



5718

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## MEDIUM-MU TRIODE

## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN\*

|                                                 | Note | Min.  | Max.      |                  |
|-------------------------------------------------|------|-------|-----------|------------------|
| Heater Current . . . . .                        | 1    | 0.138 | 0.162     | amp              |
| Grid-to-Plate Capacitance . .                   | 2    | 1.1   | 1.8       | $\mu\text{f}$    |
| Input Capacitance . . . . .                     | 2    | 1.6   | 2.8       | $\mu\text{f}$    |
| Output Capacitance . . . . .                    | 2    | 0.5   | 0.9       | $\mu\text{f}$    |
| Amplification Factor . . . . .                  | 1,3  | 23    | 31        |                  |
| Plate Current . . . . .                         | 1,3  | 6.0   | 11.0      | ma               |
| Plate Current . . . . .                         | 1,4  | —     | 100       | $\mu\text{amp}$  |
| Transconductance . . . . .                      | 1,3  | 4800  | 6800      | $\mu\text{mhos}$ |
| Transconductance . . . . .                      | 5,3  | 4500  | —         | $\mu\text{mhos}$ |
| Grid Current . . . . .                          | 1,6  | —     | $\pm 0.4$ | $\mu\text{amp}$  |
| Heater-Cathode Leakage Current:                 |      |       |           |                  |
| Heater negative with respect to cathode . . . . | 1,7  | —     | 7.0       | $\mu\text{amp}$  |
| Heater positive with respect to cathode . . . . | 1,7  | —     | 7.0       | $\mu\text{amp}$  |
| Leakage Resistance:                             |      |       |           |                  |
| Between Grid and All Other Electrodes Tied . .  | 1,8  | 100   | —         | megohms          |
| Between Plate and All Other Electrodes Tied . . | 1,9  | 100   | —         | megohms          |
| Useful Power Output . . . . .                   | 1,10 | 600   | —         | mw               |

\* Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With external shield.

Note 3: With dc plate supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode bypass capacitor of 1000 microfarads.

Note 4: With dc plate voltage of 100 volts, and dc grid voltage of -7 volts.

Note 5: With 5.5 volts ac or dc on heater.

Note 6: With dc plate supply voltage of 100 volts, cathode resistor of 150 ohms, and grid resistor of 0.5 megohm.

Note 7: With 100 volts dc between heater and cathode.

Note 8: With grid 100 volts negative with respect to all other electrodes tied together.

Note 9: With plate 300 volts negative with respect to all other electrodes tied together.

Note 10: In self-excited oscillator with dc plate voltage of 150 volts, grid resistor and feedback optimized to give useful power output at a plate current of 20 ma. and frequency of 500 Mc.

## SPECIAL RATINGS &amp; PERFORMANCE DATA

## Shock Rating:

Impact Acceleration . . . . . 450 max. g

Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.



## MEDIUM-MU TRIODE

### Fatigue Rating:

Vibrational Acceleration . . . . . 2.5 max. g  
Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

### Uniform Acceleration Rating . . . . . 1000 max. g

Tubes are subjected in each of three positions to a gradually applied uniform acceleration up to 1000 g.

### High-Frequency Vibration Performance:

RMS Output Voltage . . . . . 60 max. mv

Under the following conditions: A 100-volt plate and grid-No.2 voltage supply having an impedance not exceeding that of a 40- $\mu$ f capacitor, plate load resistance of 10000 ohms, grid-No.1 resistor of 0.1 megohm, cathode resistor of 150 ohms, cathode bypass capacitor of 1000  $\mu$ f, and vibrational acceleration of 15 g at 40 cps.

### Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . 2500 max. cycles

Under the following conditions: With heater voltage of 7.0 volts cycled 1 minute on and 4 minutes off, heater-cathode voltage of 140 volts (rms), and plate, grid-No.2, and grid-No.1 voltage = 0 volts.

### Average Life Performance:

The average life performance based on a 500-hour test at 175°C ambient temperature is not less than 450 hours. This life test is made on sample lot of tubes with heater voltage of 6.3 volts; plate supply voltage of 100 volts; grid-No.2 supply voltage of 100 volts; dc heater-cathode voltage (heater positive with respect to cathode) of 200 volts; cathode resistor of 150 ohms; and grid-No.1 resistor of 1 megohm.

