HAKO937 SOLDERING STATION

INSTRUCTION MANUAL

Thank you for purchasing the HAKKO 937 Soldering Station.

Please read this manual before operating the HAKKO 937.

Store the manual in a safe, easily accessible place for future reference.

Setting up the HAKKO 937 Calibration of Iron Temperature Troubleshooting Parts List



Pare Ring Lite

Please check the contents of the HAKKO 937 package and confirm that all of the items listed below are included.

HAKKO 937 Station
Card
Soldering Iron (HAKKO 900S, 907 or 908)1
HAKKO Iron Holder (with Cleaning Sponge) .1
Coupling Band
Instruction Manual

Spanifering

Name	накко 937			
Power Consumption	60W			
Station	937 Station E	SD		
Output Voltage	24V AC			
Temerature Range	200°C - 480°C (400°F - 899)°F)		
Dimensions	- 120 (W) x 93 (H) x 140 (D) n	-120 (W) x 93 (H) x 140 (D) mm (4.7 x 3.7 x 5.5 in.)		
Weight (w/o Cord)	1,300g (2.9 lbs.)			
Soldering Iron	900S-ESD	907-ESD	908-ESD	
Power Consumption	24V AC, 50W	24V AC, 50W		
Tip to Ground Resistance	Under 2Ω			
Tip to Ground Potential	Under 2mV (Typ. 0.6mV)			
Heating Element	Ceramic Heater			
Cord Assembly	1.2m (4 ft.)			
Total Length (w/o Cord)	176mm (7 in.) 190mm (7.5 in.) 200mm (7.9 in.)			
Weight (w/o Cord)	25g (0.06 lbs.)	44g (0.09 lbs.)	54g (0.12 lbs.)	

Notes

- Tip temperature measured using a HAKKO 191 thermometer.
- Specifications and design are subject to change without notice.

Precautions



in this instruction manual, "warning" and "caution" are defined as follows. For your own safety, be sure to comply with these precautions.

WARNING!: Misuse may potentially cause

death of, or serious injury to,

the user

CAUTION!: Misuse may potentially cause

injury to the user or physical damage to objects involved.



When the power is on, the tip temperature is between 200°C and 480°C (400°F and 899°F). Since mishandling may lead to burns or fire, be sure to comply with the following precautions.

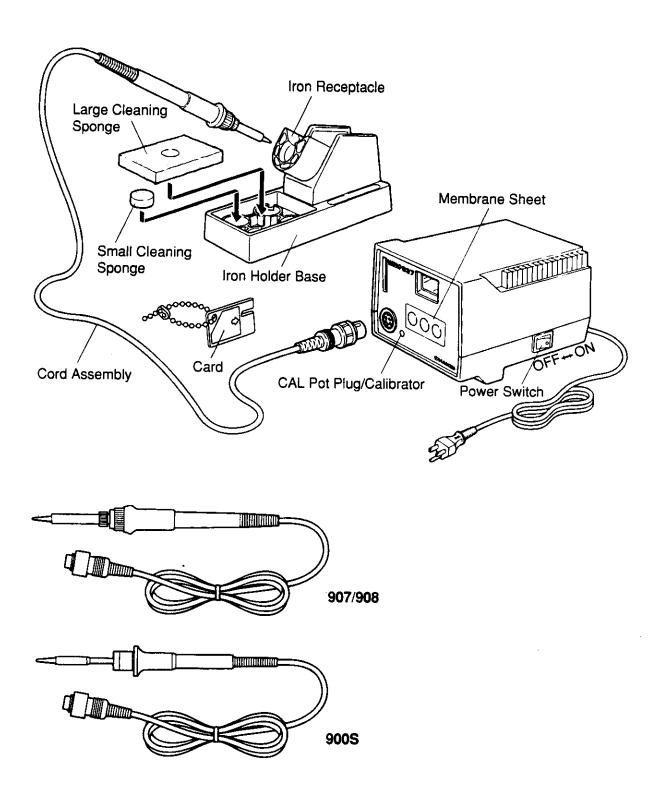
- Do not touch metallic parts near the tip.
- Do not use the product near flammable items
- Advise other people in the work area that the unit can reach a very high temperature and should be considered potentially dangerous.
- Turn the power off while taking breaks and when you are finished using it.
- Before replacing parts or storing the unit, turn the power off and allow the unit to cool to room temperature.



