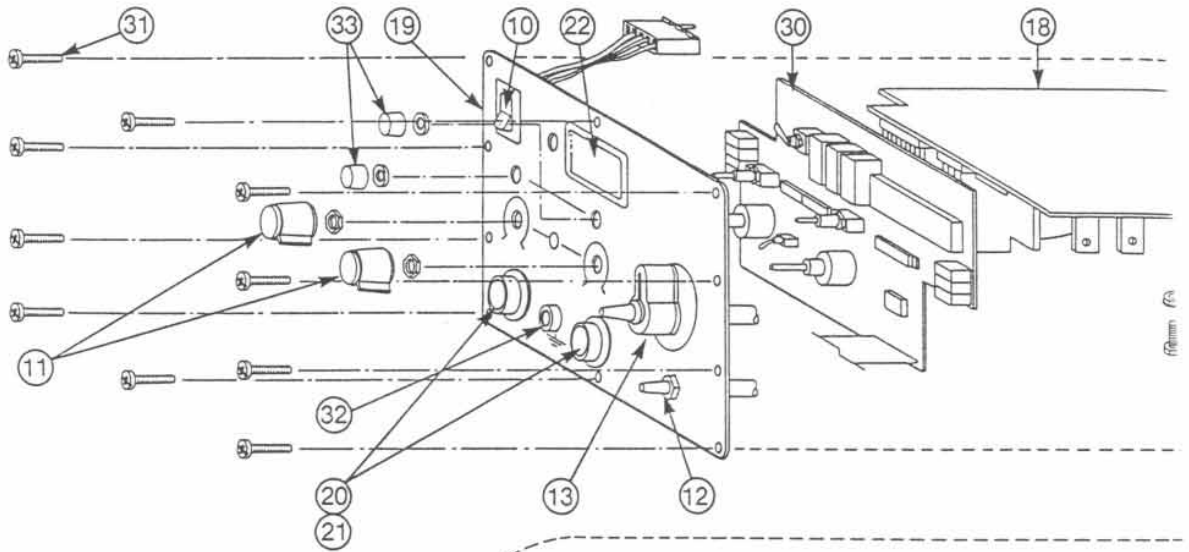
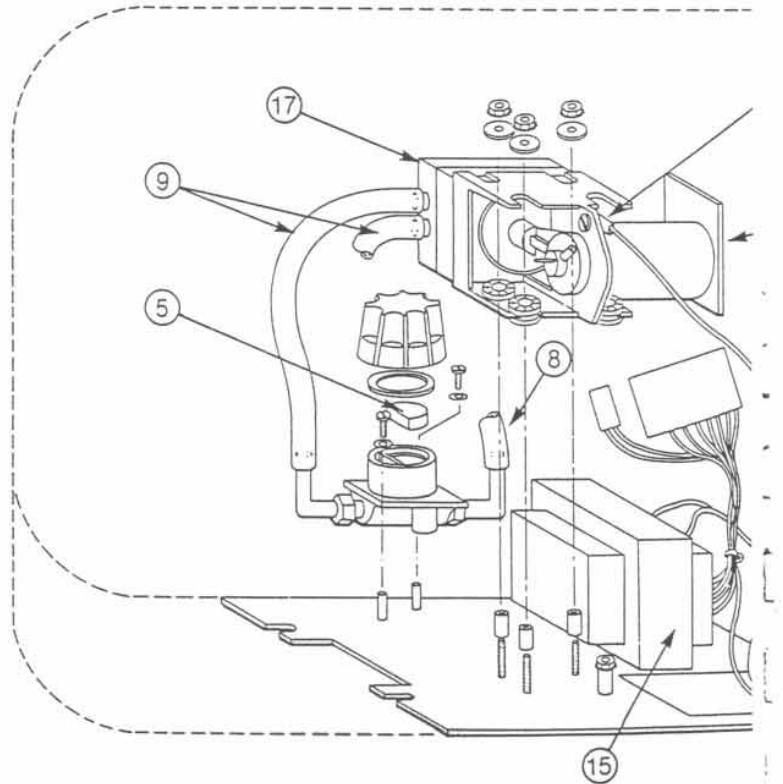
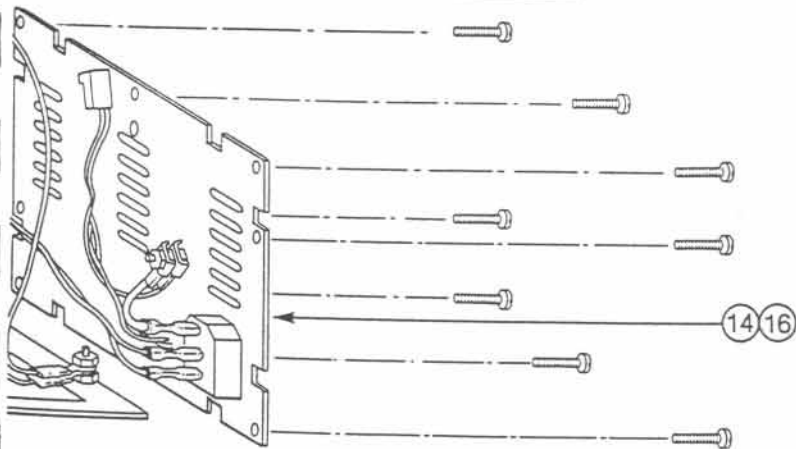
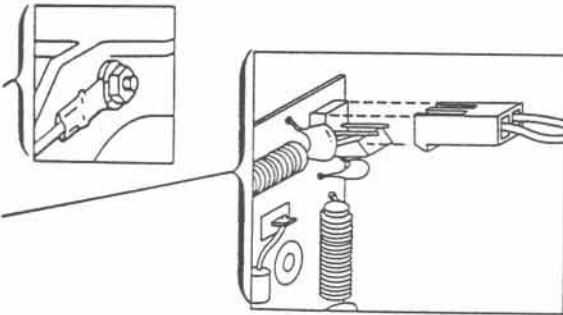
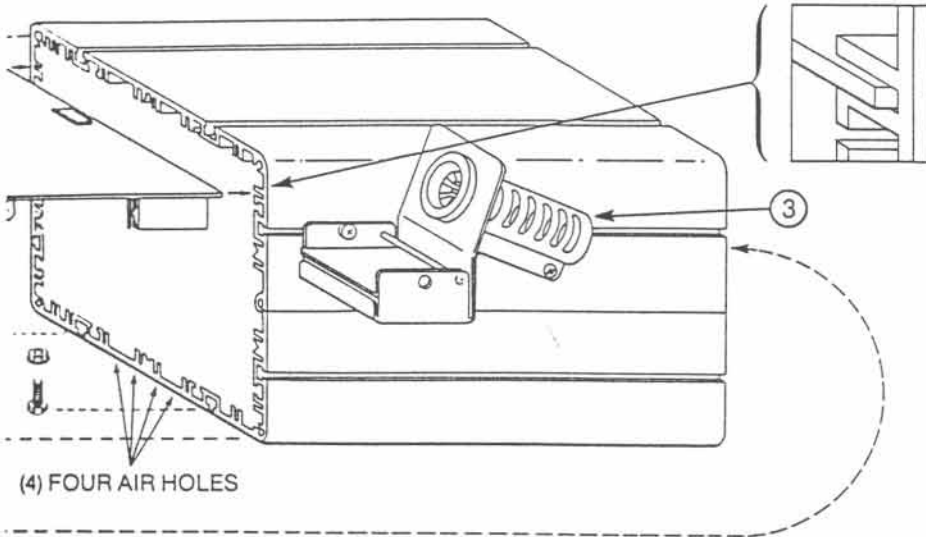


