

Ghost Detector

version 1.0

Build Instructions

F O U R
B I T
I N D U S T R I E S . C O M

Thank you for purchasing our "Ghost" EMF detector kit. The instructions below will show you the proper placement of all parts into the PCB. Be sure to follow the directions closely as many parts are polarized and will not work if inserted backwards.

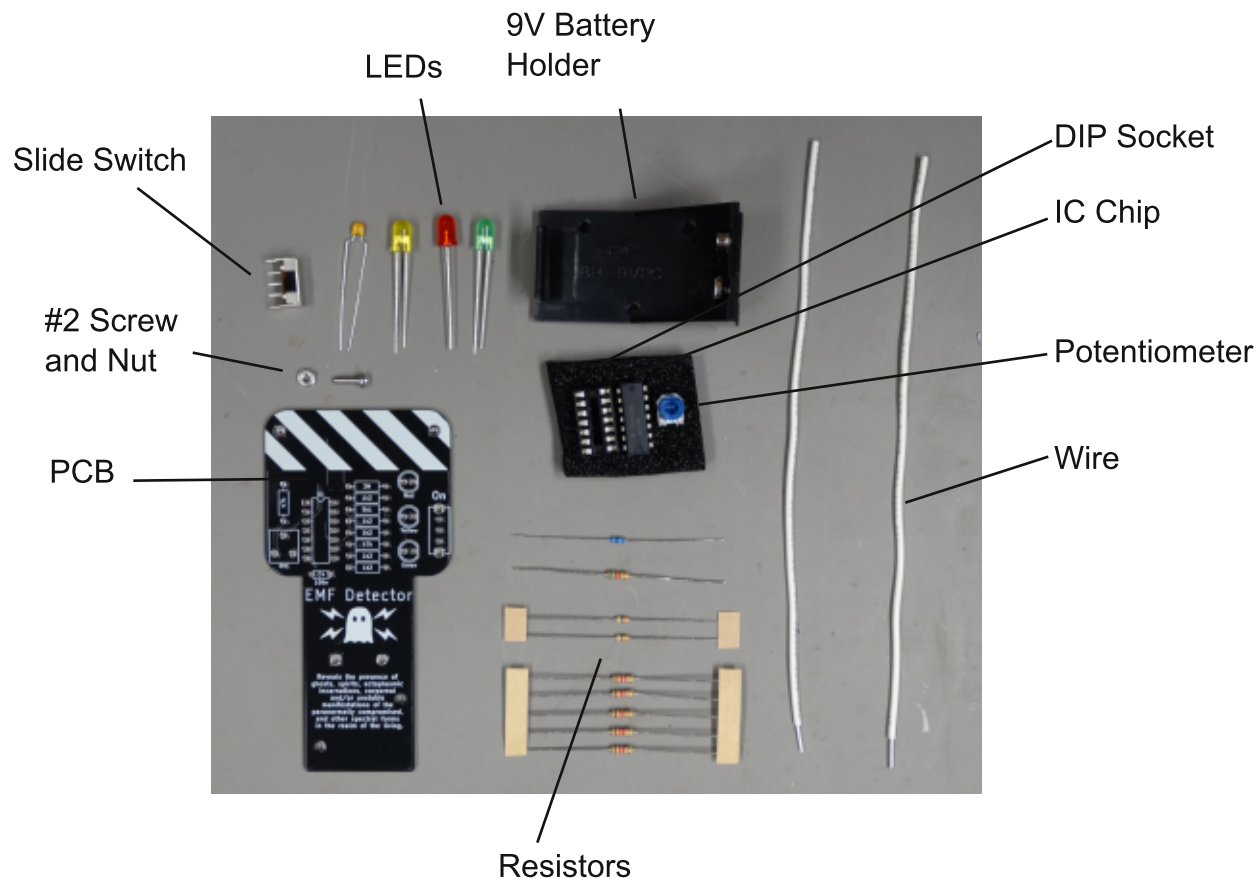
If you've never soldered before, consider taking a class at your local makerspace! We have found a good introductory video from curiousinventor.com on youtube at <https://youtu.be/lpkkfK937mU> or by following the QR code at right.



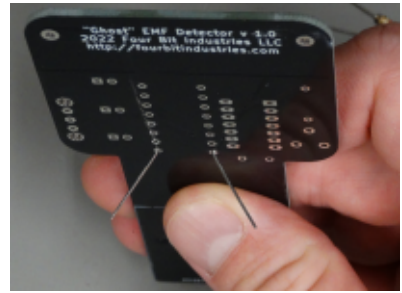
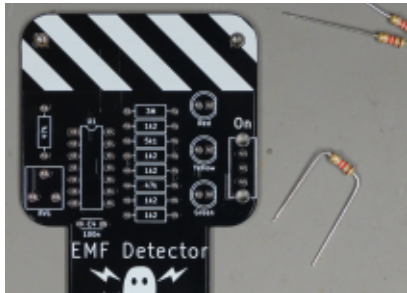
WARNINGS

Always follow best safety practices for soldering, including the wearing of eye protection and adequate fume extraction. This kit is not for children.

