

Bare Essentials Transmitter

by

W5LET

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10 Really Basic Transistor Experiments

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**Build This Bare-Essentials
Ham Transmitter for Under \$10!**



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Bare-Essentials Transmitter



By JIM WHITE, W5LET EVERYBODY talks about inflation these days. According to the experts, we're spending too much and driving the price of everything sky high. Washington now threatens us with higher taxes to stop our spree.

But for hams on a budget there's a way to have your cake and fight inflation, too. You do spend a little of the green stuff but it won't make much of a dent in your wallet or the national economy. The way out: our Bare-Essentials Transmitter. This little 40- and 80-meter rig takes the prize as *the* anti-inflationary CW transmitter of the year. You spend only \$7 to get it on the air.

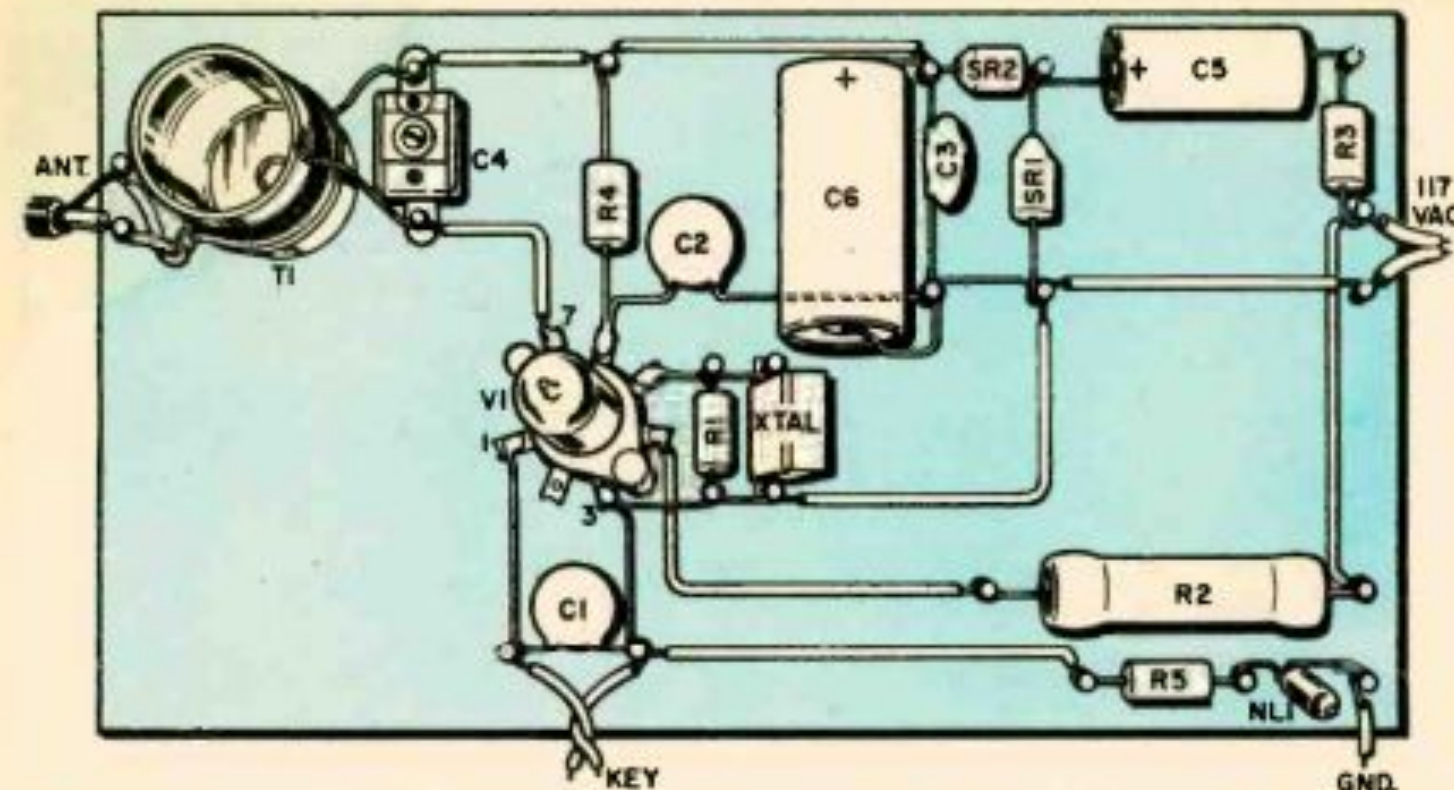
There's no chassis. The rig is built on a piece of wood—any kind, like the end of an orange crate, will do. And for tie points you use finishing nails. The 50C5 (or a 50L6) tube can be salvaged from an old AC/DC radio. You'll have to spend 11¢ for a tube socket but you won't have to buy a socket for the crystal. It's not fancy but it packs a wallop for its price.

