ELECTRONICS

14BL11

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

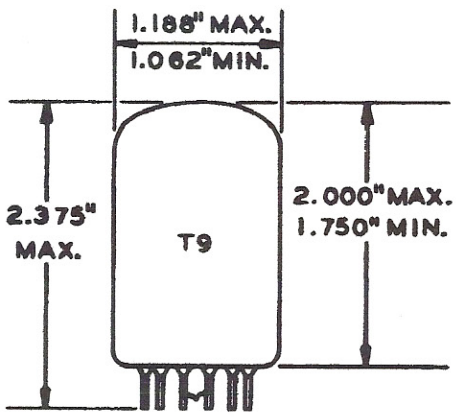
Pentode Plate to Triode Plate (Section 2): (Pp to 2Tp), maximum	0.05	pf
Triode Plate (Section 1) to Triode Plate (Section 2): (1Tp to 2Tp), maximum	0.12	pf

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

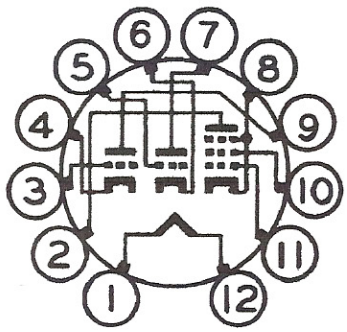


EIA 9-58

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

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
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	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
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	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

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

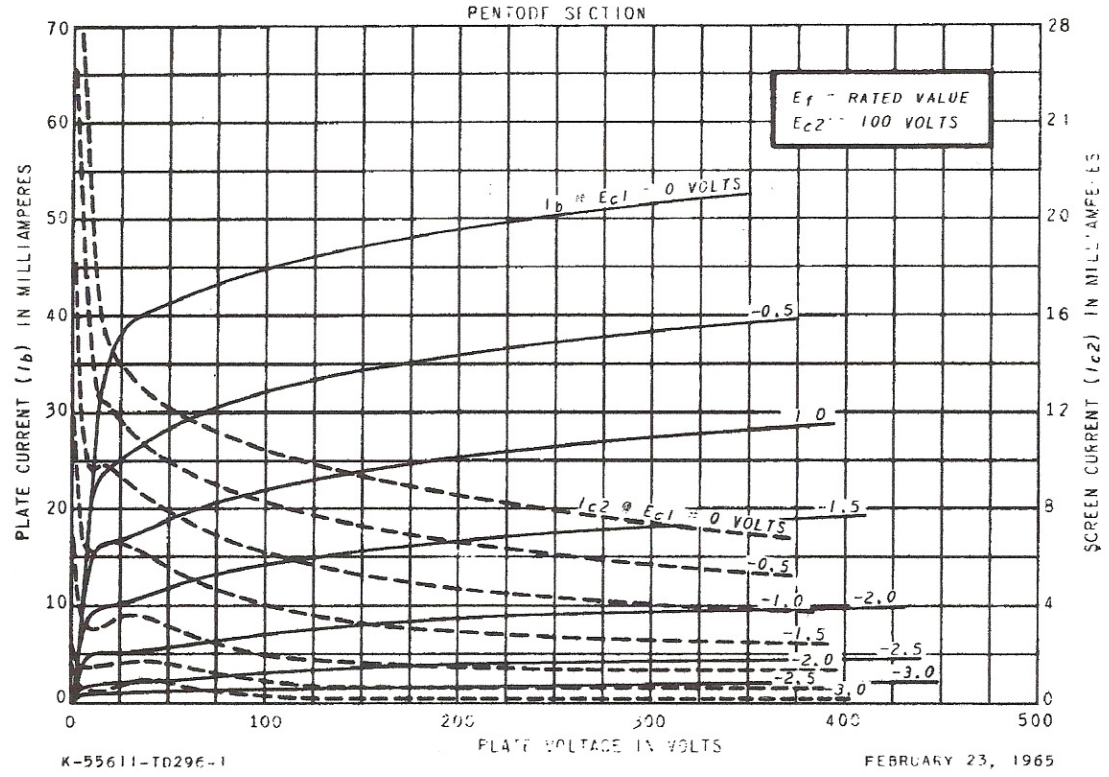
* Heater voltage for a bogey tube at If = 0.45 amperes.