The 500-hour end-point limits for the 5840 with heater voltage of 6.3 volts, plate supply voltage of 100 volts, grid-No.2 supply voltage of 100 volts, cathode resistor of 150 ohms bypassed by capacitor having a maximum reactance of 3 ohms, and dc heater-cathode voltage of 100 volts with heater either positive or negative with respect to cathode are: transconductance, 3250 micromhos minimum; heater-cathode leakage current, 20 microamperes maximum; and grid-No.1 current, +0.9 microampere maximum or -0.9 microampere maximum.



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**MEDIUM-MU TRIODE**

SUBMINIATURE TYPE

*Intended for applications where dependable performance  
under shock and vibration is paramount.*

**5718  
PREMIUM  
TYPE**
**GENERAL DATA****Electrical:**

Heater, for Unipotential Cathode:

Voltage . . . . .  $6.3 \pm 5\%$  . . . . . ac or dc volts

Current . . . . . 0.150 . . . . . amp

Direct Interelectrode Capacitances:

|                         | With Exter-<br>nal Shield <sup>o</sup> | Without Exter-<br>nal Shield |                |
|-------------------------|----------------------------------------|------------------------------|----------------|
| Grid to Plate . . . . . | 1.3                                    | 1.4                          | $\mu\text{mf}$ |
| Input . . . . .         | 2.4                                    | 2.2                          | $\mu\text{mf}$ |
| Output . . . . .        | 2.4                                    | 0.7                          | $\mu\text{mf}$ |

<sup>o</sup> Having inside diameter of 0.405" and connected to lead No.5.**Characteristics, Class A<sub>1</sub> Amplifier:**

|                                                                 |      |      |                  |
|-----------------------------------------------------------------|------|------|------------------|
| Plate Supply Voltage . . .                                      | 100  | 150  | volts            |
| Cathode Resistor . . . . .                                      | 150  | 180  | ohms             |
| Amplification Factor . . .                                      | 27   | 27   |                  |
| Plate Resistance . . . . .                                      | 4650 | 4150 | ohms             |
| Transconductance . . . . .                                      | 5800 | 6500 | $\mu\text{mhos}$ |
| Plate Current . . . . .                                         | 8.5  | 13.0 | ma               |
| Grid Volts (Approx.) for<br>plate current of 10 $\mu\text{amp}$ | -7   | -11  | volts            |

**Mechanical:**

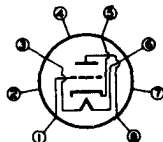
|                                                                  |                         |
|------------------------------------------------------------------|-------------------------|
| Operating Position . . . . .                                     | Any                     |
| Maximum Bulb Length . . . . .                                    | 1-3/8"                  |
| Length from Button Seal to Bulb Top<br>(Excluding tip) . . . . . | 1.075" $\pm$ 0.060"     |
| Diameter . . . . .                                               | 0.383" $\pm$ 0.017"     |
| Bulb . . . . .                                                   | T-3                     |
| Leads, Flexible . . . . .                                        | 8                       |
| Length . . . . .                                                 | 1-1/2" to 1-3/4"        |
| Orientation and Diameter . . . . .                               | See Dimensional Outline |

**BOTTOM VIEW**

Lead No.1-Grid

Lead No.2-No  
Conn.

Lead No.3-Heater

Lead No.4-No  
Conn.

Lead No.5-Cathode

Lead No.6-Heater

Lead No.7-No  
Conn.

