



**ELECTRONIC
INNOVATIONS**
IN ACTION

TUBES

PRODUCT INFORMATION

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13V10

Compactron Dissimilar Double Pentode

The 13V10 is a compactron containing a sharp-cutoff, dual-control pentode (Section 2) and a power pentode (Section 1). The dual-control pentode is intended for use as an FM detector and the power pentode as an audio-frequency output amplifier in television receivers.

GENERAL

ELECTRICAL

Cathode - Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC* 13.2 Volts
Heater Current†. 0.45±0.03 Amperes
Heater Warm-up Time, Average§ . . . 11 Seconds
Direct Interelectrode Capacitances¶

Section 1

Grid-Number 1 to Plate:

(1g1 to 1p) 0.20 pf
Input: 1g1 to (h + 1k + 2k +
1g2 + b.p. + i.s.) 10 pf
Output: 1p to (h + 1k + 2k +
1g2 + b.p. + i.s.) 10 pf

Section 2

Grid-Number 1 to Plate:

(2g1 to 2p) 0.04 pf
Grid-Number 3 to Plate:
(2g3 to 2p) 3.0 pf
Grid-Number 1 to All Except Plate:
2g1 to (h + 2k + 2g2 +
2g3 + i.s.) 6.5 pf

Section 2 (Cont'd)

Grid-Number 3 to All: 2g3 to
(h + 2k + 2g1 + 2g2 + 2p +
i.s.) 8.0 pf
Grid-Number 1 to Grid-Number 3:
(2g1 to 2g3) 0.15 pf

Coupling

Plate (Section 1) to Plate
(Section 2): (1p to 2p) 0.14 pf

MECHANICAL

Operating Position - Any

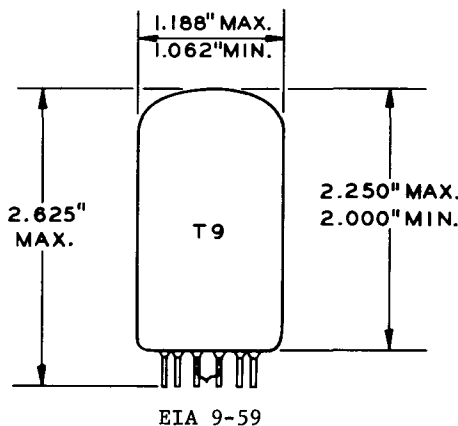
Envelope - T-9, Glass

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

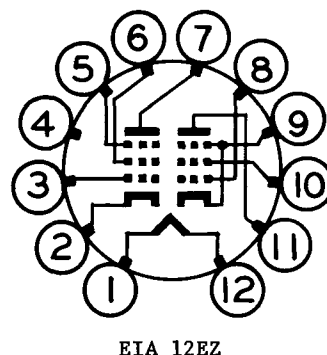
PHYSICAL DIMENSIONS



TERMINAL CONNECTIONS

Pin 1 - Heater
Pin 2 - Cathode and Internal
Shield (Section 2)
Pin 3 - Grid Number 1 (Section 2)
Pin 4 - No Connection
Pin 5 - Grid Number 3 (Suppressor)
(Section 2)
Pin 6 - Grid Number 2 (Screen)
(Section 2)
Pin 7 - Plate (Section 2)
Pin 8 - Grid Number 1 (Section 1)
Pin 9 - Cathode and Beam Plates
(Section 1)
Pin 10 - Grid Number 2 (Screen)
(Section 1)
Pin 11 - Plate (Section 1)
Pin 12 - Heater

BASING DIAGRAM



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

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GENERAL ELECTRIC

MAXIMUM RATINGS**DESIGN-MAXIMUM VALUES****Section 1**

Plate Voltage	165	Volts
Screen Voltage.	150	Volts
Plate Dissipation.	6.5	Watts
Screen Dissipation	1.8	Watts
DC Cathode Current	65	Milliamperes
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	0.25	Megohms
With Cathode Bias.	0.5	Megohms

Section 2

Plate Voltage	330	Volts
Suppressor Voltage	28	Volts
Screen Supply Voltage	330	Volts
Screen Voltage - See Screen Rating Chart		
Positive DC Grid-Number 1 Voltage	0	Volts
Plate Dissipation.	1.7	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

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**CLASS A₁ AMPLIFIER—Section 1**

Plate Voltage	145	Volts
Screen Voltage.	125	Volts
Grid-Number 1 Voltage	-6.0	Volts
Peak AF Grid-Number 1 Voltage.	6.0	Volts
Plate Resistance, approximate.	58000	Ohms
Transconductance	6400	Micromhos
Zero-Signal Plate Current	34	Milliamperes
Maximum-Signal Plate Current	36	Milliamperes
Zero-Signal Screen Current.	2.2	Milliamperes
Maximum-Signal Screen Current.	5.5	Milliamperes
Load Resistance	3000	Ohms
Total Harmonic Distortion, approximate.	7	Percent
Maximum-Signal Power Output	1.5	Watts

CHARACTERISTICS AND TYPICAL OPERATION (Cont'd)