‡ 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.

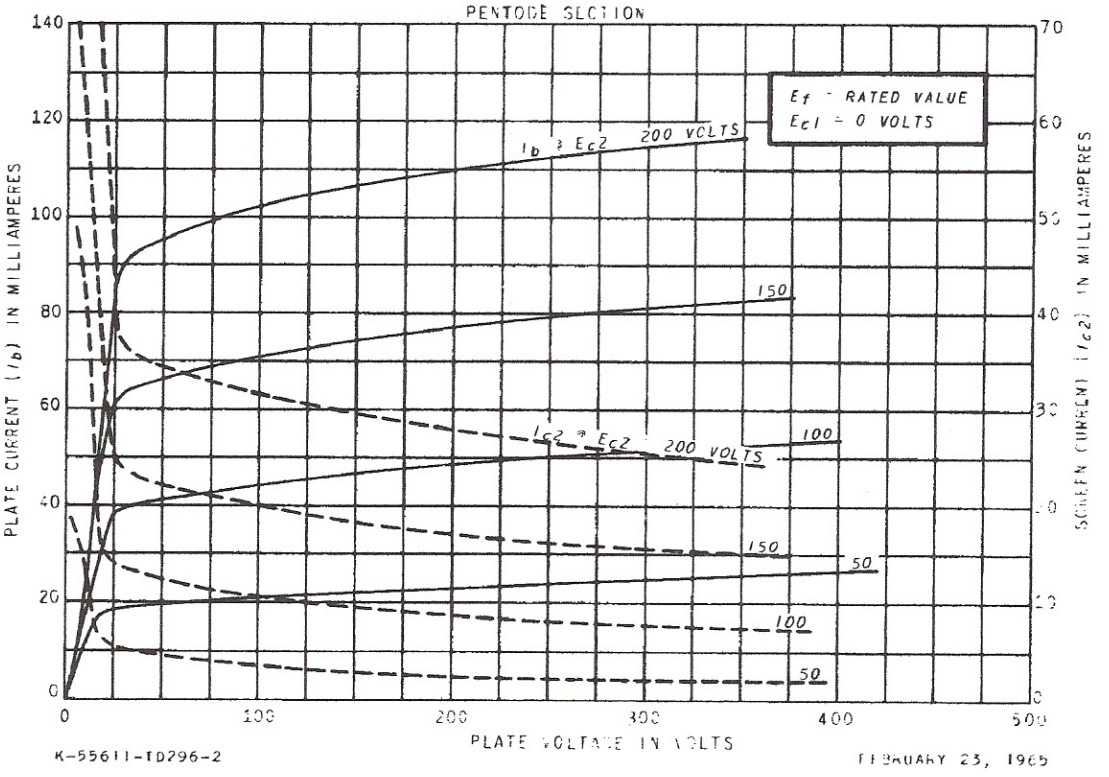
§ The time required for the voltage across the heater to reach 80 percent of the bogey value after applying 4 times the bogey heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the bogey heater voltage divided by the bogey heater current.

¶ Without external shield.