To prevent damage to the unit and to ensure a safe working environment, be sure to comply with the following precautions.

- Do not use the unit for applications other than soldering.
- Do not rap the soldering iron against the work bench to shake off residual solder, or otherwise subject the iron to severe shocks.
- Do not modify the unit.
- Make sure to use only genuine HAKKO replacement parts.
- Do not wet the unit or use it when your hands are wet.
- Do not bend or damage the card. Should the card become bent, do not force the card into the station.
- The soldering process will produce smoke, so make sure the area is well ventilated.
- While using the unit, do not do anything which may cause bodily harm or physical damage.

Names of Parts



Setting up the HAKKO 937

A. Iron Holder



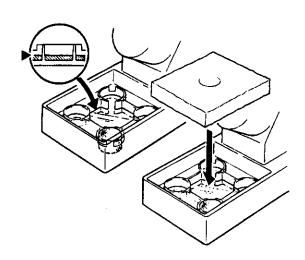
The sponge is compressed. It will swell when moistened with water. Before using the unit, dampen the sponge with water and squeeze it dry. Failure to do so may result in damage to the soldering tip.

- Dampen the small cleaning sponge with water and squeeze it dry. Place it in one of the four openings in the iron holder base.
- Add water to approximately the level shown at the left. The small sponge will absorb water to keep the larger sponge above it wet at all times.

Note: The large sponge may be used by itself. In this case, it is not necessary to insert the small sponge or add water.

 Dampen the large cleaning sponge and place it on the iron holder base.

Note: The 900 (S) and 907/908 soldering irons require different iron receptacles. Be sure to change receptacles when changing irons. (See pg. 20, Parts List)



B. Connections



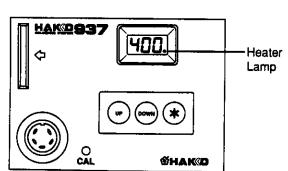
Receptacle



Align the grooves and pins, and push straight in.



Turn clockwise firmly



Be sure to turn off the power switch before connecting or disconnecting the soldering iron. Failure to do so may result in damage to the station.

- 1. Connect the cord assembly to the receptacle on the front panel of the station.
- 2. Place the soldering iron in the iron receptacle on the iron holder.
- 3. Plug the power cord into a power supply. Be sure to ground the unit.
- 4. Turn the power switch to ON.

Note: The temperature is preset at 400 °C at the factory (The No.937-4,-5,and -6, are preset at 750 °F.)

The heater lamp will flicker when the temperature has stabilized.

5. Press X to display the preset temperature. It will be displayed for two seconds.

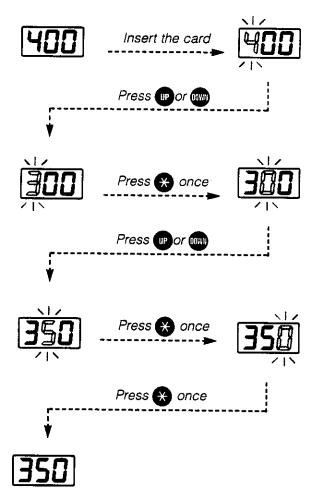
Setting up the HAKKO 937 (continued)

C. Setting the Temperature



Be sure to insert the correct end of the card into the card slot. While setting the temperature, the heating element is off.

Example: Change the temperature from 400°C to 350°C.



