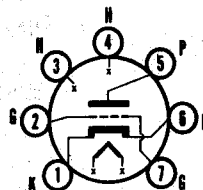


**SYLVANIA TYPE 6BN4
2BN4
3BN4**

VHF TRIODE



7EG

MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 2BN4 | 3BN4 | 6BN4 |
|---|-----------|------|-----------|
| Heater Voltage | 2.3 | 2.8 | 6.3 Volts |
| Heater Current | 600 | 450 | 200 Ma |
| Heater Warm-up Time ¹ | 11 | 11 | Seconds |
| Heater-Cathode Voltage (Design Max. Values) | | | |
| Heater Negative with Respect to Cathode | | | |
| Total DC and Peak | 100 Volts | | |
| Heater Positive with Respect to Cathode | | | |
| Total DC and Peak | 100 Volts | | |

DIRECT INTERELECTRODE CAPACITANCES (Shielded)

| | |
|-------------------|-------------|
| Grid to Plate | 1.2 μ f |
| Input | 3.2 μ f |
| Output | 1.4 μ f |
| Heater to Cathode | 2.8 μ f |

MAXIMUM RATINGS (Design Maximum Values)

| | |
|--------------------------|-------------|
| Plate Voltage | 275 Volts |
| Plate Dissipation | 2.2 Watts |
| Positive DC Grid Voltage | 0 Volts |
| DC Cathode Current | 22 Ma |
| Grid Circuit Resistance | 0.5 Megohms |

CHARACTERISTICS AND TYPICAL OPERATION

| | |
|---|-----------------|
| Class A₁ Amplifier | |
| Plate Voltage | 150 Volts |
| Cathode Bias Resistor | 220 Ohms |
| Plate Current | 9.0 Ma |
| Transconductance | 6800 μ mhos |
| Amplification Factor | 43 |
| Plate Resistance (approx.) | 6300 Ohms |
| Grid Voltage (approx.) for I _b = 100 μ a | -6 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.

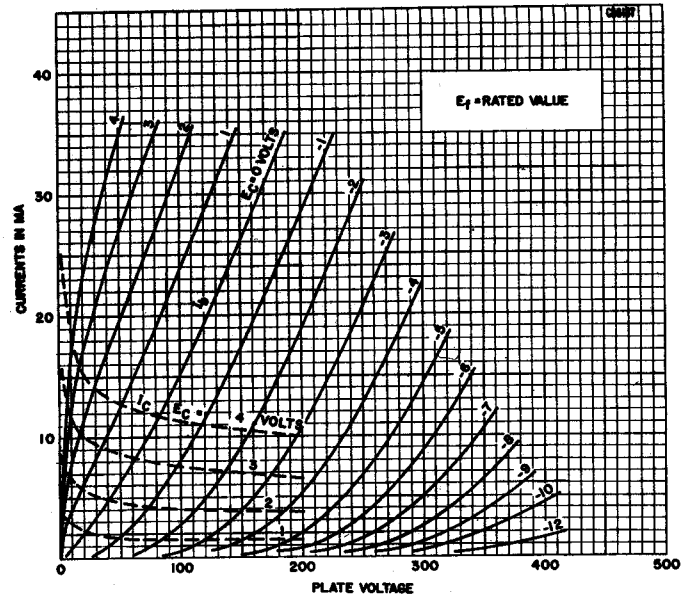
APPLICATION

The Sylvania Type 6BN4 is a miniature medium mu triode designed primarily for use as an amplifier in VHF television tuners. The characteristics of the 6BN4 are similar to one section of a 6BZ7.

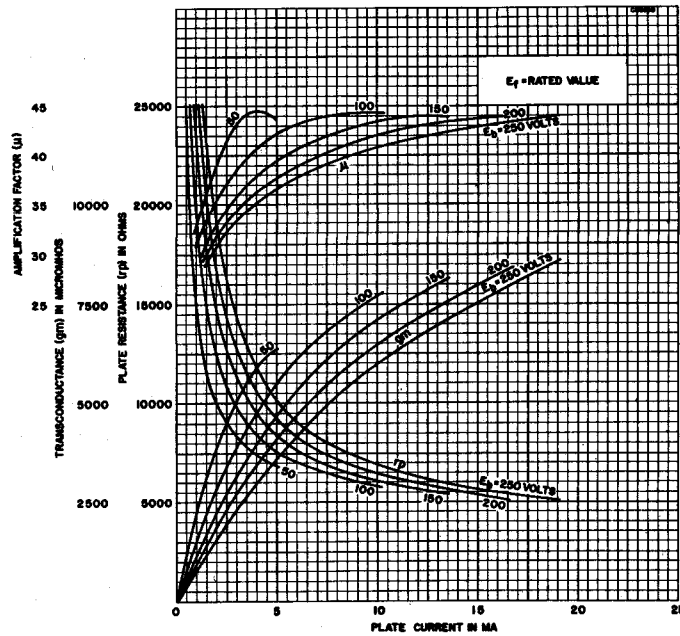
The 3BN4 employs a 450 ma heater and the 2BN4 has a 600 ma heater. Both tube types have controlled heater warm-up time for operation in receivers employing a series heater string.

6BN4, 3BN4, 2BN4 (Cont'd)

AVERAGE PLATE CHARACTERISTICS

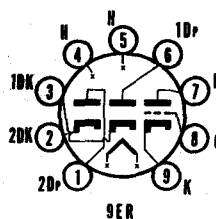


AVERAGE TRANSFER CHARACTERISTICS





SYLVANIA TYPE 6BN8 8BN8



MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 6BN8 | 8BN8 |
|--|------|----------------|
| Heater Voltage..... | 6.3 | 8.4 Volts |
| Heater Current..... | 600 | 450 Ma |
| Heater Warm-up Time ¹ | 11 | 11 Seconds |
| Heater-Cathode Voltage (Triode and Diodes 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..... | 2.5 μ f |
| Input: g to (h + Tk)..... | 3.6 μ f |
| Output: p to (h + Tk)..... | 0.25 μ f |
| Diodes | |
| No. 1 Diode Plate to No. 1 Diode Cathode + Heater..... | 1.9 μ f |
| No. 2 Diode Plate to No. 2 Diode Cathode + Heater..... | 1.9 μ f |
| No. 1 Diode Cathode to No. 1 Diode Plate + Heater..... | 4.8 μ f |
| No. 2 Diode Cathode to No. 2 Diode Plate + Heater..... | 4.8 μ f |
| Coupling | |
| No. 1 Diode Plate to Triode Grid..... | 0.060 μ f Max. |
| No. 2 Diode Plate to Triode Grid..... | 0.10 μ f Max. |
| No. 1 Diode Cathode to All: 1Dk to (h + Tk + 2Dk + Tp + 1Dp + Tg + 2Dp)... | 5.0 μ f |
| No. 2 Diode Cathode to All: 2Dk to (h + Tk + 1Dk + Tp + 1Dp + 2Dp + Tg)... | 5.0 μ f |
| No. 1 Diode Plate to No. 2 Diode Plate..... | 0.070 μ f Max. |
| No. 1 Diode Plate to All: 1Dp to (h + Tk + 1Dk + 2Dk + Tp + 2Dp + Tg)... | 3.0 μ f |
| No. 2 Diode Plate to All: 2Dp to (h + Tk + 1Dk + 2Dk + Tp + 1Dp + Tg)... | 3.0 μ f |

MAXIMUM RATINGS (Design Center Values)

| | |
|--------------------------------------|------------|
| Plate Voltage..... | 300 Volts |
| Positive D C Grid Voltage..... | 0 Volts |
| Plate Dissipation..... | 1.5 Watts |
| Grid Circuit Resistance..... | 1.0 Megohm |
| Peak Plate Current (Each Plate)..... | 54 Ma |
| D C Current (Each Plate)..... | 9 Ma |

CHARACTERISTICS AND TYPICAL OPERATION

| | Triode Section | |
|---|----------------|-----------------|
| Class A₁ Amplifier | | |
| Plate Voltage..... | 100 | 250 Volts |
| Grid Voltage..... | -1 | -3 Volts |
| Plate Current..... | 1.5 | 1.6 Ma |
| Transconductance..... | 3500 | 2500 μ mhos |
| Amplification Factor..... | 75 | 70 |
| Plate Resistance (approx.)..... | 21,000 | 28,000 Ohms |
| Grid Voltage (approx.) for Ib = 10 μ a..... | -2.5 | -5.5 Volts |
| Average Current Each Plate at 10 Volts D C ² | | 50 Ma |
| Voltage Drop Each Section at Ib = 9 Ma D C..... | | 2.6 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.

NOTE:

2. Test conditions only.

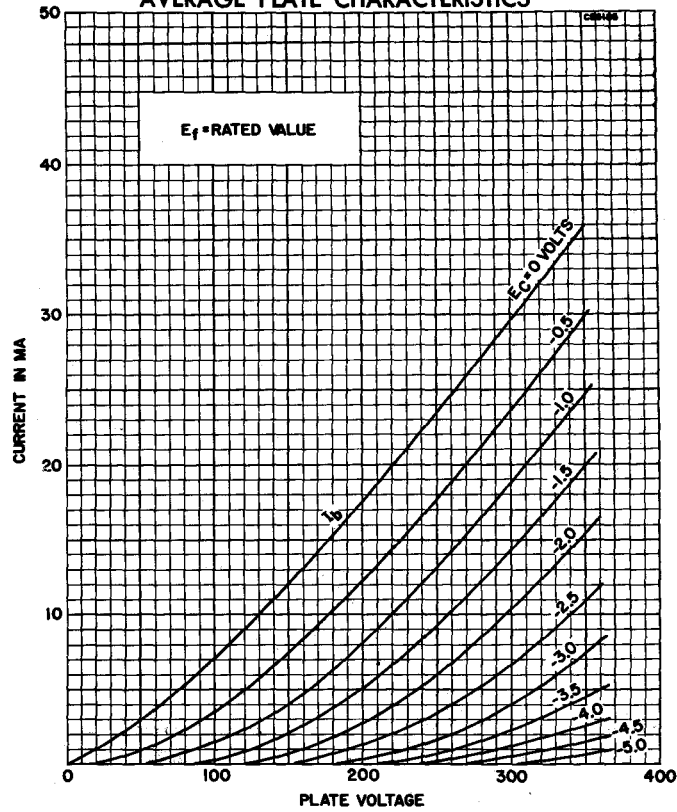
APPLICATION DATA

The Sylvania Type 6BN8 is a miniature, high μ triode, double diode intended for application in color and monochrome television receivers. The tube features separate cathode connections for each section and controlled heater warm-up time to insure dependable operation in series string receivers. The 8BN8 is identical to the 6BN8 except for heater characteristics.

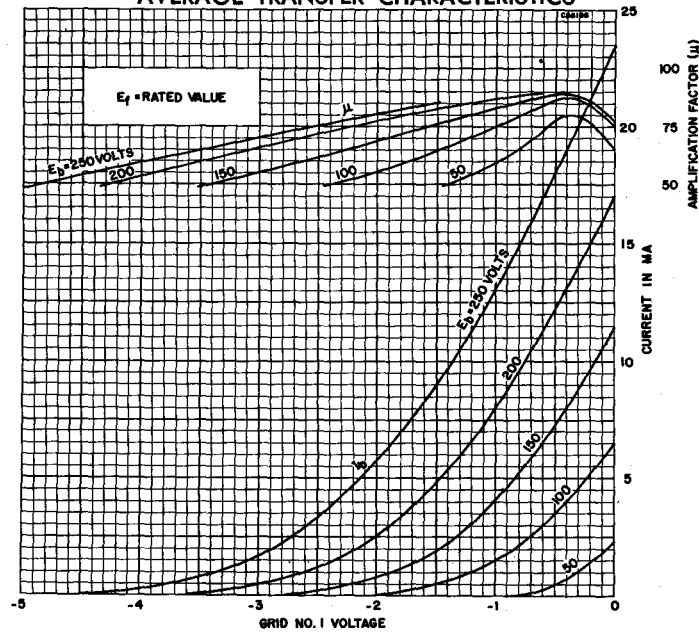
SYLVANIA ELECTRONIC TUBES

SYLVANIA TYPE 6BN8, 8BN8 (Cont'd)

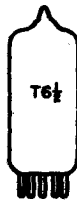
AVERAGE PLATE CHARACTERISTICS



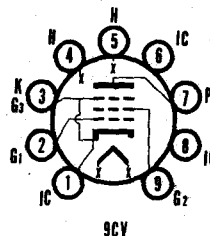
AVERAGE TRANSFER CHARACTERISTICS



SYLVANIA ELECTRONIC TUBES



SYLVANIA TYPE 6BQ5
BEAM POWER AMPLIFIER



9CV

MECHANICAL DATA

| | |
|------------------------|------------------------------|
| Bulb..... | T-6½ |
| Base..... | E9-1, Miniature Button 9-Pin |
| Outline..... | 6-4 |
| Basing..... | 9CV |
| Cathode..... | Coated Unipotential |
| Mounting Position..... | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|---|----------------|
| Heater Voltage..... | 6.3 Volts |
| Heater Current..... | 760 Ma |
| Heater-Cathode Voltage (Design Center Values) | |
| Heater Negative with Respect to Cathode..... | 100 Volts Max. |
| Heater Positive with Respect to Cathode..... | 100 Volts Max. |

DIRECT INTERELECTRODE CAPACITANCES

| | |
|---------------------------|-------------------|
| Grid No. 1 to Plate..... | 0.5 μ f Max. |
| Input..... | 10.8 μ f |
| Output..... | 6.5 μ f |
| Grid No. 1 to Heater..... | 0.25 μ f Max. |

RATINGS (Design Center Values)

| | |
|---------------------------------------|-----------------|
| Plate Voltage ¹ | 300 Volts Max. |
| Grid No. 2 Voltage ¹ | 300 Volts Max. |
| Negative Grid No. 1 Voltage..... | 100 Volts Max. |
| Plate Dissipation..... | 12 Watts Max. |
| Grid No. 2 Dissipation..... | 2 Watts Max. |
| Cathode Current..... | 65 Ma Max. |
| Grid No. 1 Circuit Resistance | |
| Fixed Bias..... | 0.3 Megohm Max. |
| Cathode Bias..... | 1.0 Megohm Max. |

CHARACTERISTICS AND TYPICAL OPERATION

| | Triode Operation ² | | | Pentode Operation | | |
|--|----------------------------------|---------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | Single Tube Class A ₁ | Class AB ₁ Push-pull | Class A ₁ Single Tube | Class AB ₁ Push-pull | Class AB ₁ Push-pull | Class AB ₁ Push-pull |
| Plate Voltage..... | 250 | 250 | 300 | 250 | 250 | 300 Volts |
| Grid No. 2 Voltage..... | — | — | — | 250 | 250 | 300 Volts |
| Grid No. 1 Voltage..... | — | — | — | -7.3 | — | Volts |
| Cathode Resistor ³ | 270 | 270 | 270 | 135 | 130 | 130 Ohms |
| Grid Voltage (RMS) ⁴ | 6.7 | 8.4 | 10 | 4.3 | 8 | 10 Volts |
| Plate Current | | | | | | |
| (Zero-Signal)..... | 34 | 40 | 48 | 48 | 62 | 72 Ma |
| (Maximum Signal)..... | 36 | 53.4 | 52 | 49.5 | 75 | 92 Ma |
| Grid No. 2 Current | | | | | | |
| (Zero Signal)..... | — | — | — | 5.5 | 7.0 | 8 Ma |
| (Maximum Signal)..... | — | — | — | 10.8 | 15 | 22 Ma |
| Transconductance..... | — | — | — | 11,300 | — | μ mhos |
| Amplification Factor ¹ | — | — | — | 19 | — | — |
| Plate Resistance..... | — | — | — | 38,000 | — | Ohms |
| Load Resistance..... | 3,500 | — | — | 5,200 | — | Ohms |
| Load Resistance (Plate to Plate)..... | — | 10K | 10K | — | 8K | 8K Ohms |
| Maximum-Signal Power Output ¹ | 1.95 | 3.4 | 5.2 | 5.7 | 11 | 17 Watts |
| Total Harmonic Distortion ¹ | 9 | 2.5 | 2.5 | 10 | 3.0 | 4.0 Percent |

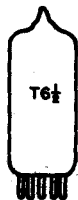
6BQ5 (Cont'd)

NOTES:

1. When the heater and positive voltages are obtained from a storage battery by means of a vibrator, the maximum values of the plate and Grid No. 2 Voltages are 250 volts and that of the plate dissipation 9 watts.
2. Grid No. 2 connected to plate.
3. Common cathode resistor for push-pull applications.
4. Per Grid.
5. Measured from Grid No. 2 to Plate.
6. For Pentode Operation—Class A Amplifier Service, the maximum signal power output and total distortion are measured at fixed bias and therefore represses the power output available during the reproduction of speech and music. When a sustained sine wave is applied to the control grid the bias across the cathode resistor will readjust itself as a result of the increased plate and screen grid currents. This will result in approximately 10 percent reduction in power output.
7. Measured with fixed bias.

