



### COMPACTRON DISSIMILAR-DOUBLE-TRIODE PENTODE

#### DESCRIPTION AND RATING

The 14BL11 is a compactron containing a high- $\mu$  triode, a medium- $\mu$  triode, and a sharp-cutoff frame-grid pentode. The pentode is intended for video amplifier service and the triodes for general-purpose use.

#### 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¶

##### Triode (Section 1)

Grid to Plate: (1Tg to 1Tp) . . . . . 1.9 pf  
Input: 1Tg to (1Tk + Pk + Pg3 + h + i.s.) . . . . . 3.0 pf  
Output: 1Tp to (1Tk + Pk + Pg3 + h + i.s.) . . . . . 2.4 pf

##### Triode (Section 2)

Grid to Plate: (2Tg to 2Tp) . . . . . 2.6 pf  
Input: 2Tg to (2Tk + Pk + Pg3 + h + i.s.) . . . . . 4.4 pf  
Output: 2Tp to (2Tk + Pk + Pg3 + h + i.s.) . . . . . 4.0 pf

##### Pentode Section

Grid-Number 1 to Plate: (Pg1 to Pp) . . . . . 0.12 pf  
Input: Pg1 to (Pk + Pg2 + Pg3 + h + i.s.) . . . . . 12 pf  
Output: P; to (Pk + Pg2 + Pg3 + h + i.s.) . . . . . 4.4 pf

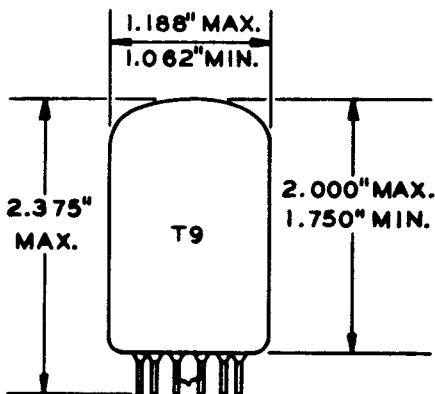
##### Coupling

Pentode Plate to Triode Plate (Section 2): (Pp to 2Tp), maximum . . . . . 0.05 pf  
Triode Plate (Section 1) to Triode Plate (Section 2): (1Tp to 2Tp), maximum . . . . . 0.12 pf

##### MECHANICAL

Operating Position - Any  
Envelope - T-9, Glass  
Base - E12-70, Button 12-Pin  
Outline Drawing - EIA 9-58  
Maximum Diameter . . . . . 1.188 Inches  
Minimum Diameter . . . . . 1.063 Inches  
Maximum Over-all Length . . . . . 2.375 Inches  
Maximum Seated Height . . . . . 2.000 Inches  
Minimum Seated Height . . . . . 1.750 Inches

##### PHYSICAL DIMENSIONS

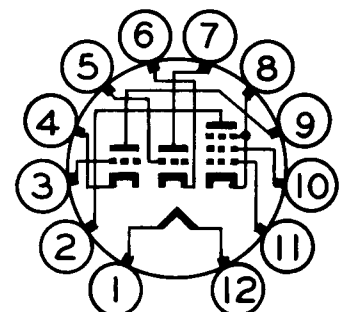


EIA 9-58

##### TERMINAL CONNECTIONS

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

##### BASING DIAGRAM



EIA 12GC

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 . . . . .	250	Volts
Screen Voltage . . . . .	125	Volts
Positive DC Grid-Number 1 Voltage . . . . .	0	Volts
Plate Dissipation . . . . .	2.5	Watts
Screen Dissipation . . . . .	1.25	Watts
<b>Heater-Cathode Voltage</b>		
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
<b>Grid-Number 1 Circuit Resistance</b>		
With Fixed Bias . . . . .	0.1	Megohms
With Cathode Bias . . . . .	0.25	Megohms

**Triode (Section 1)**

Plate Voltage . . . . .	330	Volts
Positive DC Grid Voltage . . . . .	0	Volts
Plate Dissipation . . . . .	1.5	Watts
<b>Heater-Cathode Voltage</b>		
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
<b>Grid-Circuit Resistance</b>		
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 . . . . .	2.0	Watts
<b>Heater-Cathode Voltage</b>		
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
<b>Grid-Circuit Resistance</b>		
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	200	Volts
Screen Voltage . . . . .	100	100	Volts
Grid-Number 1 Voltage. . . . .	0	---	Volts
Cathode-Bias Resistor. . . . .	---	82	Ohms
Plate Resistance, approximate . . . . .	---	70000	Ohms
Transconductance . . . . .	---	19000	Micromhos
Plate Current . . . . .	40	16	Milliamperes
Screen Current . . . . .	13	3.0	Milliamperes
Grid-Number 1 Voltage, approximate Ib = 100 Microamperes. . . . .	---	-5.5	Volts

