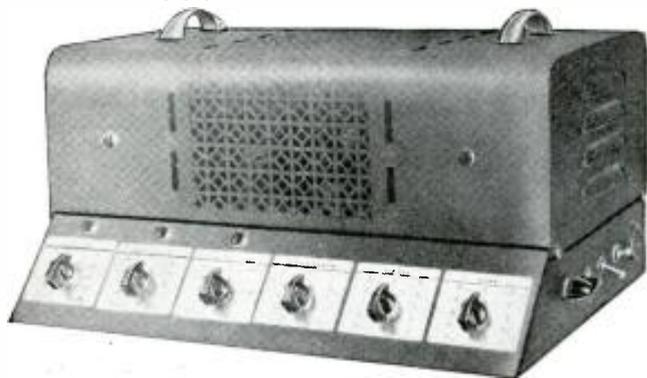


Powerful PA Amplifier Uses an 815



Transmitting tube puts
out a 54-watt a.f. signal

By GERALD A. CHASE

THE little 815 seems finally to be coming into its own. Many amateurs now are using it as a final amplifier in their low-powered transmitters and as a push-pull driver or multiplier in their higher-powered rigs. As yet, however, it does not seem to be much used for audio work. Where space is at a premium, the 815 is an ideal tube. Measuring slightly less than 4 inches high and 2 inches in diameter, it contains a pair of husky tetrodes. Used in push-pull, with 500 volts on the plates and a bias of -15 volts, it kicks out a healthy 54 watts.

A PE-103-A dynamotor is used with the amplifier described here for mobile work. With an output of 160 ma at 500 volts it is ideal for an 815 as long as the rest of the amplifier draws very little current. Even if the current exceeds the 160-ma rating enough to drop the voltage to 400, output is still better than 40 watts.

One of the main considerations in

planning the amplifier was to keep plate and filament currents as low as possible to minimize battery drain when working mobile.

The minimum requirements for input were two microphones and one phonograph, with noninteracting controls to mix all three. As can be seen from the schematic, a single 6SC7 was used for the two microphone preamplifiers. Mixing is done between the 6SC7 and the following 6SK7.

In the following stage a 6SK7 is used in conjunction with a 6C5 and a 6H6 in a volume-expander-compressor circuit which is fairly standard. This circuit was included primarily for recording. However, it has also been found very desirable for PA work. Some speakers have a tendency to wander away from the microphone. Compressor action works as an automatic gain control to boost the volume when the speaker is at a distance and to cut it as he speaks directly into the mike. Care

must be exercised in setting the control for it is possible to cause distortion with over-compression.

As shown in the schematic, the control is a special center-tapped 1-meg-ohm potentiometer (IRC VC-539X). When the arm is at center position, the grid return from the 6SK7 is directly grounded and its operation is normal. When moved toward the plate end of the control, compression takes place; and when moved toward the cathode end, expansion results.

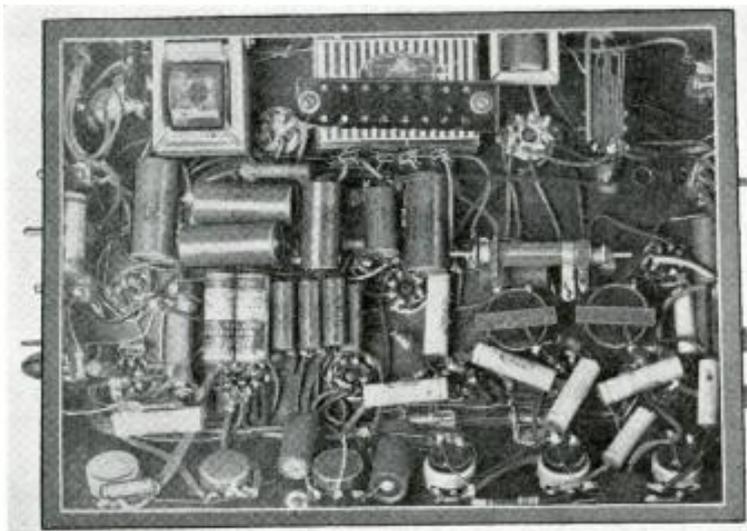
When playing music, a greater dynamic range can be achieved by using the expander. Again, care should be taken, for distortion will also result from overexpansion.

The tone control

The next stage is the tone-control circuit using a 6C5 as a "normal-tone" amplifier with a 6SL7 in parallel as a treble and bass amplifier. The signal for the grid of the 6C5 is taken from between a 47,000-ohm resistor and a 100,000-ohm resistor. This drops the signal to two-thirds of its original value. If the grid were connected directly to the 0.1- μ f coupling capacitor, the "normal-tone" volume would be great enough to blanket the action of the treble and bass controls.

The 100,000-ohm resistor between the 6SK7 plate and the grid of the bass section of the 6SL7 isolates the .01- μ f bypass across the bass control from the rest of the circuit. The 500,000-ohm potentiometer controls the amplitude of the low-frequency sounds. Be careful to filter and shield the previous stages, for, with the bass control at maximum, there is a tendency to amplify hum.

The signal is fed to the treble section of the 6SL7 through a 250- μ f capacitor, which filters out the bass. Large amounts of treble boost can be obtained with the control. It is usually impossible to operate it at more than two-



This under-chassis view shows how the bias battery should be mounted in place.

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