REPLACEMENT PARTS

OPTIONAL ACCESSORIES

Listed below are the optional accessories which are available. Refer to Table IV for applicable part numbers.

1. The Deluxe Tool Kit (illustrated in Figure 9 below) contains an assortment of drill bits, ball mills, abrasive wheels and other tools which are useful when repairing PC Assemblies. The parts in this kit may be ordered as separate items.
2. The Handle Kit provides the user with a compact carrying handle to easily transport the system.
3. The Foot Pedal Kit provides the user with the ability to operate the handpiece with foot pedal actuation.

ITEM NO.	DESCRIPTION	PART NUMBER
1	Deluxe Tool Kit	6005-0013
2	Handle Kit	6993-0164
3	Foot Pedal Kit	6993-0165

TABLE IV. OPTIONAL ACCESSORIES

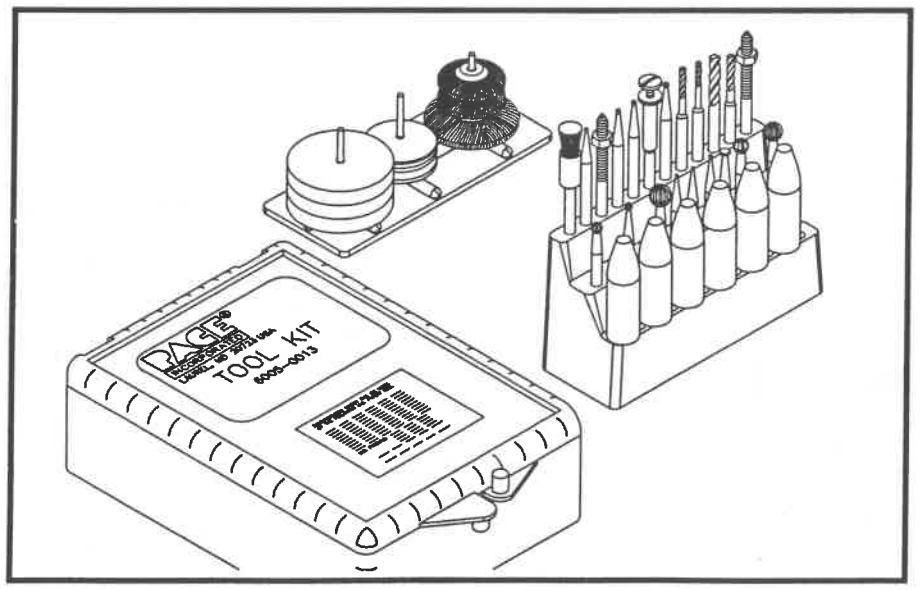
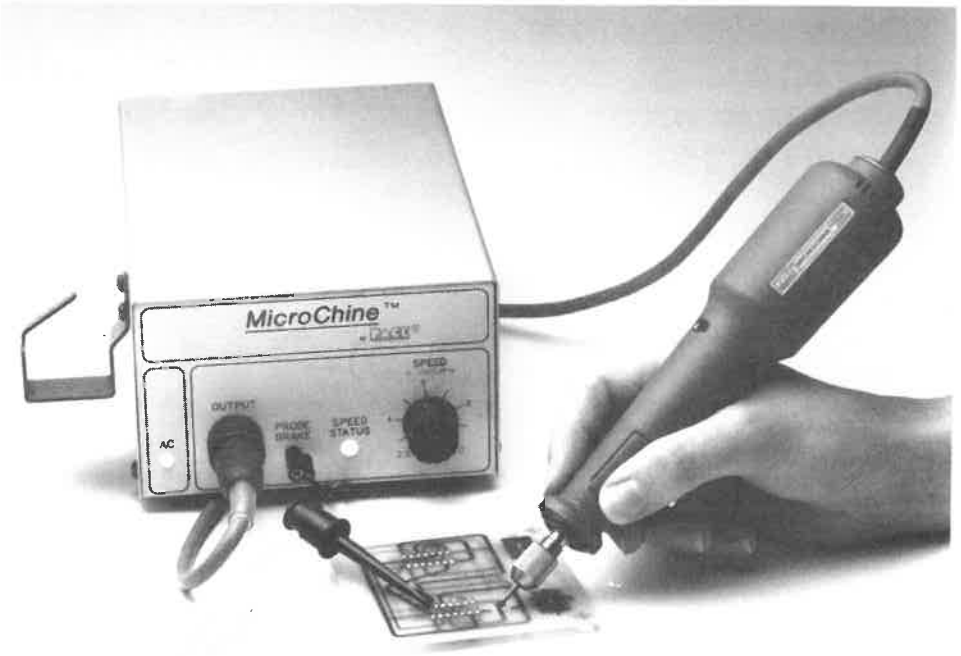


