AMPEREX TUBE TYPE 7378

The Amperex 7378 is an all-glass, beam power tetrode having a maximum plate dissipation of 100 watts at frequencies up to 30 Mc/s. It is designed for AF or RF amplifier, oscillator, and frequency multiplier service and for single sideband applications.

GENERAL CHARACTERISTICS

MECHANICAL

Dimensions	see outline drawing
Base	giant 5 pin
Maximum Operating Temperature	
Plate seal	220° C
Bottom pins	180° C
Glass Bulb	300° C
Cooling	radiation and convection
Mounting position	vertical or horizontal with plane of plate vertical
Accessories	
Socket	S-25722
Plate clip	S-25723
Net weight	7.8 ounces

ELECTRICAL

Cathode	coated, unipotential
Heater voltage	6.3 volts
Heater current	3.9 amps
Amplification factor, G1 to G2 (E_b = 750 V, E_{c2} = 250 V, I_b = 100 mA)	5.7
Transconductance (E_b = 750 V, E_{c2} = 250 V, I_b = 100 mA)	9000 micromhos
Direct Interelectrode Capacitances	
Input	30 μμf
Output	12.7 μμf
Plate to grid	0.9 μμf

RF POWER AMPLIFIER OR OSCILLATOR - CLASS C
TELEGRAPHY OR FM TELEPHONY
(Key Down Conditions)

Maximum Ratings, Absolute Values

	CCS
Frequency	30 Mc/s
D-C plate voltage	825 volts max
D-C screen voltage	300 volts max
Negative D-C grid voltage	150 volts max
Heater-cathode voltage	125 volts max
D-C plate current	400 mA max
D-C grid current	30 mA max
Plate input power	300 watts max
Screen dissipation	12 watts max
Plate dissipation	100 watts max
Grid resistor	25,000 ohms max

Typical Operation

	CCS
Frequency	30 Mc/s
D-C plate voltage	750 volts
D-C screen voltage	250 volts
Negative D-C grid voltage	90 volts
Peak Drive voltage	120 volts
D-C plate current	385 mA
D-C screen current	20 mA
D-C grid current	7 mA
Driving power	1 watt
Plate Input Power	285 watts
Screen Dissipation	5 watts
Plate Dissipation	85 watts
Plate Output Power	200 watts
Efficiency	70 %

RF AMPLIFIER - CLASS C - TELEPHONY
PLATE AND SCREEN GRID MODULATED
(Carrier Conditions)

Maximum Ratings, Absolute Values

	CCS
Frequency	30 Mc/s
D-C Plate Voltage	650 volts max
D-C Grid Voltage	—150 volts max
D-C Screen Voltage	300 volts max
Heater-Cathode Voltage	125 volts max
D-C Plate Current	350 mA max
D-C Grid Current	30 mA max
Plate Input Power	200 watts max
Screen Dissipation	10 watts max
Plate Dissipation	67 watts max
Grid resistor	25,000 ohms max

Typical Operation

	CCS
Frequency	30 Mc/s
D-C Plate Voltage	600 volts
D-C Screen Voltage	250 volts
D-C Grid Voltage	—100 volts
Peak Drive Voltage	120 volts
D-C Plate Current	300 mA
D-C Screen Current	20 mA
D-C Grid Current	4 mA
Driving Power	0.4 watts
Plate Input Power	180 watts
Screen dissipation	5 watts
Plate dissipation	50 watts
Power Output	130 watts
Efficiency	72%
Modulation depth	100 %
Peak Screen Voltage (AF)	220 volts
Modulation power	90 watts

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AF POWER AMPLIFIER AND MODULATOR - CLASS AB_2

Maximum Ratings, Absolute Values

	CCS
D-C Plate Voltage	825 volts max
D-C Screen Voltage	300 volts max
D-C Grid Voltage	−150 volts max
Heater-Cathode Voltage	125 volts max
D-C Plate Current	400 mA max
D-C Grid Current	30 mA max
Screen Dissipation	12 watts max
Plate Dissipation	100 watts max
Bias Resistance	25,000 ohms max

Typical Operation
(Two Tubes)

	CCS		CCS		
D-C Plate Voltage	750		600		volts
D-C Screen Voltage	250		250		volts
D-C Grid Voltage	−45		−45		volts
Load Resistance (Plate to Plate)	3600		3500		ohms
Peak Driving Voltage (Grid to Grid)	0	110	0	105	volts
D-C Plate Current	2 x 45	2 x 280	2 x 25	2 x 235	mA
D-C Screen Current	0	2 x 40	2 x 0.5	2 x 24	mA
D-C Grid Current	0	2 x 1	0	2 x 0.5	mA
Plate Input Power	2 x 34	2 x 210	2 x 15	2 x 140	watts
Screen Dissipation	0	2 x 10	0	2 x 6	watts
Plate Dissipation	2 x 34	2 x 60	2 x 15	2 x 40	watts
Plate Output Power	0	300	0	200	watts
Total Distortion	--	6.5	--	5	%
Efficiency	--	71.5	--	71.5	%

