

AMPEREX TUBE TYPE 7854

TENTATIVE DATA

The Amperex 7854 is a twin, four-electrode tube designed for use as a radio frequency power amplifier, oscillator, modulator and frequency multiplier. Each anode is capable of dissipating 30 watts. The cathode is indirectly heated, oxide coated. Maximum ratings apply up to 175 mc. At reduced ratings it may be operated up to 500 mc. The tube has built-in cross-neutralizing capacitors, the values of which are adjusted to be equal to the direct grid-plate capacities. This insures neutralization over the entire operating band. The plate characteristics of the 7854 are identical to the Amperex tube type 5894.

GENERAL CHARACTERISTICS

MECHANICAL

Mounting Position	Vertical, base up or down Horizontal with anode pins in any plane, horizontal plane preferred.
Maximum Glass and Seal Temperatures ¹	250°C
Accessories	
Socket	Johnson 122-105 or equal
Net Weight, Approx.	2.5 ounces

ELECTRICAL

	<u>Min.</u>	<u>Bogey</u>	<u>Max</u>
Heater Voltage			
Series	11.4	12.6	13.8 volts
Parallel	5.7	6.3	6.9 volts
Heater Current at Bogey Voltage			
Series	0.8	0.9	1.0 amps
Parallel	1.6	1.8	2.0 amps
Amplification Factor (Each Section)			
G1 - G2 Mu at Eb = 600 volts			
Ec2 = 250 volts, Ib = 40 ma	6.7	8.2	9.6
Direct Interelectrode Capacitances (Unit not Under Test, Tied to Ground)			
	<u>Push-Pull</u>	<u>Per Unit</u>	
	<u>Bogey</u>	<u>Min.</u>	<u>Max.</u>
Grid to Plate	- - -	0.06	0.09 $\mu\mu\text{f}$
Input	6.7	9.4	11.6 $\mu\mu\text{f}$
Output	2.1	2.6	3.7 $\mu\mu\text{f}$

¹ When operating the tube at maximum ratings, with forced air cooling, it is necessary to cool both the lateral bulb surface as well as the plate pin seals by directing the flow of air toward the top and sides of the bulb. In most cases approximately 20 cfm is sufficient. At reduced ratings, the use of a heat sink is permissible. However, regardless of the type of cooling being used, the degree of cooling should be determined by direct temperature measurement of both the seals and the bulb.

The temperature may be measured by means of temperature sensitive compounds such as Tempolaq, made by the Tempil Corp., New York, N.Y.

**Push-Pull RF Power Amplifier and Oscillator
Class C Telegraphy
Forced Air Cooling
Maximum Ratings, Absolute Values**

	CCS	ICAS
Frequency	175	175 Mc max.
D.C. Plate Voltage	1000	1000 volts max.
D.C. Grid No. 2 Voltage	300	300 volts max.
D.C. Grid No. 1 Voltage	-175	-175 volts max.
D.C. Plate Current	2x110	2x120 ma max.
D.C. Grid No. 1 Current	2x5	2x5 ma max.
Grid No. 2 Dissipation	7	8 watts max.
Plate Dissipation	2x30	2x34 watts max.
Plate Input	2x100	2x120 watts max.
Heater-Cathode Voltage	100	100 volts max.

Typical Operation

	CCS	CCS	ICAS	ICAS
D.C. Plate Voltage	900	1000	900	1000 volts
D.C. Grid No. 2 Voltage	244	230	260	262 volts
D.C. Grid No. 1 Voltage				
Fixed or from common resistor of	2x30	2x30	2x30	2x30 Kohm
D.C. Plate Current	2x110	2x100	2x120	2x120 ma
D.C. Grid No. 2 Current	12.5	11.2	17.0	16.5 ma
D.C. Grid No. 1 Current	5.9	5.7	5.7	5.7 ma
Driving Power ²	3.5	3.5	3.5	3.5 watts
Power Output ³	132	125	147	163 watts
Efficiency	66.6	62.5	68	68 %
Frequency	175	175	175	175 Mc