FIGURE 20. EXPLODED VIEW



REPLACEMENT PARTS



REPLACEMENT PARTS

SX-65 EXTRACTOR

TABLE 6.

ITEM NO.	DESCRIPTION	PAGE PART NO.
	SX-65 Extractor Assembly	6010-0060
1	Extractor Tip (refer to Table 8, Fig. 23, Items 2-4)	—
2	Heat Dissipator Washer	1213-0034
3	Glass Chamber	1265-0009
4	Sodr-X-Tractor Filter	1309-0018
5	Holder, Tube to Wire (Qty. 6)	1321-0085-01-P6
6	Vacuum Hose, 54" Length	1342-0001-13
7	Heat Dissipator	1360-0005
8	Screw, #4-40 x 1/4" (Qty. 3)	1405-0395
9	Screw, #40-40 x 5/16" (Qty. 3)	1405-0534
10	"S" Baffle	4010-0033
11	Heater Assembly	6010-0061
12	Rear Seal Assembly	4010-0082
13	Set Screw	1348-0285
14	Cord and Switch Assembly	4010-0090
15	Spacer	1215-0072

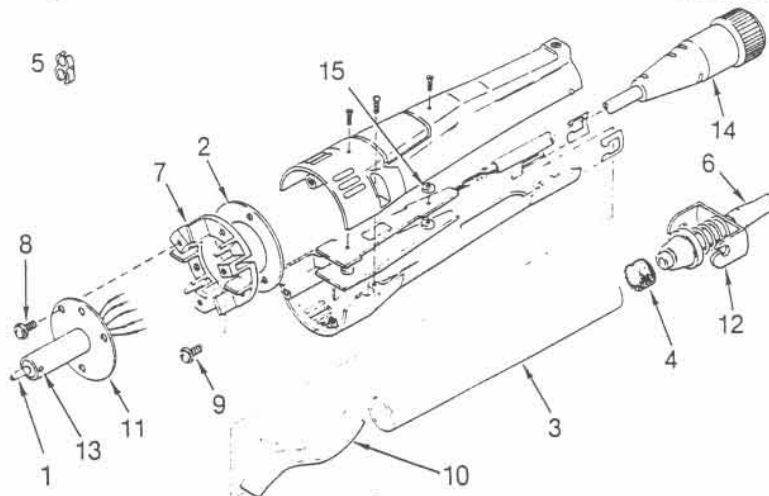


FIGURE 21. REPLACEMENT PARTS FOR SX-65 EXTRACTOR ASSEMBLY

REPLACEMENT PARTS

IR-65 SOLDERING IRON

TABLE 7.

