

**BUILD YOUR OWN**  
**BROADCAST STATION**  
**BY**  
**AL TOLER**  
**FROM**  
**ELECTRONICS ILLUSTRATED**  
**JULY 1965**

**COMPILED BY JEFF MORRISON APRIL 13, 2015**

# **TABLE OF CONTENT**

## **PAGE**

**32) GENERAL INFORMATION**

**33) GENERAL INFORMATION CONTINUED**

**33) CONSTRUCTION**

**33) CHECK OUT**

**34) CHECK OUT CONTINUED**

**34) PICTORIAL DIAGRAM**

**35) CHECK OUT CONTINUED**

**35) SCHEMATIC**

**35) SERVICE HINTS**

*At camp, school or home, would-be disc jockeys have it made with this closed-circuit wireless broadcaster.*

**T**HE entertainment you want when you want it. That takes a lot of patient dial-twisting these days. In fact, you may never be able to locate the station that plays *your* kind of music and with few commercials. But before you and your friends give up radio as an entertainment medium, have you ever thought about operating a station with your *own* programs?

We don't mean a 50-kilowatter. What we have in mind is a low-cost, low-power radio station. With such a setup you can broadcast your newest records, deliver hardhitting commercials and give your own inaccurate weather forecasts. It's the chance to show what a witty disc jockey you could be if only somebody would discover you and give you a break.

With EI's low-power broadcast station you can do all this and more. It has inputs for a microphone and record player (or tape), mixing controls and a modulation-level meter. Just turn it on, pick a clear spot on the broadcast band and you're on the air!

Because the FCC frowns on unlicensed broadcast stations, and since a licensed station costs a pile of dough, our rig was designed for limited range. Its low power is perfectly legal and you won't get into trouble with the FCC. You won't be heard all over town—in fact, you won't even be heard at the other end of the block. But in your own apartment building, your neighbor's house, at camp or in a college dorm, you'll be top dog on the band.

Our station actually is a deluxe version of the old wireless microphone. But instead of having an antenna wire hanging out of the back, our rig uses the AC power line that it's plugged into to carry the signal. And with good conditions the range may exceed that of the wireless mike of old.

Our station doesn't produce the usual barely-readable signal like many wireless mikes. It has extra power-supply filtering for low hum, and its low-distortion mike and phono preamps make its signal sound as if it is coming from a commercial station. The sound quality will be good enough for you to broad-

**build your own**



# BROADCAST STATION

By AL TOLER







cast your best hi-fi records.

For adults kept at home because of a shortage of baby sitters, there's another application for the station. Just eliminate some of its deluxe features and you have an electronic baby sitter. Put the station's mike in the baby's room, turn on the radio in the neighbor's apartment where you're visiting, and the first peep out of junior will be broadcast to the world.

### Construction

The station will fit on a 5x7x2-in. aluminum chassis. Parts layout and wiring are critical; therefore, we urge you to duplicate our layout. After the chassis has been drilled, mount VU meter M1. Space is at a premium and it might be difficult to install M1 after other components are mounted. Coil L1 should be mounted last to protect its slug-adjustment screw, which protrudes a considerable distance outside the can. Pay special attention to the values we specify for components associated with V2; do not make changes or substitutions.

Coil L1 must be modified, as shown in the diagrams on the third page of this article, to work in the station's oscillator circuit. The modification is not difficult but must be done with care to avoid damaging the delicate coil wires.

First, remove the single screw which holds the coil assembly in the can. If your coil is supplied with a rivet instead of a screw, use a 1/4-in. drill to remove the rivet's head. Then punch the rivet through the can with a nail

or a center punch. Carefully slide the coil assembly out of the can. The slug remains attached to the can, so don't move the coil to the side when taking it out. Slide it straight down.

Note that the coil has a terminal board at the bottom and that the color-coded leads are attached to only four of the five terminals. The remaining terminal is the junction for two 100-mmf capacitors.

Remove the capacitor going to the green-lead lug by clipping its leads (don't try to unsolder it). Then cut out the 100K resistor and remove the blue lead. Cut off the green lead and attach it to the terminal that was the junction of the two capacitors. Install the coil in the can again. Disregard the instructions supplied with L1 and connect it as shown.

