

### ADVANCE DATA

The Sylvania Type 6945 is a subminiature beam power pentode designed for audio frequency amplifier service. This type is characterized by extraordinary freedom from interelement short circuits of short term duration, by high resistance to interelement leakage, and by stable performance. In addition, vibrational output when the tube is subjected to wide band (White Noise) vibration is held to a very low value. It is suitable for service at high altitudes and where severe conditions of mechanical shock, vibration and high temperature are encountered. These characteristics give the type special value in guided missile applications.

### MECHANICAL DATA

Bulb	T-3
Base	E8-10 Subminiature Button
Outline	3-3
Basing	8DL
Cathode	Coated Unipotential
Mounting Position	Any

### RATINGS <sup>1</sup>

Bulb Temperature (At Hottest Point)	250 °C	Max.
Operational Altitude	80,000 Ft	Max.

### DURABILITY CHARACTERISTICS <sup>2</sup>

Impact Acceleration <sup>3</sup>	100 G
Vibrational Acceleration for an Extended Period <sup>4</sup>	10 G
On-Off Heater Cycles <sup>5</sup>	2000

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

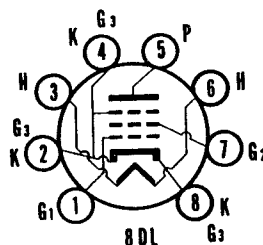
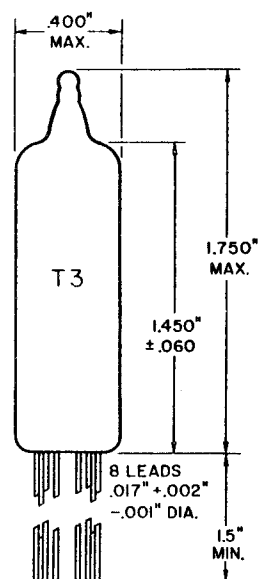
Heater Voltage	6.3 V	
Heater Current	350 mA	
Heater-Cathode Voltage (Absolute Values)	200 v	Max.

#### CONTROLLED DETRIMENTS

Interelectrode Insulation <sup>6</sup>	100 Meg	Min.
Total Grid Current <sup>7</sup>	-1.0 $\mu$ Adc	Max.
Grid Emission <sup>8</sup>	-2.0 $\mu$ Adc	Max.
Hum Output <sup>9</sup>	10.0 mv pk-pk	Max.
White Noise Vibration Output <sup>10</sup>	650.0 mv pk-pk	Max.
	75.0 mV rms	Max.
Heater-Cathode Leakage <sup>11</sup>	10.0 $\mu$ Adc	Max.

### QUICK REFERENCE DATA

The Sylvania Type 6945 is a subminiature AF beam power pentode designed specifically for guided missile service.



SYLVANIA ELECTRIC PRODUCTS INC.

RADIO TUBE DIVISION  
EMPORIUM, PA.

Prepared and Released By The  
TECHNICAL PUBLICATIONS SECTION  
EMPORIUM, PENNSYLVANIA

May 6, 1957

Page 1 of 3

DIRECT INTERELECTRODE CAPACITANCES<sup>12</sup>

Grid No. 1 to Plate	0.13	$\mu\text{f}$	Max.
Input: g1 to (h+k+g2+g3+i.s.+e.s.)	5.0	$\mu\text{f}$	
Output: p to (h+k+g2+g3+i.s.+e.s.)	5.5	$\mu\text{f}$	

RATINGS<sup>1</sup> (Absolute Values)

Heater Voltage Variation	6.3 $\pm$ 10%	V	Max.
Instantaneous Plate Voltage	360	v	Max.
Plate Voltage	250	Vdc	Max.
Grid No. 2 Voltage	150	Vdc	Max.
Plate Dissipation	3.0	W	Max.
Grid No. 2 Dissipation	0.33	W	Max.
Positive Grid No. 1 Voltage	0	Vdc	Max.
Negative Grid No. 1 Voltage	55	Vdc	Max.
External Grid No. 1 Circuit Resistance	0.5	Meg	Max.