AVERAGE PLATE CHARACTERISTICS

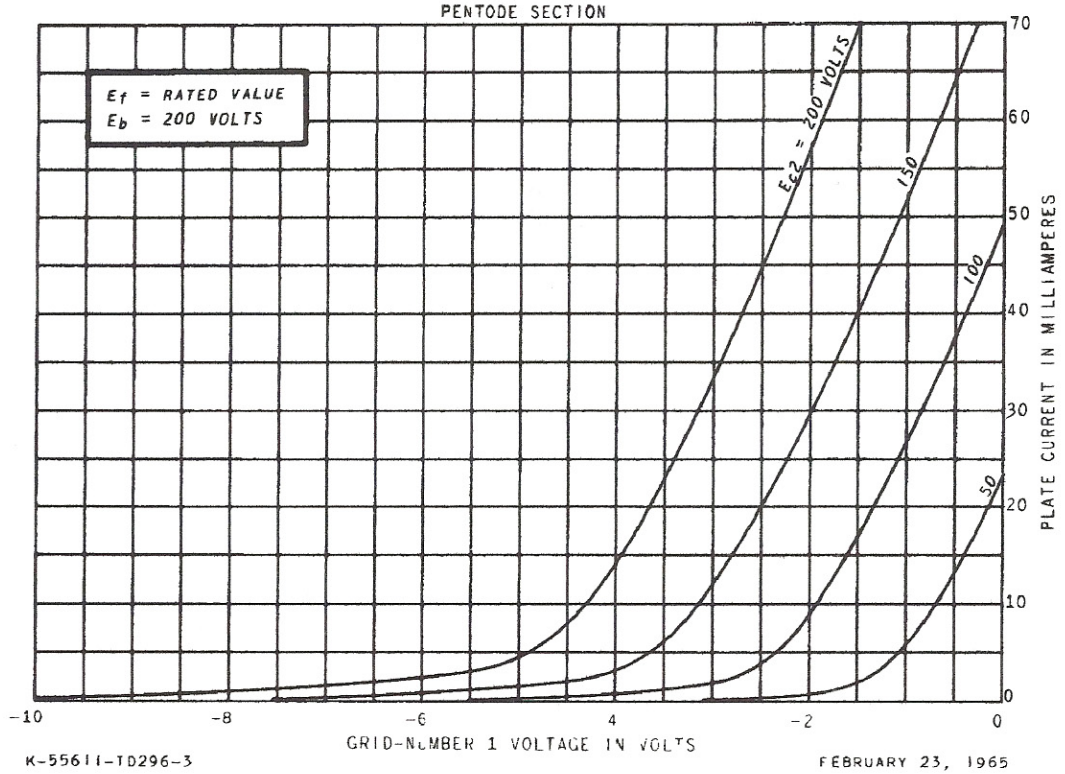


AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



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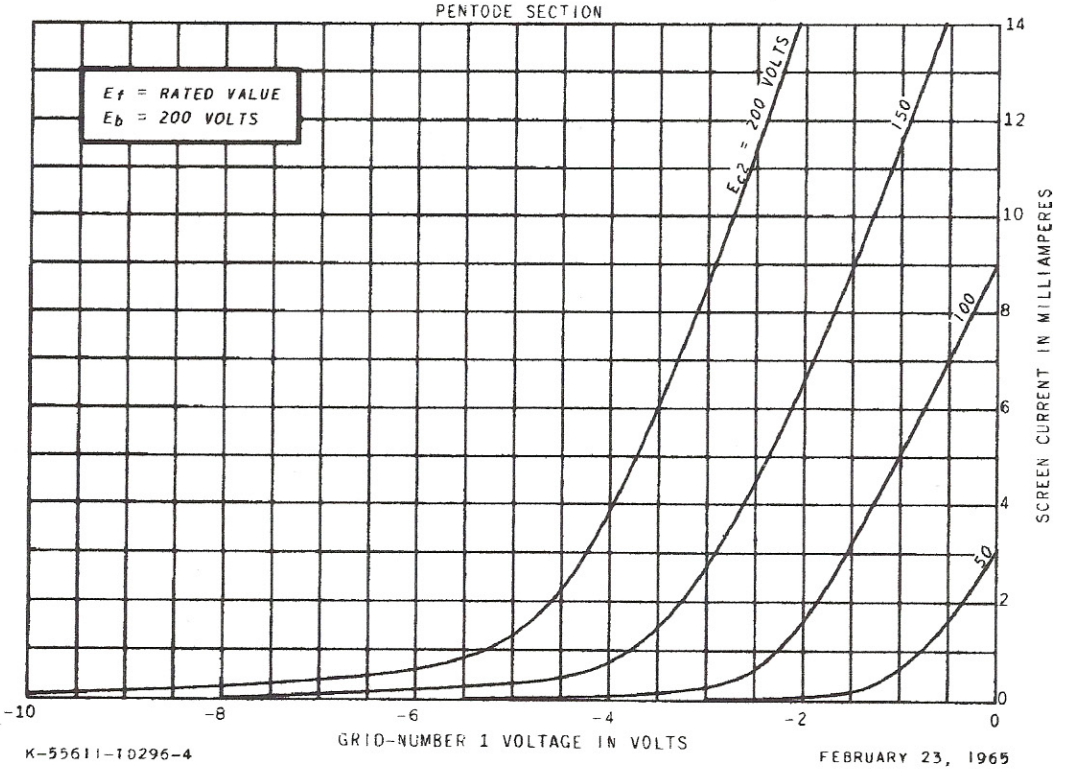
AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



