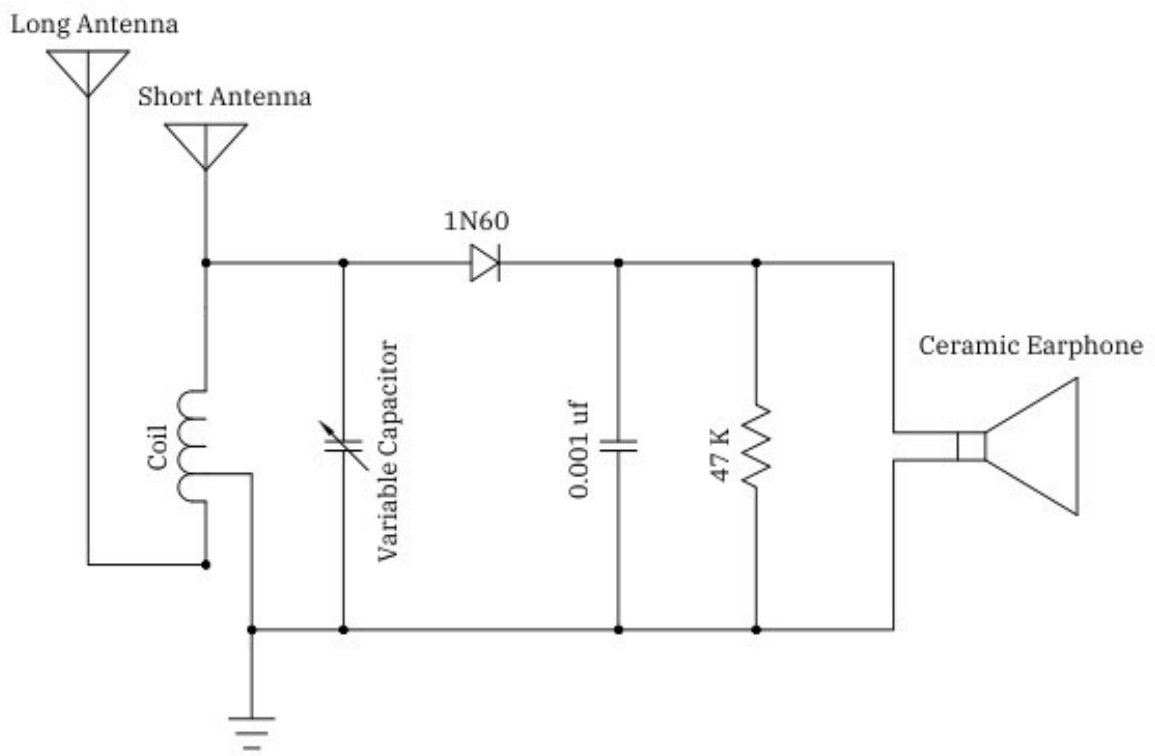
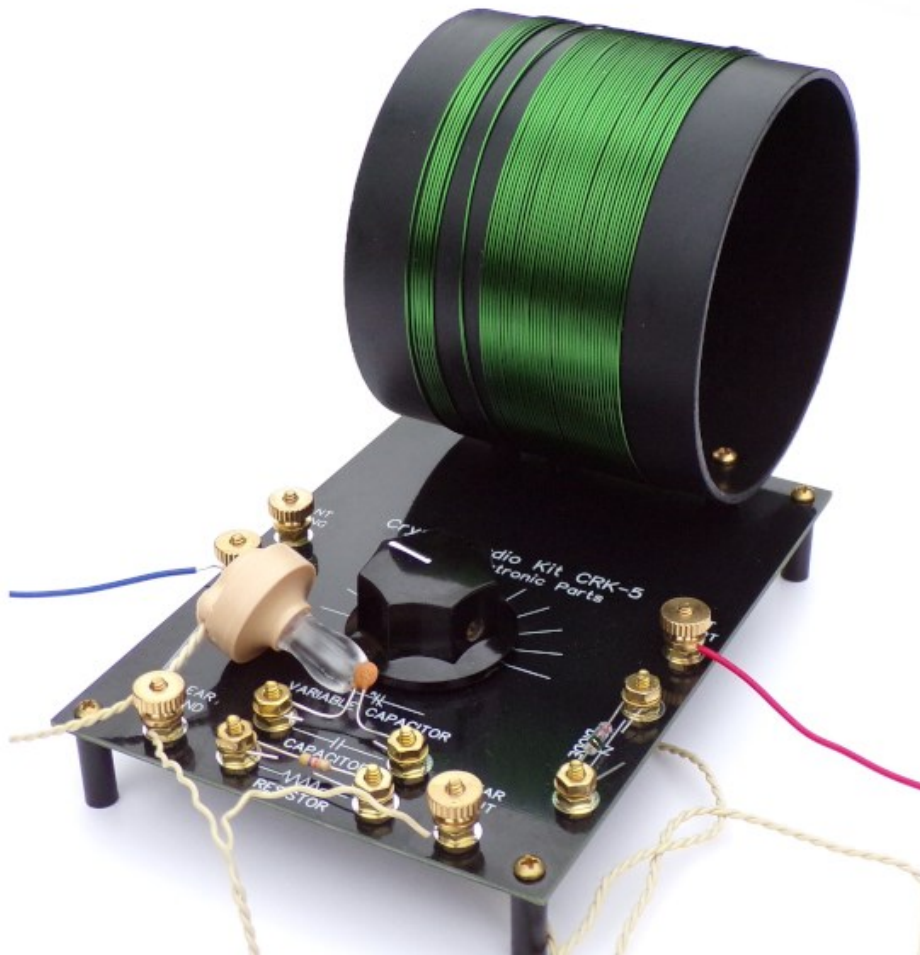


