



**ELECTRONIC  
INNOVATIONS  
IN ACTION**

**TUBES**

**— PRODUCT INFORMATION —**

**14BR11**

**Compactron  
Dissimilar-Double-Triode Pentode**

- MULTIFUNCTION
- FOR LOW B+ BLACK-AND-WHITE TV
- HIGH-MU, HIGH-TRANSCONDUCTANCE TRIODE
- MEDIUM-MU TRIODE
- VIDEO AMPLIFIER PENTODE

The 14BR11 is a compactron containing a high-mu triode, a medium-mu triode, and a sharp-cutoff pentode. The high-mu triode is intended for audio i-f, AGC keyer and other general purpose uses, the medium-mu triode for sync separator service, and the pentode for video amplifier service.

**GENERAL**

**ELECTRICAL**

Cathode - Coated Unipotential  
 Heater Characteristics and Ratings  
 Heater Voltage, AC or DC\* ..... 14.2 Volts  
 Heater Current♦ ..... 0.45 ± 0.03 Amperes  
 Heater Warm-up Time, average♠ ..... 11 Seconds  
 Direct Interelectrode Capacitances, approximate▲

**Triode (Section 1)**  
 Grid to Plate: (1Tg to 1Tp) ..... 3.8 pf  
 Input: 1Tg to (1Tk + Pk + Pg3 + h + i.s.) ..... 2.4 pf  
 Output: 1Tp to (1Tk + Pk + Pg3 + h + i.s.) ..... 3.8 pf

**Triode (Section 2)**  
 Grid to Plate: (2Tg to 2Tp) ..... 1.9 pf  
 Input: 2Tg to (1Tk + 2Tk + Pk + Pg3 + h + i.s.) ... 2.8 pf  
 Output: 2Tp to (1Tk + 2Tk + Pk + Pg3 + h + i.s.) ... 2.2 pf

**Pentode Section**  
 Grid-Number 1 to Plate: (Pg1 to Pp) ..... 0.13 pf  
 Input: Pg1 to (2Tk + Pk + Pg2 + Pg3 + h + i.s.) ... 10 pf  
 Output: Pp to (2Tk + Pk + Pg2 + Pg3 + h + i.s.) ... 4.6 pf

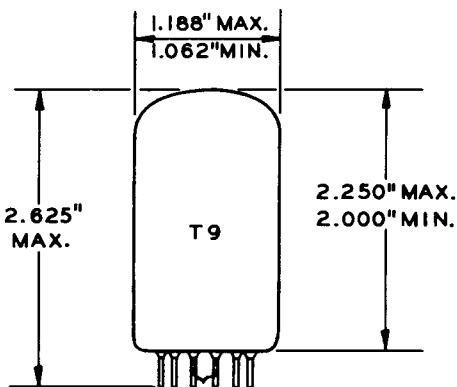
**Coupling**

Pentode Plate to Triode Plate (Section 2):  
 (Pp to 2Tp) ..... 0.16 pf  
 Triode Plate (Section 1) to Triode Plate (Section 2):  
 (1Tp to 2Tp), maximum ..... 0.2 pf

**MECHANICAL**

Operating Position - Any  
 Envelope - T-9, Glass  
 Base - E12-70, Button 12-Pin  
 Outline Drawing - EIA 9-59  
 Maximum Diameter ..... 1.188 Inches  
 Minimum Diameter ..... 1.062 Inches  
 Maximum Over-all Length ..... 2.625 Inches  
 Maximum Seated Height ..... 2.250 Inches  
 Minimum Seated Height ..... 2.000 Inches

**PHYSICAL DIMENSIONS**

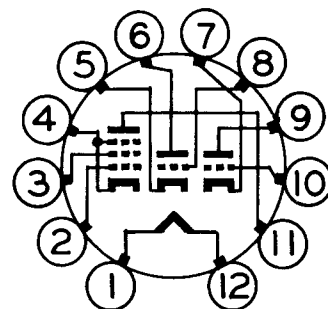


EIA 9-59

**TERMINAL CONNECTIONS**

- Pin 1 - Heater
- Pin 2 - Pentode Grid Number 1
- Pin 3 - Pentode Grid Number 2 (Screen)
- Pin 4 - Pentode Cathode, Grid Number 3, and Internal Shield
- Pin 5 - Triode Cathode (Section 2) and Internal Shield
- Pin 6 - Triode Plate (Section 2)
- Pin 7 - Triode Cathode (Section 1)
- Pin 8 - Triode Grid (Section 2)
- Pin 9 - Triode Plate (Section 1)
- Pin 10 - Triode Grid (Section 1)
- Pin 11 - Pentode Plate
- Pin 12 - Heater

**BASING DIAGRAM**



EIA 12GL

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or elements. In the absence of an

express written agreement to the contrary, General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.

## MAXIMUM RATINGS

## DESIGN-MAXIMUM VALUES

## Pentode Section

Plate Voltage .....	330	Volts
Screen Supply Voltage.....	330	Volts
Screen Voltage - See Screen Rating Chart		
Positive DC Grid-Number 1 Voltage .....	0	Volts
Plate Dissipation.....	4.0	Watts
Screen Dissipation.....	1.1	Watts
Heater-Cathode Voltage		
Heater Positive with respect to Cathode		
DC Component .....	100	Volts
Total DC and Peak.....	200	Volts
Heater Negative with respect to Cathode		
Total DC and Peak.....	200	Volts
Grid-Number 1 Circuit Resistance		
With Fixed Bias.....	1.0	Megohms
With Cathode Bias .....	1.0	Megohms

