SYLVANIA

engineering data service 6D4

MECHANICAL DATA

Bulb	T-5½
Base	E7-1, Miniature Button 7-Pin
Outline	5-2
Basing	5AY
Cathode	Coated Unipotential
Mounting Position	Any

ELECTRICAL DATA

HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts	
Heater Current	250 Ma	
Heater-Cathode Voltage (Absolute Maximum Values)		
Heater Positive with Respect to Cathode	110 Volts	Max.
Heater Negative with Respect to Cathode	110 Volts	Max.

RATINGS (Absolute Maximum Values)

Plate Supply Voltage	250 Volts	
Peak Plate Inverse Voltage	350 Volts	
Peak Plate Forward Voltage	350 Volts	
Negative Grid No. 1 Voltage	110 Volts	
Peak Plate Current	110 Ma	
Average Plate Current	25 Ma	
Cathode Heating Time[1]	30 Seconds	Min.
Duty Cycle	0.75 Percent	

CHARACTERISTICS AND TYPICAL OPERATION

Thyratron Operation

Plate Supply Voltage	50	125	300 Volts	
Series Plate Resistor	650	650	650 Ohms	
Cathode Resistor	4000	4000	4000 Ohms	
Grid Resistor	0.5	0.5	0.5 Megohm	
Heater Cathode Resistor	1.0	1.0	1.0 Megohm	
Grid Voltage to Start Conduction (approx.)	-6	-12.5	-26 Volts	
Tube Voltage Drop @ Ib = 100 Ma			18 Volts	Max.

Noise Generator Operation

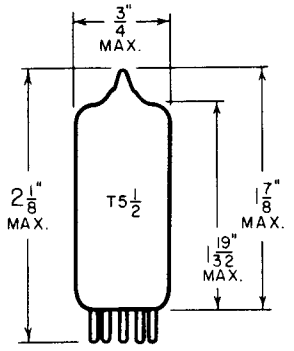
Plate Supply Voltage	250 Volts	
Grid Voltage	0 Volts	
Cathode Resistor	0 Ohms	
Plate Resistor	33,000 Ohms	
Noise Output (Peak to Peak)[2]	10 Volts	Min.

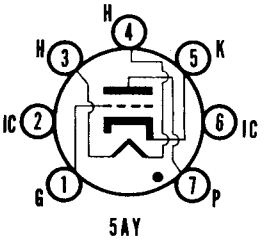
NOTES:

1. *Heater voltage must be applied before application of anode voltage so that the cathode reaches operating temperature.*
2. *The tube shall be placed in the circuit shown (Figure 1) in a constant magnetic field of 375 ± 20% gausses which is perpendicular to the normal electron path. The direction of the magnetic field shall be such as to deflect the electron beam toward the top of the tube. The noise voltage measured at the plate of the tube and across the output of the circuit shall not be less than the specified limit in peak-to-peak volts. The oscilloscope used for noise amplitude measurement shall have a 3 db video bandwidth extending to at least 4 megacycles.*

QUICK REFERENCE DATA

The Sylvania Type 6D4 is a miniature triode thyratron intended for use as a relay tube or wide band noise generator.





SYLVANIA ELECTRIC PRODUCTS INC.

RADIO TUBE DIVISION
EMPORIUM, PA.

Prepared and Released By The
TECHNICAL PUBLICATIONS SECTION
EMPORIUM, PENNSYLVANIA

JUNE, 1957

APPLICATION

The Sylvania Type 6D4 thyratron is an excellent source of wide band noise. In this application, the tube is placed in a steady magnetic field which is directed through the tube at right angles to the conducting arc. Proper magnetic field alignment will be obtained if the field is directed parallel to a center-line through the tube base. This center-line passes half-way between pins numbered 3 and 4. Preferably, the north pole of the magnet should be adjacent to pin 7. A magnetic field strength of approximately 375 ± 20% gauss should be used.

In Figure 1, the tube is employed as a diode with the grid connected to the cathode. The plate series resistance (R_p) should be selected to limit the plate current (Ib) to about 6 to 7 ma with a plate supply (Ebb) of approximately 300 volts (with the specified magnet in place the plate supply voltage may be as high as 300 volts). Supply voltages lower than 250 volts may cause uncertain firing.

The Noise Generator Circuit should be immediately followed by a buffer amplifier to prevent reactive loading of the noise generator. This facilitates the use of filter and compensating amplifier circuits.

The Sylvania Type 6D4 alone does not produce uniform noise output over its useful range of frequencies (see Figure 2). The low frequency noise output is reasonably uniform, rising to a peak in the vicinity of one megacycle then dropping off quite rapidly at frequencies above two megacycles, consequently a compensated amplifier is required to obtain a uniform high level noise output. If the full spectrum is not required, filters may be used to obtain the desired high frequency cutoff.

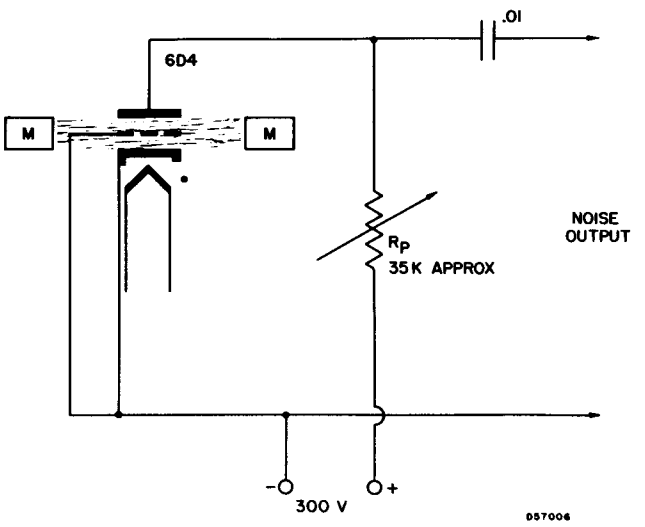


FIGURE 1. BASIC CIRCUIT OF NOISE GENERATOR

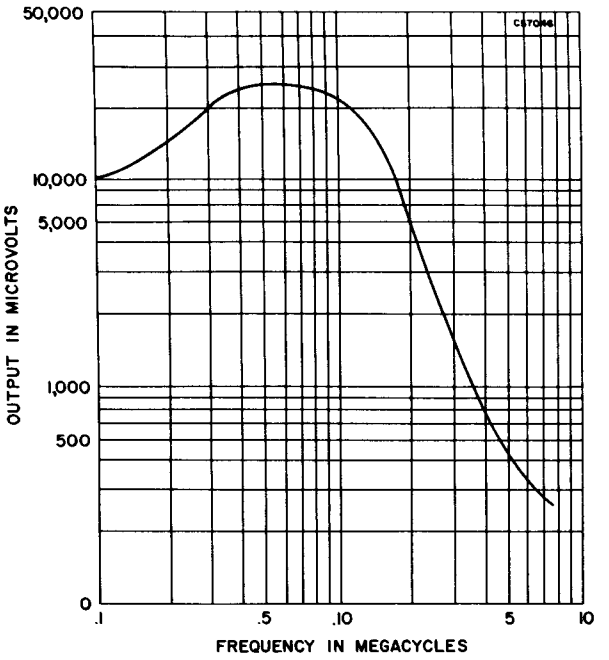


FIGURE 2. APPROXIMATE NOISE OUTPUT VS FREQUENCY