



6678

TRIODE-PENTODE

For Mobile Communications Equipment

MEDIUM-MU TRIODE
9-PIN MINIATURE

SHARP-CUTOFF PENTODE
HEATER-CYCLING RATING

PROTOTYPE—6U8

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ET-T1331
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DESCRIPTION AND RATING

The 6678 is a miniature tube containing a medium-mu triode and a sharp-cutoff pentode. It is especially suited for use as a combined oscillator and mixer at very high frequencies. The electrical characteristics are essentially equivalent to those of the 6U8.

Intended specifically for use in mobile communications equipment, the 6678 may be operated without serious degradation under normal variations in supply voltage as encountered with automotive electrical systems. Also consistent with the requirements of this equipment, the tube is capable of withstanding appreciable on-off cycling.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC.....6.3* Volts

Heater Current.....0.45 Amperes

Direct Interelectrode Capacitances **With Shield†** **Without Shield**

Pentode Section

Grid-Number 1 to Plate, maximum.....0.006 0.01 μmf

Input.....5.0 5.0 μmf

Output.....3.5 2.6 μmf

Triode Section

Grid to Plate.....1.8 1.8 μmf

Input.....2.5 2.5 μmf

Output.....1.0 0.4 μmf

Heater to Cathode, Each Section.....3.0‡ 3.0 μmf

* When operated from automotive electrical systems, the heater may be subjected to voltage variations as great as ±20 percent. Although such extremes in heater voltage may be tolerated for short periods, increased equipment reliability can be achieved with improved supply-voltage regulation.

† With external shield (RETMA 315) connected to cathode of section under test unless otherwise indicated.

‡ With external shield (RETMA 315) connected to ground.

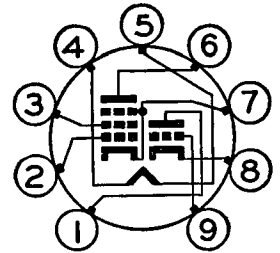
MECHANICAL

Mounting Position—Any

Envelope—T-6½, Glass

Base—E9-1, Small Button 9-Pin

BASING DIAGRAM

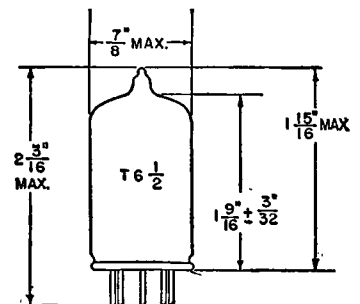


RETMA 9AE

TERMINAL CONNECTIONS

- Pin 1—Triode Plate
- Pin 2—Pentode, Grid Number 1
- Pin 3—Pentode, Grid Number 2 (Screen)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Pentode Plate
- Pin 7—Cathode, Grid Number 3, and Internal Shield
- Pin 8—Triode Cathode
- Pin 9—Triode Grid

PHYSICAL DIMENSIONS



RETMA 6-2



MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES §

	Pentode Section	Triode Section	
Plate Voltage	330	330	Volts
Screen-Supply Voltage	330	. . .	Volts
Screen Voltage—See Screen Rating Chart on Page 6.			
Positive DC Grid-Number 1 Voltage	0	0	Volts
Plate Dissipation	3.0	3.0	Watts
Screen Dissipation	0.55	. . .	Watts
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

§ Design-Maximum Ratings are the limiting values expressed with respect to bogie 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 bogie tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, and environmental conditions.

CHARACTERISTICS AND TYPICAL OPERATION

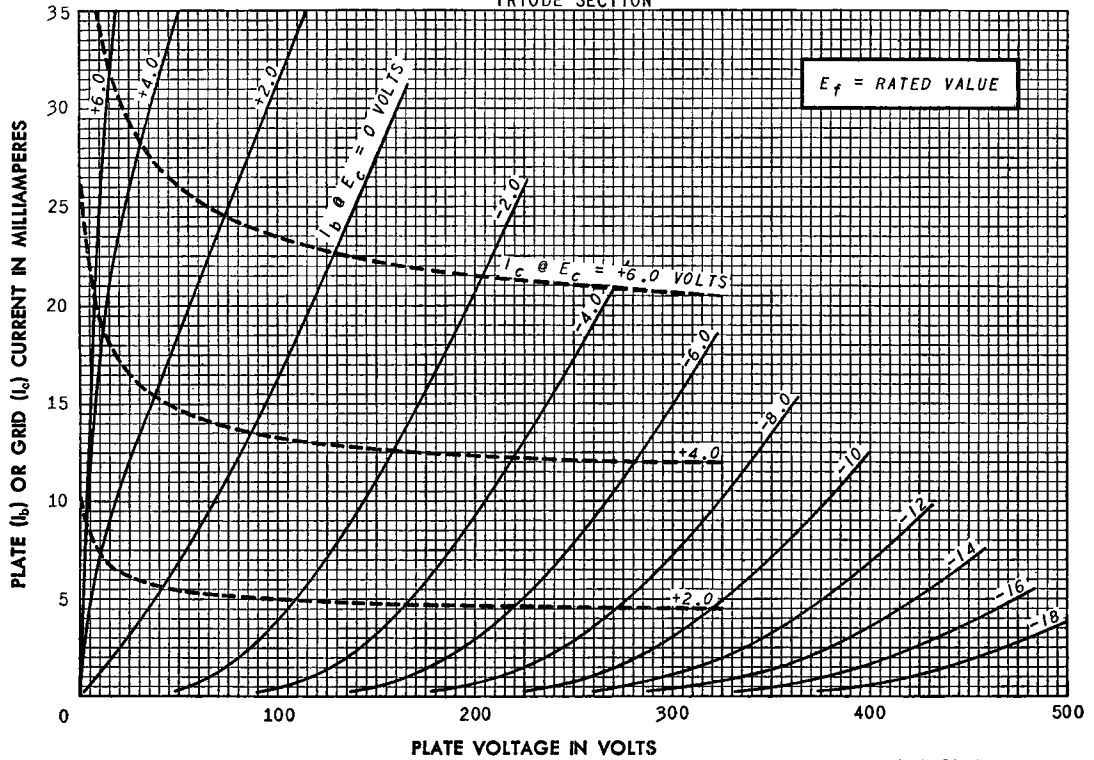
CLASS A₁ AMPLIFIER

	Pentode Section	Triode Section	
Plate Voltage	250	150	Volts
Screen Voltage	110	. . .	Volts
Cathode-Bias Resistor	68	56	Ohms
Amplification Factor		40	
Plate Resistance, approximate	400,000	5000	Ohms
Transconductance5200	8500	Micromhos
Plate Current10	18	Milliamperes
Screen Current3.5	. . .	Milliamperes
Grid-Number 1 Voltage, approximate			
$I_{b1} = 10$ Microamperes	-10	-12	Volts

