

RECEIVING

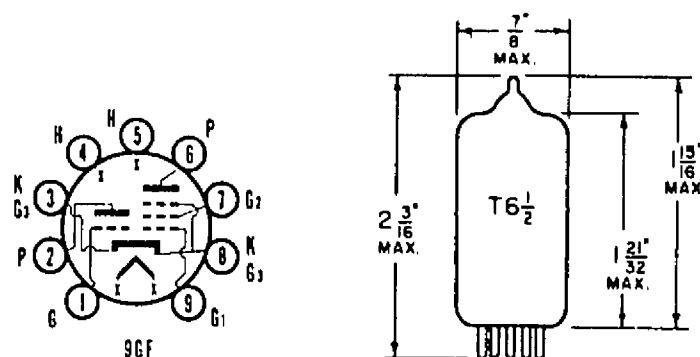
TUBES

SYLVANIA

VHF OSCILLATOR AND MIXER

6LJ8, 5LJ8, 4LJ8

- COLOR TV TYPE
- MEDIUM MU TRIODE
- SHARP CUTOFF PENTODE
- MULTI-SECTION
- LOW B+ OPERATION
- FRAME GRID PENTODE
- T-6½ ENVELOPE
- 9 PIN BASE



## DESCRIPTION

Sylvania Types 6LJ8, 5LJ8 and 4LJ8 have a medium mu triode and sharp cutoff pentode contained in a T-6½ envelope. They are designed for service as VHF oscillators and mixers.

Types 5LJ8 and 4LJ8 have controlled heater warm-up time for series connected circuits.

## MECHANICAL DATA

|                                  |                                  |
|----------------------------------|----------------------------------|
| Envelope . . . . .               | T-6½                             |
| Base . . . . .                   | E9-1                             |
| Outline Drawing . . . . .        | 6-2                              |
| Max. Diameter . . . . .          | 0.875"                           |
| Max. Seated Height . . . . .     | 1.938"                           |
| Max. Overall Length . . . . .    | 2.188"                           |
| Cathode . . . . .                | Coated Unipotential              |
| Operating Position . . . . .     | Any                              |
| Basing Diagram . . . . .         | 9GF                              |
| Pin No. 1 - Triode Grid          | Pin No. 6 - Pentode Plate        |
| Pin No. 2 - Triode Plate         | Pin No. 7 - Pentode Grid No. 2   |
| Pin No. 3 - Cathode & Grid No. 3 | Pin No. 8 - Cathode & Grid No. 3 |
| Pin No. 4 - Heater               | Pin No. 9 - Pentode Grid No. 1   |
| Pin No. 5 - Heater               |                                  |

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ELECTRICAL DATA

HEATER CHARACTERISTICS AND RATINGS (Design Maximum Rating System)(1)

|                                         | 4LJ8           | 5LJ8           | 6LJ8         |         |
|-----------------------------------------|----------------|----------------|--------------|---------|
| Heater Operation                        | Series(2)      | Series(2)      | Parallel(3)  |         |
| Heater Voltage                          | 4.3            | 5.6            | 6.3 ± 0.6(4) | Volts   |
| Heater Current                          | .600 ± .040(4) | .450 ± .030(4) | .400(5)      | Amperes |
| Heater Warm-up Time(6)                  | 11             | 11             | -            | Seconds |
| Maximum Heater Cathode Voltage          |                |                |              |         |
| Heater Negative with Respect to Cathode |                |                |              |         |
| Total DC and Peak . . . . .             |                |                | 200          | Volts   |
| Heater Positive with Respect to Cathode |                |                |              |         |
| DC . . . . .                            |                |                | 100          | Volts   |
| Total DC and Peak . . . . .             |                |                | 200          | Volts   |

DIRECT INTERELECTRODE CAPACITANCES

Triode Section

|                                    |     |    |
|------------------------------------|-----|----|
| Grid to Plate . . . . .            | 1.4 | pf |
| Input: g1 to (k+Pg3+IS+h). . . . . | 2.4 | pf |
| Output: p to (k+Pg3+IS+h). . . . . | 2.0 | pf |

Pentode Section

|                                      |       |         |
|--------------------------------------|-------|---------|
| Grid No. 1 to Plate . . . . .        | 0.015 | pf Max. |
| Input: g1 to (k+g3+IS+g2+h). . . . . | 5.5   | pf      |
| Output: p to (k+g3+IS+g2+h). . . . . | 3.4   | pf      |

