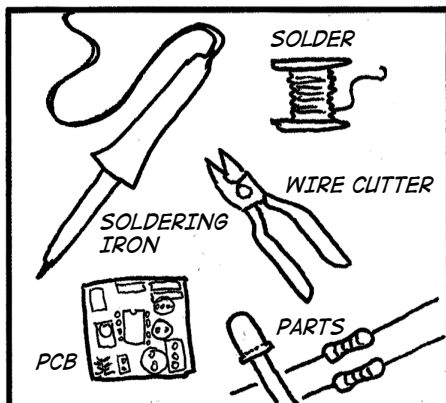




Soldering

SOLDERING IS EASY

HERE'S HOW TO DO IT



THE IRON IS HOT!! BE CAREFUL!

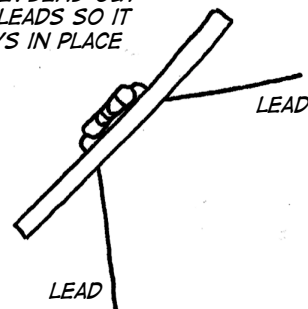


YOUR KIT SHOULD COME WITH INSTRUCTIONS FOR WHAT PARTS GO WHERE AND WHAT WAY!

CLEAN THE TIP OF YOUR IRON BEFORE EACH SOLDER CONNECTION!



PUT YOUR PART IN PLACE. BEND OUT THE LEADS SO IT STAYS IN PLACE



PUT THE PCB DOWN SO YOU CAN SOLDER.

CAREFUL WITH THE SURFACE UNDERNEATH!

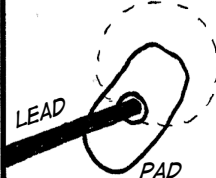
FIND SOME GOOD WAY TO KEEP IT STEADY



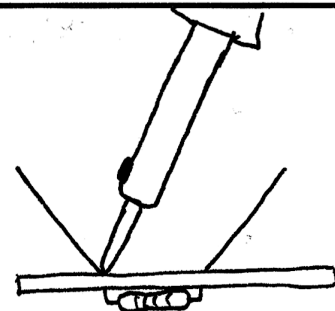
IF YOU NEED A THIRD HAND, YOU CAN MAKE A STANDING COIL OF THE SOLDER INSTEAD OF HOLDING IT IN YOUR HAND

OK, LETS SOLDER!

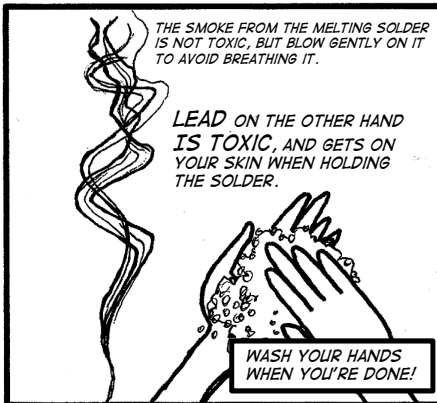
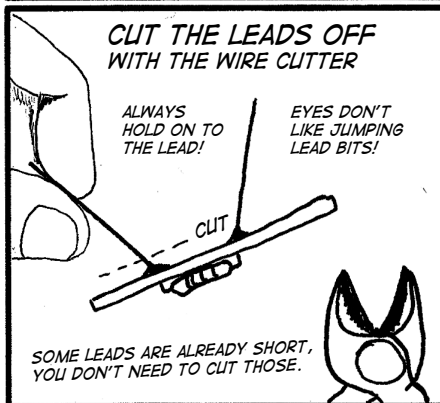
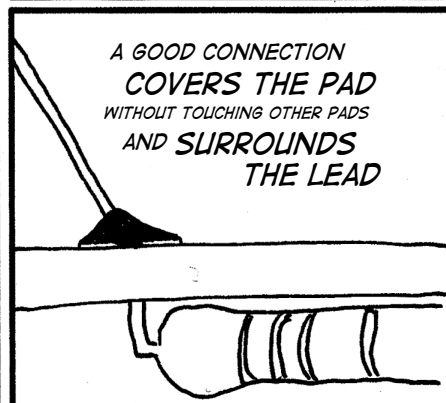
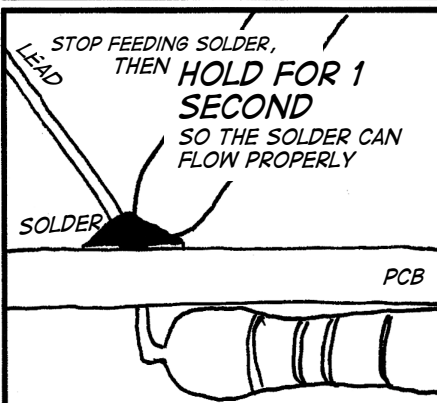
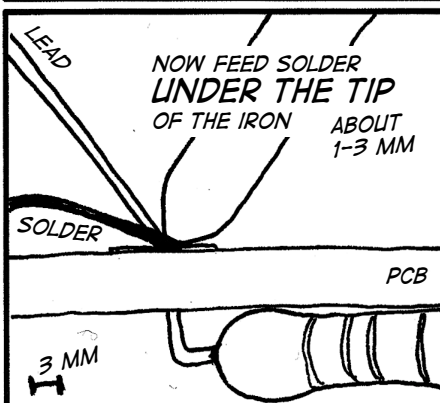
FIRST, YOU WANT TO HEAT BOTH THE PAD AND THE LEAD FOR ABOUT 1 SECOND



PSST! CLEAN THE TIP FIRST!



