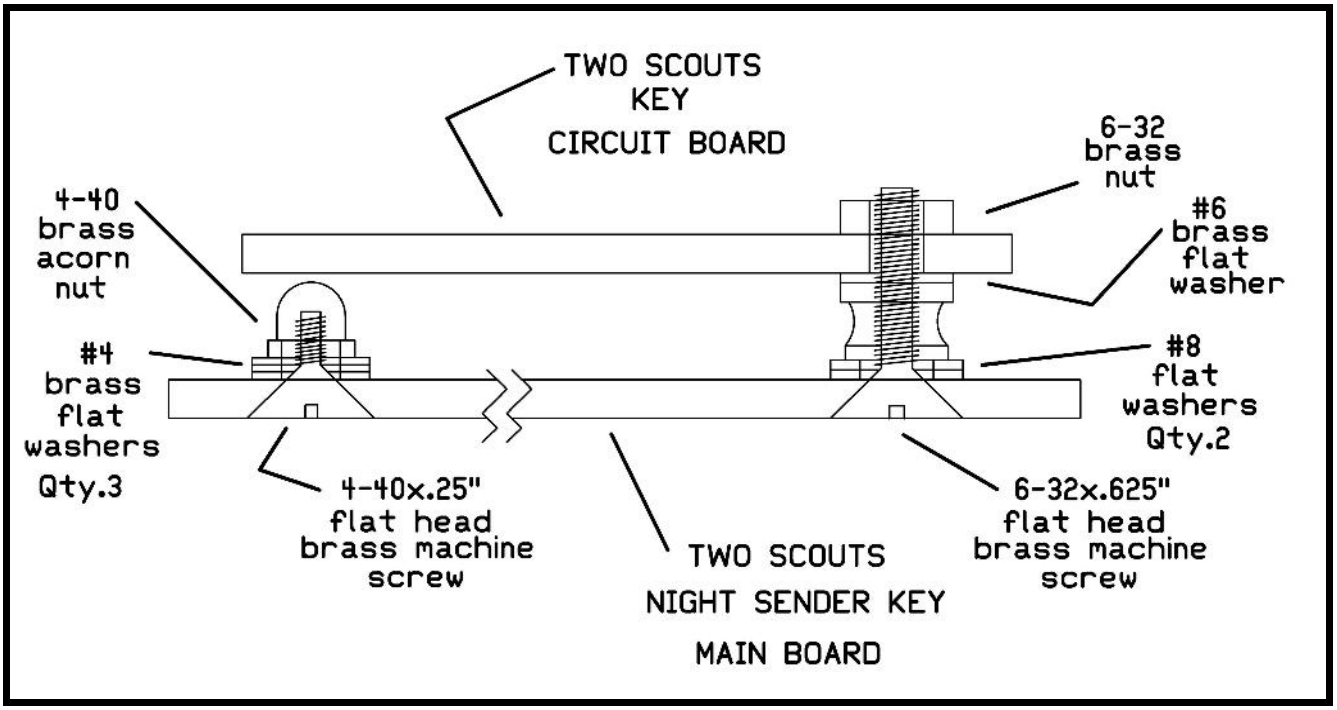
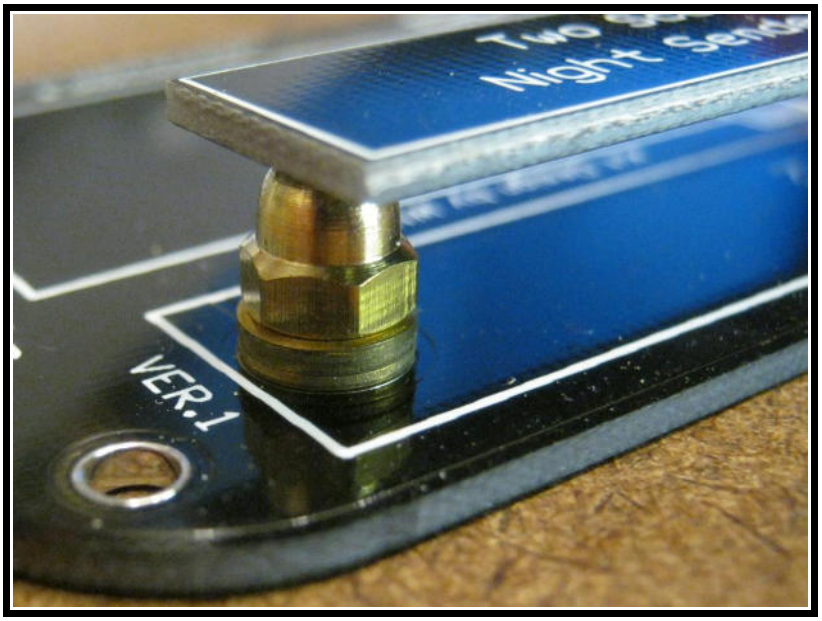
Two Scouts Night Sender Key