SPECIAL TESTS AND RATINGS

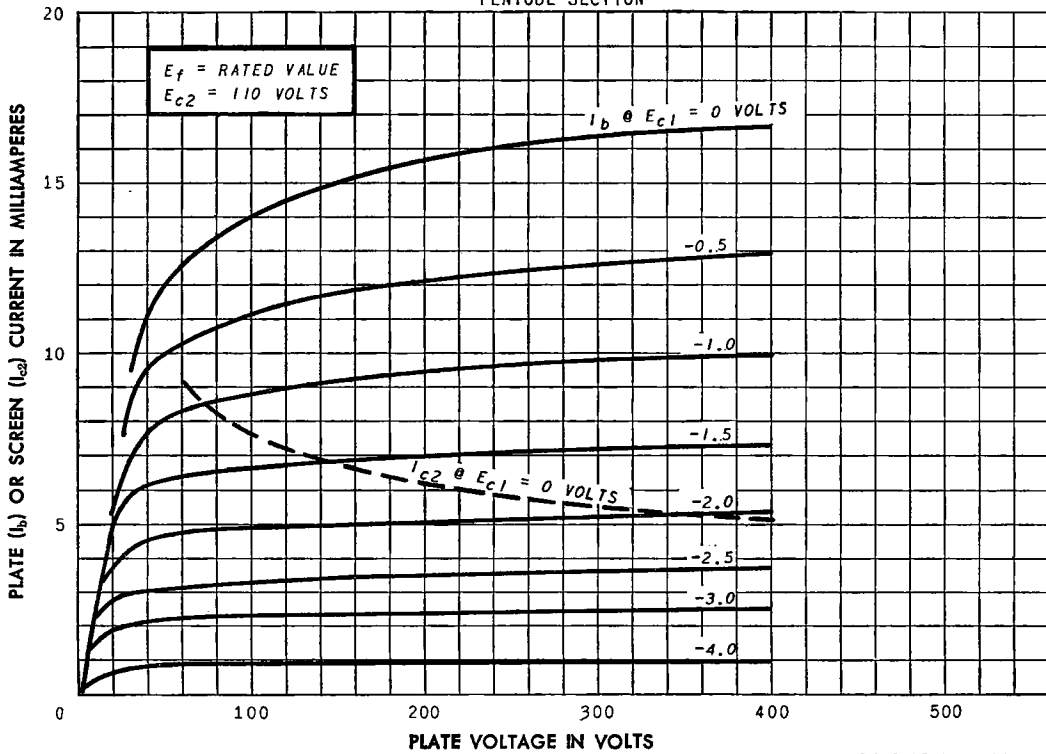
Heater Cycling Rating			
Cycles of Intermittent Operation, minimum	2000		Cycles
$E_f = 7.5$ volts cycled for one minute on and one minute off. $E_b = E_{c2} = E_{c1} = 0$ volts.			
$E_{hk} = 135$ volts with heater positive with respect to cathode.			
Average Transconductance at Reduced Heater Voltage, Pentode Section			
$E_f = 5.0$ volts, $E_b = 250$ volts, $E_{c2} = 110$ volts, $R_k = 68$ ohms (bypassed)	4100		Micromhos
Average Transconductance at Reduced Heater Voltage, Triode Section			
$E_f = 5.0$ volts, $E_b = 150$ volts, $R_k = 56$ ohms (bypassed)	6800		Micromhos

