


**Cunningham**   
**Radiotron**  
**RCA-6L7**

**Pentagrid Mixer Amplifier**

The 6L7 is a multi-electrode vacuum tube of the metal type designed with two separate control grids shielded from each other. This design permits each control grid to act independently on the electron stream. This tube, therefore, is especially useful as a mixer in superheterodyne circuits having a separate oscillator stage, as well as in other applications where dual control is desirable in a single stage. The design of the tube is such that coupling effects between oscillator and signal circuits are made very small. This feature enables the 6L7 to give high gain in high-frequency circuits.

**TENTATIVE CHARACTERISTICS**

|                                       |                    |               |
|---------------------------------------|--------------------|---------------|
| HEATER VOLTAGE (A.C. or D.C.)         | 6.3                | Volts         |
| HEATER CURRENT                        | 0.3                | Ampere        |
| DIRECT INTERELECTRODE CAPACITANCES: * |                    |               |
| Grid No.1 to Grid No.3                | 0.12               | $\mu\text{f}$ |
| Grid No.1 to Plate                    | 0.0005 max.        | $\mu\text{f}$ |
| Grid No.3 to Plate                    | 0.25               | $\mu\text{f}$ |
| Grid No.1 to All Other Electrodes     | 8.5                | $\mu\text{f}$ |
| Grid No.3 to All Other Electrodes     | 11.5               | $\mu\text{f}$ |
| Plate to All Other Electrodes         | 12.5               | $\mu\text{f}$ |
| MAXIMUM OVERALL LENGTH                | 3-1/8"             |               |
| MAXIMUM DIAMETER                      | 1-5/16"            |               |
| CAP                                   | Miniature          |               |
| BASE                                  | Small Octal 7-Pin. |               |

**As Mixer**

|                                       |                |              |
|---------------------------------------|----------------|--------------|
| PLATE VOLTAGE                         | 250 max.       | Volts        |
| SCREEN (Grids No.2 and No.4) VOLTAGE  | 150 max.       | Volts        |
| TYPICAL OPERATION:                    |                |              |
| Heater Voltage                        | 6.3            | Volts        |
| Plate Voltage                         | 250            | Volts        |
| Screen Voltage                        | 100            | Volts        |
| Signal-Grid (Grid No.1) Voltage       | -3             | Volts        |
| Oscillator-Grid (Grid No.3) Voltage** | -10            | Volts        |
| Peak Oscillator Voltage               |                |              |
| Applied to Grid No.3 (Minimum)        | 12             | Volts        |
| Plate Current                         | 2.4            | Milliamperes |
| Screen Current                        | 6.2            | Milliamperes |
| Plate Resistance                      | Greater than 1 | Megohm       |
| Conversion Conductance                | 350            | Micromhos    |
| Signal-Grid (Grid No.1) Voltage       |                |              |
| For Conver. Cond. of 5 Micromhos      | -30            | Volts        |

\*\* The d-c resistance in oscillator-grid-No.3 circuit should be limited to 50000 ohms.

# Recommended values for all-wave receivers.

\* With shell connected to cathode.

## As Amplifier

|                                                                                                                                       |                 |              |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|
| HEATER VOLTAGE                                                                                                                        | 6.3             | Volts        |
| PLATE VOLTAGE                                                                                                                         | 250 <i>max.</i> | Volts        |
| SCREEN (Grids No.2 and No.4) VOLTAGE                                                                                                  | 100 <i>max.</i> | Volts        |
| CONTROL GRID (Grid No.1) VOLTAGE                                                                                                      | -3 <i>min.</i>  | Volts        |
| CONTROL GRID (Grid No.3) VOLTAGE                                                                                                      | -3              | Volts        |
| PLATE CURRENT                                                                                                                         | 5.3             | Milliamperes |
| SCREEN CURRENT                                                                                                                        | 5.5             | Milliamperes |
| PLATE RESISTANCE                                                                                                                      | 0.8             | Megohm       |
| MUTUAL CONDUCTANCE                                                                                                                    | 1100            | Micromhos    |
| MUT. COND. $\left\{ \begin{array}{l} -15 \text{ volts bias on Grid No.1} \\ -15 \text{ volts bias on Grid No.3} \end{array} \right\}$ | 5               | Micromhos    |

## INSTALLATION

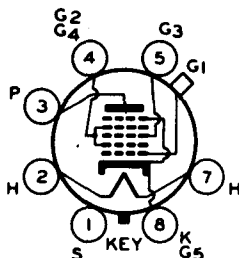
The base pins of the 6L7 fit the standard seven-contact octal-base socket (or the universal eight-contact socket) which may be installed to hold the tube in any position.

For heater operation and cathode connection, refer to INSTALLATION for type 6AB.

## APPLICATION

As a mixer in superheterodyne circuits, the 6L7 can mix the input from an external oscillator with the radio-input frequency to provide the desired intermediate frequency. For this service, design information is given under CHARACTERISTICS.

As a radio-frequency or intermediate-frequency amplifier, the 6L7 should be operated as shown under CHARACTERISTICS. In general, properly designed radio-frequency transformers are preferable to interstage coupling impedances, especially in cases where a high-impedance B-supply may cause oscillation below radio frequencies. The fact that the grid No.1-plate capacitance of the 6L7 is extremely small is advantageous in circuits where high attenuation is required.



BOTTOM VIEW

# AVERAGE CHARACTERISTICS FOR TYPE 6L7

