



MECHANICAL DATA

Bulb	T-9
Base	E12-70, 12 Pin
Outline	9-58
Basing	12BT
Cathode	Coated Unipotential
Mounting Position	Any

ELECTRICAL DATA

HEATER CHARACTERISTICS AND RATINGS

Average Characteristics

Heater Operation	17X10 Series
Heater Voltage	16.8 Volts
Heater Current	450 <sup>1</sup> Ma
Heater Warm-up Time <sup>2</sup>	11 Seconds

Ratings (Design Maximum Values)<sup>4</sup>

Heater Current <sup>3</sup>	Min-Max	420-480 Ma
Maximum Heater-Cathode Voltage		
Heater Negative with Respect to Cathode		
Total DC and Peak	200	Volts
Heater Positive with Respect to Cathode		
DC	100	Volts
Total DC and Peak	200	Volts

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Section No. 1

Grid No. 1 to (h+1k+1g2+1g3+1S)	4.4	pf
Grid No. 3 to (h+1k+1g1+1g2+1p+1S)	3.2	pf
Grid No. 1 to Grid No. 3	0.005	pf

Section No. 2

Grid to Plate	0.24	pf
Input: g to (h+2k+2g2+g3+1k+1S)	12.0	pf
Output: p to (h+2k+2g2+g3+1k+1S)	9.0	pf

RATINGS (Design Maximum Values)<sup>4</sup>

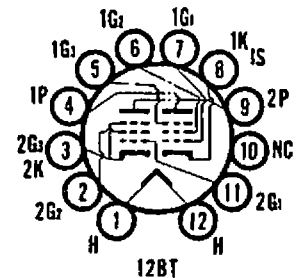
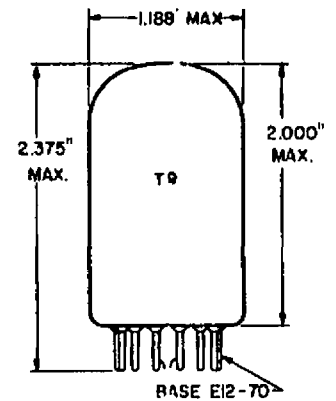
Section No. 1

Plate Supply Voltage	330	Volts
Accelerator Voltage (G2)	110	Volts
Peak Positive G1 Voltage	60	Volts
DC Cathode Current	13	Ma

QUICK REFERENCE DATA

The Sylvania Type 17X10 is a double dissimilar pentode contained in a T-9 bulb with 12 pin base. Section No. 1 is intended for Limiter/Discriminator service and Section No. 2 is designed as a power pentode.

The 17X10 has controlled heater warm-up time for series string circuits.



SYLVANIA ELECTRIC PRODUCTS INC.

Electronic Components Group  
ELECTRONIC TUBE DIVISION  
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RATINGS (Design Maximum Values)<sup>4</sup> Continued

## Section No. 2

Plate Voltage	165	Volts
Screen Voltage	150	Volts
Plate Dissipation	6.5	Watts
Screen Dissipation	1.8	Watts
DC Cathode Current	65	Ma
Grid No. 1 Circuit Resistance		
Fixed Bias	0.25	Megohms
Cathode Bias	0.5	Megohms

## AVERAGE CHARACTERISTICS

## Section No. 1

## Gated Beam Discriminator Section - Limiter/Discriminator Service

Input Signal Center Frequency	10.7	10.7	4.5	mc
Frequency Deviation	±75	±75	±25	kc
Plate Supply Voltage	85	285	270	Volts
Plate Voltage	62	122	121	Volts
Accelerator Voltage	55	100	100	Volts
Cathode Bias Resistor - Variable <sup>5</sup>	200-400	200-400	200-400	Ohms
Plate Load Resistor	.085	.330	.330	Meg
Plate Linearity Resistor	470	1500	1000	Ohms
Integrating Capacitor	.002	.001	.001	µf
Coupling Capacitor	.25	.01	.25	µf
Minimum Signal Voltage for Limiting Action, rms <sup>6</sup>	1.25	1.25	1.25	Volts
DC Plate Current	.25	.49	.44	Ma
Accelerator Current	4.1	9.8	10	Ma
Input Signal Level for AM Rejection Adjustment <sup>5</sup>	1.25	2.0	2.0	Volts
AM Rejection At Esig = 2.0 Volts, rms	31	20	25	db
AM Rejection at Esig = 3.0 Volts, rms	30	29	30	db
Total Harmonic Distortion	2.0	1.6	1.8	Percent
Peak Audio Output Voltage	6.0	16.6	16.8	Volts

## Section No. 2

## Power Amplifier

Plate Voltage	145	Volts
Screen Voltage	110	Volts
Grid No. 1 Voltage	-6.0	Volts
Peak AF Grid Voltage	6.0	Volts
Plate Resistance (Approx.)	30,000	Ohms
Transconductance	8600	µmhos
Zero Signal Plate Current	36	Ma
Maximum Signal Plate Current	40	Ma
Zero Signal Screen Current	3.0	Ma
Maximum Signal Screen Current	9.0	Ma
Load Resistance	3000	Ohms

Total Harmonic Distortion (Approx.)  
Maximum Signal Power Output

10 Per Cent  
2.4 Watts

## NOTES:

1. For series operation of heaters, equipment should be designed that a normal supply voltage bogey tubes will operate at this value of heater current.
2. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times the rated heater voltage divided by the rated heater current.
3. Heater voltage supply variations shall be restricted to maintain heater current within the specified tolerance.
4. Design Maximum Ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions. The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration. The equipment manufacturer should design so that initially and throughout life no design maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation environmental conditions, and variations characteristics of all other electron devices in the equipment.
5. The cathode resistor should be adjusted for maximum am rejection in the output of the limiter-discriminator stage at the specified signal level. Am rejection is measured with an applied signal containing 30% am and 30% fm.
6. At signal levels above specified value, limiting is within  $\pm 3$  decibels. Adequate shielding between components of the limiter grid and the quadrature grid must be used to insure proper phasing of the voltage developed at the quadrature grid. Standard de-emphasis requirements for fm are included. The Q of the quadrature grid circuit should be high enough to develop a minimum of 4 volts (rms) signal with 2 volts (rms) of the center-frequency signal applied to the limiter grid. It is recommended that the coil be shunted by a minimum of 10  $\mu\text{mf}$ . The capacitance may be composed of tube input capacitance, stray capacitance, and distributed capacitance, as well as physical capacitance.