#### Triode (Section 1)

Plate Voltage . . . . .	200	Volts
Cathode-Bias Resistor. . . . .	270	Ohms
Amplification Factor . . . . .	69	
Plate Resistance, approximate . . . . .	12500	Ohms
Transconductance . . . . .	5500	Micromhos
Plate Current . . . . .	7.1	Milliamperes
Grid Voltage, approximate Ib = 50 Microamperes . . . . .	-5.5	Volts

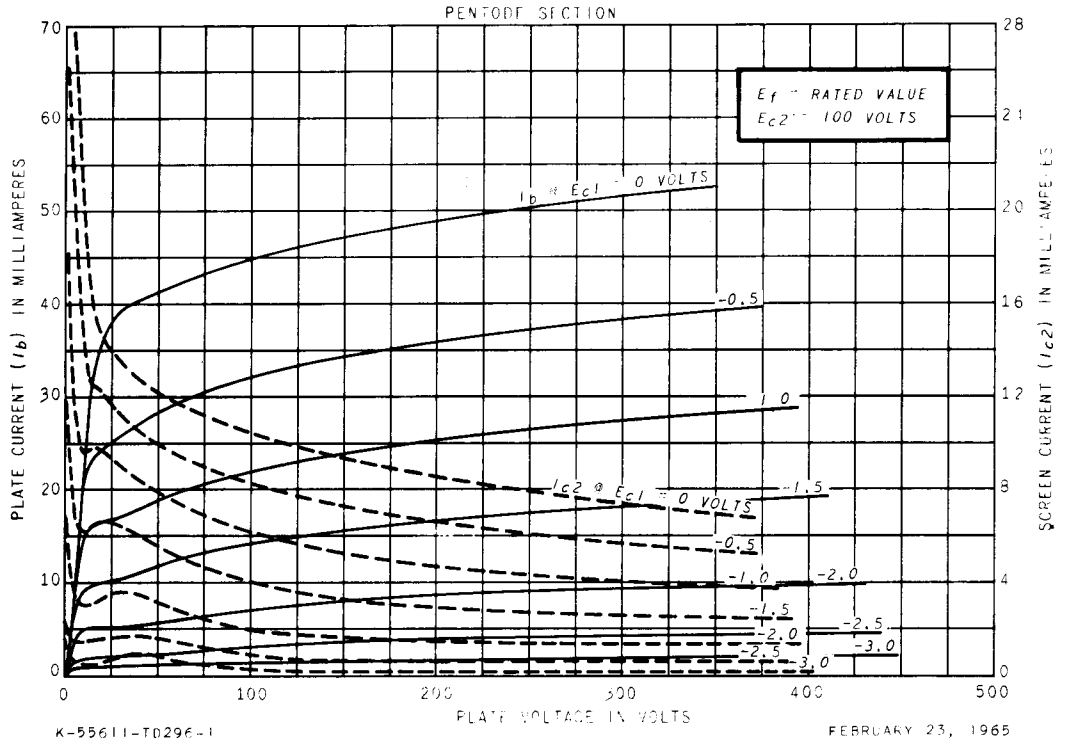
#### Triode (Section 2)

Plate Voltage . . . . .	200	Volts
Cathode-Bias Resistor. . . . .	470	Ohms
Amplification Factor . . . . .	40	
Plate Resistance, approximate . . . . .	7600	Ohms
Transconductance . . . . .	5300	Micromhos
Plate Current . . . . .	7.2	Milliamperes
Grid Voltage, approximate Ib = 100 Microamperes. . . . .	-8	Volts