FIGURE 9. DELUXE TOOL KIT

PACE® INCORPORATED

MICROCHINE 100 SYSTEMS



SYSTEM OPERATION & MAINTENANCE MANUAL

SYSTEM

Listed below (Table II) are the system parts which may be ordered directly from PACE sales or your local authorized PACE distributor. For accessory parts, refer to Tables III & IV. To obtain power source parts other than those shown, contact your local PACE distributor or PACE directly at Telephone (301) 490-9860, FAX (301) 604-9215.

ITEM NO.	DESCRIPTION	PACE PART NUMBER		
		PPS 65	PPS 65J	PPS 65E
1	Fuse 0.75 Amp, Time Lag	1159-0259	N/A	N/A
	0.80 Amp, Time Lag	N/A	1159-0261	N/A
	0.40 Amp, Time Lag	N/A	N/A	1159-0262
2	Fuse Holder	1161-0008	1161-0008	1161-0008
3	Power Cord	1332-00161	1332-0161	1332-0162

TABLE II. SYSTEM REPLACEMENT PARTS

ACCESSORY TRAY

ITEM NO.	DESCRIPTION	QTY.	PART NUMBER
1	MicroChine Handpiece	1	7026-0001
2	Probe Brake Cord	1	1332-0163
3	Ball Mill, 1/32" Diameter	1	1112-0002
4	Ball Mill, 1/8" Diameter	1	1112-0006
5	Twist Drill, 3/64" Diameter	1	1112-0032
6	Mandrel, Threaded Top	1	1115-0002
7	Abrasive Bullet, Fine	2	1129-0007
8	MicroChine Cubby Support Kit	1	6019-0040

TABLE III. ACCESSORY TRAY

CORRECTIVE MAINTENANCE

Most malfunctions are simple and easy to clear. Refer to the table below to clear these malfunctions. If you encounter any difficulty clearing the malfunction, contact PACE Customer Service directly at Tel. (301) 490-9860, FAX (301) 604-9215.

SYMPTOM	PROBABLE CAUSE	SOLUTION
MicroChine motor will not run. Green AC Power LED not illuminated.	Blown Fuse	Replace fuse located on rear panel of Power Source.
MicroChine Status LED continuously illuminated Red in color.	Shorted handpiece.	Contact PACE Customer Service.
	Power Source pcb defect.	Contact PACE Customer Service.
MicroChine speed is grossly inaccurate.	MicroChine is overloaded. Speed Status LED is illuminated Yellow in color.	Disengage MicroChine from workpiece. Resume operation exerting less pressure on handpiece.
	Defective handpiece.	Replace handpiece.
	Power Source pcb is defective.	Contact PACE Customer Service.
MicroChine Probe Brake activates prematurely.	Probe Brake test lead is connected to or exciting a circuit having less than 500 ohms resistance to ground.	Remove ground lead from pcb.
MicroChine continues to run after release of finger switch or foot pedal.	Defective MicroChine handpiece.	Replace MicroChine handpiece.
MicroChine Probe Brake reacts sluggishly or is inoperable.	Probe Brake test lead is connected to inappropriate conductor on workpiece.	Connect Probe Brake test lead to proper conductor.
	Bit in MicroChine is not conductive (non metallic).	Install conductive bit.
	Defective MicroChine handpiece.	Replace handpiece.
	Power Source pcb defective.	Contact PACE Customer Service.
MicroChine will not operate. Probe Brake LED illuminated Green in color.	Damaged Power Receptacle.	Contact PACE Customer Service.
	Defective MicroChine handpiece.	Replace handpiece.
	Power Source pcb defective.	Contact PACE Customer Service.

TABLE 1. CORRECTIVE MAINTENANCE

MANUAL NO. 5050-0341

REV. B

PACE INCORPORATED

Systems for Development, Production and Repair of Electronic Assemblies

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.