**Push-Pull RF Power Amplifier and Oscillator
Class C Telegraphy
Heat Sink Operation**

Maximum Ratings, Absolute Values

	CCS	ICAS
Frequency	175	175 Mc max
DC Plate Voltage	800	800 volts max
DC Grid No. 2 Voltage	300	300 volts max
DC Grid No. 1 Voltage	-175	-175 volts max
DC Plate Current	2x110	2x120 ma max
DC Grid No. 1 Current	2x5	2x5 ma max
Grid No. 2 Dissipation	7	8 watts max
Plate Dissipation	2x30	2x34 watts max
Plate Input	2x82.5	2x92.5 watts max
Heater-Cathode Voltage	100	100 volts max

Typical Operation

	CCS	ICAS
DC Plate Voltage	750	750 volts
DC Grid No. 2 Voltage	230	260 volts
DC Grid No. 1 Voltage		
Fixed or from common resistor of	2x30	2x30 k ohms
DC Plate Current	2x105	2x120 ma
DC Grid No. 2 Current	8.0	12.7 ma
DC Grid No. 1 Current	5.5	5.5 ma
Driving Power ²	3.0	3.5 watts
Power Output ³	105	123 watts
Efficiency	66.6	68.2 %
Frequency	175	175 mc

² Includes circuit losses as measured in a laboratory test amplifier.

³ Actual measured power delivered to a load.

**Plate and Screen Grid Modulated RF Power Amplifier
Class C Telephony Push-Pull**

Carrier conditions per tube for use with a maximum modulation factor of 1.0⁴
Forced Air Cooling

Maximum Ratings, Absolute Values

	CCS	ICAS
Frequency	175	175 Mc max.
DC Plate Voltage	800	800 volts max.
DC Grid No. 2 Voltage	250	250 volts max.
DC Grid No. 1 Voltage	-175	-175 volts max.
DC Plate Current	2x92	2x100 ma max.
DC Grid No. 1 Current	2x5	2x5 ma max.
Grid No. 2 Dissipation	5	5.5 watts max.
Plate Dissipation	2x21	2x23.5 watts max.
Plate Input	2x70	2x80 watts max.
Heater-Cathode Voltage	100	100 volts max.

Typical Operation

DC Plate Voltage	750	800 volts
DC Grid No. 2 Voltage	250	225 volts
DC Grid No. 1 Voltage		
fixed or from common resistor of		2x30 Kohm
DC Plate Current	2x90	2x100 ma
DC Grid No. 2 Current	10.4	8.8 ma
DC Grid No. 1 Current	4.4	5.0 ma
Driving Power ²	3.4	3.0 watts
Power Output ³	85	107 watts
Efficiency	63	66.9 %
Frequency	175	175 Mc

**Plate and Screen Grid Modulated RF Power Amplifier
Class C Telephony Push-Pull**

Carrier conditions per tube for use with a maximum modulation factor of 1.0
Heat Sink Operation

Maximum Ratings, Absolute Values

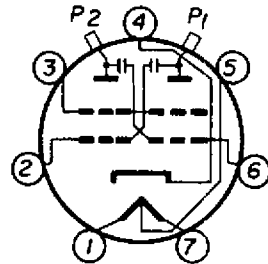
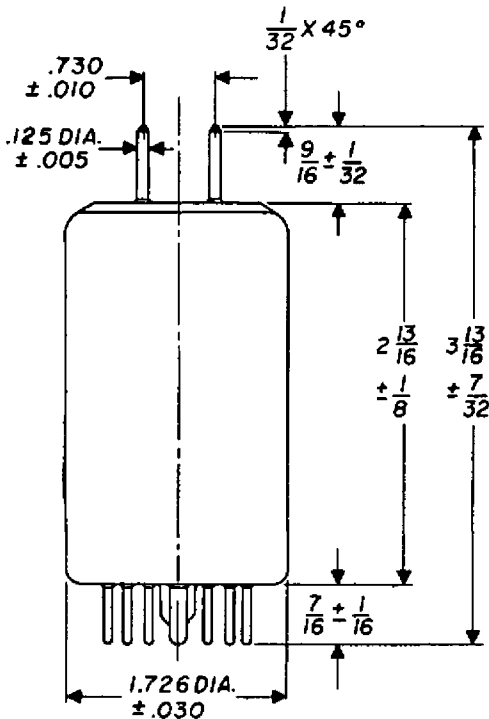
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Frequency	175	175 Mc max.
DC Plate Voltage	640	640 volts max
DC Grid No. 2 Voltage	250	250 volts max
DC Grid No. 1 Voltage	-175	-175 volts max
DC Plate Current	2x92	2x100 ma max
DC Grid No. 1 Current	2x5	2x5 ma max
Grid No. 2 Dissipation	5	5.5 watts max
Plate Dissipation	2x21	2x23.5 watts max
Plate Input	2x57.5	2x64 watts max
Heater-Cathode Voltage	100	100 volts max