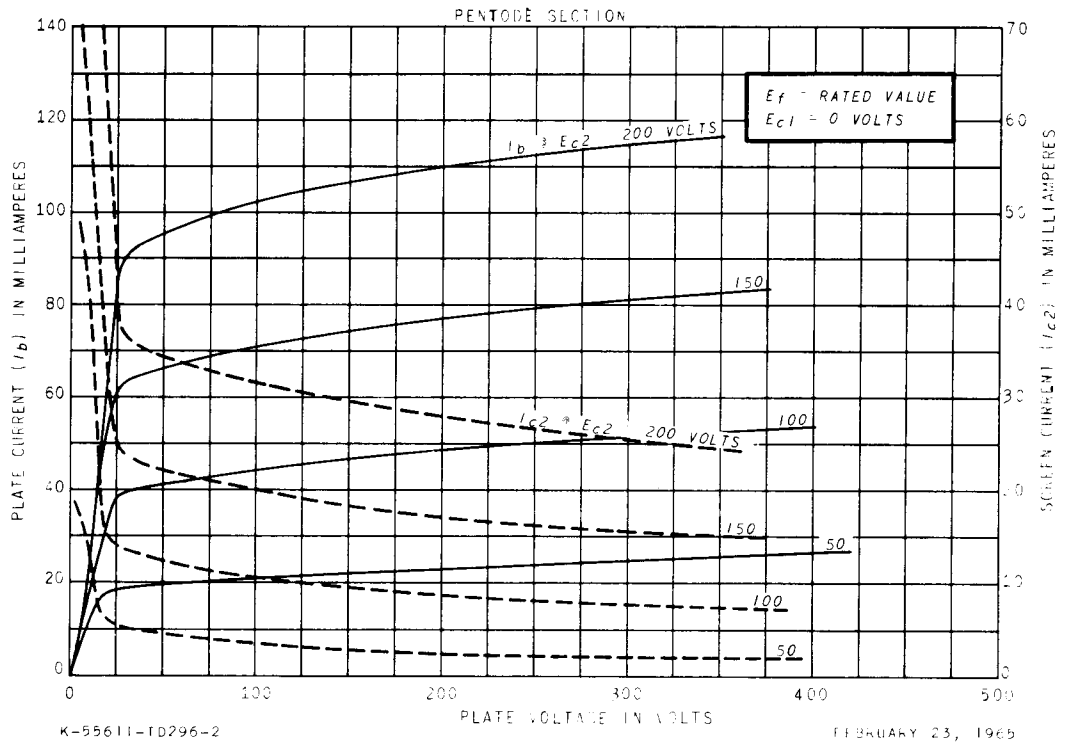
### NOTES

- \* Heater voltage for a bogey tube at  $I_f = 0.45$  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.

