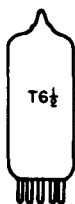
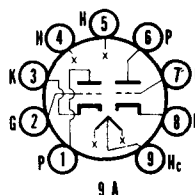


# TYPE 6AX6G

(See Condensed Data Section)



## SYLVANIA TYPE 6AX7 HIGH-MU DUO TRIODE



### ELECTRICAL DATA

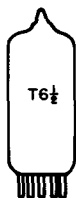
#### HEATER CHARACTERISTICS

	Parallel	Series
Heater Voltage.....	3.15	6.3 Volts
Heater Current.....	600	300 Ma
Heater Warm-up Time	Applied to Parallel Connection Only (See SERIES STRING HEATERS Section in Appendix)	
Maximum Heater-Cathode Voltage	200 Volts	
Total D C and Peak.....	100 Volts	
D C, Heater Positive with Respect to Cathode.....	100 Volts	

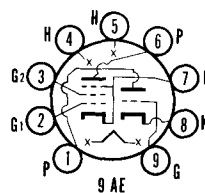
For other rating, operation, and application data, refer to corresponding Type 12AX7, which is identical except for heater ratings.

### APPLICATION

The Sylvania Type 6AX7 is intended for service in television receivers employing series connected heaters. For information on specially controlled heaters for series string operation refer to the SERIES STRING HEATER section of the Appendix.



## SYLVANIA TYPE 6AX8 TRIODE PENTODE



### MECHANICAL DATA

Bulb.....	T-6 1/2
Base.....	Small Button, 9-Pin
Outline.....	6-2
Basing.....	9AE
Cathode.....	Coated Unipotential
Mounting Position.....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	450 Ma
Heater-Cathode Voltage	
Heater Negative with Respect to Cathode	
Total D C and Peak.....	90 Volts Max.
Heater Positive with Respect to Cathode	
Total D C and Peak.....	90 Volts Max.

# TYPE 6AX8 (Cont'd)

## DIRECT INTERELECTRODE CAPACITANCES (Shielded)<sup>1</sup>

### Pentode

Grid No. 1 to Plate .....	0.006 $\mu$ f Max.
Input: g1 to (h + k & g3 & 1S + g2) .....	5.0 $\mu$ f
Output: p to (h + k & g3 & 1S + g2) .....	3.5 $\mu$ f

### Triode

Grid to Plate .....	1.8 $\mu$ f
Grid to Cathode (h + k) .....	2.5 $\mu$ f
Plate to Cathode (h + k) .....	1.0 $\mu$ f
Cathode to Heater (approx.) .....	3.5 $\mu$ f

## RATINGS (Design Center Values)

	Triode	Pentode
Plate Voltage .....	300	300 Volts Max.
Plate Dissipation .....	2.7	2.8 Watts Max.
Grid No. 2 Supply Voltage .....	---	300 Volts Max.
Grid No. 2 Voltage .....	See Rating	Chart for Type 6AM8
Grid No. 2 Dissipation .....	---	0.5 Watt Max.
Positive D C Grid No. 1 Voltage .....	0	0 Volts Max.

## CHARACTERISTICS AND TYPICAL OPERATION

	Triode	Pentode
Plate Voltage .....	150	250 Volts
Grid No. 2 Voltage .....	---	110 Volts
Cathode Resistor .....	56	120 Ohms
Plate Current .....	18	10 Ma
Grid No. 2 Current .....	---	3.5 Ma
Transconductance .....	8500	4800 $\mu$ mhos
Amplification Factor .....	40	---
Plate Resistance (approx.) .....	0.005	0.4 Megohm
Grid No. 1 Voltage for Ib = 10 $\mu$ a .....	-12	-12 Volts

### NOTE:

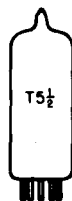
- Shield No. 315.

## APPLICATION

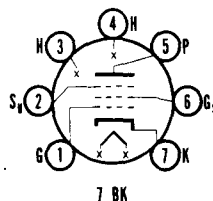
The Sylvania Type 6AX8 is a medium mu triode and high gm pentode designed for use as a video amplifier and sync separator.

# TYPES 6B4G, 6B5, 6B6G, 6B7, 6B7S, 6B8G, GT

(See Condensed Data Section)



## SYLVANIA TYPE 6BA6 REMOTE CUTOFF R F PENTODE



## MECHANICAL DATA

Bulb .....	T-5 1/2, Outline 5-2
Base .....	Miniature Button 7-Pin
Basing .....	7BK
Mounting Position .....	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

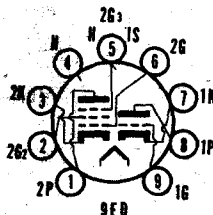
Heater Voltage .....	6.3 Volts
Heater Current .....	300 Ma
Maximum Peak Heater-Cathode Voltage .....	90 Volts

### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid to Plate .....	.0035 $\mu$ f Max.
Input .....	5.5 $\mu$ f
Output .....	5.0 $\mu$ f



**SYLVANIA TYPE 6AZ8**  
**MEDIUM MU TRIODE**  
**SEMI-REMOTE CUTOFF PENTODE**



**MECHANICAL DATA**

Bulb .....	T-6 $\frac{1}{2}$
Base .....	E9-1, Small Button 9-Pin
Outlining .....	6-2
Basing .....	9ED
Cathode .....	Coated Unipotential
Mounting Position .....	Any

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS**

Heater Voltage .....	6.3 Volts
Heater Current .....	450 Ma
Heater-Cathode Voltage (Design Center Values)	
Heater Negative with Respect to Cathode	
Total D C and Peak .....	200 Volts Max.
Heater Positive with Respect to Cathode	
D C .....	100 Volts Max.
Total D C and Peak .....	200 Volts Max.

**DIRECT INTERELECTRODE CAPACITANCES (Unshielded)**

<b>Triode Section</b>	
Grid to Plate .....	1.7 $\mu$ f
Grid to (h + k + I.S.) .....	2.0 $\mu$ f
Plate to (h + k + I.S.) .....	1.7 $\mu$ f
<b>Pentode Section</b>	
Grid No. 1 to Plate .....	0.02 $\mu$ f Max.
Grid No. 1 to (h + k + g <sub>2</sub> + g <sub>3</sub> + I.S.) .....	6.5 $\mu$ f
Plate to (h + k + g <sub>2</sub> + g <sub>3</sub> + I.S.) .....	2.2 $\mu$ f
<b>Coupling</b>	
Triode Grid to Pentode Plate .....	0.027 $\mu$ f Max.
Pentode Grid No. 1 to Triode Plate .....	0.020 $\mu$ f Max.
Pentode Plate to Triode Plate .....	0.045 $\mu$ f Max.

**MAXIMUM RATINGS (Design Center Values)**

	<b>Triode Section</b>	<b>Pentode Section</b>
Plate Voltage .....	300	300 Volts
Grid No. 2 Supply Voltage .....		300 Volts
Grid No. 2 Voltage .....	See 6AM8 Rating Chart	
Positive Grid No. 1 Voltage .....	0	0 Volts
Plate Dissipation .....	2.6	2.0 Watts
Grid No. 2 Input:		
For Grid No. 2 Voltages up to 150 Volts .....		0.5 Watt
For Grid No. 2 Voltages Between 150 and 300 Volts .....	See 6AM8 Rating Chart	
Maximum Circuit Values <sup>1</sup>		
Cathode Bias .....	1.0	1.0 Megohms
Fixed Bias .....	0.5	0.25 Megohm

**CHARACTERISTICS AND TYPICAL OPERATION**

	<b>Triode Section</b>	<b>Pentode<sup>2</sup> Section</b>
Class A <sub>1</sub> Amplifier		
Plate Supply Voltage .....	200	200 Volts
Grid No. 2 Supply Voltage .....		150 Volts
Grid No. 1 Voltage .....	-6	Volts
Cathode Bias Resistor .....		180 Ohms
Plate Current .....	13	9.5 Ma
Grid No. 2 Current .....		3 Ma
Transconductance .....	3300	6000 $\mu$ mhos
Amplification Factor .....	19	
Plate Resistance (approx.) .....	5750	300,000 Ohms
Grid No. 1 Voltage (approx.) for Plate Current of 10 $\mu$ a .....	-19	Volts
Grid No. 1 Voltage (approx.) for Transconductance of 100 $\mu$ mhos .....		-12.5 Volts

**NOTES:**

1. If either unit is operated at maximum rated conditions, Grid No. 1 Circuit Resistances for both units should not exceed the stated values.
2. The heater-cathode voltage should not exceed the value of the operating cathode bias because the voltage between the heater and cathode is also applied between the cathode and Grid No. 3. The net result is the make Grid No. 3 Negative with respect to cathode with possible change in tube characteristics.

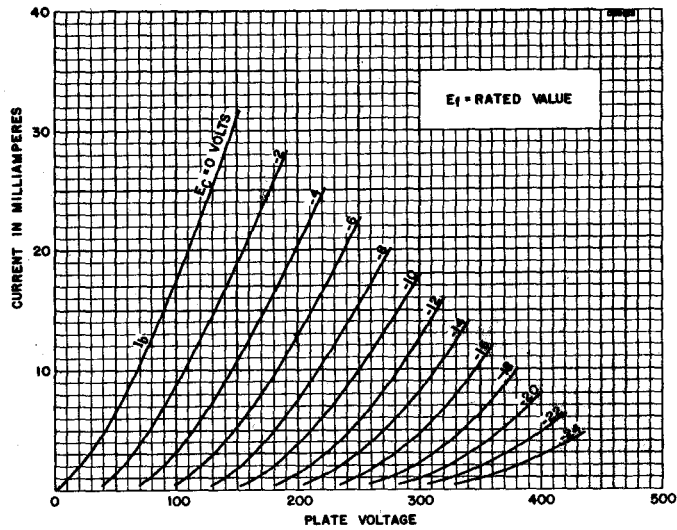
**APPLICATION**

The 6AZ8 is a miniature medium mu triode and semi-remote cutoff pentode designed for application in television receivers. The triode is well suited for operation as a sync separator, sync clipper, low frequency oscillator and phase splitter. The pentode may be used as an i f amplifier, video amplifier, a g c amplifier, and reactance tube.

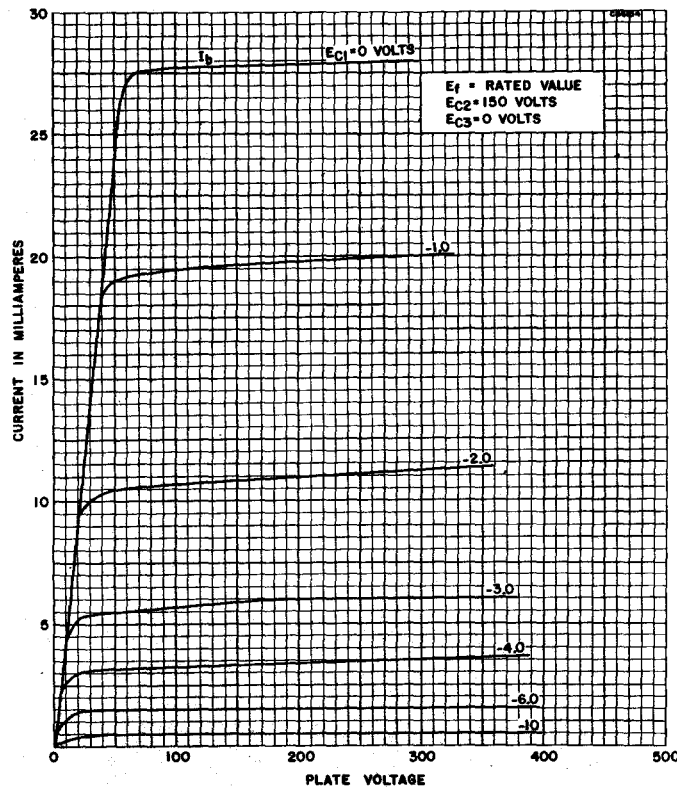
**SYLVANIA ELECTRONIC TUBES**

# 6AZ8 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS (TRIODE SECTION)



## AVERAGE PLATE CHARACTERISTICS (PENTODE SECTION)



SYLVANIA ELECTRONIC TUBES

# 6BA6 (Cont'd)

## MAXIMUM RATINGS (Design Center Values)

Plate Voltage .....	300 Volts
Plate Dissipation .....	3.0 Watts
Grid No. 2 Voltage .....	125 Volts
Grid No. 2 Supply Voltage .....	300 Volts
Grid No. 2 Dissipation .....	0.6 Watts
Positive Grid No. 1 Voltage .....	0 Volts
Negative Grid No. 1 Voltage .....	-50 Volts

## CHARACTERISTICS AND TYPICAL OPERATION

### Class A<sub>1</sub> Amplifier

Plate Voltage .....	100	250 Volts
Grid No. 2 Voltage .....	100	100 Volts
Cathode Bias Resistor <sup>1</sup> .....	68	68 Ohms
Grid No. 3 Voltage .....	Connected to Cathode	at Socket
Plate Current .....	10.8	11.0 Ma
Grid No. 2 Current .....	4.4	4.2 Ma
Transconductance .....	4300	4400 $\mu$ mhos
Plate Resistance (approx.) .....	0.25	1.0 Megohm
Grid No. 1 Voltage for Transconductance of 40 $\mu$ mhos (approx.) .....	-20	-20 Volts

### NOTE:

1. Provides an operating bias of 1.0 volt. Fixed bias operation is not recommended.

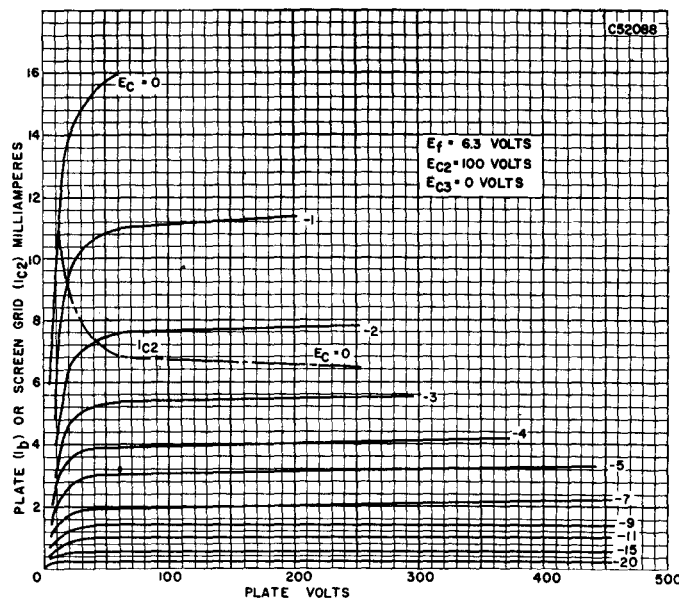
## APPLICATION

Sylvania Type 6BA6 is a miniature, semi-remote cutoff pentode designed primarily for service as a high gain r f or i f amplifier. The tube features low grid to plate capacitance and high transconductance.

## SYLVANIA TUBE TESTER SETTINGS

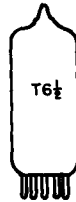
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	4	36	32	W
219/220	6.3	3	4S	29	4	16Y	5	7

## AVERAGE PLATE CHARACTERISTICS



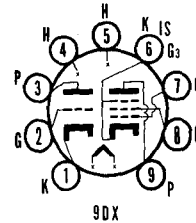
## TYPE 6BA7

(See Condensed Data Section)



## SYLVANIA TYPE 6BA8

TRIODE PENTODE



### MECHANICAL DATA

Bulb.....	T-6½, Outline 6-3
Base.....	E9-1, Miniature Button, 9-Pin
Basing.....	9DX
Mounting Position.....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	600 Ma
Heater Warm-up Time.....	(See Series String Heaters in Appendix)
Maximum Heater-Cathode Voltage.....	200 Volts
D C and Peak.....	100 Volts
D C, Heater Positive with Respect to Cathode.....	

#### DIRECT INTERELECTRODE CAPACITANCES

	Shielded <sup>1</sup>	Unshielded
<b>Triode</b>		
Grid to Plate.....	2.2	2.2 μmf
Input.....	2.7	2.5 μmf
Output.....	2.2	0.7 μmf
<b>Pentode</b>		
Grid to Plate.....	.030	0.036 μmf Max.
Input.....	11.0	11.0 μmf
Output.....	3.6	2.8 μmf
<b>Coupling</b>		
Pentode Grid No. 1 to Triode Plate.....	.005	.008 μmf Max.
Pentode Plate to Triode Grid.....	.012	.022 μmf Max.
Pentode Plate to Triode Plate.....	.050	0.20 μmf Max.

#### RATINGS (Design Center Values)

	Triode	Pentode
Plate Voltage.....	300	300 Volts Max.
Grid No. 2 Supply Voltage.....		300 Volts Max.
Grid No. 2 Voltage.....	See Rating	Chart for Type 6AM8
Plate Dissipation.....	2.0	3.25 Watts Max.
Grid No. 2 Dissipation.....		1.0 Watt Max.
Negative Grid No. 1 Voltage.....		50 Volts Max.
Positive Grid No. 1 Voltage.....		0 Volts Max.
Grid No. 1 Circuit Resistance		
Fixed Bias.....	0.5	0.25 Megohm Max.
Self Bias.....	1.0	1.0 Megohm Max.