Lead No.8-Anode

**AMPLIFIER - Class A<sub>1</sub>****Maximum Ratings, Absolute Values:**

DC PLATE VOLTAGE. . . . . 165 max. volts

APRIL 1, 1953

TUBE DEPARTMENT

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



## MEDIUM-MU TRIODE

|                                                                  |                |
|------------------------------------------------------------------|----------------|
| PLATE DISSIPATION . . . . .                                      | 3.3 max. watts |
| PEAK HEATER-CATHODE VOLTAGE:                                     |                |
| Heater negative with respect<br>to cathode . . . . .             | 200 max. volts |
| Heater positive with respect<br>to cathode . . . . .             | 200 max. volts |
| BULB TEMPERATURE (At hottest point<br>on bulb surface) . . . . . | 250 max. °C    |

### Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED AMPLIFIER CHART*  
at end of tabulated data for this type

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

|                                      |                  |
|--------------------------------------|------------------|
| For cathode-bias operation . . . . . | 1.2 max. megohms |
| For fixed-bias operation . . . . .   | Not recommended  |

Cathode-Bias Resistance—An adequate value of cathode-bias resistor should be used to protect the tube in event of temporary failure of excitation and resultant loss in developed bias.

### RF AMPLIFIER and OSCILLATOR - Class C

*Operation with full input is permissible up to 1000 Mc.*

### Maximum Ratings, Absolute Values:

|                                                                  |                |
|------------------------------------------------------------------|----------------|
| DC PLATE VOLTAGE . . . . .                                       | 165 max. volts |
| DC GRID VOLTAGE . . . . .                                        | -55 max. volts |
| DC PLATE CURRENT . . . . .                                       | 22 max. ma     |
| DC GRID CURRENT . . . . .                                        | 5.5 max. ma    |
| PLATE DISSIPATION . . . . .                                      | 3.3 max. watts |
| PEAK HEATER-CATHODE VOLTAGE:                                     |                |
| Heater negative with respect<br>to cathode . . . . .             | 200 max. volts |
| Heater positive with respect<br>to cathode . . . . .             | 200 max. volts |
| BULB TEMPERATURE (At hottest point<br>on bulb surface) . . . . . | 250 max. °C    |

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

|                                      |                  |
|--------------------------------------|------------------|
| For cathode-bias operation . . . . . | 1.2 max. megohms |
| For fixed-bias operation . . . . .   | Not recommended  |

Cathode-Bias Resistance—An adequate value of cathode-bias resistor should be used to protect the tube in event of temporary failure of excitation and resultant loss in developed bias.



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## MEDIUM-MU TRIODE

## OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER

| Plate-Supply Voltage            | 100   |       |      |      |      |      | volts |
|---------------------------------|-------|-------|------|------|------|------|-------|
| Plate Load Resistor             | 0.047 |       | 0.10 |      | 0.27 |      | meg   |
| Grid-No.1 Resistor <sup>o</sup> | 0.10  | 0.27  | 0.27 | 0.47 | 0.27 | 0.47 | meg   |
| Cathode Resistor                | 1000  | 1200  | 2200 | 2700 | 6800 | 8200 | ohms  |
| Sig. Input Volt. (rms)          | 0.5   | 0.5   | 0.5  | 0.5  | 0.5  | 0.5  | volt  |
| Output Voltage (rms)            | 8.2   | 8.5   | 8.2  | 8.2  | 7.3  | 7.4  | volts |
| Voltage Gain <sup>Δ</sup>       | 16.4  | 17.0  | 16.4 | 16.4 | 14.6 | 14.8 |       |
| Distortion                      | 3.9   | 3.2   | 3.0  | 2.71 | 3.4  | 2.8  | %     |
| Sig. Input Volt. (rms)*         | 0.59  | 0.70  | 0.67 | 0.81 | 0.75 | 0.86 | volt  |
| Output Voltage (rms)            | 9.7   | 11.75 | 11.0 | 13.1 | 11.0 | 12.7 | volts |
| Voltage Gain <sup>Δ</sup>       | 16.4  | 16.8  | 16.4 | 16.2 | 14.6 | 14.8 |       |
| Distortion                      | 4.5   | 4.7   | 4.1  | 4.6  | 5.0  | 5.0  | %     |

