SOLDERING COMPONENTS TO THE PC BOARD

A poorly soldered joint can greatly affect small current flow in circuits and can cause equipment failure. You can damage a PC board or a component with too much heat or cause a cold solder joint with insufficient heat. Sloppy soldering can cause bridges between two adjacent foils preventing the circuit from functioning.

Safety Procedures

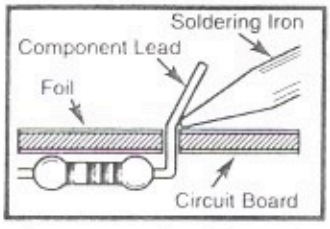
- Wear eye protection when soldering.
- Locate soldering iron in an area where you do not have to go around it or reach over it.
- **Do not hold solder in your mouth.** Wash your hands thoroughly after handling solder.
- Be sure that there is adequate ventilation present.

What Good Soldering Looks Like

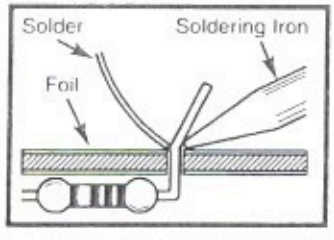
A good solder connection should be bright, shiny, smooth, and uniformly flowed over all surfaces.

Soldering a PC board

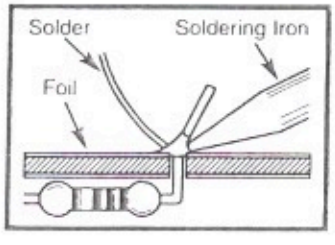
1. Solder all components from the copper foil side only. Push the soldering iron tip against both the lead and the circuit board foil.



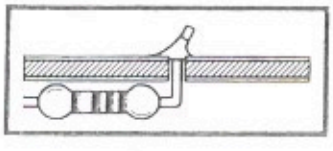
2. Apply a small amount of solder to the iron tip. This allows the heat to leave the iron and onto the foil. Immediately apply solder to the opposite side of the connection, away from the iron. Allow the heated component and the circuit foil to melt the solder.



3. Allow the solder to flow around the connection. Then, remove the solder and the iron and let the connection cool. The solder should have flowed smoothly and not lump around the wire lead.

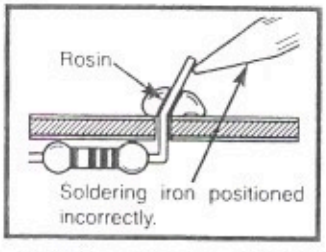


4. Here is what a good solder connection looks like.

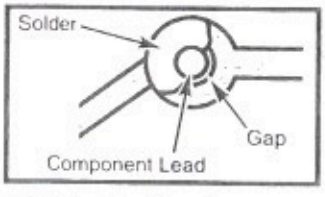


Types of Poor Soldering Connections

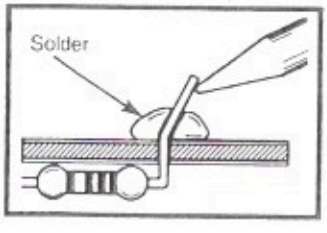
1. **Insufficient heat** - the solder will not flow onto the lead as shown.



2. **Insufficient solder** - let the solder flow over the connection until it is covered. Use just enough solder to cover the connection.

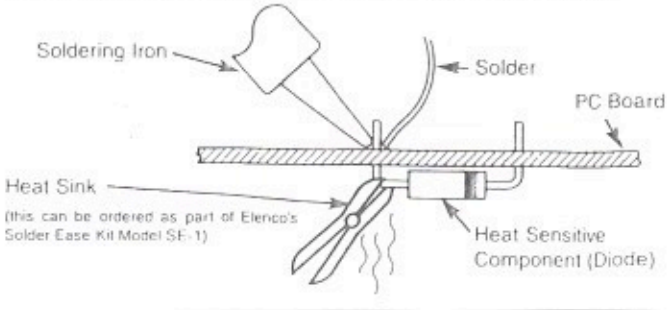


3. **Excessive solder** - could make connections that you did not intend to between adjacent foil areas or terminals.



Heat Sinking

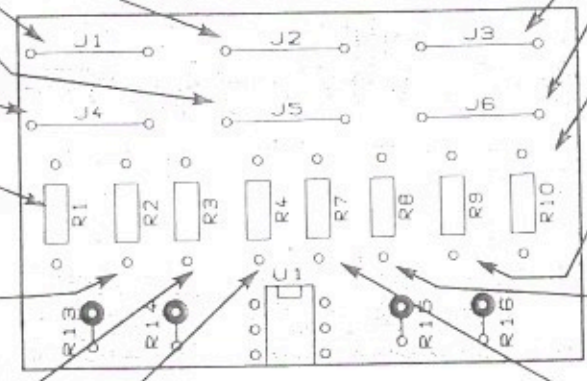
Electronic components such as transistors, IC's, and diodes can be damaged by the heat during soldering. Heat sinking is a way of reducing the heat on the components while soldering. Dissipating the heat can be achieved by using long nose pliers, an alligator clip, or a special heat dissipating clip. The heat sink should be held on the component lead between the part and the solder joint.



PC BOARD ASSEMBLY

Solder the following parts to the PC board.

- ☐ J2 - Jumper Wire (see Fig. A)
- ☐ J1 - Jumper Wire (see Fig. A)
- ☐ J5 - Jumper Wire (see Fig. A)
- ☐ J4 - Jumper Wire (see Fig. A)
- ☐ R1 - 100Ω 5% ¼W Resistor (brown-black-brown-gold) (see Figure B)
- ☐ R2 - 150Ω 5% ¼W Resistor (brown-green-brown-gold) (see Figure B)
- ☐ R3 - 200Ω 5% ¼W Resistor (red-black-brown-gold) (see Figure B)
- ☐ R4 - 220Ω 5% ¼W Resistor (red-red-brown-gold) (see Figure B)



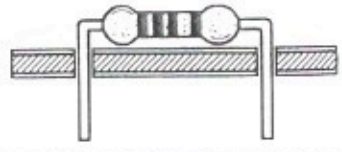
- ☐ J3 - Jumper Wire (see Fig. A)
- ☐ J6 - Jumper Wire (see Fig. A)
- ☐ R10 - 220Ω 5% ¼W Resistor (red-red-brown-gold) (see Figure B)
- ☐ R9 - 200Ω 5% ¼W Resistor (red-black-brown-gold) (see Figure B)
- ☐ R8 - 150Ω 5% ¼W Resistor (brown-green-brown-gold) (see Figure B)
- ☐ R7 - 100Ω 5% ¼W Resistor (brown-black-brown-gold) (see Figure B)

Figure A

Cut a 1" wire and strip 1/8" of insulation off of both ends.

Figure B

Mount the resistor flat against the PC board as shown.



Resistance Testing #1 (If you do not have a meter, continue to page 11)

You will test the solder connections by measuring the resistance from the following points. If your readings are different, double check your soldering connections.

Location	Value	Circuit
☐ Point A (left side of J1) to point B (right side of J3)	0.1 - 1Ω	(J1-J3)
☐ Point A (left side of J1) to point C (top lead of R4)	670Ω ±5%	(J1-J3, R1-R4)
☐ Point D (left side of J4) to point E (right side of J6)	0.1 - 1Ω ±5%	(J4-J6)
☐ Point D (left side of J4) to point F (top lead of R10)	670Ω ±5%	(J4-J6, R7-R10)