Pictorial Builder's Guide



Overall configuration of the mechanical key components

Make up the contact end of the sender key first, using the small #4x1/4" brass machine screw inserted up through the bottom of the circuit board. Place 3 small #4 brass washers above the circuit board and top it off with a #4 acorn nut and tighten it all together.



Make up the top end of the key by first inserting the larger #6x5/8" brass flat head machine screw up through the remaining larger hole. Add 2 #8 steel washers and then top with a #6 knurled brass nut and tighten. Add a #6 brass washer to the stack then the key circuit board and top it all off with a #6 brass nut and tighten everything up while holding the key circuit board centered in the silk screened box.

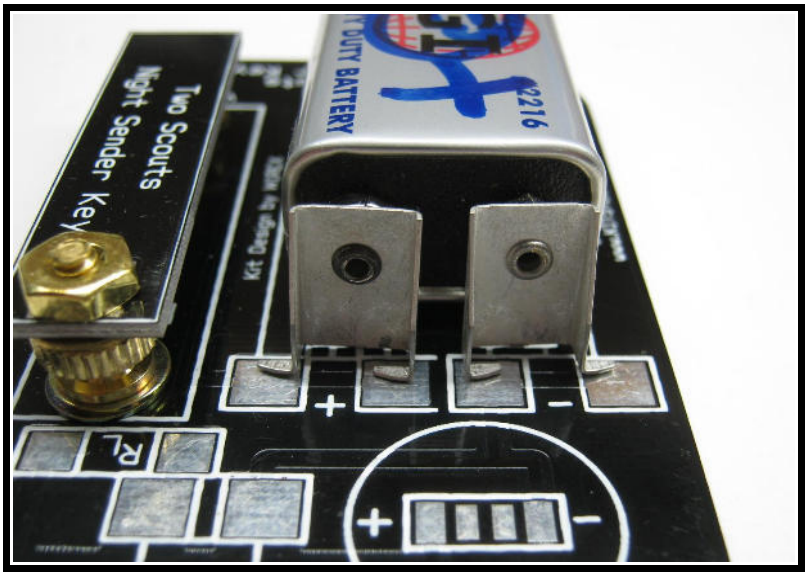
Bend the tabs on the 2 battery snaps so that they look the same as the picture to the right. The tabs are bent at right angles right at the base of the snap. Pay attention to which is the +snap and which is the – snap. Positive snap is on the right while the negative snap is on the right. The tabs on the sides closest to the other snap are bent inward instead of outward.

On the back sides of the snaps, you can see that the tabs closest to the other snaps are bent in instead of out....

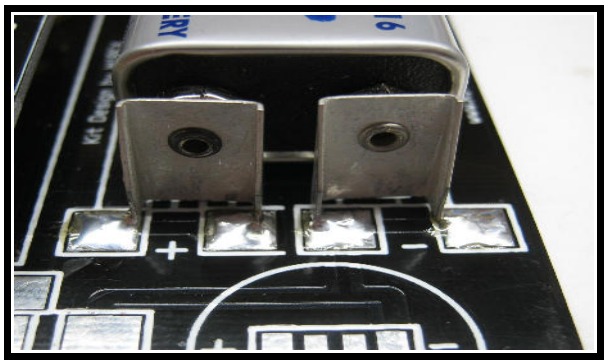
I snap the snaps onto a dead 9 volt battery to insure the proper spacing when soldering the snaps onto the circuit board.

I took an already dead battery and then wired a 1K resistor across the terminals and left it there until the battery read nothing with a voltage tester. I keep it around my bench for uses such as this.... Notice the tombstone and RIP marked on the battery so I can readily identify it as a dead one!!