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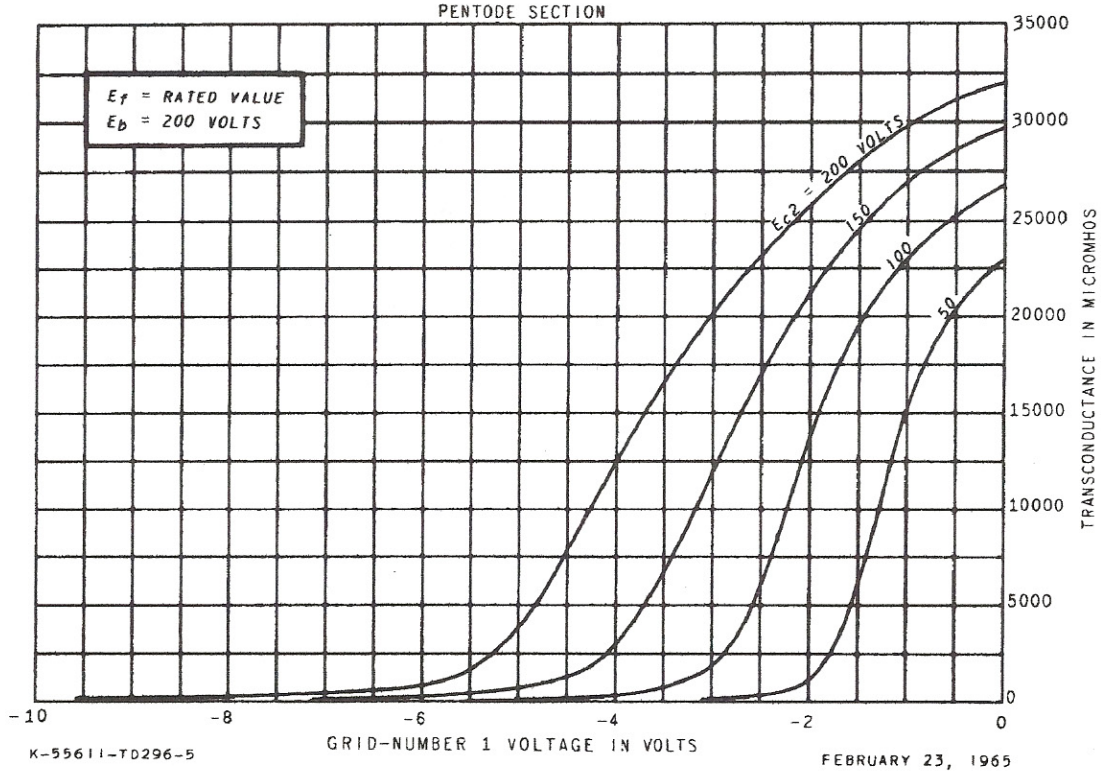
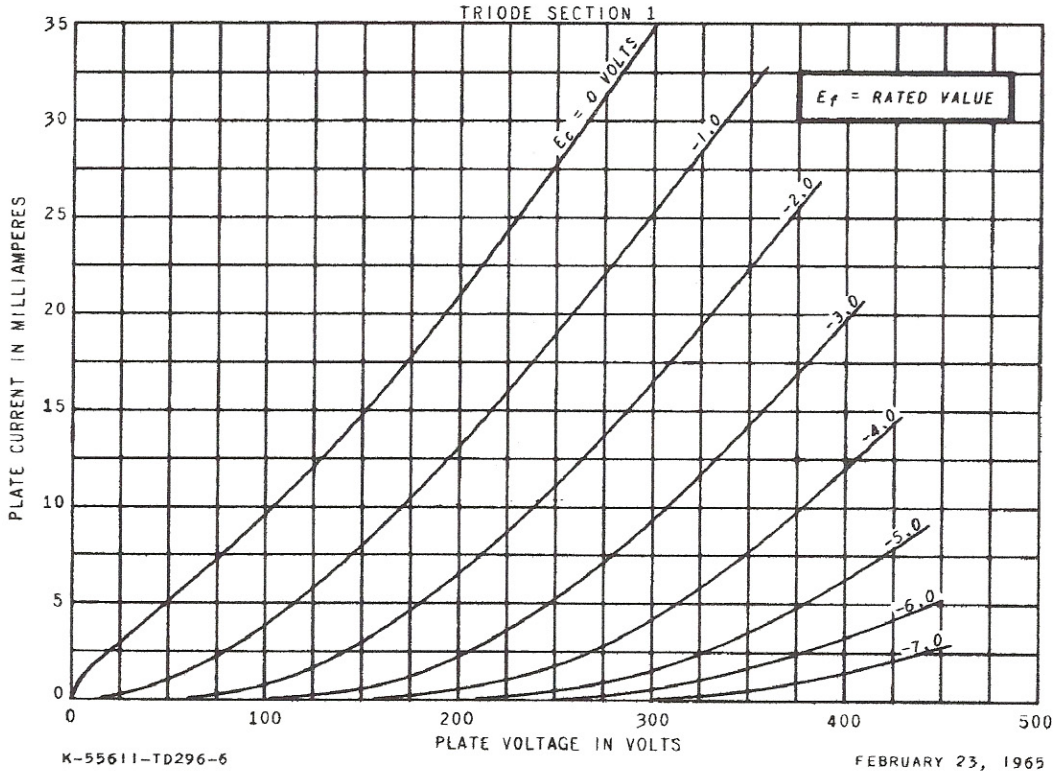