Used with a mediocre antenna, it has worked stations all over the U.S. When conditions are right and with a good antenna there is no reason why it can't work some real DX.

The Circuit. The transmitter consists of a 50C5 crystal oscillator, which operates on either 40 or 80 meters. Since the 50C5 has a 50-V filament it uses a 400-ohm 20-watt dropping resistor instead of a filament transformer.

The power supply for the plate and screen voltages is a doubler which provides about 350 VDC. Two capacitors, two silicon rectifiers and a 1-watt resistor complete the power supply.

Building The Transmitter. First thing is the chassis, which is simply a 10 x 6 x 3/4-in.-thick piece of wood. Take a close look at the pictorial



Our model, built on 6 x 10 x 3/4-in.-thick piece of pine, has 23 finishing-nail tie points. V1's socket sits on 3/4-in. spacers; carpet tacks hold it in place. Contacts from discarded tube socket hold crystal.

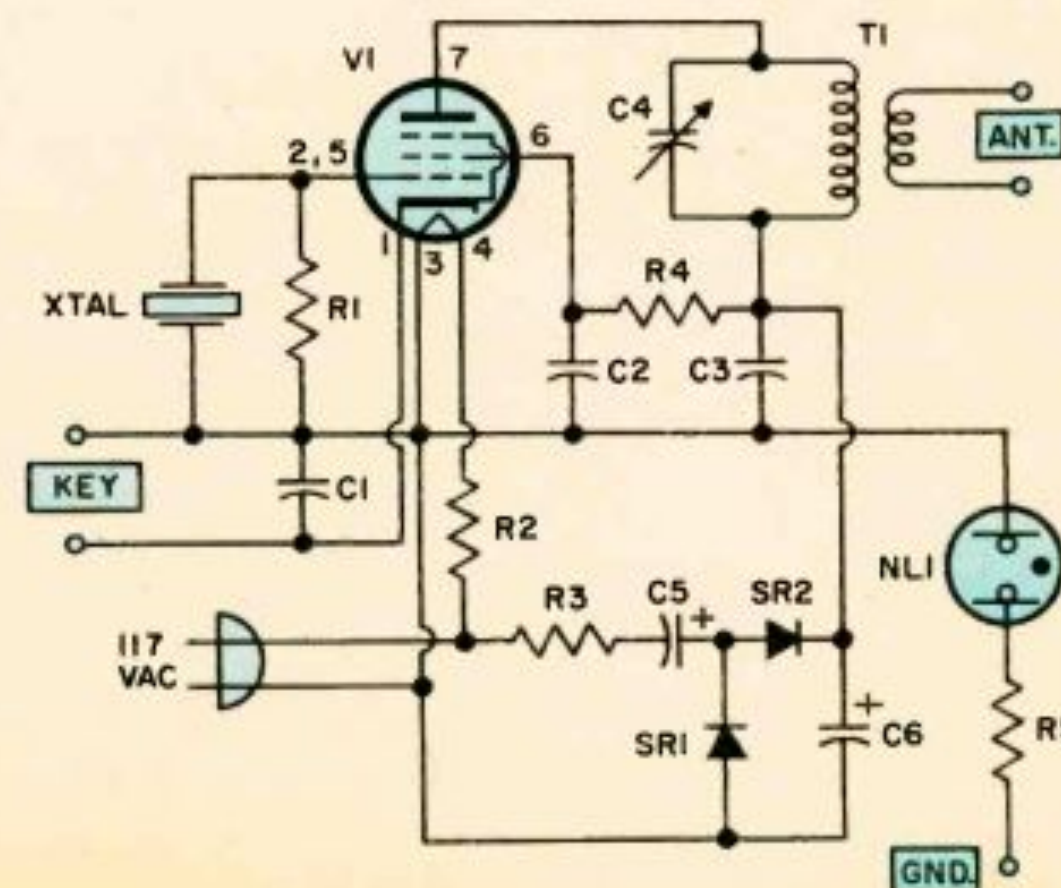
Bare-Essentials Transmitter

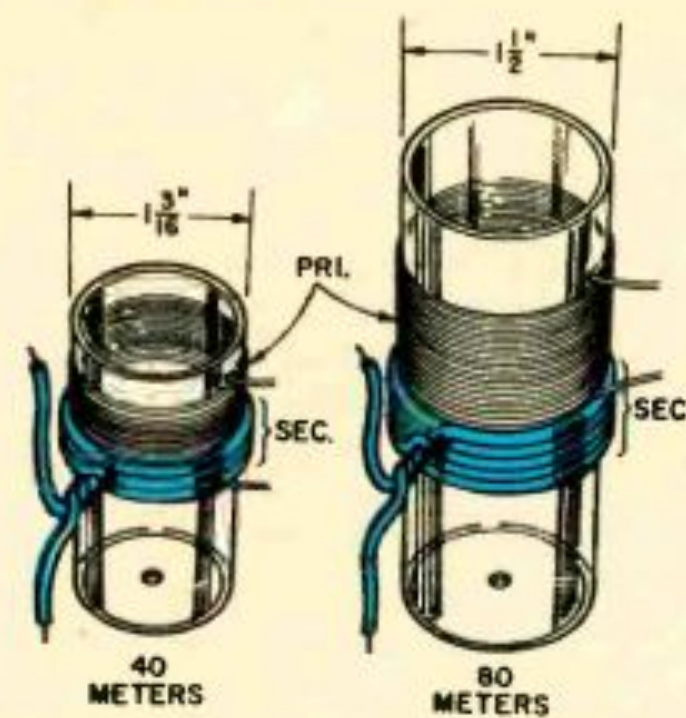
to see where each part goes. The tube socket is mounted on short spacers so that its lugs clear the wood.

The rest of the parts are soldered to finishing nails in the board. The power-supply components are located in the upper right corner of the board. There is no power switch so the AC leads go directly to the nails.

