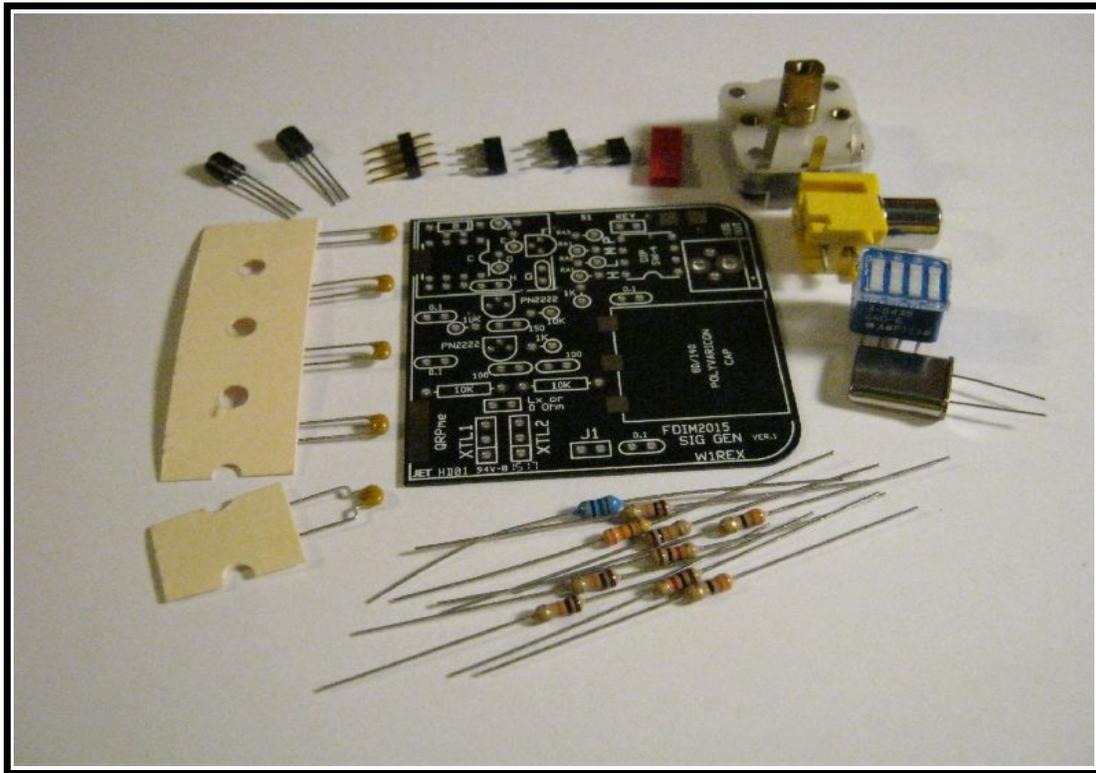


FDIM 2015 BUILDATHON SIMPLE SIGNAL GENERATOR



FDIM 2015 Simple Signal Generator Kit LOM:

0 ohm jumper (BLK)

33 ohm resistor (ORG/ORG/BLK) QTY=2

330 ohm resistor (ORG/ORG/BRN)

1k ohm resistor (BRN/BLK/RED) QTY=3

10k ohm resistor (BRN/BLK/ORG) QTY=4

15uh axial choke (BRN/GRN/BLK)

3 pin SIP socket QTY=2

150pf cap (151)

100pf cap (101) QTY=2

.1uf cap (104) QTY=4

15uh choke (BRN-GRN-BRN)