## Triode (Section 1)

Plate Voltage .....	330	Volts
Positive DC Grid Voltage .....	0	Volts
Plate Dissipation.....	2.0	Watts
Heater-Cathode Voltage		
Heater Positive with respect to Cathode		
DC Component .....	100	Volts
Total DC and Peak.....	200	Volts
Heater Negative with respect to Cathode		
Total DC and Peak.....	200	Volts
Grid Circuit Resistance		
With Fixed Bias.....	0.5	Megohms
With Cathode Bias .....	1.0	Megohms

## Triode (Section 2)

Plate Voltage .....	330	Volts
Positive DC Grid Voltage .....	0	Volts
Plate Dissipation.....	1.5	Watts
Heater-Cathode Voltage		
Heater Positive with respect to Cathode		
DC Component .....	100	Volts
Total DC and Peak.....	200	Volts
Heater Negative with respect to Cathode		
Total DC and Peak.....	200	Volts
Grid Circuit Resistance		
With Fixed Bias.....	0.5	Megohms
With Cathode Bias .....	1.0	Megohms

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its 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.

## CHARACTERISTICS AND TYPICAL OPERATION

### AVERAGE CHARACTERISTICS

#### Pentode Section

Plate Voltage .....	35	135	Volts
Screen Voltage .....	135	135	Volts
Grid-Number 1 Voltage .....	0	---	Volts
Cathode-Bias Resistor .....	---	100	Ohms
Plate Resistance, approximate .....	---	45000	Ohms
Transconductance .....	---	10400	Micromhos
Plate Current .....	34	17	Milliamperes
Screen Current .....	13	4.0	Milliamperes
Grid-Number 1 Voltage, approximate I <sub>b</sub> = 100 Microamperes .....	---	-6	Volts

#### Triode (Section 1)

Plate Voltage .....	200	Volts
Cathode-Bias Resistor .....	220	Ohms
Amplification Factor .....	41	
Plate Resistance, approximate .....	9400	Ohms
Transconductance .....	4400	Micromhos
Plate Current .....	9.2	Milliamperes
Grid Voltage, approximate I <sub>b</sub> = 100 Microamperes .....	-6.5	Volts

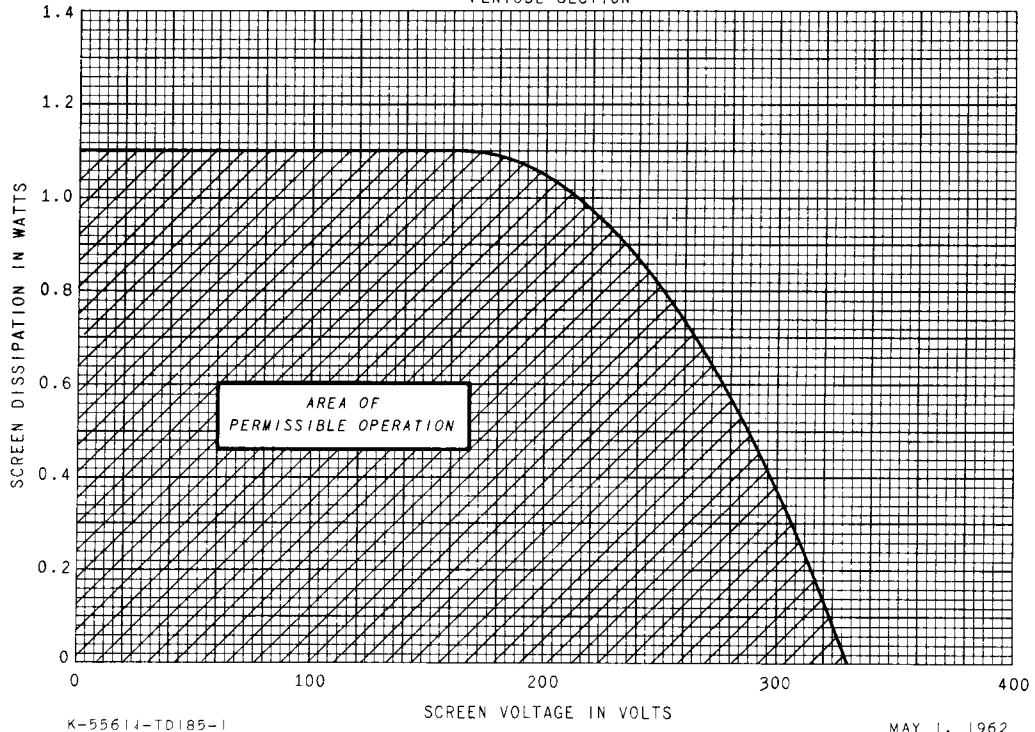
#### Triode (Section 2)

Plate Voltage .....	200	Volts
Grid Voltage .....	-2.0	Volts
Amplification Factor .....	68	
Plate Resistance, approximate .....	12400	Ohms
Transconductance .....	5500	Micromhos
Plate Current .....	7.0	Milliamperes
Grid Voltage, approximate I <sub>b</sub> = 100 Microamperes .....	-5.5	Volts