Nails again are used for connecting points for the antenna and for the key. Another nail, located at the lower right of the board is for a ground connection for neon lamp NL1. If the AC plug is in the wrong way, the hot side of the line will be connected to the key. This will mean that 117 V exists from the key to ground, enough to cause a severe shock. However, if the plug is reversed, the ground side of the AC line will be connected to the key circuit and a shock hazard will not exist.

Transmitter schematic. Power supply is a voltage doubler whose output is about 350 V. Output circuit is inductive-link type. Purpose of NL1 is to warn you if AC plug is inserted incorrectly. Be sure to connect R5 to water-pipe ground. If NL1 lights, reverse the plug.





Coils. Our 40-meter coil was wound on 1 3/16-in.-dia. plastic pill bottle; however, 1 1/4 in. would do. Primary is 1/2-in. wide; 80-meter primary is 1 1/4 in.

By connecting a water-pipe ground to the nail, the neon lamp will light if the AC plug is in the wrong way. Observe carefully the polarity of the silicon rectifiers and the electrolytics.

The coils are wound on plastic pill bottles. The 80-meter coil is wound on a 1 1/2-in.-dia. x 3 1/2-in.-long bottle. The 40-meter coil is wound on a 1 3/16- or 1 1/4-in.-dia. x 2-in.-long bottle. First drill a small hole in the bottom of each of the bottles for the mounting screw.