#### CHARACTERISTICS AND TYPICAL OPERATION

	Triode	Pentode
<b>Class A<sub>1</sub> Amplifier</b>		
Plate Voltage.....	200	200 Volts
Grid No. 2 Voltage.....		150 Volts
Grid No. 1 Voltage.....	-8	0 Volts
Cathode Bias Resistor.....		180 Ohms
Amplification Factor.....	18	
Plate Resistance (approx.).....	6700	400,000 Ohms
Transconductance.....	2700	9000 μmhos
Plate Current.....	8.0	13 Ma
Grid No. 2 Current.....		3.5 Ma
Grid No. 1 Voltage for I <sub>b</sub> = 10 μa (approx.).....	-16	-10 Volts

#### NOTE:

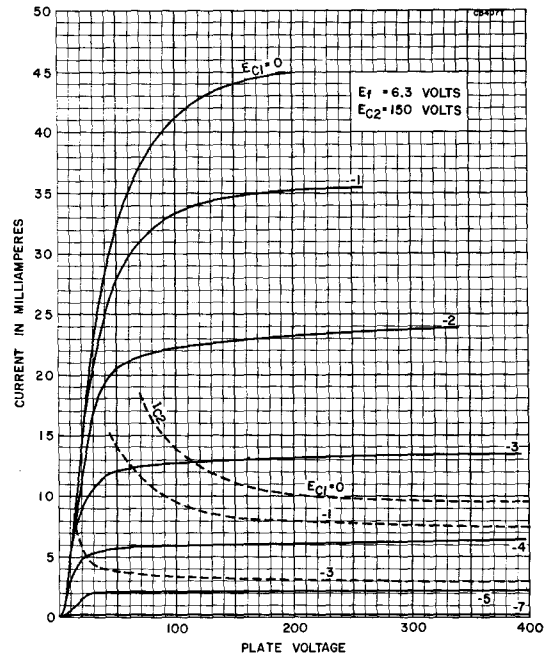
- Shield No. 315 tied to cathode base pin of section under test.

### APPLICATION

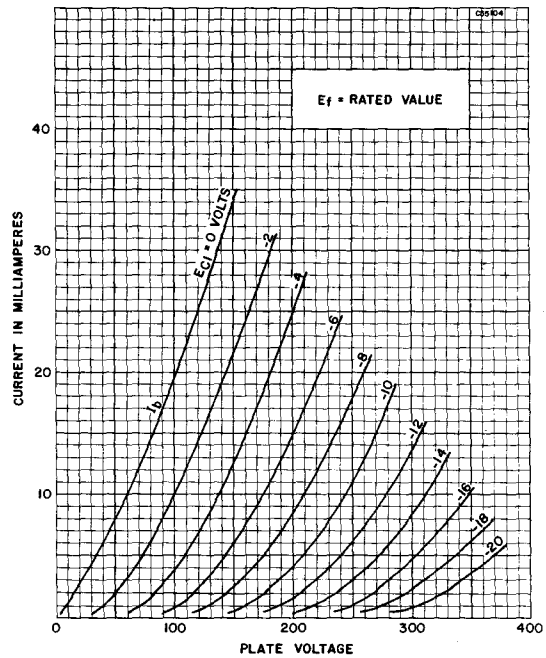
The Sylvania Type 6BA8 is intended for service in television receivers employing a series heater string. The triode may be used as a sync clipper or sync separator. The pentode section is designed primarily to serve as a video amplifier. For information on specially controlled heaters for series string operation refer to the SERIES STRING section of the Appendix.

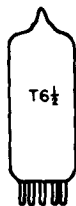
# 6BA8 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS PENTODE SECTION



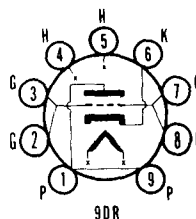
## AVERAGE PLATE CHARACTERISTICS TRIODE SECTION





## SYLVANIA TYPE 6BC4

U H F MEDIUM-MU TRIODE



### MECHANICAL DATA

Bulb	T-6 1/2, Outline 6-1
Base	Small Button 9-Pin
Basing	9DR
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	225 Ma
Maximum Peak Heater-Cathode Voltage	75 Volts

#### DIRECT INTERELECTRODE CAPACITANCES (Approx.)

	Unshielded
Grid to Plate	1.6 $\mu\text{mf}$
Input	2.9 $\mu\text{mf}$
Output	0.26 $\mu\text{mf}$
Heater to Cathode	2.7 $\mu\text{mf}$

#### MAXIMUM RATINGS (Design Center Values)

##### Class A<sub>1</sub> Amplifier

Plate Voltage	250 Volts
Plate Dissipation	2.5 Watts
Cathode Current	25 Ma
Grid No. 1 Circuit Resistance	
Fixed Bias	Not Recommended
Cathode Bias	0.5 Megohms

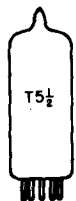
#### AVERAGE CHARACTERISTICS AND TYPICAL OPERATION

##### Class A<sub>1</sub> Amplifier

Plate Supply Voltage	150 Volts
Cathode Bias Resistor	100 Ohms
Plate Current	14.5 Ma
Transconductance	10000 $\mu\text{mhos}$
Amplification Factor	48
Plate Resistance	4800 Ohms
Grid Bias, Approx., for Plate Current of 10 $\mu\text{a}$	-10 Volts

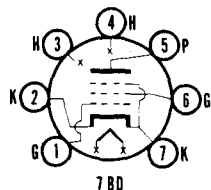
### APPLICATION

The Type 6BC4 is a u h f medium-mu triode for use as the r f amplifier in cathode-drive circuits of u h f television tuners covering the frequency range of 470 to 890 mc.



## SYLVANIA TYPE 6BC5

SHARP CUTOFF R F PENTODE



### MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-2
Base	Miniature Button 7-Pin
Basing	7BD
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	300 Ma
Maximum Heater-Cathode Voltage	90 Volts



# 6BC5 (Cont'd)

## DIRECT INTERELECTRODE CAPACITANCES

Pentode Connected	Shielded <sup>1</sup>	Unshielded
	Grid to Plate.....	0.020
Input.....	6.6	6.5 $\mu\text{mf}$
Output.....	2.6	1.8 $\mu\text{mf}$
<b>Triode Connected (Grid No. 2 Tied to Plate)</b>		
Grid to Plate.....	2.5	2.5 $\mu\text{mf}$
Input.....	4.0	3.9 $\mu\text{mf}$
Output.....	4.3	3.0 $\mu\text{mf}$

## MAXIMUM RATINGS (Design Center Values)

	Triode Connected <sup>2</sup>	Pentode Connected
	Plate Voltage.....	300
Plate Dissipation.....	2.5 <sup>3</sup>	2.0 Watts
Grid No. 2 Voltage.....	Plate	See Rating Chart For Type 6AM8
Grid No. 2 Supply Voltage.....	Plate	300 Volts
Grid No. 2 Dissipation.....		0.5 Watts
Positive Grid No. 1 Voltage.....	0	0 Volts

## CHARACTERISTICS AND TYPICAL OPERATION

### Class A<sub>1</sub> Amplifier—Pentode Connected

Plate Voltage.....	100	125	250 Volts
Grid No. 2 Voltage.....	100	125	150 Volts
Cathode Resistor.....	180	100	180 Ohms
Transconductance.....	4900	6100	5700 $\mu\text{mhos}$
Plate Resistance (approx.).....	0.6	0.5	0.8 Megohm
Plate Current.....	4.7	8.0	7.5 Ma
Grid No. 2 Current.....	1.4	2.4	2.1 Ma
Grid No. 1 Voltage for $I_b = 10 \mu\text{a}$ .....	-5	-6	-8 Volts

### Triode Connected<sup>2</sup>

Plate Voltage.....	250	180 Volts
Cathode Resistor.....	820	330 Ohms
Transconductance.....	4400	6000 $\mu\text{mhos}$
Plate Resistance (approx.).....	9000	6000 Ohms
Amplification Factor.....	40	42
Plate Current.....	6.0	8.0 Ma

## NOTES:

- External shield No. 316 connected to pin 7.
- Screen grid tied to plate.
- Total current flowing to plate and screen.

## APPLICATION

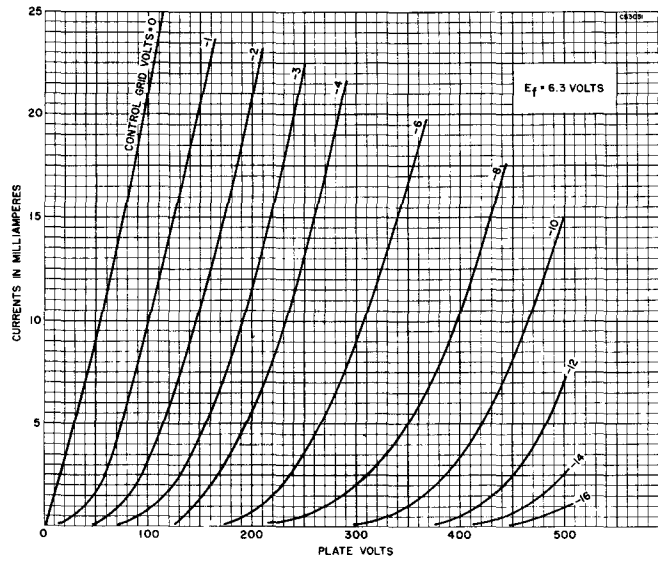
Sylvania Type 6BC5 is a sharp cutoff r f pentode amplifier of miniature construction. It may be used at frequencies up to 400 mc and is particularly useful in television receivers where a slightly higher gain than that obtained with the similar Type 6AG5 is desired.

## SYLVANIA TUBE TESTER SETTINGS

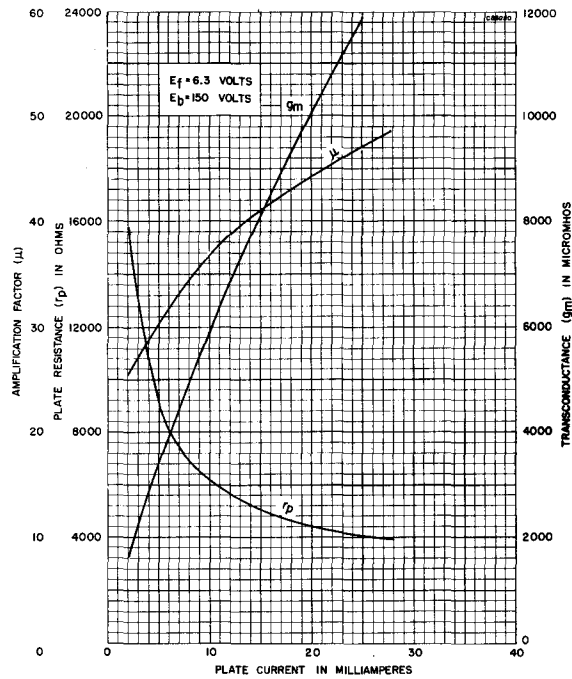
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	4	0	4	36	70	T
219/220	6.3	3	47S	64	4	16Z	5	2
	6.3	3	24S	64	4	16Z	5	7

# 6BC5 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTED

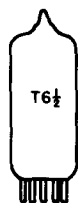
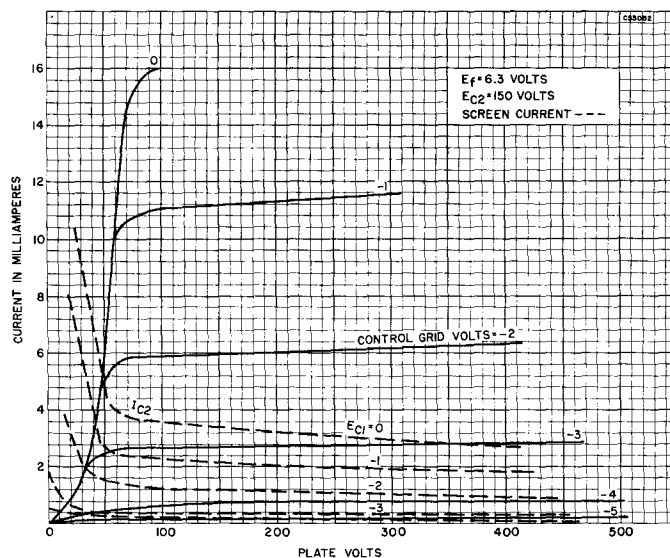


## AVERAGE TRANSFER CHARACTERISTICS

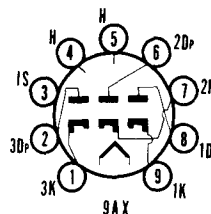


# 6BC5 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS



SYLVANIA TYPE **6BC7**  
TRIPLE DIODE



### MECHANICAL DATA

Bulb.....	T-6 1/2, Outline 6-2
Base.....	Small Button 9-Pin
Basing.....	9AX
Mounting Position.....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

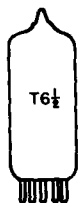
Heater Voltage.....	6.3 Volts
Heater Current.....	450 Ma
Maximum Peak Heater-Cathode Voltage.....	200 Volts

#### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

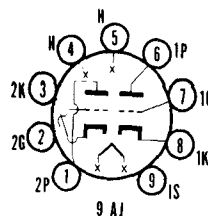
Plate Diode No. 1 to All Other Elements.....	3.5 $\mu\mu\text{f}$
Plate Diode No. 2 to All Other Elements.....	5.5 $\mu\mu\text{f}$
Plate Diode No. 3 to All Other Elements.....	3.5 $\mu\mu\text{f}$

#### MAXIMUM RATINGS (Design Center Values)

Diode Operation Current (Per Plate).....	12 Ma
--	-------



**SYLVANIA TYPE 6BC8  
4BC8  
MEDIUM MU DUO TRIODE**



**MECHANICAL DATA**

Bulb .....	T-6½
Base .....	E9-1, Small Button, 9-Pin
Outline .....	6-2
Basing .....	9AJ
Cathode .....	Coated Unipotential
Mounting Position .....	Any

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS**

	<b>6BC8</b>	<b>4BC8</b>
Heater Voltage .....	6.3	4.2 Volts
Heater Current .....	400	600 Ma
Heater Warm-up Time (See Appendix) .....		11 Seconds
Heater-Cathode Voltage (Design Center Values)		
Heater Positive with Respect to Cathode		
D C Component .....	100	100 Volts Max.
Total D C and Peak .....	200	200 Volts Max.
Heater Negative with Respect to Cathode <sup>1</sup>		
Total D C and Peak .....	200	200 Volts Max.

**DIRECT INTERELECTRODE CAPACITANCES (Shielded)<sup>2</sup>**

	<b>Section 1</b>	<b>Section 2</b>
Grid to Plate .....	1.4	1.4 $\mu\text{mf}$
Input .....	2.5	2.5 $\mu\text{mf}$
Output .....	1.3	1.3 $\mu\text{mf}$
Heater to Cathode .....	2.3	2.3 $\mu\text{mf}$
Plate Section No. 1 to Plate Section No. 2 .....	0.015	$\mu\text{mf}$ Max.
Grid Section No. 1 to Grid Section No. 2 .....	0.007	$\mu\text{mf}$ Max.

**RATINGS (Design Center Values - Each Section)**

Plate Voltage <sup>1</sup> .....	250 Volts Max.
Plate Dissipation .....	2 Watts Max.
Cathode Current .....	20 Ma Max.
Grid Circuit Resistance .....	0.5 Megohm Max.

**CHARACTERISTICS - (Each Section)**

<b>Class A<sub>1</sub> Amplifier</b>	
Plate Voltage .....	150 Volts
Grid Voltage .....	0 Volts
Cathode Bias Resistor .....	220 Ohms
Plate Current .....	10 Ma
Transconductance .....	6200 $\mu\text{mhos}$
Amplification Factor .....	35
Grid Voltage for $g_m = 50 \mu\text{mhos}$ (approx.) .....	13 Volts

**NOTES:**

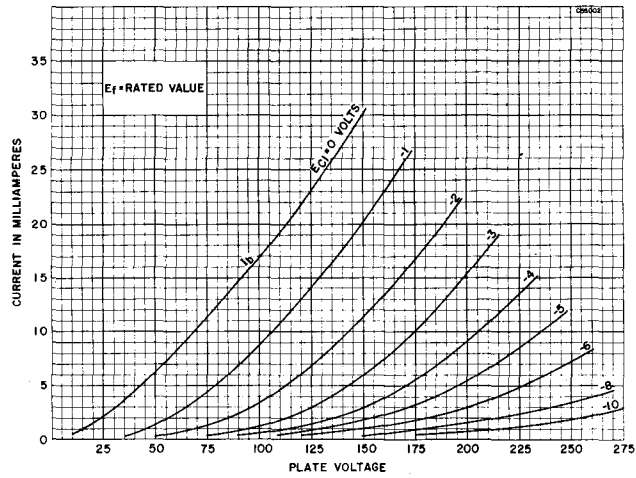
1. This rating may be as high as 300 volts max. under cutoff conditions when the tube is used as a cascode amplifier and the two sections are connected in series.
2. Shield No. 315.

**APPLICATION**

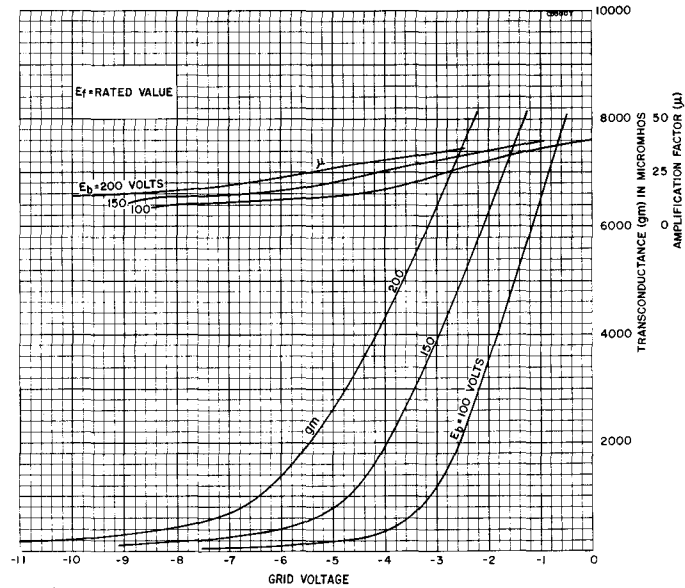
The 4BC8 and 6BC8 are twin triodes intended for application as V H F cascode amplifiers in television receivers. The 4BC8 features a 600 Ma heater and controlled heater warm-up time for operation in television receivers employing a series heater string.