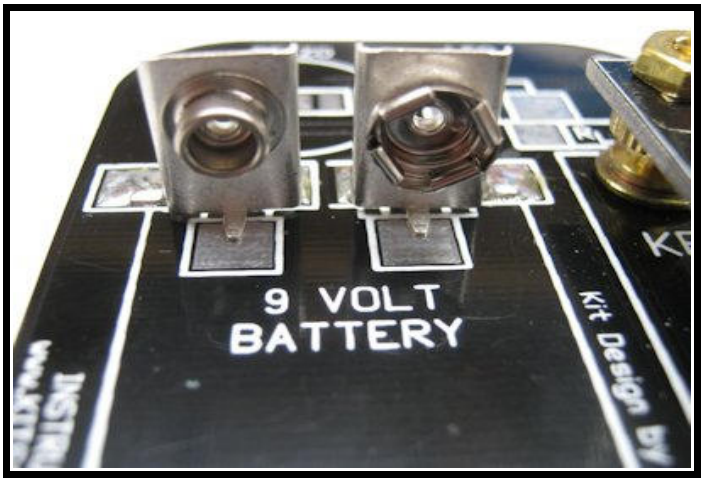
Placing the battery on the circuit board and move it around until the bent tabs fit nicely on all 6 pads. Pay attention to the tabs on the front that are under the battery. Once you have the position you want, solder the 4 backside tabs to the 4 pads on the circuit board. After you solder the first tab/pad make sure all the others are still looking good before you solder the second tab. Again, double check everything is still Ok and solder the remaining 2 tabs.



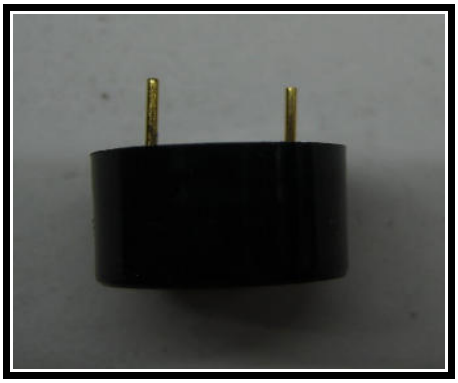
It should NOW look like this!



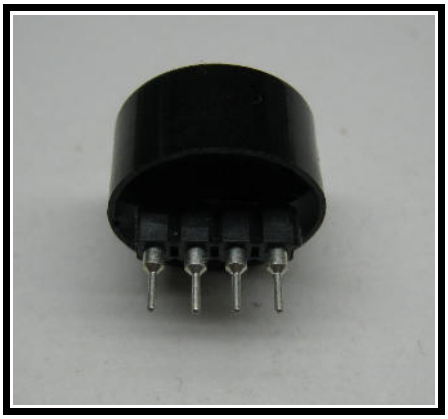
Carefully remove the battery and solder the two front tabs to their pads.



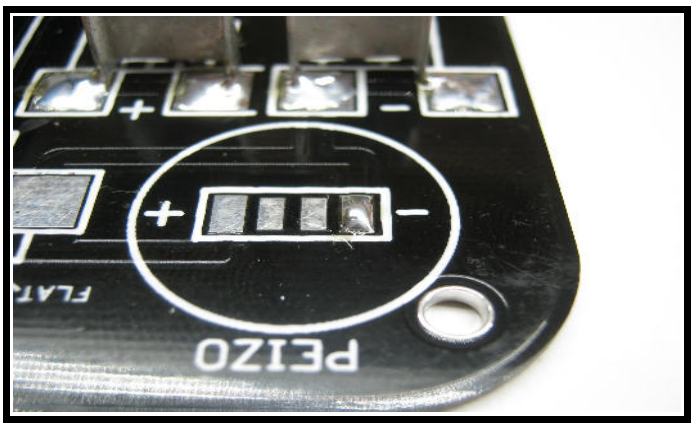
Snip of the longer pin on the piezo sounder to make the 2 pins even....



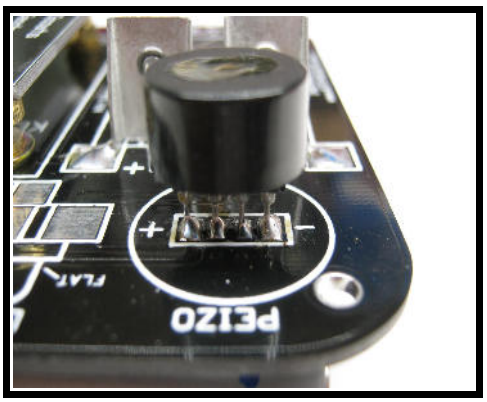
Press the piezo unto a 4 socket strip of SIP socket pins in preparation for soldering it onto the circuit board. The SIP pins make a nice socket to experimenting with different sounders...or to remove it for silent operation.