| Plate-Supply Voltage            | 200   |      |      |      |      |      | volts |
|---------------------------------|-------|------|------|------|------|------|-------|
| Plate Load Resistor             | 0.047 |      | 0.10 |      | 0.27 |      | meg   |
| Grid-No.1 Resistor <sup>o</sup> | 0.10  | 0.27 | 0.27 | 0.47 | 0.27 | 0.47 | meg   |
| Cathode Resistor                | 820   | 1000 | 1800 | 2200 | 4700 | 5600 | ohms  |
| Sig. Input Volt. (rms)          | 1.0   | 1.0  | 1.0  | 1.0  | 1.0  | 1.0  | volt  |
| Output Voltage (rms)            | 19.0  | 19.5 | 18.6 | 18.1 | 16.2 | 16.2 | volts |
| Voltage Gain <sup>Δ</sup>       | 19.0  | 19.5 | 18.6 | 18.1 | 16.2 | 16.2 |       |
| Distortion                      | 4.0   | 3.3  | 3.2  | 3.1  | 3.8  | 3.2  | %     |
| Sig. Input Volt. (rms)*         | 1.23  | 1.45 | 1.43 | 1.56 | 1.34 | 1.58 | volts |
| Output Voltage (rms)            | 23.4  | 28.0 | 26.0 | 28.2 | 21.6 | 25.0 | volts |
| Voltage Gain <sup>Δ</sup>       | 19.0  | 19.3 | 18.2 | 18.1 | 16.1 | 15.8 |       |
| Distortion                      | 5.0   | 5.0  | 4.9  | 5.0  | 5.1  | 5.1  | %     |

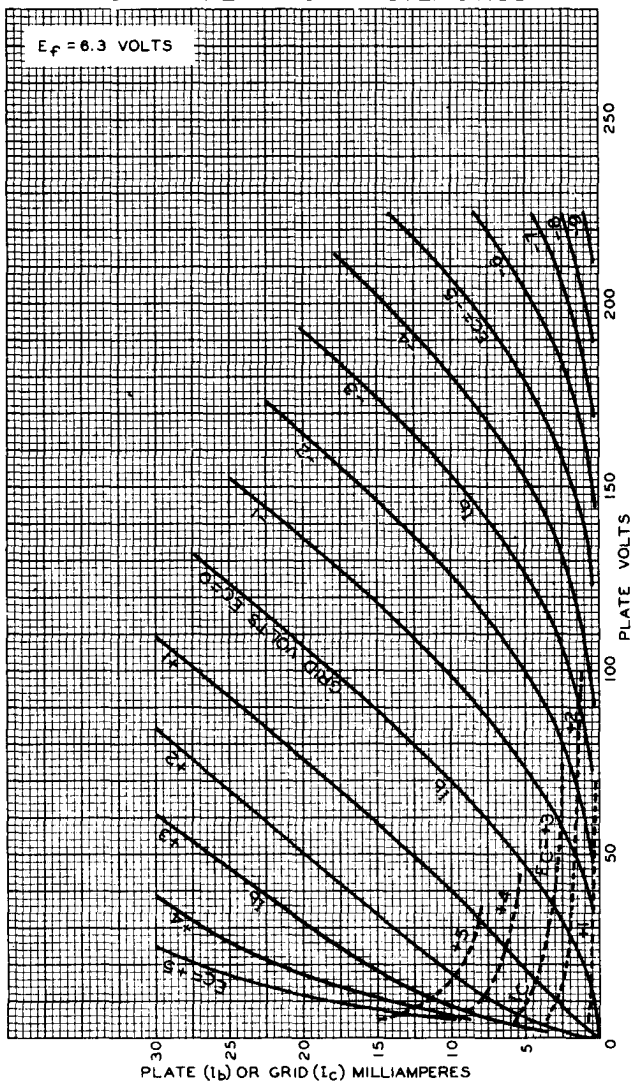
<sup>o</sup> of following stage.<sup>Δ</sup> Ratio of signal output to signal input.

\* Maximum value to swing the grid of resistance-coupled amplifier tube to the point where its grid No. 1 starts to draw current.

Note: Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.