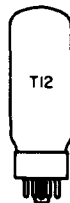
# 6BC8 4BC8 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS

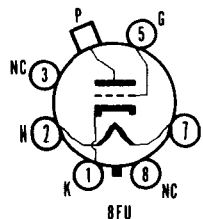


## AVERAGE TRANSFER CHARACTERISTICS





**SYLVANIA TYPE 6BD4  
6BD4A**  
HIGH VOLTAGE REGULATOR



**MECHANICAL DATA**

Bulb.....	T-12
Base.....	Short Jumbo Shell Octal
Basing.....	8FU
Maximum Overall Length.....	5 1/8"
Maximum Seated Height.....	4 5/8"

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS**

Heater Voltage (A C or D C).....	6.3 Volts
Heater Current.....	600 Ma
Maximum Peak Heater-Cathode Voltage.....	180 Volts

**DIRECT INTERELECTRODE CAPACITANCES**

Grid to Plate.....	1.0 $\mu\mu\text{f}$
Input.....	3.8 $\mu\mu\text{f}$
Output.....	0.04 $\mu\mu\text{f}$ Max

**MAXIMUM RATINGS (Design Center Values)**

	<b>6BD4</b>	<b>6BD4A</b>
D C Plate Voltage.....	20000	27000 Volts
Unregulated D C Supply Voltage.....	40000	55000 Volts
Grid Voltage		
D C Value.....	-125	-125 Volts
Peak Value.....	-550	-550 Volts
D C Plate Current.....	1.5	1.5 Ma
Plate Dissipation.....	20	25 Watts
Grid Circuit Resistance		
With Unregulated Supply with Equivalent Resistance of More Than 8 Megohms.....	3.0	4.0 Megohms
With Unregulated Supply with Equivalent Resistance of Less Than 8 Megohms.....	See Curve A	See Curve B

**CHARACTERISTIC**

Amplification Factor.....	1650
---------------------------	------

**WARNING**

The high voltage at which the 6BD4 is operated may be extremely dangerous to the user. Great care should be taken during the adjustment of circuits.

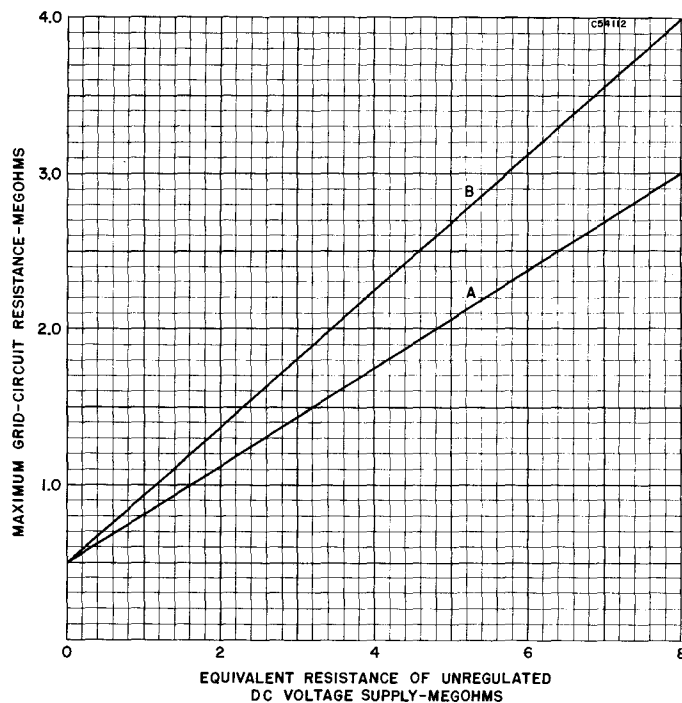
Operation of the 6BD4 at plate voltages above 16,000 volts (absolute value) results in the production of X-rays which can constitute a health hazard unless adequately shielded.

**APPLICATION**

The Types 6BD4 and 6BD4A are beam triode, high-voltage, low current regulators, which may be used to supply regulated voltages for color television picture tubes. The principle difference between Types 6BD4 and 6BD4A is the maximum value of regulated voltage that may be obtained.

# 6BD4, 6BD4A (Cont'd)

## GRID CIRCUIT RESISTANCE

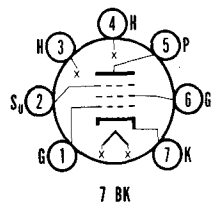


## TYPE 6BD5GT

(See Condensed Data Section)



**SYLVANIA TYPE 6BD6**  
REMOTE CUTOFF R F PENTODE



### MECHANICAL DATA

Bulb.....	T-5 1/2, Outline 5-2
Base.....	Miniature Button 7-Pin
Basing.....	7BK
Mounting Position.....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	300 Ma
Maximum Heater-Cathode Voltage.....	90 Volts

# 6BD6 (Cont'd)

## CHARACTERISTICS AND TYPICAL OPERATION

### Class A<sub>1</sub> Amplifier

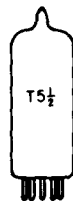
Plate Voltage	100	250 Volts
Grid No. 3 Voltage <sup>1</sup>	0	0 Volts
Grid No. 2 Voltage	100	100 Volts
Grid No. 1 Voltage	-1	-3 Volts
Plate Current	13	9 Ma
Grid No. 2 Current	5	3.5 Ma
Plate Resistance	0.12	0.7 Megohm
Transconductance	2350	2000 $\mu$ mhos
Grid No. 1 Voltage for $g_m = 10 \mu$ mhos	-35	-35 Volts

### NOTE:

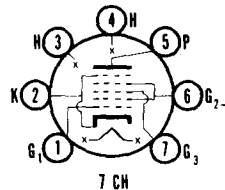
1. Pin 2 connected to pin 7 at socket.

## APPLICATION

Sylvania Type 6BD6 is a miniature remote cutoff pentode designed for service as a radio frequency or intermediate frequency amplifier. Electrically, the Type 6BD6 is similar to the Type 6SK7GT.



**SYLVANIA TYPE 6BE6**  
HEPTODE CONVERTER



## MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-2
Base	Miniature Button 7-Pin
Basing	7CH
Mounting Position	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	300 Ma
Maximum Heater-Cathode Voltage	90 Volts

### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid No. 3 to Plate	0.30 $\mu$ mf Max
Grid No. 3 to Grid No. 1	0.15 $\mu$ mf Max
R F Input (Grid No. 3 to All)	7.0 $\mu$ mf
Oscillator Input (Grid No. 1 to All)	5.5 $\mu$ mf
Mixer Output (Plate to All)	8.0 $\mu$ mf
Grid No. 1 to Cathode	3.0 $\mu$ mf
Grid No. 1 to All Except Cathode	2.7 $\mu$ mf
Grid No. 1 to Plate	0.1 $\mu$ mf
Cathode to All Electrodes Except Grid No. 1	15.0 $\mu$ mf

### MAXIMUM RATINGS (Design Center Values)

Plate Voltage	300 Volts
Plate Dissipation	1.0 Watt
Grid No. 2 and 4 Voltage	100 Volts
Grid No. 2 and 4 Supply Voltage	300 Volts
Grid No. 2 and 4 Dissipation	1.0 Watt
Positive Grid No. 3 Voltage	0 Volts
Negative Grid No. 3 Voltage	50 Volts
Cathode Current	14 Ma

## CHARACTERISTICS AND TYPICAL OPERATION

### Separate Excitation<sup>1</sup>

Plate Voltage	100	250 Volts
Grid No. 2 and 4 Voltage	100	100 Volts
Grid No. 3 Voltage	-1.5	-1.5 Volts
Grid No. 1 Resistance	20000	20000 Ohms
Grid No. 1 Current	0.5	0.5 Ma
Conversion Transconductance	455	475 $\mu$ mhos
Plate Resistance (approx.)	0.4	1.0 Megohm
Plate Current	2.6	2.9 Ma
Grid No. 2 and 4 Current	6.0	6.8 Ma
Cathode Current	10.1	10.2 Ma
Grid No. 3 Voltage for $G_c = 10 \mu$ mhos (approx.)	-30	-30 Volts

### NOTE:

1. Data for self-excitation in a zero bias circuit corresponds very closely to that for separate excitation.



# 6BE6 (Cont'd)

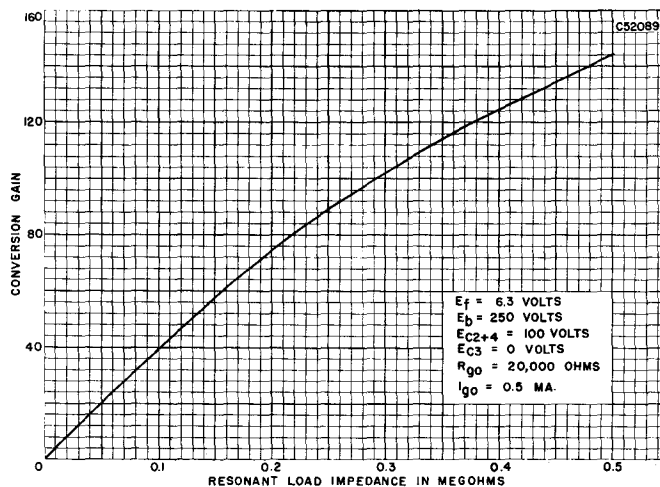
## APPLICATION

Sylvania Type 6BE6 is a miniature style heptode converter. It is similar in application to Type 6SA7GT and lock-in Type 7Q7. Operation data as given are for separate excitation but corresponds very closely to that obtained with self-excitation. The small size of this tube lends itself readily to the design of light-weight compact equipment.

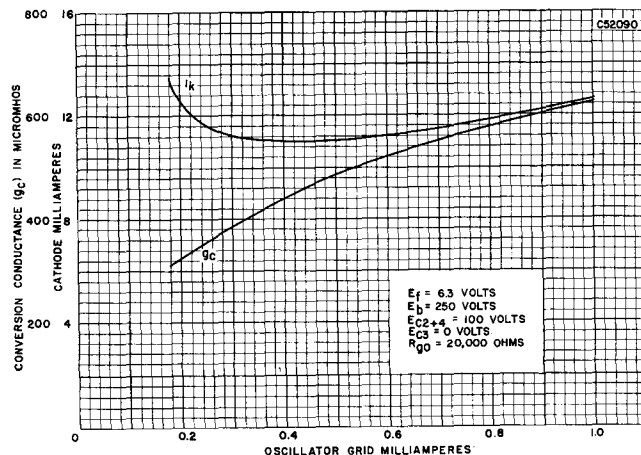
## SYLVANIA TUBE TESTER SETTINGS

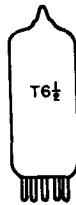
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	4	46	85	W
	6.3	0	—	0	5	3	35	U
219/220	6.3	3	4	13	4	067U	5	2
	6.3	3	4S	41	4	1X	6	2

## AVERAGE CONVERSION CHARACTERISTICS SELF EXCITATION

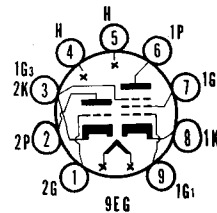


## AVERAGE CONVERSION CHARACTERISTICS SEPARATE EXCITATION





**SYLVANIA TYPE 6BE8  
5BE8**  
MEDIUM MU TRIODE  
SHARP CUTOFF PENTODE



**MECHANICAL DATA**

Bulb	T-6 $\frac{1}{2}$
Base	E9-1, Miniature Button, 9-Pin
Outline	6-2
Basing	9EG
Cathode	Coated Unipotential
Mounting Position	Any

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS**

	5BE8	6BE8	
Heater Voltage	4.7	6.3	Volts
Heater Current	600	450	Ma
Heater Warm-up Time (See Appendix)	11		Seconds
Heater-Cathode Voltage (Design Center Values)			
Heater Negative with Respect to Cathode		200	Volts Max.
Total D C and Peak	200		
Heater Positive with Respect to Cathode	100	100	Volts Max.
D C	100	200	Volts Max.
Total D C and Peak	200		

**DIRECT INTERELECTRODE CAPACITANCES (Approx.)**

Triode		
Grid to Plate (g to p)	1.8	$\mu\text{mf}$
Input: g to (k+pentode g3+I.S.+h)	2.8	$\mu\text{mf}$
Output: p to (k+pentode g3+I.S.+h)	1.5	$\mu\text{mf}$
Pentode		
Grid to Plate (g1 to p)	.040	$\mu\text{mf}$ Max.
Input: g1 to (k+g2+h)	4.4	$\mu\text{mf}$
Output: p to (k+g2+g3+triode k+I.S.+h)	2.6	$\mu\text{mf}$
Plate to (k+g2+h)	.30	$\mu\text{mf}$
Coupling		
Triode Grid to Pentode Plate	.010	$\mu\text{mf}$
Pentode Grid No. 1 to Triode Plate	.009	$\mu\text{mf}$
Triode Plate to Pentode Plate	.065	$\mu\text{mf}$

**RATINGS (Design Center Values)**

	Triode	Pentode	
Plate Voltage	300	300	Volts Max.
Grid No. 2 Supply Voltage		300	Volts Max.
Grid No. 2 Voltage	See Rating Chart for Type 6AM8		
Plate Dissipation	2.5	2.8	Watts Max.
Grid No. 2 Dissipation		0.5	Watt Max.
Positive Grid No. 1 Voltage	0	0	Volts Max.
Grid No. 1 Circuit Resistance <sup>1</sup>			
Fixed Bias	0.5	0.25	Megohm Max.
Self Bias	1.0	1.0	Megohm Max.

**CHARACTERISTICS AND TYPICAL OPERATION**

	Triode	Pentode	
<b>Class A<sub>1</sub> Amplifier<sup>2</sup></b>			
Plate Voltage	150	250	Volts
Grid No. 2 Voltage		110	Volts
Grid No. 1 Voltage	0	0	Volts
Cathode Bias Resistor	56	68	Ohms
Amplification Factor	40		
Plate Resistance (approx)	.005	0.4	Megohm
Transconductance	8500	5200	$\mu\text{mhos}$
Plate Current	18	10	Ma
Grid No. 2 Current		3.5	Ma
Grid No. 1 Voltage (approx.) for $I_b = 10 \mu\text{a}$	-12	-10	Volts

**NOTES:**

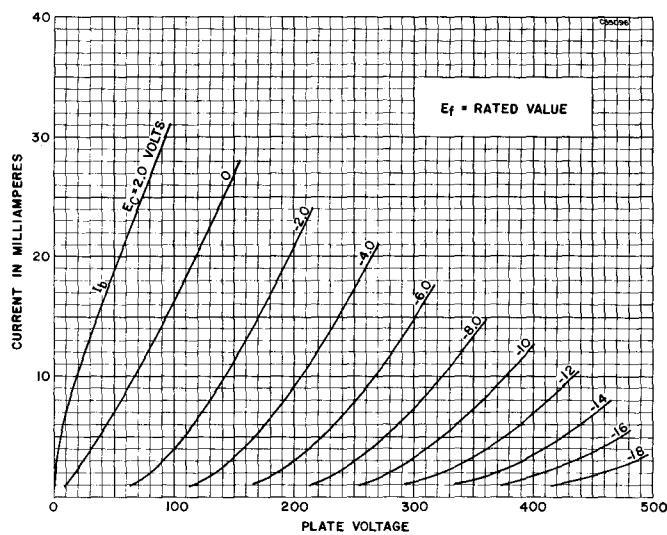
1. If either unit is operating at maximum rated conditions, Grid No. 1 Circuit Resistance for both units shall not exceed the stated values.
2. When reading characteristics of the pentode section all triode elements shall be at ground potential. Thus, because of internal connections to pin No. 3, the pentode suppressor will also be at ground.

**APPLICATION**

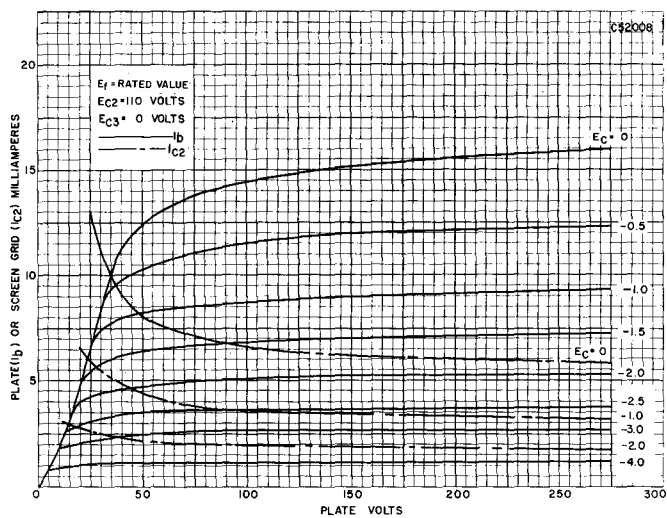
The 6BE8 is a miniature, medium mu triode and sharp cutoff pentode intended for use as a v h f oscillator mixer. The basing is unique in that the pentode No. 3 grid and internal shield are connected to the triode cathode. The 5BE8 employs controlled heater warm-up time for service in series string television receivers; otherwise, the 5BE8 is identical to the 6BE8.