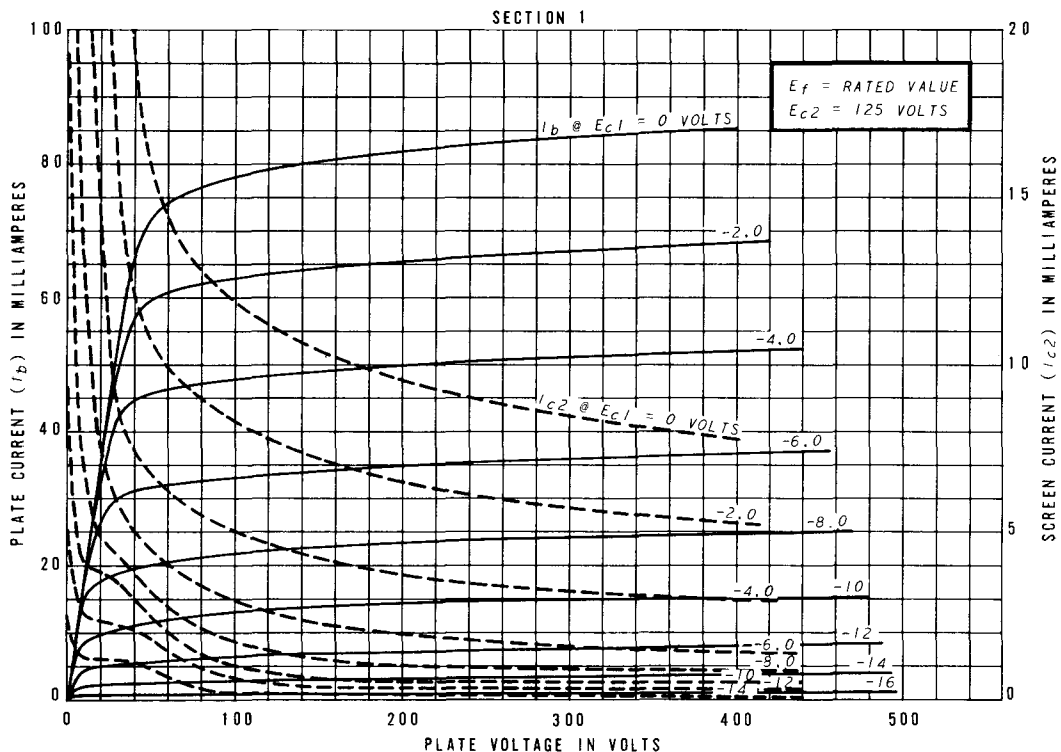
AVERAGE CHARACTERISTICS—Section 2

Plate Voltage	150	Volts
Suppressor Voltage	0	Volts
Screen Voltage.	100	Volts
Cathode-Bias Resistor	560	Ohms
Plate Resistance, approximate.	0.15	Megohms
Grid-Number 1 Transconductance	1000	Micromhos
Grid-Number 3 Transconductance	400	Micromhos
Plate Current	1.3	Milliamperes
Screen Current.	2.0	Milliamperes
Grid-Number 1 Voltage, approximate Ib = 10 Microamperes.	-4.5	Volts
Grid-Number 3 Voltage, approximate Ib = 10 Microamperes.	-4.5	Volts

NOTES

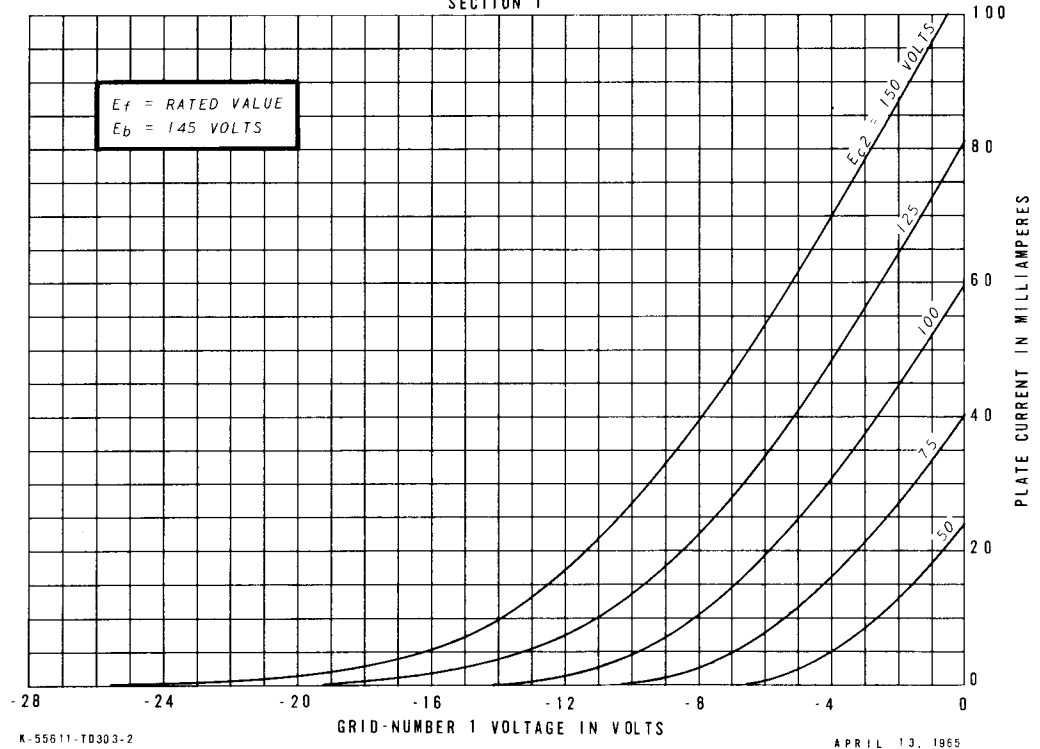
- * Heater voltage for a bogey tube at $I_f = 0.45$ amperes.
- ‡ The equipment designer should design the equipment so that heater current is centered at the specified bogey value, with heater supply variations restricted to maintain heater current within the specified tolerance.
- § The time required 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