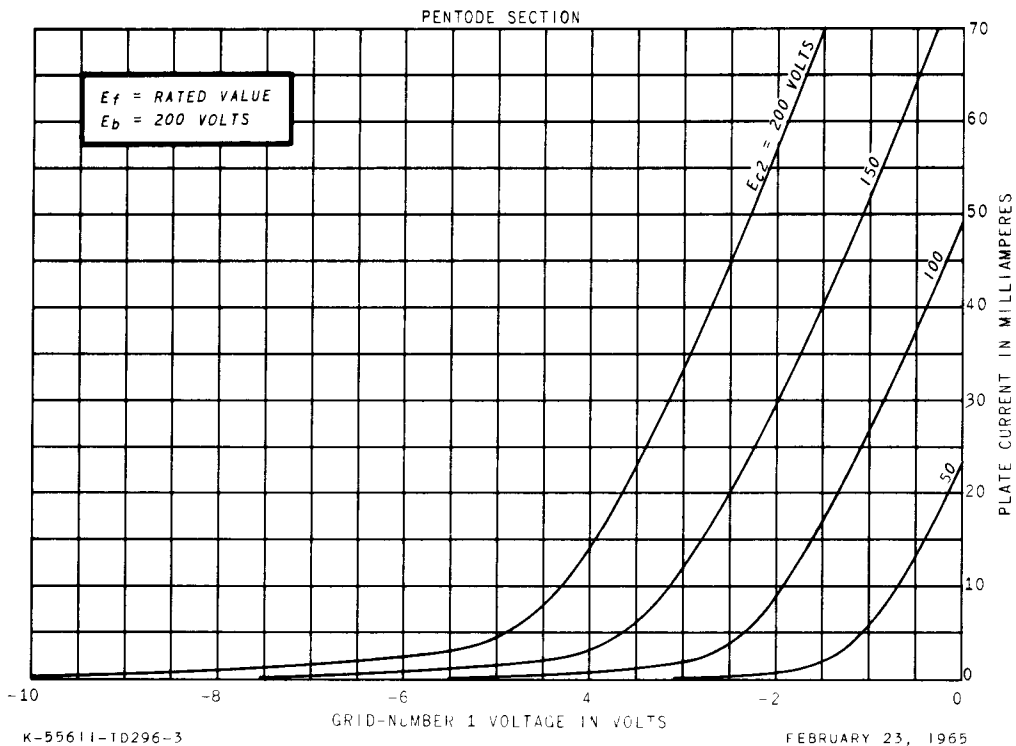
### AVERAGE PLATE CHARACTERISTICS



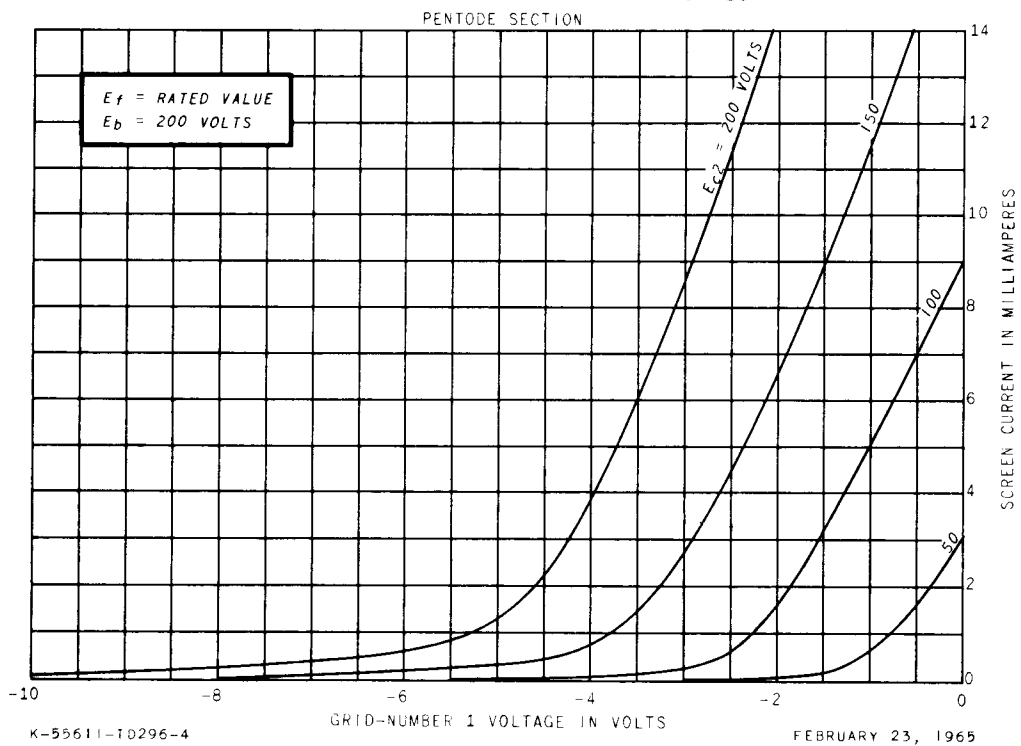
### AVERAGE PLATE CHARACTERISTICS



### AVERAGE TRANSFER CHARACTERISTICS