AVERAGE PLATE CHARACTERISTICS
 TRIODE SECTION



JUNE 22, 1956

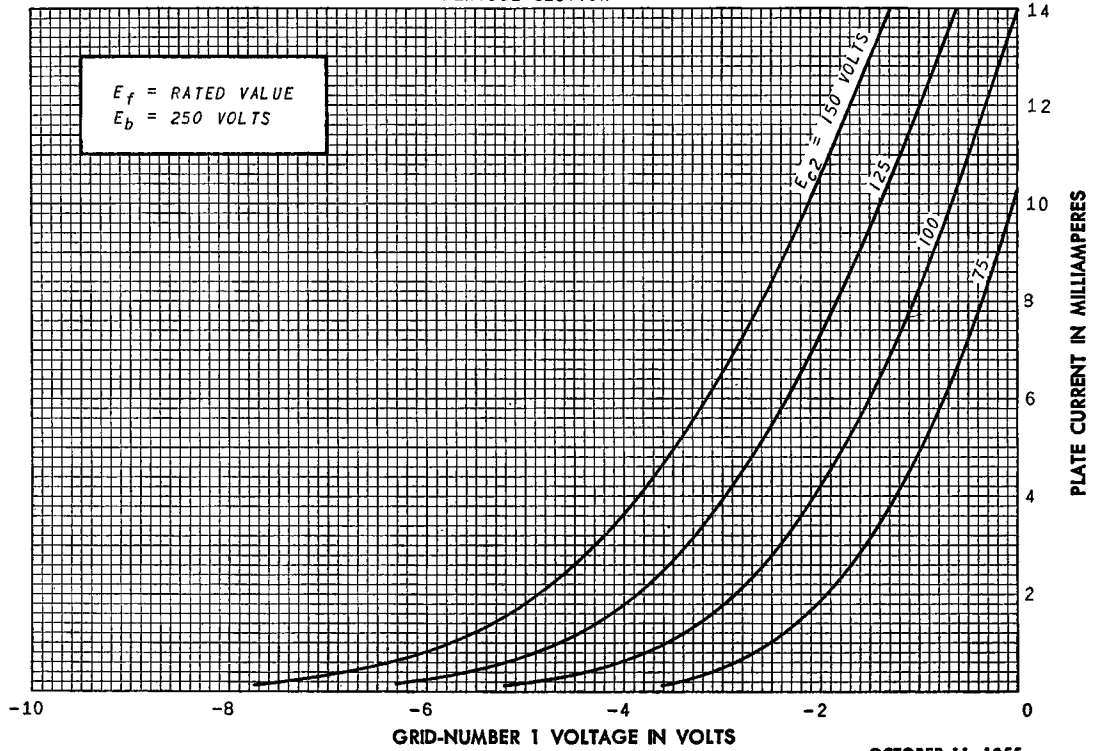
AVERAGE PLATE CHARACTERISTICS
 PENTODE SECTION



OCTOBER 11, 1955

AVERAGE TRANSFER CHARACTERISTICS