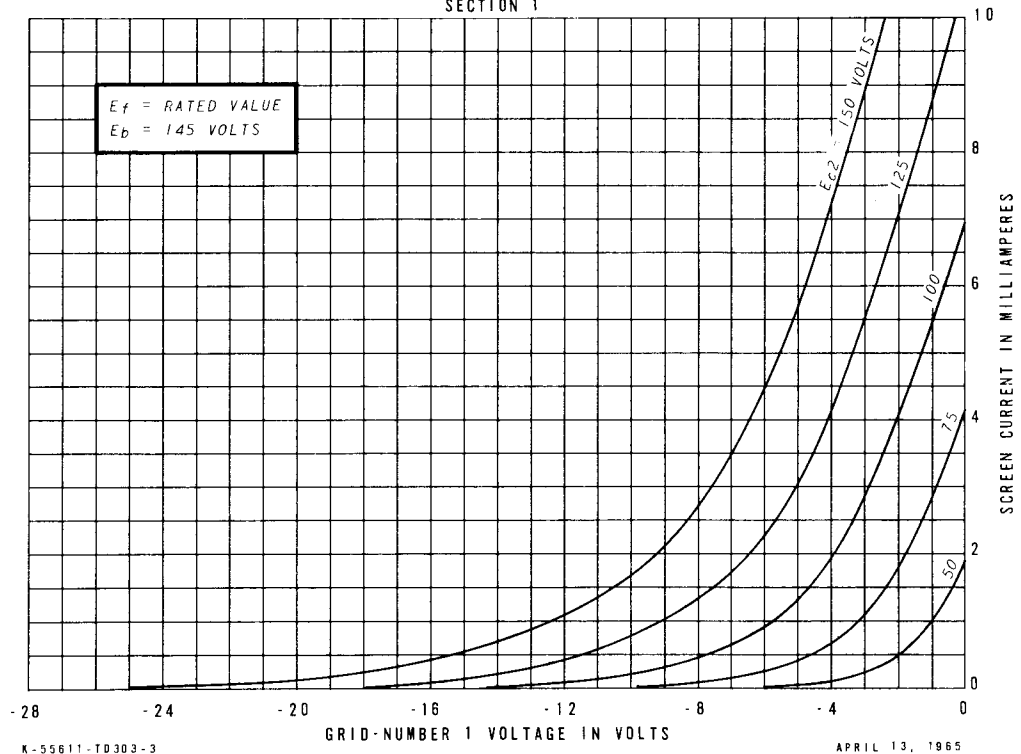
AVERAGE TRANSFER CHARACTERISTICS

SECTION 1



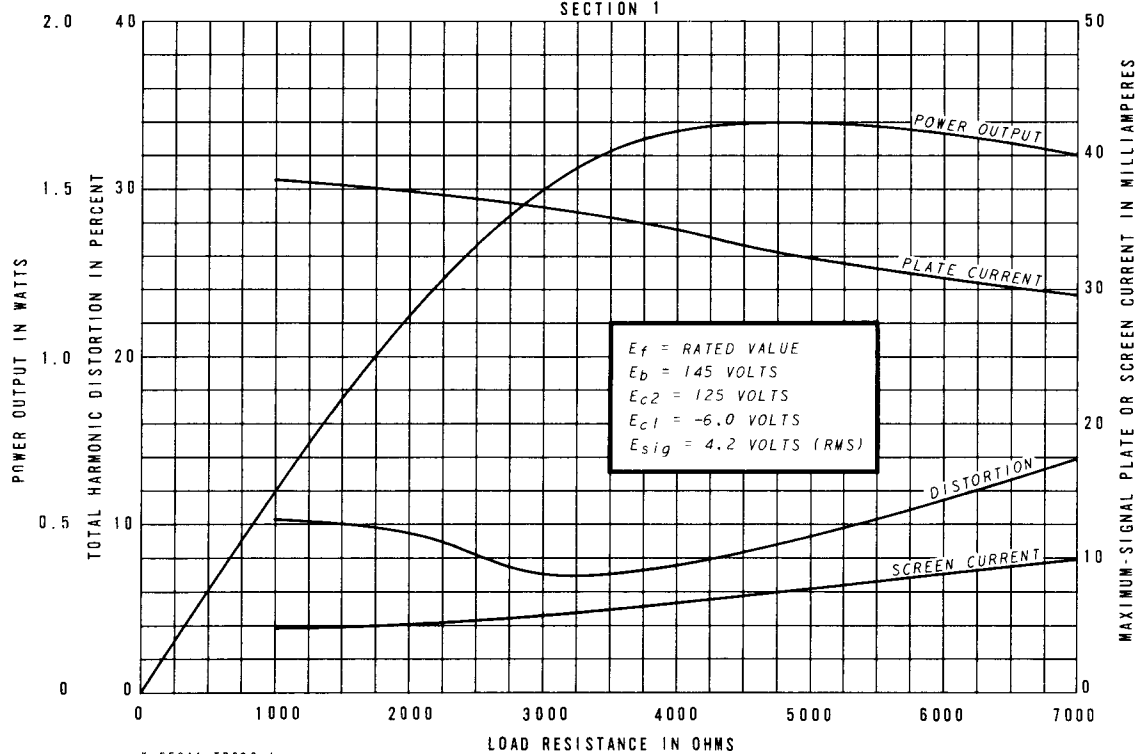
AVERAGE TRANSFER CHARACTERISTICS

SECTION 1