Typical Operation

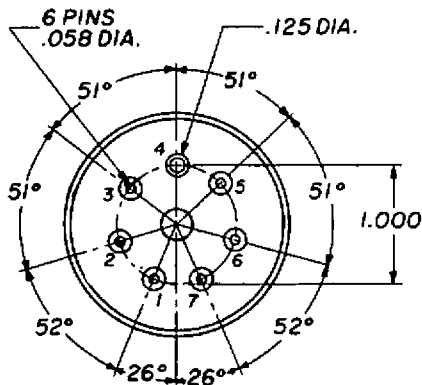
	CCS	CCS	ICAS
DC Plate Voltage	600	500	600 volts
DC Grid No. 2 Voltage	210	200	225 volts
DC Grid No. 1 Voltage			
Fixed or from common-resistor of	2x30	2x30	2x30 k ohms
DC Plate Current	2x92	2x90	2x100 ma
DC Grid No. 2 Current	7.5	6.4	7.8 ma
DC Grid No. 1 Current	5.5	5.6	5.5 ma
Driving Power ²	3.5	3.5	3.5 watts
Power Output ³	80.0	64	85 watts
Efficiency	72.5	71	70.8 %
Frequency	175	175	175 mc

⁴ Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

7854



BASE-BOTTOM VIEW



- PIN 1 - HEATER
- PIN 2 - GRID NO.1 OF UNIT NO.2
- PIN 3 - GRID NO.2
- PIN 4 - CATHODE & INTERNAL SHIELD
- PIN 5 - HEATER CENTER TAP
- PIN 6 - GRID NO.1 OF UNIT NO.1
- PIN 7 - HEATER
- P1 - PLATE OF UNIT NO.1
- P2 - PLATE OF UNIT NO.2