AVERAGE PLATE CHARACTERISTICS



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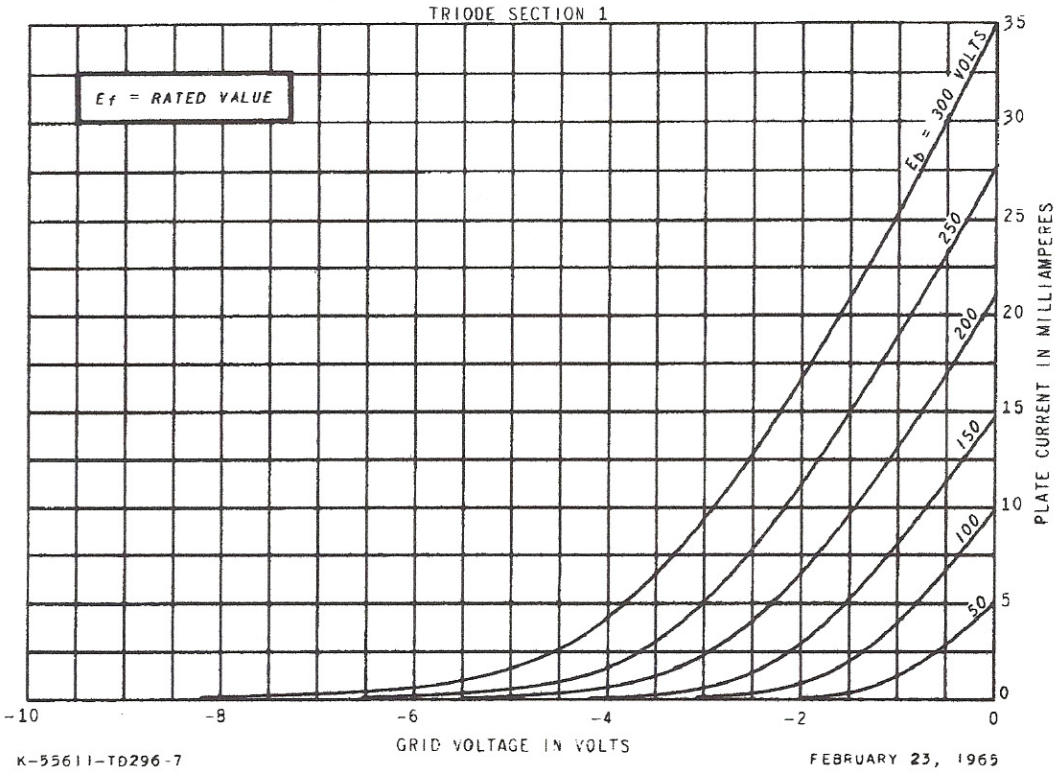

