

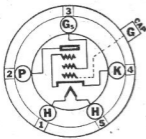
Sylvania

# TYPE 39/44

## SUPER-CONTROL

## RF AMPLIFIER

## PENTODE



### CHARACTERISTICS

Heater Voltage AC or DC . . . . .	6.3 Volts
Heater Current . . . . .	0.3 Ampere

### Direct Interelectrode Capacitances:

Grid to Plate (with tube shield) . . . . .	0.007 $\mu\text{mf}$
Input . . . . .	4.0 $\mu\text{mf}$
Output . . . . .	10.0 $\mu\text{mf}$
Maximum Over-all Length . . . . .	4 $\frac{11}{16}$ "
Maximum Diameter . . . . .	1 $\frac{1}{8}$ "
Bulb . . . . .	ST-12
Cap . . . . .	Small Metal
Base—Small 5-Pin . . . . .	5-F

### Operating Conditions and Characteristics:

Heater Voltage . . . . .	6.3	6.3	6.3 Volts
Plate Voltage . . . . .	90	180	250 Volts Max.
Grid Voltage . . . . .	-3.0	-3.0	-3.0 Volts Min.
Screen Voltage . . . . .	90	90	90 Volts Max.
Plate Current . . . . .	5.6	5.8	5.8 Ma.
Screen Current . . . . .	1.6	1.4	1.4 Ma.
Plate Resistance . . . . .	0.375	0.750	1.0 Megohm
Mutual Conductance . . . . .	960	1000	1050 $\mu\text{mhos}$
Amplification Factor . . . . .	360	750	1050
Mutual Conductance* . . . . .	2	2	2 $\mu\text{mhos}$

\*At -42.5 volts bias.

### CIRCUIT APPLICATION

Sylvania 39/44 is a super-control pentode for use as a radio frequency and intermediate frequency amplifier in a-c operated receivers, automobile receivers or any receiver operated from 110 volt power line.

The 39/44 is designed with a "suppressor" grid between the screen and plate. The "suppressor" is connected inside the tube to the cathode and hence is effective in eliminating the secondary emission effects which limit the voltage swing range permissible in the usual screen grid tube at low plate voltage, that is, at a plate voltage approximately equal to the screen voltage. This is of considerable importance in the design of receivers for use with 110 volt d-c lines, where the plate voltage is limited to about 90 volts. The plate resistance of this tube is considerably higher than that of the 36 tube for the same operating voltages, which is desirable in superheterodyne work.

The 39/44 is very effective in reducing modulation distortion and cross talk. Its design, as far as cut-off characteristics are concerned, is similar to the 35/51 in that cut-off occurs at about -40 volts control grid bias. This feature makes the tube very desirable for use in circuits incorporating automatic volume control.

Volume controlling may be accomplished by varying the negative voltage applied to the grid. In order to obtain adequate volume control, it is necessary that an available grid bias voltage of approximately 45 volts be obtainable. The 39/44 may be employed as the first detector in a superheterodyne circuit, and may be utilized to advantage in this position. In such service the grid bias may or may not be made variable. With variable bias on the first detector, the peak oscillator voltage should be about 1 volt less than the minimum grid bias, which will be approximately 7 volts. This practice will eliminate the possibility of cross modulation caused by the first detector drawing grid current. Without variable bias on the first detector, the oscillator peak voltage should be considerably less than the grid bias to prevent grid current on very strong signal swings.