## NOTES

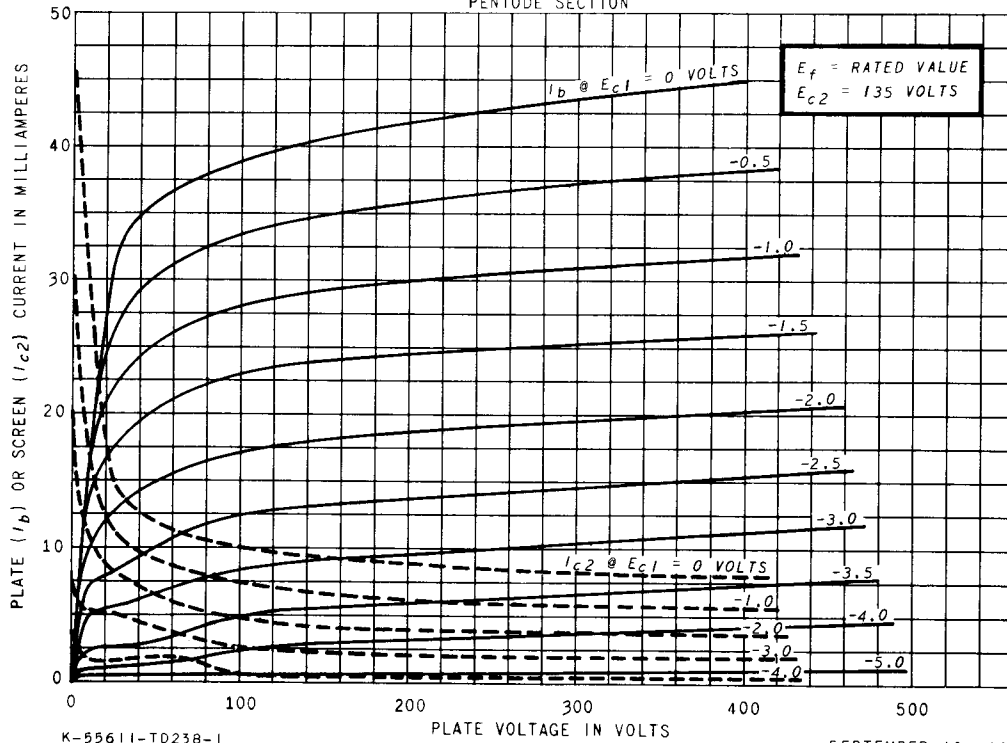
- ★ Heater voltage for a bogey tube at I<sub>f</sub> = 0.45 amperes.
- The equipment designer should design the equipment so that heater current is centered at the specified bogey value, with heater supply variations restricted to maintain heater current within the specified tolerance.
- ◆ The time required for the voltage across the heater to reach 80 percent of the bogey value after applying 4 times the bogey heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the bogey heater voltage divided by the bogey heater current.
- ▲ Without external shield.