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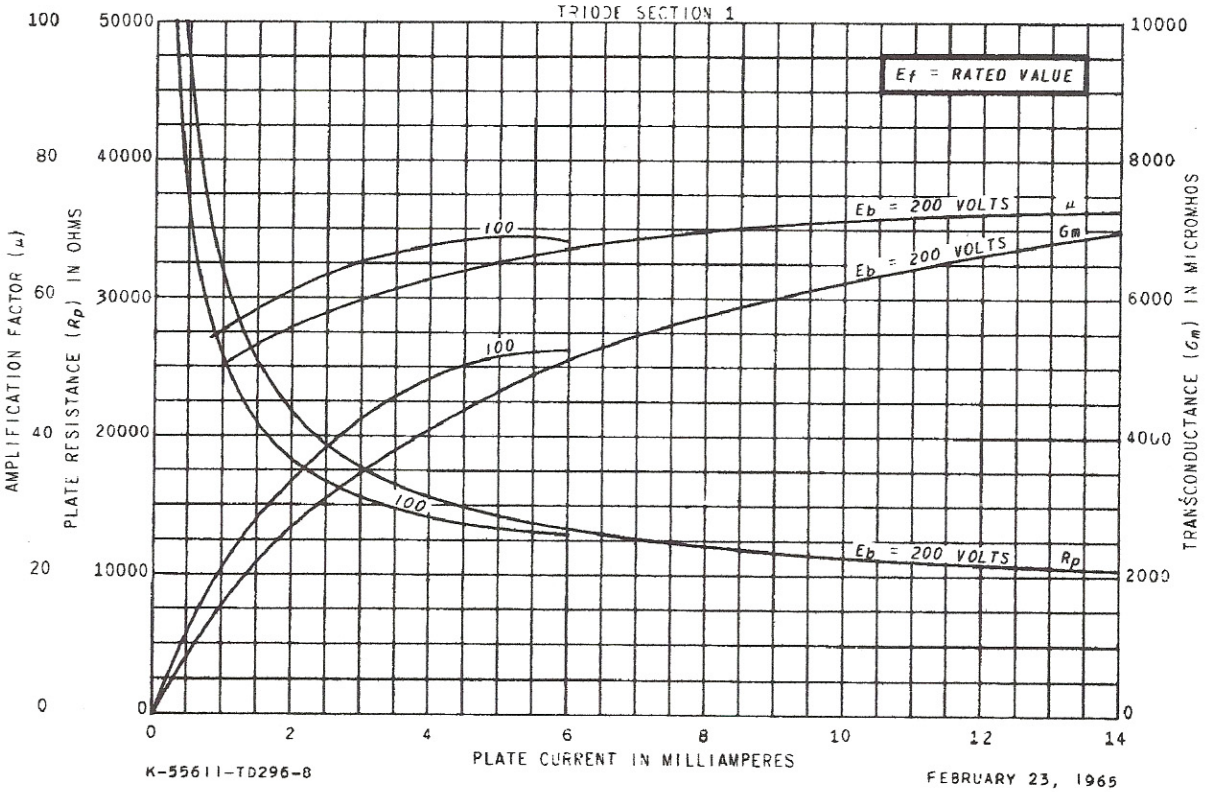