PLATE CHARACTERISTICS

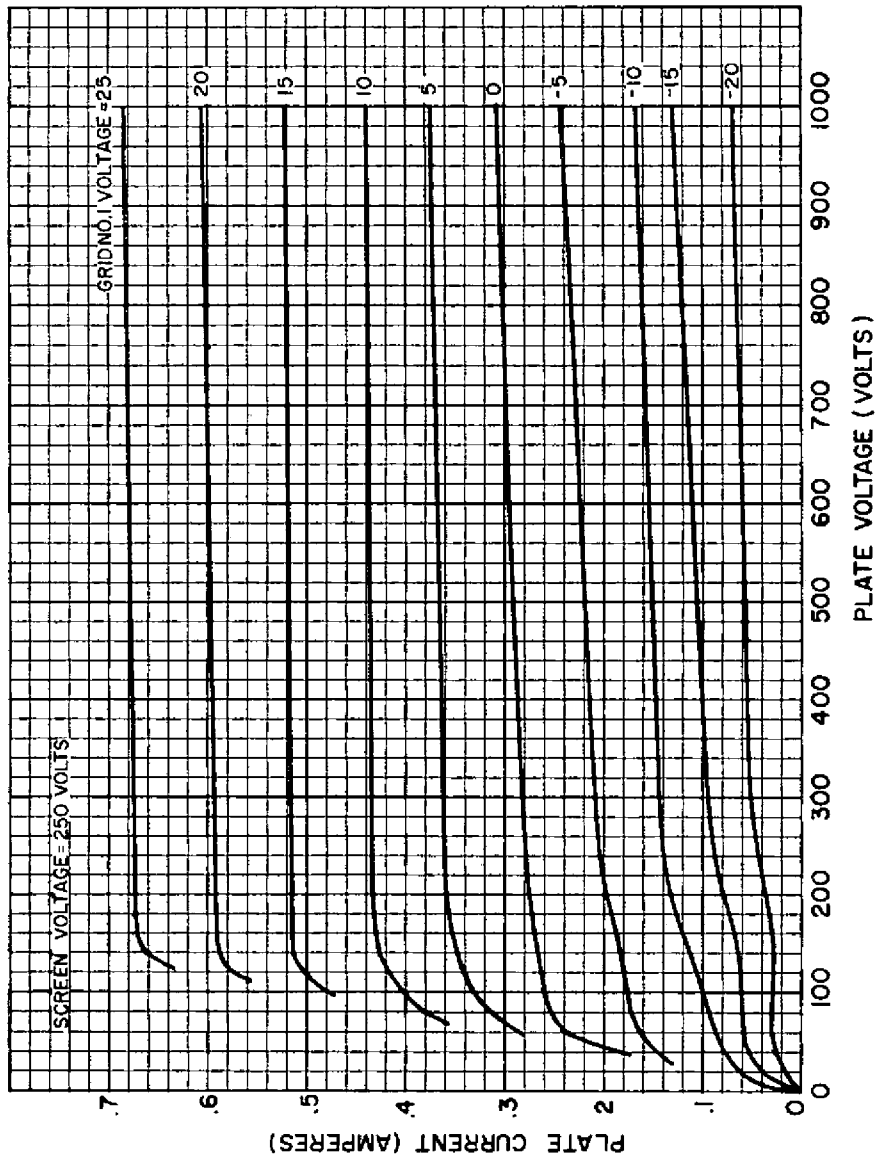