PN2222 transistor QTY=2

7040 crystal QTY=2

4 pos DIP switch

RCA connector

2 pin shorting plug

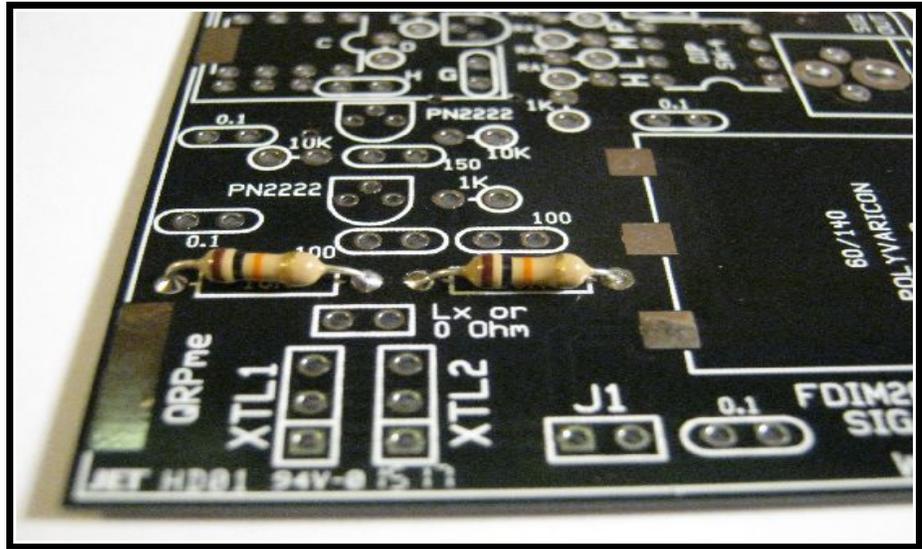
polyvaricon cap

4 pin male header

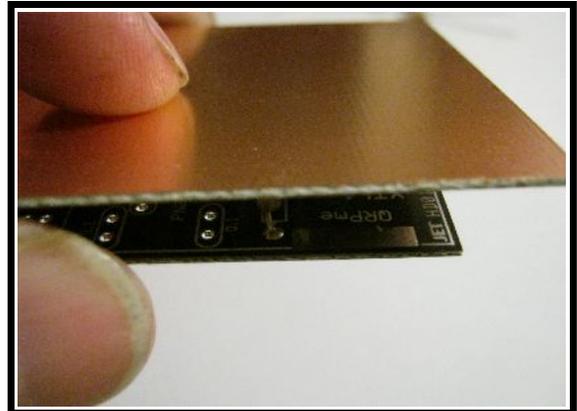
2 pin SIP socket

9V battery snap

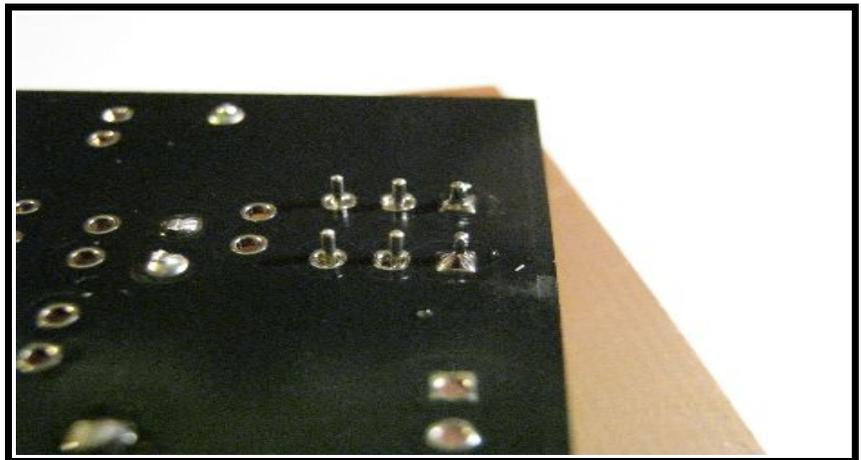
Install the two 10K resistors that lay flat on the circuit board.



The SIP sockets are next. Insert the two 3 pin SIP sockets and place any scrap piece of plastic, pcb or cardboard over them and then flip the board over. The piece of scrap keeps the tiny sockets from falling out when you flip it over. DON'T try to bend the pins to hold the sockets in... as they will surely break off!

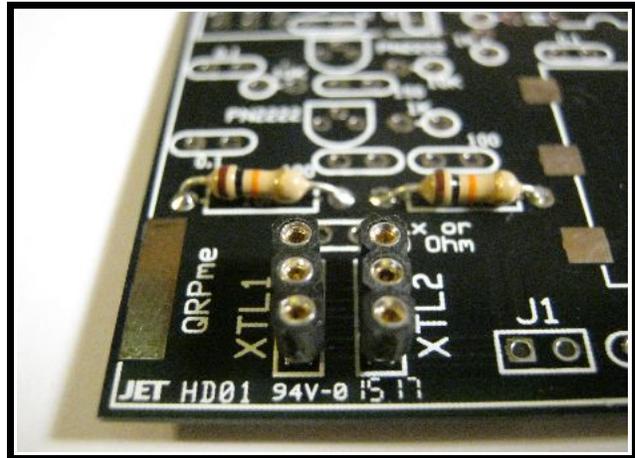


Solder a SINGLE pin on each socket. Flip the board back over and inspect the socket position: level and vertical? If not, you can reheat the SINGLE soldered pin and reposition the socket. Happy? Solder the remaining pins.

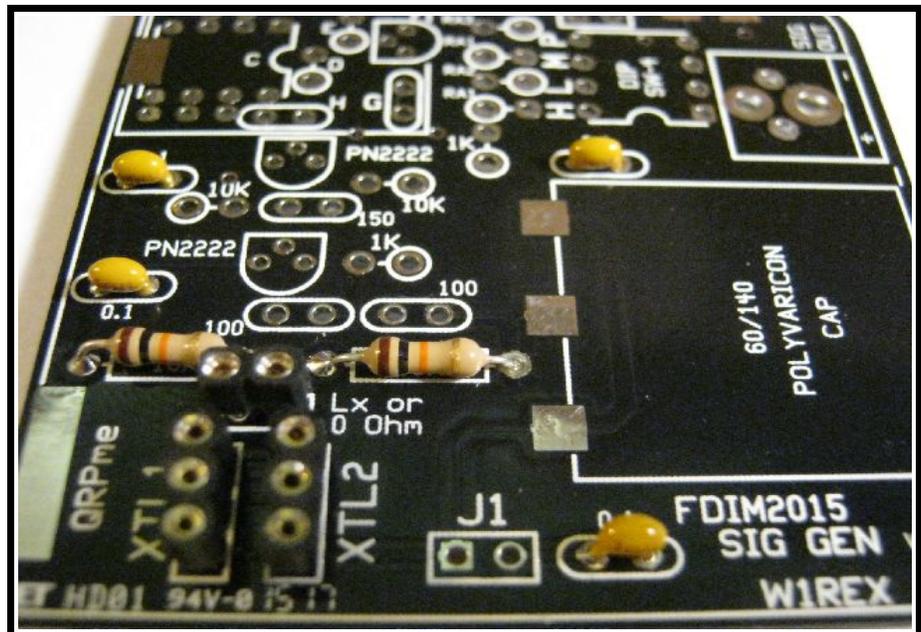


Your two SIP crystal sockets should look straight, parallel and even!