Additional copies of this manual or other PACE literature may be obtained from:

PACE Incorporated
Sales Administration
9893 Brewers Court
Laurel MD 20723-1990

(301) 490 - 9860
(301) 4983252 Fax

OPERATION

WORKPIECE GROUNDING

The Probe Brake may activate prematurely if the workpiece is attached directly to ground. The Probe Brake circuit operates when a connection is made between the MicroChine bit and the conductor to which the Probe Brake lead clip is attached; a low current flows through this connection to activate the Probe Brake. Low resistance to ground or high capacitance in the workpiece circuit connected to the Probe Brake lead may activate the electronic sensing circuitry, in continuity with the Probe Brake lead, in the system power source. In this case, PACE recommends the use of the **PROBE BRAKE** Receptacle to ground the workpiece. To prevent electrostatic build-up, this receptacle provides an impedance of 1,000 ohms to ground.

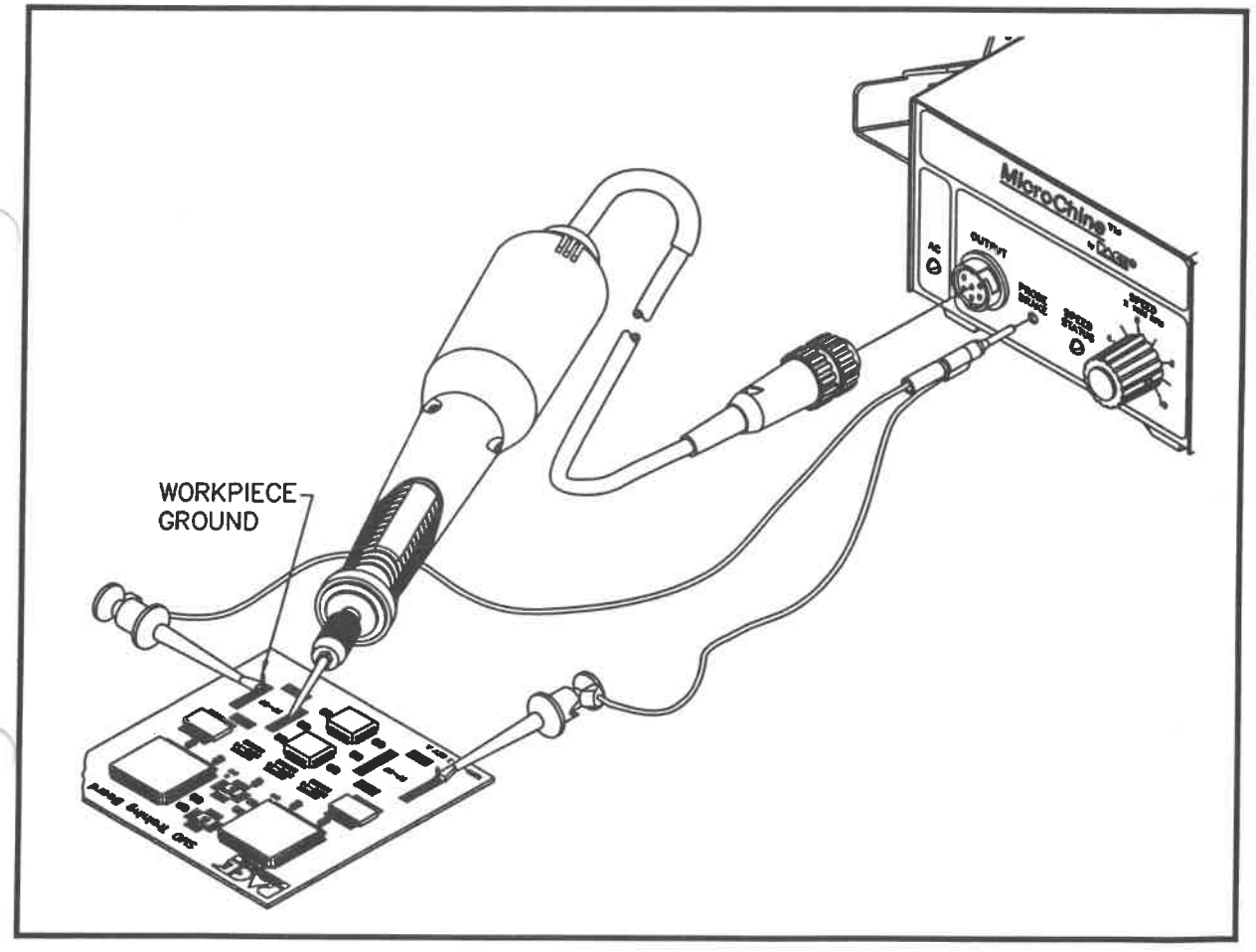


FIGURE 8. WORKPIECE GROUNDING

PROCEDURE CONT'D

4. Connect the Probe Brake lead jack to the **PROBE BRAKE** Receptacle and the clip end to a conductor (which has continuity with the conductor (s)) you want to protect. See "Workpiece Grounding".