- Insert the card into the card slot on the front panel of the station. The left-most digit in the display (the 100's digit) will begin flashing, indicating that the station is in the temperature setting mode and that the 100's digit can be adjusted.
- 2. Using the up or the button to increase or decrease the value, select the desired value for the 100's digit. The 100's digit can be set to 2. 3 or 4. Press when the desired value is displayed. This will cause the middle digit (the 10's digit) in the display to begin flashing.
- 3. Again using the por por button, select the desired value for the 10's digit. The 10's digit can be set to 1, 2, 3, 4, 5, 6, 7, 8, 9, or 0. Press when the desired value is displayed. This will cause the digit on the right (the 1's digit) in the display to begin flashing.
- 4. Again using the p or button, select the desired value for the 1's digit. The 1's digit can be set to 1, 2, 3, 4, 5, 5, 7, 8, 9, or 0. Press when the desired value is displayed. This will store the temperature setting in memory, display the temperature setting, and initiate heater control.

Note: If the power switch is turned off during any step of the temperature adjustment procedure, the setting will not be stored in memory.

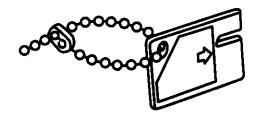
Setting up the HAKKO 937 (continued)

C. Setting or Changing the Temperature (continued)

To change the temperature setting when the card has been left in the station...

- 1. Press and hold it down for at least one second. The current temperature setting will be displayed for a moment, then the 100's digit will begin flashing, indicating that the station is now in the temperature setting mode. Proceed with the procedure on page 6.
- 2. If is pressed for less than one second, the present temperature setting will be displayed for two seconds, then the display will again show the tip temperature.

The Card



- After setting the temperature, remove the card. The preset temperature cannot be changed until the card is reinserted, even if the power switch is turned off. Thus, the power can be turned off and on without having to reset the temperature each time, and accurate and safe temperature control is assured.
- 2. Any HAKKO 937 card can be used with any HAKKO 937 station.
- The HAKKO 937 will operate normally with a card inserted. If the power is turned off while the card is inserted, when the power is turned on again, the previously set temperature will be used to heat up the soldering iron.

Stacking Stations

For greater convenience and soldering efficiency, two stations can be securely stacked.

Parameters

The HAKKO 937 has three user-adjustable or viewable parameters: a) Temperature display mode (Centigrade or Fahrenheit), b) Heater-error temperature tolerance, and c) Room temperature compensation value (test mode). Once parameter-input mode is entered, these parameters are set in the order shown. Once all three parameters have been set, normal operation is resumed.

Parameter Input Mode

- 1. Turn off the power switch.
- Press and hold the p and buttons simultaneously, and turn on the power switch.
- 3. Continue holding down the p and buttons until the display indicates either c (for Centigrade) or F (for Fahrenheit). The station is now in parameter input mode.

1. Centigrade or Fahrenheit Temperature Display

- 4. Press either the p or button to alternately display c and F.
- When the desired method is displayed, press . The heater-error temperature will now be displayed and the left-most digit (100's digit) in the display will begin flashing.

2. Heater-error Temperature Tolerance (see Heater Error on page 13)

The heater-error temperature tolerance parameter is entered in the same manner as used to set the temperature. (See pg. 6, steps 2-4.)

Heater-error Temperature Range

Centigrade: 30—150°C Fahrenheit: 60—300°F

Be sure to use a value within the allowable range. (see chart at left). If a value outside this range is selected, the display will again flash the 100's digit. Should this occur, re-enter a correct value.

After setting the heater-error temperature tolerance, the display will show the room temperature compensation value (test mode).

3. Room Temperature Compensation Value (test mode)

This is the measured temperature of the soldering iron tip. It is used to calibrate the tip temperature. (See pg. 9, *Calibration of Iron Temperature*)

No inputs are made here. The display will not blink nor will the heater receive power. Press to complete parameter input. The soldering temperature setting will be displayed for two seconds, then power will be supplied to the heater and normal temperature control will begin.

