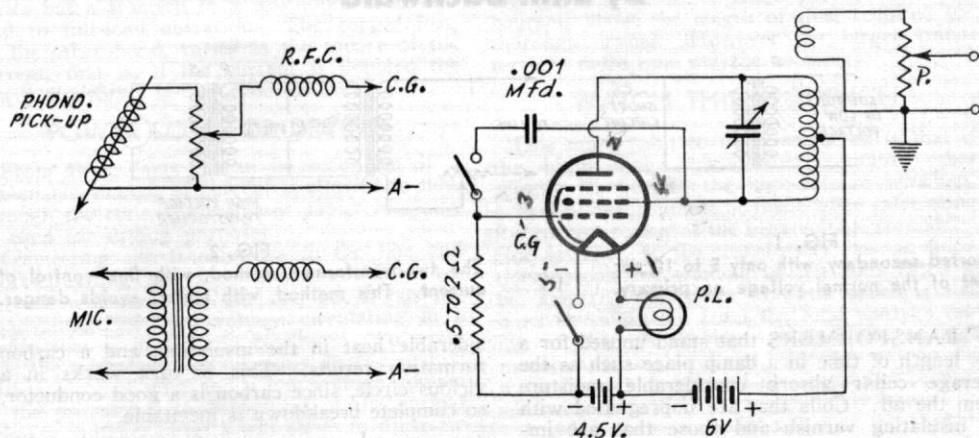


# 33 Oscillator, 6 Volts on Plate

## Stability and Self-Modulation

By R. K. Wheeler



The 33 oscillator, with two insets, one for phonograph pickup, other for microphone.

THE many varieties of multi-electrode tubes released during the past few years have offered many interesting opportunities to the experimenter and engineer. Practically every tube containing the requisite grid, or grids, and plate are tried out as oscillators, most of which offer little or no advantages over those already developed.

### OSCILLATION COIL CENTER-TAPPED

The power pentode of the two-volt series, type 33, is a tube that does offer distinct advantages over other types of oscillators. Its principal advantages are:

1. Better than ordinary stability.
2. Operates on a plate supply as low as 6 volts.
3. Easily self-modulated, with good clean note.

4. Requires only a single center-tapped coil for a given band.

5. Requires no selection of tubes.

In this application the center-tapped coil is connected between screen and plate, B plus connected to the tap. A .001 condenser between control grid and screen provides self-modulation. The grid is returned to the negative filament through a resistor of .5 to 2 megohms.

When the 33 is used, bear in mind that the suppressor is connected to the negative side of the filament inside the tube and the tube socket should be wired accordingly.

The plate supply may consist of two small 3-volt flashlight batteries, which are very satisfactory in this service, as the modulated plate current is around 75 microamperes, the unmodulated plate current around 200 microamperes. As the filament current requirement

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15- to 30-watt amplifier requires two large-sized dynamics, other larger sizes up to about 60 watts work out successfully with four speakers. Each amplifier usually has provisions for supplying field current to a limited number of speakers. Permanent magnet speakers require no field excitation.

The speakers should be placed close to the stage or any other place where the sound orig-

inates. A good installation should reinforce the program, but should not noticeably distort it. The location of the speakers, therefore, should be such that the majority of the listeners should hear simultaneously the original sound and the sound coming from the loudspeakers.

The installation and sale of public address equipment are relatively simple and every experimenter, radio serviceman and dealer should cash in on this growing market.

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is .25 ampere it will be seen that flashlight cells can be used only for short occasional service. It is recommended that three cells, or a total of 4.5 volts be used, and a pilot light included in the filament circuit so that there remains little likelihood of the oscillator being left operating unnecessarily. The output is obtained from a few turns coupled to the plate side of the coil. Such an oscillator will function on fundamentals as high as 10 megacycles. Above that, harmonics may be used.

As practically all power pentodes are good strong oscillators, the 38 may also be used in

this service, and if desired the filament supply obtained from the power line through a suitable line cord.

A novel use for either oscillator, which also has some practical aspects, is as a small transmitter for phonograph records or voice, with suitable coupling to the control grid. As some r. f. is likely to be fed back to the control grid the use of a choke at this point is desirable.

The principal disadvantages of this tube have been mentioned: the .25 ampere required for the filament and the limitation of 10 megacycles as the highest fundamental. At increased plate voltage 10 mc may not be the h-f limit.