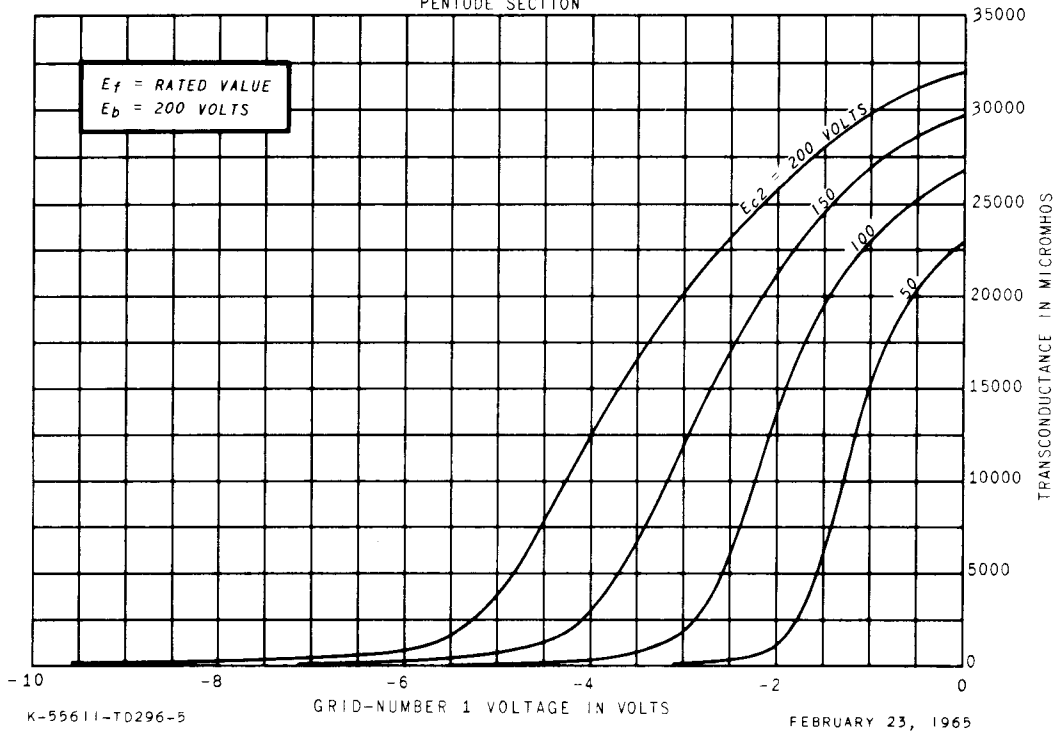


### AVERAGE TRANSFER CHARACTERISTICS



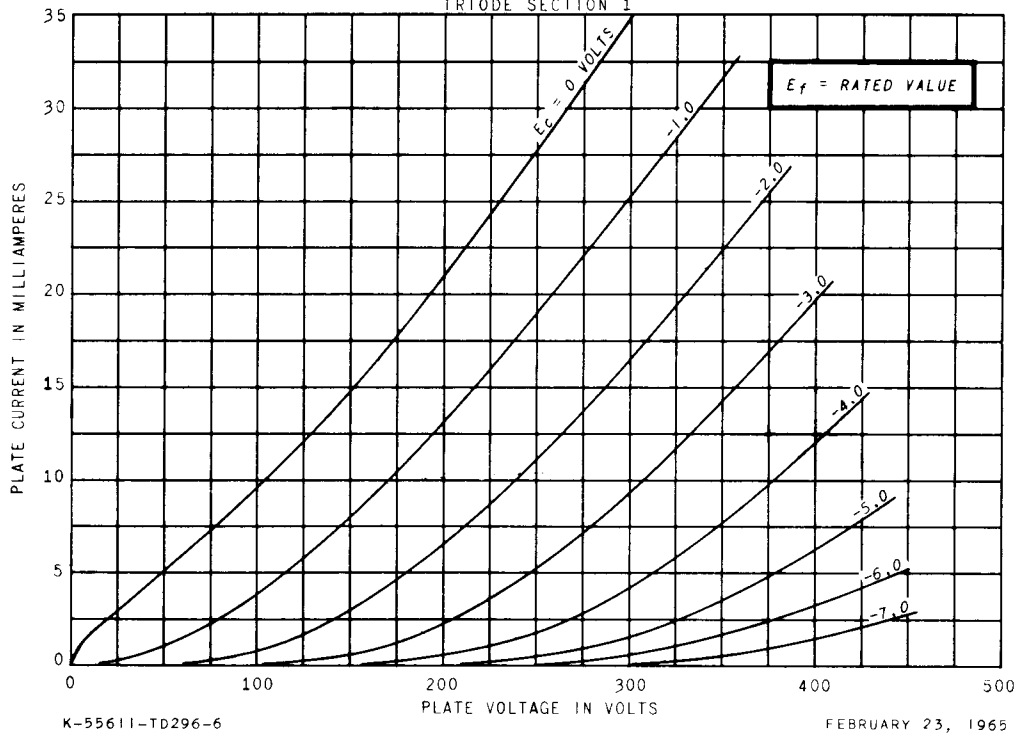
### AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