**SCREEN RATING CHART**  
PENTODE SECTION

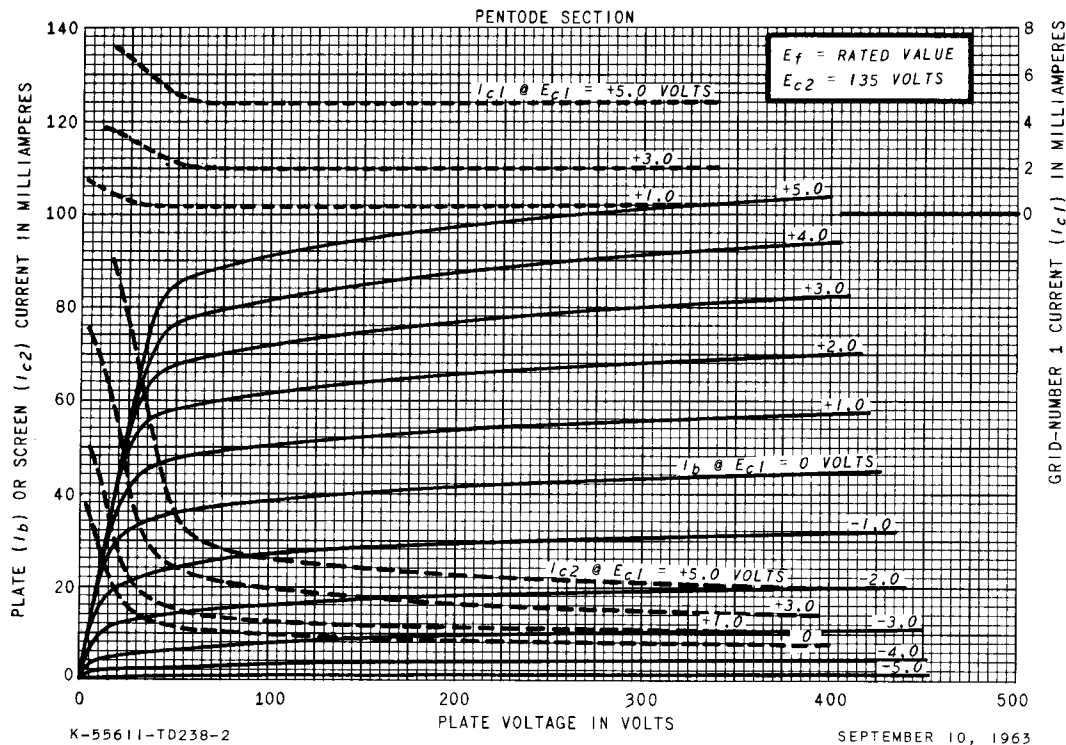


**AVERAGE PLATE CHARACTERISTICS**

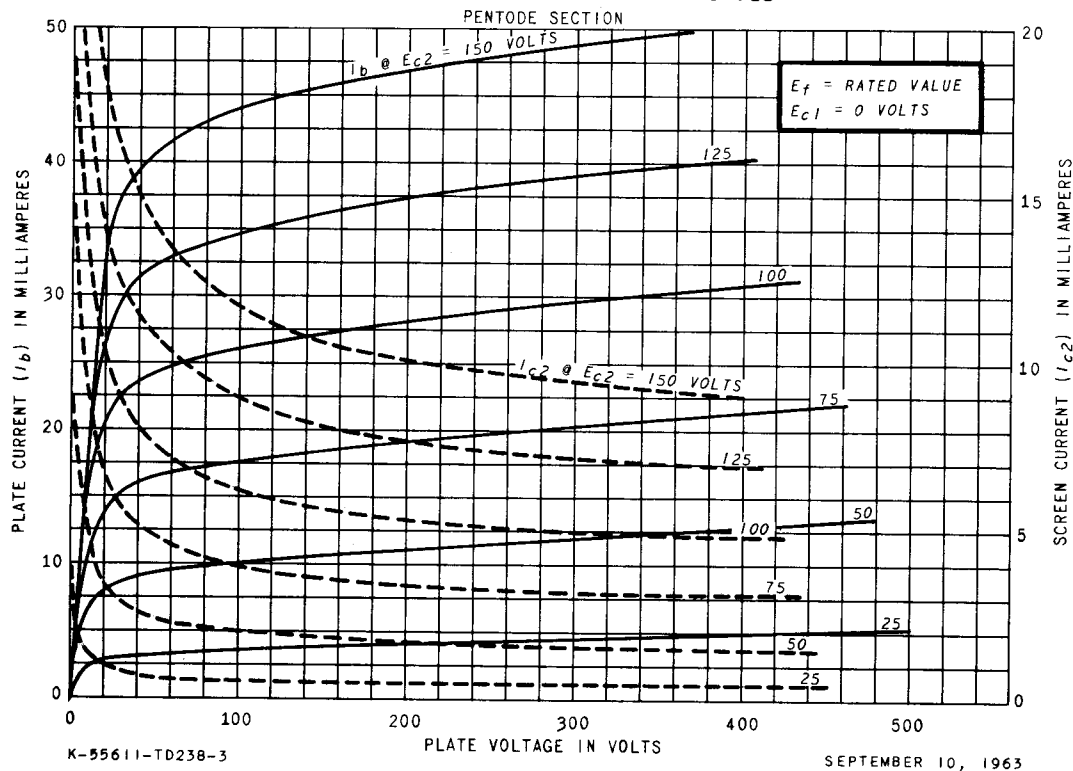
PENTODE SECTION



### AVERAGE PLATE CHARACTERISTICS

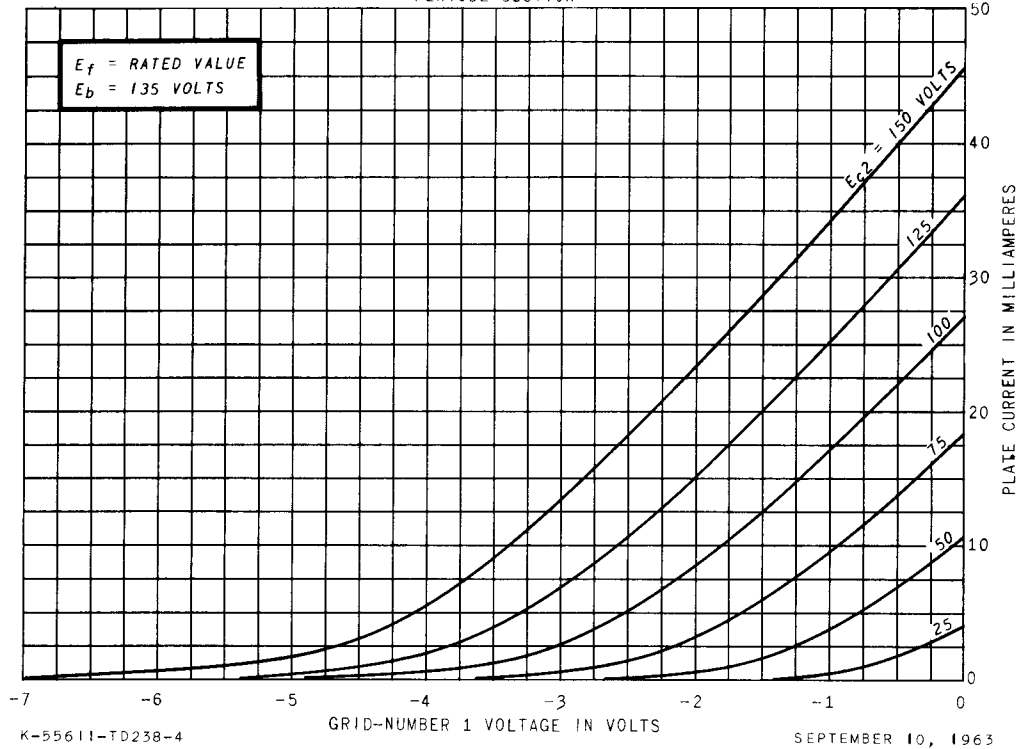


### AVERAGE PLATE CHARACTERISTICS



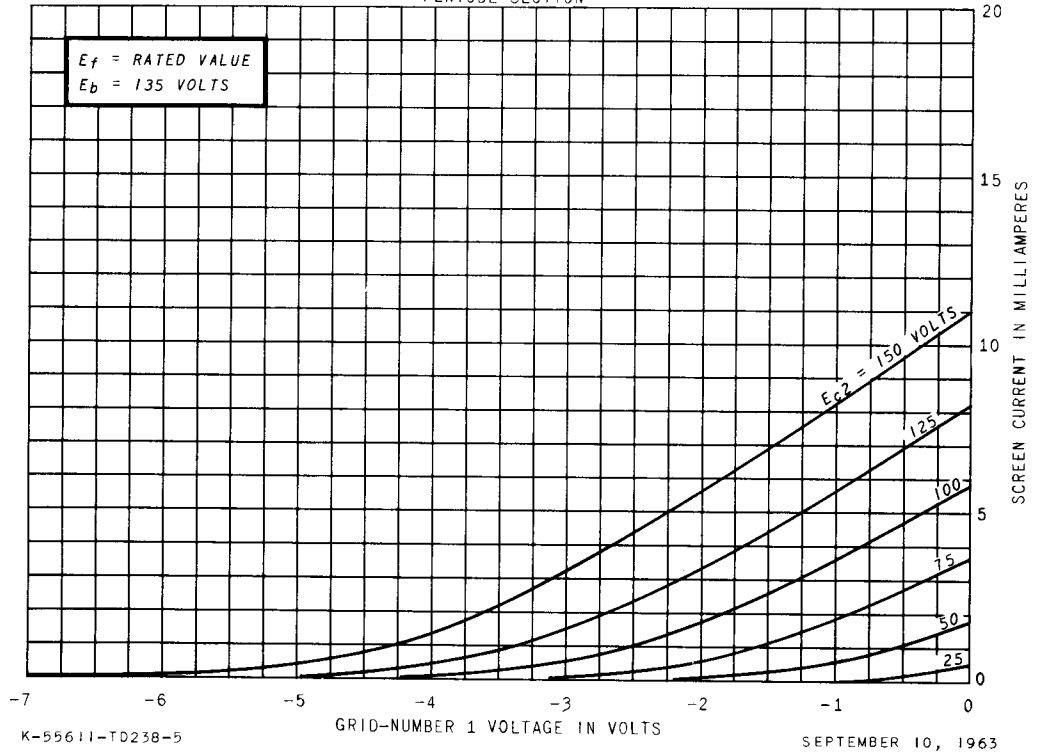
### AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



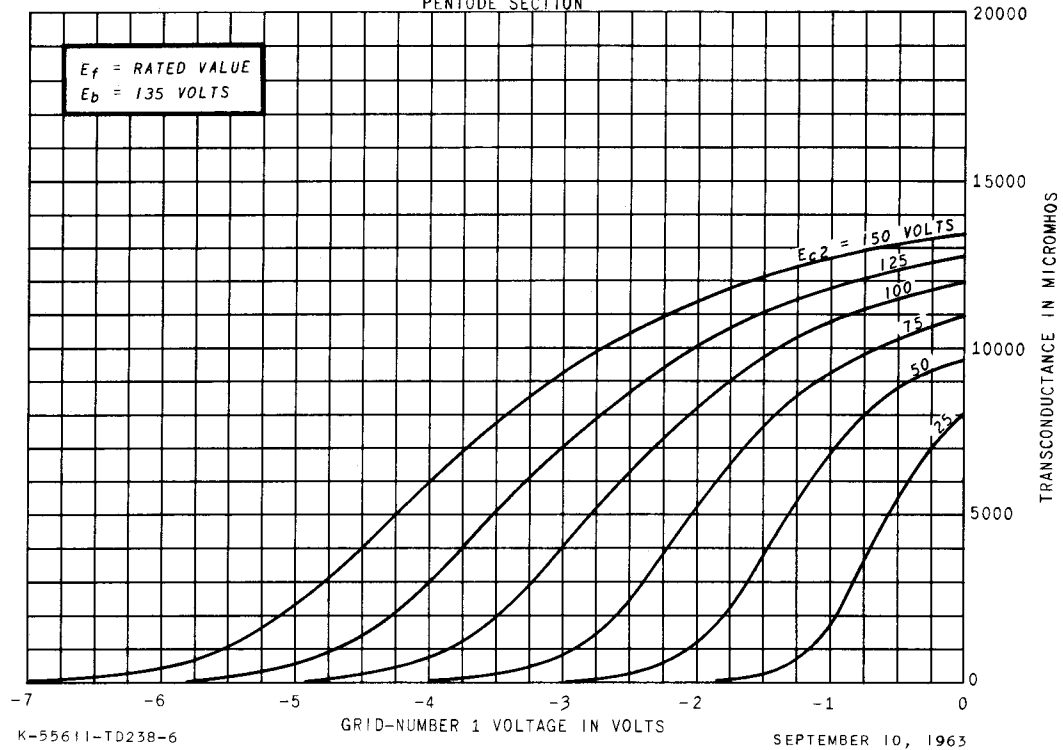
### AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



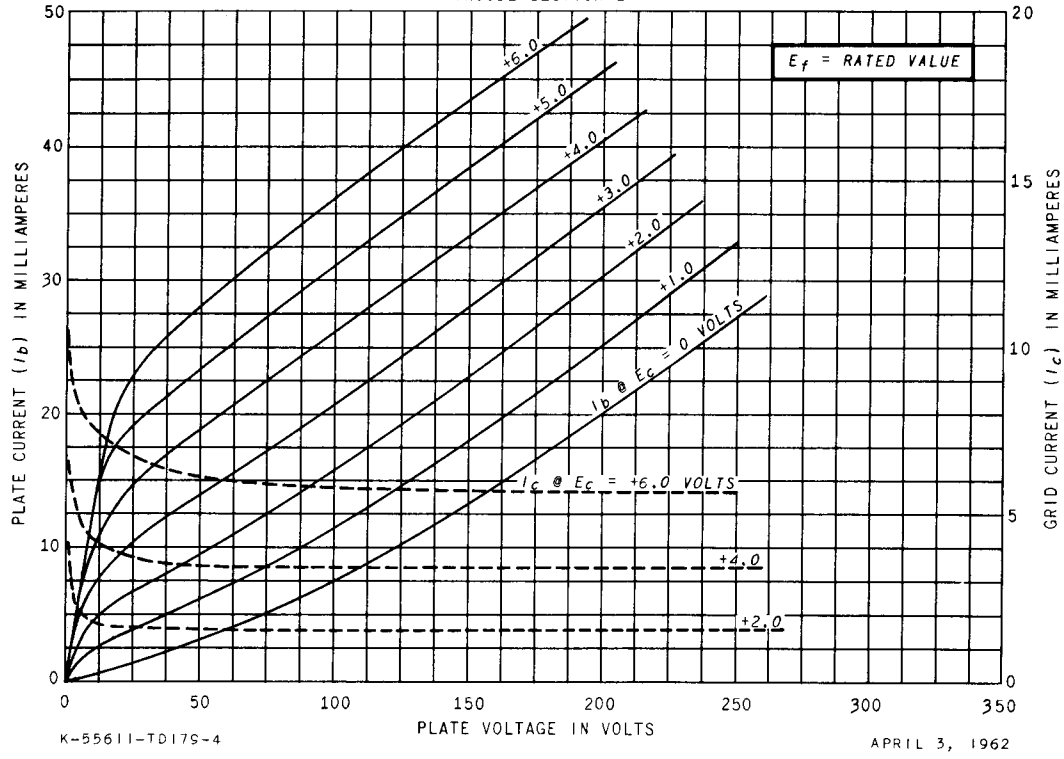
AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