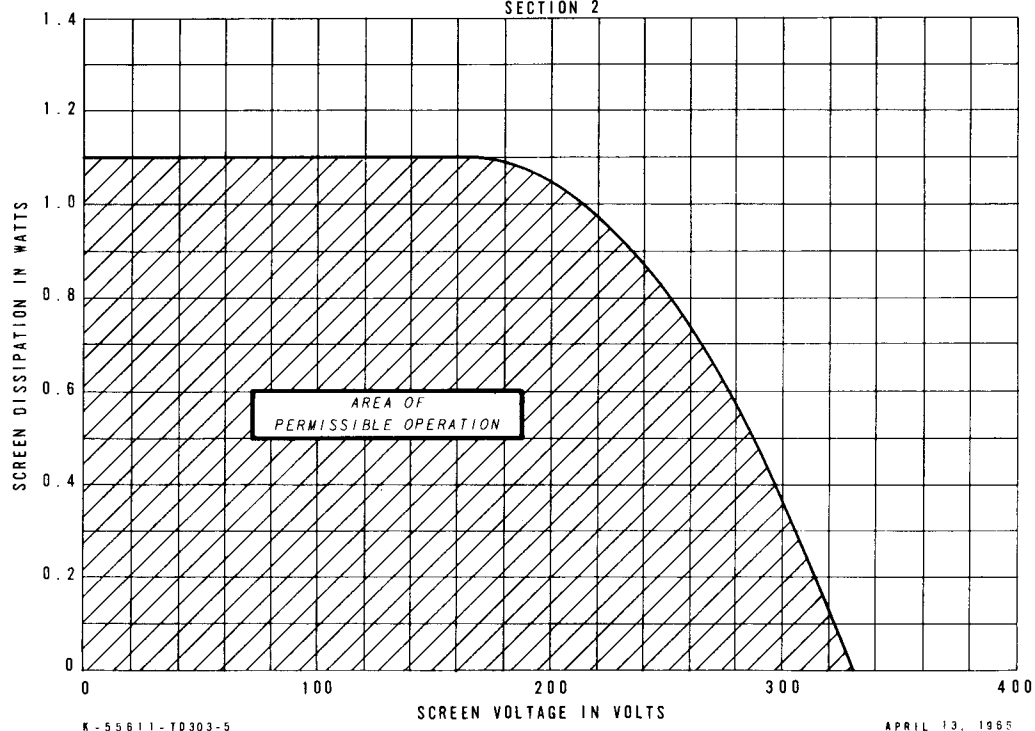
OPERATION CHARACTERISTICS

SECTION 1



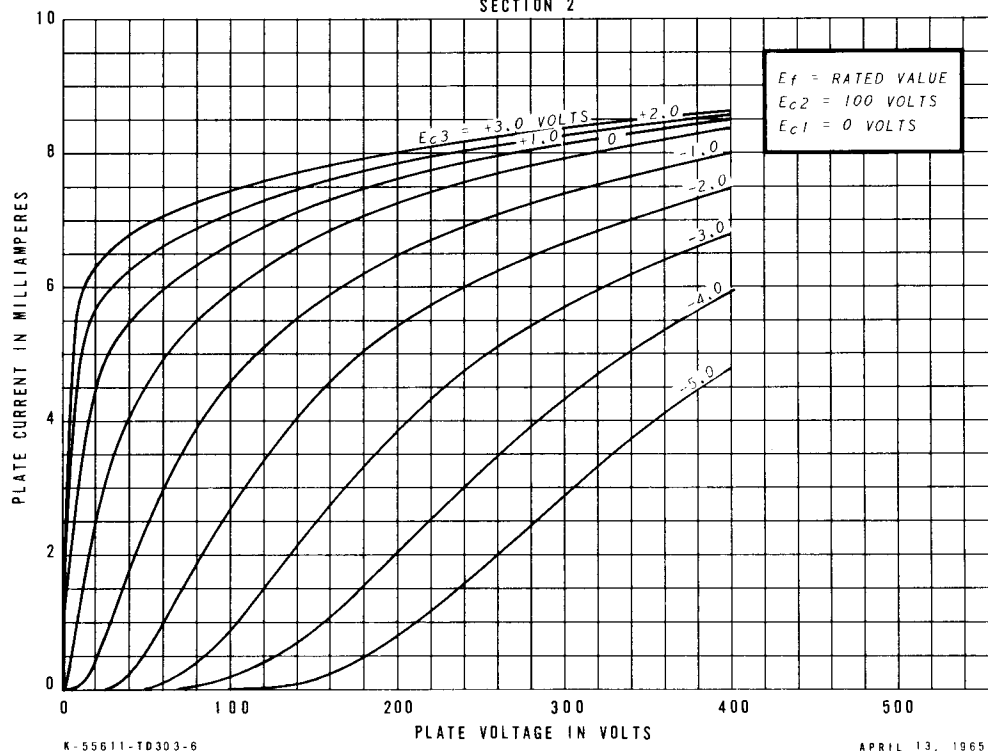
SCREEN RATING CHART

SECTION 2