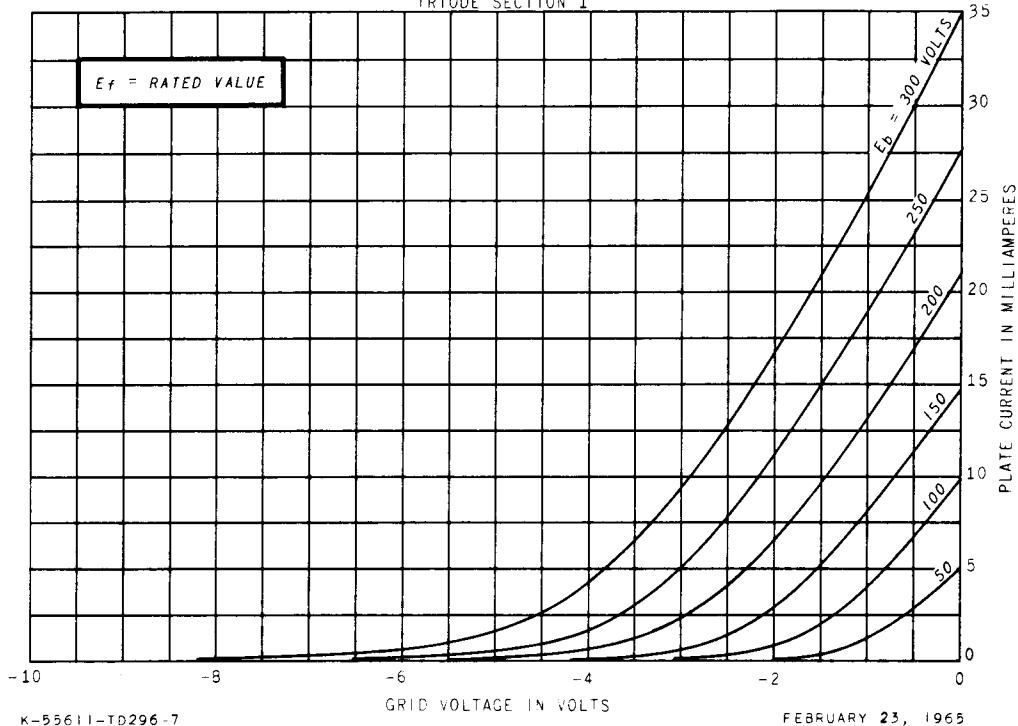
### AVERAGE PLATE CHARACTERISTICS

TRIODE SECTION 1



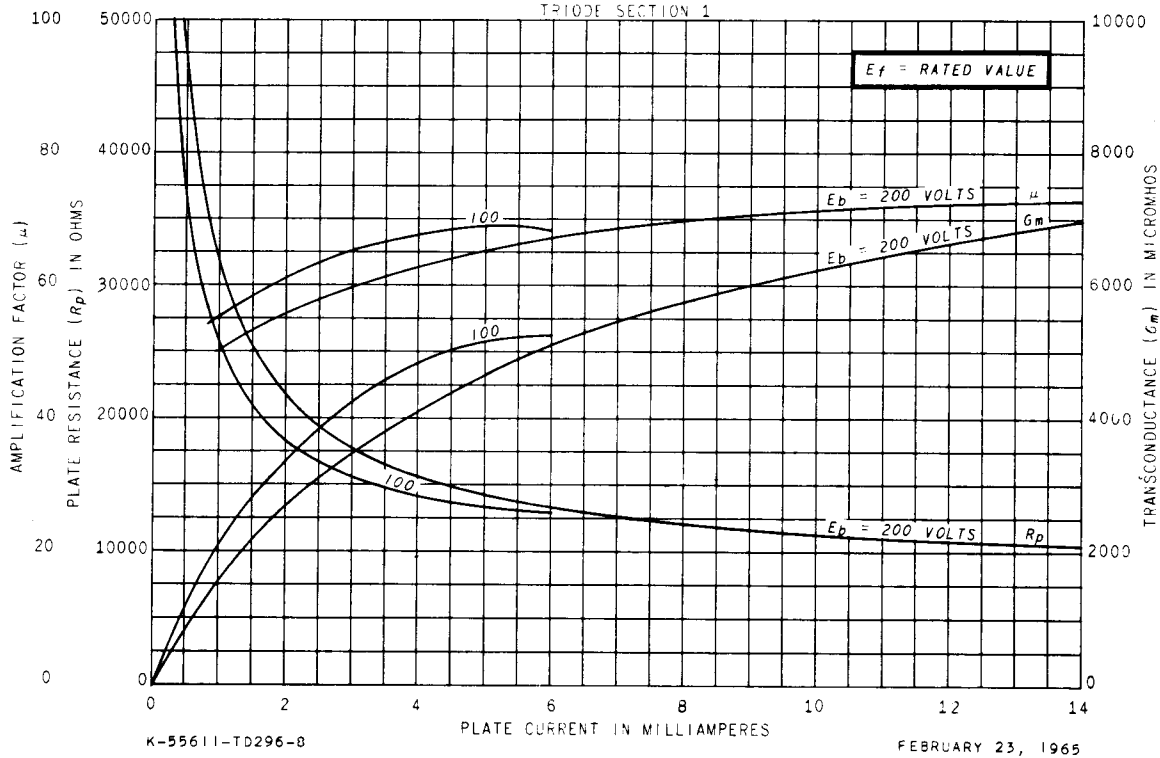
### AVERAGE TRANSFER CHARACTERISTICS

TRIODE SECTION 1

