

## DISSIMILAR DOUBLE TRIODE

FOR TV VERTICAL-DEFLECTION OSCILLATOR AND AMPLIFIER APPLICATIONS

### DESCRIPTION AND RATING

The 6CM7 is a miniature tube which contains two dissimilar medium-mu triodes in one envelope. It is intended for use as a combined vertical-deflection oscillator and amplifier in television receivers. In this application, section one may be used as a conventional blocking oscillator, while section two is particularly adapted for vertical amplifier service as a result of its high-perveance characteristics and its 5-watt plate dissipation rating.

In addition the 6CM7 features a controlled heater warm-up characteristic which makes it especially suited for use in television receivers which employ 600-milliampere series-connected heaters.

#### GENERAL

##### ELECTRICAL

|  |                  |                      |
|--|------------------|----------------------|
| Cathode—Coated Unipotential                      |                  |                      |
| Heater Voltage, AC or DC                         | 6.3              | Volts                |
| Heater Current                                   | 0.6              | Amperes              |
| Heater Warm-up Time*                             | 11               | Seconds              |
| Direct Interelectrode Capacitances, approximate† |                  |                      |
|  | <b>Section 1</b> | <b>Section 2</b>     |
| Grid to Plate                                    | 3.8              | 3.0 $\mu\mu\text{f}$ |
| Input  | 2.0              | 3.5 $\mu\mu\text{f}$ |
| Output   | 0.5              | 0.4 $\mu\mu\text{f}$ |

##### MECHANICAL

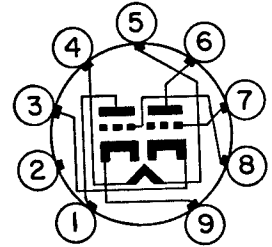
Mounting Position—Any  
Envelope—T-6½, Glass  
Base—E9-1, Small Button 9-Pin

#### MAXIMUM RATINGS

DESIGN-CENTER VALUES UNLESS OTHERWISE INDICATED

|   | Vertical-<br>Oscillator<br>Service†<br>(Section 1) | Vertical-<br>Deflection<br>Amplifier†<br>(Section 2) |              |
|---|--|--|--------------|
| DC Plate Voltage                        | 500  | 500  | Volts        |
| Peak Positive Pulse Plate Voltage       | —  | 2200§  | Volts        |
| Peak Negative Grid Voltage              | 200  | 200  | Volts        |
| Plate Dissipation                       | 1.25   | 5.5 $\pi$  | Watts        |
| DC Cathode Current                      | 15   | 20   | Milliamperes |
| Peak Cathode Current                    | 70   | 70   | Milliamperes |
| Heater-Cathode Voltage                  |  |  |              |
| Heater Positive with Respect to Cathode |  |  |              |
| DC Component                            | 100  | 100  | Volts        |
| Total DC and Peak                       | 200  | 200  | Volts        |
| Heater Negative with Respect to Cathode |  |  |              |
| Total DC and Peak                       | 200  | 200  | Volts        |
| Grid Circuit Resistance                 |  |  |              |
| With Fixed Bias                         | 2.2  | 1.0  | Megohms      |
| With Cathode Bias                       | 2.2  | 2.5  | Megohms      |
| With Grid-Resistor Bias                 | 2.2  | —  | Megohms      |

#### BASING DIAGRAM

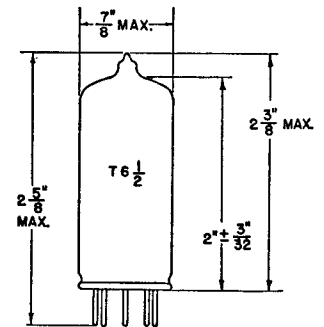


RETMA 9ES

#### TERMINAL CONNECTIONS

- Pin 1—Plate (Section 2)
- Pin 2—No Connection
- Pin 3—Cathode (Section 1)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Grid (Section 2)
- Pin 9—Cathode (Section 2)

#### PHYSICAL DIMENSIONS



RETMA 6-3

## CHARACTERISTICS AND TYPICAL OPERATION

| <b>CLASS A<sub>1</sub> AMPLIFIER</b> | <b>Section 1<br/>(Oscillator)</b> | <b>Section 2<br/>(Amplifier)</b> |              |
|--------------------------------------|-----------------------------------|----------------------------------|--------------|
| Plate Voltage .....                  | 200                               | 250                              | Volts        |
| Grid Voltage .....                   | -7                                | -8                               | Volts        |
| Amplification Factor .....           | 21                                | 18                               |              |
| Plate Resistance, approximate .....  | 10500                             | 4100                             | Ohms         |
| Transconductance .....               | 2000                              | 4400                             | Micromhos    |
| Plate Current .....                  | 5.0                               | 20                               | Milliamperes |
| Plate Current, approximate           |                                   |                                  |              |
| $E_c = -10$ Volts .....              | 1                                 | —                                | Milliamperes |
| Grid Voltage, approximate            |                                   |                                  |              |
| $I_b = 10$ Microamperes .....        | -14                               | —                                | Volts        |

\* The time required for the voltage across the heater to reach 80 percent of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the rated heater voltage divided by the rated heater current.

† Without external shield.

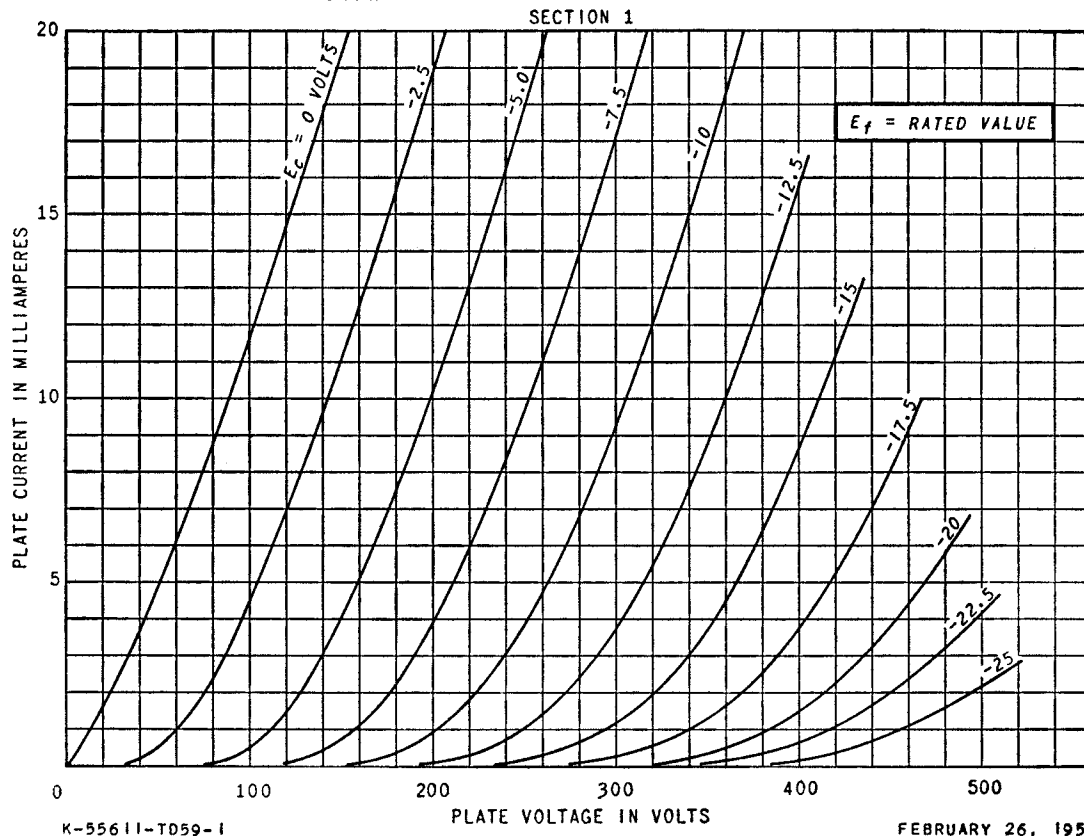
‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

§ Value given is to be considered as an Absolute Maximum Rating. In this case, the combined effect of supply voltage variation, manufacturing variation including components in the equipment, and adjustment of equipment controls should not cause the rated value to be exceeded.

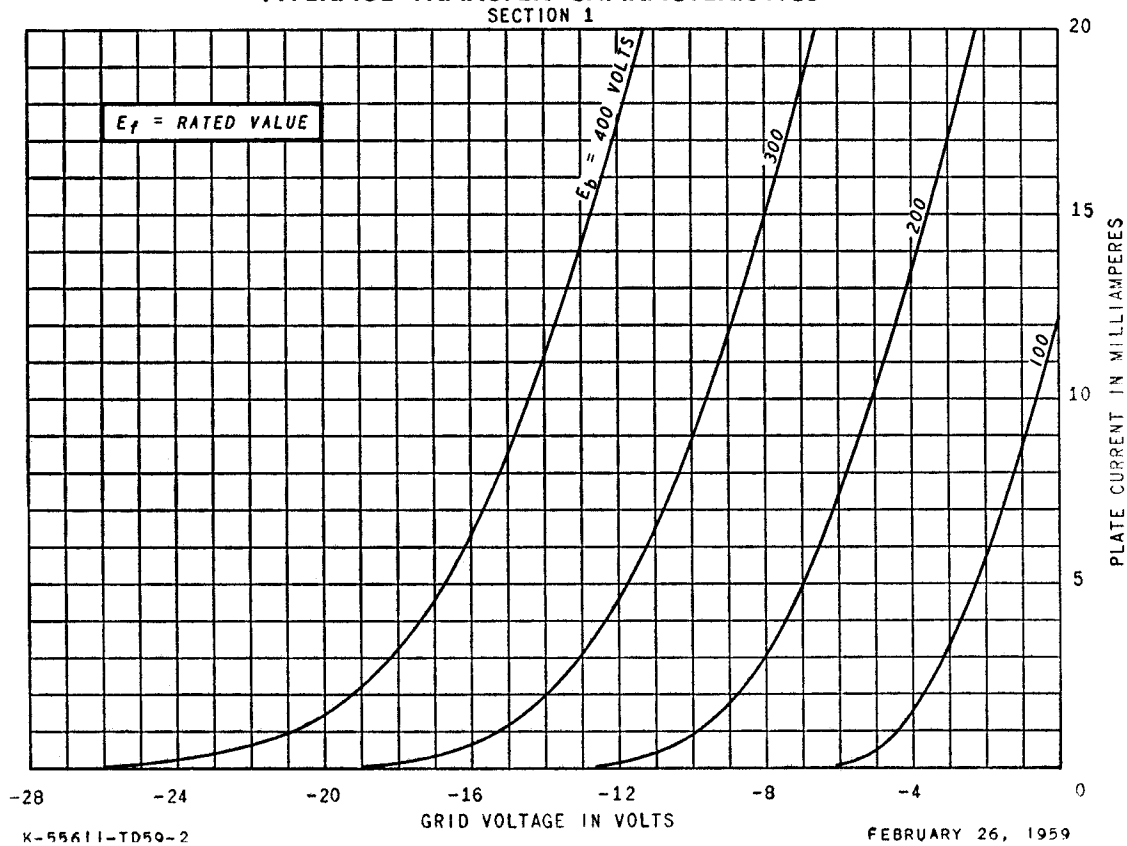
π In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.

TUBE DEPARTMENT  
**GENERAL  ELECTRIC**  
 Schenectady 5, N. Y.

**AVERAGE PLATE CHARACTERISTICS**

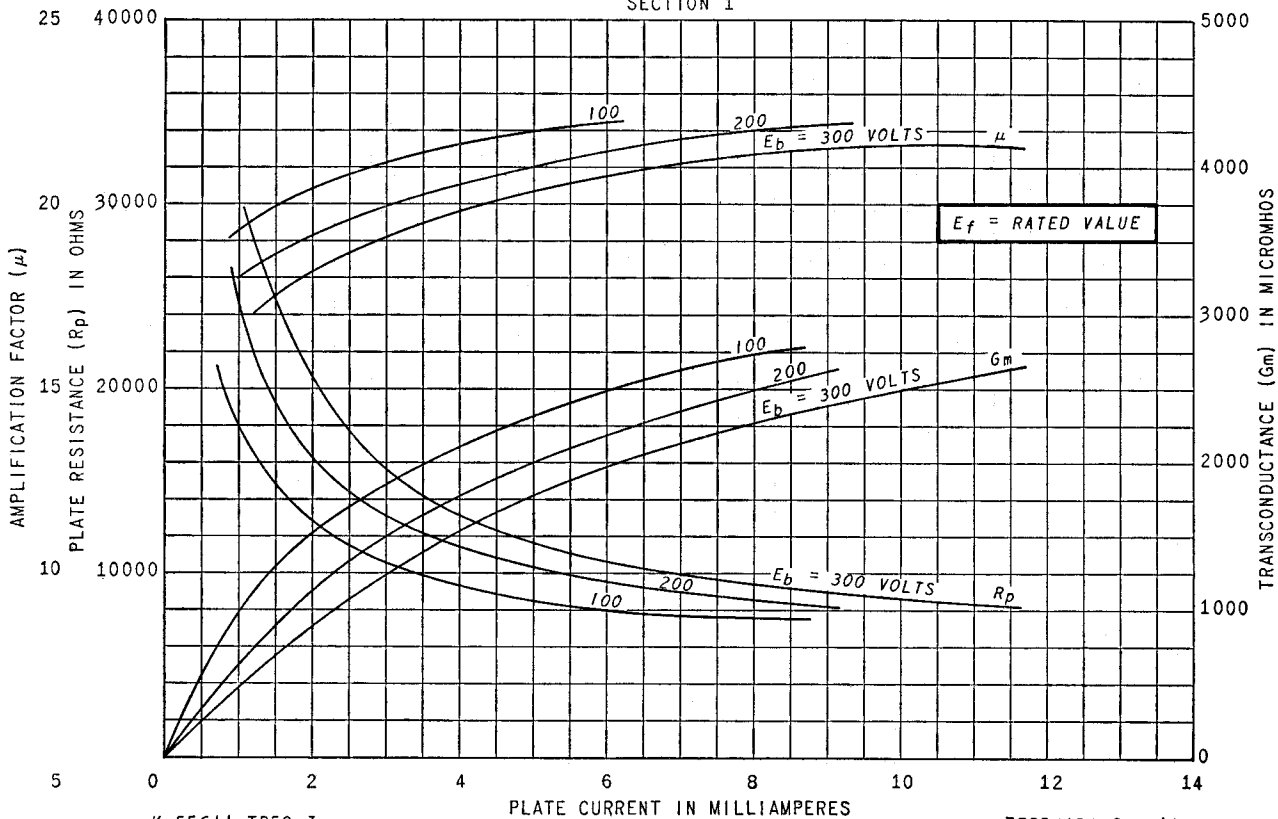


**AVERAGE TRANSFER CHARACTERISTICS**



**AVERAGE CHARACTERISTICS**

SECTION 1

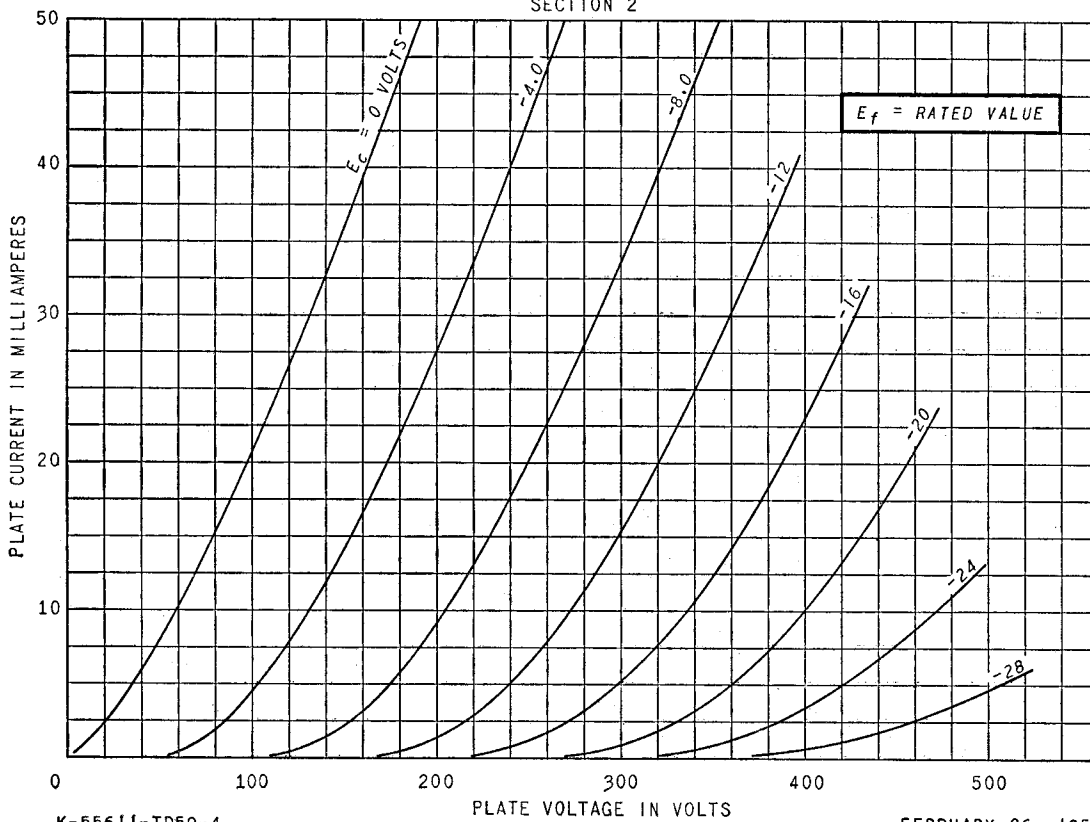


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**AVERAGE PLATE CHARACTERISTICS**

SECTION 2

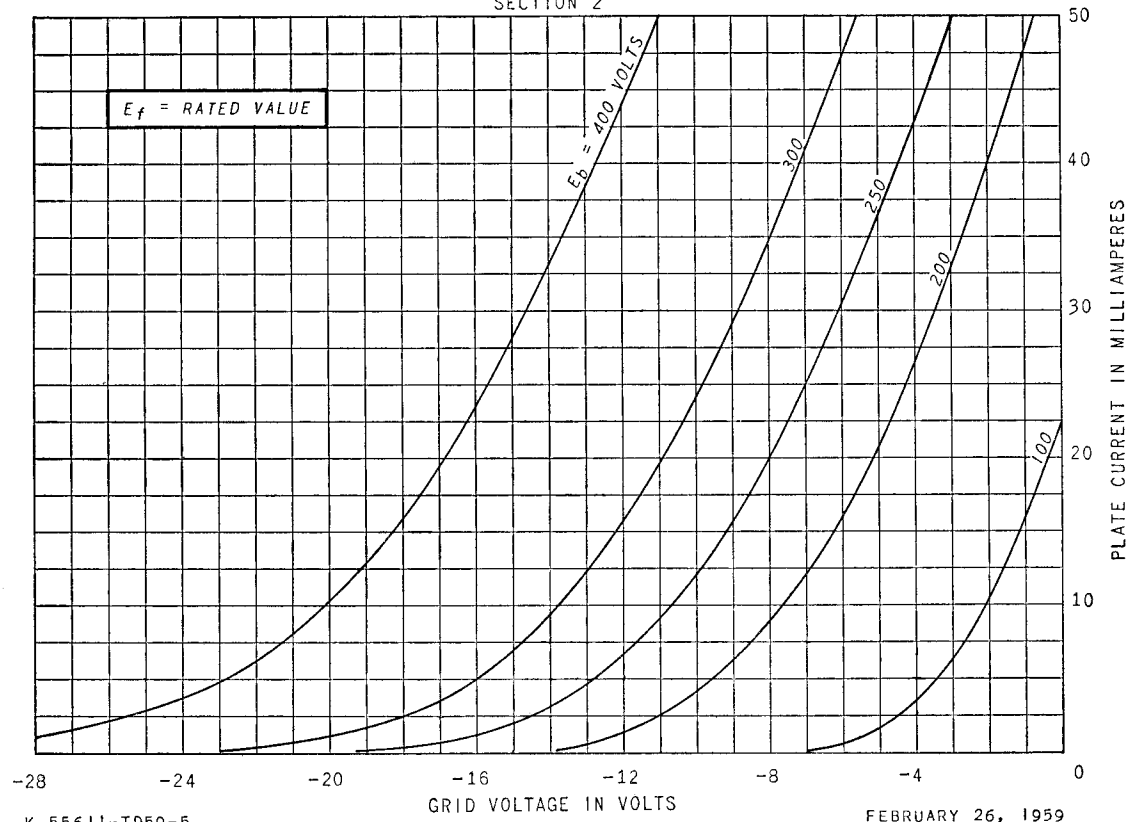


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### AVERAGE TRANSFER CHARACTERISTICS

SECTION 2

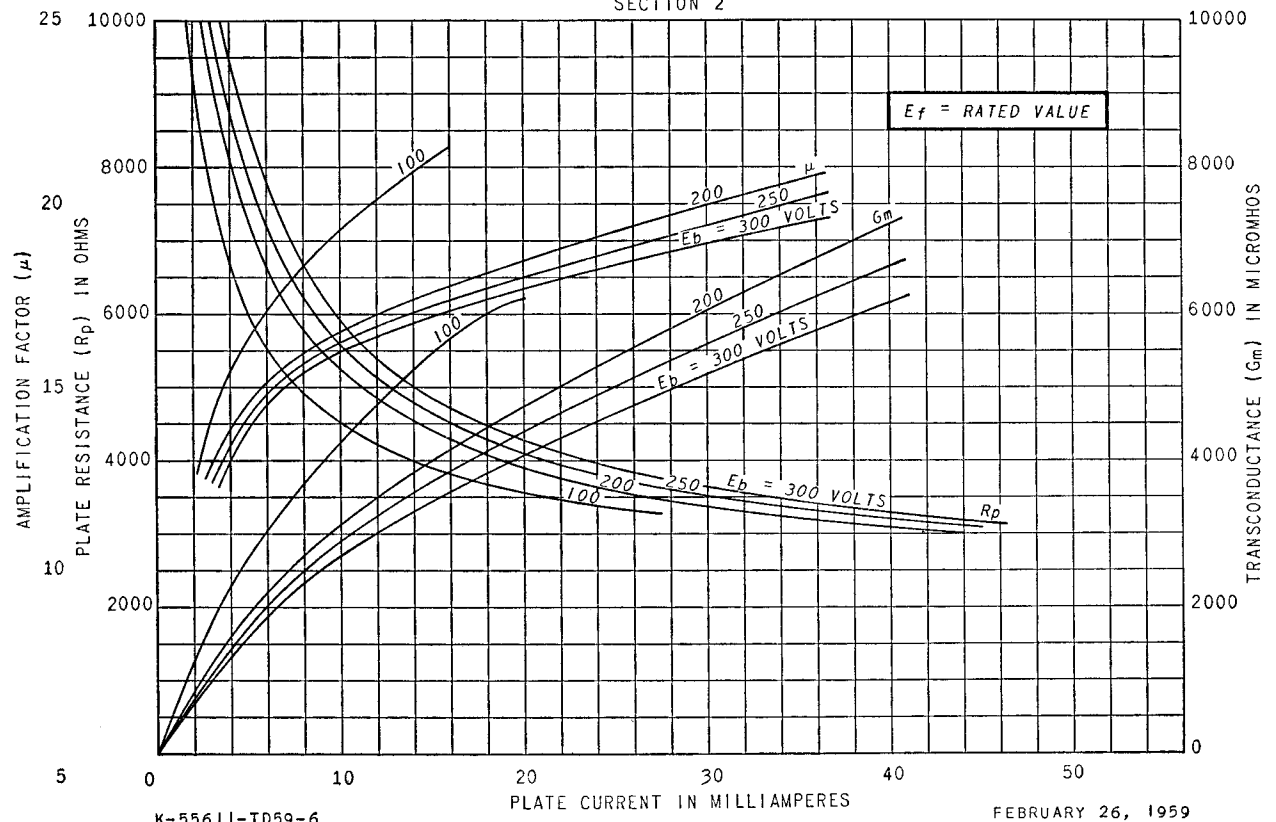


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### AVERAGE CHARACTERISTICS

SECTION 2



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