

THE "NOVICE SPECIAL" TRANSMITTER



Exterior view of the 15-watt transmitter. All controls are located on the front panel.

This 15-watt, 80- and 40-meter cw transmitter is intended for the novice constructor. It uses standard components, is easy to assemble, and is capable of spanning more than 1000 miles with its signal. The secret of success with this, as with any transmitter, is the employment of a good antenna system. This circuit is an adaptation of one which appears in *How To Become A Radio Amateur*, 25th Edition. It was designed by WITS.

The Circuit

Fundamental-type crystals for the 80- and 40-meter bands are used at V_1 , in the Pierce oscillator stage (V_1 of Fig. 6-40). The oscillator is untuned, thus eliminating the need for band switching in that part of the circuit. The signal is fed to the grid of V_2 , the power amplifier, where it is increased to the operating level. A pi-section tuned circuit is used in the plate of V_2 . It is switched from 80- to 40-meter operation by shorting out some of the coil turns by means of S_2 , which is located on the front panel. During operation on the 80-meter band S_2 connects a 680-pF capacitor in parallel with loading capacitor C_3 , providing the proper constants for that band.

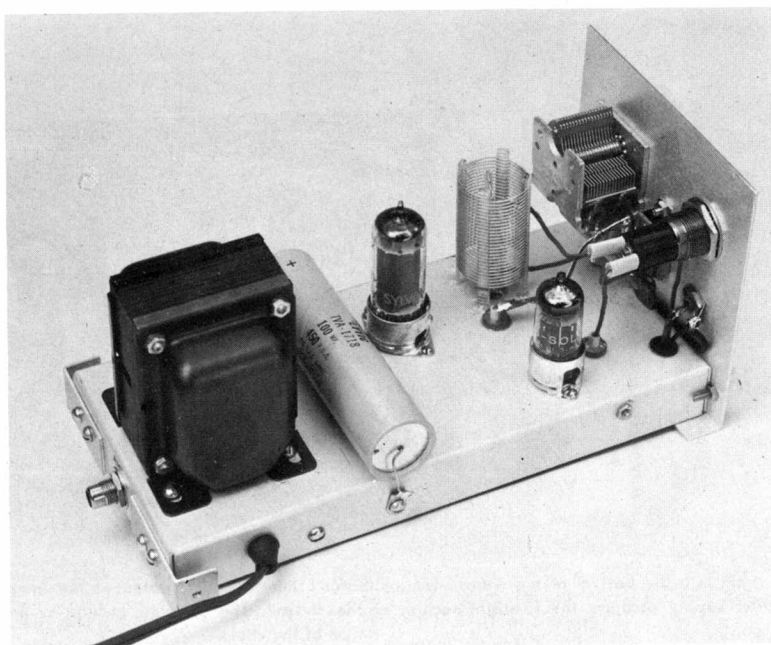
A No. 49 pilot lamp serves as a plate-tuning indicator. A 0-100 mA meter can be substituted, but the lamp will serve nicely for dipping and loading the PA stage.

Keying is accomplished by breaking the cathode leads of V_1 and V_2 , at J_1 . To prevent clicks, and to shape the cw note, a 0.47-uF capacitor and a 100-ohm resistor are series-connected from J_1 to ground. This shaping network should not be omitted from the circuit.

Construction

The Novice Special is housed in an LMB SQ-1 cabinet, which measures $8\frac{1}{2} \times 4\frac{1}{2} \times 4\frac{1}{2}$ inches. It comes complete with chassis and panel, so nothing additional is required for the housing of the unit.

Top-chassis layout of the transmitter. C_3 is located under C_2 (upper left of panel). The tank coil is cemented to the chassis with epoxy glue. Its polystyrene ribs serve as mounting feet. The power supply filter capacitor is visible just ahead of the power transformer. Its B-plus end is covered with insulating tape to prevent electrical contact by the operator. Its B-plus pigtail is covered with spaghetti tubing and routed through the chassis via a rubber grommet.



All of the controls are mounted on the front panel. The antenna jack is located on the rear chassis lip for easy access. Feedthrough bushings are used for routing the rf leads through the chassis, but small rubber grommets can be substituted in their place. Coaxial cable is used to connect J_2 to the stator terminal of C_3 . Its shield is grounded at each end.

Tuneup and Use

It is *not* recommended that 3.5-MHz crystals be used for 40-meter operation. This would encourage harmonics to appear in the output of the transmitter when doubling in the PA stage. Always use straight-through operation for both bands.