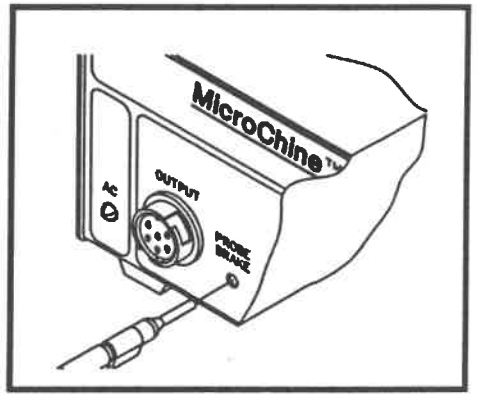


FIGURE 7. PROBE BRAKE ATTACH.

PROBE BRAKE OPERATION

The MicroChine's Probe Brake feature instantly stops all rotary machining at a selected layer depth for nondestructive multilayer repair.

In use, the Probe Brake cable is attached to the **PROBE BRAKE** Receptacle on the front panel of the system power source. The opposite end of the Probe Brake cable must be connected to a connector pin, component lead, or a soldered-on extension of the circuit board assembly. The connection point must have electrical continuity with the internal conductor to be repaired. A schematic diagram or layout artwork of the printed wiring assembly (PWA) is a great aid in locating the most effective connection point for the Probe Brake cable. The electronic Probe Brake circuit stops the MicroChine handpiece instantly when the working drill or mill makes contact with the internal layer of circuitry, in continuity with the Probe Brake lead, and the **STATUS** LED illuminates Red in color. Once the brake circuit has stopped the motor, the finger switch or foot pedal must be released before the motor can be started again.

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PROCEDURE

1. Adjust the MicroChine Variable **SPEED** Control to the desired rotational speed. Speeds are available from 2500 to 10,000 RPM. On any task, start with a lower speed and increase it within your control.

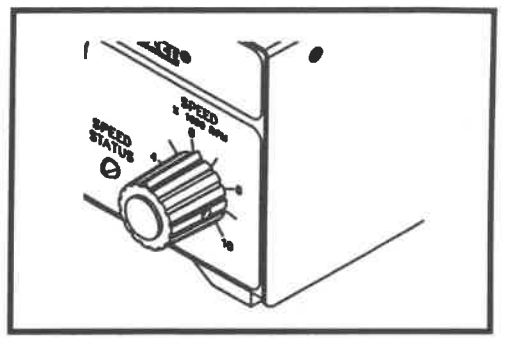

FIGURE 4. SPEED CONTROL

2. Select and attach the desired drill, mill or abrasive tool for the task at hand. Insert a small drill bit or ball mill into the access hole in the MicroChine housing and shaft to lock the shaft in position when removing or installing a tool.

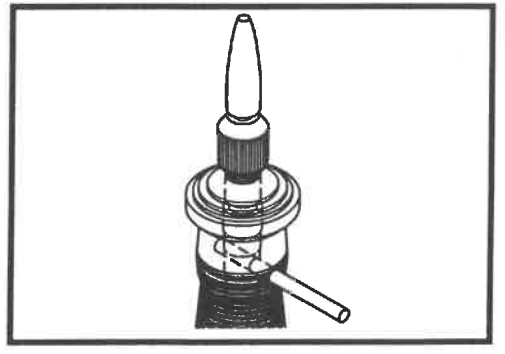

FIGURE 5. TOOL ATTACHMENT

3. There are two power switching options, the finger switch on the handpiece, or optional foot pedal control. When use of the foot pedal is desired, the pedal must be attached to the Foot **PEDAL** Receptacle at the rear panel of the system power source (a plastic filler plug will be present if foot pedal option has not been installed).