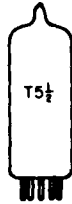
# 6BE8, 5BE8 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS (Triode Section)



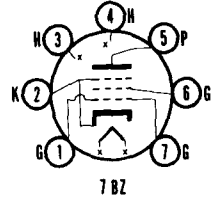
## AVERAGE PLATE CHARACTERISTICS (Pentode Section)





## SYLVANIA TYPE 6BF5

### BEAM POWER AMPLIFIER



### MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-3
Base	Miniature Button 7-Pin
Basing	7BZ
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	1.2 Ampere
Maximum Heater-Cathode Voltage	
Total D C and Peak	200 Volts
D C, Heater Positive with Respect to Cathode	100 Volts

#### DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.65 $\mu\text{mf}$
Input	14 $\mu\text{mf}$
Output	6 $\mu\text{mf}$

#### MAXIMUM RATINGS (Design Center Values—Except as Noted)

##### Class A<sub>1</sub> Amplifier

Plate Voltage	250 Volts
Plate Dissipation	5.5 Watts
Grid No. 2 Voltage	117 Volts
Grid No. 2 Dissipation	1.25 Watts

##### Vertical Deflection Amplifier (Triode Connected)<sup>1</sup>

Plate Voltage, D C	250 Volts
Peak Positive Plate Voltage (Abs. Max.)	900 Volts
Plate Dissipation <sup>2</sup>	5.0 Watts
Peak Negative Grid No. 1 Voltage	250 Volts
Average Cathode Current	40 Ma
Peak Cathode Current	120 Ma
Grid No. 1 Circuit Resistance	2.2 Megohms

#### CHARACTERISTICS AND TYPICAL OPERATION

##### Class A<sub>1</sub> Amplifier

Plate Voltage	110 Volts
Grid No. 2 Voltage	110 Volts
Grid No. 1 Voltage	-7.5 Volts
Peak A F Grid No. 1 Voltage	7.5 Volts
Plate Current (Zero Signal)	36 Ma
Plate Current (Maximum Signal)	39 Ma
Grid No. 2 Current (Zero Signal)	4.0 Ma
Grid No. 2 Current (Maximum Signal)	10.5 Ma
Transconductance	7500 $\mu\text{mhos}$
Plate Resistance	12000 Ohms
Load Resistance	2500 Ohms
Maximum Signal Power Output	1.9 Watts
Total Harmonic Distortion (approx.)	10 Percent

##### Triode Connected

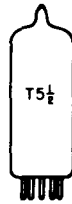
Plate Voltage	225 Volts
Grid No. 2 Voltage	Connected to Plate
Grid No. 1 Voltage	-30 Volts
Plate Current	10 Ma
Transconductance	2700 $\mu\text{mhos}$
Amplification Factor	6.7
Plate Resistance	2500 Ohms
Grid No. 1 Bias for I <sub>b</sub> = 0.5 Ma (approx.)	-40 Volts

#### NOTES:

- For operation in a 525 line, 30 frame system, the duty cycle of the voltage pulse must not exceed 15 % of one scanning cycle.
- In stages operating with grid-leak bias, an adequate cathode bias resistor or other suitable means is required to protect the tube in the absence of excitation.

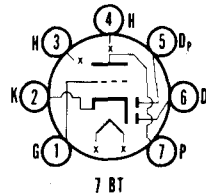
### SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	4	0	4	36	18	W
	6.3	0	3	0	4	46	18	W
219/220	6.3	3	14S	10	4	067Y	5	2
	6.3	3	47S	10	4	16Y	5	2



## SYLVANIA TYPE 6BF6

DUO DIODE TRIODE



### MECHANICAL DATA

Bulb.....	T-5 1/2, Outline 5-2
Base.....	Miniature Button 7-Pin
Basing.....	7BT
Mounting Position.....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	300 Ma
Maximum Peak Heater-Cathode Voltage.....	90 Volts

#### DIRECT INTERELECTRODE CAPACITANCES

	Shielded <sup>1</sup>	Unshielded
Grid to Plate.....	2.0	2.0 $\mu\mu\text{f}$
Input.....	1.8	1.8 $\mu\mu\text{f}$
Output.....	1.1	0.8 $\mu\mu\text{f}$

#### CHARACTERISTICS AND TYPICAL OPERATION

##### Class A<sub>1</sub> Amplifier

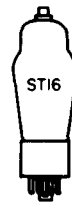
Plate Voltage.....	250 Volts
Grid Voltage.....	-9 Volts
Plate Current.....	9.5 Ma
Transconductance.....	1900 $\mu\text{mhos}$
Plate Resistance.....	8500 Ohms
Amplification Factor.....	16
Load Resistance.....	10000 Ohms
Power Output.....	300 Mw
Total Harmonic Distortion.....	6.5 Percent
Average Diode Current Per Plate With 10 Volts D C Applied.....	0.8 Ma

#### NOTE:

1. Shield No. 316.

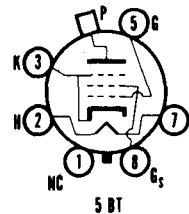
### APPLICATION

Sylvania Type 6BF6 is a miniature twin diode, medium mu triode. It is designed for service as a combined detector, amplifier and automatic volume control tube. Electrically, the Type 6BF6 is similar to the Type 6SR7. Data for use in Resistance Coupled Amplifier Circuits is given in the Appendix.



## SYLVANIA TYPE 6BG6G

BEAM POWER AMPLIFIER



### MECHANICAL DATA

Bulb.....	ST-16, Outline 16-5
Base.....	Medium Shell Octal 6-Pin
Basing.....	5BT
Cap.....	Small
Mounting Position.....	Vertical <sup>1</sup>

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	900 Ma
Maximum Heater-Cathode Voltage.....	
Total D C and Peak.....	200 Volts
D C, Heater Positive with Respect to Cathode.....	100 Volts

# 6BG6G (Cont'd)

## DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid No. 1 to Plate	0.34 $\mu\text{mf}$ Max
Input	12 $\mu\text{mf}$
Output	6.5 $\mu\text{mf}$

## MAXIMUM RATINGS (Design Center Values—Except as Noted)

<b>Horizontal Deflection Amplifier<sup>2</sup></b>	
D C Plate Supply Voltage (Boost + D C Power Supply)	700 Volts
Peak Positive Plate Voltage (Abs. Max.)	6600 Volts
Peak Negative Plate Voltage	1500 Volts
Plate Dissipation	20 Watts
Grid No. 2 Voltage	350 Volts
Grid No. 2 Dissipation	3.2 Watts
Average Cathode Current	110 Ma
Peak Cathode Current	400 Ma
Peak Negative Grid No. 1 Voltage	300 Volts
Grid No. 1 Resistance	0.47 Megohm
Bulb Temperature (At Hottest Point)	210° C

## TYPICAL OPERATING CONDITIONS

<b>Horizontal Deflection Amplifier Notes 2 &amp; 3</b>	
D C Plate Supply Voltage (Boost + D C Power Supply)	550 Volts
Grid No. 2 Voltage	250 Volts
Cathode Bias Resistor	100 Ohms
Grid No. 1 Signal Voltage	
Sawtooth Component	75 Volts
Negative Peaking Component	50 Volts
Plate Current	85 Ma
Grid No. 2 Current	10 Ma
Peak Cathode Current	300 Ma
Average Grid No. 1 Current	30 $\mu\text{a}$
Peak Positive Plate Voltage	5500 Volts
Peak Negative Plate Voltage	550 Volts
Grid No. 1 Circuit Resistance	1.0 Megohm

## NOTES:

- Horizontal operation permitted if Pins 2 and 7 are in a vertical plane.
- For operation in a 525-line, 30 frame system, the duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.
- For 17", 70° deflection CR tube with 12 kv second anode voltage.

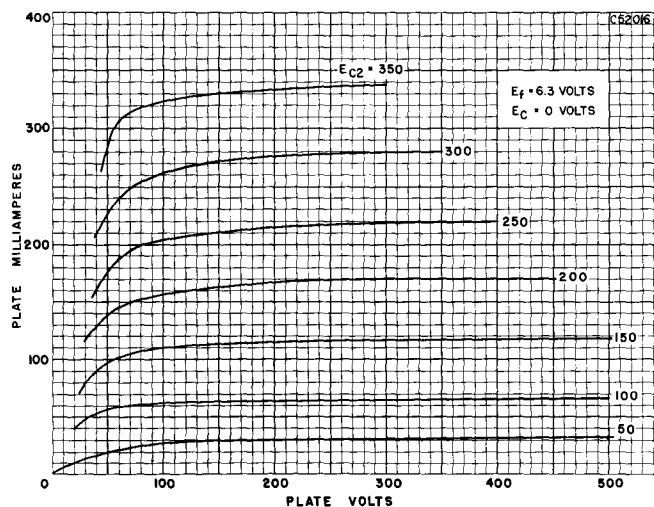
## APPLICATION

Sylvania Type 6BG6G is a pentode beam power amplifier designed for use as a horizontal deflection driver tube in television receivers using electro-magnetic deflection.

## SYLVANIA TUBE TESTER SETTINGS

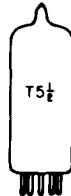
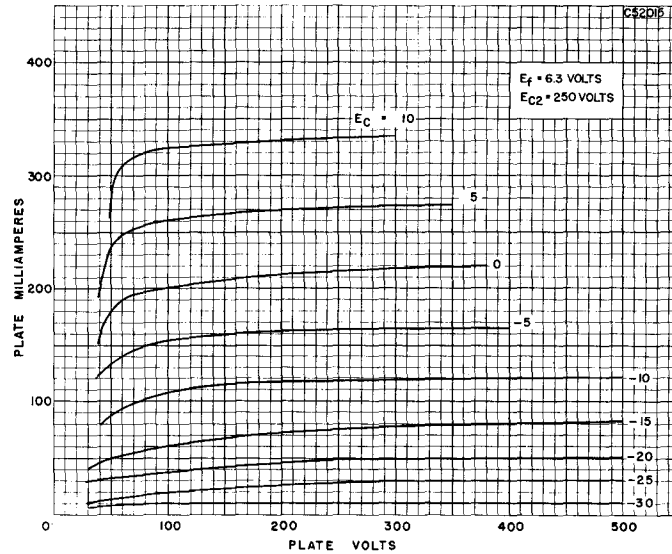
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	8	47	27	Y
219/220	6.3	2	7	20	7	58Z	9	3

## AVERAGE PLATE CHARACTERISTICS

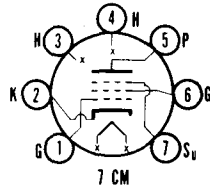


# 6BG6G (Cont'd)

## AVERAGE PLATE CHARACTERISTICS



### SYLVANIA TYPE 6BH6 SHARP CUTOFF R F PENTODE



#### MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-2
Base	Miniature Button 7-Pin
Basing	7CM
Mounting Position	Any

#### ELECTRICAL DATA

##### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	150 Ma
Maximum Heater-Cathode Voltage	90 Volts

##### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid to Plate	0.0035 $\mu\text{f}$
Input	5.4 $\mu\text{f}$
Output	4.4 $\mu\text{f}$

##### MAXIMUM RATINGS (Design Center Values)

Plate Voltage	300 Volts
Plate Dissipation	3.0 Watts
Grid No. 2 Voltage	(See Rating Chart for Type 6AM8)
Grid No. 2 Supply Voltage	300 Volts
Grid No. 2 Dissipation	0.5 Watts
Positive Grid No. 1 Voltage	0 Volts
Negative Grid No. 1 Voltage	-50 Volts

# 6BH6 (Cont'd)

## TYPICAL OPERATION

### Class A<sub>1</sub> Amplifier

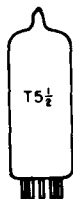
Plate Voltage.....	100	250 Volts
Grid No. 2 Voltage.....	100	150 Volts
Grid No. 3 Voltage.....	Connected to Cathode at Socket	
Grid No. 1 Voltage.....	-1.0	-1.0 Volt
Plate Current.....	3.6	7.4 Ma
Grid No. 2 Current.....	1.4	2.9 Ma
Transconductance.....	3400	4600 $\mu$ mhos
Plate Resistance.....	0.7	1.4 Megohms
Grid No. 1 Bias (approx.)		
For $I_b = 10 \mu$ a.....	-5.0	-7.7 Volts

## APPLICATION

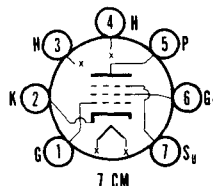
Sylvania Type 6BH6 is a sharp cutoff rf pentode of miniature construction. It has a 150 Ma heater which makes it useful in a c/d c receivers, and in mobile equipment requiring low heater drain. Data for use in Resistance Coupled Amplifier Circuits is given in the Appendix.

## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	4	36	50	U
219/220	6.3	3	4	41	4	16X	5	2



**SYLVANIA TYPE 6BJ6**  
REMOTE CUTOFF PENTODE



## MECHANICAL DATA

Bulb.....	T-5 1/2, Outline 5-2
Base.....	Miniature Button 7-Pin
Basing.....	7CM
Mounting Position.....	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	150 Ma
Maximum Heater-Cathode Voltage.....	90 Volts

### DIRECT INTERELECTRODE CAPACITANCES

	Shielded <sup>1</sup>	Unshielded
Grid to Plate.....	0.0035	0.0035 $\mu$ f Max
Input.....	4.5	4.5 $\mu$ f
Output.....	5.5	5.5 $\mu$ f

### MAXIMUM RATINGS (Design Center Values)

Plate Voltage.....	300 Volts
Plate Dissipation.....	3.0 Watts
Grid No. 2 Supply Voltage.....	300 Volts
Grid No. 2 Voltage.....	(See Rating Chart for Type 6AM8)
Grid No. 2 Dissipation.....	0.6 Watts
Positive Grid No. 1 Voltage.....	0 Volts
Negative Grid No. 1 Voltage.....	-50 Volts

## CHARACTERISTICS AND TYPICAL OPERATION

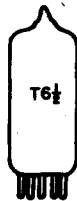
### Class A<sub>1</sub> Amplifier

Plate Voltage.....	100	250 Volts
Grid No. 2 Voltage.....	100	100 Volts
Grid No. 3 Voltage.....	(Pin 7 Connected to Pin 2 at Socket)	
Grid No. 1 Voltage.....	-1.0	-1.0 Volt
Plate Current.....	9.0	9.2 Ma
Grid No. 2 Current.....	3.5	3.3 Ma
Transconductance.....	3650	3600 $\mu$ mhos
Plate Resistance.....	0.25	1.3 Megohms

### NOTE:

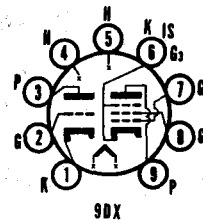
1. Shield No. 316 connected to Pins 2 and 7.





# SYLVANIA TYPE 6BH8 8BH8

Sharp Cutoff Pentode  
Medium-Mu Triode



## MECHANICAL DATA

Bulb.....	T-6½
Base.....	E9-1, Small Button 9-Pin
Outline.....	6-3
Basing.....	9D X
Cathode.....	Coated Unipotential
Mounting Position.....	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

	6BH8	8BH8
Heater Voltage.....	6.3	8.4 Volts
Heater Current.....	600	450 Ma
Heater Warm-up Time.....	11	11 Seconds
Heater-Cathode Voltage (Design Center Values)		
Heater Negative with Respect to Cathode		
Total D C and Peak.....	200	200 Volts Max.
Heater Positive with Respect to Cathode		
D C.....	100	100 Volts Max.
Total D C and Peak.....	200	200 Volts Max.

### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Triode	
Grid to Plate.....	2.4 μf
Input.....	2.6 μf
Output.....	0.38 μf
Pentode	
Grid to Plate.....	0.046 μf
Input.....	7.0 μf
Output.....	2.4 μf
Coupling: (Pentode Grid No. 1 to Triode Plate).....	0.004 μf
Coupling: (Triode Grid to Pentode Plate).....	0.016 μf
Coupling: (Pentode Plate to Triode Plate).....	0.095 μf

### RATINGS (Design Center Values)

	Triode	Pentode
Plate Voltage.....	300	300 Volts Max.
Grid No. 2 Supply Voltage.....		300 Volts Max.
Grid No. 2 Voltage.....	See Screen Grid Rating Chart on Page 5 of Appendix 10th Ed. Tech. Manual	
Plate Dissipation.....	2.5	3.0 Watts Max.
Grid No. 2 Dissipation.....		1.0 Watt Max.
Grid No. 1 Circuit Resistance		
Fixed Bias.....	0.5	0.25 Megohm Max.
Self Bias.....	1.0	1.0 Megohm Max.

### CHARACTERISTICS AND TYPICAL OPERATION

#### Class A<sub>1</sub> Amplifier

	Triode	Pentode
Plate Voltage.....	150	200 Volts
Grid No. 2 Voltage.....		125 Volts
Grid No. 1 Voltage.....	-5	Volts
Cathode Bias Resistor.....		82 Ohms
Amplification Factor.....	17	
Plate Resistance (approx.).....	5,150	150,000 Ohms
Transconductance.....	3,300	7,000 μmhos
Plate Current.....	9.5	15 Ma
Grid No. 2 Current.....		3.4 Ma
Grid No. 1 Voltage (approx.) for I <sub>b</sub> = 100 μa.....	-14	-8 Volts

#### NOTE:

1. Heater Warm-up Time is defined as the time required for the voltage across the heater to reach 80% of its rated value 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 rated heater voltage divided by rated heater current.

## APPLICATION

These tubes are intended for service in television receivers employing a series string heater arrangement. The triode section is designed for operation as a sync separator, amplifier, clipper or as a sweep oscillator. The pentode section is designed to serve as a video amplifier.

The 6BH8 employs a 600 Ma heater while the 8BH8 has a 450 Ma heater. Both types have controlled heater warm-up time and are intended for use in receivers having a series heater string.