APPLICATION

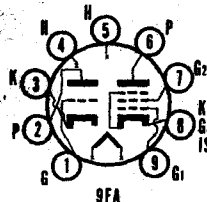
The Sylvania Type 6BQ5 is a beam power pentode audio amplifier designed for service in the output stage of high quality audio amplifiers or other equipment requiring high power output at relative low distortion.



SYLVANIA TYPE 6BR8

5BR8

**MEDIUM MU TRIODE
SHARP-CUTOFF PENTODE**



MECHANICAL DATA

| | |
|-------------------|-----------------------------|
| Bulb | T-6 1/2 |
| Base | E9-1 Miniature Button 9-Pin |
| Outline | 6-2 |
| Basing | 9FA |
| Cathode | Coated Unipotential |
| Mounting Position | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 5BR8 | 6BR8 |
|---|------|----------------|
| Heater Voltage | 4.7 | 6.3 Volts |
| Heater Current | 600 | 450 Ma |
| Heater Warm-up Time ¹ | 11 | Seconds |
| Heater-Cathode Voltage (Design Center Values) | | |
| Heater Negative with Respect to Cathode | | 250 Volts Max. |
| Total DC and Peak | | |
| Heater Positive with Respect to Cathode | | 100 Volts Max. |
| DC | | 200 Volts Max. |
| Total DC and Peak | | |

DIRECT INTERELECTRODE CAPACITANCES

| Triode Section | Shielded ² | Unshielded |
|------------------------|-----------------------|--------------------------|
| Grid to Plate | 1.8 | 1.8 μf |
| Grid to Cathode | 2.5 | 2.5 μf |
| Plate to Cathode | 1.0 | 0.4 μf |
| Heater to Cathode | 3.0 | 3.0 μf |
| Pentode Section | | |
| Grid No. 1 to Plate | 0.008 | 0.015 μf Max. |
| Input | 5.0 | 5.0 μf |
| Output | 3.5 | 2.6 μf |
| Heater to Cathode | 3.0 | 3.0 μf |

MAXIMUM RATINGS (Design Center System)

| | Triode Section | Pentode Section |
|---------------------------|-----------------------|-----------------|
| Plate Voltage | 300 | 300 Volts |
| Grid No. 2 Voltage | See 6AM8 Rating Chart | |
| Grid No. 2 Supply Voltage | | 300 Volts |
| Positive Grid Voltage | 0 | 0 Volts |
| Plate Dissipation | 2.7 | 2.8 Volts |
| Grid No. 2 Dissipation | | 0.5 Watt |

CHARACTERISTICS AND TYPICAL OPERATION

| Class A ¹ Amplifier | Triode Section | Pentode Section |
|---|----------------|-----------------------|
| Plate Voltage | 150 | 250 Volts |
| Grid No. 2 Voltage | | 110 Volts |
| Cathode Resistor | 56 | 68 Ohms |
| Plate Current | 18 | 10 Ma |
| Grid No. 2 Current | | 3.5 Ma |
| Transconductance | 8500 | 5200 μmhos |
| Amplification Factor | 40 | |
| Plate Resistance (approx.) | 5000 | 400,000 Ohms |
| E_{c1} for $I_b = 10 \mu\text{a}$ (approx.) | -12 | -10 Volts |

NOTES:

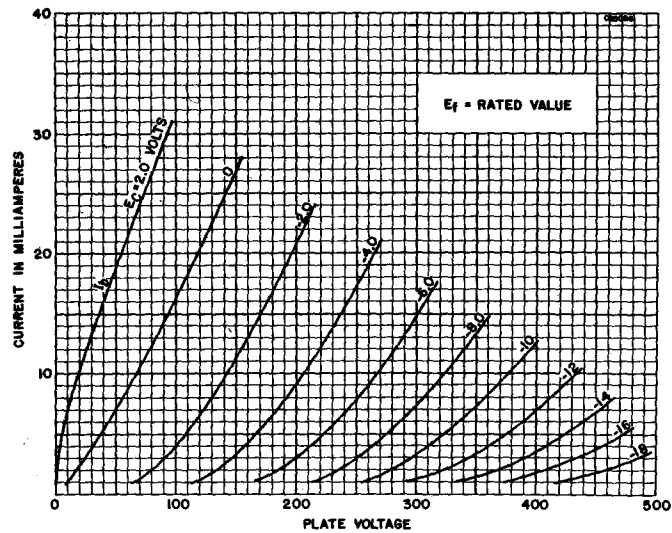
- Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times rated heater voltage divided by rated heater current.
- With external JETEC No. 315 shield connected to cathode of section under test.

APPLICATION

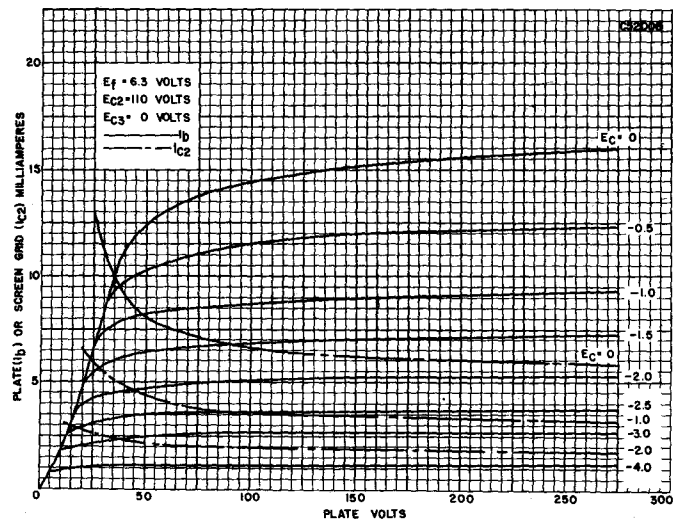
The Sylvania Types 5BR8 and 6BR8 have a medium mu triode and sharp-cutoff pentode contained in one envelope. Types 5BR8 and 6BR8 have controlled heater warm-up time for series string operation.

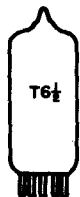
6BR8, 5BR8 (Cont'd)

AVERAGE PLATE CHARACTERISTICS (TRIODE SECTION)

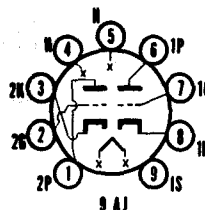


AVERAGE PLATE CHARACTERISTICS (PENTODE SECTION)





SYLVANIA TYPE **6BS8**
5BS8
4BS8
 MEDIUM MU
 DOUBLE TRIODE



MECHANICAL DATA

| | |
|-------------------------|------------------------|
| Bulb | T-6 1/2 |
| Base | Miniature Button 9-Pin |
| Outline | 6-2 |
| Basing | 9AJ |
| Cathode | Coated Unipotential |
| Mounting Position | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 4BS8 | 5BS8 | 6BS8 |
|---|------|------|----------------|
| Heater Voltage | 4.5 | 5.6 | 6.3 Volts |
| Heater Current | 600 | 450 | 400 Ma |
| Heater Warm-up Time ¹ | 11 | 11 | Seconds |
| 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 (Shielded)²

| | Section 1 | Section 2 |
|--|-----------|-------------------|
| Grid to Plate | 1.15 | 1.15 μ f |
| Input | 2.6 | μ f |
| Output | 1.2 | μ f |
| Heater to Cathode | 2.6 | 2.6 μ f |
| Plate to Cathode | 0.15 | 0.15 μ f Max. |
| Coupling | | |
| Plate to Plate | 0.01 | μ f Max. |
| Plate of Section 2 to Plate and Grid of Section 1 | 0.024 | μ f Max. |
| Grounded Grid Operation | | |
| Input | 5.0 | 5.0 μ f |
| Output | 2.2 | 2.2 μ f |

MAXIMUM RATINGS (Design Center Values)

| | |
|--|------------|
| Plate Voltage | 150 Volts |
| Plate Dissipation (Each Section) | 2.0 Watts |
| D C Cathode Current | 20 Ma |
| Grid Circuit Resistance (Each Section) | 0.5 Megohm |

CHARACTERISTICS AND TYPICAL OPERATION

Class A₁ Amplifier (Each Section)

| | |
|--|-----------------|
| Plate Voltage | 150 Volts |
| Cathode Bias Resistor | 220 Ohms |
| Plate Current | 10 Ma |
| Transconductance | 7200 μ mhos |
| Amplification Factor | 36 |
| Plate Resistance | 5000 Ohms |
| Grid Voltage for $I_b = 10 \mu$ a (Section 2 only) | -7 Volts |

Cascode Amplifier³

| | |
|--|-------------------|
| Plate Supply Voltage | 250 Volts |
| Plate Current | 16 Ma |
| Grid Voltage | -1 Volt |
| Transconductance | 10,000 μ mhos |
| E_{c1} for $g_m = 50 \mu$ mhos (approx.) | -6 Volts |

NOTES:

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.
2. External shield No. 315.
3. Section 2 (Pins 1, 2 and 3) is intended as the input section of the cascode circuit.

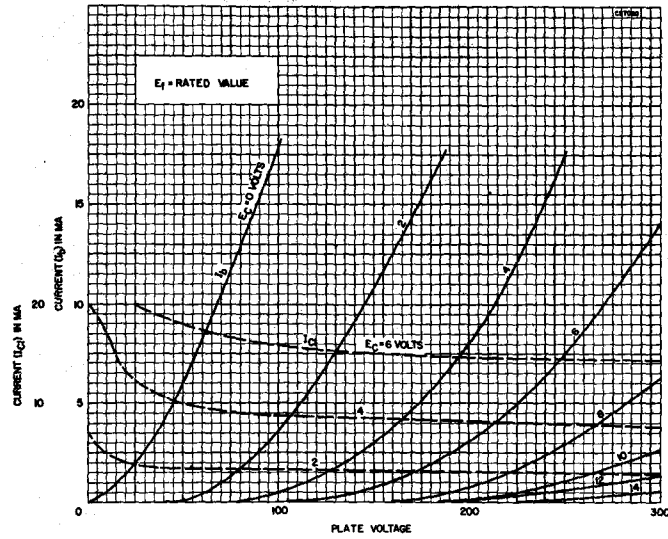
APPLICATION

The Types 4BS8, 5BS8 and 6BS8 are miniature, medium mu, twin triodes designed for use as low noise v h f cascode amplifiers. The 4BS8 and 5BS8 have controlled heater warm-up time for series string operation.

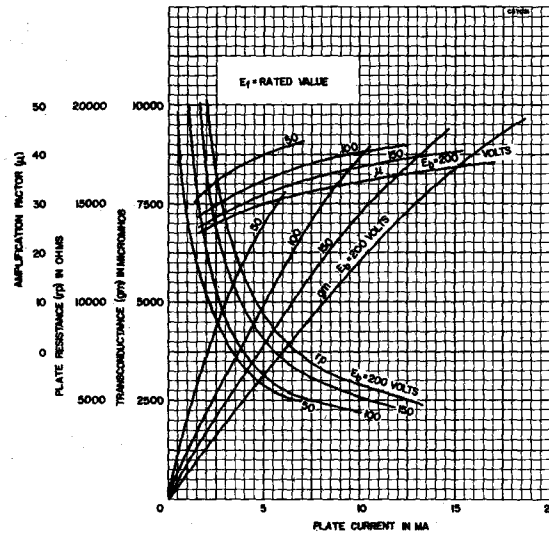
SYLVANIA ELECTRONIC TUBES

6BS8, 5BS8, 4BS8 (Cont'd)

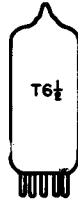
AVERAGE PLATE CHARACTERISTICS



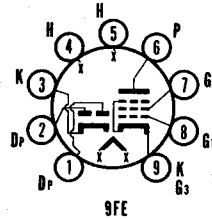
AVERAGE TRANSFER CHARACTERISTICS



SYLVANIA ELECTRONIC TUBES



**SYLVANIA TYPE 6BT8
5BT8**
DUODIODE
SHARP CUTOFF PENTODE



MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 5BT8 | 6BT8 |
|--|------|----------------|
| Heater Voltage..... | 4.7 | 6.3 Volts |
| Heater Current..... | 600 | 450 Ma |
| Heater Warm-up Time..... | 11 | Seconds |
| 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)

| | |
|--|------------------|
| Pentode Section | |
| Grid No. 1 to Plate..... | .04 μ f Max. |
| Input..... | 7.0 μ f |
| Output..... | 2.3 μ f |
| Diode (Each Section) | |
| Plate to (h + k)..... | 1.3 μ f |
| Cathode to (h + p)..... | 3.0 μ f |
| Coupling | |
| Pentode Grid No. 1 to Diode Plate..... | 0.005 μ f |
| Pentode Plate to Diode Plate..... | 0.020 μ f |

RATINGS (Design Center System)

| | |
|----------------------------------|------------------|
| Plate Voltage..... | 300 Volts Max. |
| Grid No. 2 Supply Voltage..... | 300 Volts Max. |
| Grid No. 2 Voltage..... | See Rating Chart |
| Positive Grid No. 1 Voltage..... | 0 Volts Max. |
| Plate Dissipation..... | 2.0 Watts Max. |
| Grid No. 2 Input..... | 0.5 Watts Max. |
| Grid No. 1 Circuit Resistance | |
| Fixed Bias..... | 0.25 Megohm Max. |
| Self Bias..... | 1.0 Megohm Max. |

CHARACTERISTICS AND TYPICAL OPERATION

| | |
|--|-----------------|
| Plate Voltage..... | 200 Volts |
| Grid No. 2 Voltage..... | 150 Volts |
| Cathode Bias Resistor..... | 180 Ohms |
| Plate Current..... | 9.5 Ma |
| Grid No. 2 Current..... | 2.8 Ma |
| Transconductance..... | 6200 μ mhos |
| Plate Resistance (approx.)..... | 300,000 Ohms |
| Grid No. 1 Voltage for $I_b = 10 \mu$ amp (approx.)..... | -8 Volts |
| Average Diode Current with 10 Volts D C Applied (Each Section)..... | 8.0 Ma |

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.

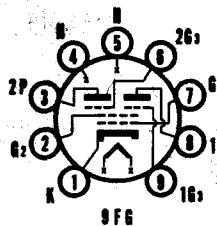
APPLICATION

The Sylvania Types 5BT8 and 6BT8 have a double diode and sharp cutoff pentode contained in one envelope. The pentode section may be used as an IF amplifier, video amplifier, a gc amplifier or reactance tube. Type 5BT8 has controlled heater warm-up time for series string operation.