RATINGS (Design Maximum Rating System)(1)

|                                       | Triode<br>Section | Pentode<br>Section |            |
|---------------------------------------|-------------------|--------------------|------------|
| Plate Voltage . . . . .               | 280               | 280                | Volts Max. |
| Grid No. 2 Supply Voltage . . . . .   | -                 | 280                | Volts Max. |
| Grid No.2 Voltage . . . . .           | See Rating Chart  |                    |            |
| Cathode Current . . . . .             | 20                | 20                 | Ma Max.    |
| Plate Dissipation . . . . .           | 2.0               | 2.0                | Watts Max. |
| Grid No.2 Dissipation . . . . .       | -                 | 0.5                | Watt Max.  |
| Positive Grid No. 1 Voltage . . . . . | 0                 | 0                  | Volt Max.  |
| Maximum Grid No. 1 Circuit Resistance |                   |                    |            |
| Self Bias . . . . .                   | 0.5               | 0.25               | Megohm     |
| Fixed Bias . . . . .                  | 1.0               | 0.5                | Megohm     |

Control grid to cathode spacing of the pentode section of this type is of such low order of magnitude as to preclude the use of voltage between these elements of more than 30 volts dc or peak ac in commercial tube checkers and shorts indicating devices, particularly where mechanical excitation of the tube is employed.

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## CHARACTERISTICS AND TYPICAL OPERATION

## Class A1 Amplifier (7)

|                                             | Triode<br>Section | Pentode<br>Section |            |
|---------------------------------------------|-------------------|--------------------|------------|
| Plate Voltage . . . . .                     | 125               | 125                | Volts      |
| Grid No. 2 Voltage . . . . .                | -                 | 125                | Volts      |
| Grid No. 1 Voltage . . . . .                | 0                 | 0                  | Volt       |
| Cathode Bias Resistor . . . . .             | 68                | 33                 | Ohms       |
| Plate Current . . . . .                     | 13                | 12                 | Ma         |
| Grid No. 2 Current . . . . .                | -                 | 3.5                | Ma         |
| Transconductance . . . . .                  | 8000              | 13,000             | $\mu$ mhos |
| Amplification Factor . . . . .              | 40                | -                  |            |
| Plate Resistance (Approx.) . . . . .        | 5000              | 125,000            | Ohms       |
| Ecl for Ib = 30 $\mu$ a (Approx.) . . . . . | -6.5              | -4                 | Volts      |

## NOTES:

- (1) Design Maximum Ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by the published data, and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all other electron devices in the equipment.

- (2) Operated with the heater in series with the heaters of other tubes having the same bogey current.
- (3) Operated with the heater in parallel with the heaters of other tubes having the same bogey heater voltage.
- (4) For series/parallel heater operation, the equipment designer should design the equipment so that heater current/voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater current/voltage within the specified tolerance.
- (5) Heater current of a bogey tube at Ef = 6.3 volts.

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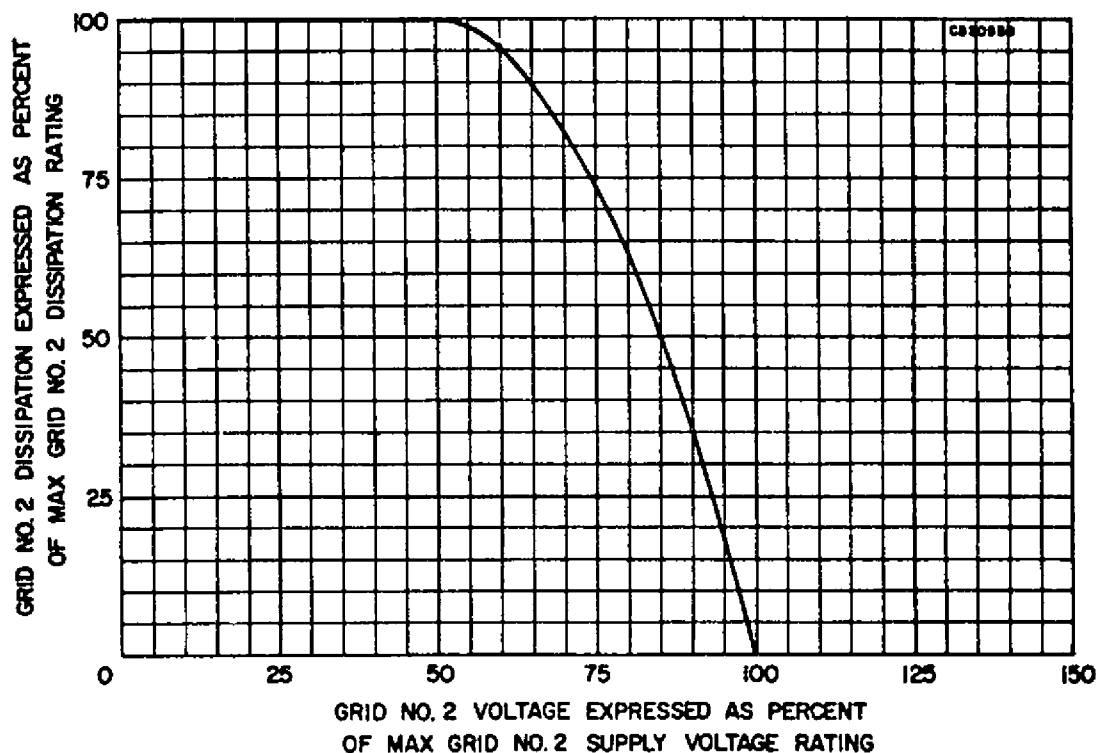
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NOTES: (Cont'd)

