BEAM PENTODE

FOR AF POWER-AMPLIFIER APPLICATIONS

DESCRIPTION AND RATING

The 7581-A is a beam-power pentode primarily designed for use in audio-frequency power-amplifier applications. The 7581-A is unilaterally interchangeable with the 7581 and the 6L6-GC.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC*	6.3 ± 0.6	Volts
Heater Current†	0.9	Amperes

Direct Interelectrode Capacitances, approximate‡

Grid-Number 1 to Plate: (g1 to p)	0.6	pf
Input: g1 to (h+k+b.p.+g2)	10	pf
Output: p to (h+k+b.p.+g2)	6.5	pf

MECHANICAL

Operating Position—Any

Envelope—T-12, Glass

Base—B6-148, Short Medium-Shell Octal 6-Pin Micanol

Outline Drawing—EIA 12-15

Maximum Diameter	$1\frac{9}{16}$	Inches
Maximum Over-all Length	$4\frac{1}{4}$	Inches
Maximum Seated Height	$3\frac{11}{16}$	Inches

MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES

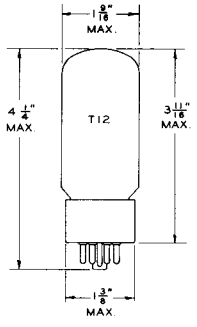
	Pentode Connection	Triode§ Connection	
Plate Voltage	500	450	Volts
Screen Voltage	450¶	...	Volts
Plate Dissipation	35	35	Watts
Screen Dissipation	5.0	...	Watts
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode	200	200	Volts
Heater Negative with Respect to Cathode	200	200	Volts
Grid-Number 1 Circuit Resistance			
With Fixed Bias	0.1	0.1	Megohms
With Cathode Bias	0.5	0.5	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.

PHYSICAL DIMENSIONS

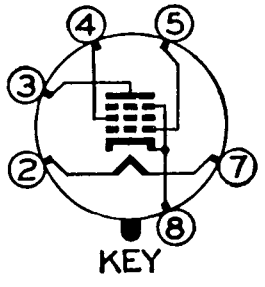


EIA 12-15

TERMINAL CONNECTIONS

Pin 2—Heater
Pin 3—Plate
Pin 4—Grid Number 2 (Screen)
Pin 5—Grid Number 1
Pin 7—Heater
Pin 8—Cathode and Beam Plates

BASING DIAGRAM



EIA 7AC

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

Plate Voltage	70	250	Volts
Screen Voltage	300	250	Volts
Grid-Number 1 Voltage	0△	−14	Volts
Plate Resistance, approximate	—	22500	Ohms
Transconductance	—	6000	Micromhos
Plate Current	210	72	Milliamperes
Screen Current	25	5.0	Milliamperes

CLASS A_1 AMPLIFIER, TRIODE CONNECTION‡

Plate Voltage	250	Volts
Grid-Number 1 Voltage	−20	Volts
Peak AF Grid-Number 1 Voltage	20	Volts
Amplification Factor	8	
Plate Resistance, approximate	1700	Ohms
Transconductance	4700	Micromhos
Zero-Signal Plate Current	40	Milliamperes
Maximum-Signal Plate Current	44	Milliamperes
Load Resistance	5000	Ohms
Total Harmonic Distortion, approximate	5	Percent
Maximum-Signal Power Output	1.4	Watts

CLASS A_1 AMPLIFIER, PENTODE CONNECTION

Plate Voltage	250	300	350	Volts
Screen Voltage	250	200	250	Volts
Grid-Number 1 Voltage	−14	−12.5	−18	Volts
Peak AF Grid-Number 1 Voltage	14	12.5	18	Volts
Plate Resistance, approximate	22500	35000	33000	Ohms
Transconductance	6000	5300	5200	Micromhos
Zero-Signal Plate Current	72	48	54	Milliamperes
Maximum-Signal Plate Current	79	55	66	Milliamperes
Zero-Signal Screen Current	5.0	2.5	2.5	Milliamperes
Maximum-Signal Screen Current	7.3	4.7	7.0	Milliamperes
Load Resistance	2500	4500	4200	Ohms
Total Harmonic Distortion, approximate	10	11	15	Percent
Maximum-Signal Power Output	6.5	6.5	10.8	Watts

PUSH-PULL CLASS A_1 AMPLIFIER, VALUES FOR TWO TUBES

Plate Voltage	250	270	Volts
Screen Voltage	250	270	Volts
Grid-Number 1 Voltage	−16	−17.5	Volts
Peak AF Grid-to-Grid Voltage	32	35	Volts
Zero-Signal Plate Current	120	134	Milliamperes
Maximum-Signal Plate Current	140	155	Milliamperes
Zero-Signal Screen Current	10	11	Milliamperes
Maximum-Signal Screen Current	16	17	Milliamperes
Effective Load Resistance, Plate-to-Plate	5000	5000	Ohms
Total Harmonic Distortion	2	2	Percent
Maximum-Signal Power Output	14.5	17.5	Watts

CHARACTERISTICS AND TYPICAL OPERATION (Cont'd)

PUSH-PULL CLASS AB_1 AMPLIFIER, VALUES FOR TWO TUBES

Plate Voltage	360	360	450	Volts
Screen Voltage	270	270	400	Volts
Grid-Number 1 Voltage	−22.5	−22.5	−37	Volts
Peak AF Grid-to-Grid Voltage	45	45	70	Volts
Zero-Signal Plate Current	88	88	116	Milliamperes
Maximum-Signal Plate Current	132	140	210	Milliamperes
Zero-Signal Screen Current	5.0	5.0	5.6	Milliamperes
Maximum-Signal Screen Current	15	11	22	Milliamperes
Effective Load Resistance, Plate-to-Plate	6600	3800	5600	Ohms
Total Harmonic Distortion	2	2	1.8	Percent
Maximum-Signal Power Output	26.5	18	55	Watts

PUSH-PULL CLASS AB_2 AMPLIFIER, VALUES FOR TWO TUBES

Plate Voltage	360	360	Volts
Screen Voltage	225	270	Volts
Grid-Number 1 Voltage	−18	−22.5	Volts
Peak AF Grid-to-Grid Voltage	52	72	Volts
Zero-Signal Plate Current	78	88	Milliamperes
Maximum-Signal Plate Current	142	205	Milliamperes
Zero-Signal Screen Current	3.5	5.0	Milliamperes
Maximum-Signal Screen Current	11	16	Milliamperes
Effective Load Resistance, Plate-to-Plate	6000	3800	Ohms
Total Harmonic Distortion	2	2	Percent
Maximum-Signal Power Output	31	47	Watts

NOTES

* The equipment designer should design the equipment so that the heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.