Install C3 so it can be removed easily. If you want to use the station for baby-sitting purposes only, eliminate J2, R5, R6, R7, C5 and M1 and connect R4's wiper directly to pin 7 on V1B.

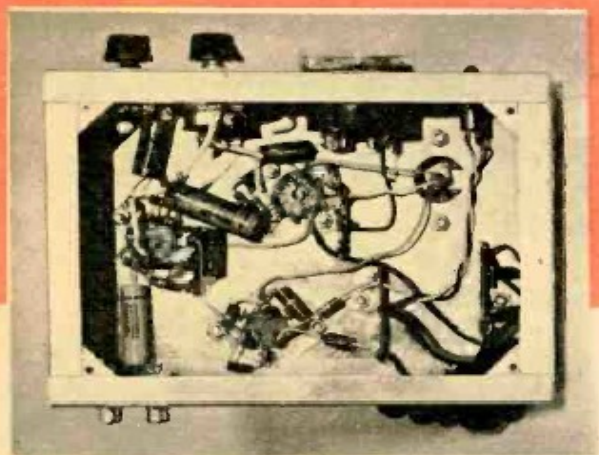
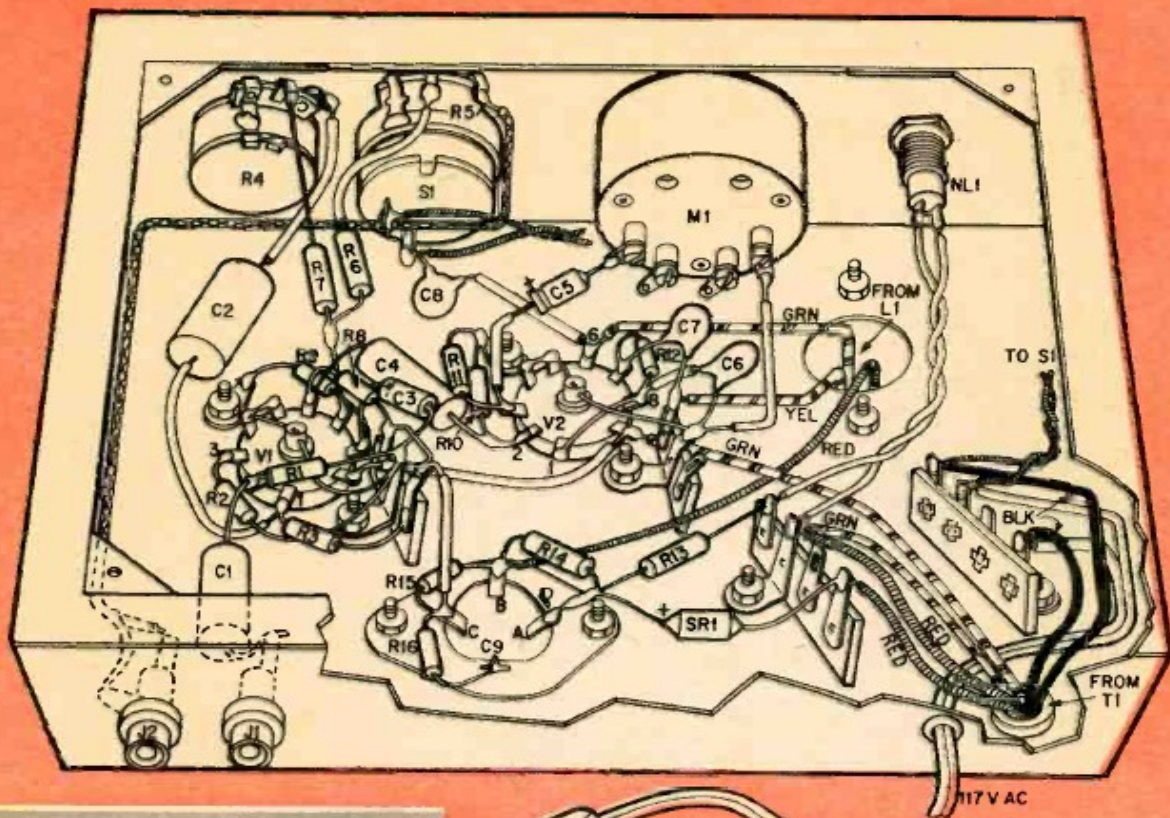
Make certain that C8 is connected to the contact on S1 that goes to T1. It should *not* connect to the line side of S1. Twist the leads going to switch S1 and to neon lamp NL1. Use shielded wire to connect J2 to R5.

