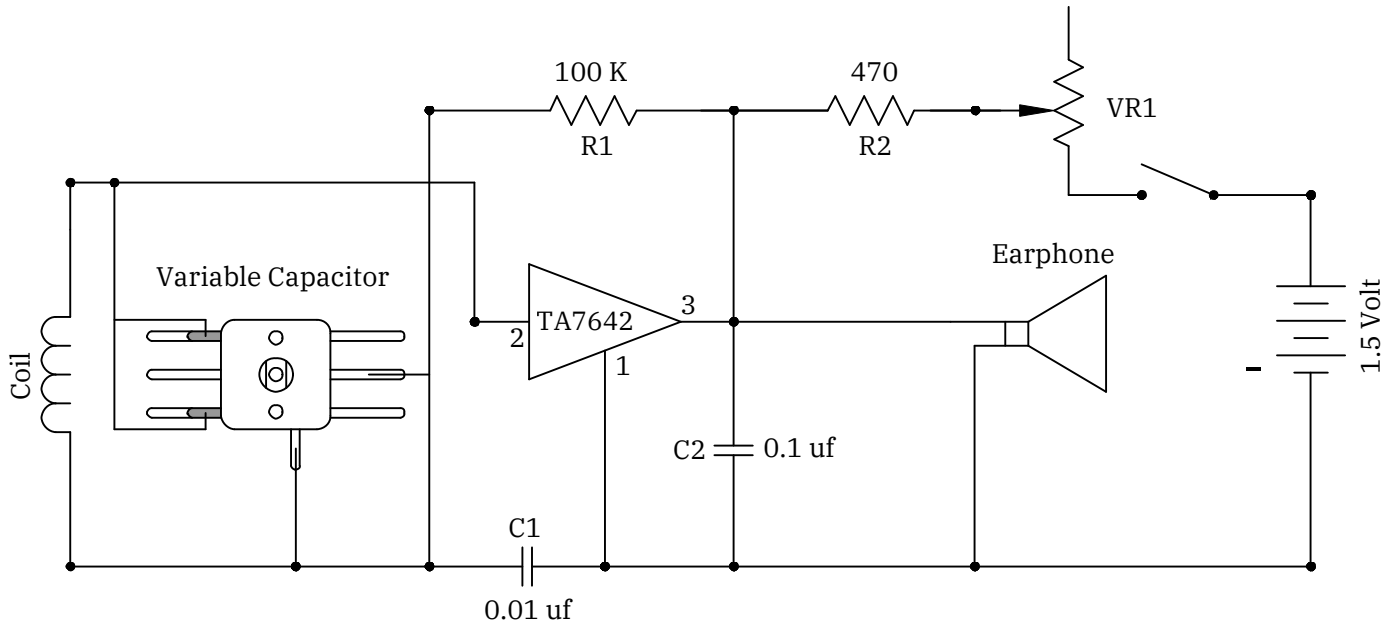
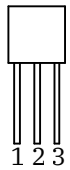


# AM Radio IC Kit 3

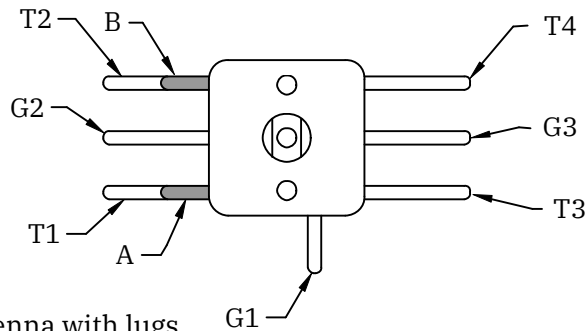
## Mike's Electronic Parts, LLC.



TA7642  
Flat Side Up



- 1 - Ground
- 2 - Input
- 3 - Output



- A 266pf
- B 266pf
- T1 T2 T3 T4 ~10pf Trimmers
- G1 G2 G3 Ground

### Parts List

- 1 - Circuit Board
- 1 - 180uh Ferrite Loopstick Antenna with lugs
- 1 - Plastic variable capacitor dual section 266pf
- 1 - IC1 TA7642 Radio IC
- 1 - R1 100K Resistors (brown black yellow gold)
- 1 - R2 470 Ohm Resistor (yellow violet brown gold)
- 1 - C1 0.01uf Capacitor (marked 103)
- 1 - C2 0.1uf Capacitor (marked 104)
- 1 - Ceramic Earphone
- 1 - Variable Resistor with switch
- 1 - Variable Capacitor knob with shaft and screw
- 1 - Variable Resistor knob
- 1 - AA Battery Holder with screw
- 15 - 3/8" #4 Screws
- 4 - 1/2" #4 Screws
- 28 - #4 Nuts
- 15 - #4 Washers
- 2 - #4 Thumb Nuts
- 4 - Nylon Feet
- 2 - Coil Clamps
- 1 - Philips Screwdriver
- 1 - 1/4" Wrench



# AM Radio IC Kit 3

## Mike's Electronic Parts, LLC.

AM Radio IC Kit 3 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 is included in the kit. Easy to assemble with no soldering required. AM Radio IC Kit 3 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.