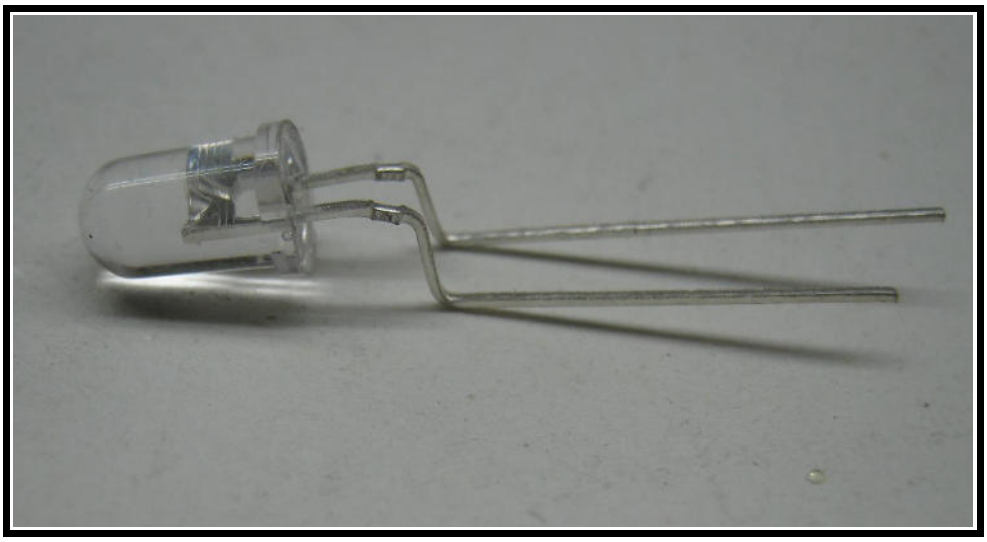


Add solder to a single outside pad where the piezo sounder goes. Hold the piezo/SIP pin unit so that the pins and pads line up and reheat the solder on the presoldered pad. The piezo should be attached but still really flimsy. Check the other 3 pads for good spacing and if everything looks good, solder the other 3 pins to their pads.



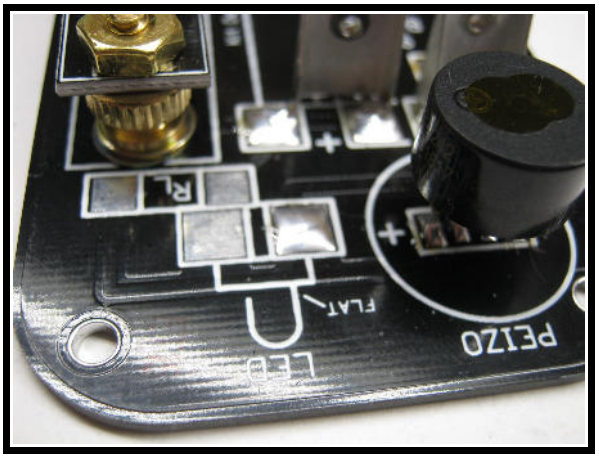
You can reheat the pins and pads and add a little solder to make them better. Just do them slowly one at a time so that the piezo remains in the same position when reworking the pins.