Calibration of Iron Temperature

Calibration is required whenever the soldering iron, or its heating element or tip have been replaced. Although either of the two following calibration methods can be used, calibration with a tip thermometer is more accurate.

Calibration with a Tip Thermometer

We recommend the HAKKO 191 and HAKKO 192 thermometers for measuring the tip temperature.

- 1. Set the temperature to 400°C (750°F).
- 2. When the temperature stabilizes, remove the CAL pot plug.
- Using a regular or small cross point screwdriver, turn the screw marked CAL on the front panel of the station until the tip thermometer indicates a temperature of 400°C (750°F).

Note: Turn the screw clockwise to increase the temperature and counterclockwise to reduce the temperature.

4. Reattach the CAL pot plug.

Calibration with a Room Thermometer (test mode)

- 1. Allow the HAKKO 937 to cool to room temperature. (approx. 1 hour)
- Press and hold down the p and buttons simultaneously, and turn the power switch on. (see Parameters on pg. 8)
- Following the procedure on page 8, display the room temperature compensation value (test mode). This is the measured temperature of the soldering iron tip.



If a mistake is made while performing steps 2 or 3, the station will start up normally and the heating element will begin warming up. Should this happen, turn the station off and wait until it has again cooled to room temperature.

- Using a regular or small cross point screwdriver, turn the screw marked CAL on the front panel of the station until the display indicates the room temperature plus or minus the value in the calibration chart on page 10.
- Press to complete the calibration.
 Power will now be supplied to the heater and normal temperature control will begin.

Calibration Chart

Example:

To calibrate the 900M-T-LB tip at a room temperature of 22°C (70°F), adjust the CAL potentiometer until the digital display reads 20 (55).

900\$		907		908	
Tip No	Compensation Value	Tip No	Compensation Value	Tip No.	Compensation Value
900S-T-1,2D	0	900M-T-0.8D	0	900L-T-B	0
900S-T-1.6D	0	900M-T-1.2D	+2°C (+4°F)	900L-T-2B	
900S-T-2C	0	900M-T-1.6D	0	900LT-2.4D	0
900S-T-1C	0	900M-T-2.4D	0	900L-T-3.2D	0
900S-T-B	0	900M-T-3.2D	0	900L-T-2C	-5°C (-9°F)
900S-T-I	0	900M-T-1.2LD	0	900L-T-2CF*	-5°C (-9°F)
		900M-T-SB	0	900L-T-3C	0
		900M-T-B	0	900L-T-3CF*	0
		900M-T-LB	-2°C (-4°F)	900L-T-4C	0
		900M-T-0.5C	0	900L-T-4CF*	0
		900M-T-0.8C	-2°C (-4°F)	900L-T-5C	0
	[900M-T-1C	0	900L-T-5CF*	0
	[900M-T-1CF*	0	900L-T-I	-5°C (-9°F)
		900M-T-1.5CF*	0	900L-T-K	+5°C (+9°F)
		900M-T-2C	0		
		900M-T-2CF*	0		
		900M-T-3C	0		
		900M-T-3CF*	0		
		900M-T-4C	0		
	Γ	900M-T-4CF*	0		
	Γ	900M-T-K	+7°C (+12°F)		
		900M-T-R	0		
		900M-T-RT	0		
		900M-T-Si	0		
	Γ	900M-T-I	-2°C (-4°F)		
		900M-T-H	-5°C (-9°F)		
		900M-T-1.8H	-2°C (-4°F)		
	<u> </u>				

+4°C (+7°F)

Tip Care and Use

Tip Temperature

High soldering temperatures can degrade the tip. Use the lowest possible soldering temperature. The excellent thermal recovery characteristics ensure efficient and effective soldering even at low temperatures. Low temperatures also protect the soldered items from thermal damage.

Cleaning

Clean the tip regularly with a cleaning sponge, as oxides and carbides from the solder and flux can form impurities on the tip. These impurities can result in defective joints, or reduce the tip's heat conductivity.