† Heater current of a bogey tube at Ef = 6.3 volts.

‡ Without external shield.

§ With screen connected to plate.

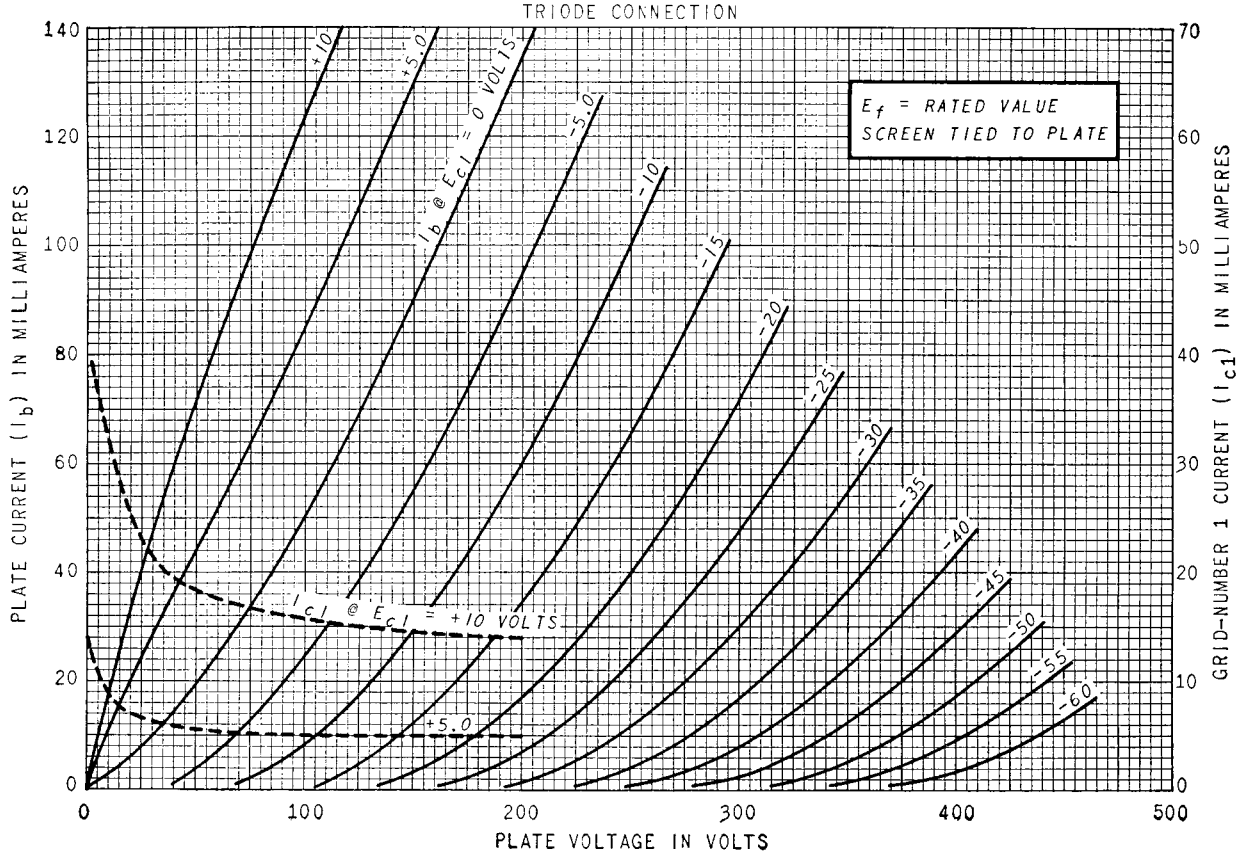
¶ The maximum screen voltage rating is 500 volts in push-pull circuits where the screen of each tube is connected to a tap on the plate winding of the output transformer.

△Applied for short interval (two seconds maximum) so as not to damage tube.

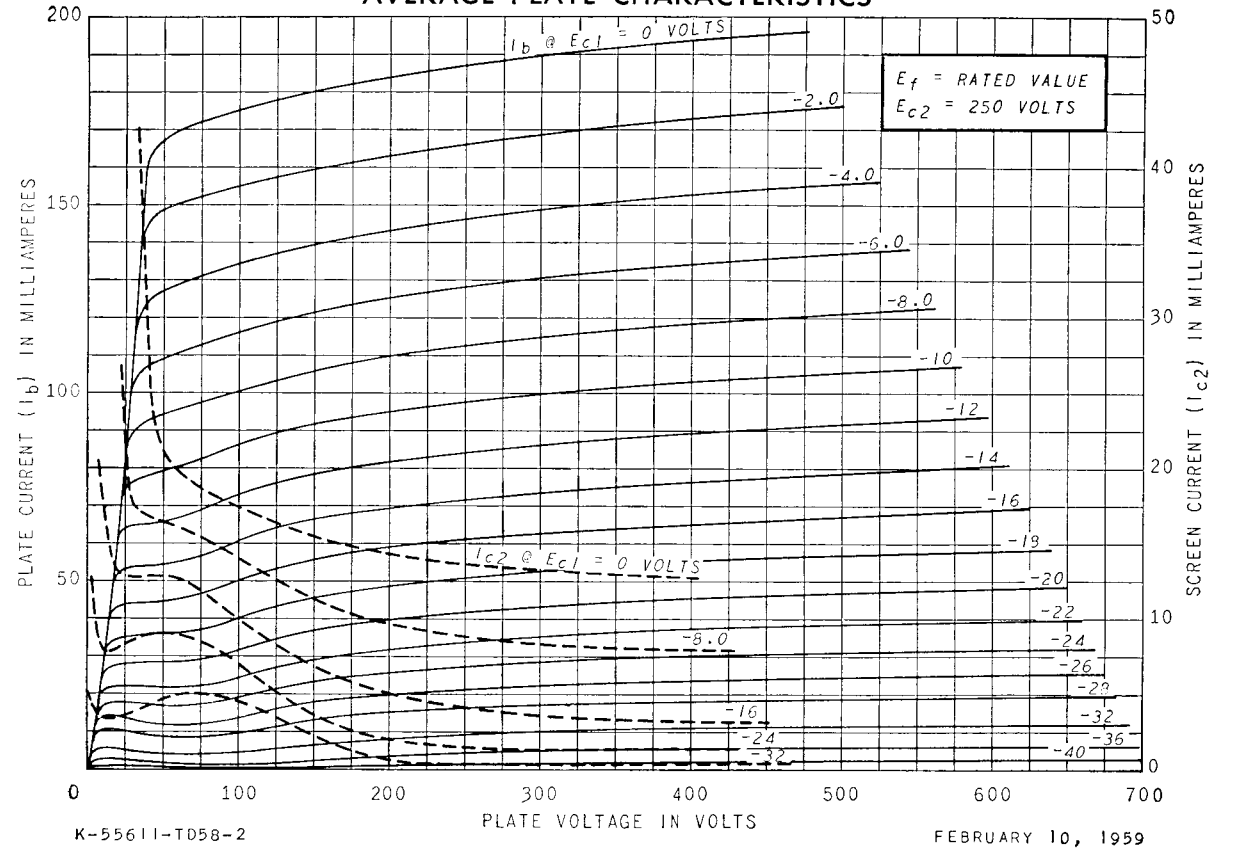
The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or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