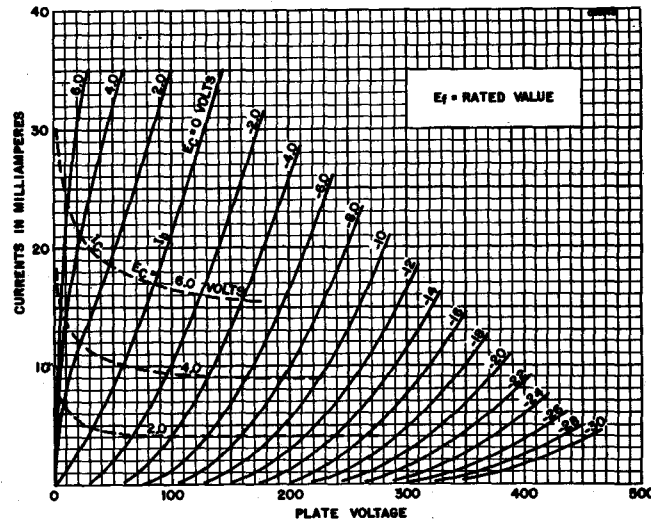
## SYLVANIA ELECTRONIC TUBES

Issued as a supplement to the manual in Sylvania News for February 1957

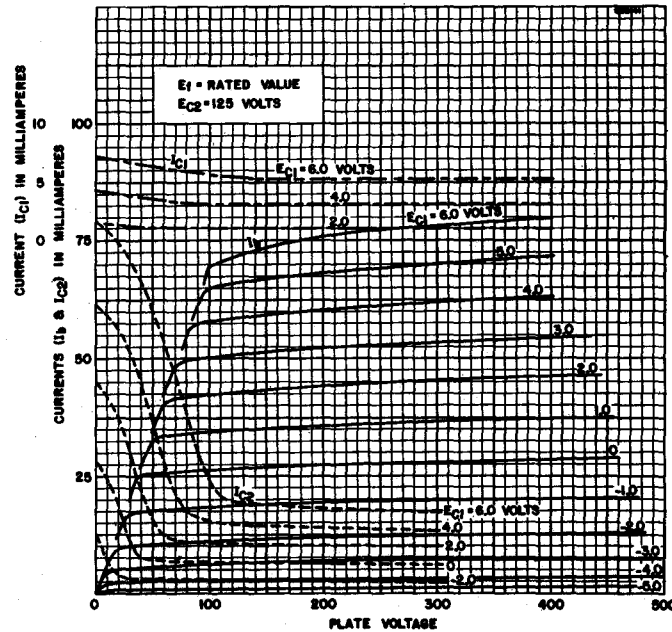
SYLVANIA TYPE 6BH8 (Cont'd)

8BH8

AVERAGE PLATE CHARACTERISTICS  
(TRIODE SECTION)



AVERAGE PLATE CHARACTERISTICS  
(PENTODE SECTION)



SYLVANIA ELECTRONIC TUBES

# 6BJ6 (Cont'd)

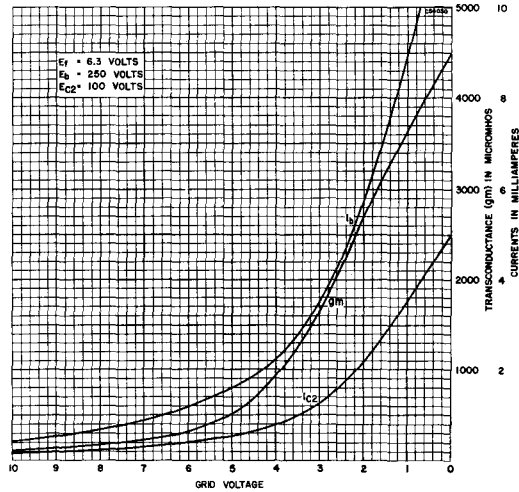
## APPLICATION

Sylvania Type 6BJ6 is a miniature, remote cutoff pentode designed for service as an r f or i f amplifier. The 6BJ6 features low input and output capacitances, relatively high gm and low current heater.

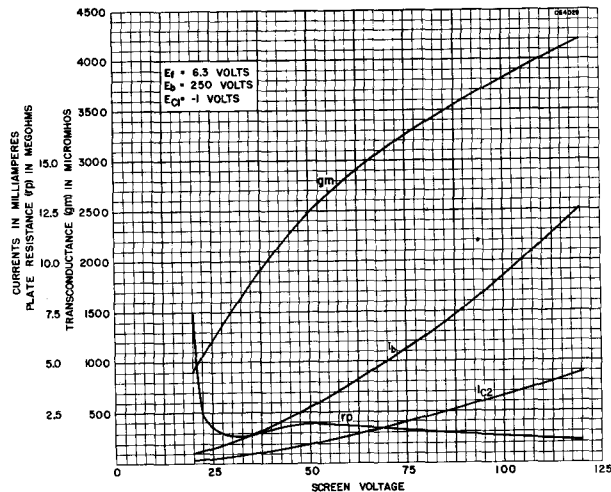
## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	4	36	29	W
219/220	6.3	3	4	48	4	16Z	5	2

## AVERAGE TRANSFER CHARACTERISTICS

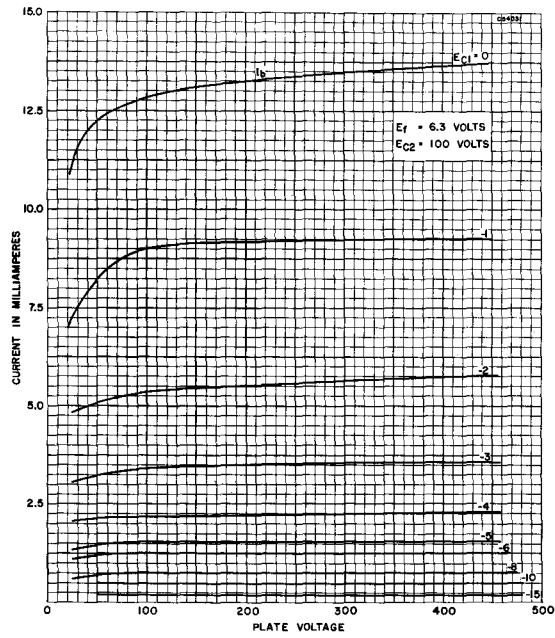


## AVERAGE TRANSFER CHARACTERISTICS

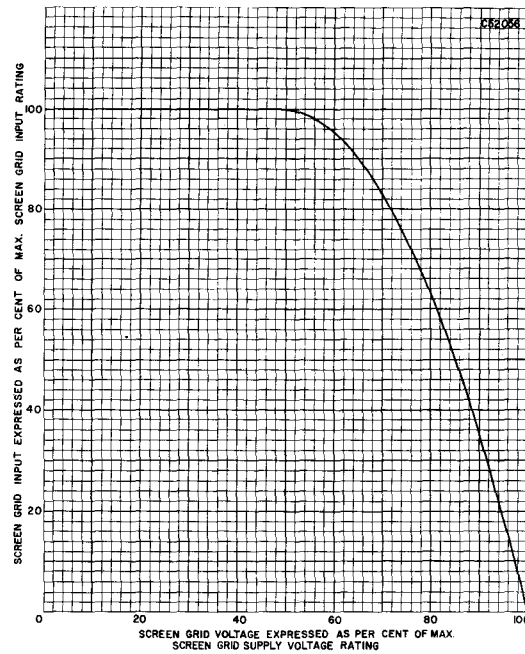


# 6BJ6 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS

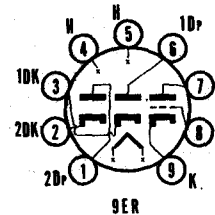


## SCREEN GRID RATING CHART





**SYLVANIA TYPE 6BJ8**  
MEDIUM MU TRIODE  
DOUBLE DIODE



**MECHANICAL DATA**

Bulb	T-6 $\frac{1}{2}$
Base	E9-1, Small Burton 9-Pin
Outline	6-3
Basing	9ER
Cathode	Coated Unipotential
Mounting Position	Any

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS**

Heater Voltage	6.3 Volts
Heater Current	600 Ma
Heater Warm-up Time <sup>1</sup>	11 Seconds
<b>Heater-Cathode Voltage (Design Center Values)</b>	
Heater Negative with Respect to Cathode	
Total DC and Peak	200 Volts Max.
Heater Positive with Respect to Cathode	
DC	100 Volts Max.
Total DC and Peak	200 Volts Max.

**DIRECT INTERELECTRODE CAPACITANCES (Unshielded)**

**Diode Section**

No. 1 Diode Plate to No. 1 Diode	
Cathode + Heater	1.9 $\mu$ f
No. 2 Diode Plate to No. 2 Diode	
Cathode + Heater	1.9 $\mu$ f
No. 1 Diode Cathode to No. 1 Diode	
Plate + Heater	4.6 $\mu$ f
No. 2 Diode Cathode to No. 2 Diode	
Plate + Heater	4.6 $\mu$ f

**Triode Section**

Grid to Plate	2.6 $\mu$ f
Input: g to (h + Tk)	2.8 $\mu$ f
Output: p to (h + Tk)	0.31 $\mu$ f

**Coupling**

No. 1 Diode Plate to Triode Grid	0.070 $\mu$ f Max.
No. 2 Diode Plate to Triode Grid	0.11 $\mu$ f Max.
No. 1 Diode Cathode to All:	
1 Dk to (h + Tk + 2Dk + Tp + 1Dp + Tg + 2Dp)	4.8 $\mu$ f
No. 2 Diode Cathode to All:	
2 Dk to (h + Tk + 1Dk + Tp + 1Dp + 2Dp + Tg)	4.8 $\mu$ f
No. 1 Diode Plate to No. 2 Diode Plate	0.060 $\mu$ f Max.
No. 1 Diode Plate to All:	
1 Dp to (h + Tk + 1Dk + 2Dk + Tp + 2Dp + Tg)	3.0 $\mu$ f
No. 2 Diode Plate to All:	
2 Dp to (h + Tk + 1Dk + 2Dk + Tp + 1Dp + Tg)	3.0 $\mu$ f

**MAXIMUM RATINGS—Each Section**

(Design Center Values—Except as Noted)

	Class A <sub>1</sub> Amplifier	Vertical Deflection Amplifier
<b>Triode Section</b>		
Plate Voltage	300	300 Volts
Peak Positive Pulse Plate Voltage (Abs. Max.)		1200 Volts
Peak Negative Pulse Grid Voltage		250 Volts
Positive DC Grid Voltage	0	Volts
Maximum Plate Dissipation <sup>2</sup>	3.5	3.5 Watts
Average Cathode Current	20	20 Ma
Peak Cathode Current		70 Ma
Grid Circuit Resistance		
Self Bias	1.0	2.2 Megohms
Fixed Bias	1.0	Megohms
<b>Diode Section</b>		
Peak Plate Current, (each plate)		54 Ma
DC Current, (each plate)		9 Ma

**CHARACTERISTICS AND TYPICAL OPERATION**

	Class A <sub>1</sub> Amplifier	Triode Section
Plate Voltage	90	250 Volts
Grid Voltage	0	-9 Volts
Plate Current	13.5	8.0 Ma
Transconductance	4700	2800 $\mu$ mhos
Amplification Factor	22	20
Plate Resistance (approx.)	4700	7150 Ohms
Plate Current at E <sub>c</sub> = -12.5 Volts DC		1.7 Ma
Grid Voltage (approx.) for I <sub>b</sub> = 10 $\mu$ a	-7	-18 Volts

# 6BJ8 (Cont'd)

Average Current Each Plate at 10 Volts D C'....  
Voltage Drop Each Section at  $I_b = 9$  Ma DC'....

Diode Section  
50 Ma  
2.6 Volts

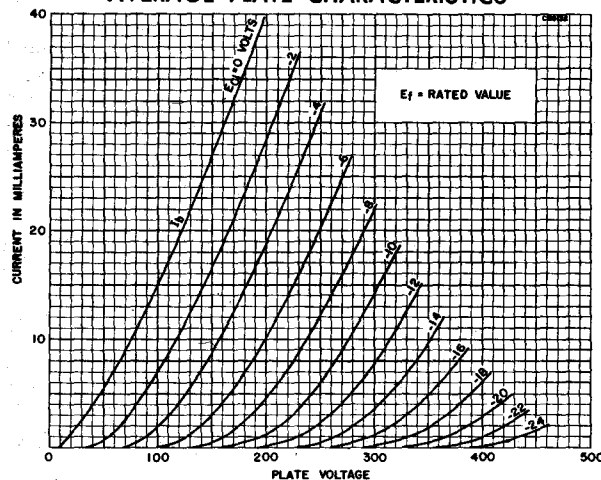
## NOTES:

1. 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 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three times the rated heater voltage divided by the rated heater current.
2. For operation in a 525 line, 30-frame system as described in "Standards of Good Engineering Practice for Television Stations; Federal Communications Commission." The duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.
3. In stages operating with grid leak bias, an adequate cathode bias resistor or other suitable means is required to protect the tube in the absence of excitation.
4. Test conditions only.

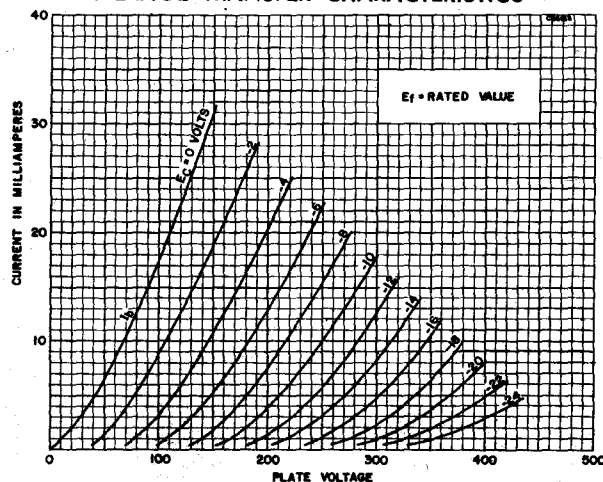
## APPLICATION

The Sylvania Type 6BJ8 is a miniature, medium  $\mu$  triode, double diode intended for use as a phase splitter, phase comparator and horizontal deflection oscillator. The tube features controlled heater warm-up time to insure dependable operation in series string receivers and separate cathode connections for each section.

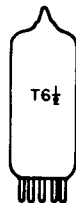
### AVERAGE PLATE CHARACTERISTICS



### AVERAGE TRANSFER CHARACTERISTICS

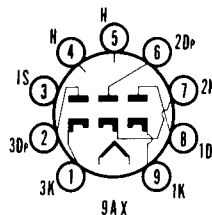


SYLVANIA ELECTRONIC TUBES



## SYLVANIA TYPE 6BJ7

TRIPLE DIODE



### MECHANICAL DATA

Bulb	T-6 1/2, Outline 6-2
Base	Small Button 9-Pin
Basing	9A X
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	450 Ma
Maximum Heater-Cathode Voltage	
Heater Positive with Respect to Cathode	100 Volts
Heater Negative with Respect to Cathode	330 Volts

#### MAXIMUM RATINGS (Design Center Values)

##### Television D C-Restorer Service

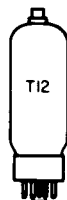
Peak Inverse Plate Voltage	330 Volts
Peak Plate Current per Plate	10 Ma
D C Output Current per Plate	1.0 Ma

#### CHARACTERISTICS

Tube Voltage Drop, Each Section	
$I_b = 10 \text{ Ma D C}$	2.7 Volts

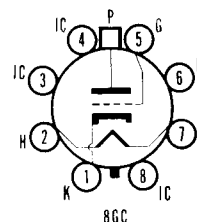
### APPLICATION

The Sylvania Type 6BJ7 is a miniature triple diode intended primarily for use as a d c restorer in each of three signal channels of color television receivers. The electrical characteristics of each section of the 6BJ7 are similar to those of each section of the 6AL5.



## SYLVANIA TYPE 6BK4

HIGH VOLTAGE REGULATOR



### MECHANICAL DATA

Bulb	T-12
Base	Short Jumbo Shell Octal
Maximum Overall Length	5 7/32"
Maximum Seated Height	4 11/16"
Basing	8GC
Top Cap	Small
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage (A C or D C)	6.3 Volts
Heater Current	200 Ma
Maximum Heater-Cathode Voltage	
Heater Positive with Respect to Cathode	Not Recommended
Heater Negative with Respect to Cathode	225 Volts

#### DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.03 $\mu\text{f}$
Input	2.6 $\mu\text{f}$
Output	1.0 $\mu\text{f}$ Max

# 6BK4 (Cont'd)

## MAXIMUM RATINGS (Design Center Values)

D C Plate Voltage.....	25000 Volts
Unregulated D C Supply Voltage.....	55000 Volts
Grid Voltage.....	
D C Value.....	-125 Volts
Peak Value During 20 Sec. Warm-Up.....	400 Volts
D C Plate Current.....	1.5 Ma
Plate Dissipation.....	25 Watts
Grid Circuit Resistance for use with Flyback Transformer H.V. Supply.....	3.0 Megohms

## CHARACTERISTICS

Amplification Factor (Approx.).....	2000
-------------------------------------	------

## NOTE:

- Do not use Pins 3, 4, 6 and 8 for tie points.

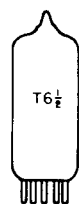
## WARNING

The high voltages at which the 6BK4 is operated may be extremely dangerous to the user. Great care should be taken during the adjustments of circuits.

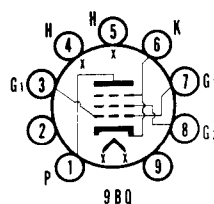
Operation of the 6BK4 at plate voltages above 16,000 volts (absolute value) results in the production of X-rays which can constitute a health hazard unless adequately shielded.

## APPLICATION

The Type 6BK4 is a beam triode, high voltage low current regulator that may be used in color television receivers to supply regulated picture tube voltages.



**SYLVANIA TYPE 6BK5**  
BEAM POWER AMPLIFIER



## MECHANICAL DATA

Bulb.....	T-6 1/2, Outline 6-3
Base.....	Small Button 9-Pin
Basing.....	9BQ
Mounting Position.....	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	1.2 Amperes
Maximum Heater-Cathode Voltage.....	100 Volts

### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid to Plate.....	0.6 $\mu\mu\text{f}$
Input.....	13 $\mu\mu\text{f}$
Output.....	5.0 $\mu\mu\text{f}$

### MAXIMUM RATINGS (Design Center Values)

#### Class A<sub>1</sub> Amplifier

Plate Voltage.....	250 Volts
Plate Dissipation.....	9 Watts
Grid No. 2 Voltage.....	250 Volts
Grid No. 2 Dissipation.....	2.5 Watts
Positive Grid No. 1 Voltage.....	0 Volts
Grid No. 1 Circuit Resistance.....	
Fixed Bias.....	0.1 Megohm
Cathode Bias.....	0.5 Megohm



# 6BK5 (Cont'd)

## CHARACTERISTICS AND TYPICAL OPERATION

Plate Voltage	250 Volts
Grid No. 2 Voltage	250 Volts
Grid No. 1 Voltage	5 Volts
Peak A F Grid No. 1 Voltage	5 Volts
Plate Current (Zero Signal)	35 Ma
Plate Current (Maximum Signal)	37 Ma
Grid No. 2 Current (Zero Signal)	3.5 Ma
Grid No. 2 Current (Maximum Signal)	10 Ma
Plate Resistance (approx.)	100,000 Ohms
Transconductance	8,500 $\mu$ mhos
Load Resistance	6,500 Ohms
Maximum-Signal Power Output	3.5 Watts
Total Harmonic Distortion (approx.)	7 Percent

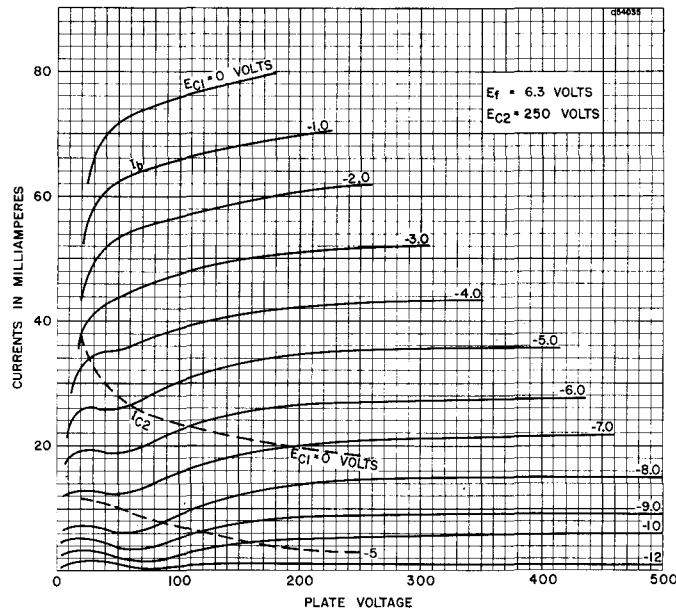
## APPLICATION

The Sylvania Type 6BK5 is a miniature beam power amplifier designed for use as the audio power output stage in radio and television receivers. The 6BK5 features high power sensitivity, high transconductance and high plate efficiency.