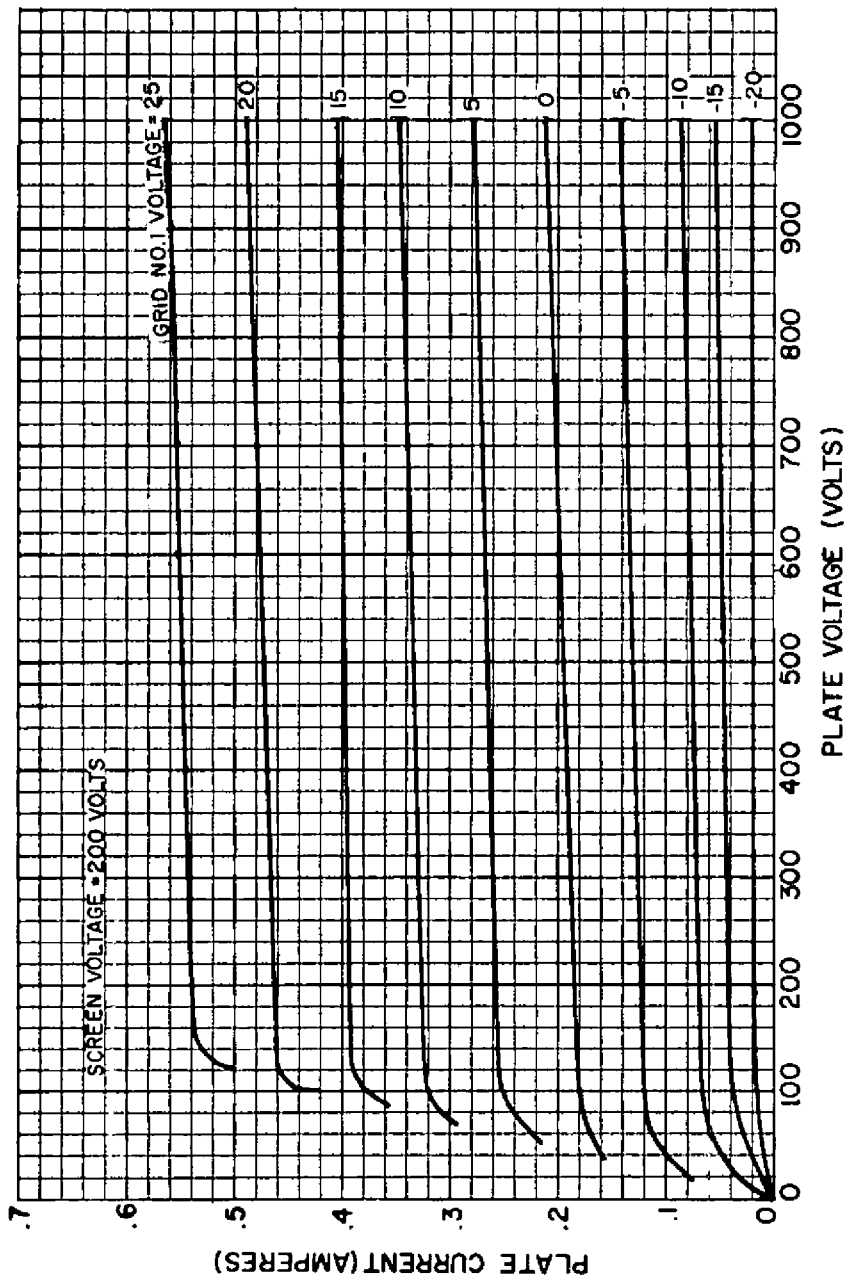
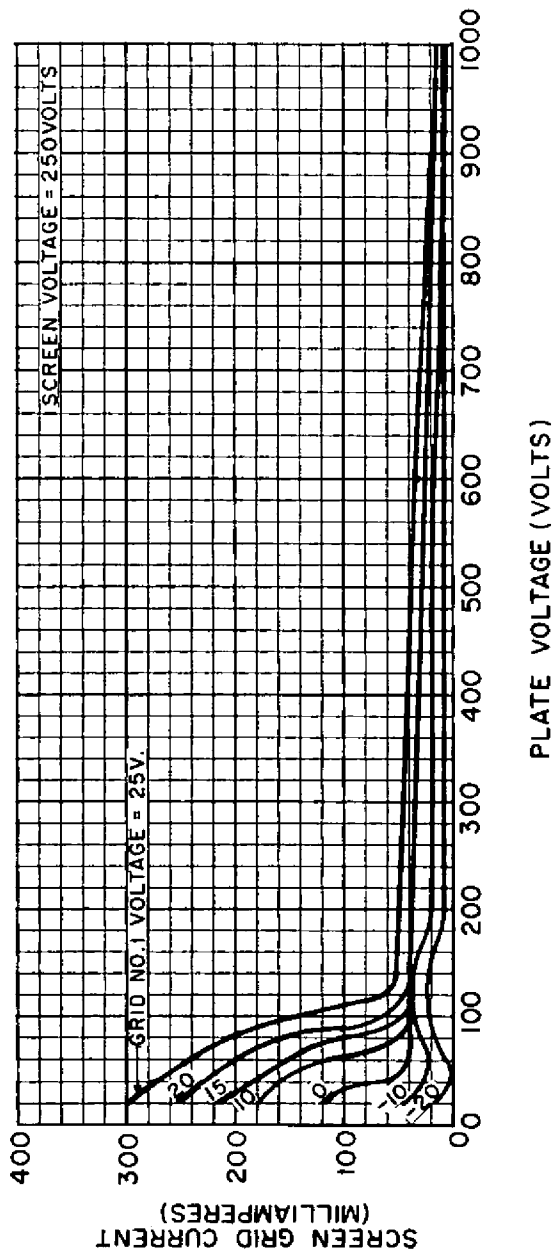