# Crystal Radio Kit 5

Mike's Electronic Parts, LLC



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### Parts List

- 1 – Circuit Board
- 1 - Variable Capacitor Pre-soldered To Circuit Board
- 1 – 1N60 Germanium Diode
- 1 – .001uf Capacitor
- 1 – 47K Resistor
- 1 – Ceramic Earphone
- 1 – Knob with Shaft and Screw
- 1 – 1/8” Spacer
- 10 – 3/8” #4 Screws
- 8 – 1/2" #4 Screws
- 5 – #4 Thumb Nuts
- 26 – #4 Nuts
- 14 – #4 Washers
- 4 – Nylon Feet
- 1 – Coil Form
- 1 – Spool of Coil Wire
- 1 – ~30 feet Antenna Wire
- 1 – ~10 feet Ground Wire
- 1 – Small Piece of Sandpaper
- 1 – Philips Screwdriver
- 1 – 1/4” Wrench

### Tools Required

- Wire cutters or finger nail clippers
- 1/8” Jewelers Screwdriver

Crystal Radio Kit 5 is a great way to get started in electronics and radio building. This is a fun and simple project for both beginners and expert builders alike. Everything needed to build a fully functional radio, including an antenna and ground wire, is included in the kit. Easy to assemble with no soldering required. Crystal Radio Kit 5 is a great project to build with your child or grandchild, scout groups and schools.

The kit contains small parts that may be a choking hazard. Adult supervision is always advised while building the radio kit.

1. Locate and familiarize yourself with all the parts in the parts list. Please refer to the picture of the completed kit for reference as you build the kit.

2. Assemble the legs.

Items used: 4 – 3/8" Screws, 4 Nylon Feet.

The legs will be attached to the board at each corner. The holes for the feet can be identified as they have no metal around them. Insert a 3/8" screw through the top side of the board.

Thread a Nylon foot onto the screw. Hand tighten or lightly tighten with screwdriver.

Repeat for all 4 legs.

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### 3. Assemble the 3/8" posts.