## SYLVANIA TUBE TESTER SETTINGS

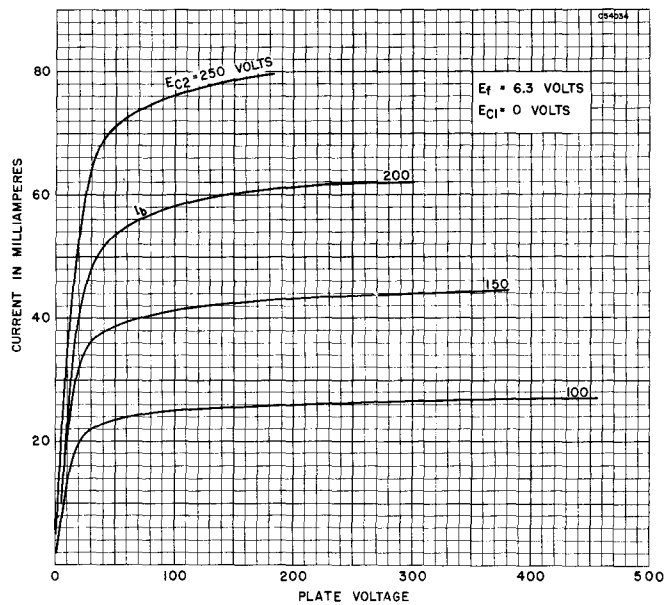
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	7	0	1	69	28	Y
	6.3	0	6	0	1	79	28	Y
219/220	6.3	4	57	24	5	38Z	1	6
	6.3	4	35	24	5	78Z	1	6

## AVERAGE PLATE CHARACTERISTICS

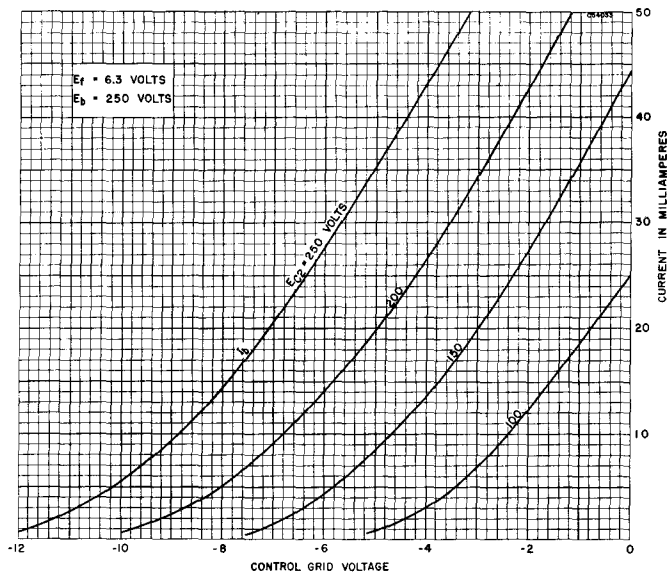


# 6BK5 (Cont'd)

## AVERAGE PLATE CHARACTERISTICS

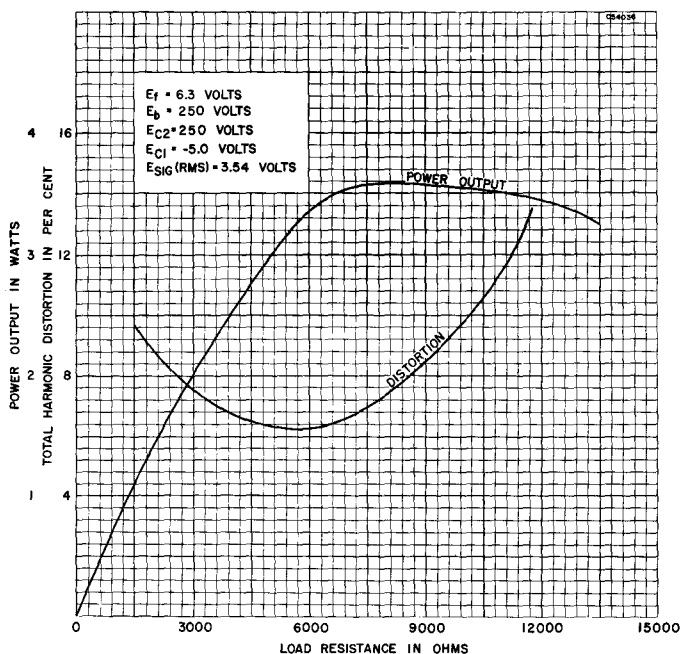


## AVERAGE TRANSFER CHARACTERISTICS



# 6BK5 (Cont'd)

## AVERAGE OPERATION CHARACTERISTICS



## TYPE 6BK6

(See Condensed Data Section)

## SYLVANIA TYPE 6BK7

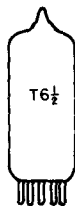
DUO TRIODE R F AMPLIFIER

### TYPICAL OPERATION

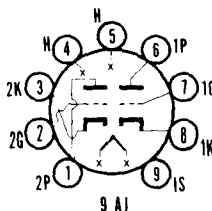
#### Class A<sub>1</sub> Amplifier

Plate Voltage.....	100	150 Volts
Cathode Bias Resistor.....	120	56 Ohms
Plate Current.....	9.0	18 Ma
Amplification Factor.....	37	40
Plate Resistance (approx.).....	6100	4700 Ohms
Transconductance.....	6100	8500 $\mu$ mhos
Grid Voltage for $I_b = 10 \mu$ a (approx.).....	-9	-12 Volts

The Sylvania Type 6BK7 is identical mechanically and similar electrically to Sylvania Type 6BK7A. Heater characteristics of these tube types are identical. Type 6BK7 is replaced by Type 6BK7A.



**SYLVANIA TYPE 6BK7A**  
DUO TRIODE R F AMPLIFIER



**MECHANICAL DATA**

Bulb.....T-6 1/2, Outline 6-2  
Base.....Small Button 9-Pin  
Basing.....9AJ  
Mounting Position.....Any

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS**

Heater Voltage.....6.3 Volts  
Heater Current.....450 Ma  
Peak Heater-Cathode Voltage<sup>1</sup>.....90 Volts Max

**DIRECT INTERELECTRODE CAPACITANCES (Unshielded)**

	Section 1 <sup>2</sup>	Section 2
Grid to Plate.....	1.8	1.8 $\mu\text{mf}$
Input.....	3.0	3.0 $\mu\text{mf}$
Output.....	1.0	0.9 $\mu\text{mf}$
Heater to Cathode.....	2.8	3.0 $\mu\text{mf}$
Grid to Grid (Max).....	0.004	$\mu\text{mf}$
Plate to Plate (Max).....	0.075	$\mu\text{mf}$
Grounded Grid Operation		
Plate to Cathode.....	0.22	0.22 $\mu\text{mf}$
Input.....	6.0	6.0 $\mu\text{mf}$
Output.....	2.4	2.4 $\mu\text{mf}$

**MAXIMUM RATINGS (Design Center Values)**

Plate Voltage.....300 Volts  
Plate Dissipation (Each Section).....2.7 Watts  
Negative D C Grid Voltage.....50 Volts

**CHARACTERISTICS AND TYPICAL OPERATION**

**Class A<sub>1</sub> Amplifier (Each Section)**

Plate Voltage.....150 Volts  
Cathode Bias Resistor.....56 Ohms  
Plate Current.....18 Ma  
Transconductance.....9300  $\mu\text{mhos}$   
Amplification Factor.....43  
Plate Resistance.....4600 Ohms  
Grid Voltage for  $I_b = 10 \mu\text{a}$ .....-11 Volts

**NOTES:**

- When operated as a cascode amplifier and the two sections are connected in series, the heater-cathode voltage of the grounded grid stage may be as high as 250 volts maximum with the heater negative with respect to the cathode.
- Section 1 connects to Pins 6, 7 and 8. Section 2 connects to Pins 1, 2 and 3.

**APPLICATION**

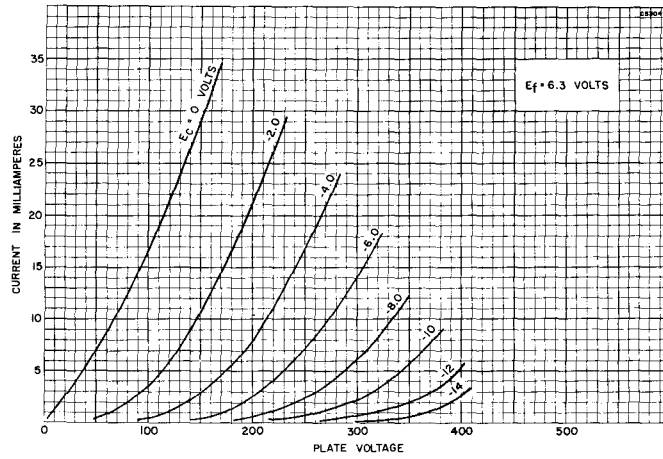
The Sylvania Type 6BK7A is a medium mu twin triode designed for use as a cascode amplifier below approximately 300 mc. The tube features high gain, low noise figure and shielding between sections to minimize internal capacity. The Type 6BK7A is considered as the replacement for the Type 6BK7.

**SYLVANIA TUBE TESTER SETTINGS**

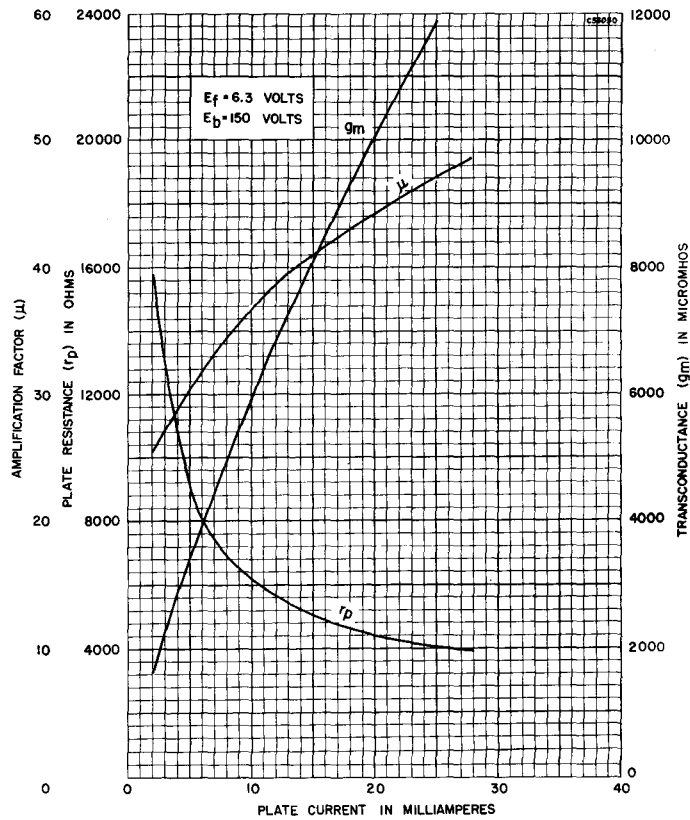
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	1	3	18	W
	6.3	0	—	0	3	7	18	W
219/220	6.3	4	58	25	5	2X	1	3
	6.3	4	35	25	5	7X	6	8

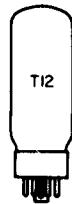
# 6BK7A (Cont'd)

## AVERAGE PLATE CHARACTERISTICS



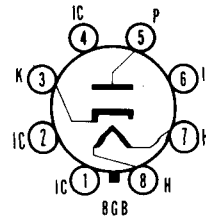
## AVERAGE TRANSFER CHARACTERISTICS





## SYLVANIA TYPE 6BL4

### HALF-WAVE RECTIFIER



#### MECHANICAL DATA

Bulb.....	Short Jumbo Shell Octal 8-Pin with External Barriers	T-12
Base.....		8GB
Maximum Overall Length.....		45/8"
Maximum Seated Height.....		41/16"
Basing <sup>1</sup> .....		8GB
Mounting Position.....		Any

#### ELECTRICAL DATA

##### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	3.0 Amps
Maximum Peak Heater-Cathode Voltage.....	
Heater Negative with Respect to Cathode (Abs. Max.) <sup>2</sup>	
Total D C and Peak.....	4500 Volts
D C.....	900 Volts
Heater Positive with Respect to Cathode.....	
Total D C and Peak.....	300 Volts
D C.....	100 Volts

##### DIRECT INTERELECTRODE CAPACITANCES (Approx.)

	Unshielded
Plate to Heater and Cathode.....	11.5 $\mu\text{mf}$
Heater to Cathode.....	5.0 $\mu\text{mf}$
Cathode to Heater and Plate.....	16 $\mu\text{mf}$

##### MAXIMUM RATINGS (Design Center Values—Except as Noted)

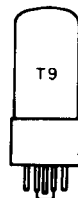
Damper Service <sup>3</sup>	
Peak Inverse Plate Voltage (Abs. Max.) <sup>2</sup> .....	4500 Volts
Plate Dissipation.....	8.0 Watts
Plate Current, D C.....	200 Ma
Peak Plate Current.....	1200 Ma

##### NOTES:

- Do not use Pins 1, 2, 4 and 6 for tie points.
- Under no circumstances should this absolute value be exceeded.
- For operation in a 525-line, 30 frame television system, the duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.

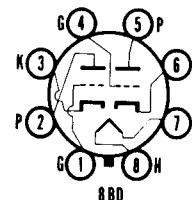
#### APPLICATION

The Sylvania Type 6BL4 is a half-wave vacuum rectifier which is particularly suited for use as a damper diode in color television receivers.



## SYLVANIA TYPE 6BL7GT

### DUO TRIODE



#### MECHANICAL DATA

Bulb.....	Short Intermediate Octal 8-Pin	T-9, Outline 9-41
Base.....		8BD
Basing.....		Any
Mounting Position.....		

#### ELECTRICAL DATA

##### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	1.5 Amperes
Maximum Peak Heater-Cathode Voltage.....	200 Volts

# 6BL7GT (Cont'd)

## DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

	Section 1 <sup>1</sup>	Section 2
Grid to Plate.....	6.0	6.0 $\mu\mu\text{f}$
Input.....	4.2	4.6 $\mu\mu\text{f}$
Output.....	0.9	0.9 $\mu\mu\text{f}$

## MAXIMUM RATINGS (Design Center Values)

### Vertical Oscillator<sup>2</sup>

Plate Voltage.....	500 Volts
Peak Negative Pulse Grid Voltage.....	400 Volts
Average Cathode Current.....	60 Ma
Peak Cathode Current.....	210 Ma
Grid Circuit Resistance.....	2.2 Megohms
Plate Dissipation (each plate) <sup>3</sup> .....	10 Watts

### Vertical Deflection Amplifier<sup>2</sup>

Plate Voltage.....	500 Volts
Peak Positive Pulse Plate Voltage.....	2000 Volts abs Max
Peak Negative Pulse Grid Voltage.....	250 Volts
Average Cathode Current.....	60 Ma
Peak Cathode Current.....	210 Ma
Grid Circuit Resistance.....	2.2 Megohms
Plate Dissipation (each plate) <sup>3</sup> .....	10 Watts

## TYPICAL OPERATION

### Class A<sub>1</sub> Amplifier—Single Section

Plate Voltage.....	250 Volts
Grid Voltage.....	-9.0 Volts
Plate Current.....	40 Ma
Transconductance.....	7000 $\mu\text{mhos}$
Amplification Factor.....	15
Plate Resistance.....	2150 Ohms
Grid Voltage (approx.) for $I_b = 50 \mu\text{a}$ .....	-23 Volts

## NOTES:

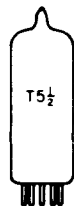
1. Section 1 connects to Pins 4, 5 and 6.
2. For operation in a 525 line, 30 frame system, the duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.
3. Total dissipation of both sections is limited to 12 watts.

## APPLICATION

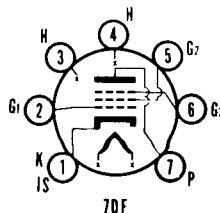
Sylvania Type 6BL7GT is a high transconductance duo triode designed for use as a vertical deflection amplifier in television receivers. The high current available at low voltage provides the power necessary to deflect wide angle picture tubes.

## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	78	1	7	5	32	Y
	6.3	0	7	1	3	3	32	Y
219/220	6.3	7	68	21	8	1Z	2	3
	6.3	7	38	21	8	4Z	5	6



## SYLVANIA TYPE 6BN6 GATED BEAM DISCRIMINATOR



### MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-3
Base	Miniature Button 7-Pin
Basing	7DF
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	300 Ma
Maximum Heater-Cathode Voltage	90 Volts

#### DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid No. 1 to All Other Electrodes	4.2 $\mu\text{f}$
Grid No. 3 to All Other Electrodes	3.3 $\mu\text{f}$
Grid No. 1 to Grid No. 3	0.004 $\mu\text{f}$ Max

#### MAXIMUM RATINGS (Design Center Values)

Plate Supply Voltage	300 Volts
Accelerator Voltage	100 Volts
Peak Positive Limiter-Grid Voltage	55 Volts
Total Cathode Current	11.5 Ma

### CHARACTERISTICS AND TYPICAL OPERATION

#### Limiter-Discriminator Service

Input Signal Center Frequency	10.7	10.7	4.5 Mc
Frequency Deviation	$\pm 75$	$\pm 75$	$\pm 25$ Kc
Plate Supply Voltage	85	285	270 Volts
Plate Voltage	63	122	121 Volts
Accelerator Voltage	55	100	100 Volts
Cathode Bias Resistor (Variable) <sup>1</sup>	200-400	200-400	200-400 Ohms
Plate Load Resistor	85000	330000	330000 Ohms
Plate Linearity Resistor	470	1500	1000 Ohms
Integrating Capacitor	0.002	0.001	0.001 $\mu\text{f}$
Coupling Capacitor	0.25	0.01	0.25 $\mu\text{f}$
Minimum Signal Voltage for Limiting			
Action (R M S) <sup>2</sup>	1.25	1.25	1.25 Volts
Average D C Plate Current	0.25	0.49	0.44 Ma
Accelerator Current	4.1	9.8	10.0 Ma
Input Signal Level for A M Rejection			
Adjustment <sup>1</sup>	1.25	2.0	2.0 Volts
A M Rejection at $E_{s,ik} = 2.0$ Volts (R M S)	31	20	25 db
A M Rejection at $E_{s,ik} = 3.0$ Volts (R M S)	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

#### NOTES:

- The cathode resistor should be adjusted for maximum a m rejection in the output of the limiter-discriminator stage at the specified signal level. A m rejection is measured with an applied signal containing 30% a m and 30% f m.
- At signal levels above specified value, limiting is within  $\pm 2$  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 f m are included.

The Q of the quadrature grid circuit should be high enough to develop a minimum of 4 volts (r m s) signal with 2 volts (r m s) of the center-frequency signal applied to the limiter grid. It is recommended that the coil be shunted by a minimum of 10  $\mu\text{f}$ . The capacitance may be composed of tube input capacitance, stray capacitance, and distributed capacitance, as well as physical capacitance.

### APPLICATION

Sylvania Type 6BN6 is a gated beam tube in miniature construction designed primarily for the combined operations of limiter, discriminator and audio voltage amplifier in f m and inter-carrier television receivers. It may also be used as a sync separator and square-wave generator.

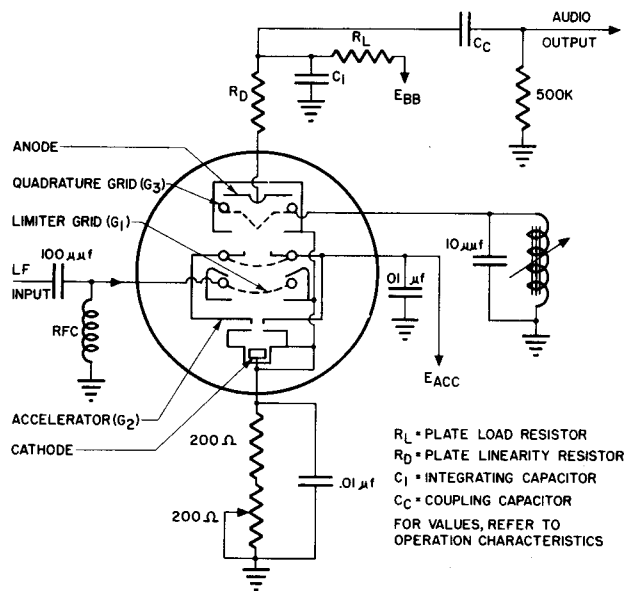


# 6BN6 (Cont'd)

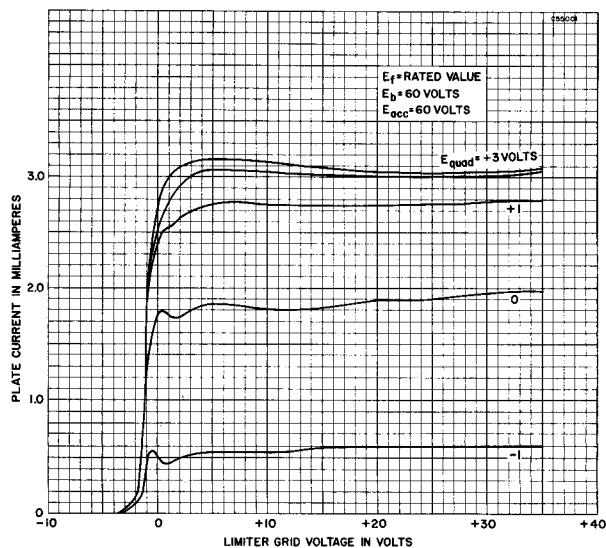
## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	3	25	48	V
	6.3	0	—	0	3	056	35	V
219/220	6.3	3	4	34	4	25U	7	1
	6.3	3	4	21	4	056U	7	1

## TYPICAL FM SOUND DISCRIMINATOR AND INTERNAL CONSTRUCTION OF THE TYPE 6BN6



## AVERAGE CHARACTERISTICS



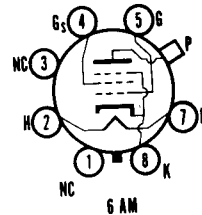
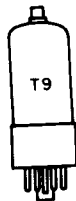
# TYPE 6BN7

(See Condensed Data Section)

## SYLVANIA TYPE

6BQ6G  
6BQ6GA  
6BQ6GT  
6BQ6GTA

BEAM POWER AMPLIFIER



### MECHANICAL DATA

	6BQ6G	6BQ6GA
Bulb	ST-12, Outline 12-8	T-11
Base	Small Shell Octal	Medium Shell Octal 7-Pin
Basing	6AM	6AM
Top Cap	Skirted Miniature	Skirted Miniature
Mounting Position	Any	Any
	6BQ6GT	6BQ6GTA
Bulb	T-9, Outline 9-49	T-9, Outline 9-50
Base	Intermediate Shell Octal	Short Intermediate Shell Octal
Basing	6AM	6AM
Top Cap	Skirted Miniature	Skirted Miniature
Mounting Position	Any	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	1.2 Amperes
Maximum Heater-Cathode Voltage	200 Volts
Total D C and Peak	100 Volts
D C, Heater Positive with Respect to Cathode	

#### DIRECT INTERELECTRODE CAPACITANCES (Approx.)

	6BQ6GA	6BQ6GTA 6BQ6GT 6BQ6G
Grid to Plate	0.8	0.6 $\mu\text{f}$
Input	14	15 $\mu\text{f}$
Output	6.5	7.5 $\mu\text{f}$

#### MAXIMUM RATINGS (Design Center Values—Except as Noted)

##### Horizontal Deflection Amplifier<sup>1</sup>

	6BQ6GTA 6BQ6GA 6BQ6G	6BQ6GT
Plate Voltage, D C	600	550 Volts
Peak Positive Plate Voltage (Abs. Max.)	6000	5500 Volts
Peak Negative Plate Voltage	1250	1250 Volts
Plate Dissipation <sup>2</sup>	11	11 Watts
Grid No. 2 Voltage, D C	175	175 Volts
Grid No. 2 Dissipation	2.5	2.5 Watts
Peak Negative Grid No. 1 Voltage	300	300 Volts
Average Cathode Current	110	110 Ma
Peak Cathode Current	400	400 Ma
Grid No. 1 Circuit Resistance	0.47	0.47 Megohm
Bulb Temperature at Hottest Point	See Note 3	

#### CHARACTERISTICS

	6BQ6G 6BQ6GA	6BQ6GT 6BQ6GTA
<b>Pentode Operation:</b> With $E_b = 250 \text{ V}$ , $E_{c2} = 150 \text{ V}$ , $E_{c1} = -22.5 \text{ V}$		
Plate Current		55 Ma
Grid No. 2 Current		2.1 Ma
Transconductance		5500 $\mu\text{mhos}$
Plate Resistance		20000 Ohms

# 6BQ6G, 6BQ6GA 6BQ6GT, 6BQ6GTA (Cont'd)

	6BQ6G 6BQ6GA 6BQ6GT	6BQ6GTA
<b>Zero Bias: With <math>E_b = 60</math> V and <math>E_{c2} = 150</math> V (Instantaneous Values)</b>		
Plate Current.....	225	260 Ma
Grid No. 2 Current.....	25	26 Ma
<b>Cutoff: For <math>I_b = 1</math> ma with <math>E_b = 250</math> V and <math>E_{c2} = 150</math> V</b>		
Grid No. 1 Voltage (approx.).....	-46	-43 Volts
<b>Triode Amplification Factor:</b>		
$E_b = E_{c2} = 150$ V and $E_{c1} = -22.5$ V.....	4.3	4.3 Volts

## NOTES:

- For operation in a 525-line, 30 frame system, the duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.
- In stages operating with grid leak bias, an adequate cathode bias resistor or other suitable means is required to protect the tube in the absence of excitation.
- Maximum bulb temperature at hottest point:
 

6BQ6GA	—190°C
6BQ6G	—200°C
6BQ6GTA	—220°C
6BQ6GT	—220°C

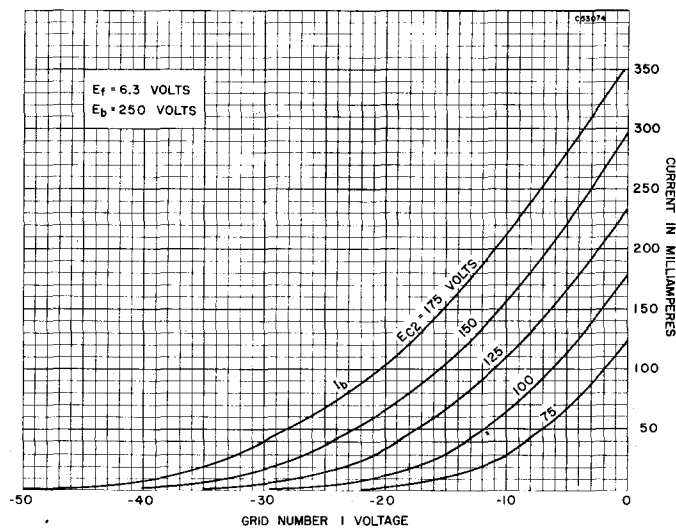
## APPLICATION

These tubes are beam power amplifiers designed for service as the horizontal amplifier in television receivers. They are generally interchangeable except that the Types 6BQ6G, 6BQ6GA and 6BQ6GTA have slightly higher maximum ratings than the Type 6BQ6GT. In substituting one for the other, the difference in maximum bulb temperatures should be considered in addition to the maximum voltage and power dissipation differences. The Sylvania Type 6BQ6GTA is recommended to replace the others in most circuits as it has both the highest maximum electrical ratings and highest maximum bulb temperature.

## SYLVANIA TUBE TESTER SETTINGS

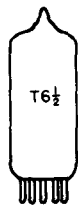
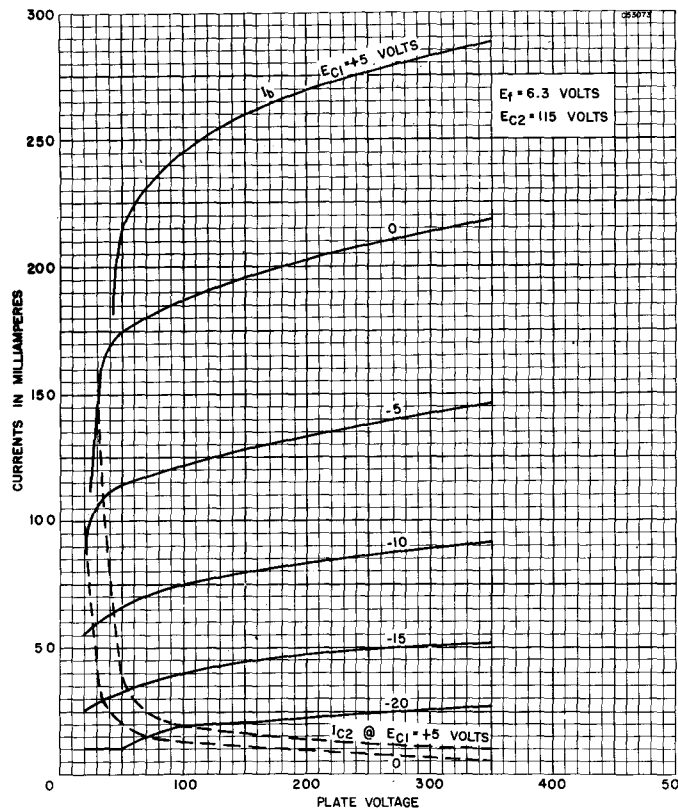
	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	5	0	8	034	21	Y
219/220	6.3	2	7	10	7	045Y	9	8

## AVERAGE PLATE CHARACTERISTICS

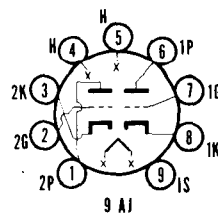


# 6BQ6G, 6BQ6GA 6BQ6GT, 6BQ6GTA (Cont'd)

## AVERAGE PLATE CHARACTERISTICS



**SYLVANIA TYPE 6BQ7**  
MEDIUM-MU DUO TRIODE



Type 6BQ7 is similar to its replacement—Type 6BQ7A. The Type 6BQ7 has a lower transconductance and amplification factor.

### TYPICAL OPERATION

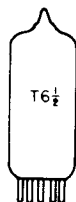
#### Class A<sub>1</sub> Amplifier

Plate Voltage	150 Volts
Cathode Bias Resistor	220 Ohms
Plate Current	9.0 Ma
Transconductance	6000 $\mu$ mhos
Plate Resistance	5800 Ohms
Amplification Factor	35

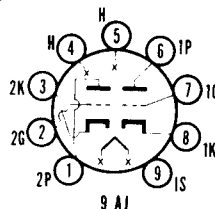
# 6BQ7 (Cont'd)

## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	1	3	20	W
	6.3	0	—	0	3	7	20	W
219/220	6.3	4	58	25	5	2X	1	3
	6.3	4	35	25	5	7X	6	8



### SYLVANIA TYPE 6BQ7A V H F DUO TRIODE



### MECHANICAL DATA

Bulb .....	T-6 1/2, Outline 6-2
Base .....	Small Button 9-Pin
Basing .....	9AJ
Mounting Position .....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage .....	6.3 Volts
Heater Current .....	400 Ma
Maximum Heater-Cathode Voltage .....	200 Volts

#### DIRECT INTERELECTRODE CAPACITANCES (Shielded)<sup>1</sup>

	Section 1 <sup>2</sup>	Section 2
Grid to Plate .....	1.2	1.2 $\mu\mu\text{f}$
Input .....	2.6	$\mu\mu\text{f}$
Output .....	1.2	$\mu\mu\text{f}$
Plate to Cathode .....	0.12	0.12 $\mu\mu\text{f}$
Heater to Cathode .....	2.6	2.6 $\mu\mu\text{f}$
Plate to Plate .....	0.010	$\mu\mu\text{f}$
Plate Section 2 to Plate and Grid Section 1 .....	0.024	$\mu\mu\text{f}$
<b>Grounded Grid Operation</b>		
Input .....		5.0 $\mu\mu\text{f}$
Output .....		2.2 $\mu\mu\text{f}$

#### MAXIMUM RATINGS (Design Center Values—Each Section)

Plate Voltage .....	250 Volts
Plate Dissipation .....	2 Watts
Cathode Current .....	20 Ma
Grid Circuit Resistance .....	0.5 Megohm

#### CHARACTERISTICS AND TYPICAL OPERATION

##### Class A<sub>1</sub> Amplifier—Each Section

Plate Voltage <sup>3</sup> .....	150	Volts
Cathode Bias Resistor .....	220	Ohms
Plate Current .....	9	Ma
Transconductance .....	6400	$\mu\text{mhos}$
Plate Resistance .....	5900	Ohms
Amplification .....	38	
Grid Voltage for $I_b = 100 \mu\text{a}$ (approx.) .....	-6.5	Volts

##### Direct Coupled R F Grounded Grid Operation<sup>4</sup>

	Section 1	Section 2
Plate Supply Voltage .....	250	250 Volts
Plate Voltage .....	135	115 Volts
Negative Grid Voltage .....	-1	Volts
Cathode Bias Resistor .....	100	Ohms
Grid Resistor .....		0.5 Megohm
Plate Current .....	10	10 Ma
Grid Current .....	0	0 Ma
Grid Voltage for $I_b = 10 \mu\text{a}$ (approx.) .....	-14	Volts

##### Push-Pull R F Grounded Grid Operation

Plate Voltage .....	150 Volts
Grid Voltage .....	-2 Volts
Cathode Bias Resistor (Common to Both Sections) .....	100 Ohms
Plate Current .....	10 Ma

# 6BQ7A (Cont'd)

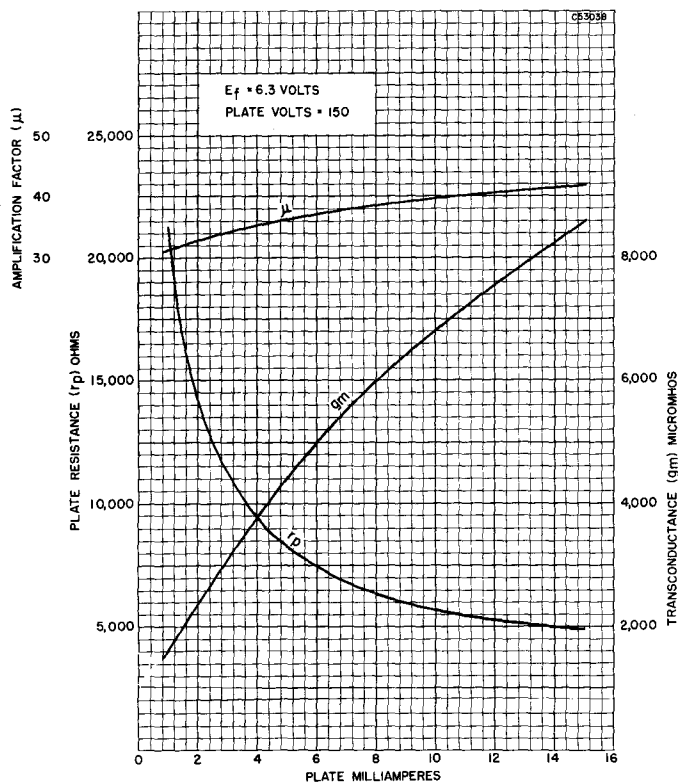
## NOTES:

1. RETMA shield No. 315.
2. Section No. 1 connects to Pins 6, 7 and 8. Section No. 2 connects to Pins 1, 2 and 3.
3. Under cutoff conditions, in r f grounded grid circuits with direct coupled drive, this voltage may be as high as 300 volts.
4. Section No. 1 (Driver) is directly coupled to Section No. 2 (Driven Grounded Grid Amplifier.)