1. Verify the parts in your kit.

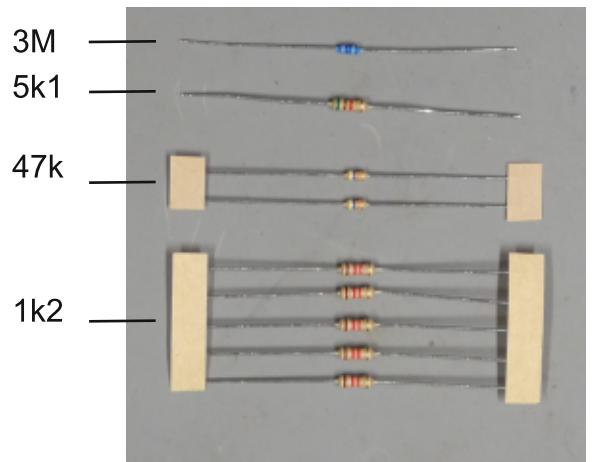


2. Start by placing and soldering the five 1.2k resistors. These resistors have a color code of Brown, Red, Red, Gold. Look for the five rectangles marked 1k2. These are called footprints, and indicate where the component should be placed. Bend the leads of the resistor down and then insert them in the holes at either end of the footprint. Resistors are not polarized, so either lead can go into either hold. Then bend the leads outward to hold it in place for soldering. You can insert all the resistors and then solder them, or you can insert and solder one at a time. Be sure to have the iron in contact with the lead and pad, then flow solder into the joint.

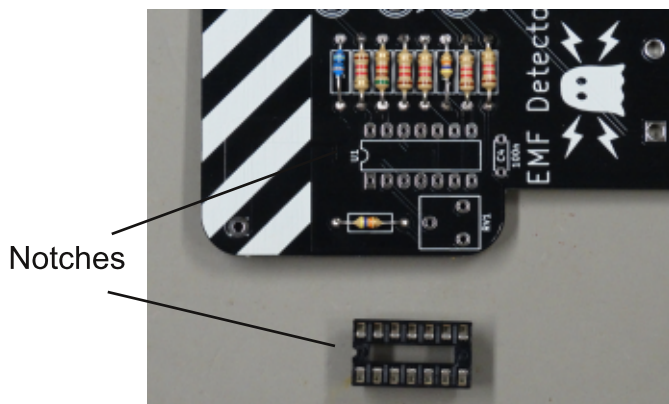


3. Next we will place and solder the two 47k resistors. These have the color code of yellow, violet, orange, gold. The resistors are small, so just look for the two resistors that are taped together. These resistors should be placed in the footprints marked 47k. One is in the row of resistors in the middle of the board, the other is off to the left.

4. The next resistor to solder has a value of 5.1k and has color code green, brown, red, gold. It is placed in the footprint marked 5k1. The last resistor to place is the 3M resistor. This resistor has a blue body and is placed in the footprint marked 3M.



5. The DIP socket must be inserted the right way around. Locate the footprint marked U1. You will notice a notch drawn in one end of the footprint that matches a notch in one end of the socket. Insert the socket so the notches line up. You can tape the socket into place for soldering. Solder just one lead and check the socket again to make sure it is flush against the board. If it isn't, you can reheat the solder and push it into place with a heat-safe tool. Then solder the remaining leads.



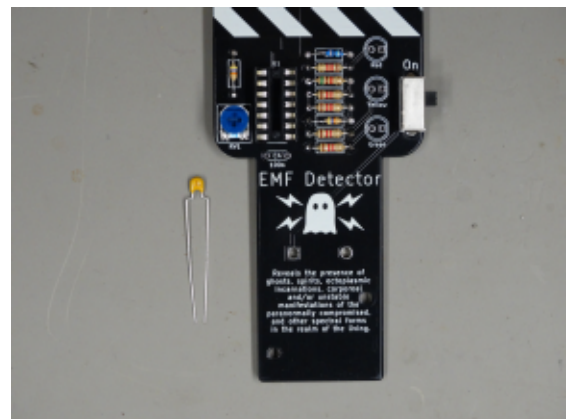
6. Next we will insert and solder the slide switch. The toggle on the switch should point to the right, so it sticks out from the board. If the switch doesn't hold in place, you can tape it. Be sure to solder the three pins and also the two large legs. You will need more heat and solder for the legs. Make sure to have the iron touching both the leg and the pad and give them a few seconds to heat before flowing in solder.



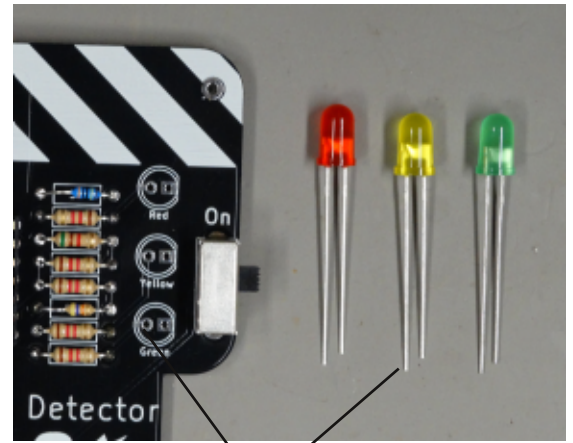
7. The potentiometer has three leads and will only fit into footprint RV1 one way. The leads are bent so they should hold the potentiometer into place for soldering. Be sure all three leads come through the holes before soldering them.



8. The tan bodied capacitor (100nF) is not polarized and can be soldered into C4, below the IC socket.



9. The three LEDs, like all diodes, are polarized and have to be inserted correctly. There is a long leg and a short leg on each LED. On the footprint for each LED you will see a round pad and square pad. The long lead should be soldered to the round pad. The short lead should be soldered to the square pad. Solder each color of LED to the matching labeled footprint.

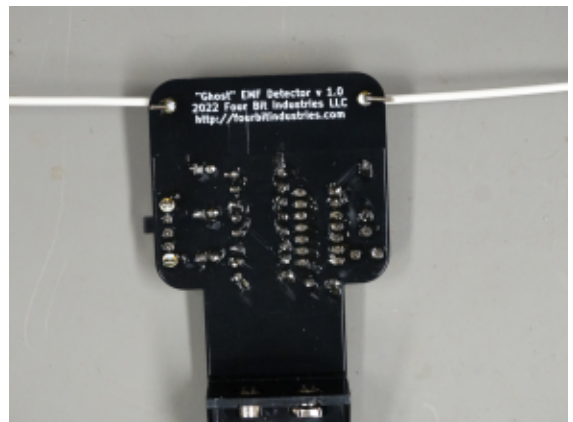


Long lead to round pad

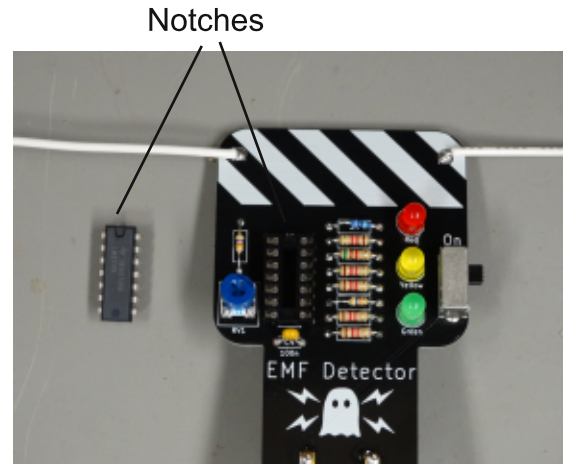
10. The 9V battery holder is soldered differently than the other components in that it is inserted from the back and soldered at the front. Use the included #2 screw and nut to attach the battery holder to the board before soldering. The screw should be inserted through the battery holder and up through the board so the nut is screwed on from the front of the board. Once the battery holder is attached, you can solder the leads.



11. The last items to solder are the two wires that act as antennae. One end of each wire is stripped to expose the wire. Hook these exposed portions of wire through the two holes at the top and solder them into place.



12. Finally, we need to insert the IC chip. The chip will either have a notch at the end, or it will have a dot near pin 1. Either way, the notch or dot needs to be near the notch on the DIP socket. Your chip will probably have legs that are slightly splayed out. To straighten them, you can gently roll the chip on its side against the table to straighten all the pins at once. Then you can do the same for the other side. Be sure to insert the chip the right way around or it could be damaged.



To use the "Ghost" EMF detector, attach a 9V battery (not included) and switch the detector on. To adjust the sensitivity, first stand away from any nearby sources of EMF like LED lights, WiFi routers, or televisions. Turn the potentiometer fully clockwise. All three LEDs should light up. (If any LEDs do not light up, it may be an indication that one was improperly soldered.) Then, slowly, turn the potentiometer counter-clockwise until the yellow light is just extinguished.

As you come close to any sources of EMFs, the yellow or red LEDs should light, with red indicating a higher level of EMF than yellow.