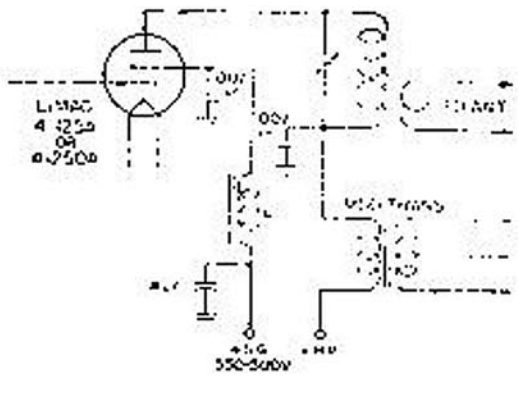
MODULATING TETRODES

Nearly every amateur knows that to high-level modulate a class-C tetrode amplifier, the screen must be modulated along with the plate. And most are familiar with two methods of getting the necessary audio voltage for the screen: (1) using a separate screen winding on the modulation transformer and, (2) using a dropping resistor from the **unmodulated** plate supply to deliver voltage to the screen, letting the screen "modulate itself" because of the normal variation in screen current under plate modulation. Both these systems are described in the technical data sheets for the 4-125A and 4-250A, which are yours for the asking at your dealer's or direct from Eimac.

Not all amateurs know about the system diagrammed here, however.



This is a sure-fire arrangement which has been thoroughly tested in the Eimac laboratory and in a number of amateur transmitters. Here a small reactor, L, takes the place of the series resistor in regard to providing a high audio impedance in the screen circuit. The d-c voltage drop inherent in the resistor method is eliminated, however, thus allowing the use of a low-voltage screen supply without requiring a three-winding modulation transformer.

Inductor L needs to be nothing more than a garden-variety low-voltage filter choke. It should have a rated inductance of not less than 10 henrys divided by the number of tubes in the class-C stage, and a current rating of two or three times the actual screen current being used. Screen current will be in the neighborhood of 20 to 50 milliamperes per tube for Eimac 4-125A or 4-250A types. The diagram shows a 0.002 uf screen bypass capacitor; if two or more tubes are used in the modulated amplifier, each may have a bypass capacitor of 0.002 uf.

The 4 uf capacitor shown from the lower end of L to ground is to prevent audio variations in screen current from backing up into the screen supply and possibly introducing audio into the plate circuits of other stages operating from the same supply. If the screen supply has a 4-uf or larger capacitor across its output, the one shown in the diagram can be eliminated.

No matter which system you use, high-level modulating an Eimac tetrode takes no more audio power than plate modulating a triode running at the same plate input. More about this soon.

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