

TYPE 6L7

PENTAGRID MIXER

AMPLIFIER



CHARACTERISTICS

Heater Voltage AC or DC	6.3 Volts
Heater Current	0.3 Ampere

Direct Interelectrode Capacitances:

Grid G to Grid Gm	0.12 μf
Grid G to Plate	0.0005 μf
Grid Gm to Plate	0.025 μf
Grid G to all other Electrodes	8.5 μf
Grid Gm to all other Electrodes	11.5 μf
Plate to all other Electrodes	12.5 μf
Maximum Over-all Length	3 1/8"
Maximum Diameter	1 1/8"
Cap	Miniature
Base—Small Octal 7-Pin	7-T

Typical Operation:

MIXER OPERATION

Heater Voltage	6.3	6.3 Volts
Plate Voltage	250	250 Max. Volts
Screen Voltage (Gs)	100	150 Max. Volts
Control Grid Voltage (G)	-3	-6 Min. Volts
Control Grid Voltage (Gm)	-10	-15 (approx.) Volts
Peak Oscillator Voltage applied to Gm	12	18 (approx.) Volts
Plate Current	2.4	3.3 Ma.
Screen Current	6.2	8.3 Ma.
Plate Resistance	1	1 Megohm Min.
Conversion Conductance	350	350 μmhos
Voltage on G for Conversion Conductance of 5 Micromhos	-30	-45 Volts

AMPLIFIER OPERATION

Heater Voltage	6.3	6.3 Volts
Plate Voltage	250	250 Max. Volts
Screen Voltage (Gs)	100	100 Max. Volts
Control Grid Voltage (G)	-3	-3 Min. Volts
Control Grid Voltage (Gm)	-3	-3 Volts
Plate Current	5.3	5.3 Ma.
Screen Current	5.5	5.5 Ma.
Plate Resistance	0.8	0.8 Megohm
Mutual Conductance	1100	1100 μmhos
Mutual Conductance at { -15 Volts Bias on G } { -15 Volts Bias on Gm }	5	5 μmhos

CIRCUIT APPLICATION

Sylvania 6L7 pentagrid mixer amplifier differs considerably in internal construction and connections from other pentagrid tubes such as the well known 6A7 and the new metal Type 6A8.

The grid structures and their uses will be described briefly. Starting from the cathode and proceeding outward the first grid (G) is connected to the top cap. The incoming signal circuit is connected to this grid and the return circuit may be connected to the automatic volume control circuit. The second grid serves as a shield between G and Gm and is tied internally to the fourth grid. Thus the second and fourth grids together become the screen grid (Gs). The third grid (Gm) is the one to which the oscillator voltage is applied. The fifth and outermost grid is the suppressor grid and is connected internally to the cathode.

The above arrangement, which is incorporated in the 6L7, makes this mixer tube superior to other types due to the fact that the plate impedance is considerably higher than that of tubes heretofore available. True electron coupling is provided since the oscillator voltage is applied to Gm. The capacity between Gm and ground is quite high and this fact must be taken into account in designing the oscillator circuit so as to adequately cover the desired range.

In addition to its principal use as a mixer tube, the 6L7 may be employed as an amplifier. By applying adjustable bias to both control grids, G and Gm, cut-off may be reached much more rapidly and less applied a-v-c voltage will be required to obtain control. The characteristics of the 6L7 as an amplifier do not compare favorably with the 78 or 6K7 because the transconductance is lower.

A Type 6L7 is included in the tube complement of the receiver circuit shown on Page 165.