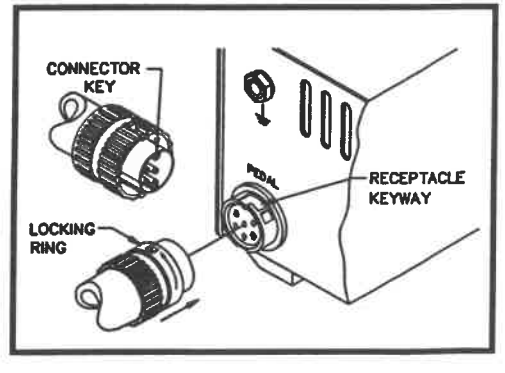

FIGURE 6. FOOT PEDAL CONNECTION

OPERATION

INTRODUCTION

The following information provides the user with the operating instructions for normal use. Continuous use at maximum torque (**SPEED STATUS** LED Amber in color) may cause the handpiece case to become warm. If this condition occurs, discontinue use and allow the system to cool.

CAUTION
Continued use without a cooling period may cause damage to the handpiece and/or the power source.

GENERAL INFORMATION

USE OF THIS MANUAL

The information contained in this manual will provide the user with the basic knowledge necessary to properly operate and maintain the PACE MicroChine 100 system. PACE STRONGLY RECOMMENDS THAT THE USER READ AND FULLY UNDERSTAND THE "OPERATION" PORTIONS OF THIS MANUAL PRIOR TO USE OF THE SYSTEM. If you encounter any difficulty operating your system, call your local authorized PACE dealer or contact PACE Applications Engineering directly at Tel. (301) 490-9860 or FAX (301) 604-9215.

INTRODUCTION

The MicroChine 100 represents the latest PACE development in hand machining for circuit board rework and repair. The self-contained motor handpiece connects to the power source via a special connector. The motor unit can be actuated by a fingertip control switch or optional foot pedal. A feedback loop between the motor and controller keeps the speed that you select constant as the load on the motor changes. To the right of the **OUTPUT** Power Receptacle you will find a connection jack labeled **"PROBE BRAKE"** which offers additional control of milling and drilling operations. Connecting the probe to a conductive element where you wish machining to stop will cause the motor to stop immediately as soon as contact is made. This feature can also be used to protect other circuit elements (e.g., adjacent lands or circuit traces) when machining in the tight spaces often found on todays' circuit assemblies. The **SPEED STATUS** LED will light Green when the unit is running and Red when the probe brake has been activated. The **SPEED STATUS** LED will shift its color from Green to Yellow when the motor has reached its maximum load. This is normally an indication that too much pressure is being applied to the workpiece. The Variable **SPEED** Control knob regulates the speed of the motor unit so that it can be easily set for the work to be performed. The MicroChine uses the same collet previously found in the PACE MiniChine systems, so that all existing bits will be interchangeable and features the same special static dissipative housing material found in all PACE soldering/desoldering handpieces. An optional chuck is available (replaces standard collet) to accommodate variable shank diameter bits.

The MicroChine 100 system is available in the MicroChine 100, 115 VAC (Domestic) version, MicroChine 100J, 100 VAC (Japan) version and the MicroChine 100E, 230 VAC (Export) version. The system includes the Power Source, MicroChine handpiece and a selection of accessories and functional aids.

SPECIFICATIONS

POWER REQUIREMENTS

MicroChine 100 (PPS 65 power source): Domestic version operates on 97-127 VAC, 60 Hz. 72 Watts maximum.

MicroChine 100J (PPS 65J power source): Japan version operates on 85-110 VAC, 50/60 Hz. 80 Watts maximum.

MicroChine 100E (PPS 65E power source): Export version operates on 195-264 VAC, 50/60 Hz. 84 Watts maximum.

PHYSICAL PARAMETERS

Size: 12.7 cm W x 7.62 cm H x 22.1 cm D (5.0 in W x 3.0 in H x 8.7 in D)

Weight: PPS 65 - 2.0 Kg (4.3 Lbs)

PPS 65J - 2.0 Kg (4.3 Lbs)

PPS 65E - 2.2 Kg (4.8 Lbs)

ENVIRONMENTAL

Ambient Operating Temperature: 0°C to 50°C (32°F to 122°F)

HANDPIECE

Install the MicroChine handpiece using Figure 3 and the following steps.