The plate winding (primary) for the 80-meter coil is 45 turns of No. 24 enameled

PARTS LIST

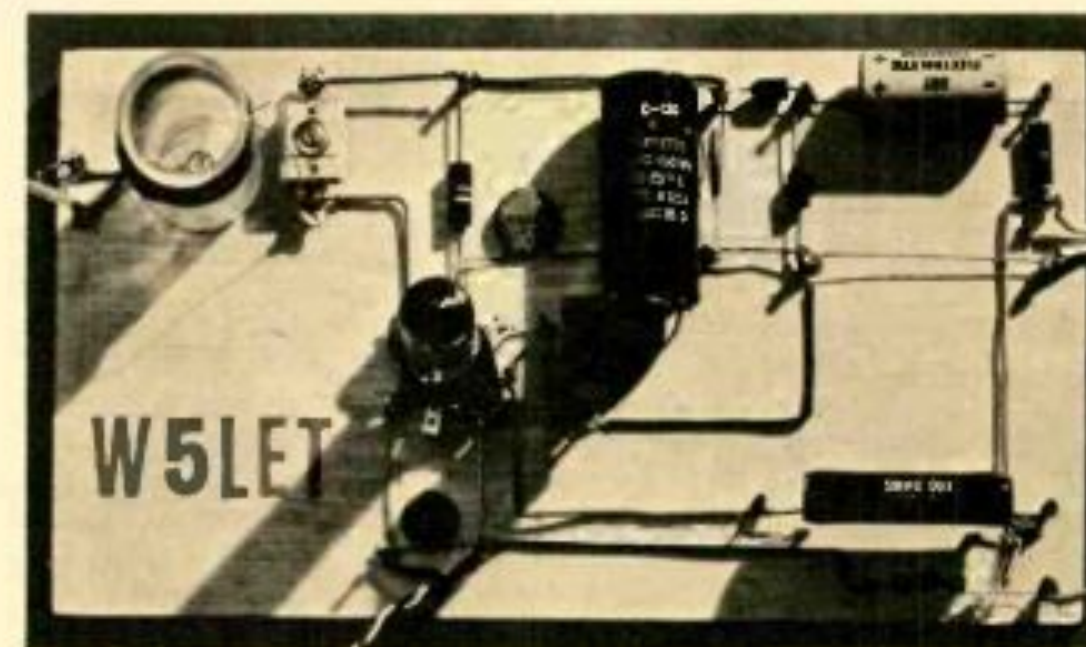
C1,C3—.005 μ f, 1,000 V ceramic disc capacitor
C2—.01 μ f, 1,000 V ceramic disc capacitor
C4—2-30 μ f trimmer capacitor
C5—40 μ f, 150 V electrolytic capacitor
C6—40 μ f, 450 V electrolytic capacitor
NL1—NE-2 neon lamp
R1,R5—100,000 ohm, 1/2 watt, 10% resistor
R2—400 ohm, 20 watt wirewound resistor
R3—10 ohm, 1 watt, 10% resistor
R4—10,000 ohm, 1 watt, 10% resistor
SR1,SR2—Silicon rectifier, 400 PIV, 750 ma
T1—Transformer; 40- and 80-meter primaries wound of No. 24 enameled wire; secondaries wound of No. 20 solid hookup wire (see text)
V1—50C5 tube
Xtal.—40- or 80-meter crystal
Misc.—plastic pill bottles (see text), 10 x 6 x 1/4-in.-thick piece of wood, finishing nails, 7-pin tube socket, AC cord

wire, closewound. The 40-meter primary is 23 turns of No. 24 enameled wire also closewound. Both secondaries are No. 20 solid hookup wire: the 80 meter is four turns, the 40 meter three turns.

Before winding the primaries drill four small holes (two at the top and two at the bottom of the primary winding) in each form. Then thread the ends of the primary wire through these holes.

The secondaries are wound over the primary coils and are held in place by twisting the ends together as shown in the coil pictorial.

On The Air: After mounting a coil mount
[Continued on page 109]



Ready to go on the air. Layout is wide open; there should be no construction problems. Power supply is in upper right corner, neon lamp and current-limiting resistor R5 are in lower-right corner. Lugs of trimmer capacitor C4 are soldered to heads of finishing nails. T1 (upper left) is screwed to board.

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Continued from page 31

and connect its four leads, then check your work once more. If you're going to work 40, plug a 40-meter crystal into its pin connectors. Plug in the tube, connect an antenna (using 50-ohm coax) to the antenna nails and a key to the key nails. Be sure that you have a water-pipe ground connected to NL1.

Now plug in the transmitter. If NL1 glows, reverse the AC plug. Wait about 30 seconds for VT's filament to reach operating temperature and press the key. Quickly adjust C4 until oscillation starts. Oscillation can be determined by listening to a receiver tuned to the crystal frequency. Or hold a neon lamp against the plate transformer. If the transmitter is working the lamp will glow. Adjust C4. When the lamp glows at maximum brilliance, tuning is correct.

In loading the transmitter into an antenna some adjustment of T1's secondary may be necessary. Closer coupling can be achieved by moving the coil higher up over the primary winding. An input of about 50 ma at about 350 V (17.5 watts) is about right.

Do not operate the transmitter without an antenna because this may cause C4 to break down if the key is held down for an extended period of time.

Spiel Stopper

Continued from page 47

from the TV's output transformer—and connect the transformer lead to the *xformer*. screw on TS1. Then connect the free speaker terminal to the *spkr.* screw on TS1.