**SYLVANIA TYPE 6BU8
3BU8
4BU8**

**DUAL CONTROL
DUO PENTODE**



MECHANICAL DATA

| | |
|-------------------------|--------------------------|
| Bulb | T-6 $\frac{1}{4}$ |
| Base | E9-1, Small Button 9-Pin |
| Outline | 6-3 |
| Basing | 9FG |
| Cathode | Coated Unipotential |
| Mounting Position | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 3BU8 | 4BU8 | 6BU8 |
|---|------|------|----------------|
| Heater Voltage | 3.15 | 4.2 | 6.3 Volts |
| Heater Current | 600 | 450 | 300 Ma |
| Heater Warm-up Time ¹ | 11 | 11 | Seconds |
| Heater-Cathode Voltage (Design Maximum Values) ² | | | |
| Heater Negative with Respect to Cathode | | | 200 Volts Max. |
| Total D C and Peak | | | |
| Heater Positive with Respect to Cathode | | | 100 Volts Max. |
| D C | | | |
| Total D C and Peak | | | 200 Volts Max. |

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

| | |
|--|---------------------|
| Grid No. 3 to Plate (Each Section) | 1.9 μ mf |
| Grid No. 1 to All | 6.0 μ mf |
| Grid No. 3 (Each Section) to All | 3.6 μ mf |
| Plate (Each Section) to All | 3.0 μ mf |
| Grid No. 3 (Section 1) to Grid No. 3 (Section 2) | 0.015 μ mf Max. |

MAXIMUM RATINGS (Design Maximum Values)²

| | |
|---|-------------|
| Plate Voltage (Each Section) | 300 Volts |
| Grid No. 2 Voltage | 150 Volts |
| Positive D C Grid No. 3 Voltage (Each Section) | 3.0 Volts |
| Negative D C Grid No. 3 Voltage (Each Section) | 50 Volts |
| Peak Positive Grid No. 3 Voltage (Each Section) | 50 Volts |
| Negative D C Grid No. 1 Voltage | 50 Volts |
| Plate Dissipation (Each Section) | 1.1 Watts |
| Grid No. 2 Dissipation | 0.75 Watts |
| D C Cathode Current | 12 Ma |
| Grid No. 1 Circuit Resistance | 0.5 Megohms |
| Grid No. 3 Circuit Resistance (Each Section) | 0.5 Megohms |

CHARACTERISTICS AND TYPICAL OPERATION

Both Sections Operating

| | | |
|---|--------|------------|
| Plate Voltage (Each Section) | 100 | 100 Volts |
| Grid No. 2 Voltage | 67.5 | 67.5 Volts |
| Grid No. 3 Voltage (Each Section) | -10 | 0 Volts |
| Grid No. 1 Voltage | Note 3 | Note 3 |
| Plate Current (Each Section) | | 2.2 Ma |
| Grid No. 2 Current | 6.5 | 3.3 Ma |
| Cathode Current | 6.6 | 7.8 Ma |

Each Section Separately with Plate and Grid No. 3 of Opposite Section Grounded

| | | |
|--|------|----------------|
| Plate Voltage | 100 | 100 Volts |
| Grid No. 2 Voltage | 67.5 | 67.5 Volts |
| Grid No. 3 Voltage | 0 | 0 Volts |
| Grid No. 1 Voltage | 0 | Note 3 |
| Plate Current | | 2.2 Ma |
| Grid No. 3 Transconductance | | 180 μ mhos |
| Grid No. 1 Transconductance | 1500 | μ mhos |
| Grid No. 3 Voltage (approx.) for $I_b = 100 \mu$ a | | -4.5 Volts |
| Grid No. 1 Voltage (approx.) for $I_b = 100 \mu$ a | | -2.3 Volts |

NOTES:

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.
2. Design-Maximum Ratings are the limiting values expressed with respect to bogen tubes at which satisfactory tube life can be expected to occur. To obtain satisfactory circuit performance, therefore, the equipment designer must establish the circuit design so that no design-maximum value is exceeded with a bogen tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, and environmental conditions.
3. Grid Current adjusted for 100 μ a d.c.

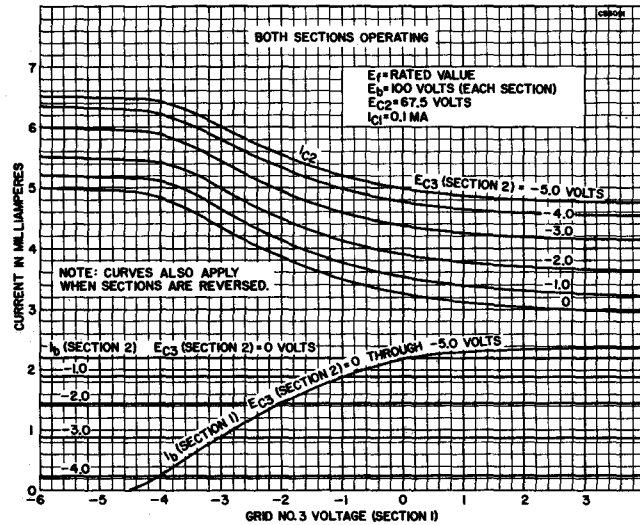
SYLVANIA ELECTRONIC TUBES

6BU8, 3BU8, 4BU8 (Cont'd)

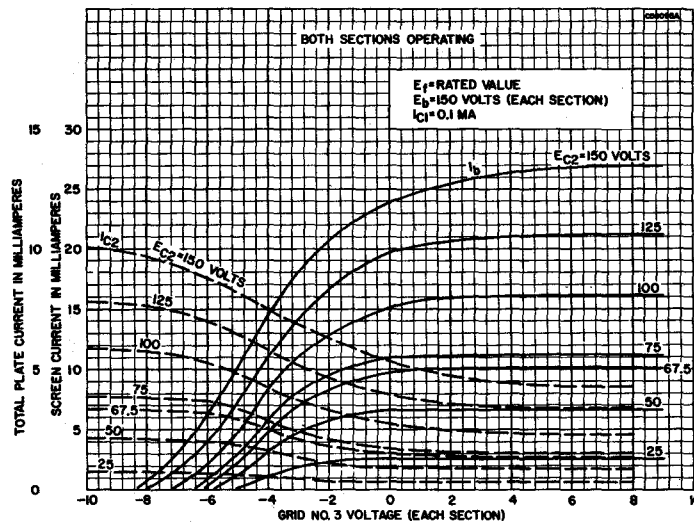
APPLICATION

The Sylvania Types 6BU8, 4BU8 and 3BU8 have dual pentodes with separate plates and separate No. 3 Grids contained in one envelope. They are primarily intended for service as a combined sync separator-clipper and AGC tube in television receivers. The 4BU8 and 3BU8 are identical to the 6BU8 except they have controlled heater warm-up time for series string operation.

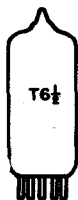
AVERAGE CHARACTERISTICS



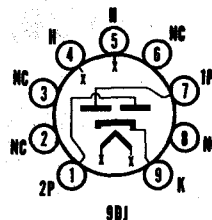
AVERAGE TRANSFER CHARACTERISTICS



SYLVANIA ELECTRONIC TUBES



**SYLVANIA TYPE 6BW4
12BW4**
FULL WAVE RECTIFIER



MECHANICAL DATA

| | |
|------------------------|------------------------------|
| Bulb..... | T-6½ |
| Base..... | E9-1 Miniature Button, 9-Pin |
| Outline..... | 6-3 |
| Basing..... | 9DJ |
| Cathode..... | Coated Unipotential |
| Mounting Position..... | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 6BW4 | 12BW4 |
|---|------|------------|
| Heater Voltage ^a A C or D C..... | 6.3 | 12.6 Volts |
| Heater Current..... | 900 | 450 Ma |
| Maximum Heater Cathode Voltage Heater Negative, D C..... | 450 | Volts |

MAXIMUM RATINGS (Design Center Values)¹

Rectifier Service

| | |
|--|--------------------|
| Peak Inverse Plate Voltage..... | 1275 Volts |
| A C Plate Supply Voltage Each Plate, R M S (See Rating Chart I)..... | 450 Volts |
| D C Output Current..... | See Rating Chart I |
| Steady State Peak Plate Current Each Plate (See Rating Chart II)..... | 350 Ma |
| Transient Peak Plate Current Each Plate (See Rating Chart III)..... | 2.0 Amperes |

AVERAGE CHARACTERISTICS

| | |
|---|----------|
| Tube Voltage Drop Tube Conducting: 100 Ma Each Plate..... | 40 Volts |
|---|----------|

TYPICAL OPERATION

Full Wave Rectifier—Capacitor Input Filter

| | |
|---|-----------|
| A C Plate Supply Voltage Each Plate, R M S ² | 325 Volts |
| Filter Input Capacitor..... | 40 μf |
| Effective Plate Supply Resistance, Each Plate..... | 82 Ohms |
| D C Output Current..... | 100 Ma |
| D C Output Voltage at Filter Input..... | 330 Volts |

Full Wave Rectifier—Choke Input Filter

| | |
|---|-----------|
| A C Plate Supply Voltage Each Plate, R M S ² | 450 Volts |
| Filter Input Choke..... | 10 Henrys |
| D C Output Current..... | 100 Ma |
| D C Output Voltage at Filter Input..... | 360 Volts |

NOTES:

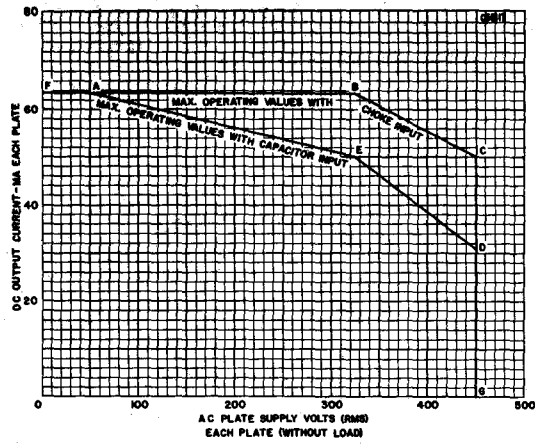
1. See "Interpretation of Rating Charts."
2. A C plate voltage is measured without load.
3. The 12BW4 is intended to be used in automotive service from a nominal 12 volt battery source. The heater is therefore designed to operate over the 10.0 to 15.9 voltage range encountered in this type of service. The maximum ratings of the tube provide for an adequate safety factor such that the tube will withstand the wide variation in supply voltages.

APPLICATION

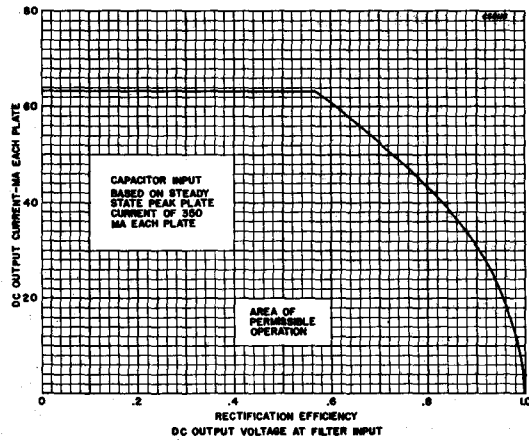
The Sylvania 6BW4 and 12BW4 are miniature cathode type full wave rectifiers featuring relatively high output current capabilities. The 12BW4 is intended primarily for use in auto receivers having a 12 volt heater supply.

6BW4, 12BW4 (Cont'd)

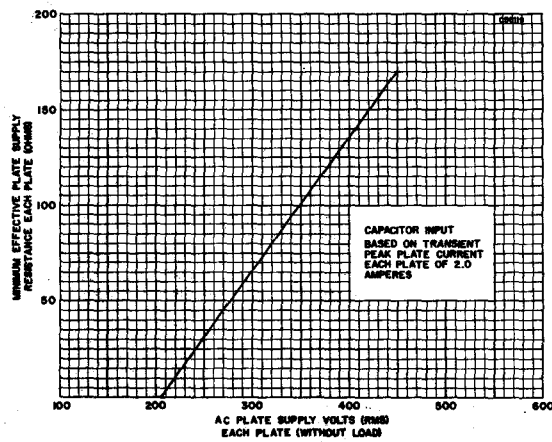
RATING CHART I



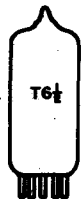
RATING CHART II



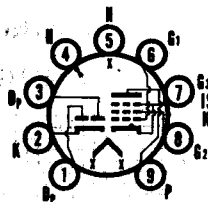
RATING CHART III



SYLVANIA ELECTRONIC TUBES



SYLVANIA TYPE 6BW8
DUO-DIODE
SHARP CUTOFF PENTODE



MECHANICAL DATA

| | |
|------------------------|--------------------------|
| Bulb..... | T-6½ |
| Base..... | E9-1, Small Button 9-Pin |
| Outline..... | 6-2 |
| Basing..... | 9HK |
| 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)

Pentode Section

| | |
|--------------------------|----------------------------|
| Grid No. 1 to Plate..... | 0.02 $\mu\mu\text{f}$ Max. |
| Input..... | 4.8 $\mu\mu\text{f}$ |
| Output..... | 2.6 $\mu\mu\text{f}$ |

Diode Section

| | |
|--|-----------------------------|
| Grid No. 1 to Each Diode Plate..... | 0.006 $\mu\mu\text{f}$ Max. |
| Diode Plate No. 1 to Cathode and Heater..... | 1.3 $\mu\mu\text{f}$ |
| Diode Plate No. 2 to Cathode and Heater..... | 1.2 $\mu\mu\text{f}$ |

MAXIMUM RATINGS¹ (Design Maximum Values)

| | |
|---|------------------|
| Plate Voltage..... | 330 Volts |
| Grid No. 2 Supply Voltage..... | 330 Volts |
| Grid No. 2 Voltage..... | See Rating Chart |
| Positive Grid No. 1 Voltage..... | 0 Volts |
| Negative Grid No. 1 Voltage..... | 55 Volts |
| Plate Dissipation..... | 3.0 Watt |
| Grid No. 2 Dissipation..... | 0.55 Watt |
| Grid No. 1 Circuit Resistance | |
| Cathode Bias..... | 0.5 Megohms |
| Fixed Bias..... | 0.1 Megohms |
| Average Diode Current (Each Diode)..... | 5.0 Ma |

CHARACTERISTICS AND TYPICAL OPERATION

Pentode—Class A1 Amplifier

| | |
|---|-----------------------|
| Plate Voltage..... | 250 Volts |
| Grid No. 2 Voltage..... | 110 Volts |
| Cathode Bias Resistor..... | 68 Ohms |
| Plate Current..... | 10 Ma |
| Grid No. 2 Current..... | 3.5 Ma |
| Transconductance..... | 5200 μmhos |
| Plate Resistance (approx.)..... | 250,000 Ohms |
| Ec1 Voltage for $I_b = 10 \mu\text{a}$ (approx.)..... | -10 Volts |
| Average Diode Current with 5 Volts D C applied ² | 20 Ma |

NOTES:

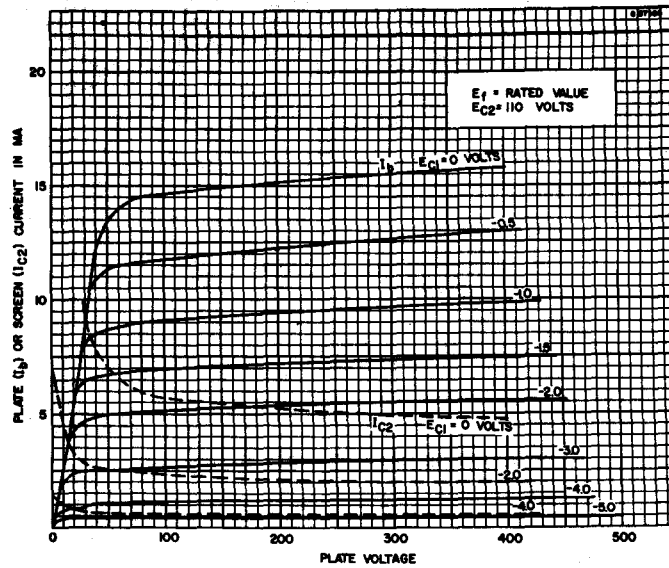
1. Design Maximum Ratings are the limiting values expressed with respect to bogey tubes at which satisfactory tube life can be expected to occur for the types of service for which the tube is rated. Therefore, the equipment designer must establish the circuit design so that initially and throughout equipment life no design maximum value is exceeded with a bogey tube under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, equipment control adjustment, load variation and environmental conditions.
2. Test condition only.