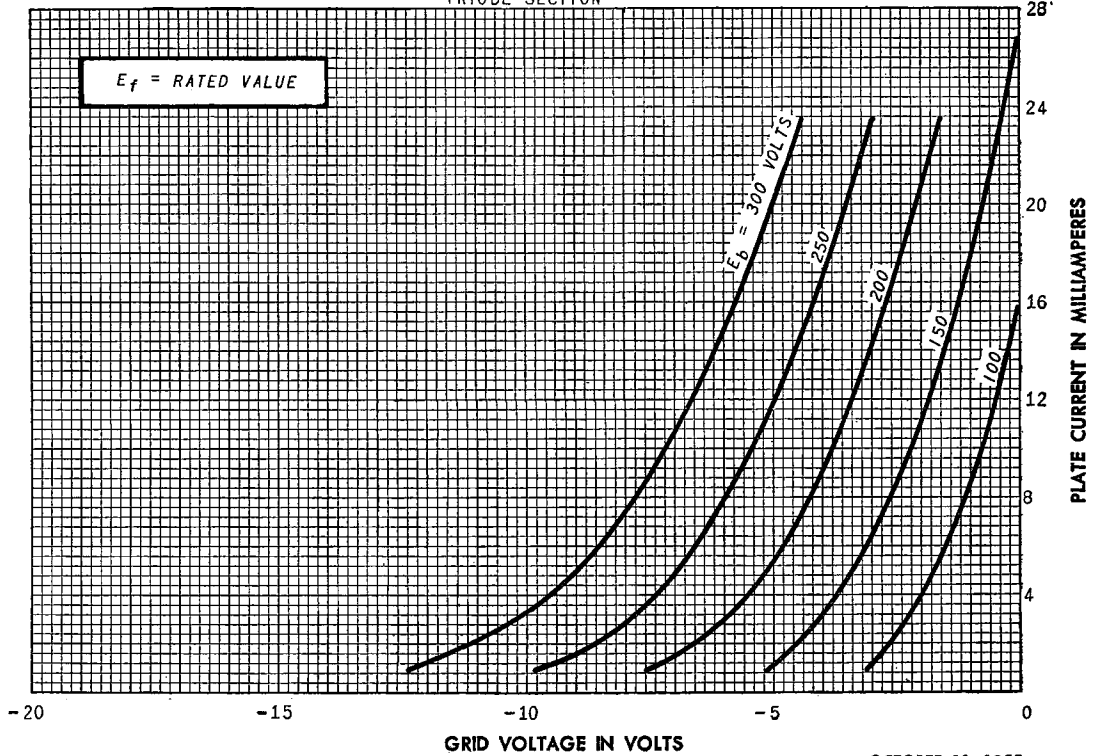
PENTODE SECTION



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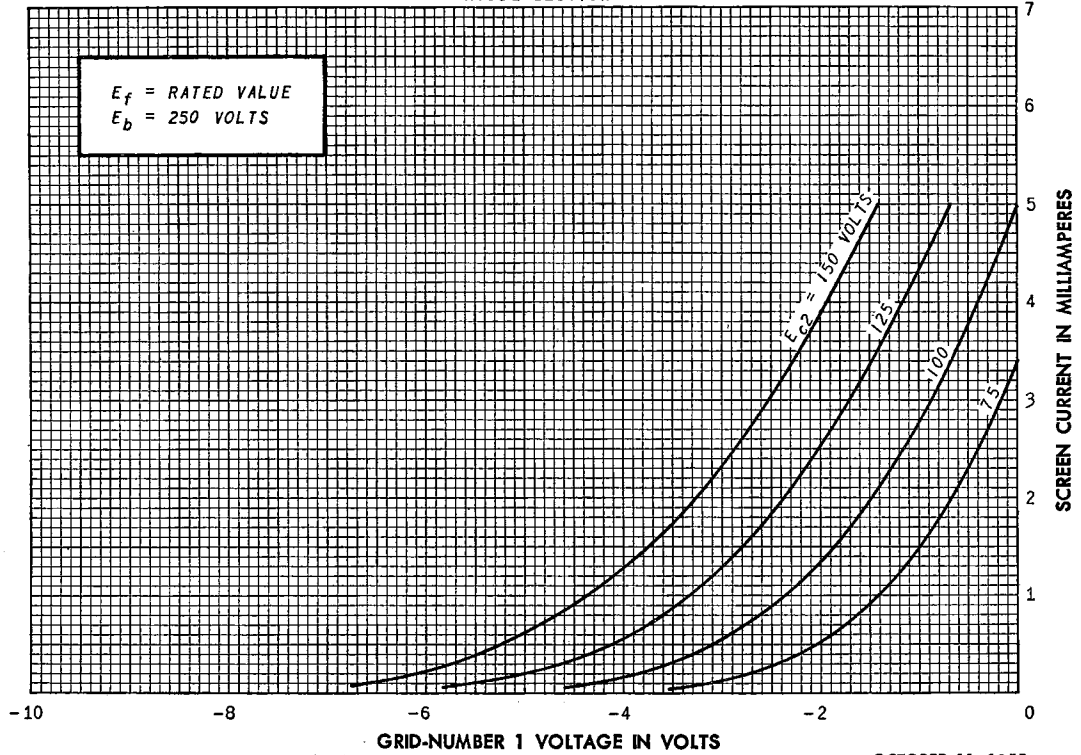
AVERAGE TRANSFER CHARACTERISTICS