1. Place the MicroChine into the MicroChine Cubby.
2. Connect the handpiece connector plug to the **OUTPUT** Power Receptacle in the following manner.
   a) Turn the Locking Ring fully counterclockwise.
   b) Orient the Connector Key on the connector with the slot of the **OUTPUT** Power Receptacle.
   c) Insert the connector into the **OUTPUT** Power Receptacle. Turn the Locking Ring clockwise slowly as necessary to align the Connector Key when inserting the connector.
   d) Turn the Locking Ring fully clockwise to lock in place.
3. If the Foot Pedal option (P/N 6993-0165) has been purchased, insert the foot pedal connector plug into the **PEDAL** receptacle on the rear panel of the power source to enable foot pedal operation of the MicroChine handpiece.

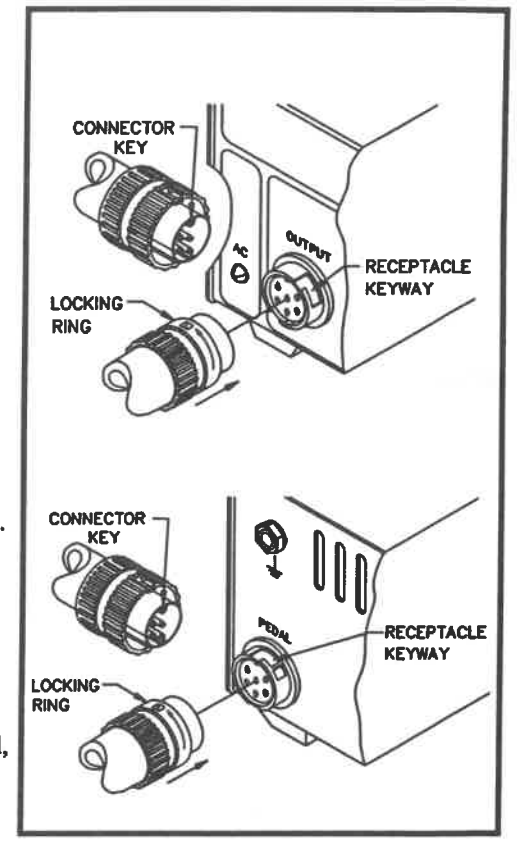

FIGURE 3. HANDPIECE/PEDAL CONNECTIONS

4. Plug the prong end of the power cord into a convenient three wire grounded AC power outlet. The system is now ready for operation.

> **CAUTION**
>
> To insure operator safety, the AC supply receptacle must be checked for proper grounding before initial operation of the system.

5. Read the "OPERATION" section of this manual thoroughly before operating the system.

SET-UP

CUBBY

Set up the MicroChine Cubby using Figure 2 and the following steps.

1. Position the system on a convenient bench.

2. The MicroChine Cubby may be mounted to either side of the Power Source. Place the cubby in the position desired and secure in place using 2 of the supplied Mounting Screws.

3. There are 2 additional Mounting Screws supplied. Insert these screws into the mounting holes on the opposite side of the Power Source from the MicroChine handpiece. These screws can be used to mount the mounting bracket for the optional Handle Kit (PACE P/N 6993-0164).