### Checkout

Turn on power by rotating R5 until the





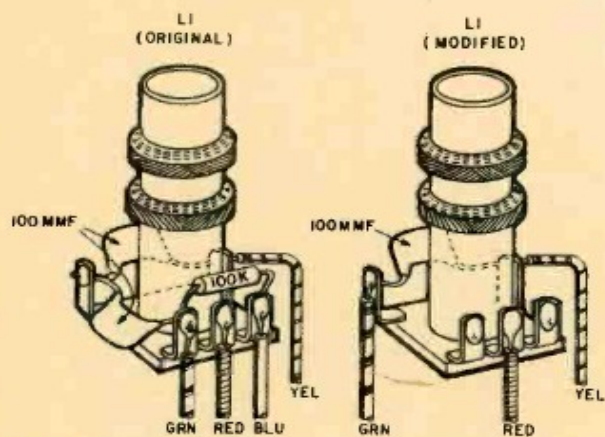


There's plenty of room for all parts in the chassis we selected. All leads should be short and direct to keep hum and distortion low and to assure proper oscillator (V2) operation. Braid on shielded lead from J2 to R5 is grounded at J2 only. Twist AC lead to S1 and position it near the chassis.

## BROADCAST STATION

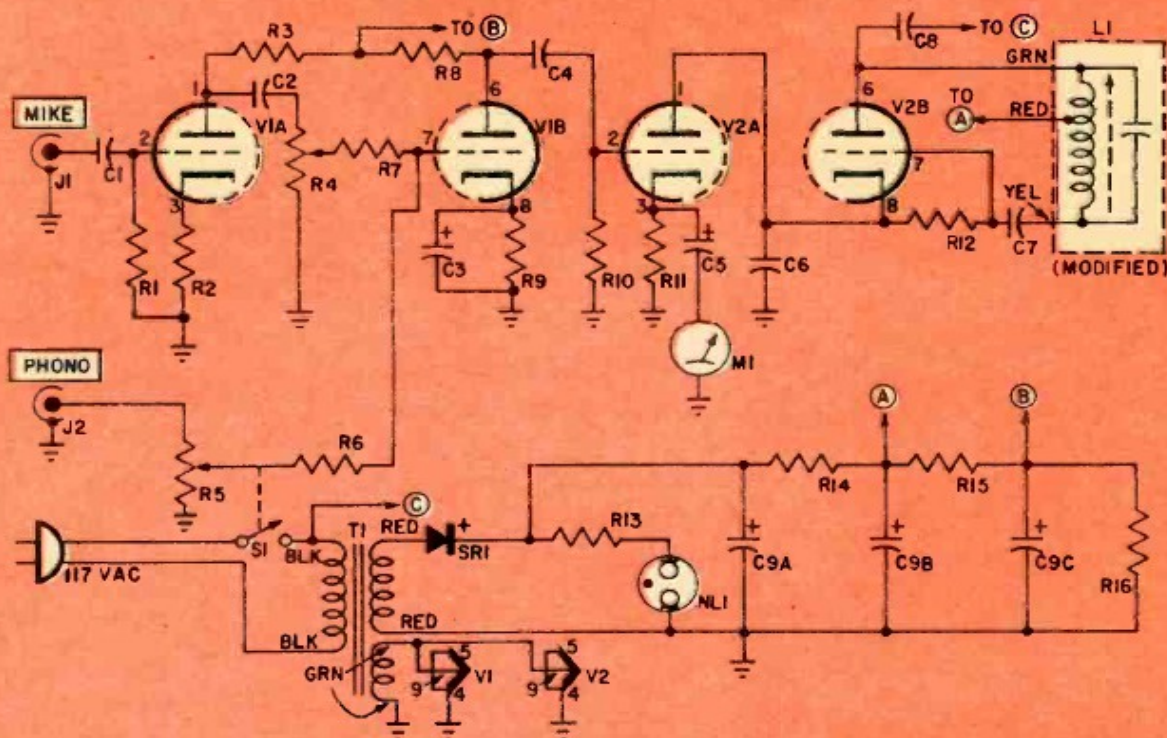
power switch clicks. Allow the unit to warm up for a few minutes, then turn on an AC or AC/DC radio plugged into the same circuit and tune the radio to a spot where there is no station. Adjust L1's slug until you pick up the signal on the receiver. The radio will get quiet and the background noise will disappear. Check to make certain the rig is not interfering with a commercial station. If the receiver is physically too close to your station you may pick up two signals, one on the high end of the dial and one on the low end. The low-end signal usually is false; it will not be received when the radio is moved to another room. (It is possible that the high-end signal is false, although this is rare.)