TRIODE SECTION



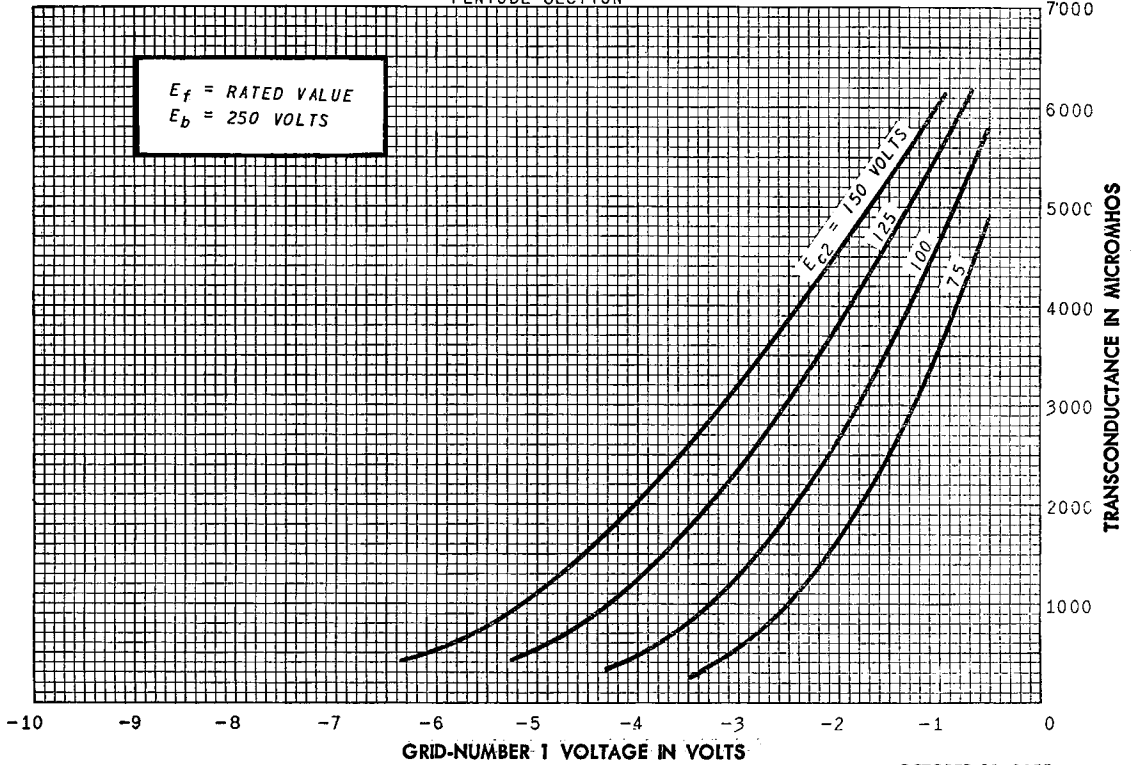
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AVERAGE TRANSFER CHARACTERISTICS
 PENTODE SECTION



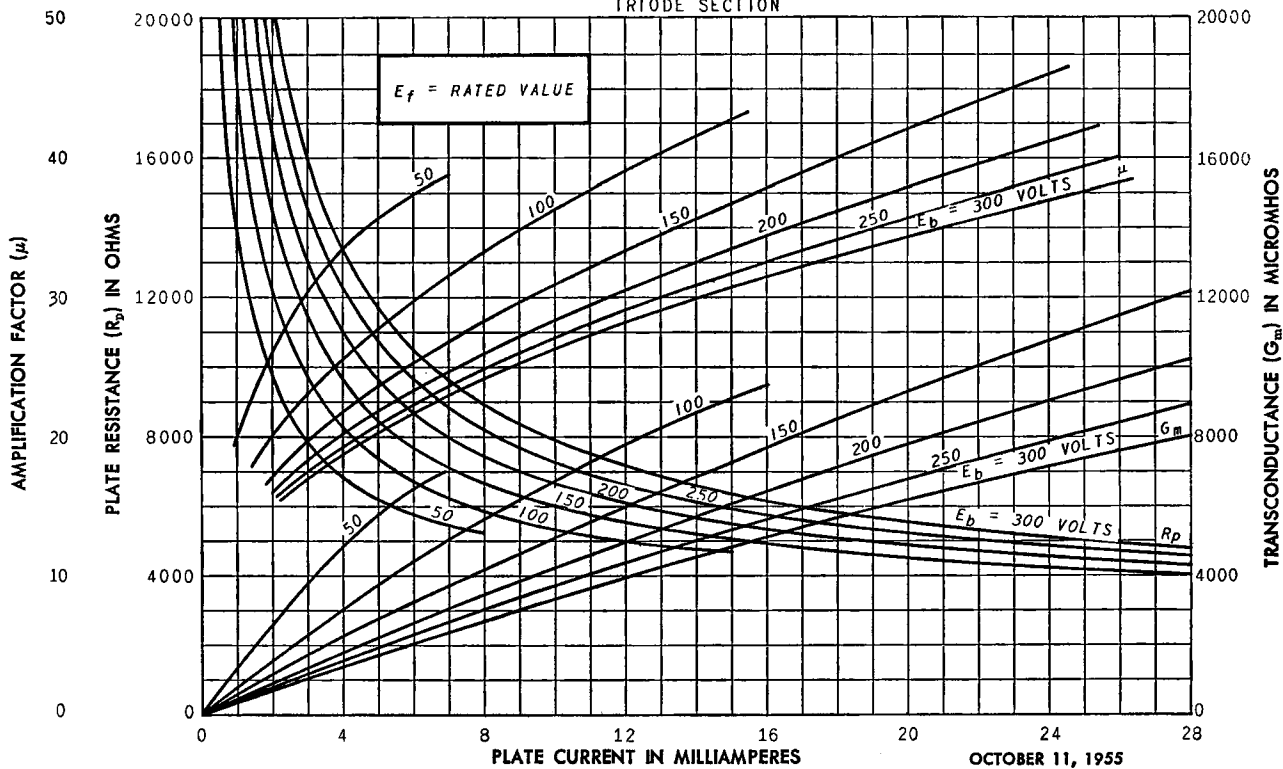
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AVERAGE TRANSFER CHARACTERISTICS
 PENTODE SECTION