APPLICATION DATA:

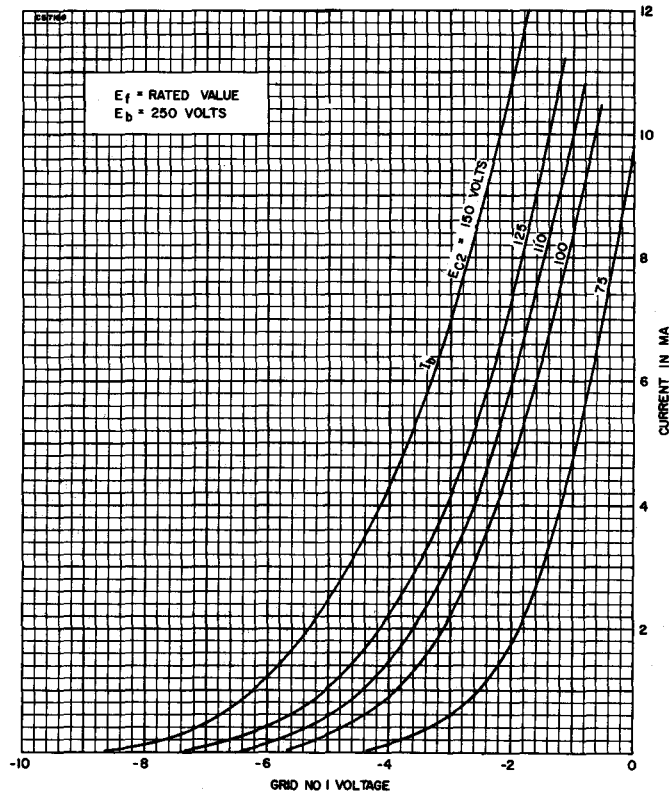
The Type 6BW8 is a duo-diode sharp-cutoff pentode. The diode and pentode units are provided with separate cathodes. The pentode unit is suited for use as a sound intermediate-frequency amplifier, sound limiter, and automatic-gain-control keyer while the diodes are essentially intended for use as a horizontal phase detector in television receivers.

SYLVANIA TYPE 6BW8 (Cont'd)

AVERAGE PLATE CHARACTERISTICS



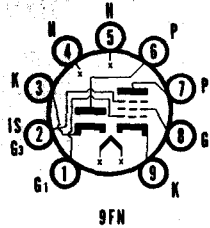
AVERAGE PLATE CHARACTERISTICS



SYLVANIA ELECTRONIC TUBES



SYLVANIA TYPE 6BY8
 HALF WAVE DIODE
 SHARP CUTOFF PENTODE



MECHANICAL DATA

| | |
|-------------------|------------------------------|
| Bulb | T-6½ |
| Base | E9-1, Miniature Button 9-Pin |
| Outline | 6-3 |
| Basing | 9FN |
| Cathode | Coated Unipotential |
| Mounting Position | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|---|----------------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 600 Ma |
| Heater Warm-up Time ¹ | 11 Seconds |
| 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 (Shielded)²

| | |
|--------------------------------|-----------------|
| Grid to No. 1 Plate | 0.0035 μμf Max. |
| Input: g1 to (h+k+g2+g3+l.S.) | 5.5 μμf |
| Output: p to (h+k+g2+g3+l.S.) | 5.0 μμf |
| Diode Plate to All: | |
| dp to (h+dk+k+g1+g2+g3+p+l.S.) | 4.8 μμf |

MAXIMUM RATINGS (Design Center System)

| | |
|-----------------------------|-----------------------|
| Pentode Section | |
| Plate Voltage | 300 Volts |
| Grid No. 2 Voltage | See 6AM8 Rating Chart |
| Grid No. 2 Supply Voltage | 300 Volts |
| Negative Grid No. 1 Voltage | 50 Volts |
| Positive Grid No. 1 Voltage | 0 Volts |
| Plate Dissipation | 3 Watts |
| Grid No. 2 Dissipation | 0.65 Watts |
| Diode Section | |
| Peak Inverse Plate Voltage | 430 Volts |
| Peak Plate Current | 180 Ma |
| D C Plate Current | 45 Ma |

CHARACTERISTICS AND TYPICAL OPERATION

Class A₁ Amplifier

| | | | |
|---|--------------------------------|------|-------------|
| Plate Voltage | 100 | 250 | 250 Volts |
| Grid No. 3 Voltage | Connected to Cathode at Socket | | |
| Grid No. 2 Voltage | 100 | 125 | 150 Volts |
| Cathode Resistor | 150 | 100 | 68 Ohms |
| Plate Current | 5.0 | 7.6 | 10.6 Ma |
| Grid No. 2 Current | 2.1 | 3.0 | 4.3 Ma |
| Transconductance | 3900 | 4500 | 5200 μmhos |
| Plate Resistance (approx.) | 0.5 | 1.5 | 1.0 Megohms |
| E _{c1} for I _b = 10 μa (approx.) | -4.2 | -5.5 | -6.5 Volts |
| Average Diode Current with 10 Volts D C Applied (Test Condition Only) | 60 Ma | | |

NOTES:

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.
2. External Shield No. 315 connected to Pentode Cathode.

APPLICATION

The Sylvania Type 6BY8 has a sharp cutoff pentode and high permeance diode contained in one envelope. The diode section is similar to one section of a 6AL5 and is intended for limiter or detector applications. The pentode section is similar to a 6AU6 and is intended for use as an rf or if amplifier. Type 6BY8 has a controlled heater warm-up time for series string operation.

SYLVANIA ELECTRONIC TUBES

^a Double tube under the worst probable operating conditions with exceeded with supply-voltage variation, equipment component variation, equipment control adjustment, load variation, and environmental conditions.

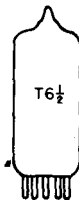
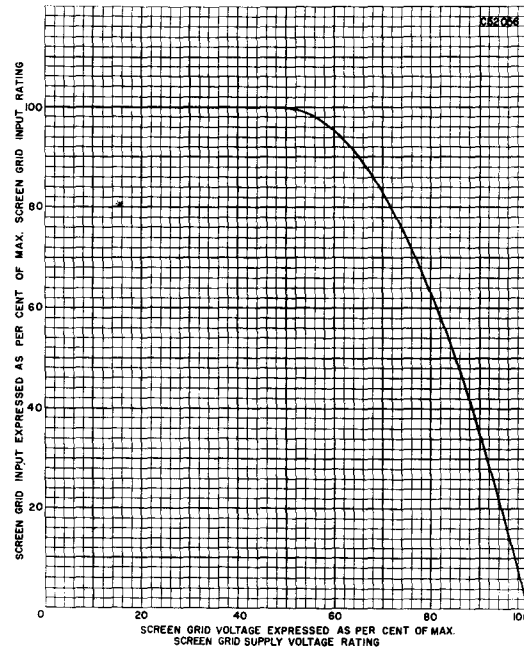
3. Use external shield No. 315.

APPLICATION

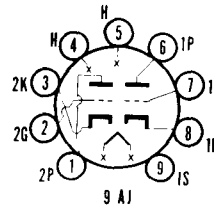
The Sylvania Type 6BZ8 is a miniature, medium mu, semi-remote cutoff double triode designed for use in low noise VHF amplifier application and particularly for cascade operation. The 4BZ8 is identical to the 6BZ8 except for heater characteristics. The 4BZ8 has a 600 ma heater and controlled heater warm-up time and is intended for use in series heater string television receivers.

6BZ6 (Cont'd)

SCREEN GRID RATING CHART



SYLVANIA TYPE 6BZ6
VHF 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 | |
| Heater Positive with Respect to Cathode | 200 Volts |
| Heater Negative with Respect to Cathode | 200 Volts |

DIRECT INTERELECTRODE CAPACITANCES (Shielded)²

| | Section 1 ³ | 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 $\mu\mu\text{f}$ |

SYLVANIA ELECTRONIC TUBES

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 μ mhos |
| Amplification Factor..... | 36 |
| Plate Resistance..... | 5300 Ohms |
| Grid Voltage for $I_b = 100 \mu$ a (approx)..... | 7 Volts |

NOTES:

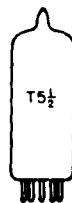
1. When operated with the two sections direct drive cascode amplifier it is permissible for this voltage to be as high as 300 volts under cutoff conditions.
2. Shield No. 315.
3. Section 1 connects to Pins 6, 7 and 8. Section 2 connects to Pins 1, 2 and 3.

APPLICATION

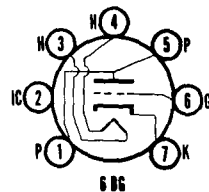
Sylvania Type 6BZ7 is a miniature medium mu duo triode designed for use in low noise vhf amplifier application and particularly for cascode operation.

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..... | 6BQ |
| 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 ¹ | Unshielded |
|--------------------|-----------------------|--------------|
| Grid to Plate..... | 1.4 | 1.6 μ mf |
| Input..... | 1.8 | 1.8 μ mf |
| Output..... | 2.5 | 1.3 μ mf |

MAXIMUM RATINGS (Design Center Values)

| | Class A ₁ 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 |

6C4 (Cont'd)

CHARACTERISTICS AND TYPICAL OPERATION

Class A₁ Amplifier

| | | |
|---|------|-----------------|
| Plate Voltage | 100 | 250 Volts |
| Grid Voltage ² | 0 | 8.5 Volts |
| Plate Current | 11.8 | 10.5 Ma |
| Plate Resistance (approx.) | 6250 | 7700 Ohms |
| Transconductance | 3100 | 2200 μ mhos |
| Amplification Factor | 19.5 | 17 |
| Grid Voltage for $I_b = 10 \mu$ a (approx.) | -10 | -25 Volts |

Class C Telephony³

| | |
|------------------------------|-----------|
| Plate Voltage | 300 Volts |
| Grid Voltage | -27 Volts |
| Plate Current | 25 Ma |
| Grid Current (approx.) | 7 Ma |
| Grid Driving Power (approx.) | 0.35 Watt |
| Power Output (approx.) | 5.5 Watts |

NOTES:

- Shield No. 316 connected to cathode.
- Transformer or impedance type input coupling devices are recommended to minimize resistance in the grid circuit.
- Approximately 2.5 watts output can be obtained when the 6C4 is used at 150 megacycles as an oscillator with a grid resistor of 10,000 ohms and with maximum rated input.

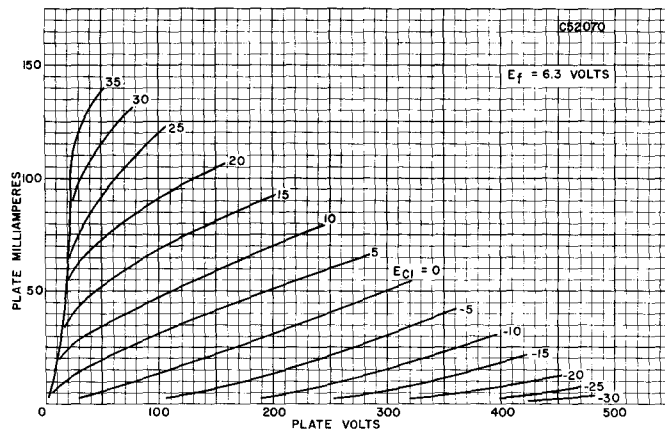
APPLICATION

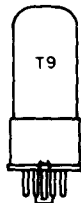
Sylvania Type 6C4 is a miniature, general purpose, medium mu triode intended for service as an oscillator, a detector or amplifier. Approximately 2.5 watts output can be obtained when the 6C4 is used as an oscillator at 150 mc. Electrically, the 6C4 is similar to the 6J5GT and one section of a 12AU7. Curves under type 12AU7 may be also used for type 6C4. Resistance Coupled Amplifier Data is in the Appendix.

SYLVANIA TUBE TESTER SETTINGS

| | A | B | C | D | E | F | G | Test or K |
|---------|-----|---|-----|----|---|----|----|-----------|
| 139/140 | 6.3 | 0 | 23 | 0 | 4 | 6 | 55 | U |
| 219/220 | 6.3 | 3 | 245 | 36 | 4 | 6Z | 1 | 7 |
| | 6.3 | 3 | 241 | 36 | 4 | 6Z | 5 | 7 |

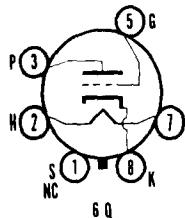
AVERAGE PLATE CHARACTERISTICS





**SYLVANIA TYPE 6C5
6C5GT**

MEDIUM MU TRIODE



MECHANICAL DATA

| | 6C5 | 6C5GT |
|-------------------------|----------------------------|----------------------------|
| Bulb | Metal, Outline 8-3 | T-9, Outline 9-12 |
| Base | Small Wafer Octal 6-Pin | Small Wafer Octal 6-Pin |
| Basing | 6Q | 6Q |
| Mounting Position | Any | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

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

MAXIMUM RATINGS (Design Center Values)

| | |
|-----------------------------|-----------|
| Plate Voltage | 300 Volts |
| Plate Dissipation | 2.5 Watts |
| Positive Grid Voltage | 0 Volts |

TYPICAL OPERATION

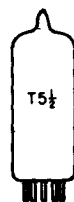
Class A Amplifier

| | |
|---|-----------------|
| Plate Voltage | 250 Volts |
| Grid Voltage | -8.0 Volts |
| Plate Current | 8.0 Ma |
| Transconductance | 2000 μ mhos |
| Amplification Factor | 20 |
| Plate Resistance | 10000 Ohms |
| Maximum D C Grid Circuit Resistance | 1.0 Megohm |

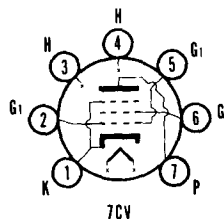
Data for use in Resistance Coupled Amplifier Circuits is given in the Appendix.

TYPES 6C6, 6C7, 6C8G

(See Condensed Data Section)



SYLVANIA TYPE 6CA5
BEAM POWER AMPLIFIER



MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

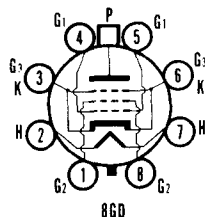
| | |
|----------------------|-------------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 1.2 Amperes |

For other rating, operation, and application data, refer to corresponding Type 12CA5, which is identical except for heater ratings.



SYLVANIA TYPE 6CB5

BEAM POWER AMPLIFIER



MECHANICAL DATA

| | |
|------------------------|--|
| Bulb | ST-16 |
| Base | Short Jumbo Shell Octal 8-Pin with External Barriers |
| Maximum Overall Length | 5 1/4" |
| Maximum Seated Height | 4 1/2" |
| Basing | 8GD |
| Top Cap | Small |
| Mounting Position | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|--|-----------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 2.5 Amps |
| Maximum Heater-Cathode Voltage | |
| Total D C and Peak | 200 Volts |
| D C, Heater Positive with Respect to Cathode | 100 Volts |

DIRECT INTERELECTRODE CAPACITANCES (Approx.)

| | Unshielded |
|---------------|-------------------|
| Grid to Plate | 0.8 μf |
| Input | 24 μf |
| Output | 10 μf |

MAXIMUM RATINGS (Design Center Values—Except as Noted)

Horizontal Deflection Amplifier¹

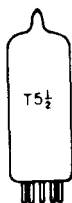
| | |
|--|--------------|
| Plate Supply Voltage, (D C and Boost) | 700 Volts |
| Peak Positive Pulse Plate Voltage (Abs. Max.) ² | 6800 Volts |
| Plate Dissipation | 23 Watts |
| Peak Negative Pulse Plate Voltage | -1500 Volts |
| D C Grid No. 2 Voltage | 200 Volts |
| D C Grid No. 1 Voltage | -50 Volts |
| Grid No. 2 Dissipation | 3.6 Watts |
| Peak Negative Pulse Grid No. 1 Voltage | -200 Volts |
| D C Plate Current | 200 Ma |
| Grid No. 1 Circuit Resistance | 0.47 Megohms |
| Bulb Temperature (At Hottest Point) | 210° C |

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.
- Under no circumstance should this absolute value be exceeded.