2. Assemble the legs.

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

The holes located in each corner without the metal pad are for the feet. Insert a 3/8" #4 screw through the top side of the board. Thread the feet onto the screw from the underside the board.

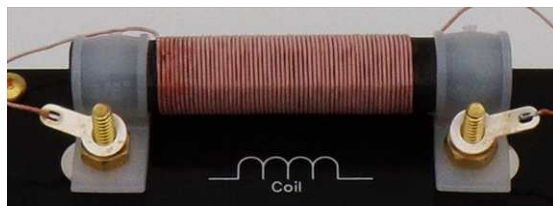
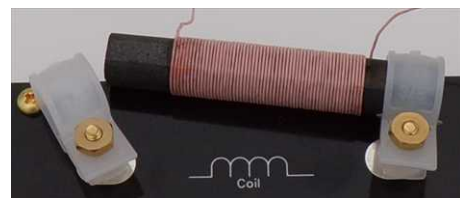
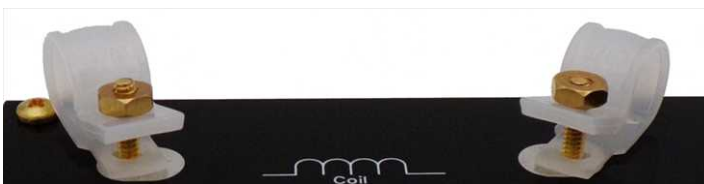
Repeat for all four legs.

3. Assemble the coil.

Items used: 1 - Ferrite Loopstick Antenna, 2 - Coil Clamps, 2 - 1/2" #4 Screws, 2 - #4 Washers, 2 - #4 Nuts.

Locate the Coil location on the circuit board. Push a #4 1/2" screw through the circuit board from the bottom. Place a coil clamp over one end of the coil. Place the coil clamp on the screw. Place a #4 nut on the screw. Leave this screw loose for now.

Repeat this for the other side of the coil. You can move the clamps and coil to center things how you like. Double check that the coil is between the coil clamps and that the wires are not being pinched by the coil clamp. When everything looks good, tighten the nuts onto the coil clamps. Place a solder lug over a screw on one end. Place a washer over the solder lug. Place a nut over the washer and tighten. Repeat for other side.



# AM Radio IC Kit 3

## Mike's Electronic Parts, LLC.

4. Assemble the 1/2" posts.

Items used: 2 - 1/2" #4 Screws, 2 #4 Nuts.

EAR GND and EAR OUT use 1/2" screws. Push a 1/2" #4 screw through the circuit board from the bottom. Use a #4 nut from the top to fasten the screw to the circuit board.

5. Assemble the 3/8" posts.

Items used: 11 - 3/8" #4 Screws, 11 #4 Nuts.

All the remaining holes use 3/8" screws. Push a 3/8" #4 screw through the circuit board from the bottom. Use a #4 nut from the top to fasten the screw to the circuit board.

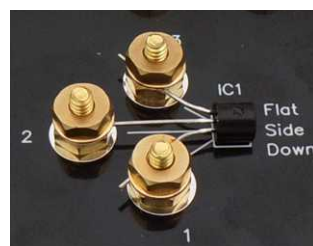
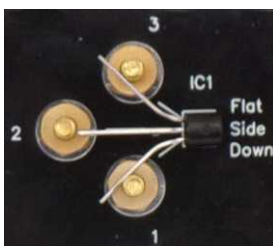
Repeat for the remaining holes in the circuit board. The board should now look like the photo below.



6. Assemble the radio IC TA7642.

Items used: 1 - TA7642 Radio IC, 3 - #4 Washers, 3 - #4 Nuts.

Locate the IC1 radio IC location on the circuit board. Gently bend the outer transistor pins to the side as pictured below. When the transistor is in position, the side pins should touch the posts of the circuit board. It is very important to mount the transistor flat side down. Place a #4 washer and #4 nut on top of the transistor pins. Tighten the nut to secure the transistor.



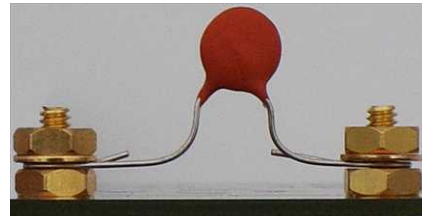
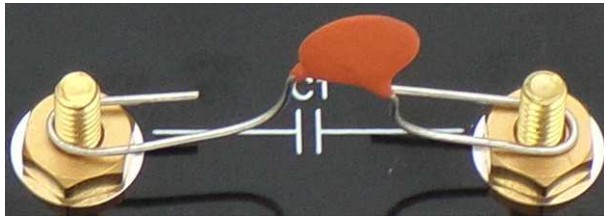
## AM Radio IC Kit 3

### Mike's Electronic Parts, LLC.

#### 7. Assemble the Capacitors and Resistors

Items used: 1 - 0.01uf Capacitor, 1 - 0.1uf Capacitor, 1 - 100K Resistor, 1 - 470 ohm Resistor, 4 - #4 Washers, 4 - #4 Nuts.

Use the schematic and photographs to match parts to their location on the circuit board. For each part, place the part across the nuts. Bend each end of the wire around the screw. Place a #4 washer and #4 nut on top of the wire. Tighten the nut to secure part. Be careful that the wire from each part is only contacting one post from the circuit board.



#### 8. Assemble the variable capacitor knob.

Items used: Variable capacitor knob, shaft, shaft screw.

Place the shaft on the variable capacitor. Put the screw through the top of the shaft. While holding the shaft in place, tighten the screw. Turn the knob shaft to the full right 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 right dial markings on the circuit board. Tighten the set screw.

#### 9. Attach the variable resistor knob.

Items used: 1 - Variable Resistor Knob.

Turn the variable resistor shaft (marked gain on the board) full left. Press the knob onto the shaft of the variable resistor aligning the marking of the knob with the off marking of the circuit board. The knob may fit tight and require a good amount of pressure to attach. Do not push the knob tight to the board. There needs to be some space between the knob and the board to allow the knob to turn. If the knob feels too stiff, try to raised the knob slightly.

#### 10. Attach the earphone.

Items used: 1 - Ceramic Earphone, 2 - #4 Washers, 2 - #4 Thumb Nuts.

Locate the EAR GND and EAR OUT on the board. Place the ends of the earphone wires on top of each nut. Place a washer and a thumb nut over the wire. Tighten lightly to secure.

Note: Do not clamp the wire by the plastic coating. The bare metal portion of the wire must be clamped by the thumb nut.

# AM Radio IC Kit 3

## Mike's Electronic Parts, LLC.

### Radio Operation

Use the gain control knob to turn the radio on and off. Use the tune knob to select radio stations. The tuning can be very sensitive. Turn the tuning knob very slowly.

The integrated circuits based off the ZN414, like the TA7642 in this kit, have a tendency to break out into oscillation. Oscillation will sound like a high pitch squeal. It will be a bit louder than you would expect a radio station to sound. Although the gain control will affect the volume, it's primary purpose is to control the gain level to prevent oscillation. As you turn the tuning knob, if you hear a loud squeal, lower the gain slowly until it goes away. Sometimes there is a station there or nearby. For weak stations turn the gain control up until the integrated circuit begins to oscillate (squeal). It may or may not squeal even all the way up. You may be using both knobs while tuning across the AM band. By turning both knobs you may find more stations hiding across the dial.

The audio output must be connected to a piezo high impedance earphone or headphone. This kit is not designed for use with magnetic earphones or headphones.

Improper orientation of either the radio IC may cause your radio permanent damage. Use the flat on the radio ic and the image on the circuit board to align the radio IC.

The TA7642 IC looks like a transistor with three pins packaged in a TO-92 case. The TA7642 contains 10 transistors and has a gain of 72 db. It also has automatic gain control provided by the R1 100K resistor. The TA7642 is made to operate from 1.1 to 1.8 volts. Over 1.8 volts will destroy the chip and may have a tendency to oscillate at higher voltages. In addition to the automatic gain, the variable resistor and the R2 470 ohm resistor provide a range of 470 ohms to 2.47K of additional manual gain control.

The TA7642 radio integrated circuit is based off the ZN414 from the 1970s. There have been several manufactures of replacement integrated circuits for the ZN414. The default radio IC included with the kit is the TA7642. We currently supply several alternate radio integrated circuits; CD7642, MK484, TA7642, UTC7642, and YS414. Any of these can be substituted in the circuit for the TA7642. From our testing and customer feedback, the KM484 (not MK484) has the highest overall gain. However, it tends to fall into oscillation easily. The CD7642, TA7642, UTC7642, and YS414 have a gain just below the MK484.