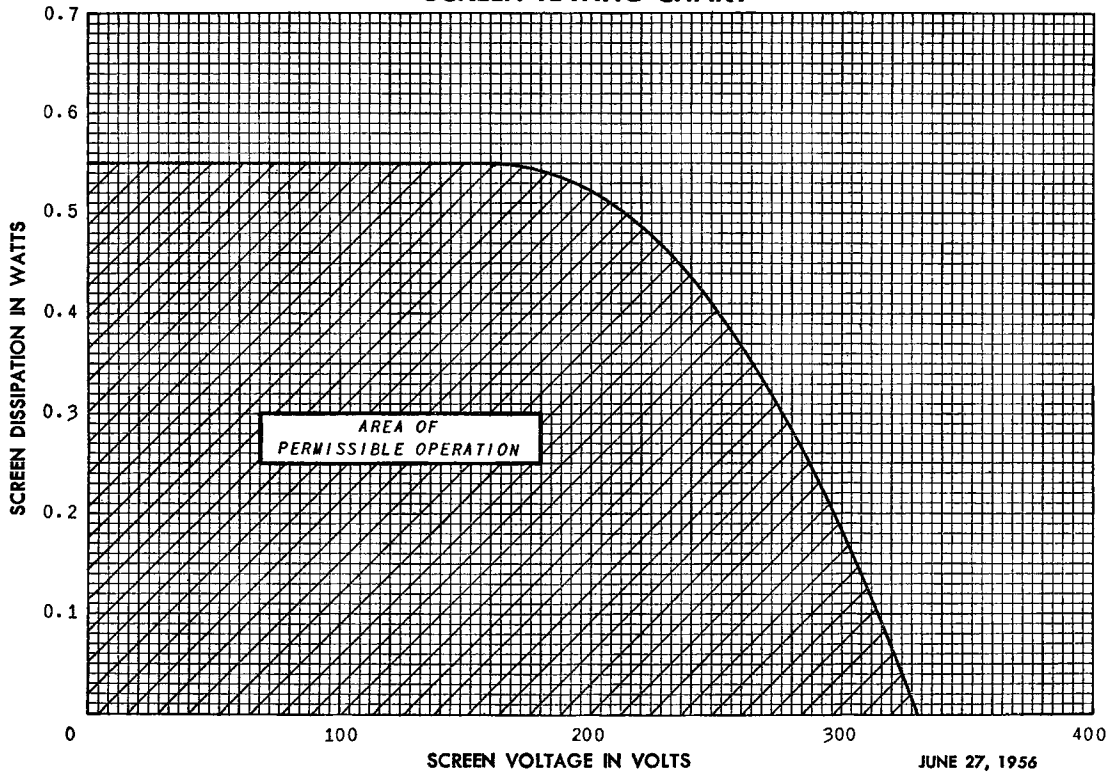
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AVERAGE CHARACTERISTICS
 TRIODE SECTION



OCTOBER 11, 1955

SCREEN RATING CHART



JUNE 27, 1956