Using the Spiel Stopper. Turn on the TV and adjust the volume to your maximum listening level. Then adjust sensitivity control R3 to the minimum level needed to have the whistle trip the relays. If gain is too high, both the whistle and the TV sound will trip the relays. Blow the whistle until the TV sound is at maximum, then readjust the receiver's volume control to the maximum listening level.

All set? Soon as that shrieking commercial comes on give one or two blasts and it will be like that commercial never existed. Another tweet or two when the commercial is over and the sound is back to normal.

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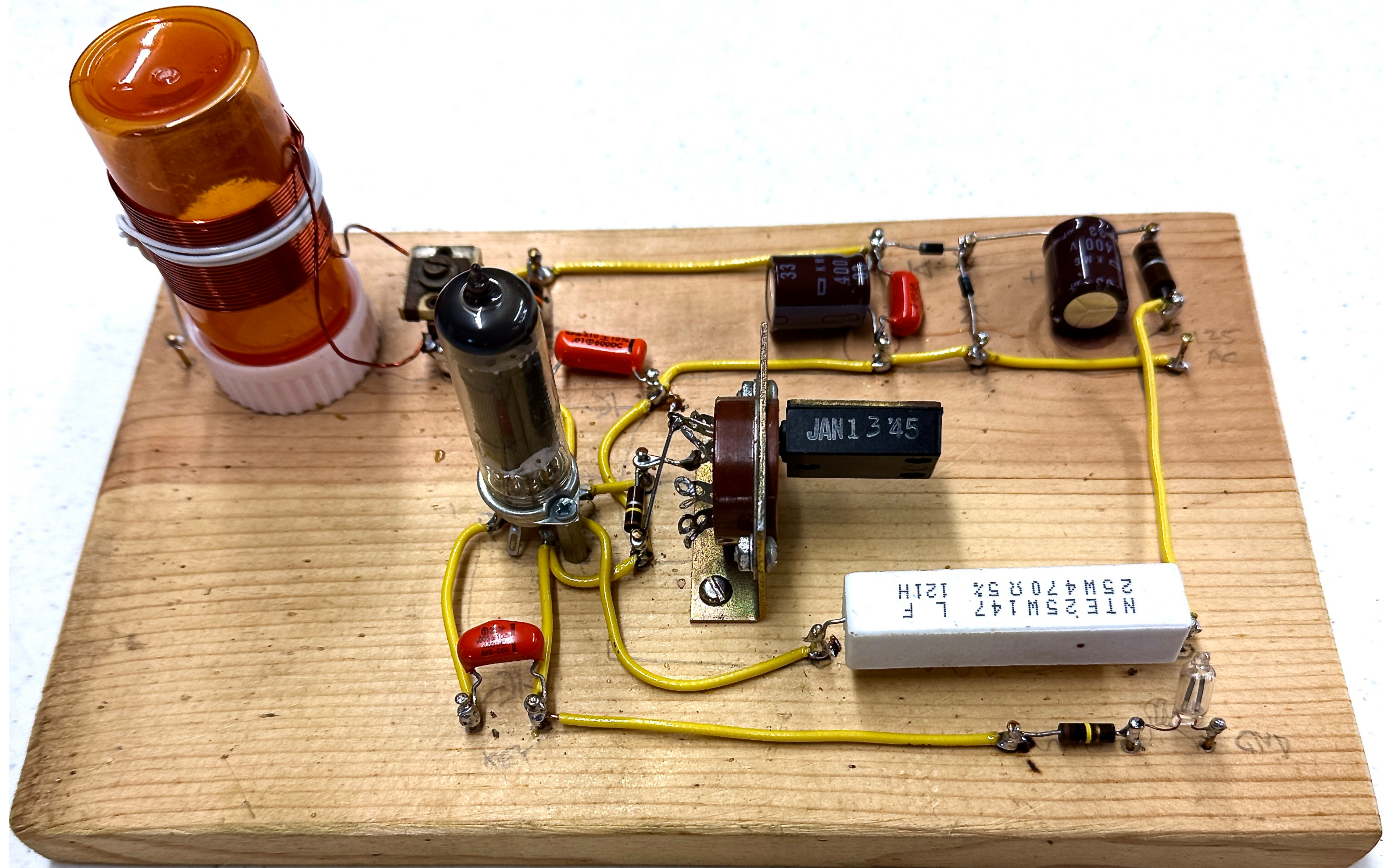