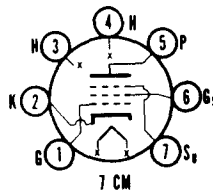
APPLICATION

The Sylvania Type 6CB5 is a high-perveance beam power vacuum tube designed especially for use as a horizontal deflection amplifier tube in color television receivers.



SYLVANIA TYPE 6CB6

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 | 300 Ma |
| Maximum Heater-Cathode Voltage | 90 Volts |

6CB6 (Cont'd)

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

| | |
|--------------------|-------------------|
| Grid to Plate..... | 0.020 μ f Max |
| Input..... | 6.5 μ f |
| Output..... | 2.0 μ f |

MAXIMUM RATINGS (Design Center Values)

| | |
|--------------------------------|----------------------------------|
| Plate Voltage..... | 300 Volts |
| Plate Dissipation..... | 2.0 Watts |
| Grid No. 2 Supply Voltage..... | 300 Volts |
| Grid No. 2 Voltage..... | (See Rating Chart for Type 6AM8) |
| Grid No. 2 Dissipation..... | 0.5 Watt |

CHARACTERISTICS AND TYPICAL OPERATION

Class A₁ Amplifier

| | |
|--|-----------------|
| Plate Voltage..... | 200 Volts |
| Grid No 2. Voltage..... | 150 Volts |
| Cathode Bias Resistor..... | 180 Ohms |
| Plate Current..... | 9.5 Ma |
| Grid No. 2 Current..... | 2.8 Ma |
| Transconductance..... | 6200 μ mhos |
| Plate Resistance (approx.)..... | 0.6 Megohm |
| Grid No. 1 Voltage for $I_b = 10 \mu$ a (approx.)..... | -8 Volts |

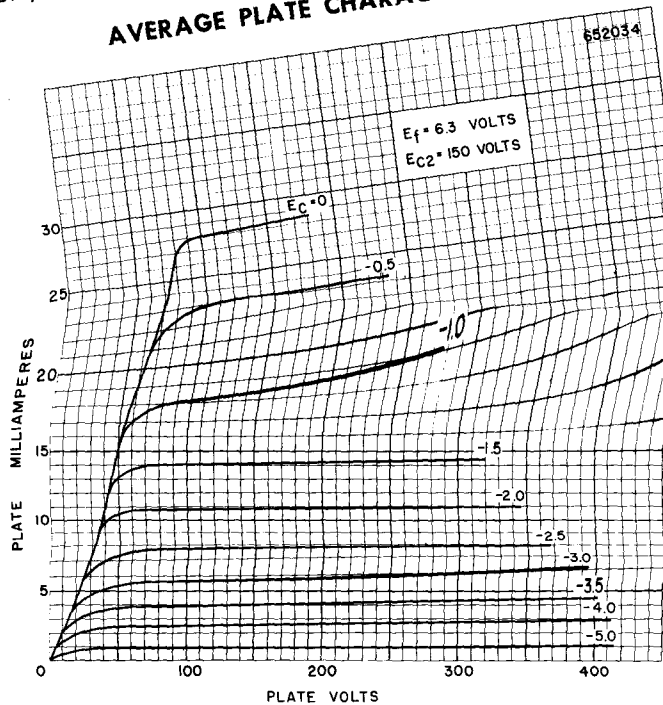
APPLICATION

Sylvania Type 6CB6 is a sharp cutoff pentode of the miniature construction designed for television use as an if amplifier operating in the vicinity of 40 megacycles. It may also be used as an rf amplifier in vhf television tuners. An added feature is the separate connection for the suppressor grid and internal shield.

SYLVANIA TUBE TESTER SETTINGS

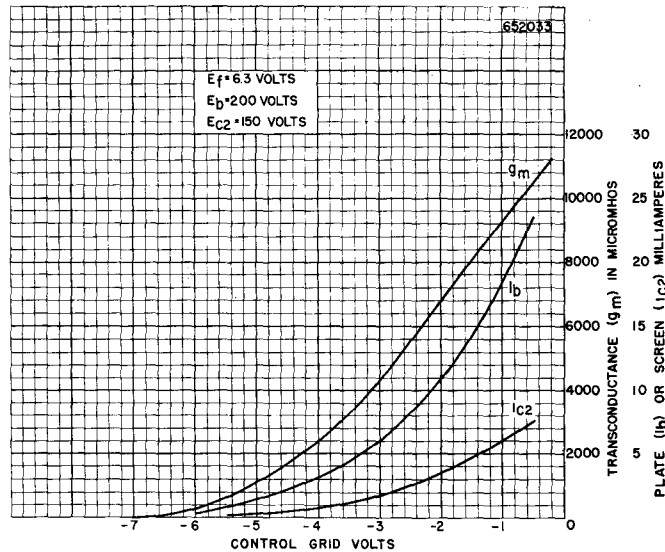
| | A | B | C | D | E | F | G | Test or K |
|---------|-----|---|----|----|---|------|----|-----------|
| 139/140 | 6.3 | 0 | — | 0 | 4 | 36 | 60 | W |
| 219/220 | 6.3 | 3 | 4S | 30 | 4 | 167Y | 5 | 2 |

AVERAGE PLATE CHARACTERISTICS

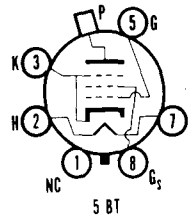


6CB6 (Cont'd)

AVERAGE CHARACTERISTICS



SYLVANIA TYPE 6CD6G
 BEAM POWER AMPLIFIER



MECHANICAL DATA

| | |
|-------------------|--------------------------|
| Bulb | ST-16, Outline 16-5 |
| Base | Medium Shell Octal 6-Pin |
| Basing | 5BT |
| Top Cap | Small |
| Mounting Position | Vertical ¹ |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|--|-------------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 2.5 Amperes |
| Maximum Heater-Cathode Voltage | |
| D C, Heater Positive with Respect to Cathode | 100 Volts |
| Total D C and Peak | 200 Volts |

DIRECT INTERELECTRODE CAPACITANCES (Approximate)

| | |
|---------------|-------------|
| Grid to Plate | 0.8 μf |
| Input | 24 μf |
| Output | 9.5 μf |

MAXIMUM RATINGS (Design Center Values—Except as Noted)

Horizontal Deflection Amplifier²

| | |
|---|-------------|
| 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 ³ | 15 Watts |
| Peak Negative Grid No. 1 Voltage | 200 Volts |
| D C Grid No. 2 Voltage | 175 Volts |
| Grid No. 2 Dissipation | 3.0 Watts |
| Average Cathode Current | 200 Ma |
| Peak Cathode Current | 700 Ma |
| Grid No. 1 Circuit Resistance | 0.47 Megohm |
| Bulb Temperature (At Hottest Point) | 210° C |

6CD6G (Cont'd)

CHARACTERISTICS

| | Instantaneous Values | |
|---|----------------------|-----------------|
| Plate Voltage | 60 | 175 Volts |
| Grid No. 2 Voltage | 100 | 175 Volts |
| Grid No. 1 Voltage | 0 | -30 Volts |
| Plate Current | 230 | 75 Ma |
| Grid No. 2 Current | 21 | 5.5 Ma |
| Transconductance | | 7700 μ mhos |
| Plate Resistance | | 7200 Ohms |
| Grid No. 1 Voltage for $I_b = 1.0$ Ma (approx.) | | -55 Volts |
| Triode Connected | | |
| Plate Voltage | | 175 Volts |
| Grid No. 2 Voltage | | 175 Volts |
| Grid No. 1 Voltage | | -30 Volts |
| Amplification Factor | | 3.9 |

TYPICAL OPERATION

Horizontal Deflection Amplifier, 90° Picture Tube

| | |
|---|-------------|
| Plate Supply Voltage | 300 Volts |
| Average Plate Voltage (Boost + Supply) | 620 Volts |
| Peak Positive Plate Voltage (D C Component + Pulse) | 5600 Volts |
| Average Plate Current | 113 Ma |
| Peak Plate Current | 380 Ma |
| Plate Dissipation | 11.0 Watts |
| Grid No. 2 Voltage | 125 Volts |
| Grid No. 2 Current | 16 Ma |
| Grid No. 2 Dissipation | 2 Watts |
| Grid No. 1 Input Voltage | |
| Peak to Peak | 180 Volts |
| Sawtooth Component | 140 Volts |
| Anode Voltage (Picture Tube) | 17.2 Kv |
| Anode Current (Picture Tube) | 100 μ a |

NOTES:

- Horizontal operation permitted if plane of Pins 2 and 7 is vertical.
- 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.

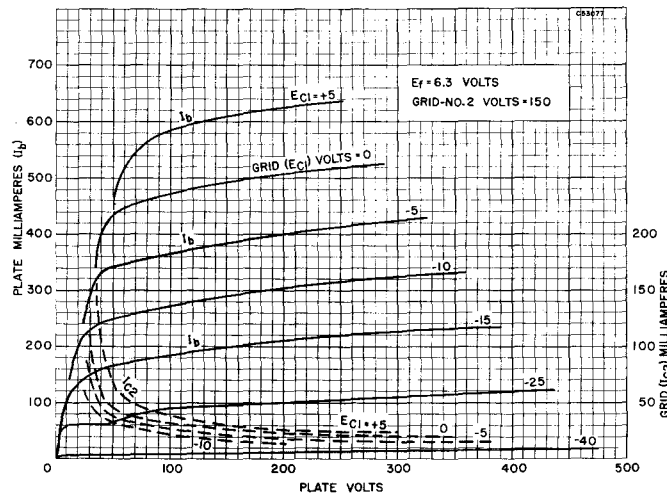
APPLICATION

Sylvania Type 6CD6G is a beam power amplifier designed for use as a horizontal deflection amplifier in television receivers.

SYLVANIA TUBE TESTER SETTINGS

| | A | B | C | D | E | F | G | Test or K |
|---------|-----|---|---|----|---|-----|----|-----------|
| 139/140 | 6.3 | 0 | — | 0 | 8 | 47 | 20 | Y |
| 219/220 | 6.3 | 2 | 7 | 12 | 7 | 58Z | 9 | 3 |

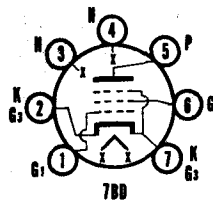
AVERAGE PLATE CHARACTERISTICS





SYLVANIA TYPE 6CE5
3CE5
4CE5

SHARP CUTOFF PENTODE



MECHANICAL DATA

| | |
|------------------------|------------------------------|
| Bulb..... | T-5 1/2 |
| Base..... | E7-1, Miniature Button 7-Pin |
| Outline..... | 5-2 |
| Basing..... | 7BD |
| Cathode..... | Coated Unipotential |
| Mounting Position..... | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 6CE5 | 4CE5 | 3CE5 |
|---|------|------|----------------|
| Heater Voltage..... | 6.3 | 4.2 | 3.15 4olts |
| Heater Current..... | 300 | 450 | 600 Ma |
| Heater Warm-up Time ¹ | | 11 | 11 Seconds |
| Heater-Cathode Voltage (Design Center Values) | | | |
| Heater Negative with Respect to Cathode..... | | | 200 Volts Max. |
| Heater Positive with Respect to Cathode..... | | | 100 Volts Max. |
| D C..... | | | 200 Volts Max. |
| Total D C and Peak..... | | | 200 Volts Max. |

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

| | |
|--------------------------|-------------------|
| Grid No. 1 to Plate..... | .003 μ f Max. |
| Input..... | 6.5 μ f |
| Output..... | 1.9 μ f |

MAXIMUM RATINGS (Design Center Values)

| | |
|------------------------------------|-----------------------|
| Plate Voltage..... | 300 Volts |
| Grid No. 2 Supply Voltage..... | 300 Volts |
| Grid No. 2 Voltage..... | See 6AM8 Rating Chart |
| Plate Dissipation..... | 2.2 Watts |
| Grid No. 2 Dissipation..... | 0.5 Watt |
| Grid No. 1 Circuit Resistance..... | 1.0 Megohm |

CHARACTERISTICS AND TYPICAL OPERATION

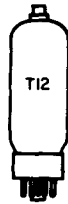
| | |
|--|-----------------|
| Plate Voltage..... | 125 Volts |
| Grid No. 2 Voltage..... | 125 Volts |
| Grid No. 1 Voltage..... | -1.0 Volts |
| Plate Current..... | 11 Ma |
| Grid No. 2 Current..... | 2.3 Ma |
| Transconductance..... | 7600 μ mhos |
| Plate Resistance (approx.)..... | 0.3 Megohm |
| Grid No. 1 Voltage for $I_b = 35 \mu$ a (approx.)..... | -5.0 Volts |

NOTE:

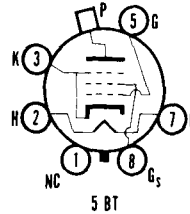
1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times the rated heater voltage divided by the rated heater current.

APPLICATION

The Sylvania Types 6CE5, 4CE5, and 3CE5 have a sharp cutoff pentode contained in a miniature envelope. It is designed primarily to be used as an RF or IF amplifier. Types 4CE5 and 3CE5 have controlled heater warm-up time for series string operation.



SYLVANIA TYPE 6CD6GA
BEAM POWER AMPLIFIER



MECHANICAL DATA

| | |
|------------------------|---------------------------|
| Bulb..... | T-12, Outline 12-106 |
| Base..... | Short Medium Shell, 8-Pin |
| Basing..... | 5BT |
| Top Cap..... | Small |
| Mounting Position..... | Vertical ¹ |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|---|-------------|
| Heater Voltage..... | 6.3 Volts |
| Heater Current..... | 2.5 Amperes |
| Maximum Heater-Cathode Voltage | |
| Total D C and Peak..... | 200 Volts |
| D C, Heater Positive with Respect to Cathode..... | 100 Volts |

MAXIMUM RATINGS (Design Center Values—Except as Noted)

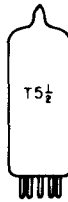
Horizontal Deflection Amplifier²

| | |
|--|--------------|
| Plate Voltage, (D C Supply and Boost)..... | 700 Volts |
| Peak Positive Plate Voltage (Abs. Max.)..... | 7000 Volts |
| Plate Dissipation ³ | 20 Watts |
| Grid No. 2 Voltage..... | 175 Volts |
| Grid No. 2 Dissipation..... | 3.0 Watts |
| Peak Negative Grid No. 1 Voltage..... | 200 Volts |
| Average Cathode Current..... | 200 Ma |
| Peak Cathode Current..... | 700 Ma |
| Grid No. 1 Circuit Resistance..... | 0.47 Megohms |
| Bulb Temperature (At Hottest Point)..... | 225° C |

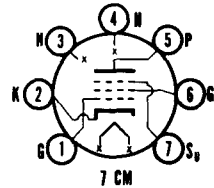
For operation and application data refer to corresponding Type 6CD6G, whose operating characteristics are identical to Type 6CD6GA.

NOTES:

- Horizontal operation permitted if plane of Pins 2 and 7 is vertical.
- 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 TYPE 6CF6
SHARP CUTOFF R F PENTODE



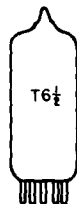
Identical to Type 6CB6 except for closely controlled grid cutoff characteristics. It is intended for use in gain controlled if amplifiers or vhf tuners. Characteristics curves for the Type 6CB6 may also be used for Type 6CF6.

TYPICAL OPERATION

| | |
|---|------------|
| Conditions: $E_b = 200$ Volts $E_{c2} = 150$ Volts $R_k = 180$ Ohms | |
| Control Grid Voltage for $I_b = 35 \mu a$ (approx.)..... | -6.5 Volts |

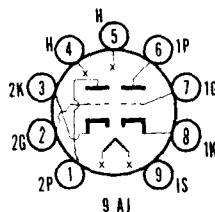
SYLVANIA TUBE TESTER SETTINGS

| | A | B | C | D | E | F | G | Test or K |
|---------|-----|---|----|----|---|-----|----|-----------|
| 139/140 | 6.3 | 0 | — | 0 | 4 | 36 | 60 | W |
| 219/220 | 6.3 | 3 | 4S | 63 | 4 | 16Z | 5 | 2 |



SYLVANIA TYPE 6CG7

MEDIUM-MU DUO TRIODE



MECHANICAL DATA

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

ELECTRICAL DATA

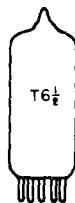
HEATER CHARACTERISTICS

| | |
|---|-----------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 600 Ma |
| Heater Warm-up Time (See SERIES STRING HEATERS Section in Appendix) | |
| Maximum Heater-Cathode Voltage | |
| Total D C and Peak | 200 Volts |
| D C, Heater Positive with Respect to Cathode | 100 Volts |

For other rating, operation and application data, refer to corresponding Type 6SN7GT, which is electrically identical except for heater ratings.

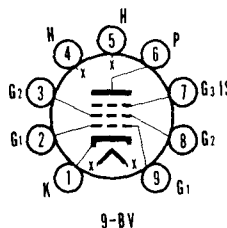
APPLICATION

The Sylvania Type 6CG7 may be used in television receivers employing series connected heaters. For information on specially controlled heaters for series string operation refer to the SERIES STRING HEATERS section of the Appendix.



SYLVANIA TYPE 6CL6

PENTODE POWER AMPLIFIER



MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|--------------------------------|-----------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 650 Ma |
| Maximum Heater-Cathode Voltage | 90 Volts |

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

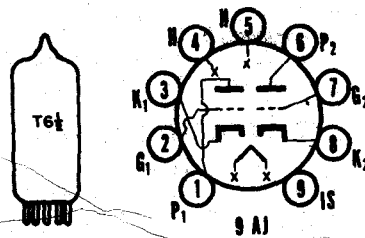
| | |
|---------------|-----------------------|
| Grid to Plate | 0.12 $\mu\mu\text{f}$ |
| Input | 11.0 $\mu\mu\text{f}$ |
| Output | 5.5 $\mu\mu\text{f}$ |

MAXIMUM RATINGS (Design Center Values)

| | |
|-------------------------------------|--------------------------------|
| Plate Supply Voltage | 300 Volts |
| Plate Voltage | 300 Volts |
| Plate Dissipation | 7.5 Watts |
| Grid No. 3 Voltage | 0 Volts |
| Grid No. 2 Voltage | See Rating Chart for Type 6AM8 |
| Grid No. 2 Supply Voltage | 300 Volts |
| Grid No. 2 Dissipation | 1.7 Watts |
| Grid No. 1 Voltage (Positive) | 0 Volts |
| Grid No. 1 Voltage (Negative) | 50 Volts |
| Grid No. 1 Circuit Resistance | |
| Fixed Bias | 0.1 Megohm |
| Cathode Bias | 0.5 Megohm |
| Bulb Temperature (At Hottest Point) | 200° C |

Sylvania Type 6CG7

MEDIUM-MU DUO TRIODE



PHYSICAL SPECIFICATIONS

| | |
|------------------------|---------------------|
| Bulb | T-6 1/4 |
| Base | Small Button, 9-Pin |
| Basing | 9A1 |
| Maximum Overall Length | 2 5/8" |
| Maximum Seated Height | 2 5/8" |
| Cathode | Coated Unipotential |
| Mounting Position | Any |

RATINGS¹

| | |
|--|------------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 600 Ma |
| Heater Warm-up Time (approx.) ² | 11 Seconds |
| Maximum Heater-Cathode Voltage | |
| Total D C and Peak | 200 Volts |
| D C, Heater Positive with Respect to Cathode | 100 Volts |

Class A₁ Amplifier

| | |
|---|------------|
| Maximum Plate Voltage | 300 Volts |
| Maximum Plate Dissipation | |
| Each Plate | 3.5 Watts |
| Both Plates | 5.0 Watts |
| Maximum Cathode Current | 20 Ma |
| Maximum Grid Circuit Resistance, Fixed Bias | 1.0 Megohm |

| | Vertical ³ Deflection Oscillator | Horizontal ³ Deflection Oscillator |
|------------------------------------|---|---|
| Maximum Plate Voltage | 300 | 300 Volts |
| Maximum Plate Dissipation | | |
| Each Plate | 3.5 | 3.5 Watts |
| Both Plates | 5.0 | 5.0 Watts |
| Maximum Peak Negative Grid Voltage | 400 | 600 Volts |
| Maximum Average Cathode Current | 20 | 20 Ma |
| Maximum Peak Cathode Current | 70 | 300 Ma |
| Maximum Grid Circuit Resistance | 2.2 | 2.2 Megohms |

Direct Interelectrode Capacitances (Unshielded—approx.)

| | Section 1 ^{3,4} | Section 2 |
|---------------|--------------------------|-------------|
| Grid to Plate | 4.0 | 4.0 μ f |
| Input | 2.3 | 2.3 μ f |
| Output | 2.2 | 2.2 μ f |

CHARACTERISTICS AND TYPICAL OPERATION

Class A₁ Amplifier

| | | |
|---|------|-----------------|
| Plate Voltage | 90 | 250 Volts |
| Grid Voltage | 0 | -8.0 Volts |
| Plate Current | 10 | 9.0 Ma |
| Plate Resistance (approx.) | 6700 | 7700 Ohms |
| Transconductance | 3000 | 2600 μ mhos |
| Amplification Factor | 20 | 20 |
| Plate Current at $E_c = -12.5$ Volts | | 1.3 Ma |
| Grid Voltage for $I_b = 10 \mu$ a (approx.) | -7.0 | -18 Volts |

NOTES:

- Design Center Values for each section except as noted.
- See Heater Warm-up Time Measurements.
- For operation in a 525 line, 30 frame system as described in "Standards of Good Engineering Practice for Television Broadcasting Stations; Federal Communications Commission." The duty cycle of the voltage pulse must not exceed 15% of one scanning cycle.
- Section No. 1 connects to pins 4, 5 and 6. Section No. 2 connects to pins 1, 2 and 3.

SYLVANIA RADIO TUBES

Issued as a supplement to the manual in Sylvania News for February 1953

6CG7 (cont'd)

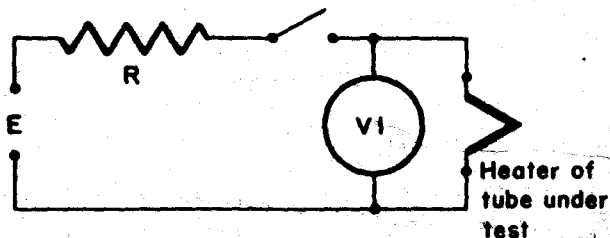
APPLICATION

The Sylvania Type 6CG7 may be used as the horizontal and vertical deflection oscillator in television receivers employing a series heater string. The 6CG7 may also be employed as a sync separator and amplifier. Electrically, the 6CG7 is identical to the 6SN7GT.

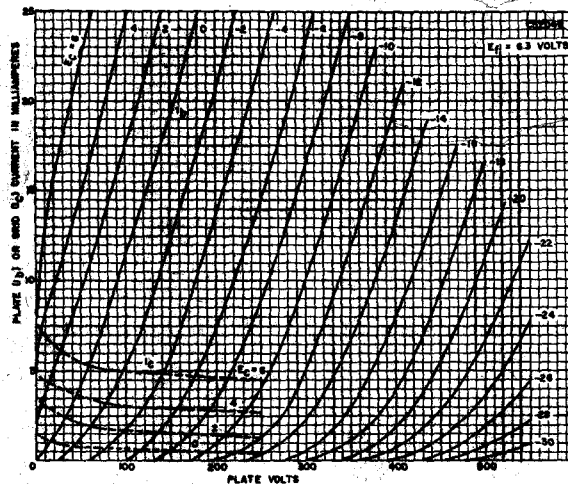
HEATER WARM-UP TIME MEASUREMENTS

Heater warm-up time is defined as the time required in the circuit shown below for the voltage across the heater terminals to increase from zero to the heater test voltage (V_1). The conditions used in conjunction with the test circuit depend upon the rated heater voltage and current of the tube under test as indicated in the table which follows:

- E—Applied Voltage, RMS or D C = 25 Volts
- R—Total Series Resistance = 31.5 Ohms
- V_1 —Heater Test Voltage, RMS or D C = 5.0 Volts
- E_f —Rated Heater Voltage of Tube Under Test = 6.3 Volts
- I_f —Rated Heater Current of Tube Under Test = 0.6 Amps.

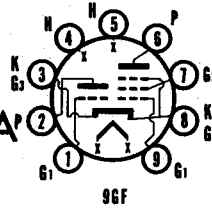


AVERAGE PLATE CHARACTERISTICS





**SYLVANIA TYPE 6CG8
6CG8A¹
5CG8**



**MEDIUM MU TRIODE
SHARP CUTOFF PENTODE**

MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 5CG8 | 6CG8 | 6CG8A |
|---|------|------|----------------|
| Heater Voltage | 4.7 | 6.3 | 6.3 Volts |
| Heater Current | 600 | 450 | 450 Ma |
| Heater Warm-up Time ¹ | 11 | | 11 Seconds |
| 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

| | Shielded ² | Unshielded |
|------------------------------------|-----------------------|--------------------------|
| Triode Section | | |
| Grid to Plate | 1.5 | 1.5 μmf |
| Grid to (k + h) | 3 | 2.6 μmf |
| Plate to (k + h) | 1 | 0.05 μmf |
| Pentode Section | | |
| Grid No. 1 to Plate | 0.016 | 0.03 μmf Max. |
| Grid No. 1 to (k+g3+g2+h) | 5 | 4.8 μmf |
| Plate to (k+g3+g2+h) | 1.6 | 0.9 μmf |
| Coupling | | |
| Pentode Grid No. 1 to Triode Plate | 0.04 | 0.05 μmf Max. |
| Pentode Plate to Triode Plate | 0.007 | 0.05 μmf Max. |
| Heater to Cathode | 5.5 ³ | 5.5 μmf |

MAXIMUM RATINGS (Design Center Values)

| | Triode Section | Pentode Section |
|---|-----------------------|-----------------|
| Converter Service | | |
| Plate Voltage | 250 | 250 Volts |
| Grid No. 2 Supply Voltage | | 250 Volts |
| Grid No. 2 Voltage | See 6AM8 Rating Chart | |
| Plate Dissipation | 1.5 | 2 Watts |
| Negative Grid No. 1 Voltage | 40 | 40 Volts |
| Positive Grid No. 1 Voltage | 0 | 0 Volt |
| 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 | |
| Grid No. 1 Input | 0.5 | Watt |
| Grid No. 1 Circuit Resistance | | |
| Fixed Bias | | 0.1 Megohm |
| Self Bias | | 0.5 Megohm |

AVERAGE CHARACTERISTICS

| | Triode Section | Pentode Section |
|---|----------------|-----------------------|
| Plate Voltage | 100 | 250 Volts |
| Grid No. 2 Voltage | | 150 Volts |
| Plate Current | 8.5 | 7.7 Ma |
| Grid No. 2 Current | | 1.6 Ma |
| Cathode Bias Resistor | 100 | 200 Ohms |
| Amplification Factor | 40 | |
| Plate Resistance (approx.) | 6900 | 750,000 Ohms |
| Transconductance | 5800 | 4600 μmhos |
| Grid No. 1 Voltage for $I_b = 10 \mu\text{A}$ (approx.) | -10 | -10 Volts |

TYPICAL OPERATION

| | Triode Section as 250 Mc Osc. | Pentode Section as Mixer ⁴ |
|--|-------------------------------|---------------------------------------|
| Plate Voltage | 150 | 150 Volts |
| Grid No. 2 Voltage | | 150 Volts |
| Mixer Grid No. 1 Supply Voltage | | -3.5 Volts |
| Oscillator Voltage at Mixer Grid No. 1 (RMS) | | 2.6 Volts |
| Plate Current | 13 | 6.2 Ma |
| Grid No. 2 Current | | 1.8 Ma |
| Grid No. 1 Current | 3.6 | Ma |
| Grid No. 1 Current | | 2 μa |

SYLVANIA ELECTRONIC TUBES

6CG8, 6CG8A, 5CG8 (Cont'd)

| | | |
|---|------|-----------------|
| Mixer Grid No. 1 Circuit Resistance | | 120,000 Ohms |
| Oscillator Grid Resistor | 2700 | Ohms |
| Conversion Transconductance | | 2100 μ mhos |
| Oscillator Power Output (approx.) | 0.5 | Watt |

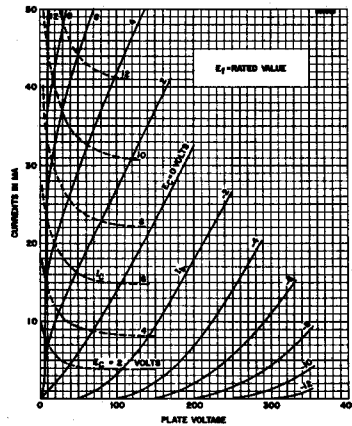
NOTES:

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 four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times the rated heater voltage divided by the rated heater current.
2. Shield No. 315 connected to cathode.
3. Shield No. 315 connected to ground.
4. With separate excitation and triode section grounded.

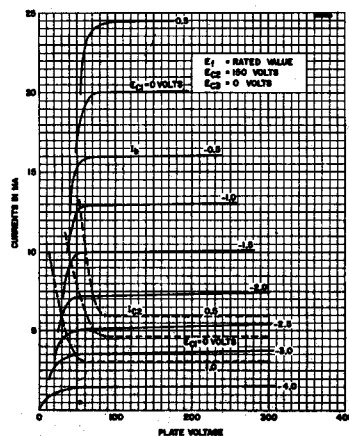
APPLICATION

The Sylvania Types 6CG8, 6CG8A and 5CG8 have medium mu triode and sharp cutoff pentode contained in a T-6½ envelope. They are designed primarily for service as a VHF oscillator and mixer in TV receivers utilizing an IF in the order of 40 mc. Types 5CG8 and 6CG8A have controlled heater warm-up time for series string operation.

AVERAGE PLATE CHARACTERISTICS (TRIODE SECTION)



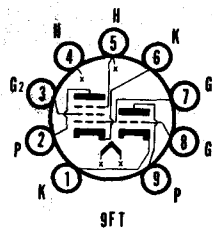
AVERAGE PLATE CHARACTERISTICS (PENTODE SECTION)





SYLVANIA TYPE 6CH8

MEDIUM MU TRIODE
SHARP CUTOFF PENTODE



9FT

MECHANICAL DATA

| | |
|------------------------|--------------------------|
| Bulb..... | T-6 1/2 |
| Base..... | E9-1, Small Button 9-Pin |
| Outline..... | 6-2 |
| Basing..... | 9FT |
| 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)

| | |
|---|-------------------|
| Triode Section | |
| Grid to Plate..... | 1.6 μ f |
| Grid to (k+h+g3+I.S.)..... | 1.9 μ f |
| Plate to (k+h+g3+I.S.)..... | 1.6 μ f |
| Pentode Section | |
| Grid No. 1 to Plate..... | .025 μ f Max. |
| Grid No. 1 to (k+h+g3+g2+I.S.)..... | 7.0 μ f |
| Plate to (k+h+g3+g2+I.S.)..... | 2.25 μ f |
| Coupling | |
| Triode Grid to Pentode Plate..... | 0.005 μ f |
| Pentode Grid No. 1 to Triode Plate..... | 0.02 μ f |
| Pentode Plate to Triode Plate..... | 0.04 μ f |

MAXIMUM RATINGS (Design Center Values)

| | Triode Section | Pentode Section |
|--|-----------------------|-----------------|
| Plate Voltage..... | 300 | 300 Volts |
| Grid No. 3 Voltage..... | | 0 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 | 0.5 Watt |
| For Grid No. 2 Voltages Between 150 and 300 Volts..... | See 6AM8 Rating Chart | |
| Grid No. 1 Circuit Resistance ¹ | | |
| Fixed Bias..... | 0.5 | 0.25 Megohm |
| Cathode Bias..... | 1.0 | 1.0 Megohm |

CHARACTERISTICS AND TYPICAL OPERATION

| | Triode Section | Pentode Section |
|--|----------------|-----------------|
| Plate Supply Voltage..... | 200 | 200 Volts |
| Grid No. 3 Voltage..... | | 0 Volt |
| 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..... | | 2.8 Ma |
| Transconductance..... | 3300 | 6200 μ mhos |
| Amplification Factor..... | 19 | |
| Plate Resistance (approx.)..... | 5750 | 300,000 Ohms |
| Grid No. 1 Voltage for $I_b = 10 \mu$ a (approx.)..... | -19 | -8 Volts |

NOTE:

1. If either section is operating at maximum rated conditions, the Grid No. 1 circuit resistance for both sections should not exceed the stated values.