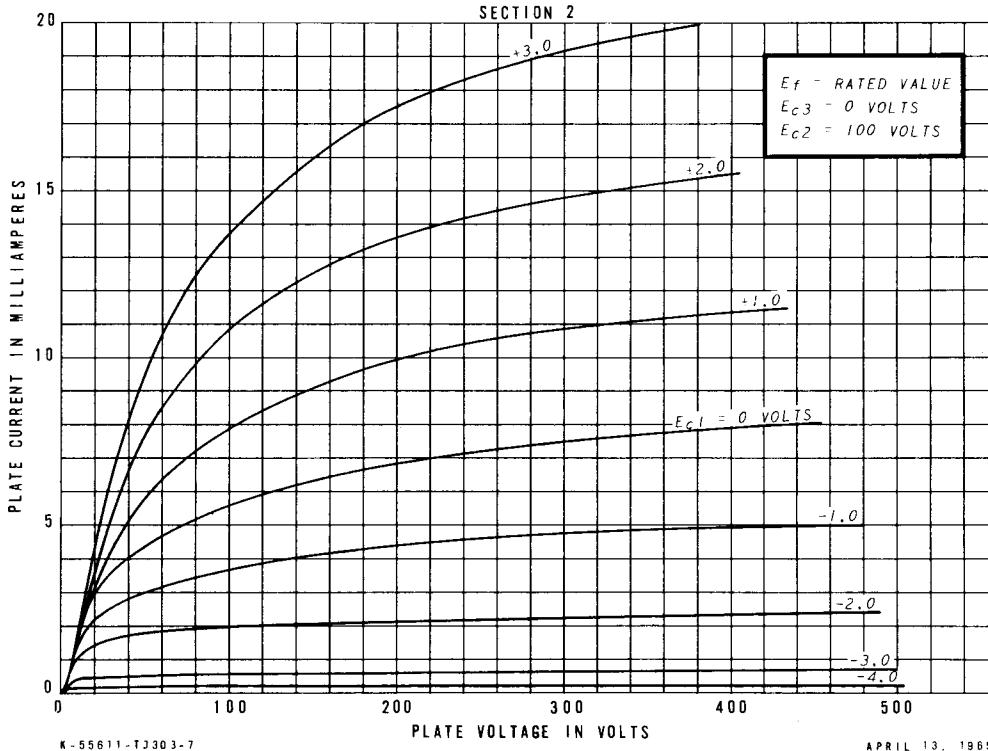
AVERAGE PLATE CHARACTERISTICS

SECTION 2



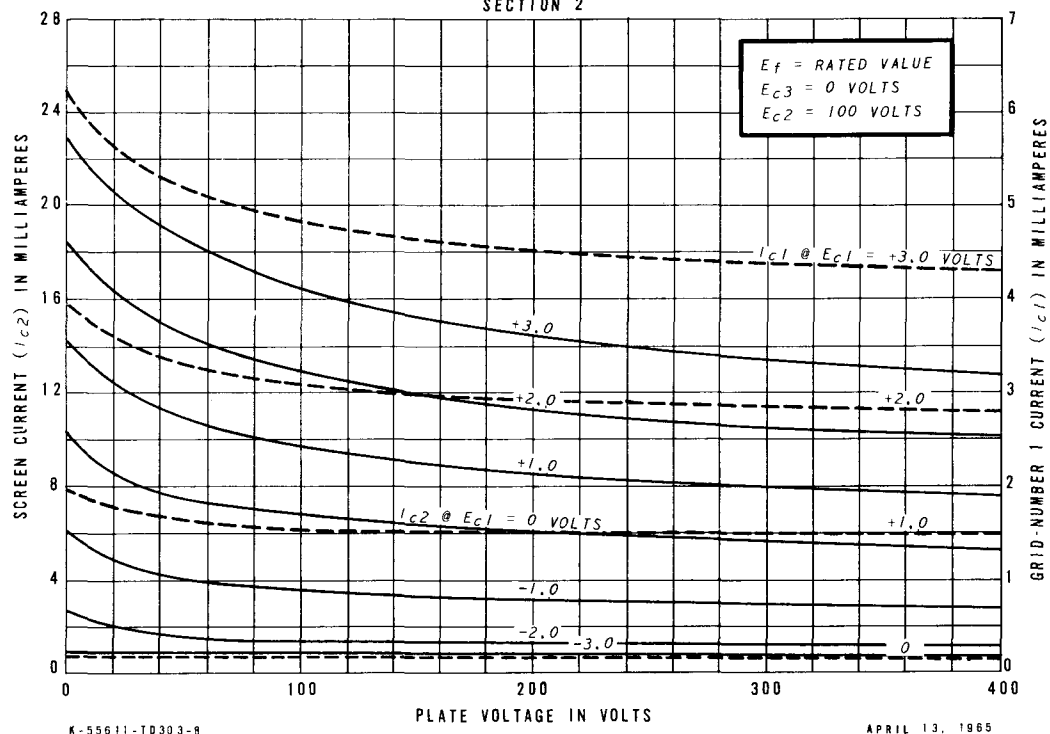
AVERAGE PLATE CHARACTERISTICS

SECTION 2



