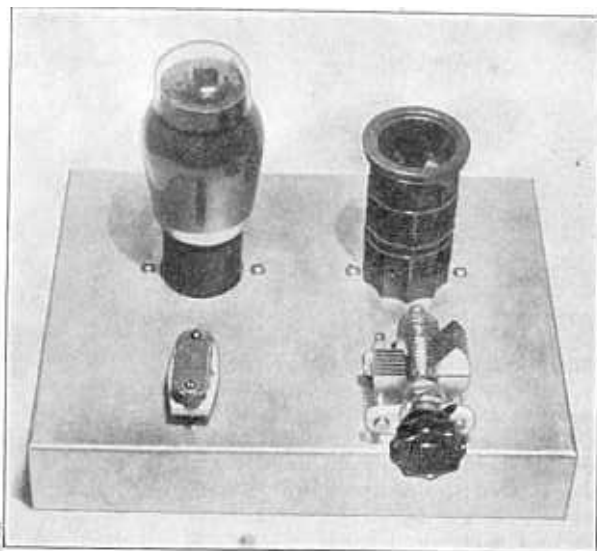


25-Watt Buffer- Doubler

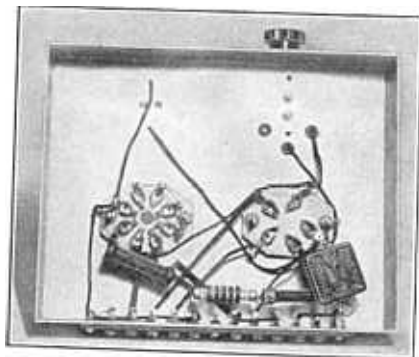
THIS 6L6 "Buffer Doubler" is designed to be used with the Tri-Tet oscillator previously described. This unit, added to the Tri-Tet oscillator, constitutes a two stage transmitter capable of operation in three amateur bands with a single crystal. The glass variety of 6L6 is employed in the buffer stage instead of the metal 6L6 which is used in the oscillator. The glass tube provides slightly better performance at the same frequencies although it requires neutralizing. As can be seen, the circuit diagram for this stage is very simple; only one tuned circuit is required.

The amplifier is mounted on an aluminum base exactly the same size as that of the oscillator. The dimensions and drilling specifications are given in the accompanying drawing. The placement of parts is clearly shown in the photograph. On the left-hand side of the chassis we have the 6L6-G tube and directly in front of it, the special neutral-



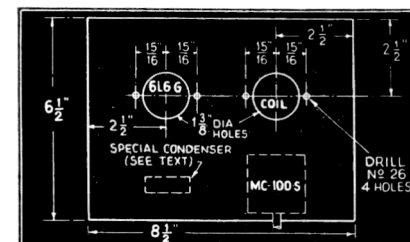
izing condenser, which will be taken up in detail later. On the right-hand side, we find the center tapped coil and in front of it, the 100 mmf. tuning condenser. All wiring and by-pass condensers are beneath the chassis as can be seen in the bottom view. The terminal strip for making various connections is along the rear edge.

Returning to the neutralizing condenser, it consists of two small pieces of thin aluminum $1\frac{1}{8}$ " long and $\frac{1}{2}$ " wide. These are mounted on an insulating strip and the spacing between the two plates is approximately $\frac{1}{8}$ ". Adjustment is made by swinging the top plate or bending to increase the spacing between them until proper neutralization is obtained. No cathode bias is employed although a 400 ohm 10 watt receiver can be connected in series with the cathode as a precautionary measure against damage to the tube should the excitation be removed while the plate voltage is applied. This resistor should be by-passed with a .01 mf. condenser of good quality, preferably mica. Screen grid voltage is obtained directly from the B-plus lead of the power supply. A 15,000 ohm resistor limits the voltage to the proper value. In order to neutralize the 6L6 it is necessary to employ a split or center-tapped inductance. These coils are wound on 5-prong XP-53 plug in forms and tuned with a 100 mmf. MC-100-S midjet condenser.



Coil data is as follows: The largest coil has 60 turns of No. 24 wire, close wound for 1.75 mc.; 34 turns of No. 28 is spaced to $1\frac{1}{2}$ " length for 3.5 mc.; 16 turns spaced to $1\frac{1}{2}$ " for 7 mc., same size wire; 10 turns No. 18 spaced to $1\frac{1}{2}$ " for 14 mc., and 6 turns of No. 18 same spacing, for 28 mc. The small coil between the two sections of the larger one (leave about $\frac{3}{16}$ " space in center of coil for the link) is the two turn link, two turns usually being sufficient for the right amount of coupling. The number of turns may be varied, however, to suit requirements. With an input of 400 volts, at approximately 100 milliamperes, the output is around 25 watts, making a real nice low powered transmitter. This stage may be operated as a straight amplifier, that is, the output circuit tuned to the same frequency as the oscillator or driver, or it may be tuned to twice this frequency. For instance, employing an 80 meter crystal in the oscillator with its plate circuit tuned to 40 meters, this amplifier may be coupled to it and tuned to 20 meters with nearly 25 watts output.

The first step in tuning the amplifier is neutralizing. The best arrangement for this is a small dial light connected to two turns of a wire approximately $\frac{1}{2}$ " larger in diameter than the coil, or, for that matter, the dial light can be connected to the two turn link. Then with the B-plus disconnected and the input terminal connected to the oscillator, adjust the 100 mmf. condenser until the dial light glows. It might be a good idea to swing the neutralizing condenser plates apart before attempting to neutralize the amplifier in order that you may be sure to obtain a glow in the bulb. Then push the plates of the neutralizing condenser closer together and



at the same time swing the plate tuning condenser back and forth through resonance. Continue this operation until the dial light does not glow when the plate circuit is tuned to resonance. With the doubler antenna connected to the amplifier, the plate current should be approximately 100 milliamperes. If the full load plate current is greater than 100 ma. it will be necessary to reduce the number of turns in the link coil. Since only link coupling is shown, a doublet antenna with twisted pair feeders must be used if this is intended for an output stage. For other type of antennas, it will be necessary to employ some sort of tuning network.

Parts List

HAMMARLUND

- 1—MC-100-S condenser
- 1—CH-X, 2.1 mh. R.F. Choke
- 1—S-8, Isolantite socket (8 prongs)
- 1—S-5, Isolantite socket (5 prongs)
- 4—SWF-5—5-prong coil forms

AEROVOX

- 2—.01 mf. mica condensers (500 V.)
- I. R. C.
- 1—15,000 ohm 10 watt resistor
- 1—50,000 ohm 1 watt resistor
- R. C. A.

MISC.

- 1—Chassis, 8-1/2" x 6-1/2" x 1-1/2"
- (1/16" aluminum)
- 1—Pointer knob

Wiring diagram of
"Buffer-Doubler" for
3-stage transmitter.