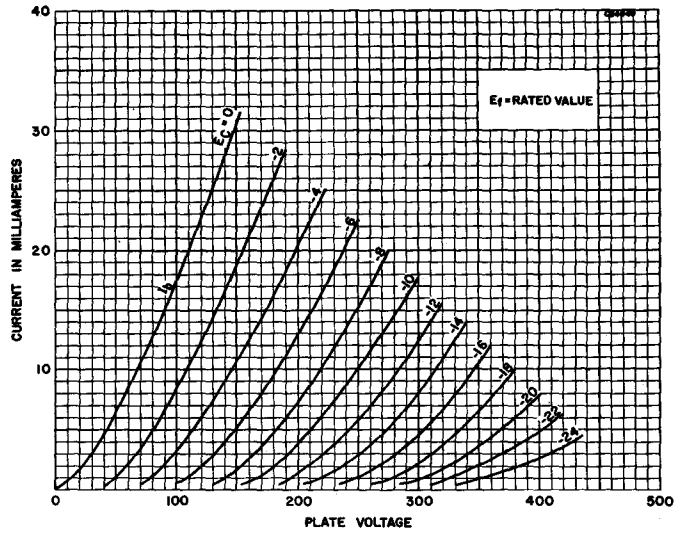
APPLICATION

The Sylvania Type 6CH8 has a medium mu triode and sharp cutoff pentode contained in one envelope. The pentode section may be used as a reactance tube, IF, video or AGC amplifier. The triode section may be used as a low frequency oscillator, sync clipper, sync separator or phase splitter.

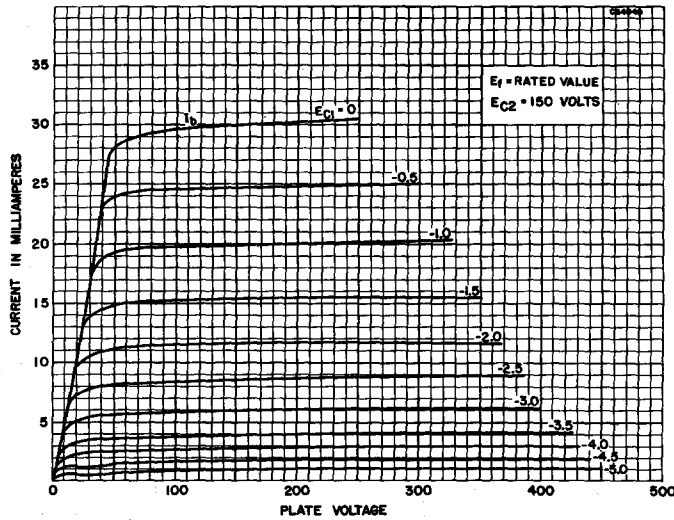
SYLVANIA ELECTRONIC TUBES

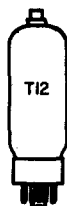
6CH8 (Cont'd)

AVERAGE PLATE CHARACTERISTICS (TRIODE SECTION)

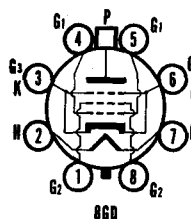


AVERAGE PLATE CHARACTERISTICS (PENTODE SECTION)





SYLVANIA TYPE 6CL5
HORIZONTAL
DEFLECTION AMPLIFIER



MECHANICAL DATA

| | |
|-------------------|---|
| Bulb | T-12 |
| Base | B8-118, Short Medium Shell Octal, 8-Pin |
| Outline | 12-106 |
| Basing | 8GD |
| Top Cap | C1-1 Small |
| Cathode | Coated Unipotential |
| Mounting Position | Vertical |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|---|-------------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 2.5 Amperes |
| Maximum Heater-Cathode Voltage | |
| Heater Negative with Respect to Cathode | |
| Total D C and Peak | 200 Volts |
| Heater Positive with Respect to Cathode | |
| D C | 100 Volts |
| Total D C and Peak | 200 Volts |

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

| | |
|---------------------|--------------------|
| Grid No. 1 to Plate | 0.7 μf |
| Input | 20.0 μf |
| Output | 11.5 μf |

MAXIMUM RATINGS (Design Center Values—Except as Noted)

| | |
|--|---------------|
| Horizontal Deflection Amplifier² | |
| D C Plate Supply Voltage | |
| (Boost + D C Power Supply) | 700 Volts |
| Peak Positive Pulse Plate Voltage (Abs. Max.) | 7000 Volts |
| Peak Negative Pulse Plate Voltage | 1500 Volts |
| Plate Dissipation ³ | 25 Watts |
| Peak Negative Grid No. 1 Voltage | 200 Volts |
| D C Grid No. 2 Voltage | 200 Volts |
| Grid No. 2 Dissipation | 4.0 Watts |
| Average Cathode Current | 240 Ma |
| Peak Cathode Current | 840 Ma |
| Grid No. 1 Circuit Resistance | 0.47 Megohm |
| Bulb Temperature (at Hottest Point) | 225 Degrees C |

AVERAGE CHARACTERISTICS

| | |
|---------------------------------------|-----------------------|
| Plate Voltage | 175 Volts |
| Grid No. 2 Voltage | 175 Volts |
| Grid No. 1 Voltage | -40 Volts |
| Plate Current | 90 Ma |
| Grid No. 2 Current | 7.0 Ma |
| Transconductance | 6500 μmhos |
| Amplification Factor ⁴ | 3.0 |
| Plate Resistance (approx.) | 6000 Ohms |
| Ec1 for Ib = 1.0 Ma (approx) | -75 Volts |
| Instantaneous Plate Knee Values | |
| Eb = 80 V, Ec2 = 100 V, and Ec1 = 0 V | |
| Ib = 280 Ma and Ic2 = 20 Ma. | |

NOTES:

- Horizontal operation permitted if plane of pins 2 and 7 is vertical.
- For operation in a 525-line, 30-frame system as described in "Standards of Good Engineering Practice for Television Broadcasting Stations; Federal Communications Commission." 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.
- Amplification factor obtained with Grid No. 2 tied to plate and operating as a triode connected amplifier.

APPLICATION DATA:

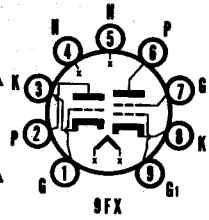
The Sylvania Type 6CL5 is a beam power amplifier designed for use as a horizontal deflection amplifier in color television receivers.

SYLVANIA ELECTRONIC TUBES

SYLVANIA ELECTRONIC TUBES



**SYLVANIA TYPE 6CL8
6CL8A
5CL8
5CL8A
9CL8**



**MEDIUM MU TRIODE
SEMI-REMOTE CUTOFF TETRODE**

MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 5CL8A 5CL8 | 6CL8A 6CL8 | 9CL8 |
|---|----------------|---------------|------------|
| Heater Voltage | 4.7 | 6.3 | 9.5 Volts |
| Heater Current | 600 | 450 | 300 Ma |
| Heater Warm-up Time ¹ | 11 | 11 | 11 Seconds |
| Heater-Cathode Voltage (Design Center Values) | | | |
| Heater Negative with Respect to Cathode | 200 Volts Max. | | |
| Heater Positive with Respect to Cathode | 100 Volts Max. | | |
| Total D C and Peak | 200 Volts Max. | | |

DIRECT INTERELECTRODE CAPACITANCES

| | Shielded ² | | | Unshielded |
|--|-----------------------|----------------------|----------------|----------------------|
| Triode Section | | | | |
| Grid to Plate | 1.8 | | | 1.8 μ f |
| Input: g to (h + k) | 2.7 | | | 2.7 μ f |
| Output: p to (h + k) | 1.2 | | | 0.4 μ f |
| Tetrode Section | | | | |
| | 5CL8A 6CL8A | 5CL8 6CL8 9CL8 | 5CL8A 6CL8A | 5CL8 6CL8 9CL8 |
| Grid No. 1 to Plate | 0.01 | .016 | .02 | .028 μ f Max. |
| Input: g ₁ to (h + k + g ₂) | 5.0 | 5.0 | 5.0 | 5.0 μ f |
| Output: p to (h + k + g ₂) | 3.4 | 3.0 | 2.4 | 2.0 μ f |
| Cathode to Heater (Either Section—approx.) | 2.5 | 2.5 | 2.5 | 2.5 μ f |

MAXIMUM RATINGS (Design Center Values)

| | Triode Section | Tetrode Section |
|-------------------------------|-----------------------|--------------------|
| Plate Voltage | 300 | 300 Volts |
| Grid No. 2 Supply Voltage | | 300 Volts |
| Grid No. 2 Voltage | See 6AM8 Rating Chart | |
| Plate Dissipation | 2.7 | 2.8 Watts |
| Grid No. 2 Dissipation | | 0.5 Watt |
| Positive Grid No. 1 Voltage | 0 | 0 Volt |
| Grid No. 1 Circuit Resistance | | |
| Fixed Bias | 0.5 | 0.25 Megohm |
| Self Bias | 1.0 | 1.0 Megohm |

CHARACTERISTICS AND TYPICAL OPERATION

| | Triode Section | Tetrode Section |
|--|-------------------|--------------------|
| Class A₁ Amplifier | | |
| Plate Voltage | 125 | 125 Volts |
| Grid No. 2 Voltage | | 125 Volts |
| Grid No. 1 Voltage | 0 | -1.0 Volts |
| Cathode Bias Resistor | 56 | Ohms |
| Plate Current | 15 | 12 Ma |
| Grid No. 2 Current | | 4.0 Ma |
| Transconductance (5CL8A, 6CL8A) ³ | 8000 | 5800 μ mhos |
| Plate Resistance (approx.) | 5000 | 100,000 Ohms |
| Grid No. 1 Voltage for I _b = 10 μ a (approx.) | -9 | -10 Ohms |

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 four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times the rated heater voltage divided by the rated heater current.
2. Shield No. 315.
3. The transconductance for the tetrode section of the 5CL8A and 6CL8A is 6400 micromhos.

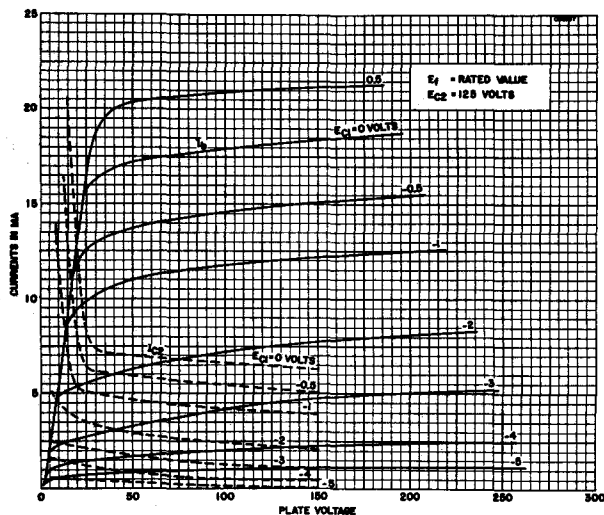
SYLVANIA ELECTRONIC TUBES

6CL8, 6CL8A, 5CL8, (Cont'd) 5CL8A, 9CL8

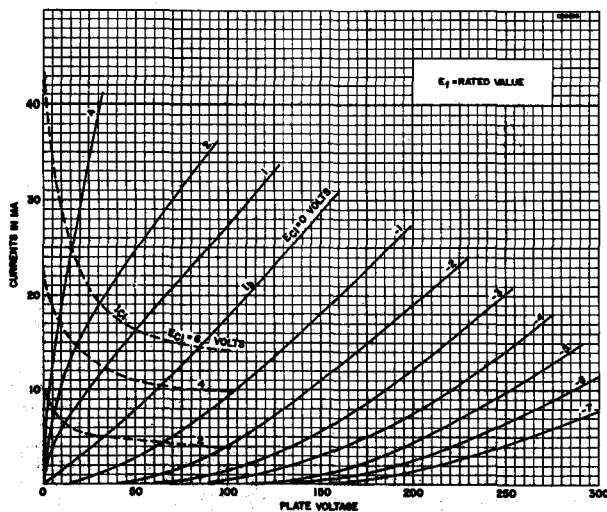
APPLICATION

The Sylvania Types 5CL8, 5CL8A, 6CL8, 6CL8A and 9CL8 have a medium mu triode and a semi-remote cutoff tetrode contained in one envelope. They are intended primarily for use as a combined VHF oscillator and mixer. Types 5CL8, 5CL8A, 6CL8, 6CL8A and 9CL8 have controlled heater warm-up time for series string operation.

AVERAGE PLATE CHARACTERISTICS (TETRODE SECTION)



AVERAGE PLATE CHARACTERISTICS (TRIODE SECTION)



SYLVANIA ELECTRONIC TUBES

6CL6 (Cont'd)

CHARACTERISTICS AND TYPICAL OPERATION

Class A₁ Amplifier

| | |
|--|--------------------------------|
| Plate Voltage | 250 Volts |
| Grid No. 3 Voltage | Connected to Cathode at Socket |
| Grid No. 2 Voltage | 150 Volts |
| Grid No. 1 Voltage | -3.0 Volts |
| Peak A F Grid No. 1 Voltage | 3.0 Volts |
| Plate Current (Maximum Signal) | 31 Ma |
| Plate Current (Zero Signal) | 30 Ma |
| Grid No. 2 Current (Maximum Signal) | 7.2 Ma |
| Grid No. 2 Current (Zero Signal) | 7.0 Ma |
| Plate Resistance (approx.) | 0.15 Megohm |
| Transconductance | 11000 μ mhos |
| Load Resistance | 7500 Ohms |
| Total Harmonic Distortion | 8 Percent |
| Maximum Signal Power Output | 2.8 Watts |
| Grid No. 1 Bias for $I_b = 10 \mu$ a (approx.) | -14 Volts |

Video Amplifier, 4 Mc Bandwidth

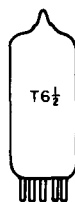
| | |
|--|--------------------------------|
| Plate Supply Voltage | 300 Volts |
| Grid No. 3 Voltage | Connected to Cathode at Socket |
| Grid No. 2 Supply Voltage | 300 Volts |
| Grid No. 2 Resistor | 24000 Ohms |
| Grid No. 1 Voltage | -2.0 Volts |
| Grid No. 1 Resistance | 0.1 Megohm |
| Grid No. 1 Signal Voltage (Peak to Peak) | 3.0 Volts |
| Plate Current (Zero Signal) | 30 Ma |
| Grid No. 2 Current (Zero Signal) | 7.0 Ma |
| Load Resistance | 3900 Ohms |
| Voltage Output (Peak to Peak) | 132 Volts |

APPLICATION

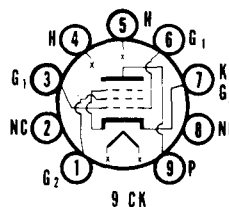
The Type 6CL6 is a miniature power pentode designed primarily for use as the video output amplifier in television receivers. It is useful for driving large television picture tubes and for wide-band amplifiers in industrial and laboratory equipment.