- (6) 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 heater in series with a resistance equal to three (3) times the rated heater voltage divided by the bogey heater current.
- (7) "Each tube section measured separately and with cathode bias resistor indicated. Section not under test is floating."

RATING CHART



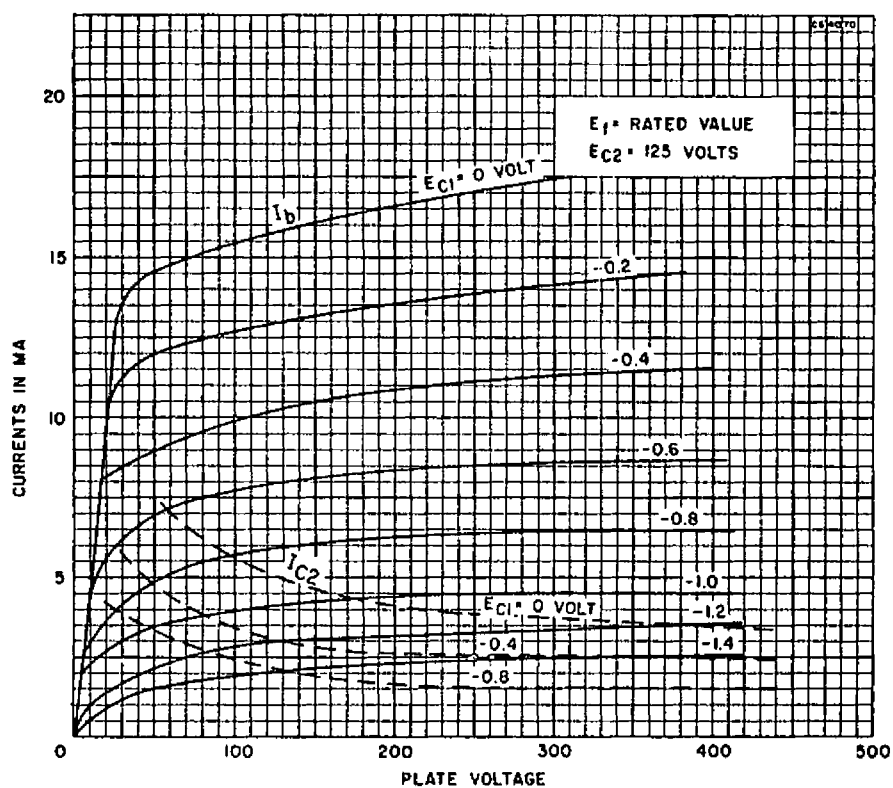
6LJ8