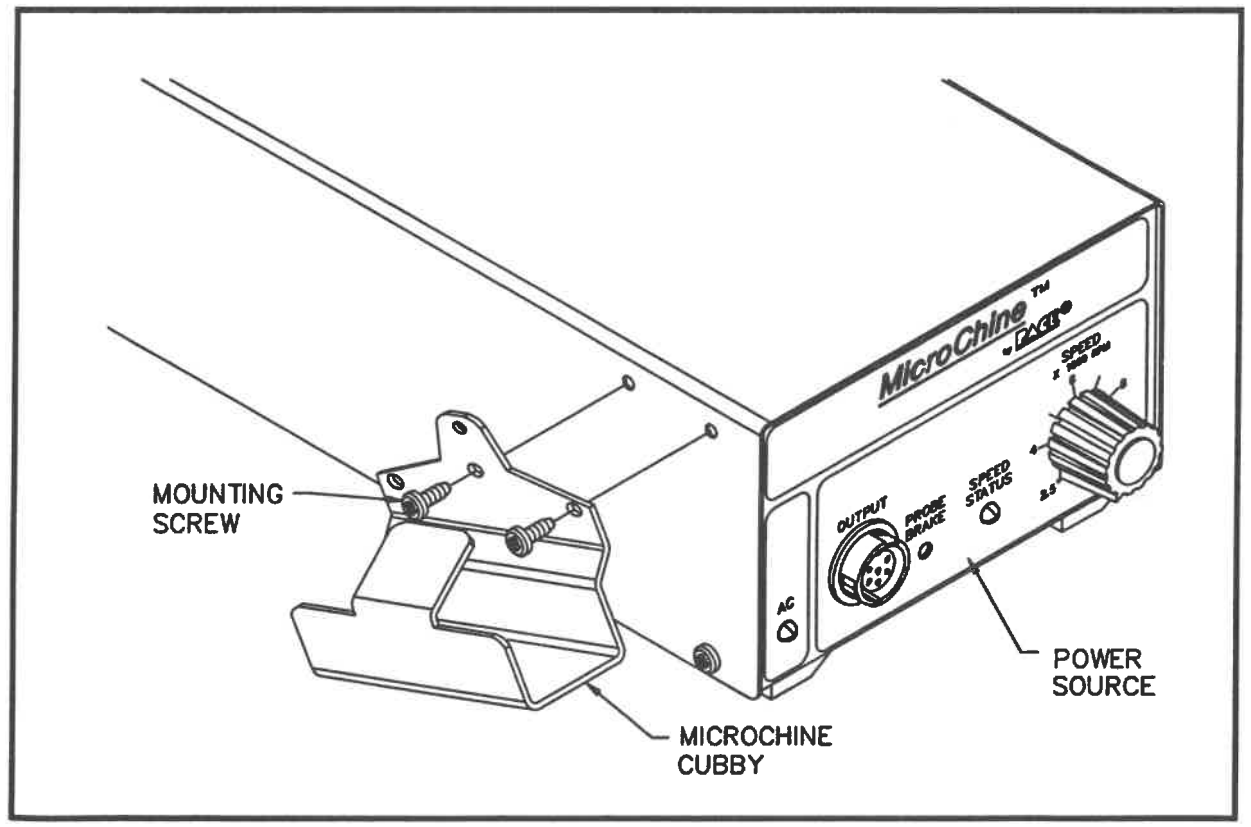

FIGURE 2. MICROCHINE CUBBY INSTALLATION

GENERAL INFORMATION

EOS/ESD

Tip-To-Ground Resistance:	**Static (not running)**	**-** Less than 5 ohms.
	Dynamic (running)	**-** Less than 5 ohms.
AC Leakage:	**Static (not running)**	**-** Less than 2 millivolts RMS from 50 Hz to 500 Hz.
	Dynamic (running)	**-** Less than 2 millivolts RMS from 50 Hz to 500 Hz.

HANDPIECE

Nominal Output Speed Range:	2,500 rpm, min. to 10,000 rpm, max.
Output Torque:	2.0 inch-ounces min.
Speed Regulation:	+10/-15% 0 to 2 inch-ounces from low line to high line voltage.
Duty Cycle:	Application dependent. Continuous use at maximum torque (Speed Status LED Amber in color) may cause the handpiece case to become warm. If this condition occurs, discontinue use and allow the system to cool. Continued use without a cooling period may cause damage to the handpiece and/or the power source.
Shaft Run-Out at Collet:	.13mm (0.005 inches) TIR (Total Indicator Reading) max.

PARTS IDENTIFICATION

1. **AC POWER LED** - Provides power input indication. Green LED is lit when system is plugged into house AC supply.

2. **OUTPUT POWER RECEPTACLE** - Provides power, tip ground and finger switch connection for the MicroChine handpiece.

3. **VARIABLE SPEED CONTROL** - Controls motor speed (2,500 - 10,000 RPM) of MicroChine handpiece.

4. **PROBE BRAKE RECEPTACLE** - Provides Probe Brake connection for the MicroChine Probe Brake feature.

5. **SPEED STATUS LED** - Illuminates Green to indicate MicroChine operation. Illuminates Amber if maximum torque load is reached. Illuminates Red to indicate braking status when Probe Brake circuit is activated.

6. **MICROCHINE HANDPIECE** - Lightweight, variable-speed miniature machining handpiece. Contains "smooth start" integral motor and finger switch for motor activation.

7. **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.

8. **FUSE HOLDER** - Houses line fuse which protects system from overcurrent conditions.