When using the soldering iron continuously, be sure to loosen the tip and remove any oxide at least once a week. This helps prevent seizure and reduction of the tip temperature.

When Not In Use

Never leave the soldering iron sitting at a high temperature for long periods, as the tip's solder plating will become covered with oxide.which can greatly reduce the tip's heat conductivity.

After Use

Wipe the tip clean and coat it with fresh solder. This helps prevent tip oxidation.

Maintenance

Inspect and Clean the tip

- 1. Set the temperature to 250°C (482°F).
- 2. When the temperature stabilizes, clean the tip with the cleaning sponge and check the condition of the tip.
- If there is black oxide on the solder-plated portion of the tip, apply new flux-contained solder and wipe the tip on the cleaning sponge. Repeat until the oxide is completely removed. Coat with new solder.



Never file the tip to remove oxide.

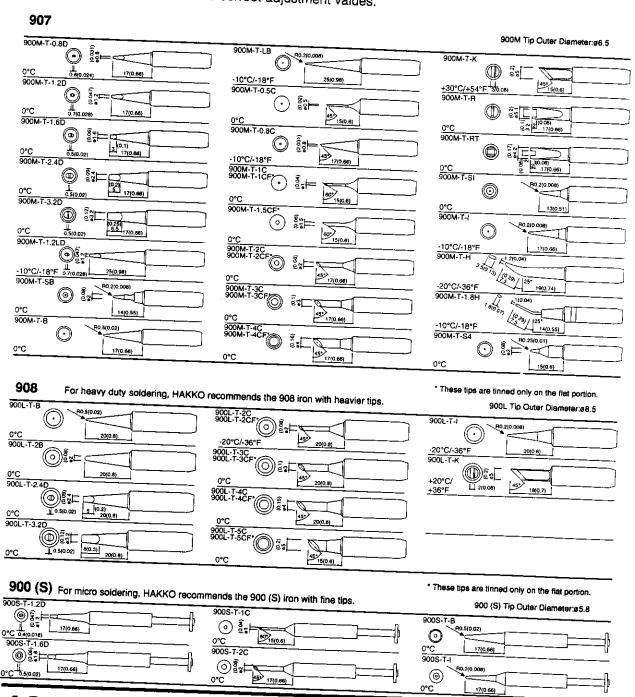
4. If the tip is deformed or heavily eroded, replace it with a new one.

Tips

The tip temperature will vary according to the shape of the tip. The preferred method of adjustment uses a tip thermometer.(See Calibration of Iron Temperature on page 9.)A less accurate method involves adjusting the temperature setting according to the adjustment value for each tip.

Example: When using a 900M-T-H tip at 400 °C (750 °F), the temperature difference between this tip and a 900M-T-B tip is -20 $^{\circ}$ C(-36 $^{\circ}$ F). Set the temperature display to 420 $^{\circ}$ C(786 $^{\circ}$ F).

Refer to the chart below for the correct adjustment values.



Error Messages

The HAKKO 937 displays various error messages whenever there is a problem. If the following messages are displayed, refer to the *Troubleshooting Guide* on page 14.

System Error

When the power is turned on, the system automatically checks its memory and the stored programmed. If a problem is found, the unit will display and all operations will come to a complete stop.

Sensor Error

If there is a possibility of a failure of the sensor or any part of the sensor circuit, **S-E** will be displayed and power to the soldering iron will be cut off.

Heater Error (Flashing of the Temperature Display)

If power is being sent to the soldering iron and the tip temperature goes below the heater-error temperature tolerance setting, the temperature display will begin flashing on and off. This indicates a possible heater malfunction.

For example, assume that the temperature setting is 400°C (750°F) and the heater-error temperature tolerance value is 50°C (100°F). If the temperature of the soldering iron goes below 350°C (650°F), even though the heater is receiving power, the display will begin flashing, indicating a possible heater malfunction.

Example:

 $400 - 50 = 350^{\circ}C (750 - 100 = 650^{\circ}F)$

The display begins flashing.