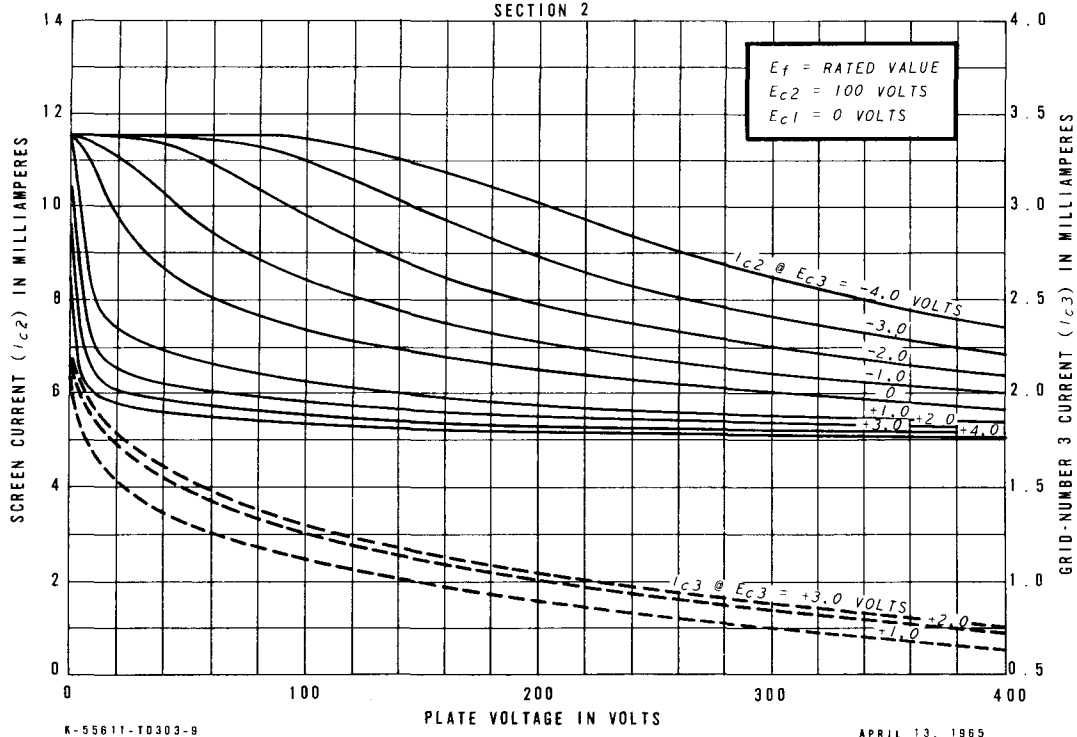
AVERAGE CHARACTERISTICS

SECTION 2

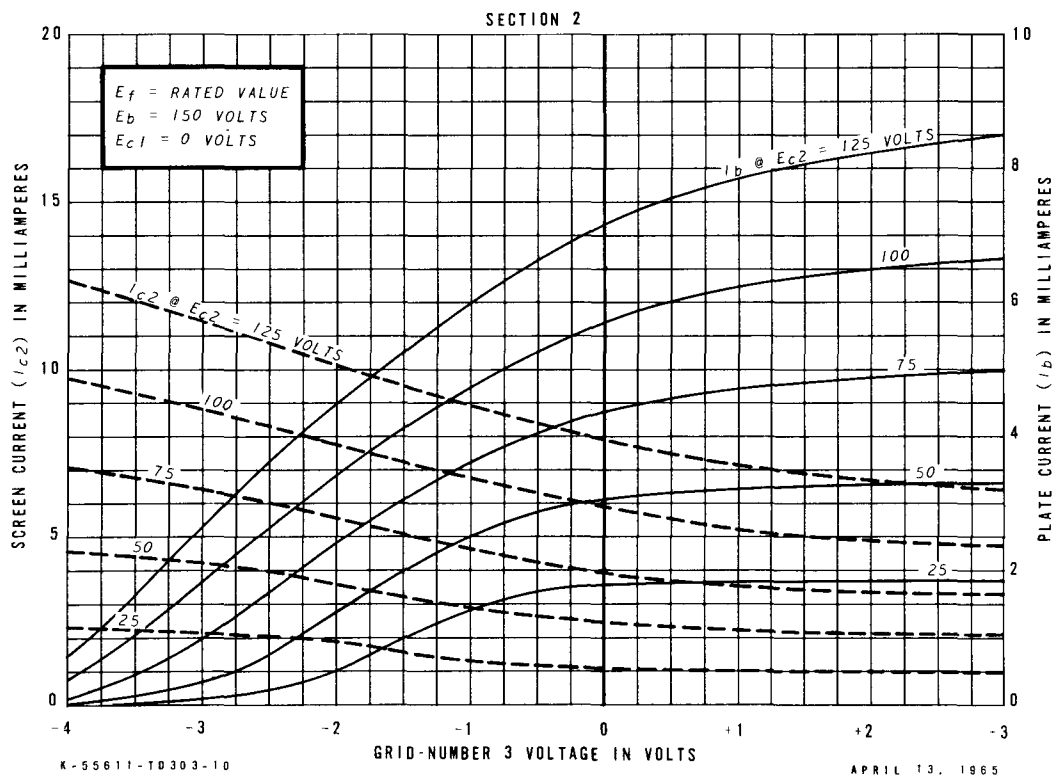


AVERAGE CHARACTERISTICS

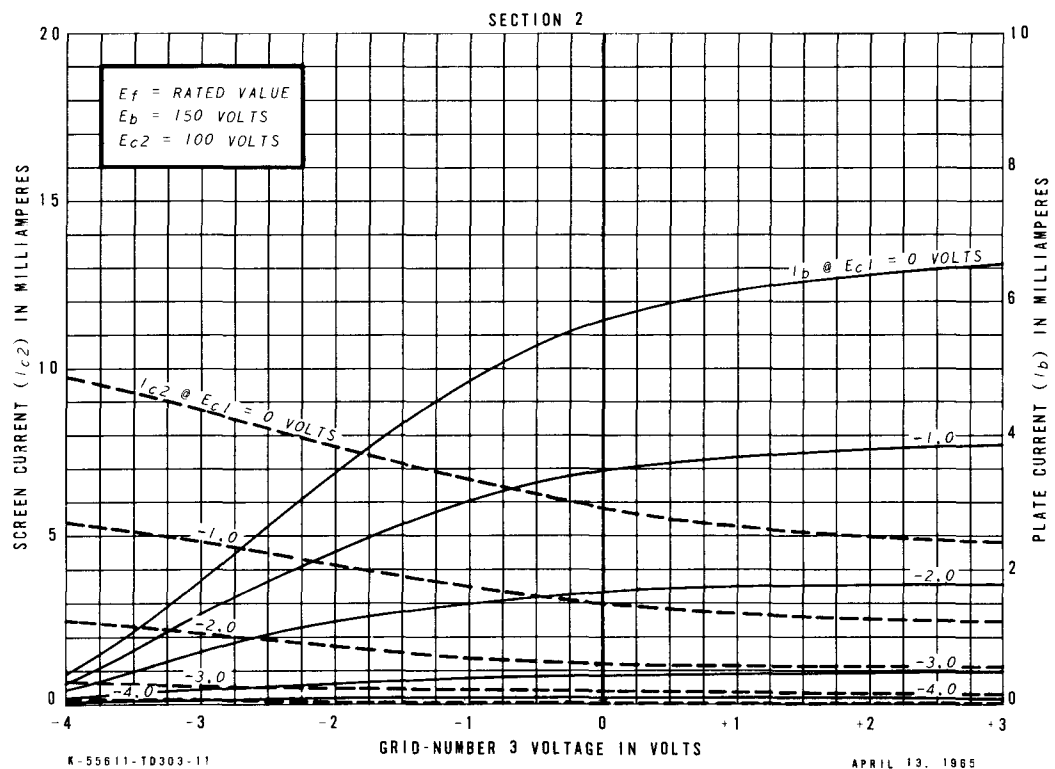