AVERAGE PLATE CHARACTERISTICS

TRIODE SECTION 2

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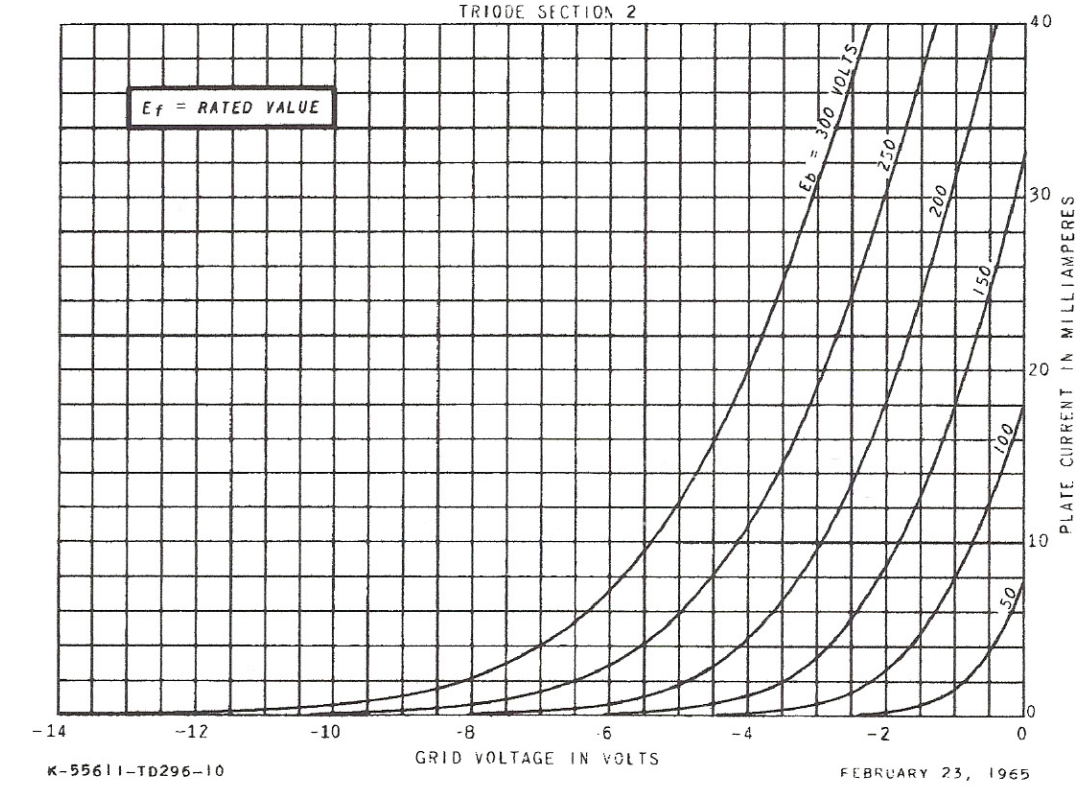
AVERAGE TRANSFER CHARACTERISTICS

TRIODE SECTION 2



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AVERAGE CHARACTERISTICS