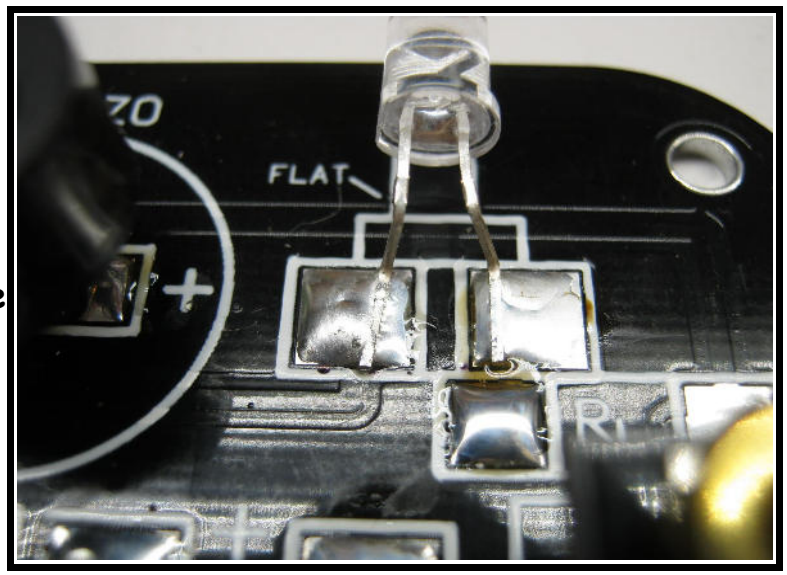


Probably the most tricky thing in this kit is bending the LED leads so that they fit the pads AND position the LED off the printed circuit board so that it is aligned with the hole in the tin. Pay attention to the FLAT side of the LED as polarity is important. Soldering the LED into the circuit backwards will cause it to not work. The body of the LED is round with a small flange at the base. There is a FLAT spot on the flange. That is the negative side of the LED and the lead on that side is the – lead. It is the side closest to the viewer in the above picture. The leads are bent 'down' just past the little barbs on the two leads. The leads are then bent back parallel to their original direction about 1/4" after the 1st bend. This will sit the LEDs about 1/4" up off the board. Check the lead spacing by 'dry fitting' the LED onto the pads without soldering. Once you are satisfied with the fit, you can begin to solder the LED onto the pads.

Add solder to ONE of the 2 LED pads on the board. Then solder the LED into place applying heat and solder to that one pre-soldered pad. Check the alignment of the LED on the second pad and if good, solder the second LED lead to the second pad. Cut off any excess LED leads.

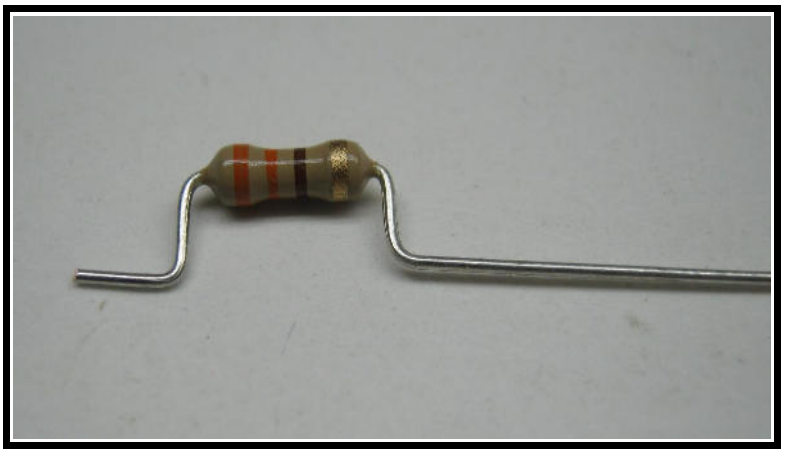


The LED should now look like the picture to the right. You can drop the partial completed circuit board into the tin to make sure the LED is aligned with the hole in the side of the tin. If the LED can't be bent into position, you will have to re-heat the pads to change the LED's position to make it fit.

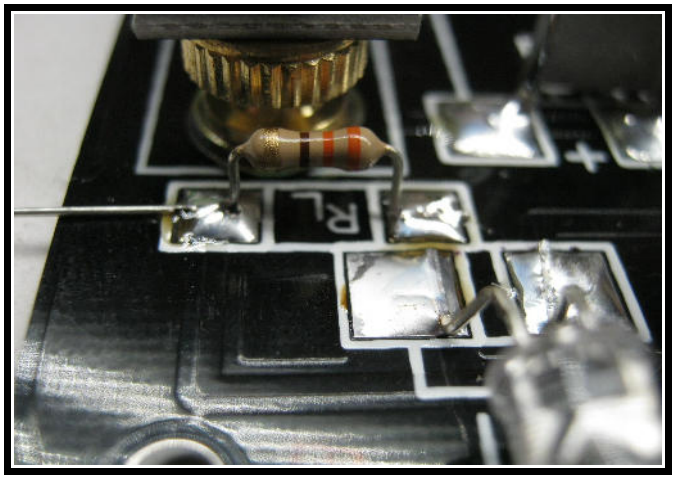


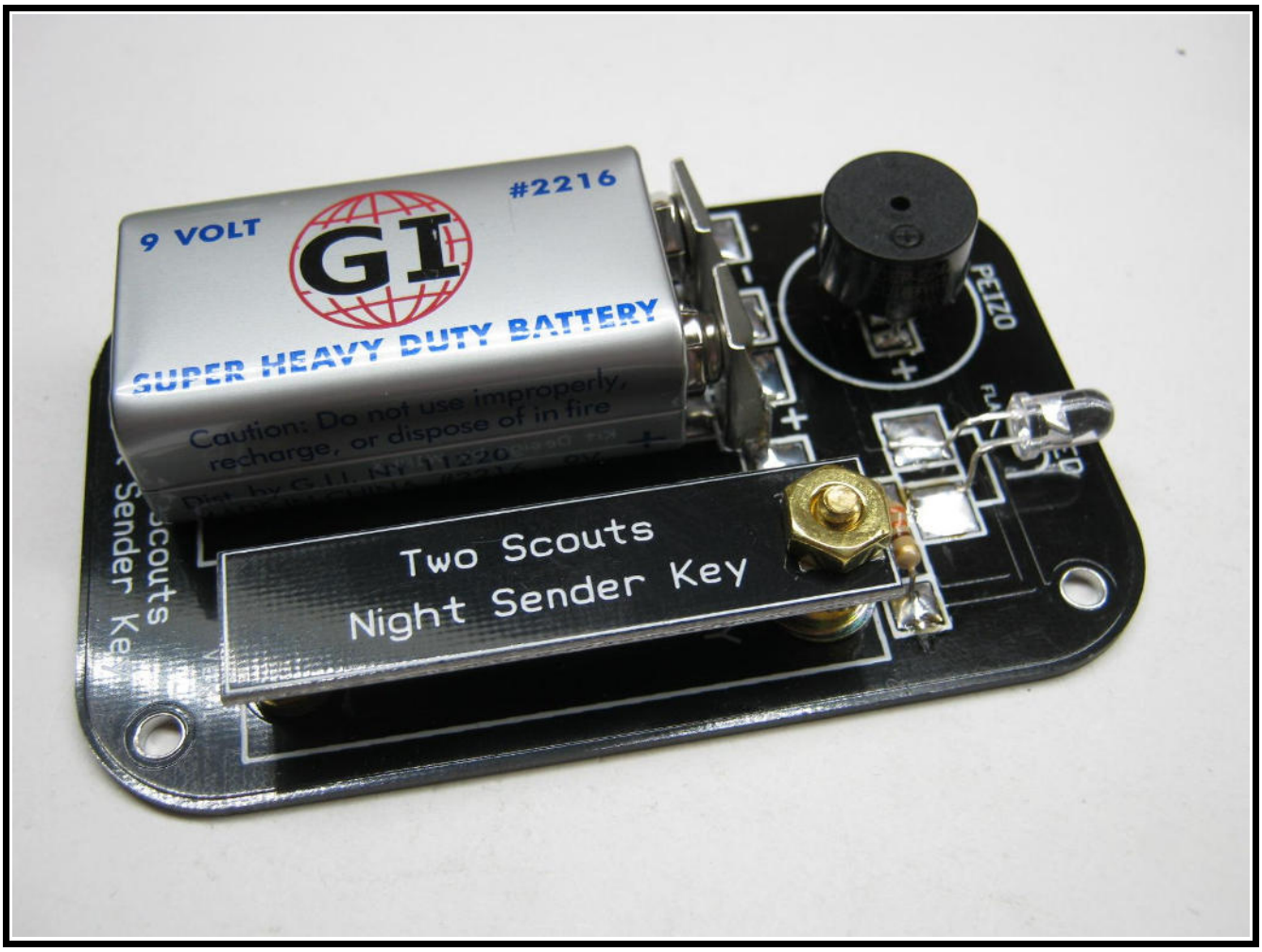
Once you have the LED good to go, you can pre-solder one of the Resistor pads to prepare it for soldering in the resistor.

The resistor leads are bent in order to fit it onto the 2 pads marked RL. The picture on the right shows a bent resistor ready to solder. The long lead is so that you can hold onto it while soldering the other end to the pre-soldered pad.



Picture on the right shows the resistor soldered onto the two RL pads with the long 'handle' lead still attached.





You can then clip off the long 'handle lead' on the resistor, insert a fresh battery and you are almost home.

Now you need to make an insulator for inserting between the bottom of the circuit board and the steel mint tin. I had and old resistor box handy to cut up. You don't need it to be real thick. An index card or manila file folder works good here. I chose the resistor box because it was yellow and would stand out in the pictures.

Set the circuit board down on some stiff but not too thick paper and trace around the board.

Cut the paper at the trace lines for a nice little isolation insert to place into the tin before setting in the completed Night Sender Key circuit board.

Put the completed circuit board into the tin, add the Morse Code sticker into the inside lid and you are ready to have some FUN learning and sending Morse Code.