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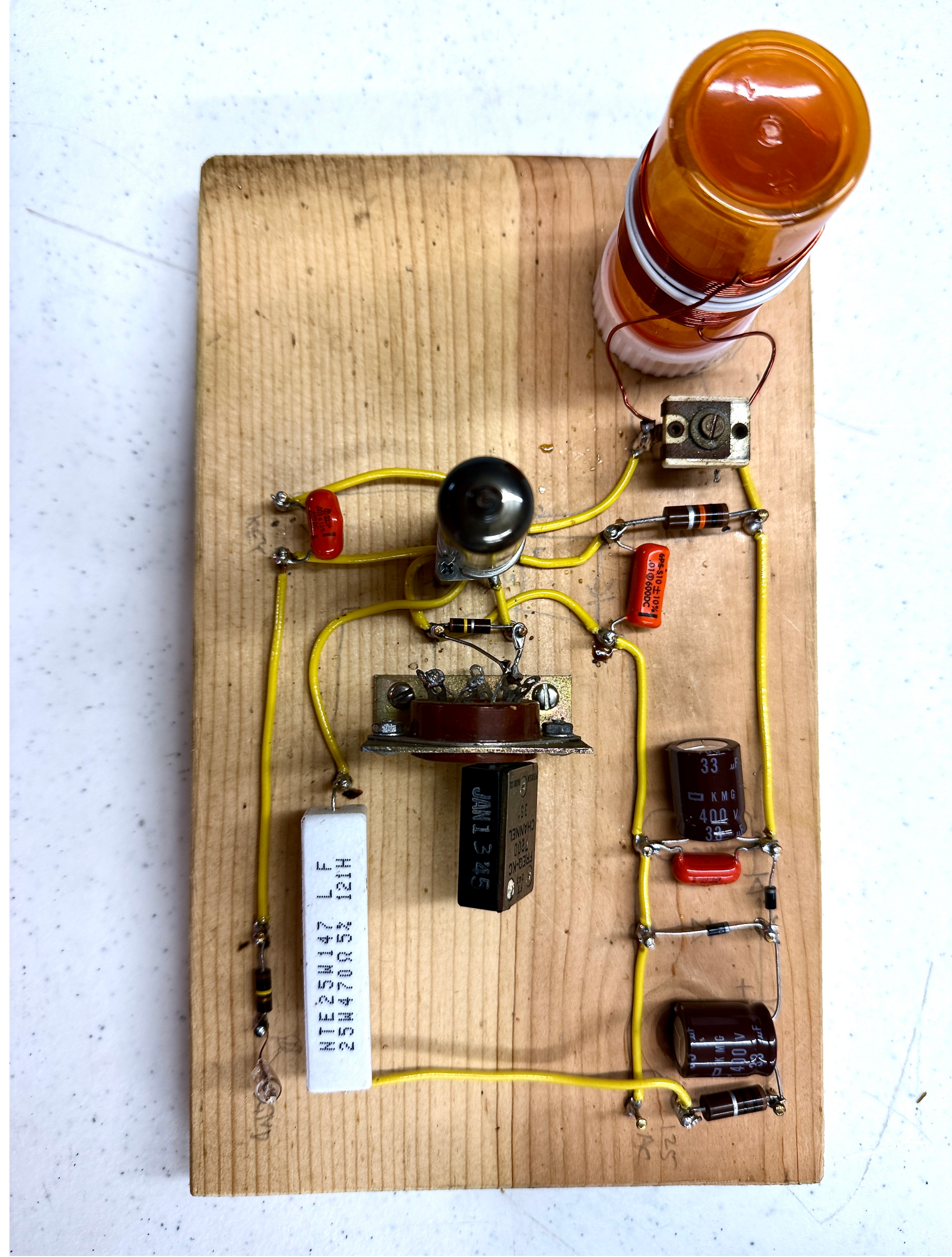
CIRCLE NUMBER 12 ON PAGE 11

- The pictures on the next two slides are reproductions by Steve Gomez, KE50, of his first transmitter, built with his dad: the Bare Essentials Transmitter by W5LET.
- Steve graciously shared his reproduction with us at our August Jefferson County Amateur Radio Club Meeting.
- A big thanks to Steve, KE50, for his show-and-tell items, which are always so interesting!

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Reference Links for the Bare Essentials Transmitter

- QSL.net Article 10 Basic Designs.pdf
- <https://www.youtube.com/watch?v=RlbIFs4gG-A&t=169s>