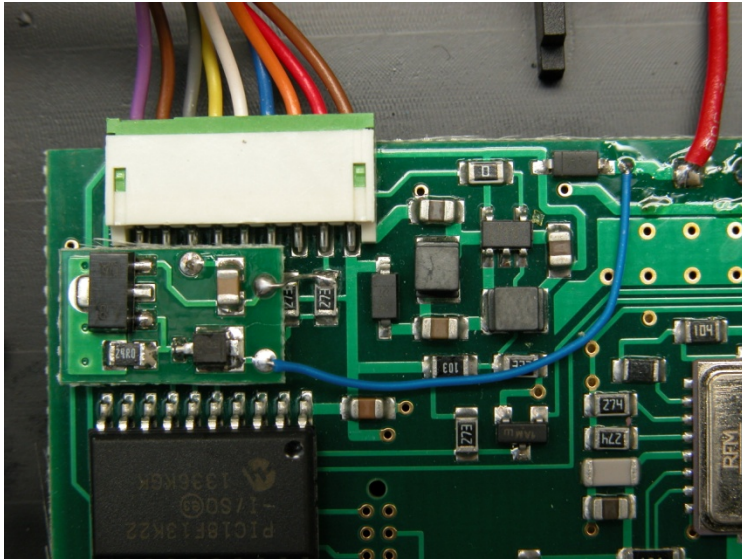


## Installing the Charger Board in a Radio Cab

November 16, 2014  
Revision 1  
Mark Schutzer



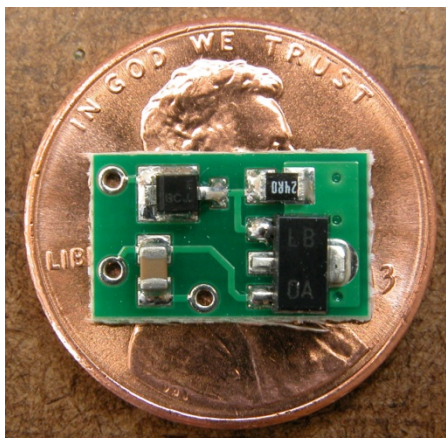
### ***Introduction:***

In a previous write up a battery charger circuit was described for NCE Radio Cabs based around a LM317 constant current regulator. This document shows how to install a small piggy back circuit board that contains this charger circuitry. This board can be installed in the cab onto any vintage of the radio board assembly. This document will show the step by step installation instructions. The charger board assemblies are available from the author.

***Note that this may affect your equipment warranty so proceed at your own risk. You should only attempt this if your soldering skills are up to the task.***

### ***Charger board:***

The charger board is a small printed circuit board that can be installed in a piggy back fashion on any radio board assembly. The photo below shows the size of the charger board in relationship to a penny.



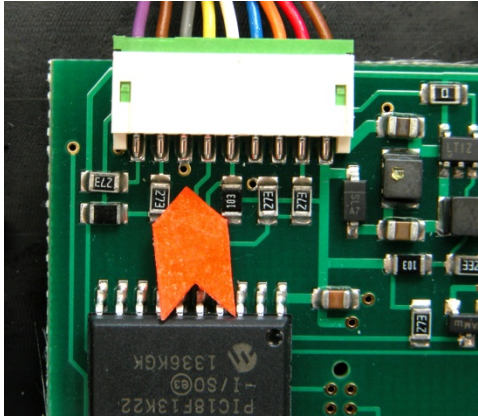
The charger board requires only 3 wire connections to the radio board and is secured in place via a piece of double sided foam tape.

Once installed in a radio cab the internal batteries will be charged with a constant 50 milliamps of current any time that the cab is plugged into a live cab bus jack. This is a trickle charging rate for AAA NIMH batteries and a full charge will take about 24 hours.

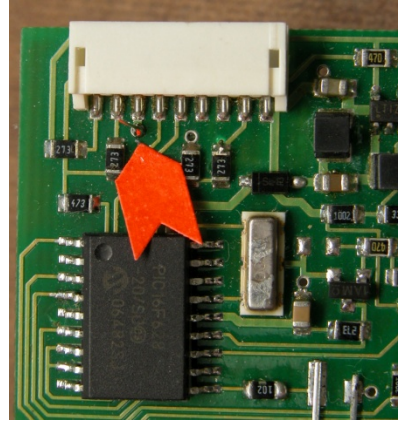
Once the charger is installed regular Alkaline batteries **MUST NOT** be used in the cab as they will leak or explode if charged.

**Installation Steps:**

**Step 1:** Identify the ground hole location on the radio board. See the photos below that show the ground hole location for both old style and new style radio boards.