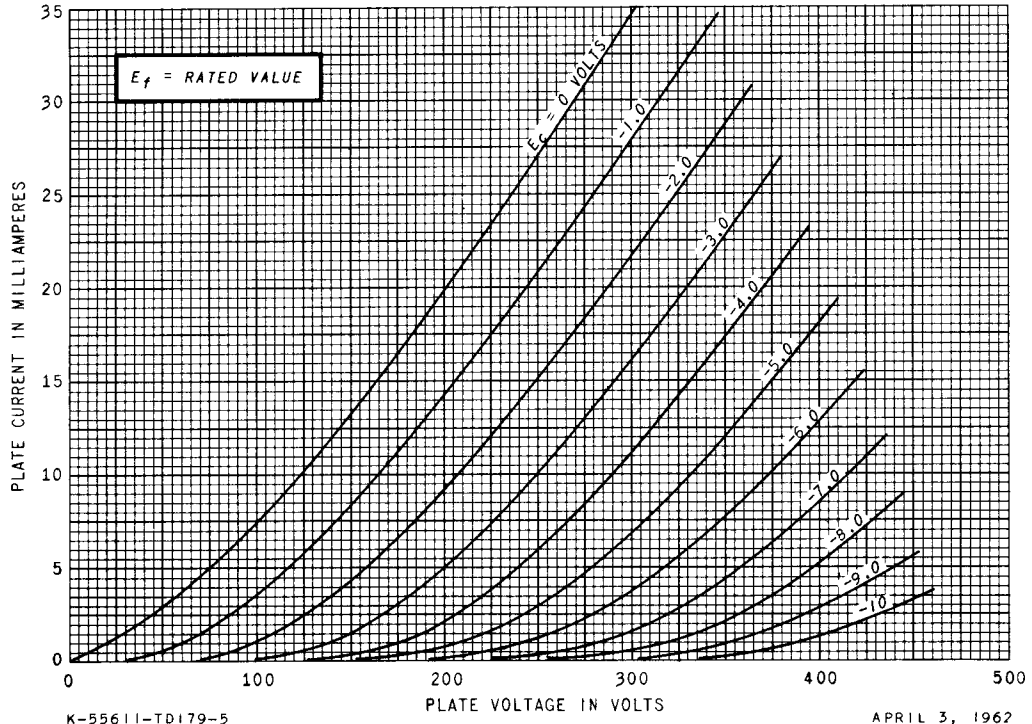
AVERAGE PLATE CHARACTERISTICS

TRIODE SECTION 1



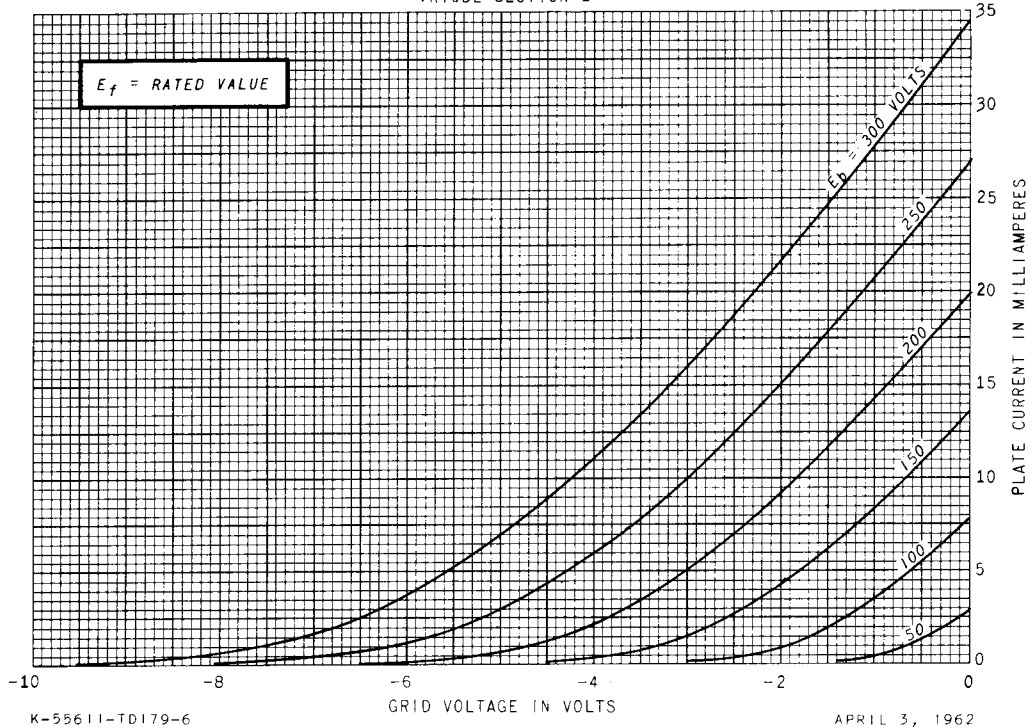
### AVERAGE PLATE CHARACTERISTICS

TRIODE SECTION 1



### AVERAGE TRANSFER CHARACTERISTICS

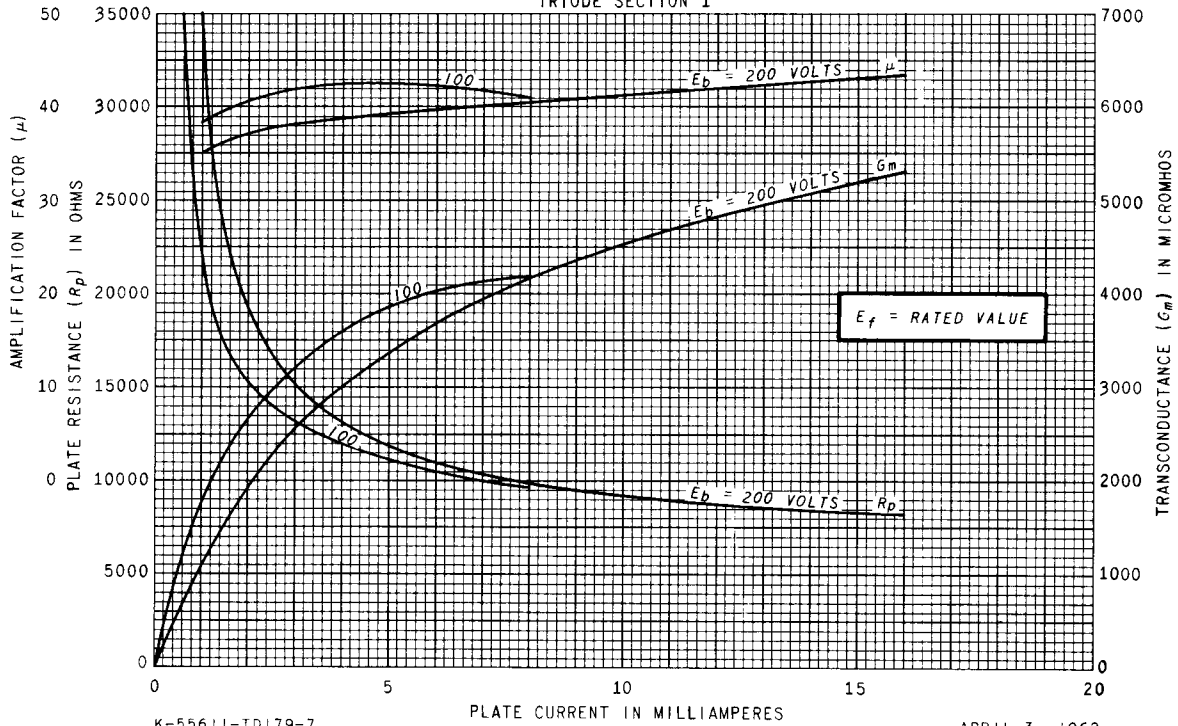
