

INSTRUCTIONS FOR  
**INSTALLING**  
*and*  
**OPERATING**



THE TYPE 405

**GENERAL RADIO**  
PLATE SUPPLY

MANUFACTURED BY  
**GENERAL RADIO COMPANY**  
30 State Street, - - Cambridge, Mass., U.S.A.

# INSTALLATION AND OPERATION



## Placing the 405 unit with Relation to Set

When used with a highly sensitive radio set the Plate supply should be located at least three and preferably five feet away. If used with a less sensitive receiver it may be found on trial that a smaller distance will be satisfactory. On the other hand, a much greater separation is not desirable. The attachment plug and cord, extended if necessary, should run to a lighting receptacle or wall outlet supplying 60-cycle current at a voltage from 110 to 115. This cord should be kept as far as practicable from all wires leading to the radio set, including antenna and ground.

## To Insert Tubes

Remove the cover of the instrument and insert a Type BH Raytheon tube into the socket. The two large prongs on the tube base must, of course, go into the two large holes in the socket. Do not attempt to use any other form of rectifying tube than the BH Raytheon.

The cover may now be replaced and the outfit will require no further attention except, of course, to operate the snap switch when the instrument is used.

## Making Connections to Set

The necessary number of wires for carrying the Plate potentials to the set may be run in the usual manner.

The majority of radio sets have either the positive or negative filament terminal connected to ground. This provides a sufficient grounding for the Plate supply. With sets wherein the filaments are not grounded and those employing an ungrounded loop it may be advisable to ground the B — terminal

directly, or if this is not desirable, to ground it through a condenser of from two to four MF capacity. This ground is unnecessary in many cases, but under certain conditions it is desirable to cut out a slight alternating current hum which may be perceptible in the loudspeaker.

The B — terminal of the eliminator should, of course, be connected directly to the B — terminal of the radio set. As stated previously, there are four different B + taps available. The detector tube and such amplifier tubes as are normally operated on detector tube voltage should be fed from the 45-volt tap of the Plate supply. The amplifier tubes requiring a higher voltage may be connected to the + 90 or + 130-volt terminal. No specific rule covering all cases can be given. The best procedure is to try each of these high voltage terminals and ascertain which one gives the better results. In general it may be said that sets employing more than four tubes fed from the high voltage terminal will probably require connection to the 130-volt taps. It is, of course, necessary that the grids of the amplifier tubes be properly biased, especially when using the 130-volt terminal.

The 200-volt terminal gives the total over-all voltage of the Plate supply. This is sufficiently high to afford plenty of voltage for operating a power amplifier tube, such as the UX171. If a separate source of filament power is available for this tube it is possible to utilize a portion of this voltage to afford the necessary negative grid bias for the tube.

## Measuring Plate Voltages

A word of caution should be inserted here concerning the attempt to measure the voltage at the terminals of this Plate supply. The ordinary inexpensive voltmeter draws so much current that the increased load on the Plate supply lowers the voltage considerably, so that the readings of such a meter are meaningless unless the meter load is known and taken into account. Reliable results may be obtained by using a five milliamperé meter connected in series with a resistance of 100,000 ohms. Such a voltmeter draws only one milliamperé per 100 volts deflection, which is permissible.

Tests have shown that, on the average, the open circuit voltage at the + 40 terminal is about 55 and that it drops at a uniform rate of about 2.35 volts per milliamperé load drawn from this terminal. The open circuit voltage at the + 90 terminal is about 132 and this drops at a uniform rate of

approximately 3.50 volts per milliampere load drawn from this terminal. At the + 130-volt terminal the open circuit voltage is about 205. This undergoes an approximate drop of 3.10 volts for each milliampere load drawn from this terminal. The open circuit voltage of the 200-volt terminal is about 260 and the rate of drop only 1.80 volts per milliampere load.

When properly installed the instrument should operate in a reliable and satisfactory manner. As stated previously, care must be taken that the tubes of the radio set, both detector and amplifiers, are not overloaded and are properly biased.