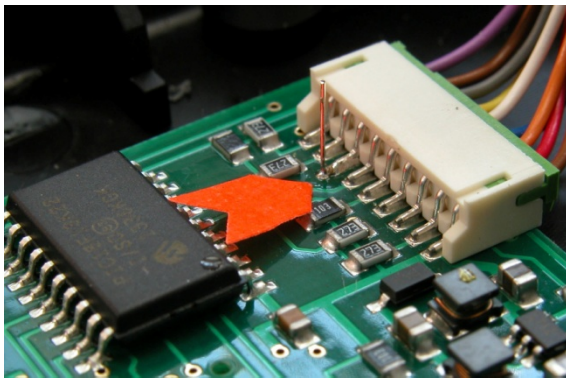


Ground hole location – New board

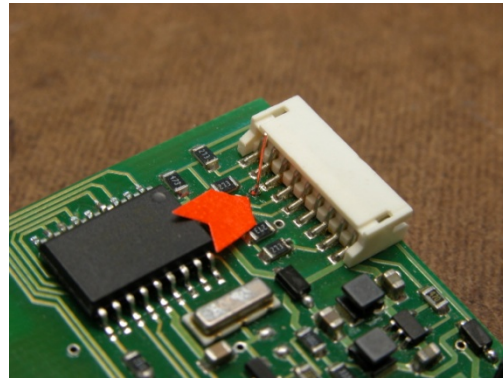


Ground hole location – Old Board

**Step 2:** Insert a piece of ½" long #30 solid wire into the ground hole and solder it in place. The length of the wire only needs to be about a ¼" long ultimately but it is easier to solder if you start with a longer piece of wire. The photo on the right above shows the wire soldered in place as do the two photos below:



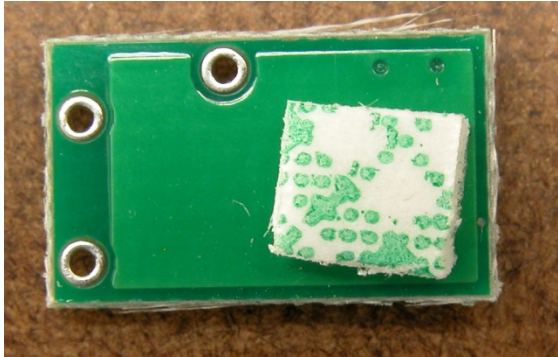
Ground wire soldered in place – New Board



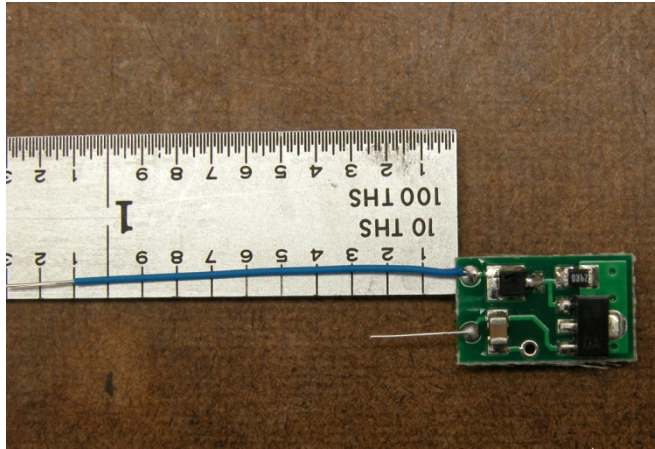
Ground Wire in place – Old Board

**Step 3:**

Prepare the charger board to be installed. Cut a small piece of double sided foam tape and stick it on the bottom of the charger board being careful not to cover any of the three holes on the board. Then solder a 1.1" piece of insulated solid #30 wire into one hole, and a roughly ¼" of bare #30 solid wire into the other hole on the board. The photos at the top of the next page show the foam tape on the back, and the wire locations. As the board is very small it is easier to solder the wires in place if you remove the backing on the foam tape and stick the board to a flat surface. The tape will hold the board in place while you solder the wires in place.