TRIODE SECTION 1





AVERAGE CHARACTERISTICS

TRIODE SECTION 1

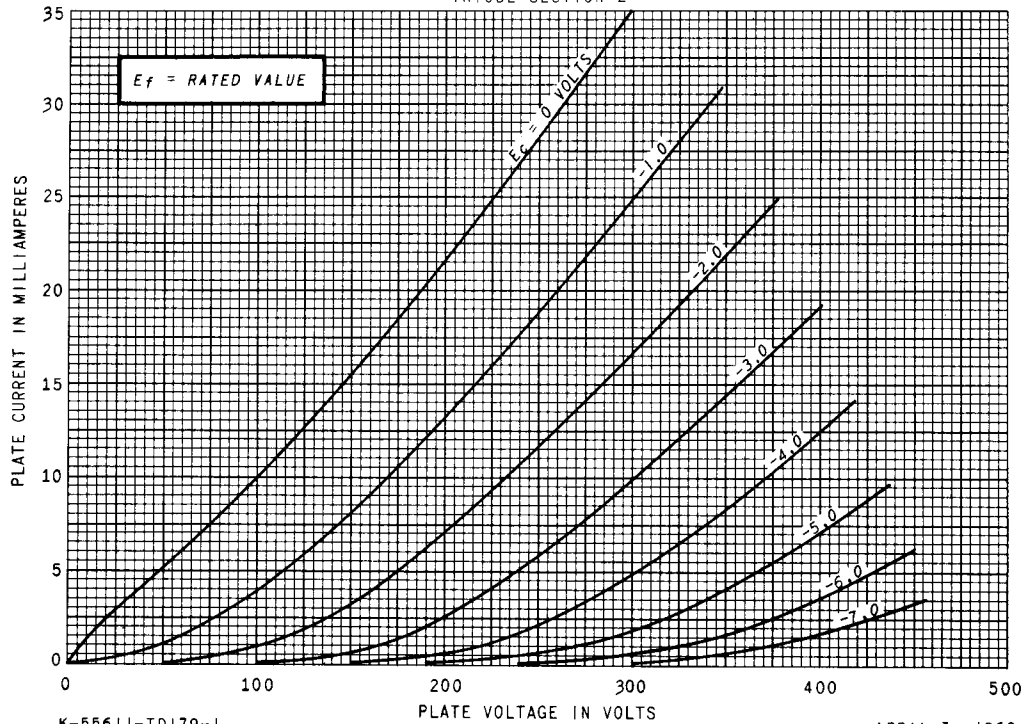


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APRIL 3, 1962

AVERAGE PLATE CHARACTERISTICS

TRIODE SECTION 2

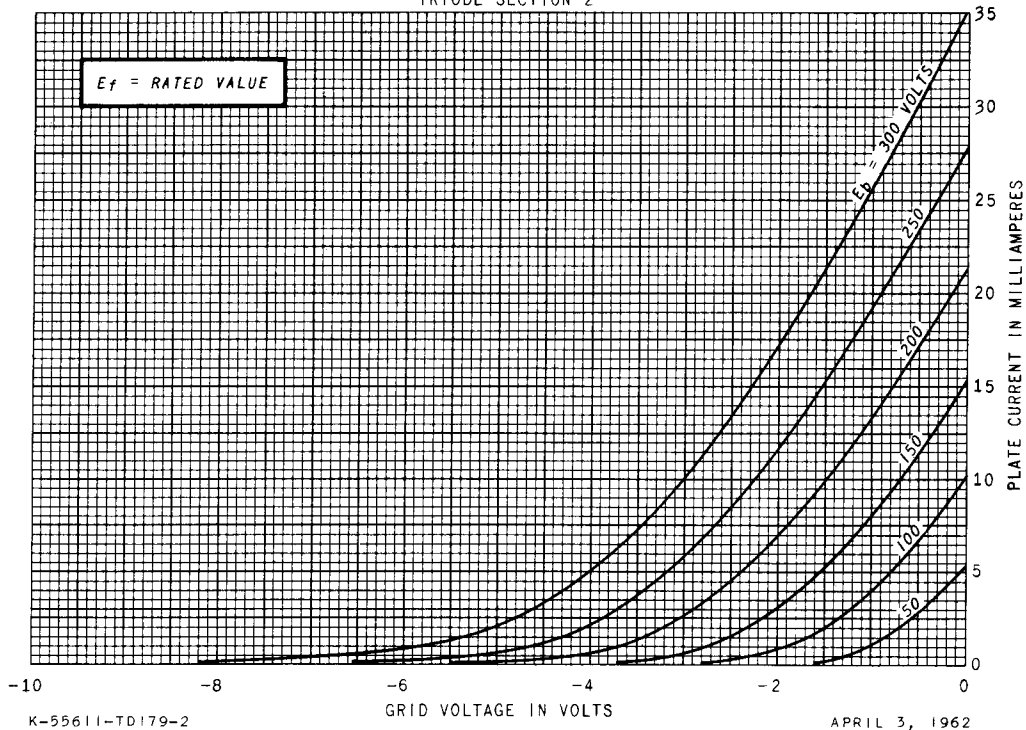