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



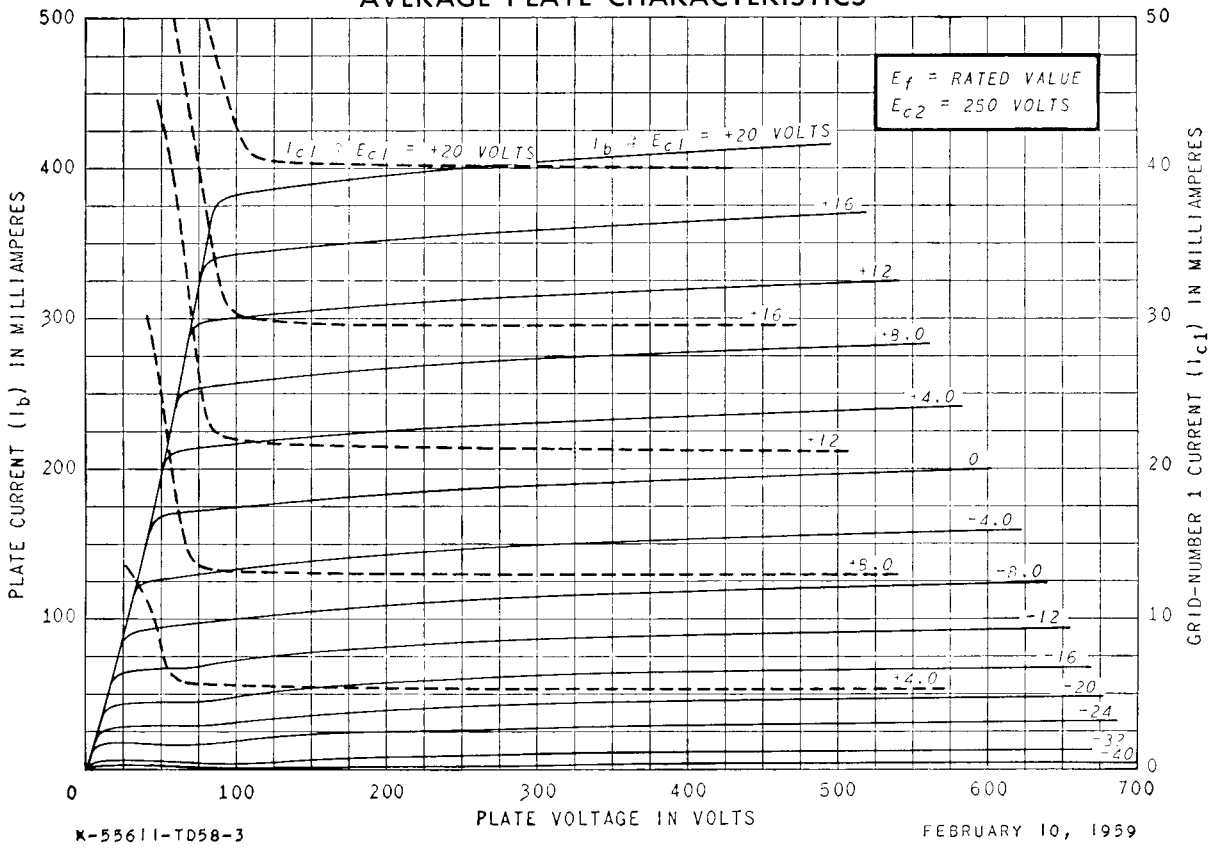
AVERAGE PLATE CHARACTERISTICS



K-55611-TD58-2

FEBRUARY 10, 1959