SECTION 2



AVERAGE TRANSFER CHARACTERISTICS

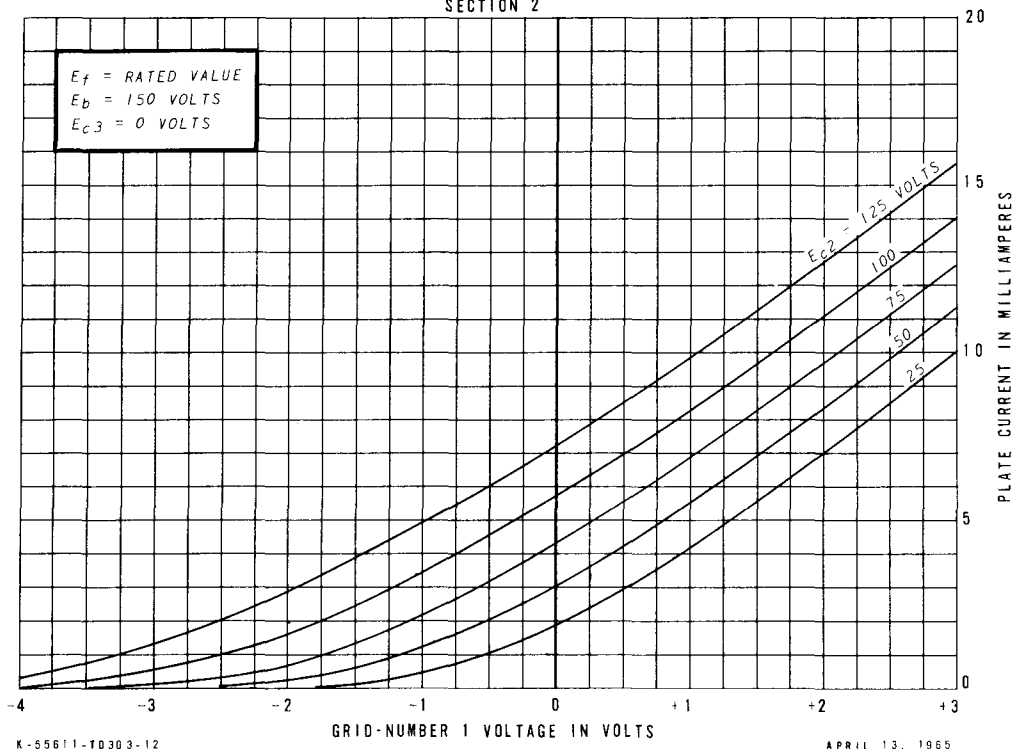


AVERAGE TRANSFER CHARACTERISTICS



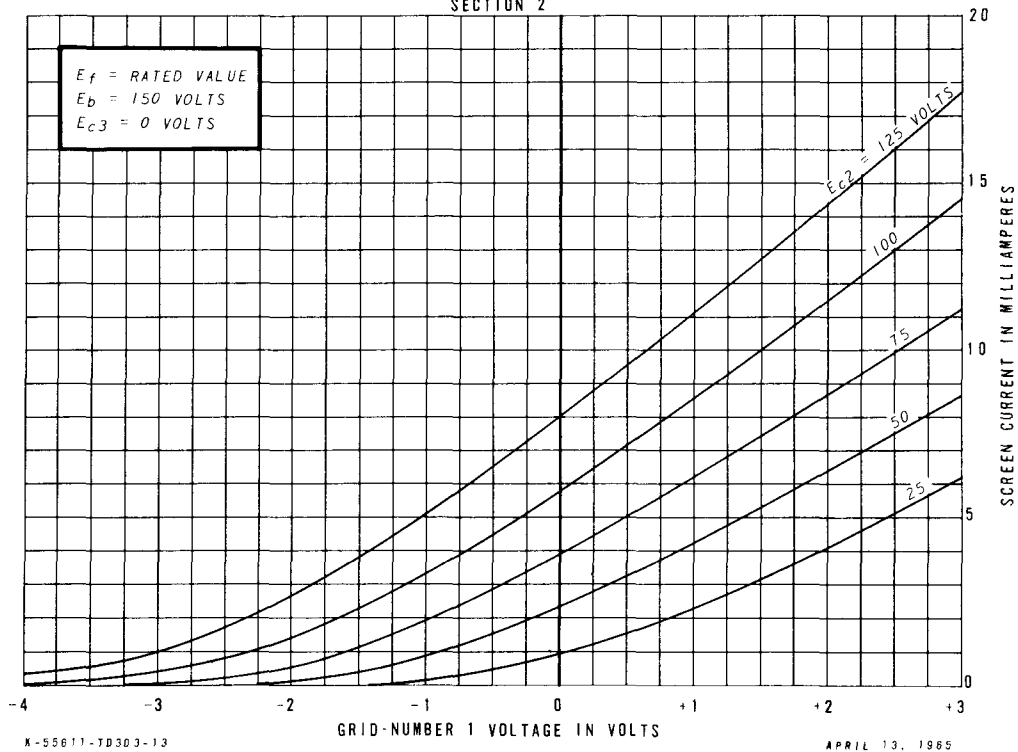
AVERAGE TRANSFER CHARACTERISTICS

SECTION 2



AVERAGE TRANSFER CHARACTERISTICS

SECTION 2



TUBE DEPARTMENT
GENERAL  ELECTRIC
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