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APRIL 3, 1962

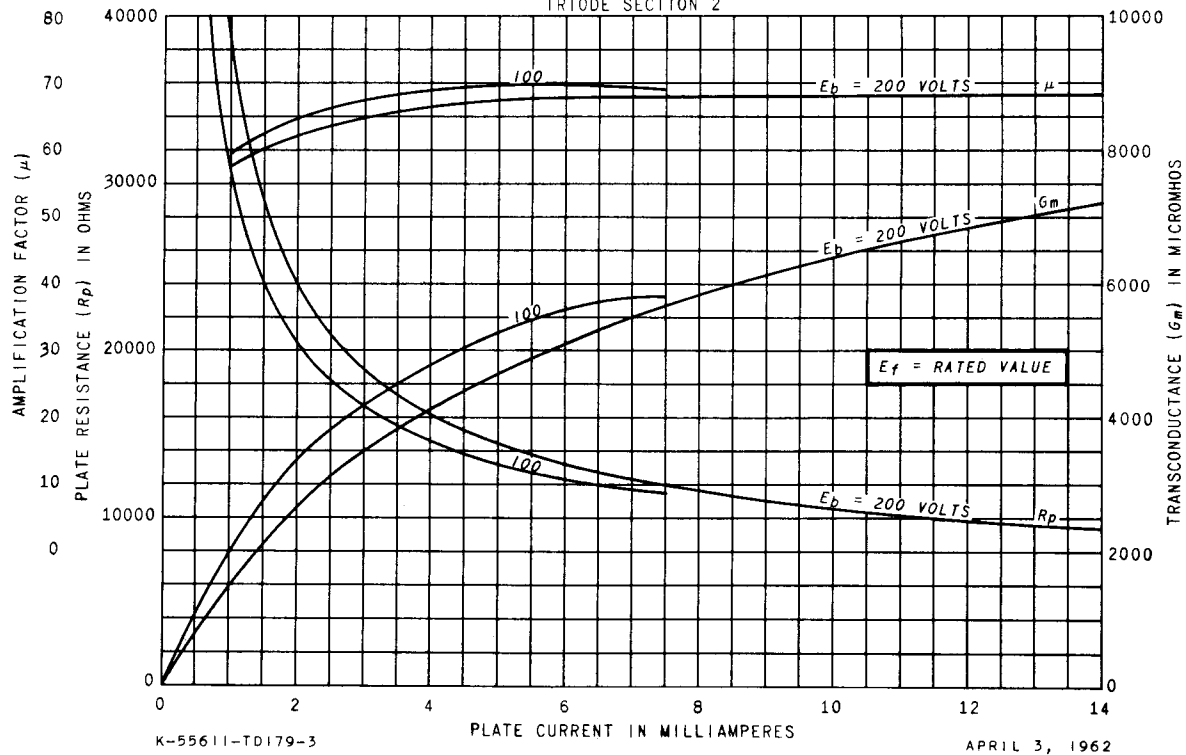
AVERAGE TRANSFER CHARACTERISTICS

TRIODE SECTION 2



AVERAGE CHARACTERISTICS

TRIODE SECTION 2



TUBE DEPARTMENT



Owensboro, Kentucky 42301