Now do the same thing with the TWO pin SIP socket where the printed circuit board is marked Lx or 0 Ohm.



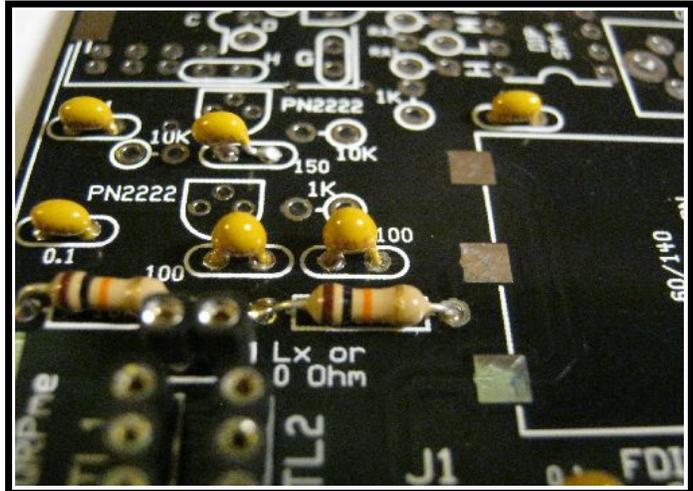
Next install the 4 .1uf caps which are marked 104.



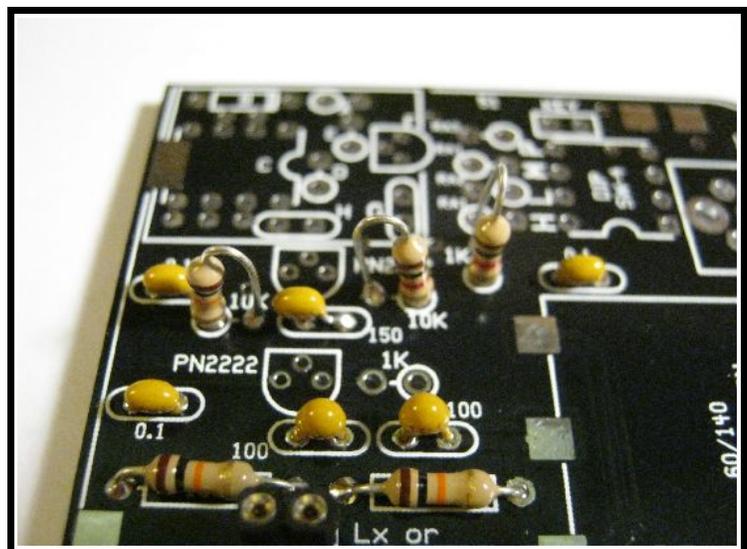
The 150pf cap (marked 151) might need one lead re-bent a little to fit into the pads on the pcb a little easier. The pads are .1" apart and the cap leads are .2" Flatten one side bend a little..



Install the 150pf cap between the two PN2222 transistor locations and then solder in the two 100pf caps just above the 2 lay down 10K resistors. Your 100pf caps might look a little different as they may be NPO ceramic disc caps....



Now install the two hairpin style 10K resistors. Pay particular attention to that 3rd color band! Red and Orange bands are pretty close when looking at them in not so optimal lighting. A 1K resistor in a 10K location will prevent the circuit from oscillating. I built mine in the middle of the night and got a 1K in the wrong spot. It took a while...AND better lighting to spot that goof. LED lighting will make it easier to distinguish the color bands properly!

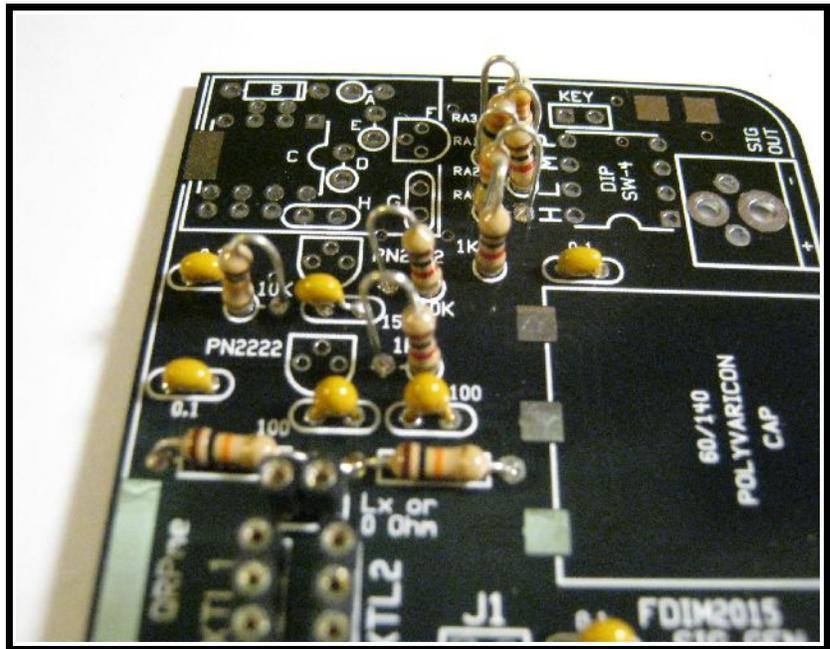


More hairpin style resistors:

1K (BRN-BLK-RED)
@ 1K, 1K & RA2

33 (ORG-ORG-BLK)
@ RA1 & RA1

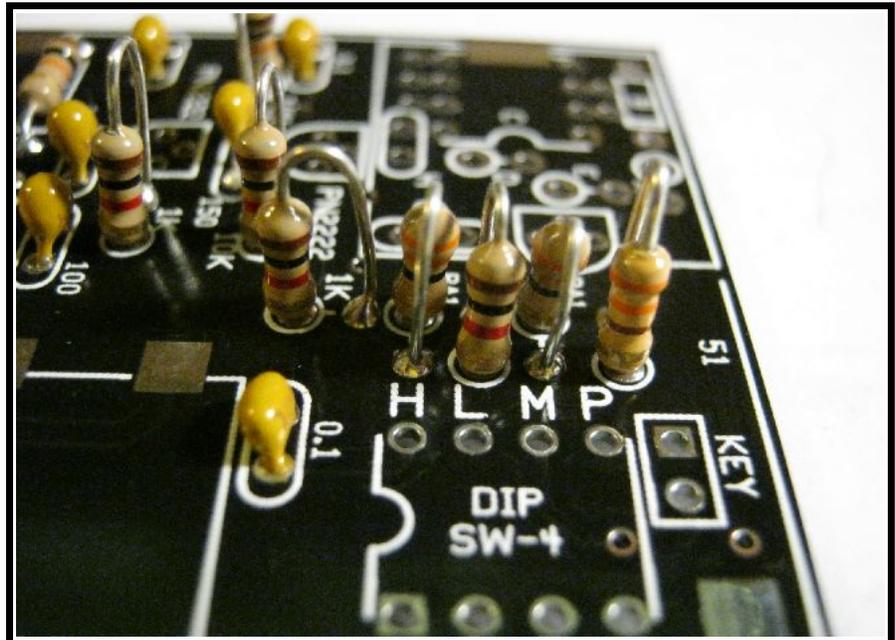
330 (ORG-ORG-BRN)
@ RA3



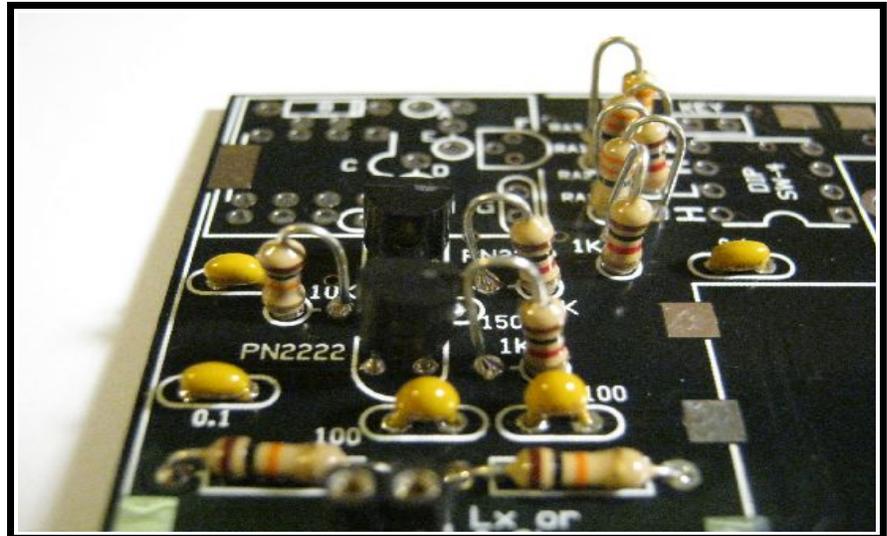
From another angle,
HLMP is actually:
High signal level
Low signal level
Micro on/off switch
Power on/off switch

If you matched them
up with the hairpin
resistors behind
them:

H=33 ohms L=1K ohms M=33 ohms and P=330 ohms



Mount two PN2222 transistors in the marked locations.

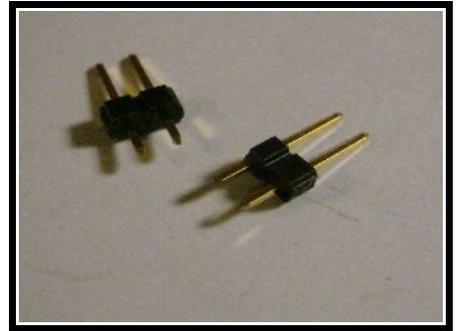


You need to turn a 4 pin male header into two 2 pin headers. I use a nifty utility knife-blade guillotine cutter for this job. I love my cutters! They cut components SUPER clean, square and with very little deformation.

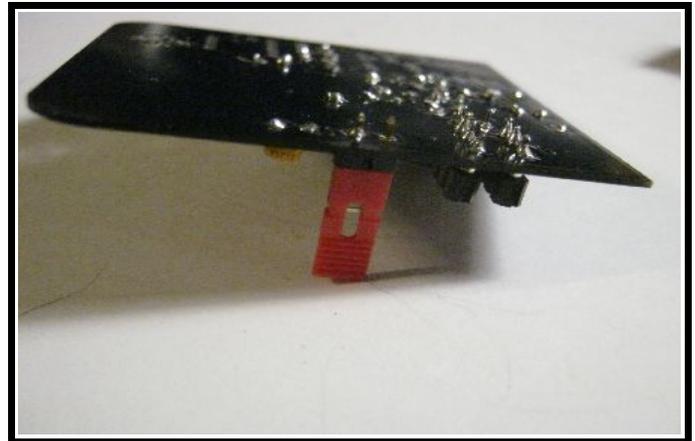


BE VERY CAREFULL USING THESE CUTTERS! They can just as easily chop **YOUR ENTIRE FINGER** off **SUPER CLEAN**, square and with very little deformation! Also, move them at a careful deliberate pace as you can see that the pointy tip of the cutter has **NO guard**. I've used these cutters for several years and have only stabbed my finger holding a part once! That pointy part is **VERY POINTY** a **VERY SHARP** and can make a pretty nasty incision into your finger tip **VERY quickly!** Use **SLOW, DELIBERATE, CAREFUL MOTION** when approaching your tiny hard electronic part held in you big fleshy soft fingers!!

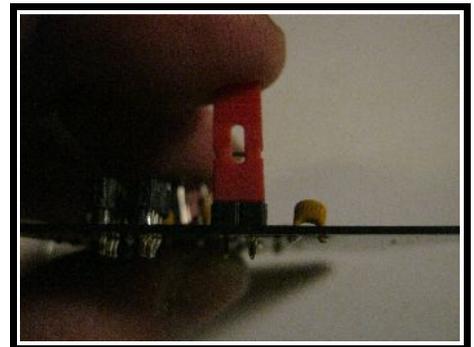
If everything goes according to plan, you end up with 10 intact fingers and 2 littler header connectors!



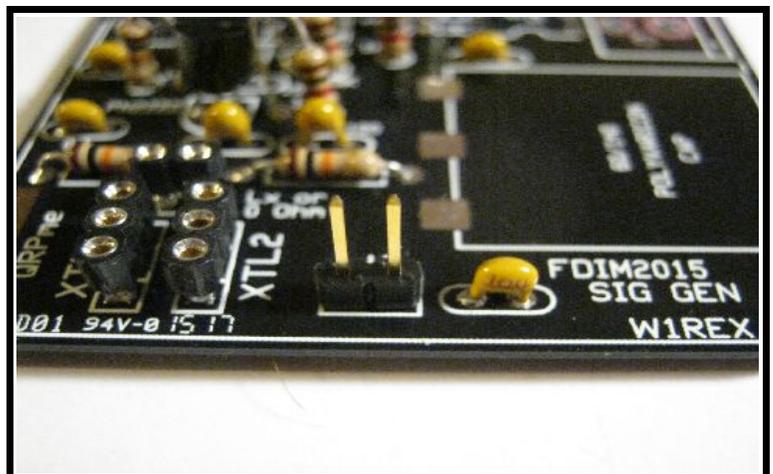
Insert a 2 pin male header into the marked location down by the crystal sockets. Put the jumper plug on the header and rest the board upside down on the plug, solder ONE pin and then check the alignment.



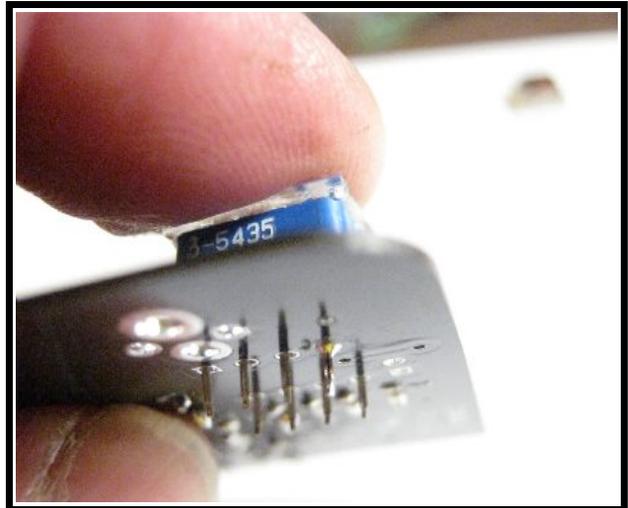
You can re-heat the single solder joint and set the part alignment with your finger tip.



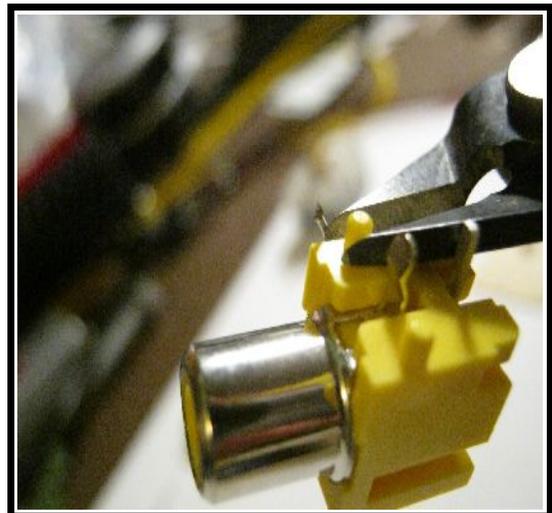
When you are happy with the alignment, solder the second pin.



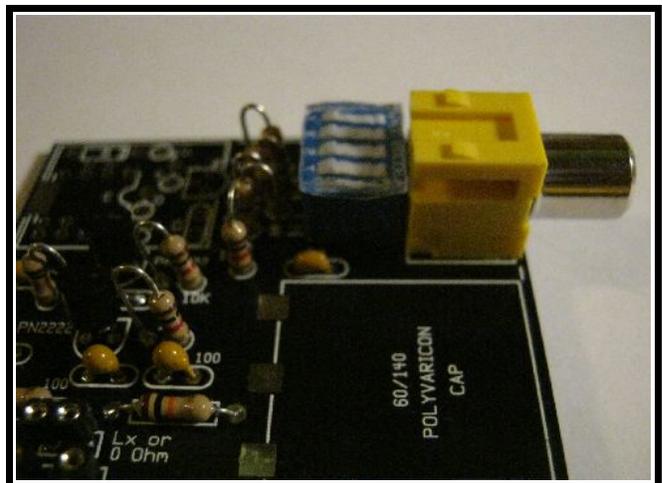
Solder in the 4 position DIP switch.



Nip off the tiny peg feet on the yellow RCA connector.

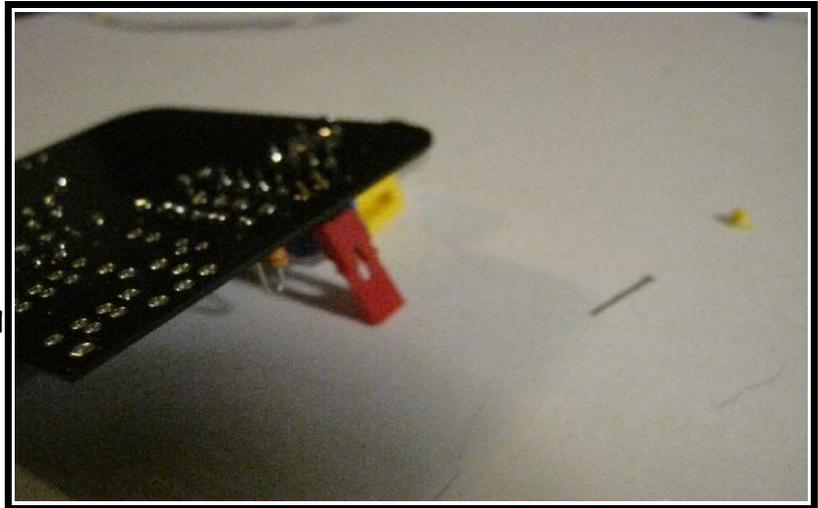


Install the RCA connector beside the DIP switch. I prefer to mount the DIP switch with the switch ON position next to the HLMP markings, ie towards the center of the pcb.

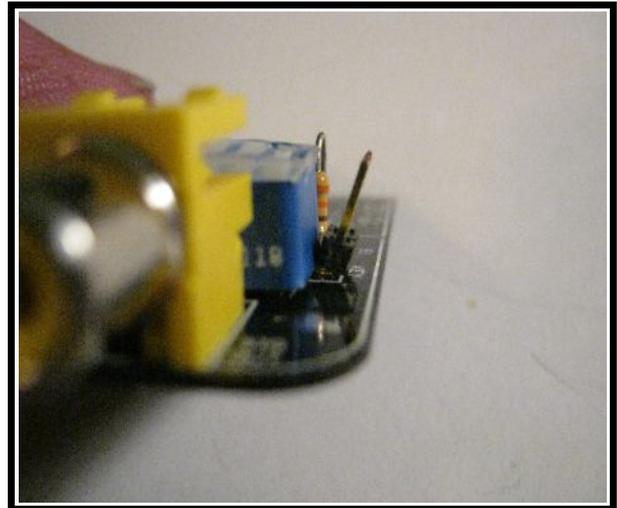


Again, use the shorting plug on the remaining header as a foot to hold the header in while soldering. Solder a SINGLE pin, and then you can hold an wiggle the plug while re-heating the single soldered pin.

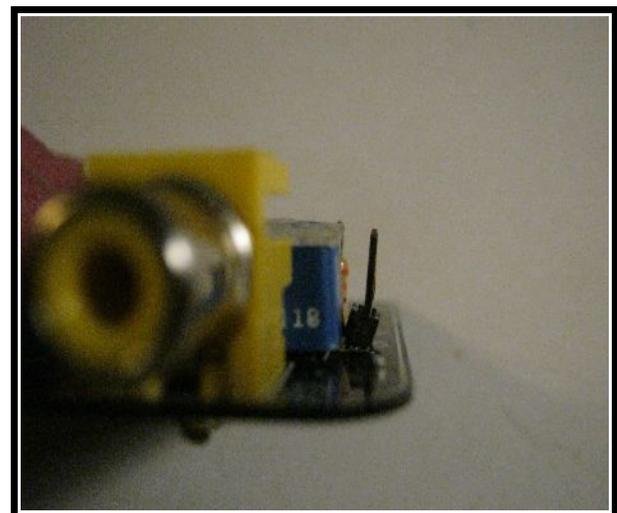
Happy? Solder the second pin.



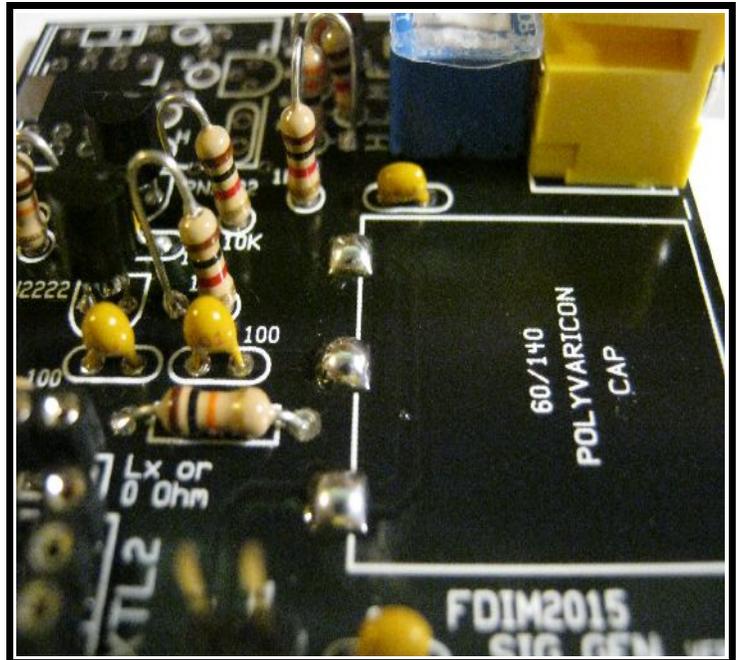
There is a little clearance issue with the header connector. Use your alligator pliers to put a slight bend in the pins to make them vertical.



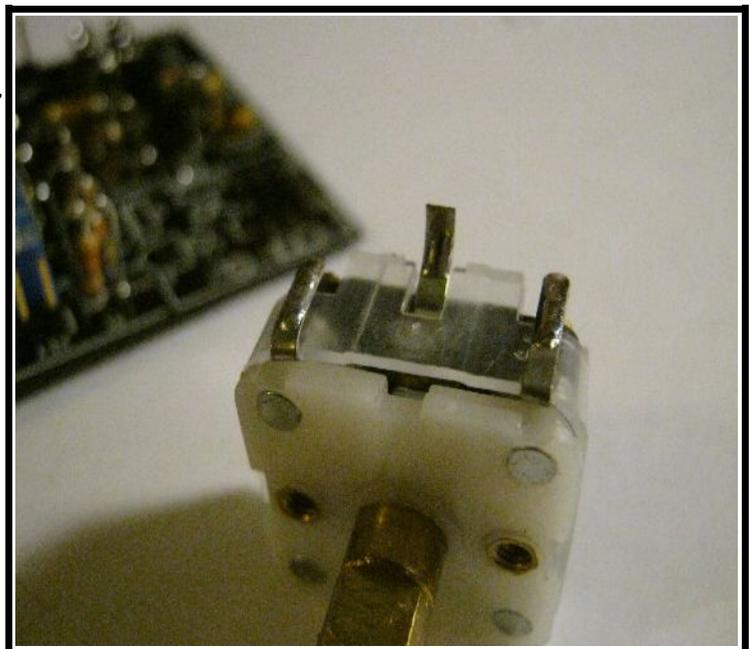
Like this...

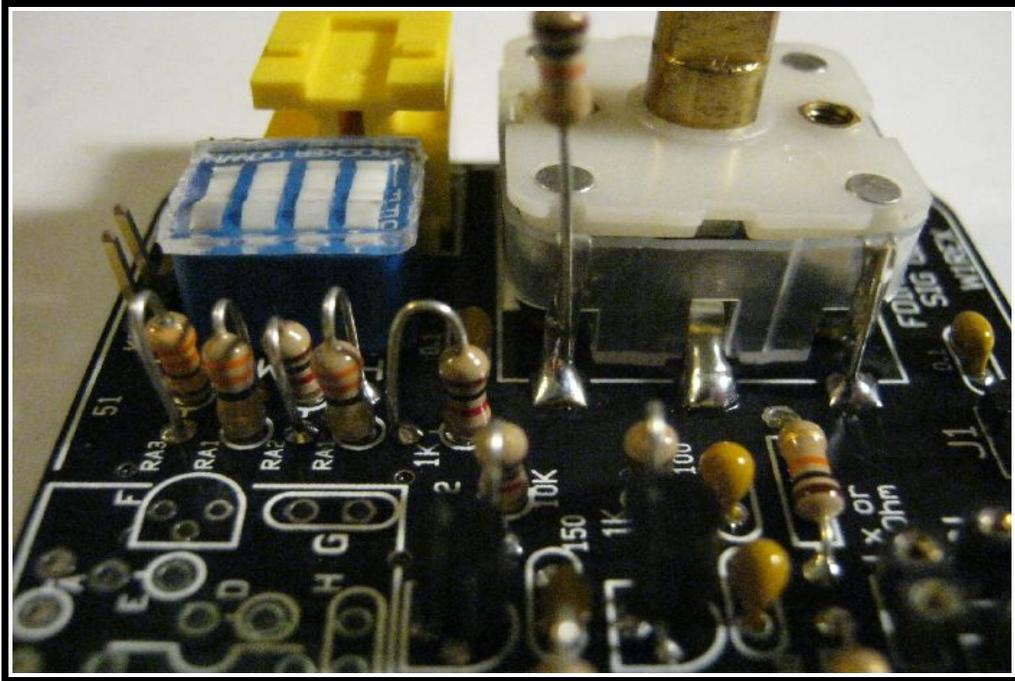


Put a nice 'dollup' of solder on the 3 pins for the polyvaricon capacitor.



