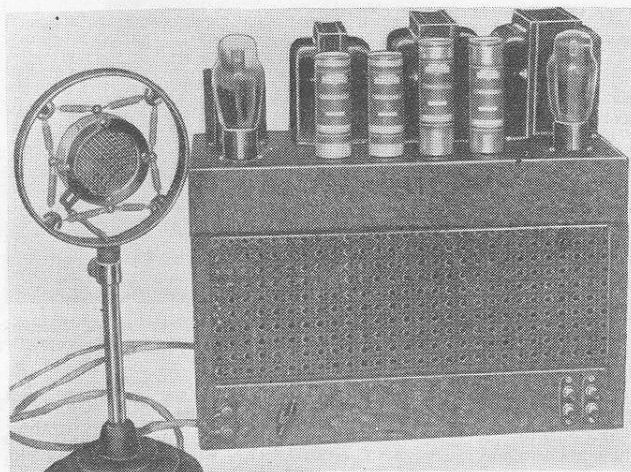


The 6L6 MODULATOR

HANDLES 50 WATTS . . .



Complete modulator, including the crystal microphone.

● THE famous 6L6 tube, although not very old, has become one of the most popular of all tubes manufactured and is, to say the least, the most interesting. Previous articles in *Short Wave Craft* have shown its adaptability to transmitting apparatus in the R.F. portion and in this article there is described a modulator using them in the output stage.

Two of these tubes in Class A-B in this modulator will deliver over 50 watts of audio and are capable of modulating an R.F. amplifier with inputs up to 100 watts. This modulator is designed to work in conjunction with a crystal microphone and uses metal tubes throughout, except in the power-supply. The diagram reveals that we start out with a hi-mu triode, as the first stage of speech amplification, a low-mu triode in the second stage of speech, two in push-pull as drivers for the push-pull 6L6's. Resistance coupling is used in the first two stages which employ a 6F5 and a 6C5. The speech amplifier is "transformer-coupled" to the driver stages which, in turn, make use of the new Thordarson 6L6 transformers for the input and output circuits.

The output transformer is designed for 2500, 5000, and 7000 ohm loads, and is capable of carrying the plate current of the modulated amplifier. The entire audio portion is built on a 7 x 17 inch, crackle-finished chassis, 2 inches deep, and has a metal cane style cover. The power supplies—there are two of them, one for the power stage and another for the three amplifier stages—are mounted on a similar chassis. A cage was not employed here, but would undoubtedly improve its appearance.

Separate Power-Supplies Used

The photographs show the complete unit ready to couple to the R.F. amplifier with the power supply sitting on the top of the speech equipment. The other two photographs show close-ups of both the speech and the power-supply portions. Due to the rather heavy current requirements of the power-stage and extra good regulation being necessary, separate power-supplies were used. The

The 6L6 tube, which is fast making history, is featured in this new modulator using all metal tubes. It has an output of better than 50 watts, and it will fully modulate an R.F. amplifier with 100 watts input.

one delivers 400 volts at 250 mills (ma.) and has only to serve the plates of the 6L6's. Another power-supply, delivering 250 volts, supplies the plate voltages for the three low-power stages and screen-voltage for the 6L6's. The screen voltage was taken from the low voltage power-supply in order to obtain perfect regulation and maintain the screen voltage constant during current swings of the power stage.

The transformers available would not permit a single 6.3 volt winding to feed all of the heaters and, therefore, as the diagram shows, the heaters were split up, some being run off the low-voltage power-supply, and some from the high-voltage power-supply. This is not at all inconvenient because the windings are already present on the transformer and are taken care of in the plug arrangement. In the rear of the speech unit we have two sockets which are receptacles for the power-supply leads and from the power-supply unit there are two cables with plugs attached to fit the sockets. In the high-voltage supply, we used an 83 rectifier and an 80 in the low-voltage power-supply. If the 83 causes a *hash* in the receiver, merely substitute it with an 83V which is

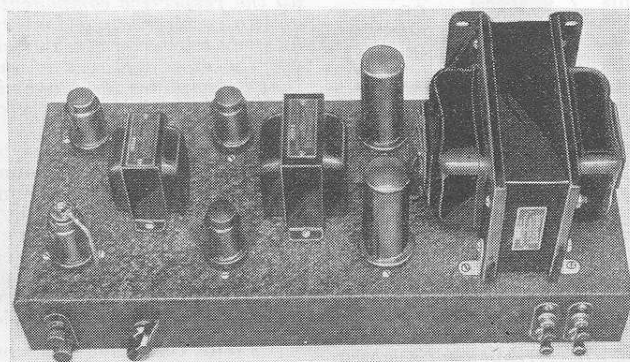
a special vacuum tube, with regulation nearly as good as the 83. The 83 proved slightly more satisfactory when high output power-levels were desired because of its superior regulation.

"Gain-Control" and Bias Arrangements

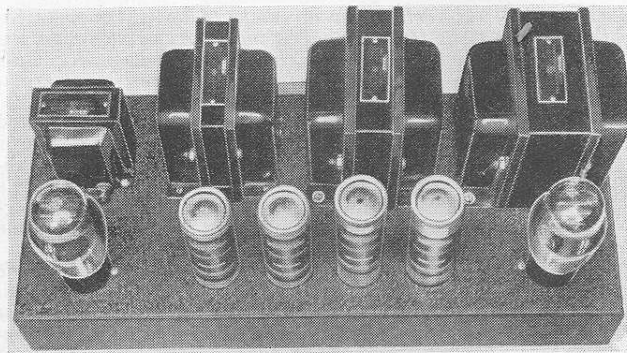
Good equipment must be used in the construction of the power-supply and the modulator, because poor regulation can *not* be tolerated, otherwise you will have serious distortion and low-power output. The *gain-control* is incorporated in the grid circuit of the second speech amplifier. This is a 500,000 ohm potentiometer and usually has to

be turned on about 60 per cent for comfortable speaking into the microphone.

Plenty of circuit-isolating resistors and condensers are incorporated in the speech-amplifiers and are absolutely necessary wherever shown in order to obtain maximum stability.



The speech or audio part of the modulating equipment.



Right — The two power-supplies combined in one unit, which are used for the 6L6 modulator.