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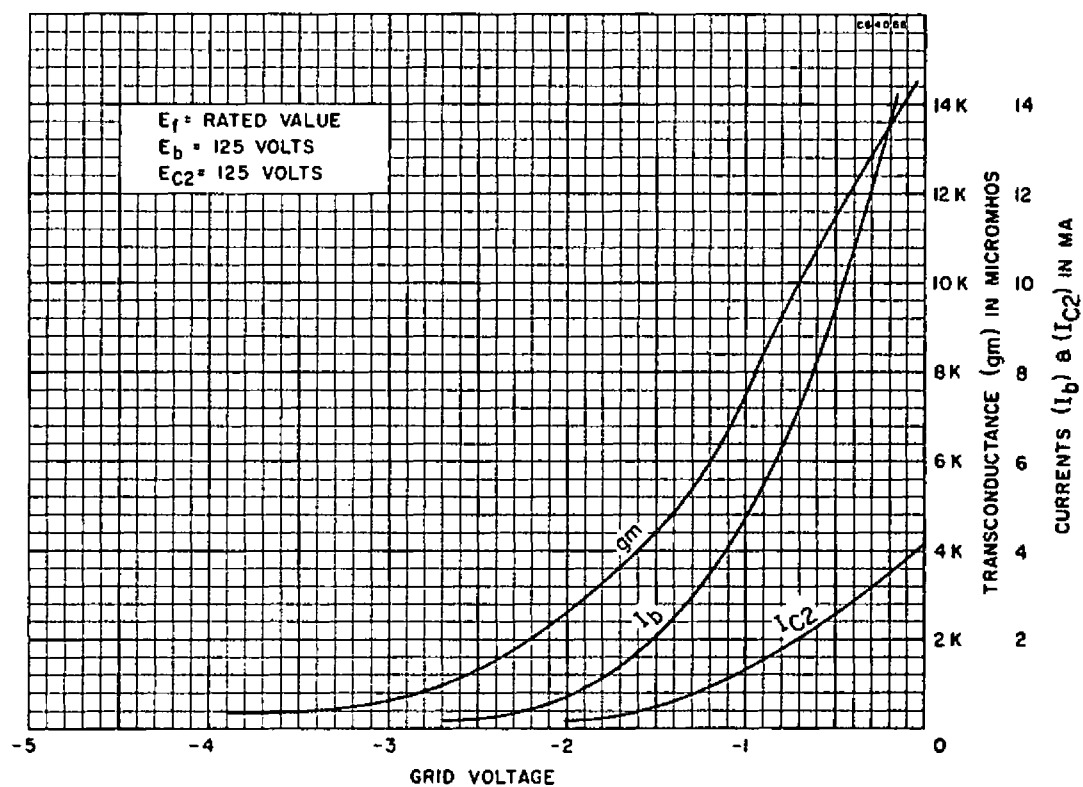
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# AVERAGE PLATE CHARACTERISTICS (Pentode Section)

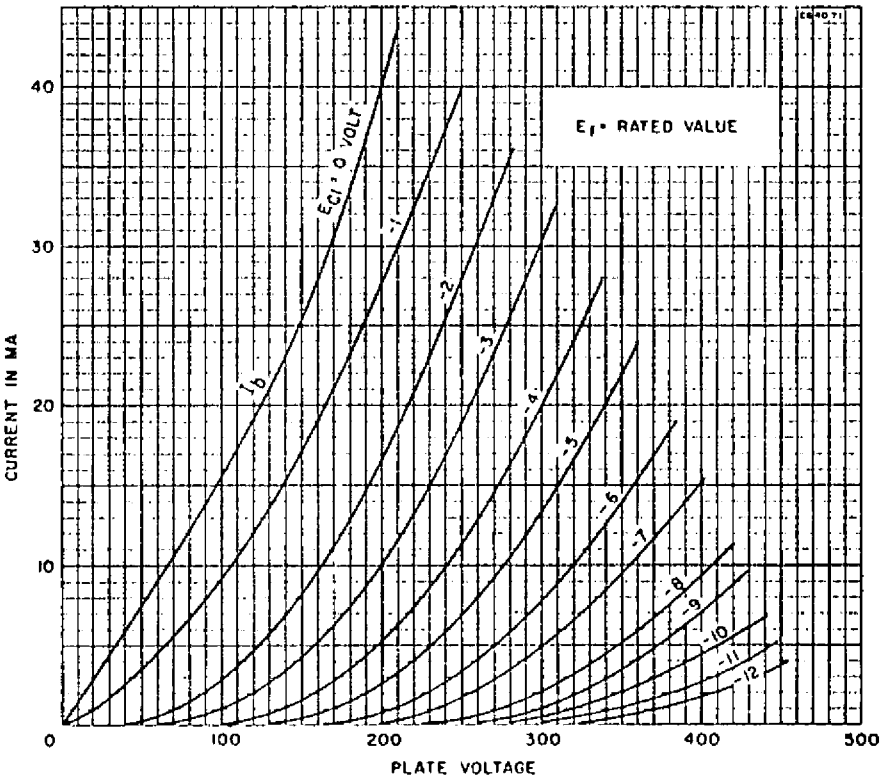


# AVERAGE TRANSFER CHARACTERISTICS (Pentode Section)



6LJ8  
5LJ8  
4LJ8

AVERAGE PLATE CHARACTERISTICS  
(Triode Section)



AVERAGE TRANSFER CHARACTERISTICS  
(Triode Section)