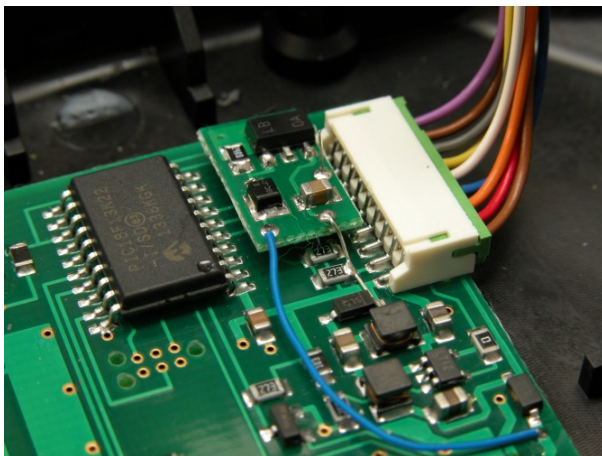
Foam tape on back of charger board



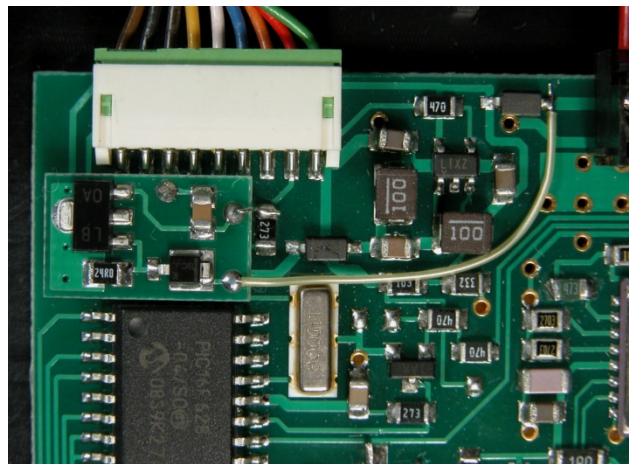
Wires soldered to charging board.

**Step 4:**

Remove the backing from the foam tape (if not already done) and slip the charger board over the ground wire installed in step 2 above. Press the board down onto the radio board to set the adhesive on the tape, and then solder the ground wire to the hole in the charger board. After soldering you can trim off any excess wire. See photos below:



Charger in place on new board – wires yet to trim



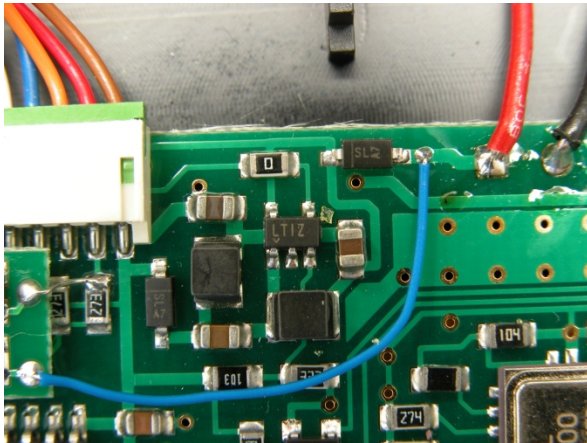
Charger in place on old board

**Step 5:**

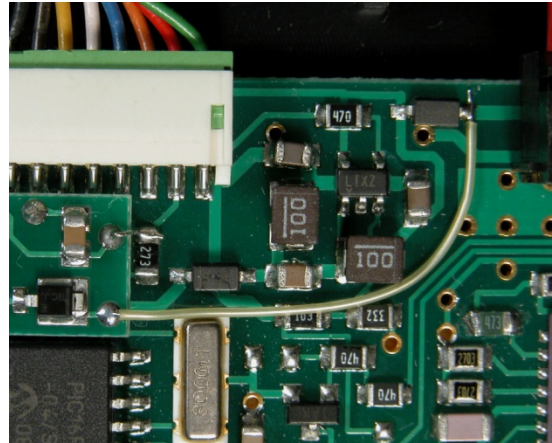
Bend the short bare wire down and solder it to the end of the 27k resistor (labeled 273) that connects to the red wire in the harness. See the photos above. After soldering the wire in place trim off any excess length with a #11 Xacto blade, just gently press down on the wire with the blade and you will cut right through it.

### Step 6:

Connect the long wire over to the trace next to the positive battery (red wire) connection. On new radio boards there is a convenient hole in the board where the wire can be attached. On older style radio boards solder the long wire to the end of the diode. See the photos below for the location of where the long wire goes:



Location of long wire – New board



Location of long wire – Old style board

### Step 7:

Put the cab back together and test the charger. Remove the batteries from the cab. Plug the cab into a live cab bus jack. Using a multimeter set on the DC amps range connect the multimeter leads across the positive and negative battery clips. You should read about 50 mA on the multimeter if the charger is installed correctly. (Note that most multimeters require you to move the lead(s) to the current terminal connection before making a current measurement)

### Step 8:

Place a label on the back of the cab near the battery compartment that says “NIMH Only” to remind the user to only use nickel metal hydride rechargeable batteries in the cab.

### Conclusion:

The charger board is straight forward to install but it does require fine solder skills and should only be installed by someone with sufficient soldering skills.