## AVERAGE PLATE CHARACTERISTICS

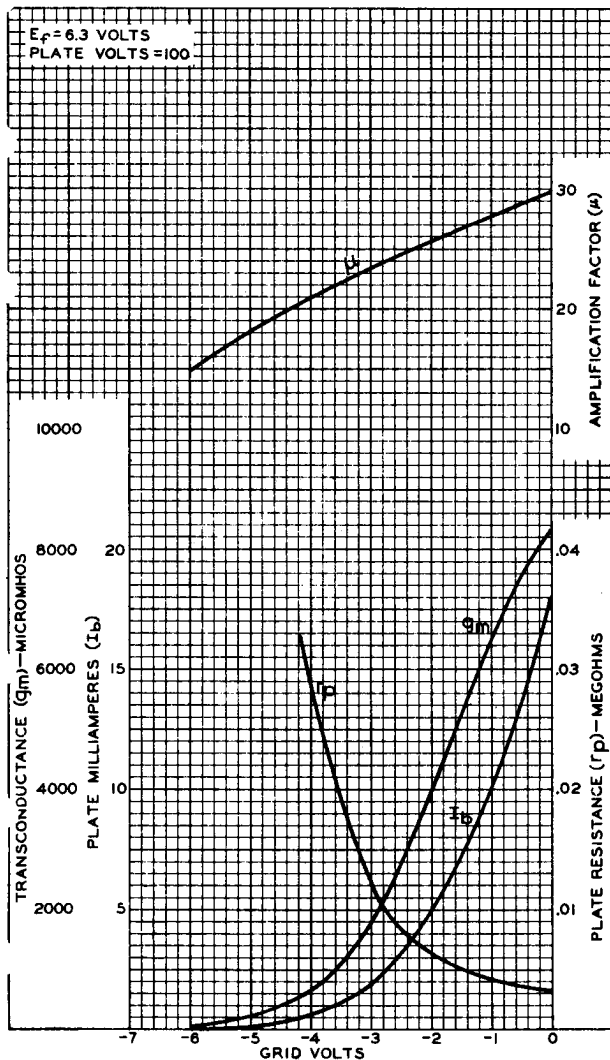




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## AVERAGE CHARACTERISTICS

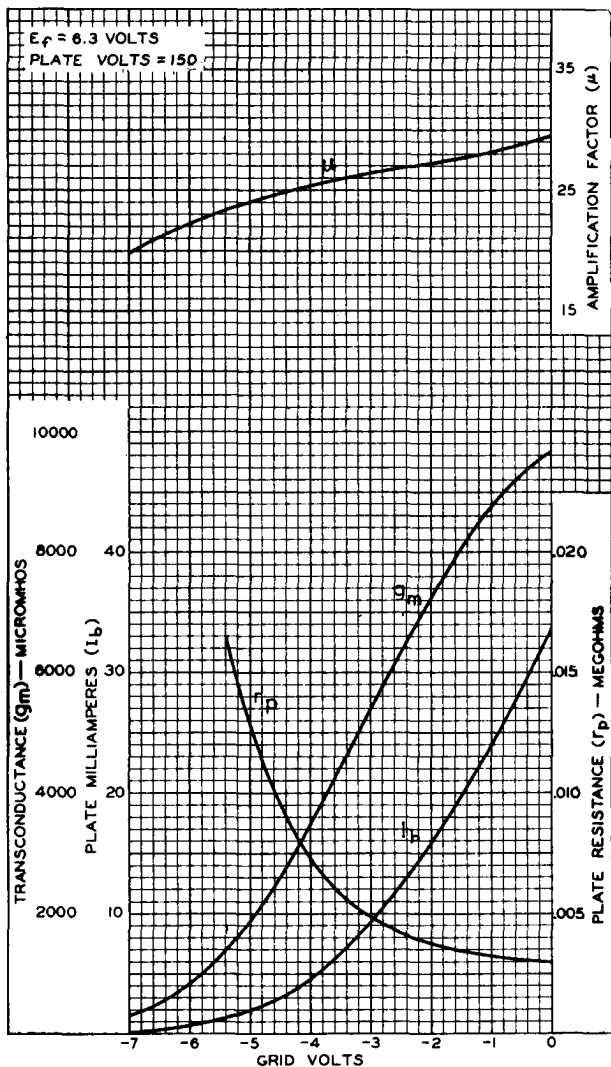


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## AVERAGE CHARACTERISTICS



APRIL 22, 1955

TUBE DIVISION

92CM-7851R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY