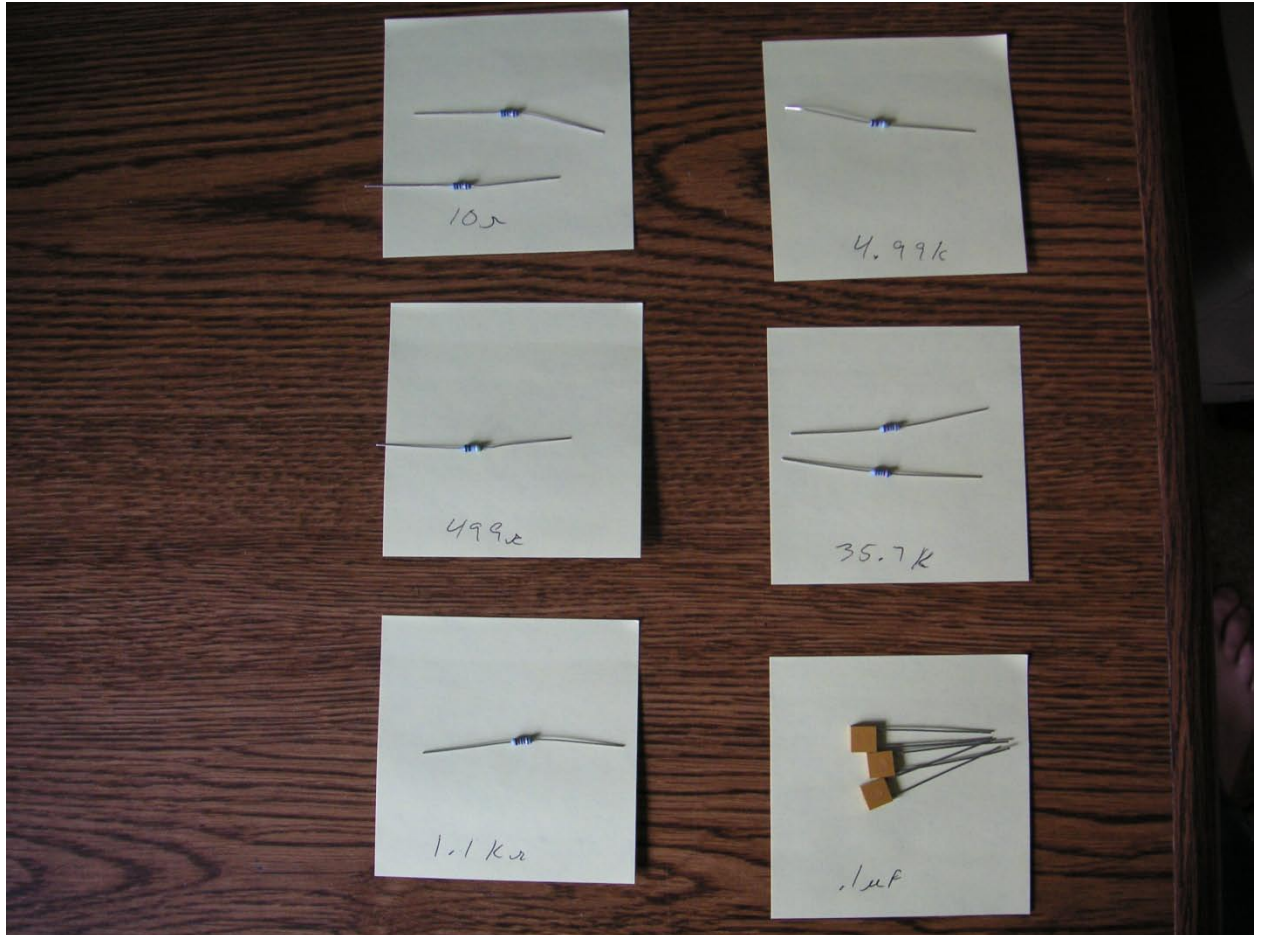
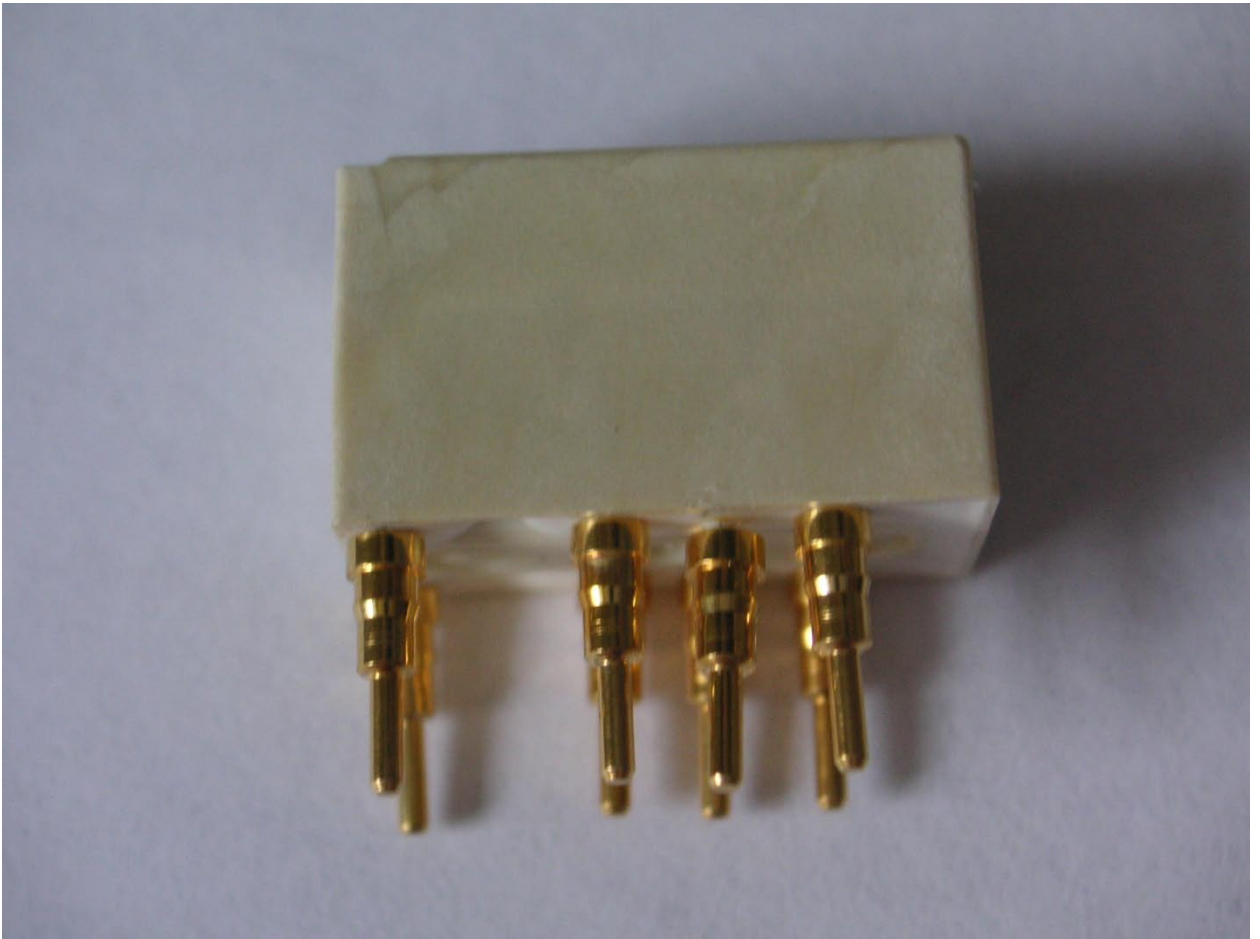


1. Use the bare Printed Circuit Board (PCB) as a template to mark and center punch the aluminum enclosure in four places corresponding to the mounting holes at the four corners of the PCB. Then use a 1/8" drill to drill the 4 mounting holes in the bottom of the enclosure.
2. Sort the resistors using an ohm-meter. An auto-ranging DMM will make this an easy task.

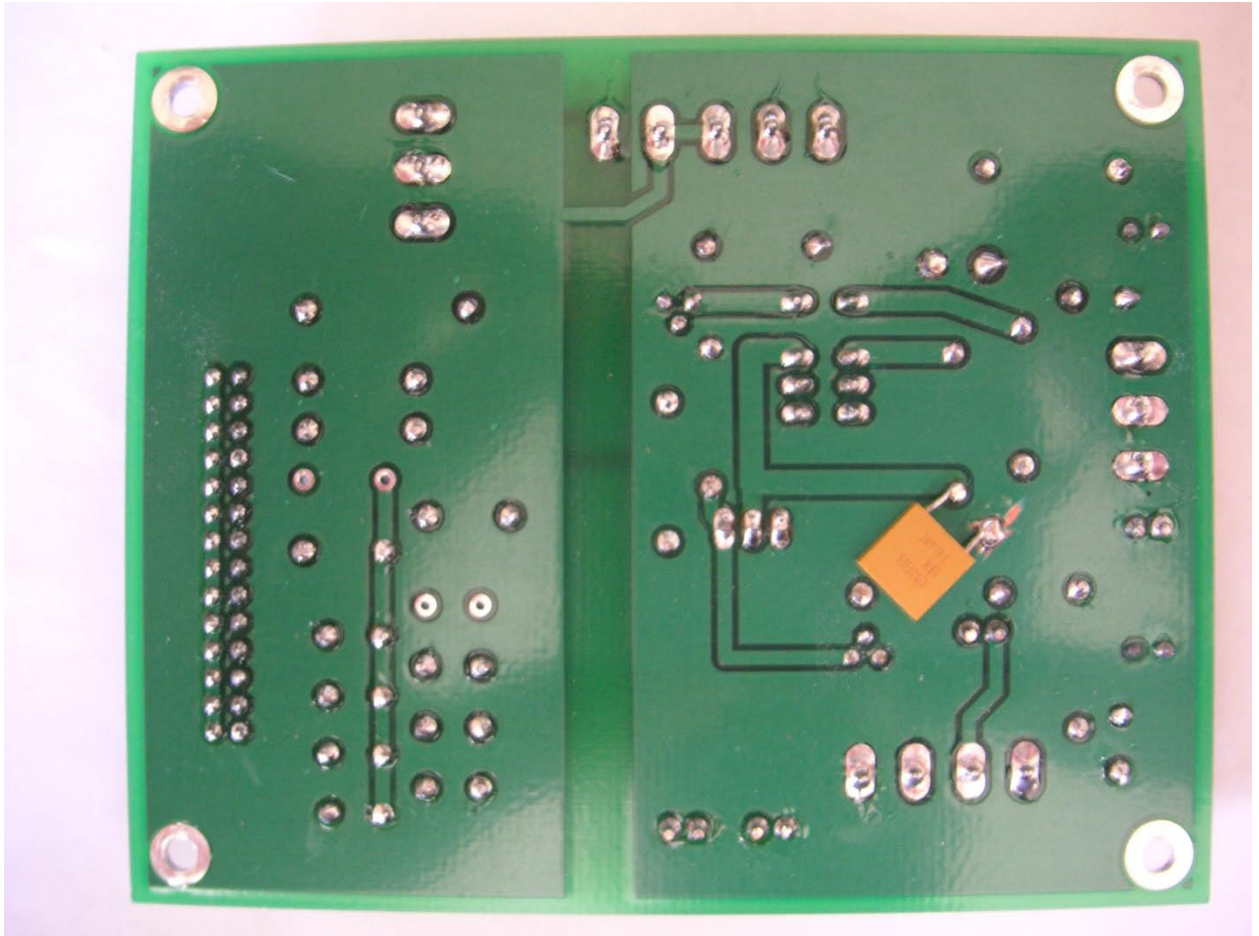


- Carefully straighten the pins on the relay and slide the gold socket pins onto the relay pins.



- Insert the relay with socket pins into the PCB and solder the pins in place. Note: to make the socket pins more solid and rugged, heat each pin from the solder side of the PCB and apply a small amount of solder to the pins on the component side.
- Remove the relay from the socket pins for the remainder of the assembly process.
- Insert and solder the 10Ω Resistors on the PCB at R1,R2.
- Insert and solder the 499Ω Resistor on the PCB at R3.
- Insert and solder the $1.1k\Omega$ Resistor on the PCB at R8.
- Insert and solder the $4.99k\Omega$ Resistor on the PCB at R4.
- Insert and solder the $4.99k\Omega$ Resistor on the PCB at R15.
- Insert and solder the $35.7k\Omega$ Resistors on the PCB at R21 and R22.
- Install the 1N4004 diode onto the PCB at D2. Take care to align the banded end of the diode (cathode) with the silk screen image on the PCB.
- Bend the leads of the IRLIZ24N NMOS Power FET to a 90 angle (bend back towards the flat side of the transistor approximately $\frac{1}{4}$ " from the plastic package) and Install the FET at Polarize SW.
- Install the 2N3904 (NPN) transistor at Q1. Take care to align the flat side of the transistor with the outline on the PCB silk screen.

15. Install the 2N3906 (PNP) transistor at Q2. Take care to align the flat side of the transistor with the outline on the PCB silk screen.
16. Install the 4 short wire loop test points at COM, RELAY, POLARIZATION CONTROL
17. Install the LED's at +5V and VPOL. Take care to align the flat on the rim of the LED to the image on the PCB.
18. Install the 0.1uf capacitors at C1, C21 and C24. note: On ver. 0.8.8 PCB, C1 should be mounted on the solder side of the PCB in the location shown in the photo. You will need to scrape away a small area of the solder mask coating to solder one lead of the capacitor directly to the copper ground plane. Make a "Z" bend in the capacitor leads to bring them down to the surface of the PCB and keep the leads as short as practical.



19. Install the 150uf electrolytic capacitor at C23. Take care to match the polarity of the capacitor to the silk screen image.
20. Install an assortment of resonating capacitors. Keep in mind that you will want to enable combinations of capacitors to resonate with the sensor coils ($\sim 200\text{NnF}$) and will want to be able to "fine tune" the capacitance in small increments. I installed 1nf, 2.2nf, 4.7nf, 10nf, 22nf, 33nf, 39nf and 47nf capacitors.
21. Solder in the header for the resonating capacitor jumpers.
22. Install the 3 pole terminal blocks at AMPLIFIER and POLARIZE PS.
23. Install the 4 (2+2) pole terminal block at DIGITAL I/O.

24. Install the 5 (2+3) pole terminal block at SENSOR COILS.

25. Install the relay by plugging it into the socket pins.