Note:

If the temperature begins to rise again, the display will stop flashing, even if the displayed temperature is

below 350°C (650°F)

Before Servicing...



Always disconnect the power plug before servicing. Failure to do so may result in electric shock.

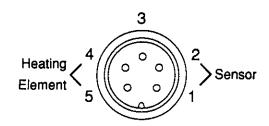
If the power cord is damaged, it must be replaced by the manufacturer or its service agent or similarly qualified person in order to avoid electrical hazards.

Troubleshooting Guide

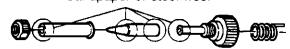
Problem	Check
The unit does not operate.	 Is the fuse blown? Determine why the fuse blew and eliminate the cause, then replace the fuse Is the inside of the iron short-circuited? Is the grounding spring touching the heating element? Is the heating element lead twisted and short-circuited? Is the power cord broken?
	Replace it with a new cord.
The tip does not heat up. Sensor error or heater error is displayed.	 Is the power cord and/or connecting plug disconnected? Connect it.
	 Is the soldering iron cord broken? See Check for a Broken Heating Element or Cord Assembly, pg. 15.
	 Is the heating element broken? See Check for a Broken Heating Element or Cord Assembly, pg. 15.
The tip heats up intermittently.	Is the soldering iron cord broken? See Check for a Broken Heating Element or Cord Assembly, pg. 15.
Solder will not wet the tip.	 Is the tip temperature too high? Set an appropriate temperature.
	 Is the tip clean? Clean the tip. (See Tip Care and Use, pg. 11.)
The tip temperature is too low.	 Is the tip coated with oxide? Clean the tip. (See Tip Care and Use, pg. 11.)
	Is the iron calibrated correctly? Recalibrate. (See Calibration of Iron Temperature on page 9.)
A system error is displayed.	Contact your nearest HAKKO representative.
Heater errors are frequently displayed.	 Is the tip too small for the items to be soldered? Use a heavier tip. Is the heater-error temperature tolerance setting too low? Increase the value of the setting.

Replacing the Heating Element

1. Check for a Broken Heating Element or Cord Assembly



Sandpaper or steel wool



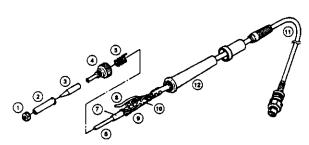
- 1. Disconnect the connecting plug.
- 2 Measure the resistance value between pins 1 and 2 (the sensor). It should be between 43Ω and 58Ω .
- 3 Measure the resistance value between pins 4 and 5 (the heating element). It should be between 2.5Ω and 3.5Ω .

If either of the two measured values are outside their acceptable ranges, it will be necessary to replace the heating element, sensor and/or cord assembly.

4 Measure the resistance value between pin 3 and the tip. It should be less than 2Ω .

If it is not, there may be oxidation. Using sandpaper or steel wool, lightly rub the areas of the tip indicated at left.

2. Disassemble the Soldering Iron

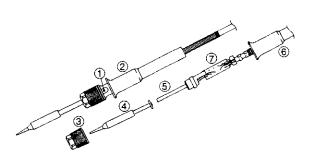


Disassembling the 907/908

- 1. Turn the nut (1) counterclockwise and remove the tip enclosure (2) and the tip (3).
- 2. Turn the nipple (4) counterclockwise and remove it from the iron.
- 3. Pull both the heating element (6) and the cord assembly (11) toward the tip of the iron and out of the handle (12).
- Pull the grounding spring (5) out of the Dsleeve.

Disassembling the 900S

- Slide the handle cover (2) toward the cord and remove the screw (1) securing the heating element.
- 2. Turn the nut (3) counterclockwise and remove it from the iron.
- 3. Remove the tip (4).
- 4. Pull both the heating element (5) and the cord toward the tip of the iron and out of the handle (6).