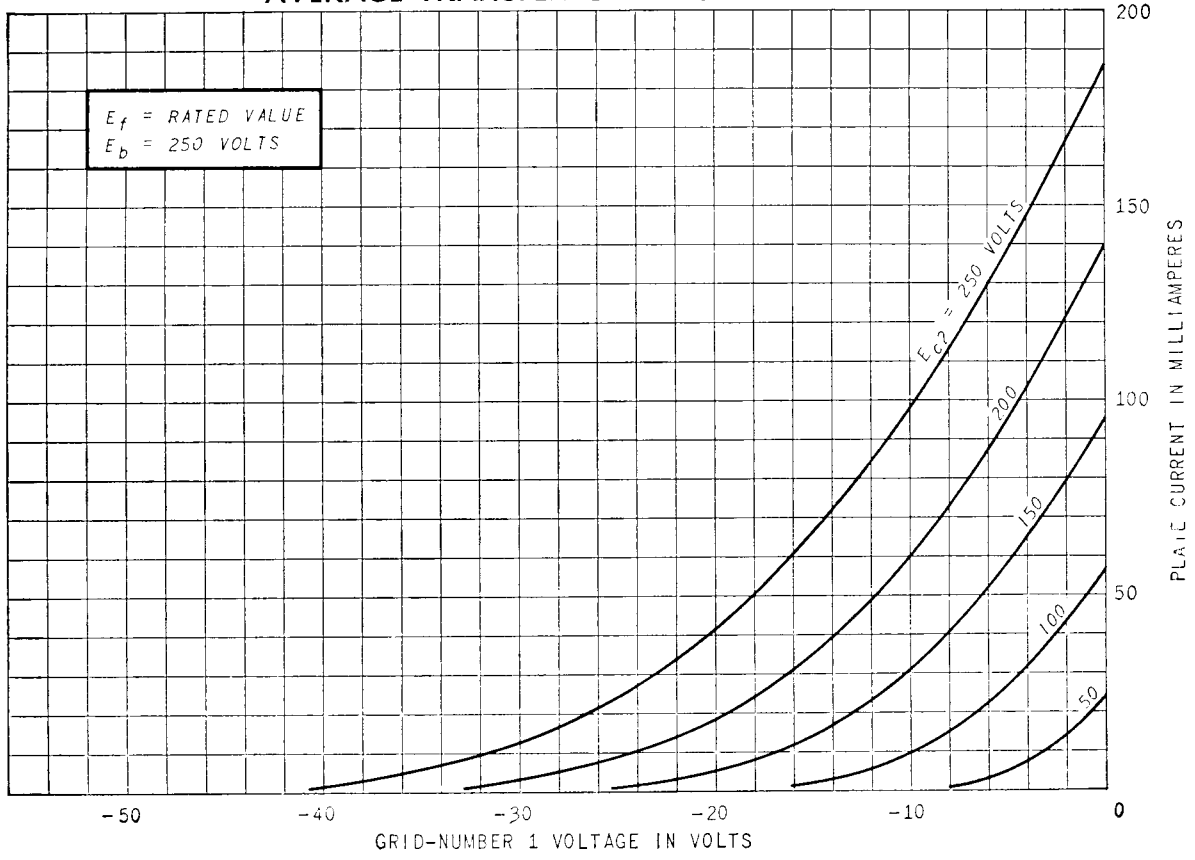
AVERAGE PLATE CHARACTERISTICS



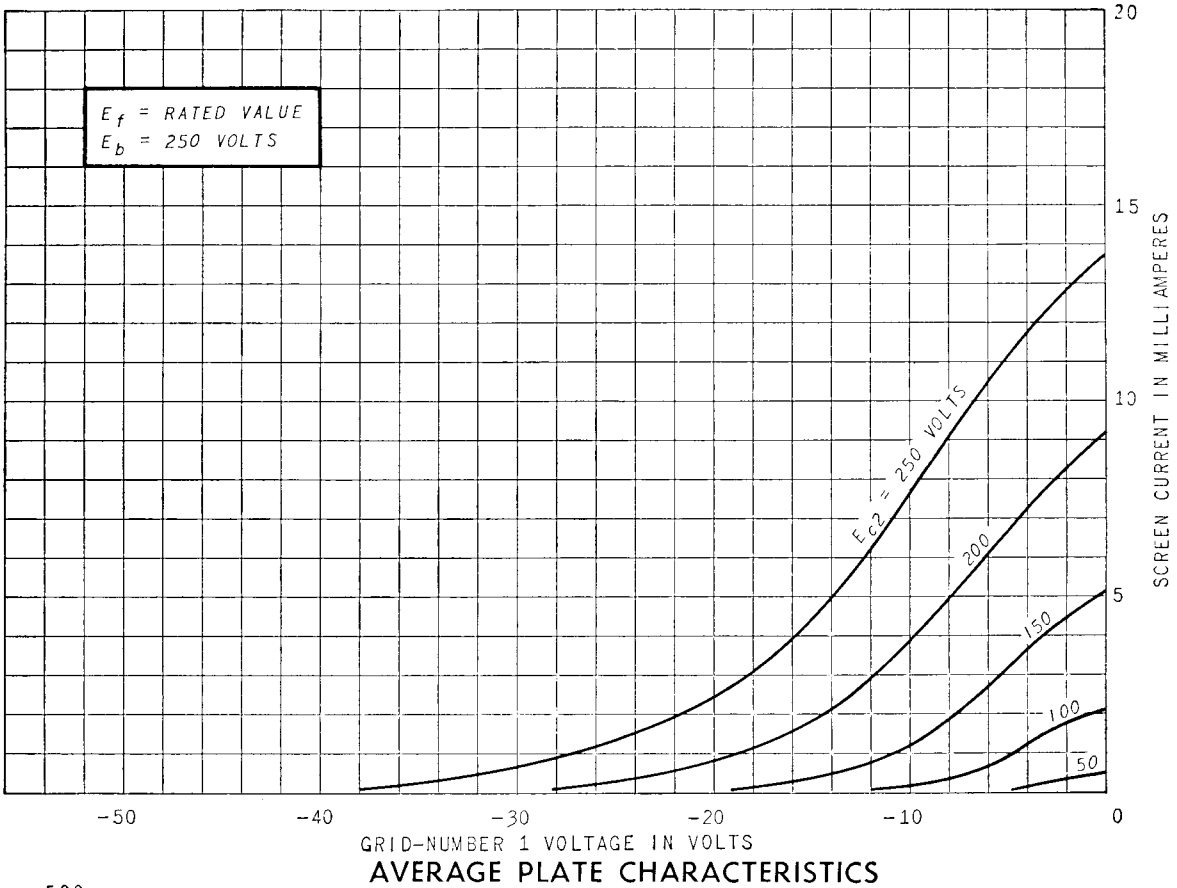
K-55611-TD58-3

FEBRUARY 10, 1959

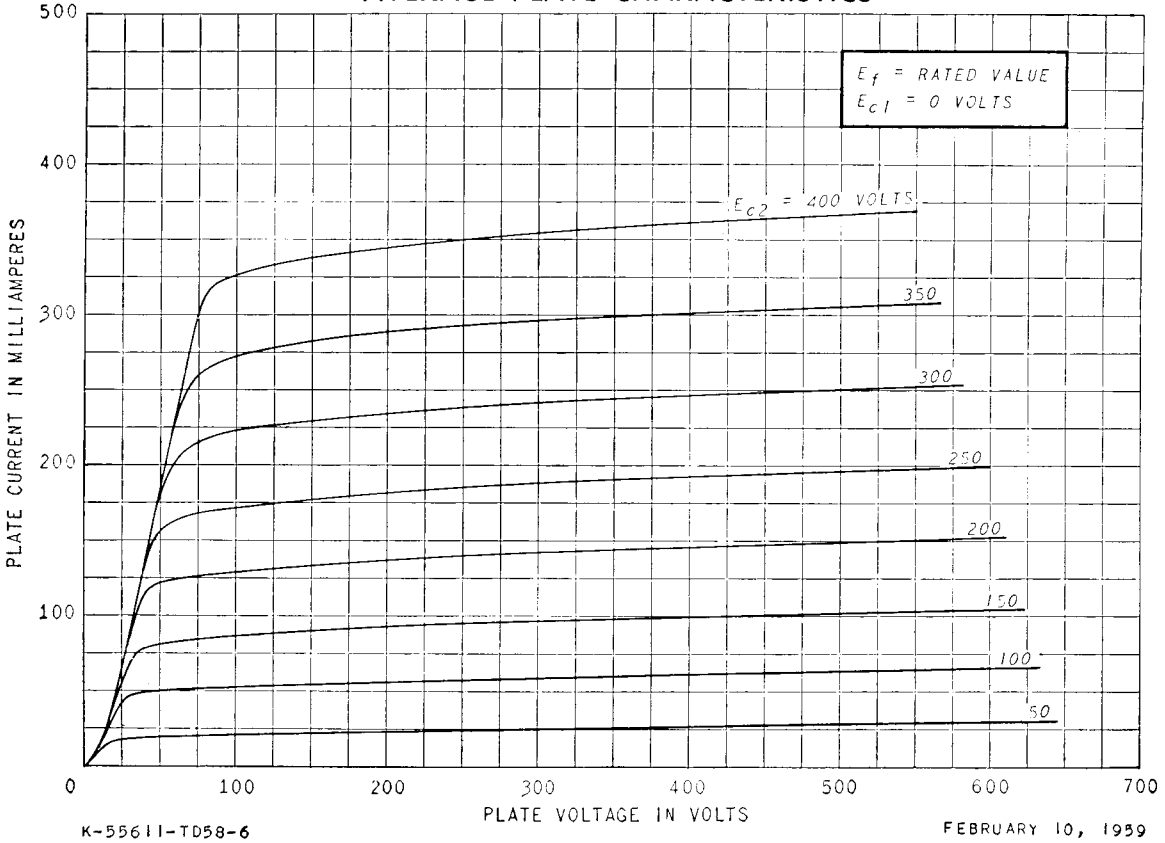
