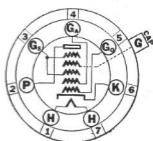


Sylvania

TYPE 6A7

PENTAGRID CONVERTER



CHARACTERISTICS

Heater Voltage AC or DC	6.3 Volts
Heater Current	0.3 Ampere

Direct Interelectrode Capacitances:

Grid G to Plate (with tube shield)	0.30 $\mu\mu\text{f}$
Grid G to Grid Ga (with tube shield)	0.20 $\mu\mu\text{f}$
Grid G to Grid Go (with tube shield)	0.15 $\mu\mu\text{f}$
Grid Go to Grid Ga	1.0 $\mu\mu\text{f}$
Grid G to all other Electrodes (R-F Input)	8.5 $\mu\mu\text{f}$
Grid Ga to all other Electrodes (Osc. Output)	5.5 $\mu\mu\text{f}$
Grid Go to all other Electrodes (Osc. Input)	7.0 $\mu\mu\text{f}$
Plate to all other Electrodes (Mixer Output)	9.0 $\mu\mu\text{f}$

Maximum Over-all Length	4 $\frac{13}{32}$ "
Maximum Diameter	1 $\frac{1}{16}$ "
Bulb	ST-12
Cap	Small Metal
Base—Small 7-Pin	7-C

Operating Conditions and Characteristics:

Heater Voltage	6.3	6.3 Volts
Plate Voltage	100	250 Volts Max.
Control Grid Voltage (Grid G)	-1.5	-3 Volts
Screen Voltage (Grid Gs)	50	100 Volts Max.
Anode Grid Voltage (Grid Ga)	100*	250* Volts Max.
Oscillator Grid Resistor (Grid Go)	50000	50000 Ohms
Plate Current	1.3	3.0 Ma.
Screen Grid Current	1.3	3.0 Ma.
Anode Grid Current	1.4	4.0 Ma.
Oscillator Grid Current	0.25	0.7 Ma.
Cathode Resistor	300	300 Ohms
Plate Resistance	0.5	0.36 Megohm
Conversion Conductance	350	520 μmhos
Control Grid Voltage (2 μmhos Conv. Cond.)	-20	-45 Volts

*Applied through 20000 ohm dropping resistor.

CIRCUIT APPLICATION

Sylvania 6A7 is highly recommended for detector-oscillator service in superheterodyne receivers. It is adaptable in automobile, AC, AC-DC, and DC radios as well as in sets designed to operate on 32 volt farm lighting equipment. The inner section of the tube supplies the local oscillator frequency and, at the same time, the radio input signal is applied to the No. 4 or control grid; the beating of these signals produces the requisite intermediate frequency.

Conventional circuits for a triode oscillator are applicable for the oscillator section of the 6A7 provided proper consideration is given to the constants involved.

Likewise, the detector section may, in general, be considered as functioning similar to a separate variable- μ detector. However, due to the series modulation which results from the oscillator control of the electron stream, it is not necessary to feed the oscillator voltage into the detector grid circuit; nor is there cause for concern of driving the signal grid positive.

The value of the oscillator-grid resistor is not critical, but will be determined primarily by the voltage applied to the anode-grid and the screen.

Plate Volts	Anode-Grid Volts	Screen Volts	Approx. Values of Oscillator-Grid Resistor Ohms
250	250	100	50,000 to 100,000
250	100	75	25,000 to 50,000
250	100	50	10,000 to 25,000
100	100	50	10,000 to 25,000

If in a given circuit an audio frequency oscillation is experienced in the 6A7 it will probably be due to the fact that there is too much feed-back for the value of grid leak and condenser employed. In such a case, it may be necessary to reduce the coupling between the oscillator-grid and anode coils, or to lower the value of the grid leak resistance if the value was originally too high.

The total cathode current should not exceed the 14 milliampere maximum rating. The average value will be about 11 milliamperes.

Translation gain of the tube can be controlled by a variable negative voltage on the modulator grid which may be obtained either from a separate supply or from a variable resistor in the cathode circuit. If the latter method is used, the oscillator-grid return **must** be made directly to the cathode. Otherwise, the oscillator performance will be affected by variations in modulator-grid bias.

It is important to use a plate load capacity of sufficient size (at least 50 $\mu\mu\text{f.}$) in order to limit the r-f voltage built up across the load. Otherwise, an r-f voltage feed-back will occur between the plate and oscillator-grid, producing degeneration and loss of gain.

For the 250 volt rating on Grid Ga (the anode-grid), a series resistor of approximately 20,000 ohms should be inserted in order to prevent excessive heating. If the resistor is omitted these rods will get red hot whenever the oscillations are feeble due to the small bias voltage developed across the grid leak and to the high anode-grid potential.

NOTE: For discussion of **Improved Oscillator Modulator Systems**, see Type 2A7.