ITEM NO.	DESCRIPTION	PACE PART NO.
	IR-65 Soldering Iron Assembly	6025-0005
1	Soldering Iron Tip, 1/8" Chisel	1121-0130
	Soldering Iron Tip, 1/16" Chisel	1121-0131
	Needle Tip	1121-0132
2	Heater Assembly	6010-0062
3	Set Screw	1348-0285
4	Screw, #4-40 x 1/4" (Qty. 3)	1405-0395

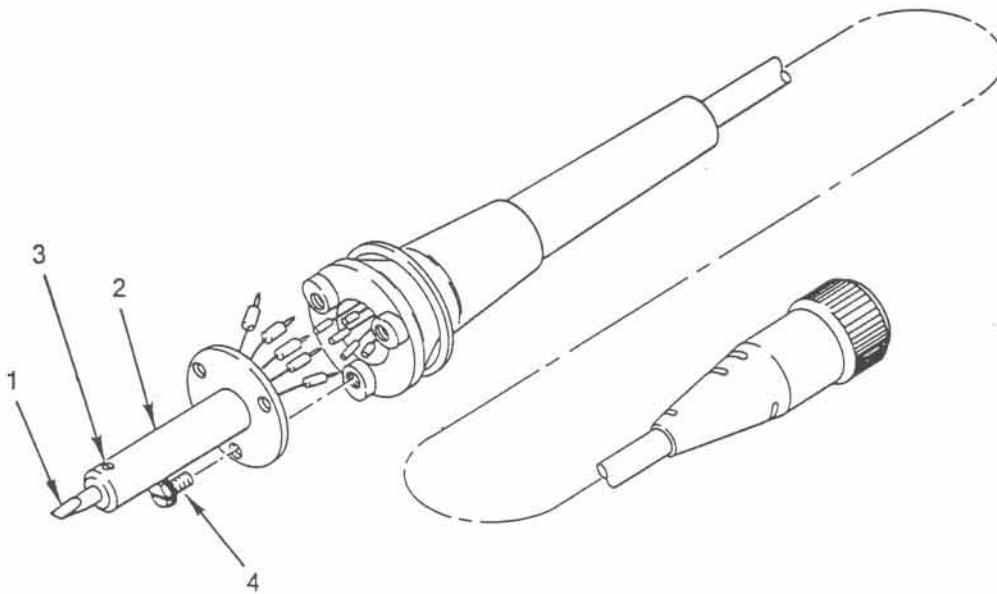


FIGURE 22. REPLACEMENT PARTS FOR IR-65 SOLDERING IRON HANDPIECE ASSEMBLY

REPLACEMENT PARTS

ACCESSORY KIT(S)

TABLE 8.

ITEM NO.	DESCRIPTION	PACE PART NO.	
		MBT-210	MBT-210E
	Accessory Kit	7900-0009	7900-0010
1	Tip Tool	1100-0206	1100-0206
2	Micro Tip, .025 I.D.	1121-0253	1121-0253
3	Micro Tip, .036 I.D.	1121-0254	1121-0254
4	Micro Tip, .061 I.D.	1121-0255	1121-0255
5	Filter, Sodr-X-Tractor	1309-0018	1309-0018
6	Tip, 1/16" Chisel	1121-0131	1121-0131
7	Nylon Brush	1127-0002	1127-0002
8	Wire Brush, 3 1/2"	1127-0006-02	1127-0006-02
9	Fuse, 1.25	1159-0217	
	Fuse, .63A		1159-0214
10	Clip, Holding	1209-0012	1209-0012
11	Screw, Binder Head, 4-40 x 1/4" (Qty. 4)	1405-0016	1405-0016
12	PVC Tubing, 2" L.	1342-0001-01	1342-0001-01

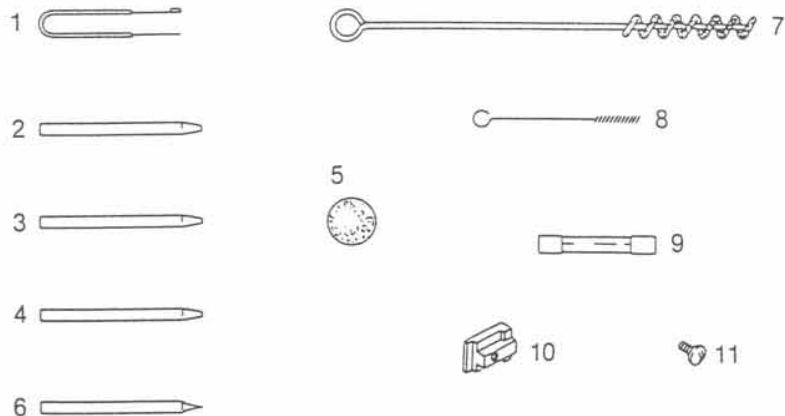


FIGURE 23. REPLACEMENT PARTS FOR ACCESSORY KIT(S)