AVERAGE TRANSFER CHARACTERISTICS



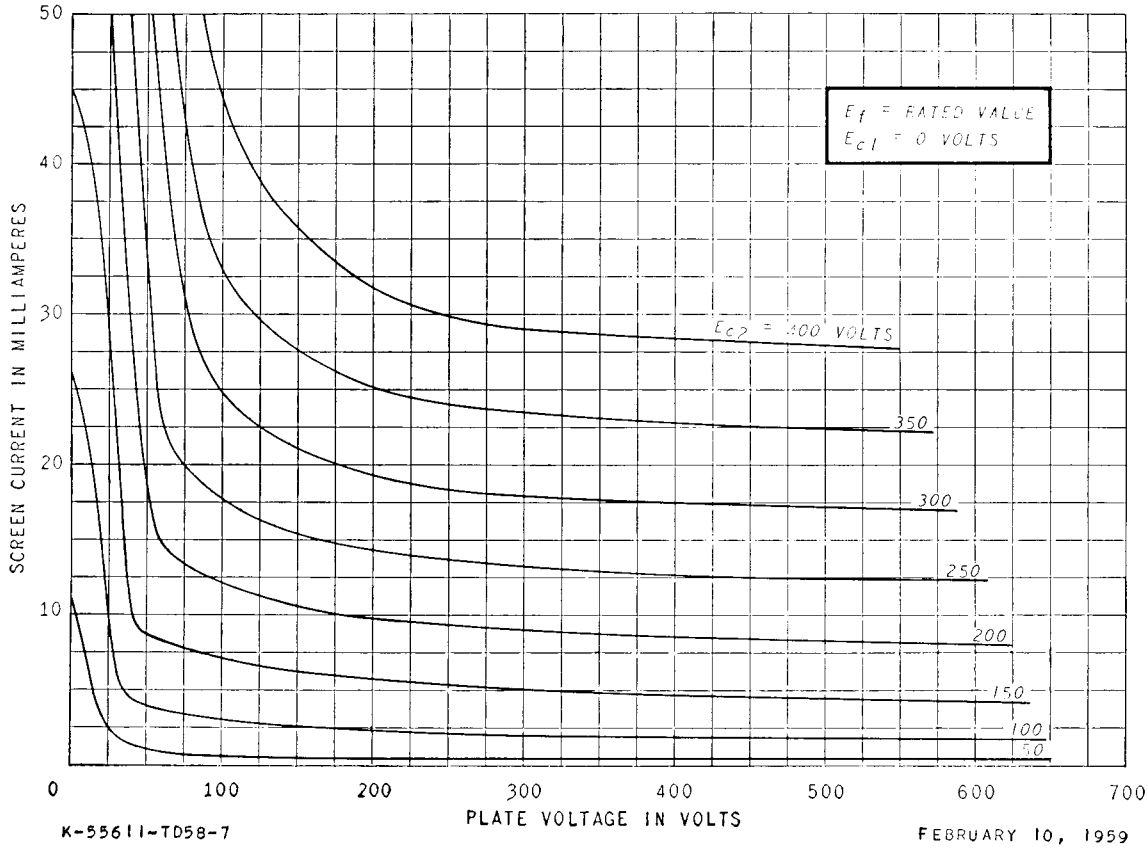
AVERAGE TRANSFER CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS



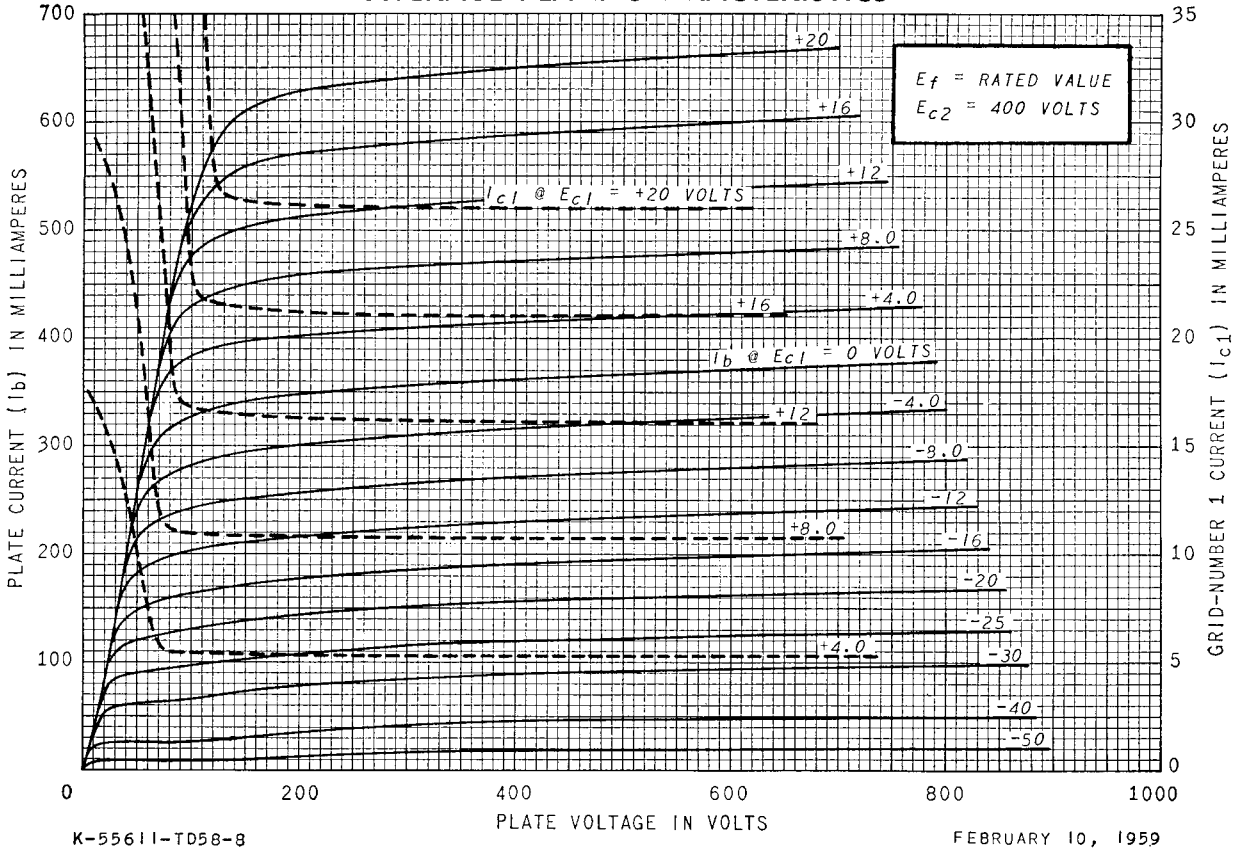
AVERAGE SCREEN CHARACTERISTICS



K-5561I-TD58-7

FEBRUARY 10, 1959

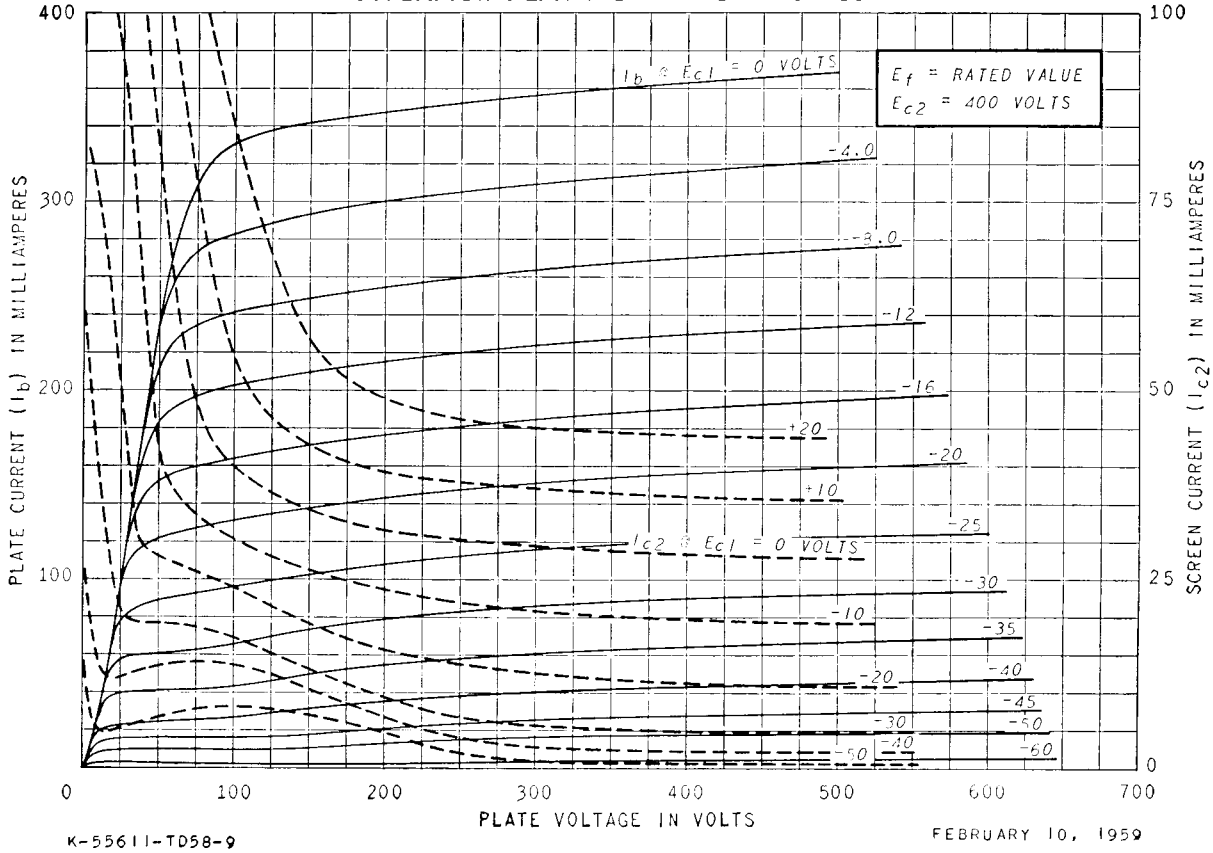
AVERAGE PLATE CHARACTERISTICS



K-5561I-TD58-8

FEBRUARY 10, 1959