Connect a mike to J1 and plug a record player with a crystal or ceramic cartridge



Coil L1 as it appears when removed from can, at left. Modify it by removing 100 mmf capacitor, 100 K resistor, blue lead; also move the green lead.





Mike signal is amplified by V1A and fed via R4 to V1B and further amplified. The signal continues to V2A which, because it is connected between Hartley oscillator V2B and ground, modulates the oscillator.

#### PARTS LIST

##### Capacitors:

C1—.01 mf, 400 V tubular  
C2—.02 mf, 400 V tubular  
C3, C5—30 mf, 15 V electrolytic  
C4—.05 mf, 400 V tubular  
C6, C8—330 mmf, 500 V disc  
C7—.001 mf, 500 V ceramic disc  
C9A, B, C—20/20/20 mf, 250 V electrolytic  
J1, J2—Phono jack  
L1—Phono oscillator coil: J. W.

Miller No. 522, Allied Radio stock  
No. 61 G 005, \$2.97 plus postage.  
(Not listed in catalog)  
M1—VU meter (Lafayette 99 G 5024)  
NL1—NE-2 neon lamp and holder  
Resistors: ½ watt, 10% unless otherwise stated. Values in ohms.  
R1—1 megohm R2, R9—1,500  
R3, R8, R10—100,000  
R4, R5—250,000 ohm audio-taper

##### potentiometer

R6, R7—470,000 R11, R15—2,200  
R12—22,000 R13—220,000  
R14—1,200 R16—270,000  
S1—SPST switch on R5  
SR1—Silicon rectifier: 500 ma, 400 PIV or higher  
T1—Power transformer: secondaries: 125 V @ 15 ma, 6.3 V @ 0.6 A Lafayette 33 G 7502.  
V1—12AY7 tube V2—12AX7A tube

in J2. (You would also connect a tape deck output to J2). If your record player has a magnetic cartridge, plug it in J1 and connect a 22K-ohm resistor from J1 to ground.

Adjust volume controls R4 and R5 until M1 indicates between 60 and 85 per cent modulation. (Don't try to push the modulation any higher or you will produce a distorted signal.) Move the radio away to check the station's range. If the range is only a few feet, reverse the station's plug.

Since power lines have considerable losses at broadcast frequencies the station's operating range will depend on the type of house wiring (metal-clad BX or insulated Romex) and the equipment connected to the line, such as lights, heaters or motors. The range also will depend on power-line transformers. If you are on one side of a distribution transformer and your neighbor is on the other, he won't be able to pick up your signal.

If the operating range is too restricted by power-line problems, it can be extended by converting the station to wireless operation. To do this, install an insulated binding post on the chassis, disconnect C8 from S1 and connect C8 to the binding post. Then connect a 50-in. length of wire to the binding post. If the station's frequency changes when the wire antenna is approached, change C8's value to 50 mmf. If you find the mike or phono signal has too much bass, remove C3.

#### Service Hints

If L1's slug does not lower the output frequency sufficiently, increase the value of C8 by 50 mmf. If L1's adjustment can't raise the output frequency sufficiently, lower the value of C8 by 50 mmf. If the sound is distorted severely and M1 doesn't indicate, or just barely wiggles, check C5's polarity. Be sure the positive end connects to pin 3 of V2A.