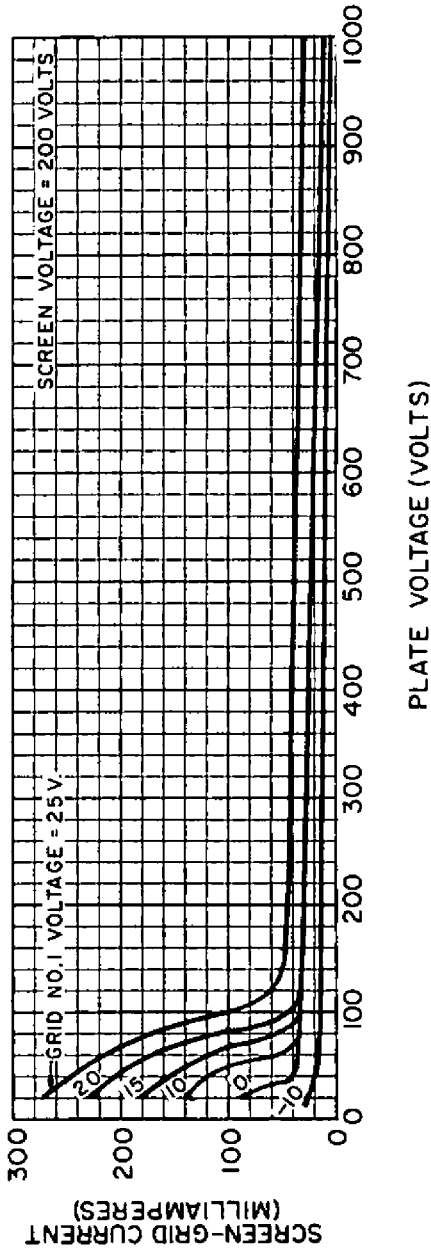
PLATE CHARACTERISTICS



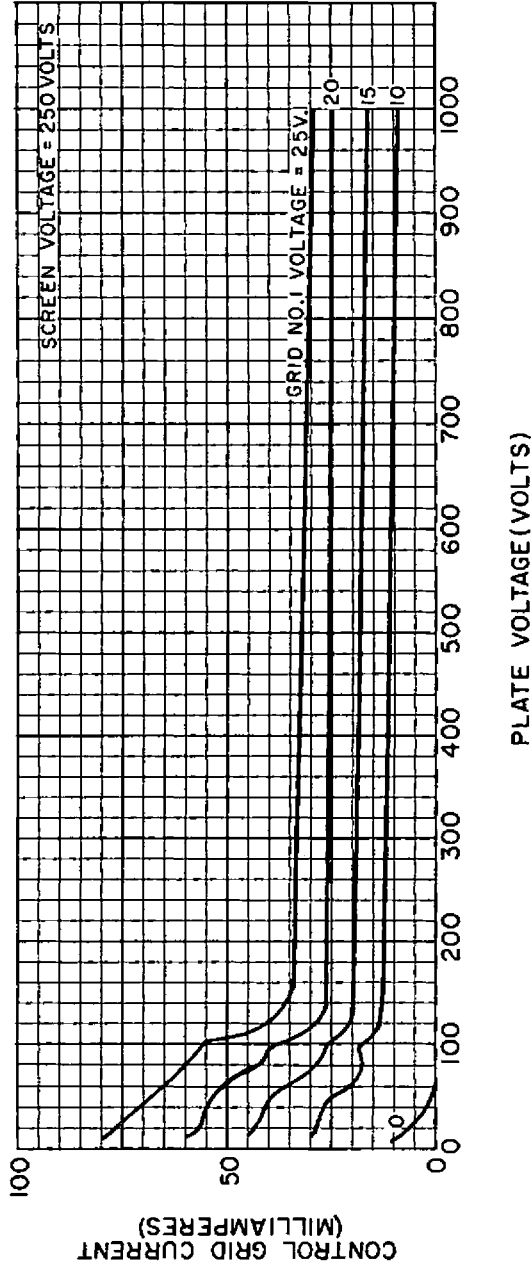
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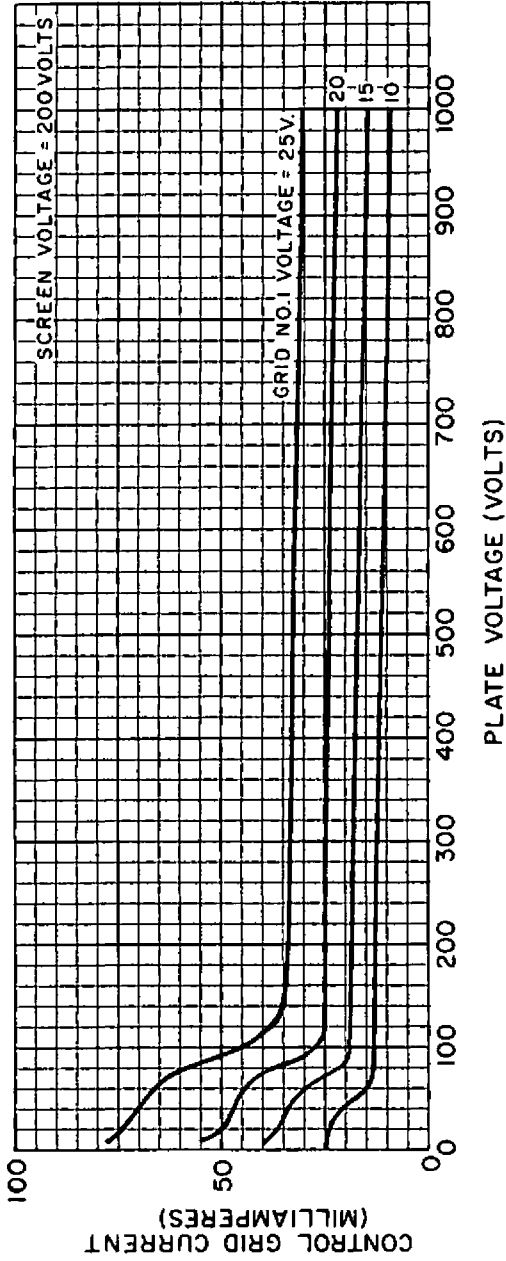
TRANSFER CHARACTERISTICS



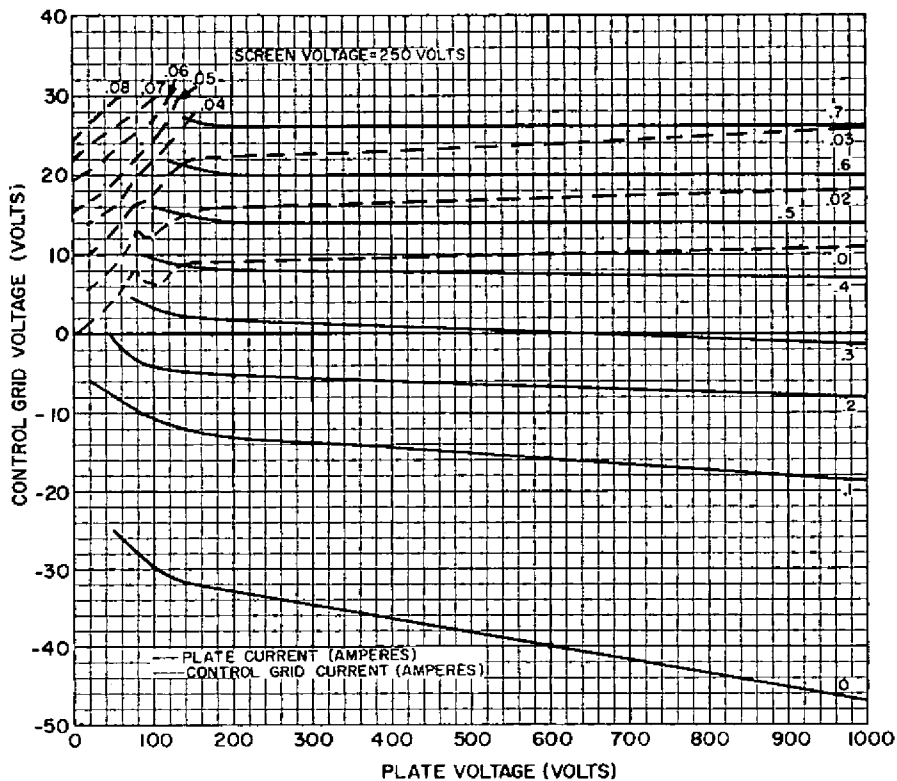
TRANSFER CHARACTERISTICS



TRANSFER CHARACTERISTICS



CONSTANT CURRENT CHARACTERISTICS



CONSTANT CURRENT CHARACTERISTICS