SYLVANIA TUBE TESTER SETTINGS

| | A | B | C | D | E | F | G | Test or K |
|---------|-----|---|------|----|---|------|----|-----------|
| 139/140 | 6.3 | 0 | 59 | 0 | 3 | 36 | 29 | Y |
| | 6.3 | 0 | 36 | 0 | 3 | 59 | 29 | Y |
| 219/220 | 6.3 | 4 | 359S | 27 | 5 | 28Z | 6 | 1 |
| | 6.3 | 4 | 258S | 27 | 5 | 039Z | 6 | 1 |



SYLVANIA TYPE 6CM6
BEAM POWER PENTODE



MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | |
|--|-----------|
| Heater Voltage | 6.3 Volts |
| Heater Current | 450 Ma |
| Maximum Heater-Cathode Voltage | |
| D C, Heater Positive with Respect to Cathode | 100 Volts |
| Total D C and Peak | 200 Volts |

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

| | |
|---------------|-------------|
| Grid to Plate | 0.7 μ f |
| Input | 8.0 μ f |
| Output | 8.5 μ f |

6CM6 (Cont'd)

MAXIMUM RATINGS (Design Center Values—Except as Noted)

Class A₁ Amplifier

| | |
|-------------------------------|------------|
| Plate Voltage..... | 315 Volts |
| Plate Dissipation..... | 12 Watts |
| Grid No. 2 Voltage..... | 285 Volts |
| Grid No. 2 Dissipation..... | 2 Watts |
| Grid No. 1 Circuit Resistance | |
| Fixed Bias..... | 0.1 Megohm |
| Cathode Bias..... | 0.5 Megohm |

Vertical Deflection Amplifier¹

| | Pentode Connected | Triode Connected |
|---|----------------------|---------------------|
| Plate Voltage..... | 315 | 315 Volts |
| Peak Positive Plate Voltage (Abs. Max.)..... | 2000 | 2000 Volts |
| Plate Dissipation ² | 8 | 8 Watts |
| Grid No. 2 Voltage..... | 285 | Volts |
| Grid No. 2 Dissipation ² | 1.75 | Watts |
| Peak Negative Grid Voltage..... | 250 | 250 Volts |
| Average Cathode Current..... | 40 | 40 Ma |
| Peak Cathode Current..... | 120 | 120 Ma |
| Grid No. 1 Circuit Resistance, Cathode Bias.. | 2.2 | 2.2 Megohms |

NOTES:

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

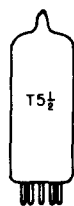
For Characteristics and Typical Operation refer to Type 6V6GT which is identical except for envelope size and maximum ratings.

SYLVANIA TUBE TESTER SETTINGS

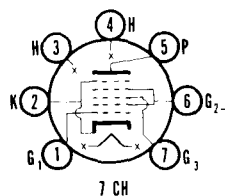
| | A | B | C | D | E | F | G | Test or K |
|---------|-----|---|----|----|---|------|----|-----------|
| 139/140 | 6.3 | 0 | 4 | 0 | 4 | 026 | 35 | Y |
| | 6.3 | 0 | 6 | 0 | 4 | 024 | 35 | Y |
| 219/220 | 6.3 | 4 | 56 | 26 | 5 | 013Z | 9 | 7 |
| | 6.3 | 4 | 35 | 26 | 5 | 016Z | 9 | 7 |

TYPE 6CR6

(See Condensed Data Section)



SYLVANIA TYPE 6CS6 DUAL CONTROL HEPTODE



MECHANICAL DATA

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

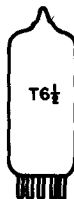
ELECTRICAL DATA

HEATER CHARACTERISTICS

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

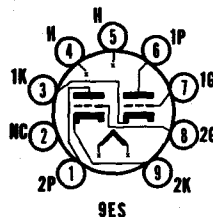
DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

| | |
|--|------------------|
| Grid No. 1 to Plate..... | 0.07 μ f Max |
| Grid No. 3 to Plate..... | 0.36 μ f Max |
| Grid No. 1 Input (g1 to h+k+g2+g3 and g5)..... | 5.5 μ f |
| Grid No. 3 Input (g3 to h+k+g1+g2+g5)..... | 7.0 μ f |
| Output (p to All)..... | 7.5 μ f |
| Coupling (g1 to g3)..... | 0.22 μ f Max |



SYLVANIA TYPE 6CM7 8CM7

DOUBLE TRIODE



MECHANICAL DATA

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

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 6CM7 | 8CM7 |
|--|------|----------------|
| Heater Voltage..... | 6.3 | 8.4 Volts |
| Heater Current..... | 600 | 450 Ma |
| Heater Warm-up Time ¹ | 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 No. 1 | Triode No. 2 |
|-----------------------------|--------------|--------------|
| Grid to Plate (g to p)..... | 3.8 | 3.0 μμf |
| Input: g to (k + h)..... | 2.0 | 3.5 μμf |
| Output: p to (k + h)..... | 0.5 | 0.4 μμf |

RATINGS (Design Center Values—Except as Noted)

Vertical Deflection Oscillator and Amplifier²

| | Triode No. 1 (Oscillator) | Triode No. 2 (Amplifier) |
|--|------------------------------|-----------------------------|
| D C Plate Voltage..... | 500 | 500 Volts Max. |
| Peak Positive Pulse Plate Voltage..... | | 2200 Volts Abs. Max. |
| Peak Negative Pulse Grid Voltage..... | 200 | 200 Volts Max. |
| Plate Dissipation ³ | 1.25 | 5.5 Watts Max. |
| Average Cathode Current..... | 15 | 20 Ma Max. |
| Peak Cathode Current..... | 70 | 70 Ma Max. |
| Grid Circuit Resistance | | |
| Cathode Bias..... | 2.2 | 2.5 Megohms Max. |
| Fixed Bias..... | 2.2 | 1.0 Megohms Max. |

AVERAGE CHARACTERISTICS

| | Triode No. 1 (Oscillator) | Triode No. 2 (Amplifier) |
|--|------------------------------|-----------------------------|
| Plate Voltage..... | 200 | 250 Volts |
| Grid Voltage..... | -7 | -8 Volts |
| Plate Current..... | 5 | 20 Ma |
| Transconductance..... | 2000 | 4400 μmhos |
| Amplification Factor..... | 21 | 18 |
| Plate Resistance..... | 10,500 | 4100 Ohms |
| Plate Current at E _c = -10 Volts..... | 1.0 | Ma |
| Grid Voltage for I _b = 10 μa..... | -14 | Volts |

NOTES:

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.
2. For operation in a 525 line, 30-frame system as described in "Standards of Good Engineering Practice for Television Broadcasting 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.

APPLICATION

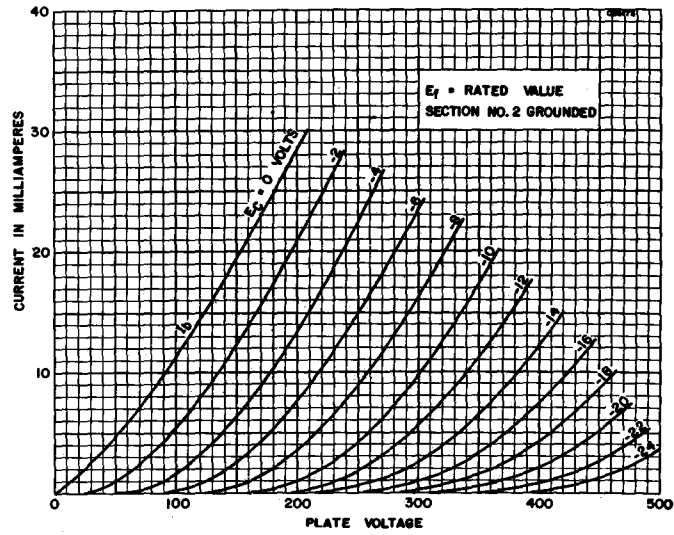
Each of these types is a miniature double triode having dissimilar sections. Section No. 1 is intended for operation as a vertical deflection oscillator and Section No. 2 as a vertical deflection amplifier. The 8CM7 features a 450 Ma heater and is identical to the 6CM7 except for heater characteristics. Both types have controlled heater warm-up time and are intended for use in series string television receivers.

SYLVANIA ELECTRONIC TUBES

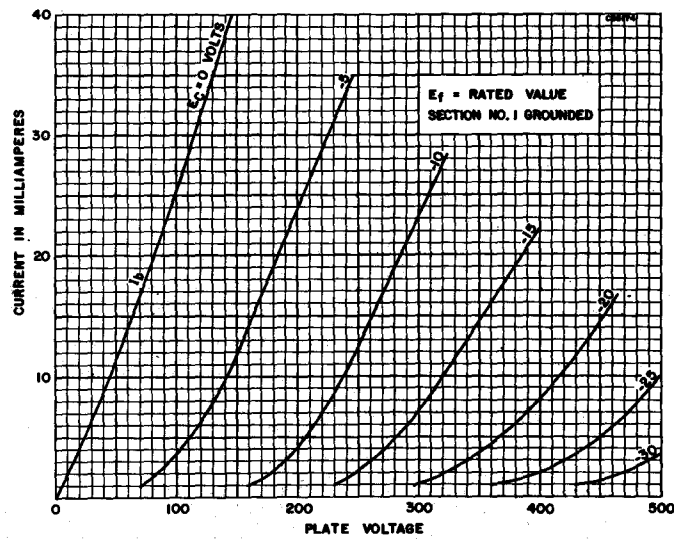
Issued as a supplement to the manual in Sylvania News for January 1957

SYLVANIA TYPE 6CM7 (Cont'd)
8CM7

AVERAGE PLATE CHARACTERISTICS
SECTION I



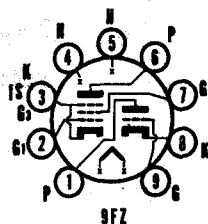
AVERAGE PLATE CHARACTERISTICS
SECTION II





SYLVANIA TYPE 6CM8 5CM8

HIGH-MU TRIODE
SHARP CUTOFF PENTODE



MECHANICAL DATA

| | |
|-------------------|--------------------------|
| Bulb | T-6 1/2 |
| Base | E9-1, Small Button 9-Pin |
| Outline | 6-2 |
| Basing | 9FZ |
| Cathode | Coated Unipotential |
| Mounting Position | Any |

ELECTRICAL DATA

HEATER CHARACTERISTICS

| | 5CM8 | 6CM8 |
|---|------|----------------|
| Heater Voltage | 4.7 | 6.3 Volts |
| Heater Current | 600 | 450 Ma |
| Heater Warm-up Time ¹ | 11 | 11 Seconds |
| Heater-Cathode Voltage (Design Center Values) | | |
| Heater Negative with Respect to Cathode | | 200 Volts Max. |
| Total D C and Peak | | |
| Heater Positive with Respect to Cathode | | 100 Volts Max. |
| D C | | 200 Volts Max. |
| Total D C and Peak | | |

DIRECT INTERELECTRODE CAPACITANCES (Approx.)

| Triode Section | | |
|------------------------------------|--|-------------------------|
| Grid to Plate | | 1.9 μf |
| Input: g to (h + k) | | 1.6 μf |
| Output: p to (h + k) | | 0.22 μf |
| Pentode Section | | |
| Grid No. 1 to Plate | | 0.02 μf Max. |
| Input: g1 to (h+k+g2+g3+I.S.) | | 6.0 μf |
| Output: p to (h+k+g2+g3+I.S.) | | 2.6 μf |
| Coupling | | |
| Pentode Plate to Triode Grid | | 0.01 μf Max. |
| Pentode Grid No. 1 to Triode Plate | | 0.15 μf Max. |
| Pentode Plate to Triode Plate | | 0.10 μf Max. |

MAXIMUM RATINGS (Design Center Values)

| | Triode Section | Pentode Section |
|-------------------------------|-----------------------|-----------------|
| Plate Voltage | 300 | 300 Volts |
| Grid No. 2 Supply Voltage | | 300 Volts |
| Grid No. 2 Voltage | See 6AM8 Rating Chart | 0 Volts |
| Positive Grid No. 1 Voltage | 0 | 0 Volts |
| Plate Dissipation | 1.0 | 2.0 Watts |
| Grid No. 2 Dissipation | | 0.5 Watt |
| Grid No. 1 Circuit Resistance | | |
| Self Bias | | 1.0 Megohm |
| Fixed Bias | | 0.25 Megohm |

CHARACTERISTICS

Class A₁ Amplifier

| | Triode Section | Pentode Section |
|---|----------------|-----------------------|
| Plate Supply Voltage | 250 | 200 Volts |
| Grid No. 2 Voltage | | 150 Volts |
| Grid No. 1 Voltage | -2 | 0 Volts |
| Cathode Bias Resistor | | 180 Ohms |
| Plate Current | 1.8 | 9.5 Ma |
| Grid No. 2 Current | | 2.8 Ma |
| Amplification Factor | 100 | |
| Plate Resistance (approx.) | 50,000 | 600,000 Ohms |
| Transconductance | 2000 | 6200 μmhos |
| Grid No. 1 Voltage for $I_b = 10 \mu\text{a}$ (approx.) | | -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

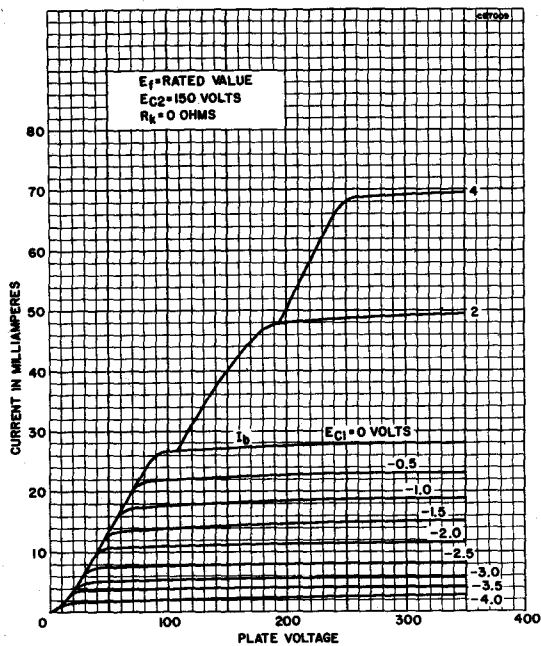
The Sylvania Type 6CM8 is a high mu triode and sharp cutoff pentode. The pentode section may be used as an I F amplifier, video amplifier, AGC amplifier and reactance tube.

The 5CM8 is identical to the 6CM8 except for heater characteristics. Both types employ controlled heater warm-up time for service in series heater string television receivers.

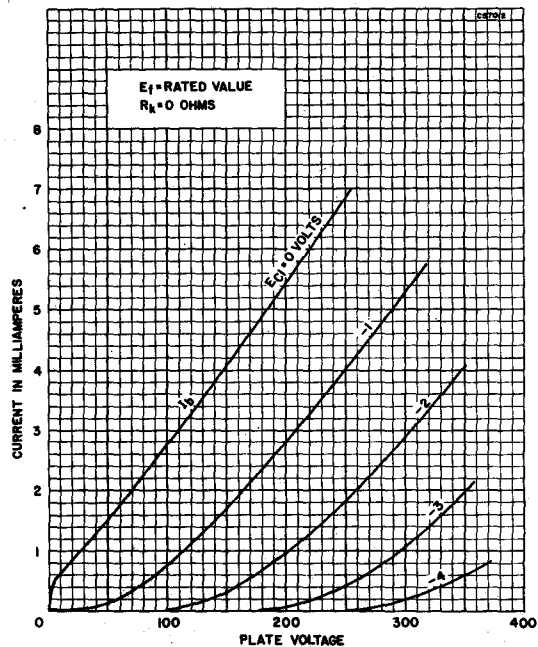
SYLVANIA ELECTRONIC TUBES

6CM8, 5CM8 (Cont'd)

AVERAGE PLATE CHARACTERISTICS (PENTODE SECTION)



AVERAGE PLATE CHARACTERISTICS (TRIODE SECTION)



SYLVANIA ELECTRONIC TUBES