A 15-watt incandescent lamp can be used as a dummy antenna during testing. Connect it to J_2 . Insert a crystal at Y_1 , and plug the key in at J_1 .

Turn the power supply on and close the key after the tube filaments are warmed up. Lamp I_2 should illuminate. If so, tune C_2 for a dip in lamp brilliance, indicating resonance of the PA tank. Adjust C_3 for a brighter glow of I_2 and retune C_2 for a dip. Repeat this process until the dummy load cannot be made to glow any brighter. At this point I_2 should glow quite brightly with C_2 adjusted for a dip.

Key the transmitter and monitor the cw note on the station receiver. Adjust C_1 experimentally for the best sounding note—one with minimum chirpiness. This completes tuneup. When operating into an antenna whose impedance is anywhere between 30 and 75 ohms the foregoing tuning procedure should produce the same results as when the dummy lamp was used at J_2 . If the transmitter will not load up, check the antenna to make sure it is cut for the correct operating frequency (see chapter on antennas).

AN RF-ACTUATED CW MONITOR

This unit permits the operator to monitor his cw sending. Also, it can be used as a code-practice oscillator. As an oscillator, connect a key to TB_1 , and plug a set of phones into J_3 . To use the speaker, close S_1 and advance R_2 . For use as a monitor, connect coax from your transmitter to J_1 and route the antenna feed to J_2 . Set R_1 so that the arm of the control is at the ground end. Connect a VTVM between terminal 1 on TB_1 and the chassis. Next, tune up the rig to the input and adjust R_1 so that the VTVM reads -7 or -8 volts. The monitor should be generating a tone, and if you have S_1 turned on

and the audio gain control, R_2 , turned up, you should hear a note.

For headphone use, plug the phones into J_3 and plug P_1 into the receiver headphone jack. When receiving, the audio from the receiver will be piped through the monitor. When going to transmit, you'll hear the multivibrator oscillator tone in the phones. The battery drain is about 2 mA, it is a good idea to leave S_1 switched off when the speaker is not in use. You don't have to disconnect the monitor from the rf line in order to use the unit as a code practice oscillator. (From *QST*, Nov. 1968)

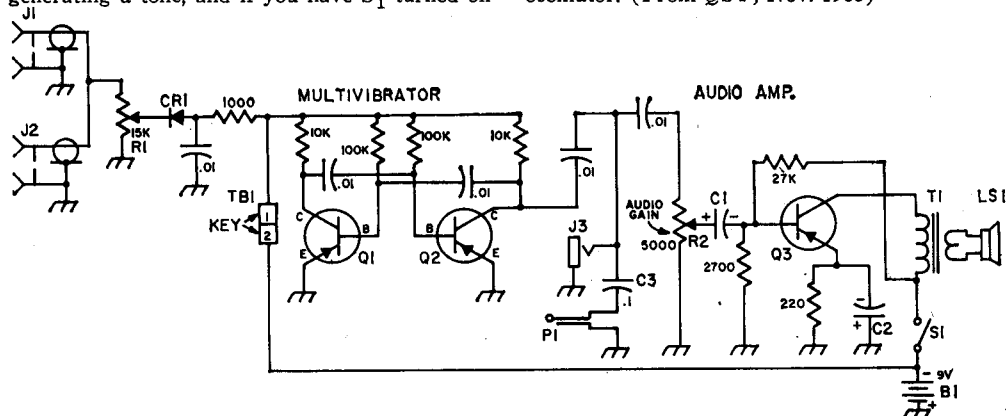


Fig. 40A—Circuit diagram of the cw monitor. Unless specified, all resistors are ½ watt; resistances are in ohms ($K = 1000$). All values of capacitors are in microfarads (μF , all 0.01- μF capacitors are disk ceramic. Capacitors marked with polarity are electrolytic.

B₁—9-volt battery.

C₁, C₂—25- μ F electrolytic, 25 working volts or more.

C₃—0.1 μ F paper, 25 working volts or more.

CR₁—1N277 or 1N34A.

J₁, J₂—Coax chassis receptacle, type SO-239.

J₃—Open-circuit phone jack.

LS₁—Speaker, 3-inch diameter, 4-ohm type.

P₁—Phone plug,

Q₁, Q₂, Q₃—2N406, SK3003, or equivalent.

R₁—15,000-ohm, 2-watt control.

R₂—5000-ohm control with single-pole, single-throw switch, **S₁**, mounted on rear.

T₁—Output transformer, 2000- to 5000-ohm primary, 4- to 10-ohm voice-coil secondary; see text (Lafayette 99 H 6101 or similar).

TB₁—Two-terminal connector.