## APPLICATION

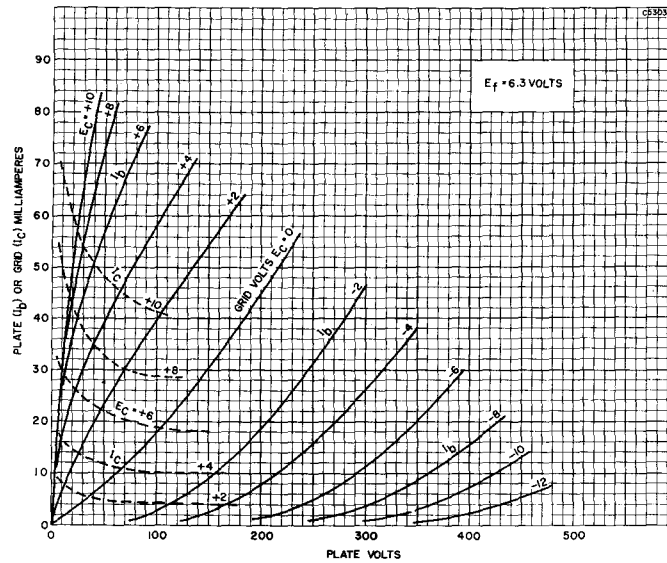
Sylvania Type 6BQ7A is a miniature, medium  $\mu$ , twin triode intended for service as the first amplifier in tuners or vhf television receivers or other applications requiring a high gain, low noise twin triode amplifier. The Type 6BQ7A is considered as a replacement for Type 6BQ7.

## AVERAGE TRANSFER CHARACTERISTICS



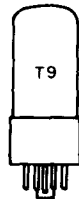
# 6BQ7A (Cont'd)

## AVERAGE PLATE CHARACTERISTICS

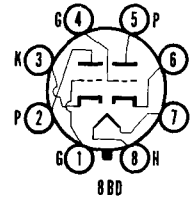


## TYPE 6BU5

(See Condensed Data Section)



SYLVANIA TYPE 6BX7GT  
DUO TRIODE



### MECHANICAL DATA

Bulb.....	T-9, Outline 9-41
Base.....	Short Intermediate Shell Octal
Basing.....	8BD
Mounting Position.....	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage.....	6.3 Volts
Heater Current.....	1.5 Amperes
Maximum Heater-Cathode Voltage.....	200 Volts
Total D C and Peak.....	100 Volts
D C, Heater Positive with Respect to Cathode.....	

#### MAXIMUM RATINGS (Design Center Values—Except as Noted)

##### Vertical Deflection Amplifier and Oscillator (Notes 2 & 3)

Plate Voltage.....	500 Volts
Peak Positive Plate Voltage (Abs. Max.).....	2000 Volts
Plate Dissipation <sup>4</sup>	
Each Plate.....	10 Watts
Both Plates.....	12 Watts
Positive Grid Voltage D C.....	0 Volts
Peak Negative Grid Voltage.....	250 Volts
Average Cathode Current D C (Each Section).....	60 Ma
Grid Circuit Resistance.....	2.2 Megohms
Peak Cathode Current D C (Each Section).....	180 Ma

# 6BX7GT (Cont'd)

## CHARACTERISTICS (Each Section)

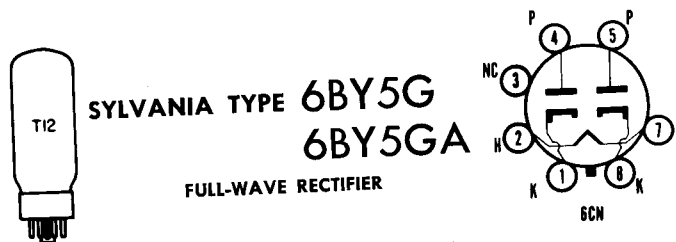
Plate Voltage.....	100	250	Volts
Grid Voltage.....	0		Volts
Cathode Resistor.....	0	390	Ohms
Plate Current.....	80	42	Ma
Amplification Factor.....		10	
Transconductance.....		7600	$\mu$ mhos
Plate Resistance.....		1300	Ohms
Grid Voltage for $I_b = 50 \mu$ a.....		-40	Volts

## NOTES:

1. Section No. 1 connects to Pins 4, 5 and 6.
2. For operation in a 525-line, 30 frame system, the duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.
3. When one section is operated as an oscillator it is recommended that section No. 1 (Pins 4, 5 and 6) be used.
4. An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

## APPLICATION

Sylvania Type 6BX7GT is a high permeance double triode designed for use as a vertical amplifier and/or oscillator in television receivers.



## MECHANICAL DATA

	6BY5G	6BY5GA
Bulb.....	ST-14, Outline 14-3	T-12, Outline 12-101
Base.....	Medium Shell Octal	Short Medium Octal
Basing.....	6CN	6CN
Mounting Position.....	Any	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

Heater Voltage.....	6.3	Volts
Heater Current.....	1.6	Amperes
Maximum Heater-Cathode Voltage.....	450	Volts
Heater Negative with Respect to Cathode.....	100	Volts
Heater Positive with Respect to Cathode.....		

### MAXIMUM RATINGS (Design Center Values)

Peak Inverse Voltage.....	1400	Volts
Rectifier Service.....	2500	Volts
Damper Service <sup>1</sup> .....	175	Ma
D C Output Current.....	525	Ma
Peak Plate Current.....	32	Volts
Tube Drop at 175 Ma Per Plate.....		

### TYPICAL OPERATION

Full-Wave Rectifier, Capacitor Input Filter		
A C Plate Supply Voltage Each Plate (R M S).....	375	Volts
Filter Input Capacitor.....	8	$\mu$ f
Effective Plate Supply Impedance Per Plate.....	100	Ohms
D C Output Voltage.....	380	Volts
D C Output Current.....	175	Ma

## NOTE:

1. In a 525-line, 30 frame system, the duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.

## APPLICATION

Sylvania Types 6BY5G and 6BY5GA are duo diodes with separate unipotential cathodes. They are suitable for damper diode service in television deflection circuits or rectifier service in conventional power supply applications.



# 6BY5G (Cont'd)

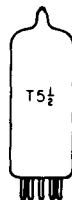
## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	2	—	19	Y
	6.3	0	—	0	3	—	19	Y
219/220	6.3	2	78	11	7	Z	4*	1
	6.3	2	17	11	7	Z	5*	8

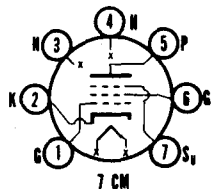
\* Diode gas test does not apply.

## TYPE 6BY6

(See Condensed Data Section)



### SYLVANIA TYPE 6BZ6 SEMI-REMOTE CUTOFF PENTODE



### MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-2
Base	Miniature Button 7-Pin
Basing	7CM
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	300 Ma
Maximum Heater-Cathode Voltage	
Total D C and Peak	200 Volts
D C, Heater Positive with Respect to Cathode	100 Volts

#### DIRECT INTERELECTRODE CAPACITANCES

	Shielded <sup>1</sup>	Unshielded
Grid to Plate	0.015	0.02 $\mu$ f Max
Input	7.5	7.5 $\mu$ f
Output	2.8	1.8 $\mu$ f

#### MAXIMUM RATINGS (Design Center Values)

Plate Voltage	300 Volts
Plate Dissipation	2.5 Watts
Grid No. 2 Voltage	See Rating Chart for Type 6AM8
Grid No. 2 Supply Voltage	300 Volts
Grid No. 2 Dissipation	0.5 Watt
Grid No. 1 Circuit Resistance	
Fixed Bias	0.25 Megohm
Self Bias	1.0 Megohm

#### CHARACTERISTICS AND TYPICAL OPERATION

##### Class A<sub>1</sub> Amplifier

Plate Voltage	200 Volts
Grid No. 2 Voltage	150 Volts
Grid No. 3 Voltage	Connected to Cathode at Socket
Cathode Bias Resistor	180 Ohms
Plate Current	11.0 Ma
Grid No. 2 Current	2.6 Ma
Plate Resistance (approx.)	0.6 Megohm
Transconductance	6100 $\mu$ mhos
Grid No. 1 Voltage for gm of 50 $\mu$ mhos (approx.)	-23 Volts

#### NOTE:

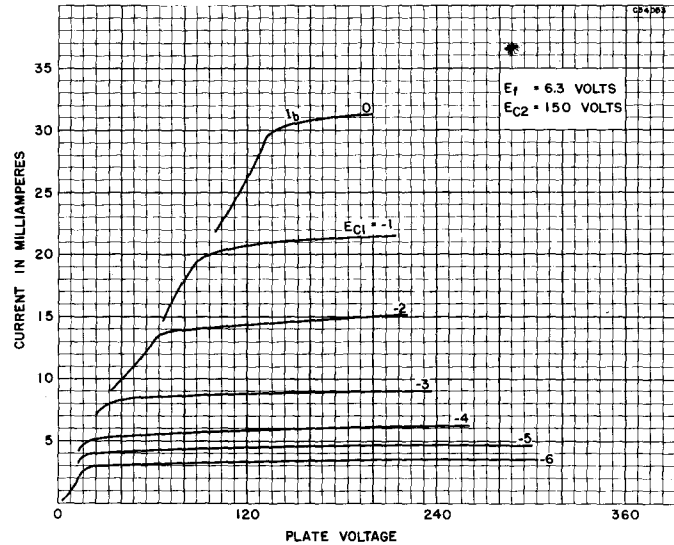
1. External shield No. 316 connected to Pin No. 2 (cathode) at socket.

# 6BZ6 (Cont'd)

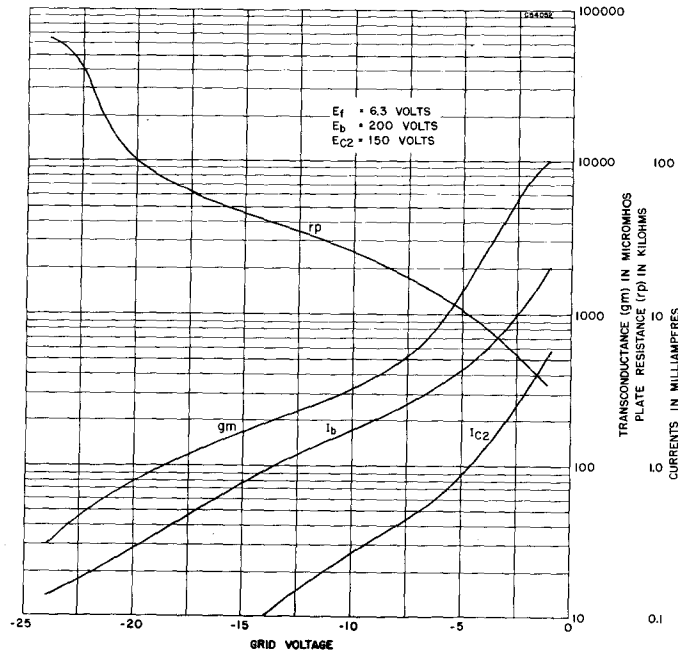
## APPLICATION

Sylvania Type 6BZ6 is designed for application as a gain control i f amplifier in television receivers. The semi-remote cutoff characteristic of the 6BZ6 eliminates possible distortion resulting from high signal levels, as well as distortion caused by a g c time delay. This tube also features high transconductance, thus providing maximum gain in low signal areas.

## AVERAGE PLATE CHARACTERISTICS



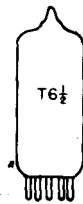
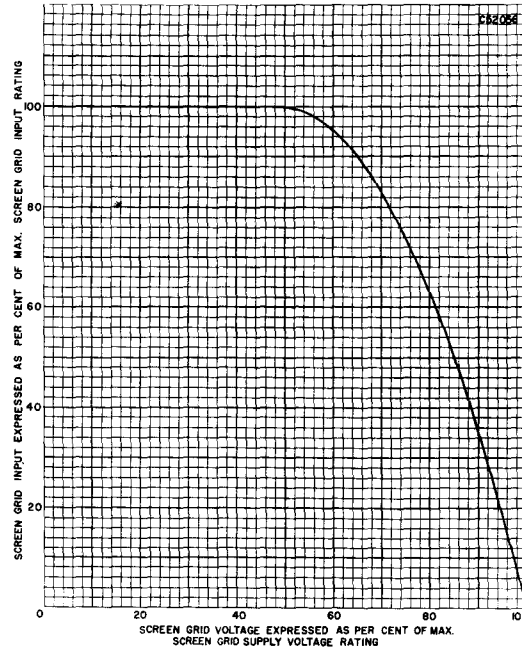
## AVERAGE TRANSFER CHARACTERISTICS



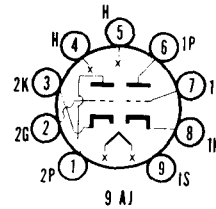
SYLVANIA ELECTRONIC TUBES

# 6BZ6 (Cont'd)

## SCREEN GRID RATING CHART



### SYLVANIA TYPE 6BZ7 V H F DUO TRIODE



### MECHANICAL DATA

Bulb	T-6 1/2 Outline 6-2
Base	Small Button 9-Pin
Basing	9A1
Mounting Position	Any

### ELECTRICAL DATA

#### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	400 Ma
Maximum Heater-Cathode Voltage	
Heater Positive with Respect to Cathode	200 Volts
Heater Negative with Respect to Cathode <sup>1</sup>	200 Volts

#### DIRECT INTERELECTRODE CAPACITANCES (Shielded)<sup>2</sup>

	Section 1 <sup>3</sup>	Section 2
Grid to Plate	1.2	1.2 $\mu\mu\text{f}$
Input	2.6	$\mu\mu\text{f}$
Output	1.2	$\mu\mu\text{f}$
Plate to Cathode	0.12	0.12 $\mu\mu\text{f}$
Heater to Cathode	2.6	2.6 $\mu\mu\text{f}$
Plate to Plate	0.010	$\mu\mu\text{f}$
Plate Section 2 to Plate and Grid Section 1	0.024	$\mu\mu\text{f}$

#### Grounded Grid Operation

Input	5.0 $\mu\mu\text{f}$
Output	2.2 $\mu\mu\text{f}$

# 6BZ7 (Cont'd)

## MAXIMUM RATINGS (Design Center Values—Each Section)

Plate Voltage	250 Volts
Plate Dissipation	2 Watts
Cathode Current	20 Ma
Grid Circuit Resistance	0.5 Megohm

## CHARACTERISTICS

### Class A Amplifier (Each Section)

Plate Voltage	150 Volts
Cathode Bias Resistor	220 Ohms
Plate Current	10 Ma
Transconductance	6800 $\mu$ mhos
Amplification Factor	36
Plate Resistance	5300 Ohms
Grid Voltage for $I_b = 100 \mu$ a (approx)	7 Volts

## NOTES:

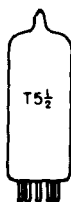
1. When operated with the two sections direct drive cascode amplifier it is permissible for this voltage to be as high as 300 volts under cutoff conditions.
2. Shield No. 315.
3. Section 1 connects to Pins 6, 7 and 8. Section 2 connects to Pins 1, 2 and 3.

## APPLICATION

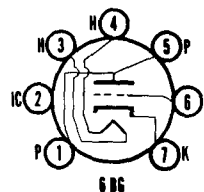
Sylvania Type 6BZ7 is a miniature medium mu duo triode designed for use in low noise v h f amplifier application and particularly for cascode operation.

## SYLVANIA TUBE TESTER SETTINGS

	A	B	C	D	E	F	G	Test or K
139/140	6.3	0	—	0	1	3	32	U
	6.3	0	—	0	3	7	32	U
219/220	6.3	4	58	24	5	2X	1	3
	6.3	4	53	25	5	7X	6	8



## SYLVANIA TYPE 6C4 HIGH FREQUENCY POWER TRIODE



## MECHANICAL DATA

Bulb	T-5 1/2, Outline 5-2
Base	Miniature Button 7-Pin
Basing	6BG
Mounting Position	Any

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

Heater Voltage	6.3 Volts
Heater Current	150 Ma
Maximum Heater-Cathode Voltage	200 Volts

### DIRECT INTERELECTRODE CAPACITANCES

	Shielded <sup>1</sup>	Unshielded
Grid to Plate	1.4	1.6 $\mu$ f
Input	1.8	1.8 $\mu$ f
Output	2.5	1.3 $\mu$ f

### MAXIMUM RATINGS (Design Center Values)

	Class A <sub>1</sub> Amplifier	Class C Telegraphy
Plate Voltage	300	300 Volts
Plate Dissipation	3.5	5.0 Watts
Plate Current		25 Ma
Negative D C Grid Voltage		-50 Volts
D C Grid Current		8 Ma
Grid Circuit Resistance		
Fixed Bias	0.25	0.25 Megohm
Cathode Bias	1.0	1.0 Megohm