Replacing the Heating Element (continued)

3. Remeasure the Resistance

Heating Element (red) Sensor (blue)

Instructions for installing a new heating element for both the HAKKO 900 (S) and 907/908 are included with the replacement part.

Remeasuring the resistance—907/908

Measure the resistance when the heating element is at room temperature.

- The resistance value between the blue leads (sensor) should be between 43Ω and $58\Omega.$
- The resistance value between the red leads (heating element) should be between 2.5 $\!\Omega$ and 3.5 $\!\Omega$

If either of the resistance values is outside the acceptable range, replace the heating element.

After replacing the heating element, measure the following resistance values

- Between pin 4 and pin 1 or 2.
- Between pin 5 and pin 1 or 2.

If both values are not ∞ , the heating element and the sensor are touching, which will damage the station.

Finally, remeasure the following resistance values to confirm that the leads are not twisted and that the grounding spring is properly connected.

- Between pins 1 and 2 (43 58Ω)
- Between pins 4 and 5 (2.5 3.5Ω)
- Between pin 3 and the tip (under 2Ω)

Remeasuring the resistance—900S

Measure the resistance values of the sensor and the heating element on the terminal board.

- Sensor: 43 58Ω
- Heating element: 2.5 3.5Ω

If either of the resistance values is outside the acceptable range, replace the heating element.

Replacing the Cord Assembly

Two methods are available for testing the cord assembly....



Test Method 1

- Turn the unit on.
- 2. Set the temperature to 480°C (899°F).
- 3. Without waiting for the iron to reach the set temperature, wiggle and kink the cord at various points along the length of the cord, including in the strain relief area at the base of the iron handle. If the heater lamp flickers, the cord is broken and should be replaced.



The heater lamp will flicker if the iron temperature is allowed to reach the set temperature. Before replacing the cord, be sure that this is not the reason for the flickering.

	Wire Color	Resistance Value
1	Red	0Ω
2	Blue	0Ω
3	Green	0Ω
4	White	0Ω
5	Black	0Ω

Test Method 2

Check the resistance between each pin on the connecting plug and its associated wire on the terminal board inside the handle. (See chart at left.)

All measured values should be 0Ω . If any value is greater than 0Ω or is ∞ , replace the cord.

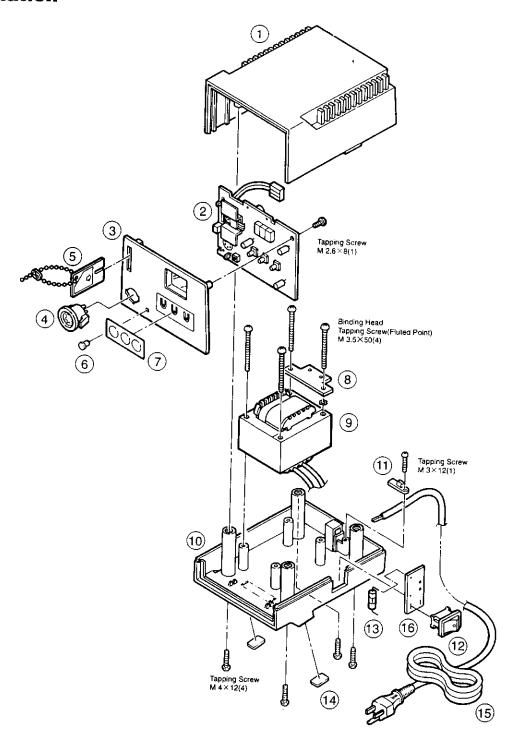
Replacing the Fuse

Be sure to use only genuine HAKKO replacement parts!

The fuse is located on the power switch P.W.B.

- 1. Remove the upper case. (See the exploded view drawing on page 19.)
- 2. Desolder the blown fuse and remove it.
- 3. Solder on a new fuse.
- Reattach the upper case.