TOUCH THE SOLDERING IRON TO BOTH THE PAD AND THE LEAD!



KEEP SOLDERING EACH PART IN ITS CORRECT PLACE. REMEMBER SOME PARTS NEED TO GO IN A CERTAIN WAY!

IF ALL YOUR CONNECTIONS ARE GOOD, YOUR CIRCUIT WILL JUST WORK!

THERE ARE MORE TRICKS YOU WILL LEARN AS YOU KEEP SOLDERING, BUT NOW YOU KNOW ENOUGH TO MAKE MANY COOL THINGS.

SOLDERING COURSE BY MITCH ALTMAN
[HTTP://CORNFIELDELECTRONICS.COM](http://cornfieldelectronics.com)

COMIC ADAPTATION BY ANDIE NORDGREN
[HTTP://LOG.ANDIE.SE](http://log.andie.se)



Soldering

Helping Hands

To make life easier for us, we can use 'Helping Hands' to hold our board and components in place. The helping hands consist of metal limbs with crocodile clips at the end. The joints at the corner of each limb are adjustable by loosening and tightening their screws. Take a bit of time to adjust these to make your soldering experience as comfortable as possible.

The helping hands also contain the soldering iron stand. Just be careful not to burn yourself!



Soldering!

We are now going to learn some useful soldering skills.

1) Solder a wire to the board. Begin by pushing the wire through the back of the board (the plastic side) and solder onto the metal side. *Use the helping hands to hold both the wire and the board in place, and make sure the wire is sticking through the board at right angles to its surface.*



2) Solder a resistor onto the board. Put the resistor through the back of the board (the plastic side) and solder onto the metal side. *Leave enough of a gap between the legs of the resistor so that the body of the resistor can lie flat. Once it's in place bend one of the legs to hold it still.*

3) Solder a second resistor onto the board. This time solder it into two holes that are side by side. *You will need to bend one of the legs so that it is parallel to the body of the resistor and the other leg. This will allow the resistor to sit up on the surface of the board..*

4) Sometimes you need to solder wires together, or solder a wire to the leg of a component. To do this we first need to add a bit of solder to each bit of wire we are going to solder together.

This is called '*Tinning*' the wire.

Put the wire in the helping hands, heat one end of the wire with the soldering iron, then press the solder against the end of the soldering iron. You will see the solder flow onto the wire.

Now repeat with the second wire.

To finish, leave the second wire in the helping hands, take the iron in your writing hand, and the other wire in your other hand. Bring the wires together and use the iron to melt the solder. With a steady hand move the



Soldering

Making the Instrument Cable

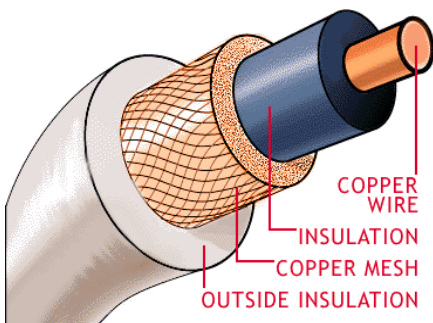
To connect different bits of equipment we need cables that will carry the electrical signal between them. This is what we are going to make now.

This cable is made up of a single core wire with a 'shield' of braided copper wire, and connectors on each end.



The Wire

The wire is made up of four parts:



- 2 inner conducting parts:

The inner conductor (copper wire) that carries the signal, and an outer conductor (copper braid) that screens the current from interference and connects the ground (zero volts) between devices.

- 2 insulating parts

The outer insulation and the insulation between the inner conductor and the copper mesh.

The Connectors

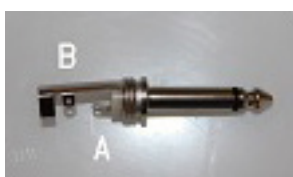
There are two parts to the connectors. The metal "Jack" that connects the different equipment, and its insulating cover.



- We need to first put both insulating covers over the ends of the wire, with the large open side facing each end.

Soldering the cable together

We have to solder the connectors to either end of the wire. The conducting copper wire from the middle of the wire goes through the hole at point A in our diagram (see below). Place the wire through and solder here. The outer conductor goes through point b. Place the wire through and solder into place.



- Finish by using your pliers to squeeze the tabs at the back of the connector jack around the black wire, and screwing over the insulating covers.