9. **FUSE** - Protects system from overcurrent conditions.

10. **POWER CORD** - Integral AC cord supplies power to the system from the house AC supply.

11. **PEDAL CUTOUT** - Opening in rear panel which is normally covered with a plastic filler cap. This opening is used to house a foot pedal receptacle when the foot pedal option is purchased.

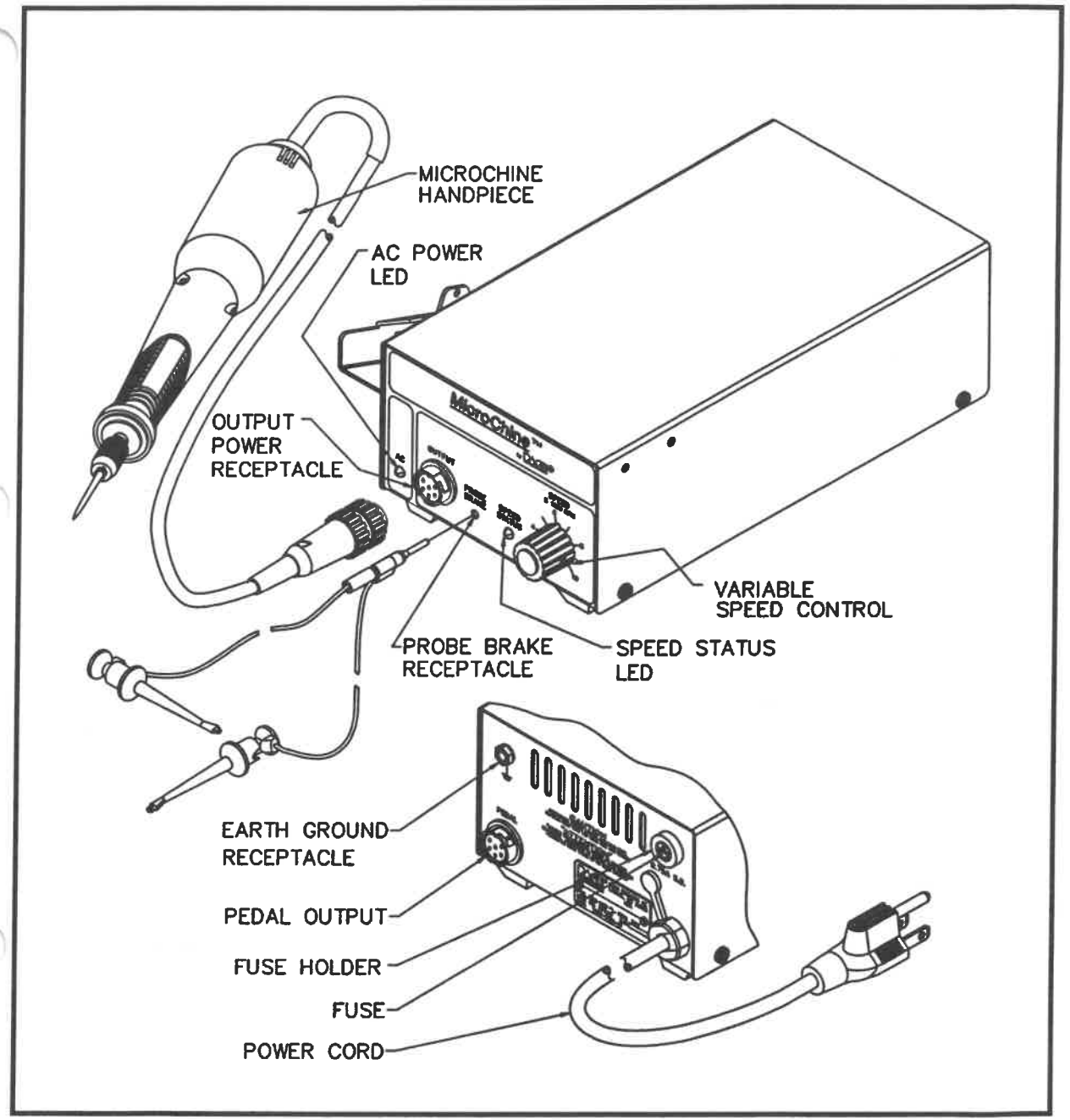

FIGURE 1. PARTS IDENTIFICATION