Station

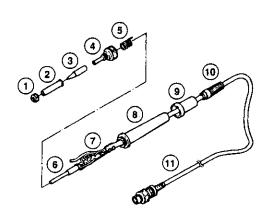


Parts List (continued)

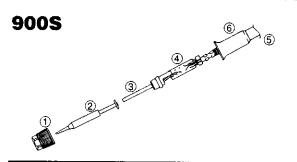
Station (continued)

Item No.	D		
	Part No.	Part Name	Description
1	B2034	Upper Case	E.S.D.
2	B2036	P.W.B. for Temp. Control	
	B2322	P.W.B. for Temp. Control	Australia
3	B2035	Panel	
4	B2006	Receptacle	
5	B2037	Card	
6	B2018	CAL Pot Plug	
7	B2047	Membrane Sheet	-
8	B2227	Grounding Plate	
9	B2038	Transformer	100-24V
	B2039	Transformer	110-24V
	B2040	Transformer	120-24V
[B2041	Transformer	220, 230, 240-24V
	B2302	Transformer	240-24V (Australia)
10	B2002	Lower Case	E.S.D., w/ Rubber Stopper
11	B2015	Cord Stopper	
12	B1084	Power Switch	
13	B2007	Fuse	125V-2A
[[B2008	Fuse	250V-0.8A
14	B2016	Rubber Stopper	Set of 2
15	B1318	Power Cord	3-wire Cord (No Plug)
	B1319	Power Cord	3-wire Cord & American Plug
	B2042	Power Cord	3-wire Cord & Australian Plug
	B2043	Power Cord	3-wire Cord & European Plug
16	B2103	Wiring Board for Switch	

907/908

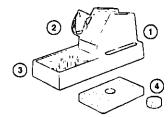


Item No.	Part No.	Part Name	Description	For Use With
1 1	B1784	Nut		907
	B1794	Nut		908
2	B1786	Tip Enclosure	- "	907
	B1787	Tip Enclosure		908
3		Soidering Tip	See page 12	907
		Soldering Tip	See page 12	908
4	B2022	Nipple		907
	B2033	Nipp le		908
5	B2032	Grounding Spring		907, 908
6	A1321	Heating Element	Old Part No.: 900M-H, 900L-H	907, 908
7	B2028	Terminal Board		907, 908
8	B2024	Handle	w/Handle Cover, E.S.D.	907
	B2026	Handle	w/Handle Cover, E.S.D.	908
9	B2027	Handle Cover		907, 908
10	B2031	Cord Bushing		907, 908
11	B2030	Cord Asse'y	E.S.D.	907, 908

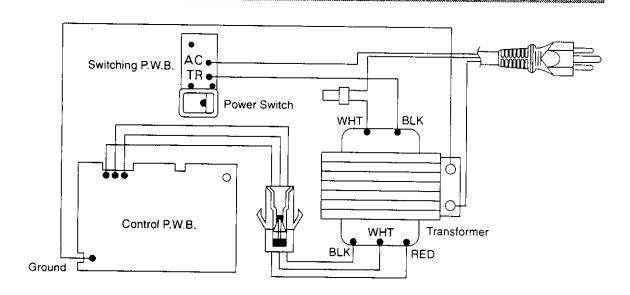


Item No	. Part No.	Part Name	Description
1	900S-006S	Nut	E.S.D.
2		Soldering Tip	See page 12
3	A1322	Heating Element	Old Part No.: 900S-H
4	9008-101	Terminal Board	w/Cord Stopper
5	9005-0015	Handle	w/Handle Cover, E.S.D.
6	900S-034S	Handle Cover	E.S.D.
7	9008-010	Cord Bushing	
8	900S-039S	Cord Asse'y	E.S.D.

Iron Holder



Item No.	Part No.	Part Name	For Use With
1	C1141	Iron Holder	900S
	C1142	Iron Holder	907, 908
2	B2020	Iron Receptacle	9005
	B2021	Iron Receptacle	907, 908
3	B2019	fron Holder Base	9005, 907, 908
4	A1042	Cleaning Sponge	9005, 907, 908



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