Items used: 6 – 3/8" Screws, 6 – Nuts.

The 3/8" screws will be used for the Capacitor, Resistor and Diode as marked on the board. Insert a 3/8" screw through the board upward from beneath the board. Place a nut on the screw and tighten.

Repeat for the Capacitor, Resistor and Diode.

### 4. Assemble the .001uf Capacitor

Items used: 1 – .001uf Capacitor, 2 – Washers, 2 – Nuts.

Locate the Capacitor location on the circuit board. Place the capacitor across the nuts. Bend each end of the wire around the screw (Figure 1). Place a washer on top of the wire and a nut on top of the washer (Figure 2).

Tighten the nut to secure the capacitor.



Figure 1 Wire around screws

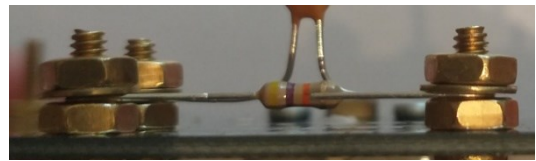


Figure 2 Wire placement between washer and nuts

### 5. Assemble the 47K resistor as described in step 4 above.

### 6. Assemble the 1N60 diode as described in step 4 above.

### 7. Assemble the 1/2" posts.

Items used: 5 – 1/2" Screws, 5 – Nuts, 5 – Washers, 5 – Thumb Nuts

The 1/2" screws will be used for the ANT LNG, ANT SHORT, GND, EAR GND, and EAR OUT as marked on the board. Insert a 1/2" screw through the board upward from beneath the board. Place a nut on the screw and tighten. Place a washer on the screw. Place a thumb nut on the screw, do not tighten these more than a gentle hand tighten.

Repeat for the ANT LNG, ANT SHORT, GND, EAR GND, and EAR OUT.

### 8. Assemble the Knob.

Items used: Knob, shaft, shaft screw, and 1/8" spacer.

Place the shaft on the variable capacitor. Slide the spacer onto the screw. Put the screw with spacer through the top of the shaft. While holding the shaft in place, tighten the screw. Turn the knob shaft to the full left position. Loosen the set screw in the side of the knob. Slide the knob over the knob shaft. Align the line on the top of the knob with the far left dial markings on the circuit board. Tighten the set screw.



Figure 3 Assembled Knob Shaft



Figure 4 Knob Set Screw

## Crystal Radio Kit 5

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#### 9. Assemble the coil screws.

Items used: Coil Form, 3 – Screws, 3 – Nuts.

Put a screw through the coil form from the inside. Place a nut on the screw (outside) and tighten.



*Figure 5 Coil Form with Screws*

#### 10. Preparing the coil wire.

Items used: Coil Wire, Small Piece of Sandpaper.

The green insulation needs to be thoroughly removed from approximately the last inch of the wire. Sand off the green insulation from the end of the wire. You can squeeze the wire between your finger and the sandpaper and pull the wire. You may find it easier to fold the sandpaper in half around the wire. Either method you choose, pull the wire through the sandpaper until there is no more green showing. Do not worry about sanding exactly one inch, it is better to sand a little more than not enough.

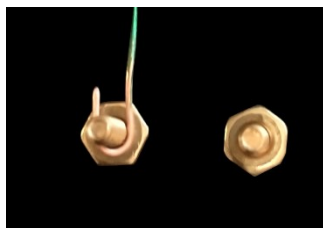


*Figure 6 Sanded Wire End*

#### 11. Wind the small coil.

Items used: Coil Form, Coil Wire, 1 – Nut, 1- Washer

There are two screws closer together on one side of the coil form. The coil winding will start with the screw closest to the end of the coil form. Left most screw in figure 5. Wrap the coil wire around the screw as shown in figure 7. Place a washer and a nut over the wire and tighten (figure 8). Wrap 7 turns of wire. Keep wire tight.