## AVERAGE CHARACTERISTICS

## Conditions:

Heater Voltage	6.3	V
Plate Voltage	100	Vdc
Grid No. 2 Voltage	100	Vdc
Cathode Bias Resistor	270	Ohms
Plate Current	25	mAdc
Grid No. 2 Current	1.5	mAdc
Transconductance	3500	$\mu\text{mhos}$
Plate Resistance	20,000	Ohms
Grid No. 1 Voltage for $I_b = 10 \mu\text{a}$	-30	Vdc
Power Output at $R_L = 3000 \text{ Ohms}$ ; $E \text{ signal} = 6.4 \text{ Vac}$	0.8	W

Operation Time<sup>13</sup> (maximum) 20 secs

## Triode Connected

Plate and Grid No. 2 Voltage	100	Vdc
Cathode Bias Resistor	270	Ohms
Plate Current	26	mAdc
Transconductance	3700	$\mu\text{mhos}$
Plate Resistance	1500	Ohms
Amplification Factor	5.5	

## NOTES:

- Limiting values beyond which normal tube life and normal tube performance may be impaired.
- Tests performed as a measure of the mechanical durability of the tube structure.
- Force as applied in any direction by the Navy Type High Impact (Flyweight) Shock Machine for Electronic Devices. Shock duration = 4 milliseconds.
- Vibrational forces applied in any direction for a period of six hours repeatedly sweeping the range from 30 cps to 3000 cps and back, with the period of the sweep cycle being three minutes.

## NOTES: (Cont'd)

5. One cycle consists of the application of  $E_f = 7.0$  V for one minute and interruption of the filament voltage for four minutes. A voltage of  $E_{hk} = 140$  Vac is applied continuously.
6. Measured with  $E_f = 6.3$  V;  $E_{g1-all} = -100$  Vdc;  $E_{g2-all} = -200$  Vdc;  $E_p-all = -300$  Vdc; cathode is positive so that no cathode emission occurs.
7. Measured with  $E_f = 6.3$  V;  $E_b = E_{c2} = 100$  Vdc;  $R_k = 270$  Ohms;  $R_{g1} = 0.5$  Meg.
8. Preheated for five minutes with  $E_f = 7.5$  V;  $E_b = 250$  Vdc;  $E_{c2} = 150$  Vdc;  $R_k = 1700$  Ohms;  $R_{g1} = 0.5$  Meg; then tested with  $E_f = 7.5$  V;  $E_b = E_{c2} = 100$  Vdc;  $E_{c1} = -30$  Vdc;  $R_{g1} = 0.5$  Meg. This is a destructive test and therefore must be conducted on a sample basis.
9. Test with  $E_f = 6.3$  V (400 cps);  $E_b = E_{c2} = 100$  Vdc;  $R_k = 270$  Ohms;  $R_L = 500$  Ohms; measure the hum output across  $R_L$  in the frequency band from 20 cps to 5000 cps.
10. Test with  $E_f = 6.3$  V;  $E_b = E_{c2} = 100$  Vdc;  $R_k = 270$  Ohms;  $R_p = 2000$  Ohms; The White Noise voltage across  $R_p$  is filtered to roll off approximately 35 db between 10,000 cps and 13,000 cps and is then measured with both a peak to peak meter and an rms reading meter. The vibrational force applied to the tube under test is such that the instantaneous values of acceleration form a White Noise spectrum from 100 cps to 5000 cps. Energy within this spectrum is distributed such that each octave of bandwidth delivers 2.3 G's rms acceleration. The degree of clipping is such that peak values of acceleration exceed 15 G's.
11. Measured with  $E_f = 6.3$  V;  $E_{hk} = \pm 100$  Vdc.
12. Capacitances are measured with an external shield of 0.405" i.d.
13. Operation time is the time required for a tube to reach a value of plate current equal to 85% of that value attained after three minutes.