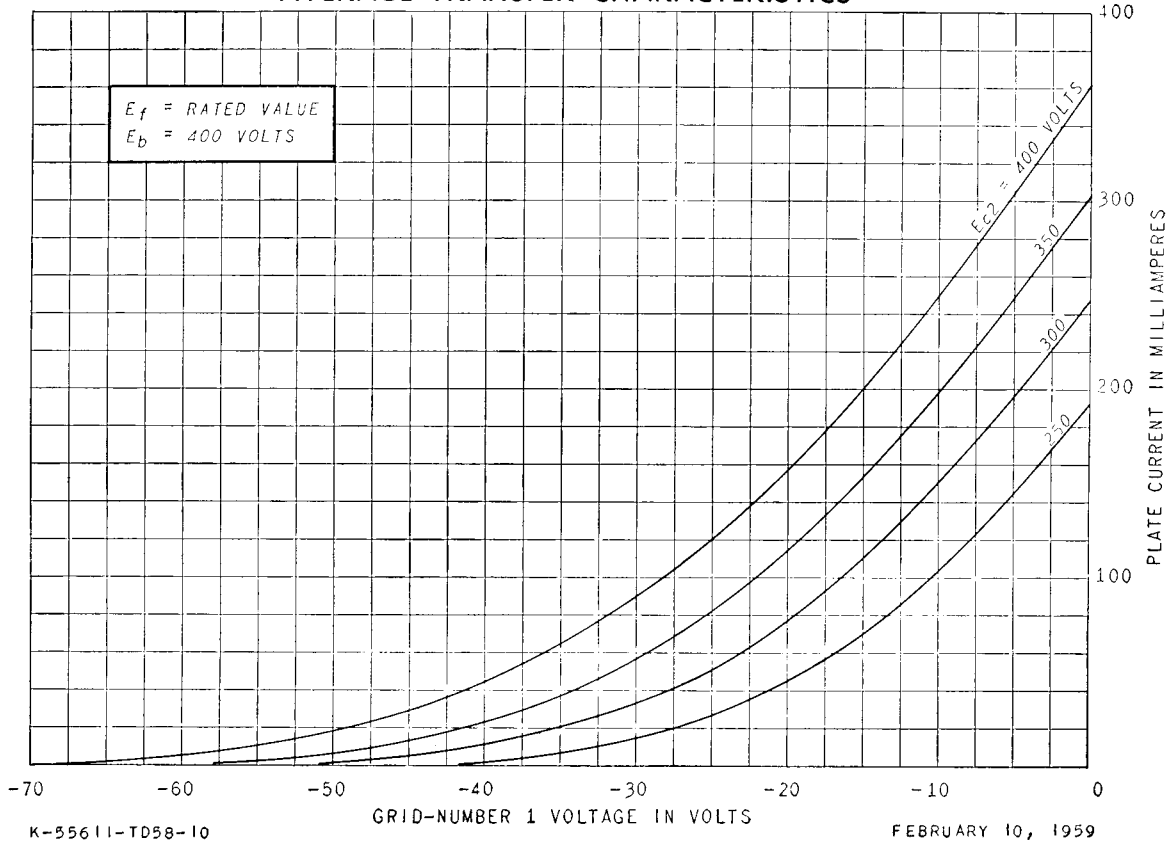
AVERAGE PLATE CHARACTERISTICS



K-55611-TD58-9

FEBRUARY 10, 1959

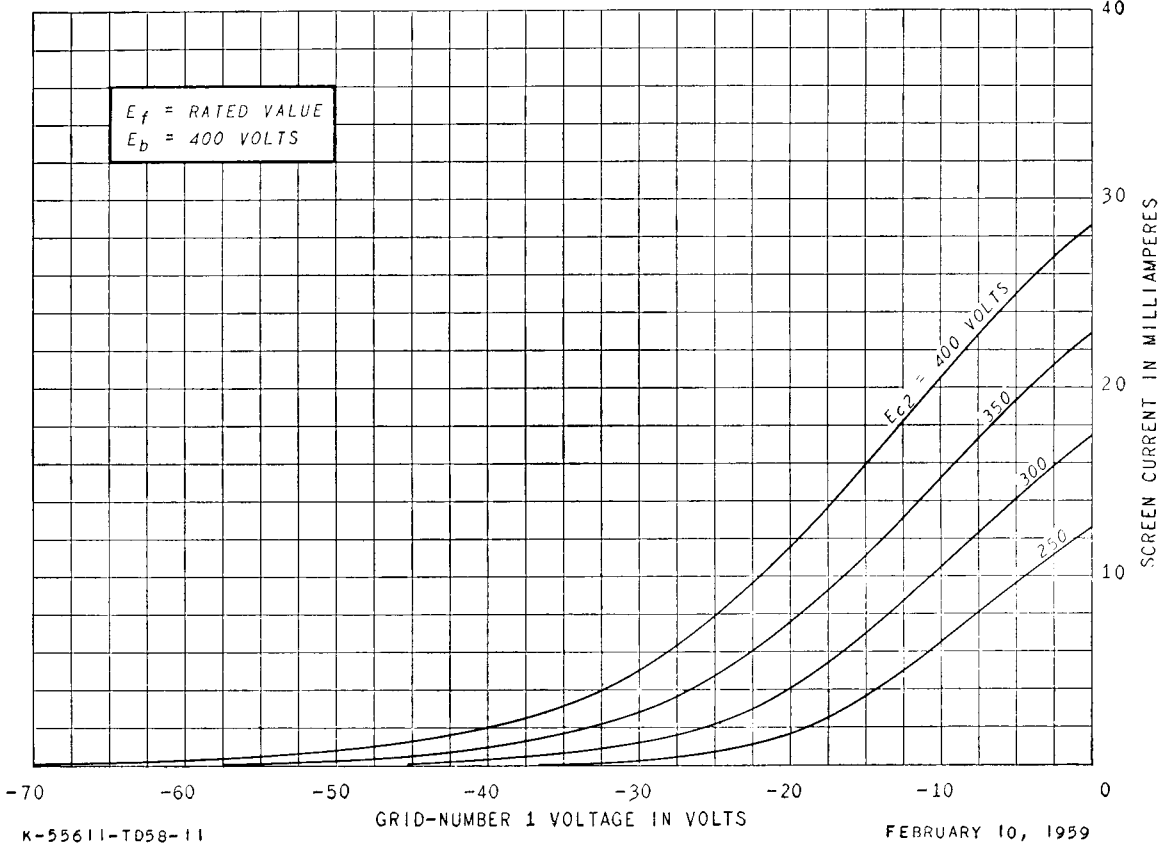
AVERAGE TRANSFER CHARACTERISTICS



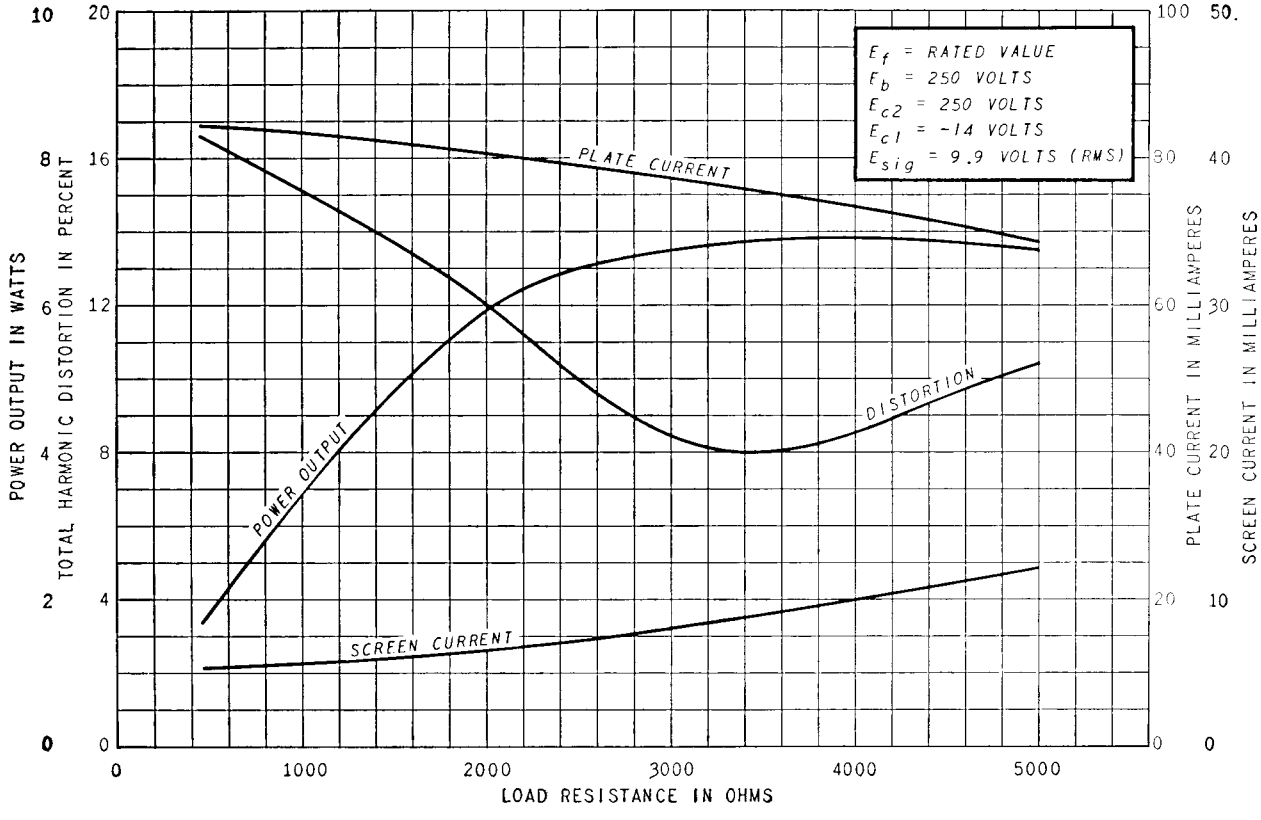