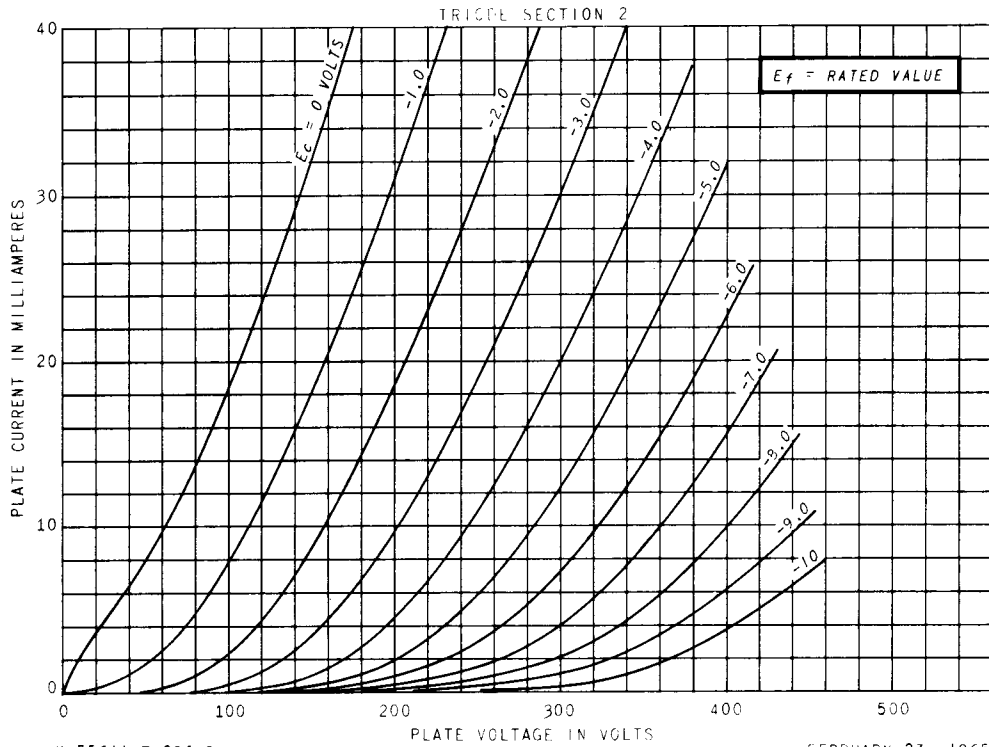


### AVERAGE CHARACTERISTICS

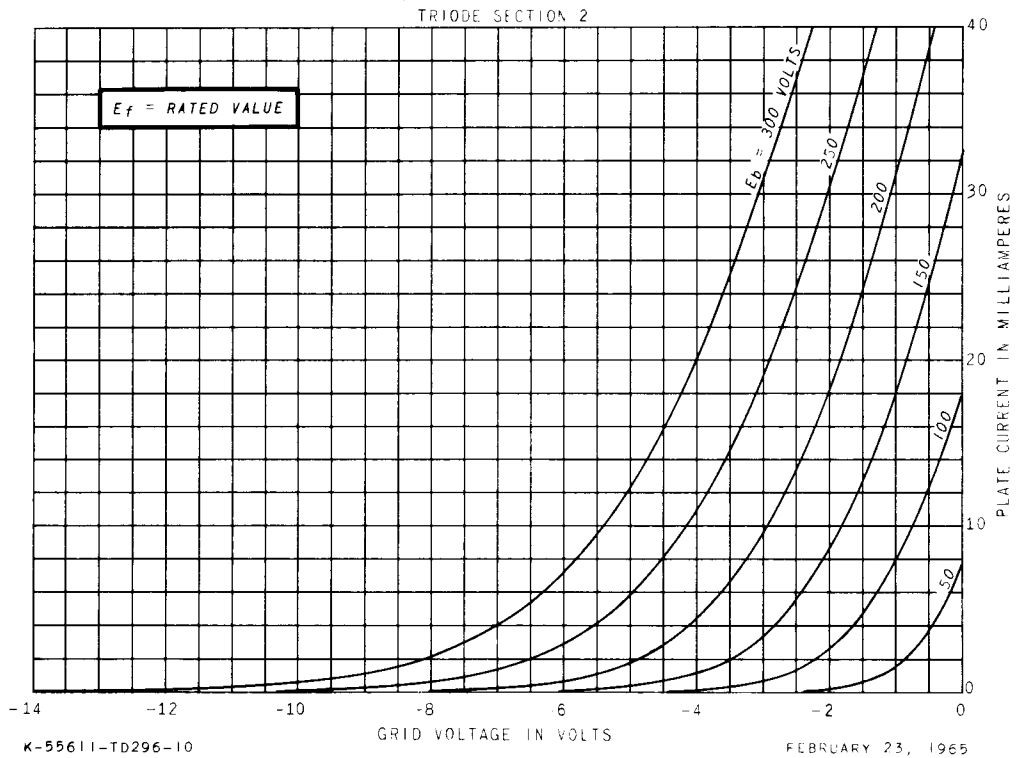
TRIODE SECTION 1



### AVERAGE PLATE CHARACTERISTICS



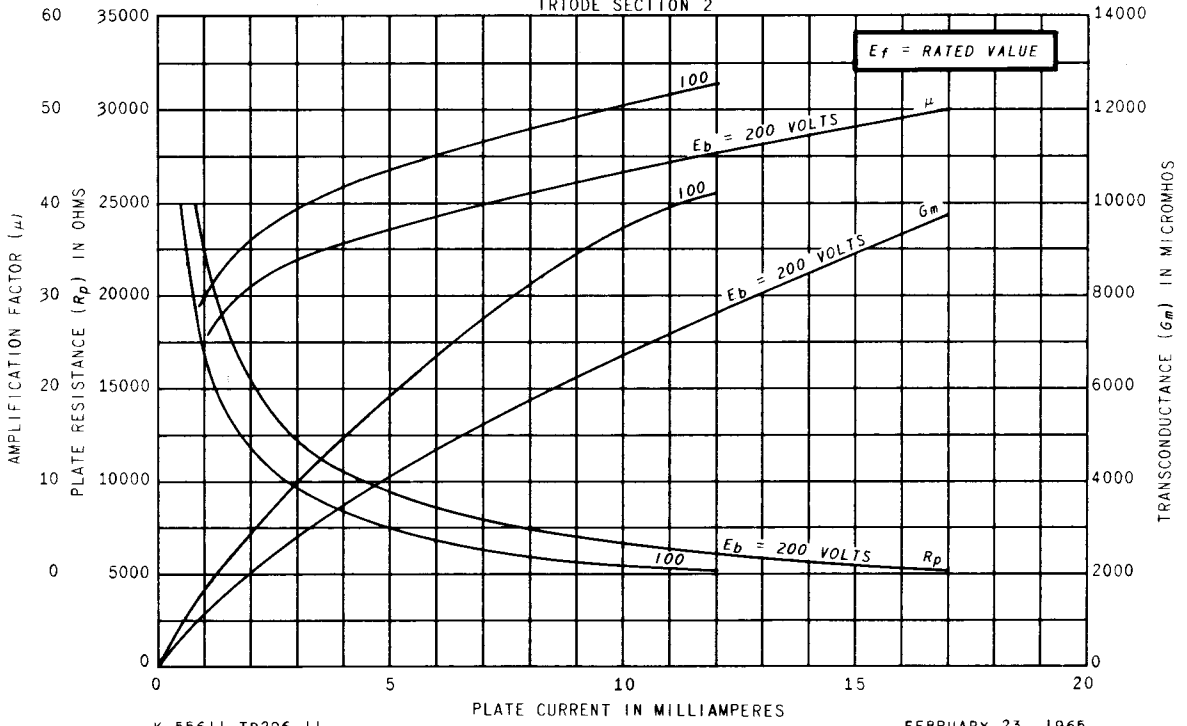
### AVERAGE TRANSFER CHARACTERISTICS





AVERAGE CHARACTERISTICS

TRIODE SECTION 2



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TUBE DEPARTMENT  
**GENERAL**  **ELECTRIC**  
Owensboro, Kentucky