Bend the leads down the side of the polyvaricon. The center lead is bent at a right angle and then the excess is cut off leaving a short 'foot'

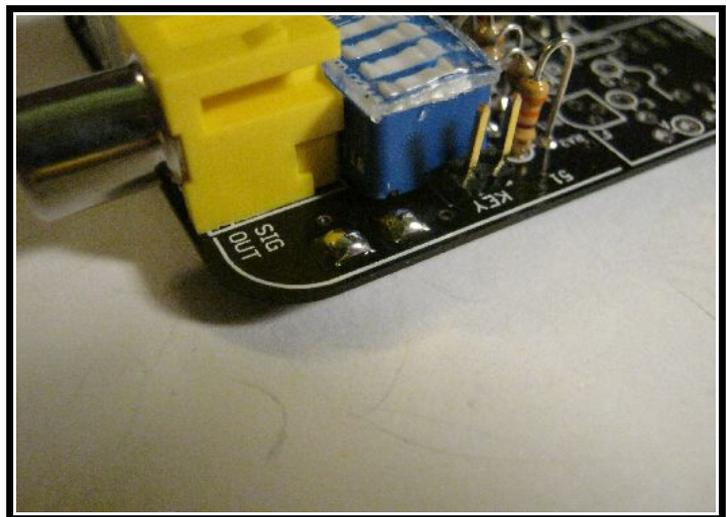




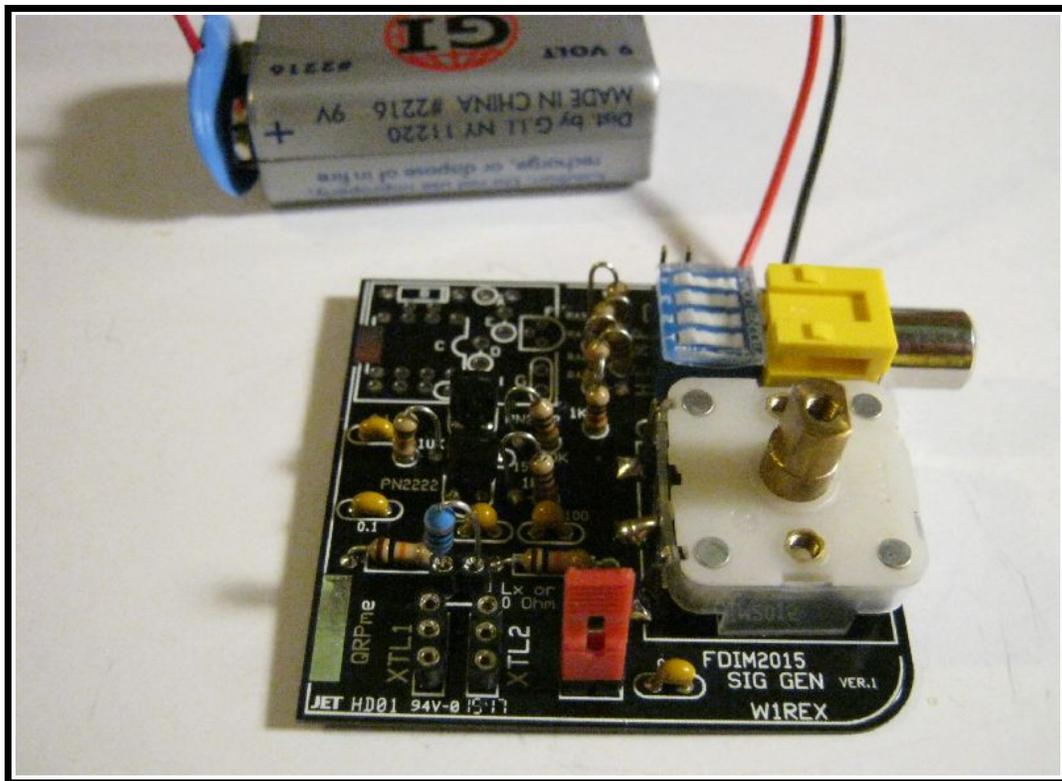
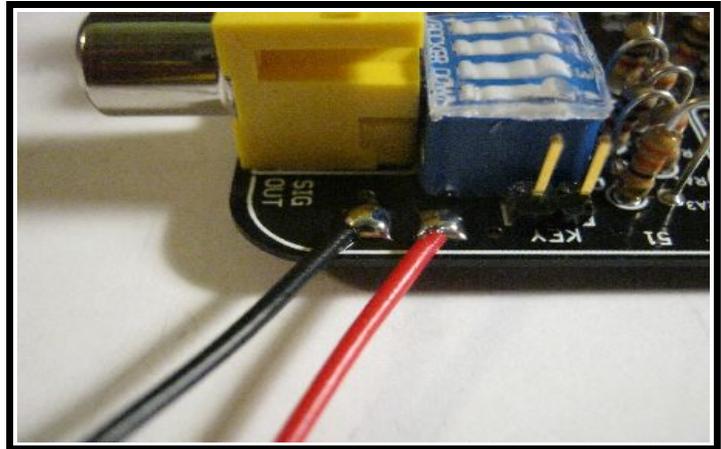
The center lead, with the foot, can be soldered directly to the pad. The other 2 leads don't even reach the pads. Use a scrap piece of cut off lead, or any old scrap resistor as an extension. Tin the piece before trying to use it so that solder time around the plastic polyvaricon housing can be kept to a minimum! Cut off any excess lead.

Prep the two pads for the 9 volt battery clip down by the RCA connector.

A small 'dollup' of solder sitting on the pad will allow quick attachment of the 9 volt battery clip leads....



Pay attention to the polarity of the battery clip leads. RED towards the KEY connector and BLACK towards the RCA connector.



Place a battery in the battery snap and place the shorting plug back into the header connector near the crystal sockets. Place the 15uh choke or 0 ohm jumper into the little 2 pin SIP socket hairpin style. Your Signal Generator is now ready to test and use.

5/20/2015 WIREX