*Figure 7 Coil wire around screw*



*Figure 8 Coil wire, washer and nut*

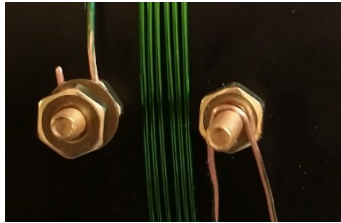
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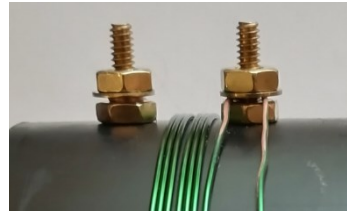
#### 12. Prepare the center tap.

Items used: Coil Wire, Sandpaper, 1 – Nut, 1 – Washer

Place the coil wire next to the center screw and note the location where the wire will wrap around the screw. Use the sandpaper to thoroughly remove the green insulation from the coil wire as previously done in step 10. Be sure the green is removed both before and after where the wire will contact the screw. Wrap the wire around the screw as shown in figure 9. Place a washer and nut over the wire. Keep wire tight while tightening the nut.



*Figure 9 Coil wire around center tap*



*Figure 10 Coil wire, washer, nut center tap*

#### 13. Winding the large coil.

Items used: Coil Wire, Coil Form, 1 – Washer, 1 – Nut

The long coil section will be wound in the opposite direction of the short section. Wind 40 turns of coil wire around the coil form. It helps to keep the coil wire tight as you wrap the coil. As in the previous step, place the coil wire next to the screw on the end of the coil and note the location. Use the sandpaper to thoroughly remove the green insulation from the wire. Be sure the green insulation is removed both before and after the screw. Wrap the wire around the screw. Place a washer and a nut over the wire and tighten. Use wire cutters or finger nail clippers to cut the excess wire after the screw.



*Figure 11 Completed Coil*

#### 14. Install the coil.

Items used: 3 – Nuts, Completed coil, Circuit Board.

Insert the coil screws into the 3 holes at the top of the circuit board from the top side of the board. Place a nut on the bottom side of each screw and tighten.

## **Crystal Radio Kit 5**

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15. Attach the earphone to the EAR GND and EAR OUT. The earphone wire should be under the washer. Gently tighten the thumb nuts.
16. Attach the included antenna wire to the ANT SHORT. The antenna wire should be under the washer. Gently tighten the thumb nut. Run the antenna wire as high as is feasible, parallel to the ground and straight. If there is not enough space to run the antenna in a straight line, the wire can be placed in an arc or loop shape as well. Experiment with the antenna placement and shape to achieve the best results.

If using an antenna longer than the one provided, you can experiment with using the ANT LONG connection option. Just connect your antenna to ANT LONG. Only one antenna connection should be used at a time. When using the ANT LONG connection for your antenna there should be nothing connected to ANT SHORT. The ground connection is more important when using the ANT LONG connection. Use of a good grounding source is highly recommended.

Do not use the antenna outdoors during bad weather.

17. Attach the included ground wire to GND. The ground wire should be under the washer. Gently tighten the thumb nut.

The use of a ground is optional. However, performance is generally much better with a good ground. There are many options for connecting a ground. You can just lay the ground wire along the floor in the opposite direction from the antenna. You can connect the end of the ground wire to a metal object, like a metal desk. You can also connect the end of the ground wire to a physical earth ground if you have access to one. Some metal plumbing in a home may be physically earth grounded for example. A good physical earth ground provides the best results typically, feel free to experiment.

### **Congratulations! Your Crystal Radio is ready to use.**

Use the tuning knob to locate local radio stations. Keep in mind that the crystal radio will only receive strong stations. Unlike a traditional battery powered radio, the power to drive the sound you hear is from the signal the antenna is able to pick up. Experiment moving the antenna to different locations to increase stations and/or volume.

If you have any questions at this stage, please refer to the photo on page 1 and double check any directions and photos applicable.