K-55611-TD58-10

FEBRUARY 10, 1959

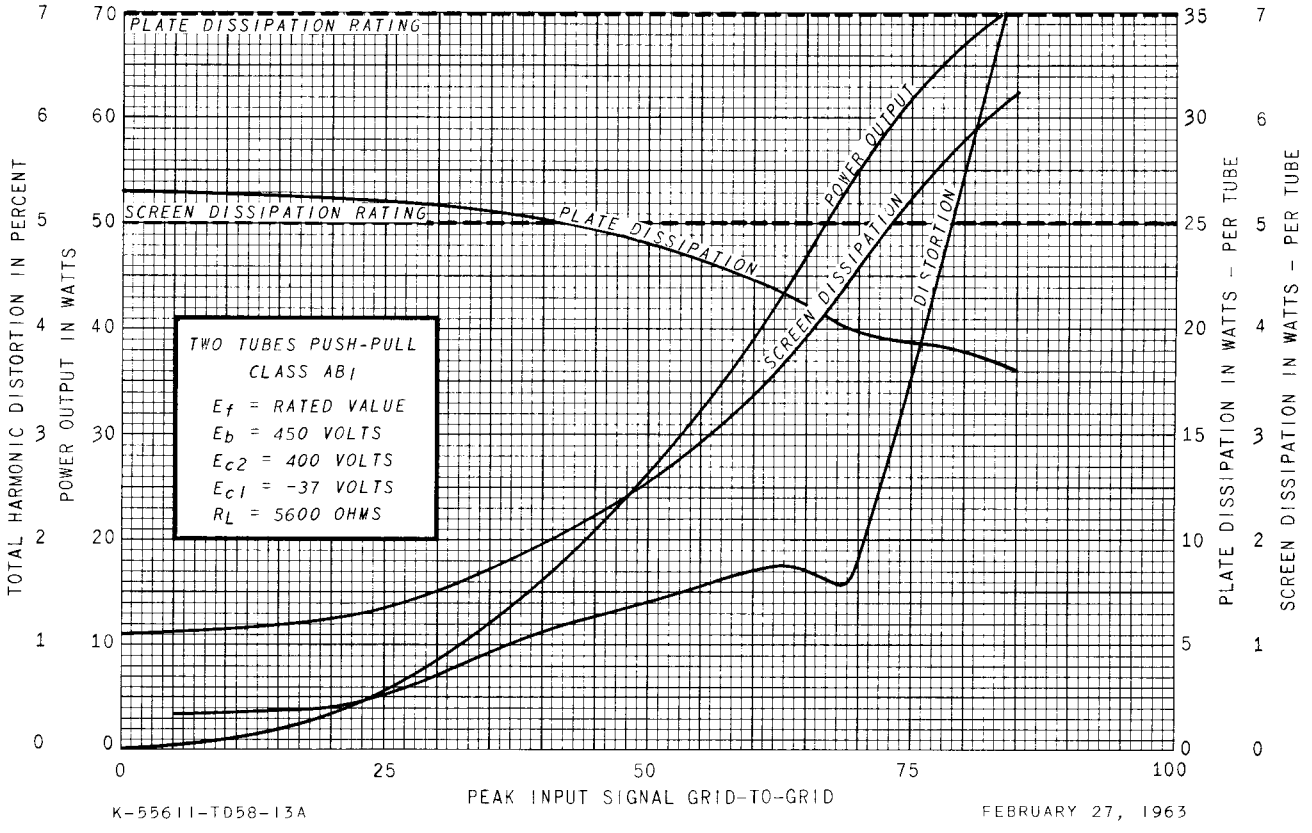
AVERAGE TRANSFER CHARACTERISTICS



OPERATION CHARACTERISTICS



OPERATION CHARACTERISTICS



RECEIVING TUBE DEPARTMENT

GENERAL ELECTRIC

Owensboro, Kentucky