LINEAR RF AMPLIFIER - CLASS AB_1
SINGLE SIDEBAND SUPPRESSED CARRIER OPERATION

Maximum Ratings, Absolute Values

	CCS
Frequency	30 Mc/s max
D-C Plate Voltage	825 volts max
D-C Grid No. 2 Voltage	350 volts max
D-C Grid No. 1 Voltage	−100 volts max
D-C Plate Current	400 mA max
Plate Input	300 watts max
Plate Dissipation	100 watts max
Grid No. 2 Dissipation	12 watts max

Typical Operation
Single Tone and/or Two Tone Modulation

	CCS	ICAS
D-C Plate Voltage	750	750 volts
D-C Grid No. 2 Voltage	310	310 volts
D-C Grid No. 1 Voltage	46	48 volts
Zero-Signal D-C Plate Current	95	73 mA
Zero-Signal D-C Grid No. 2 Current	2	2 mA
Effective RF Load Resistance	1300	1000 ohms

Single-Tone Modulation

	CCS	ICAS
Max Signal D-C Plate Current	338	435 mA
Max Signal D-C Grid No. 2 Current	38	38 mA
Max Signal D-C Grid No. 1 Current	0	1.6 mA
Max Signal D-C Peak RF grid Voltage	46	58 volts
Max Signal Driving Power	0	0.09 watts
Max Signal Plate Power Output	167	228 watts

Two-Tone Modulation

Average D-C Plate Current	230	272 mA
Average D-C Grid No. 2 Current	22	21 mA
Average D-C Grid No. 1 Current	0	0.32 mA
Max Resultant Peak RF Grid Voltage	46	58 volts
Average Plate Power Output	83.5	114 watts
Peak Envelope Plate Power Output	167	228 watts
3rd Order Intermodulation Distortion	35	27 db

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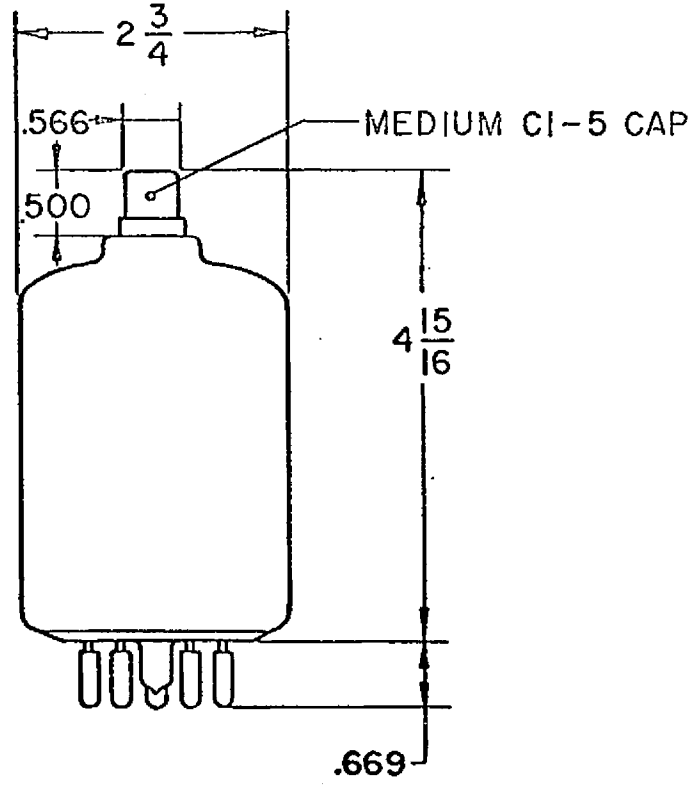

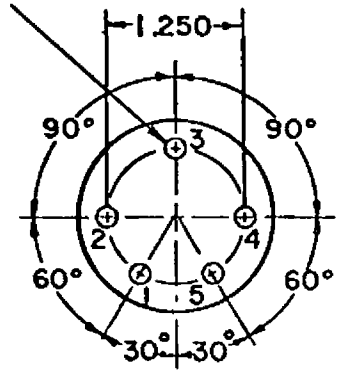

PIN CONNECTIONS

1 - HEATER
2 - CATHODE
3 - GRID NO. 1
4 - GRID NO. 2
5 - HEATER

GIANT 5 PIN BASE

5 PINS .187 ±.003 DIA.

CONSTANT CURRENT CHARACTERISTICS

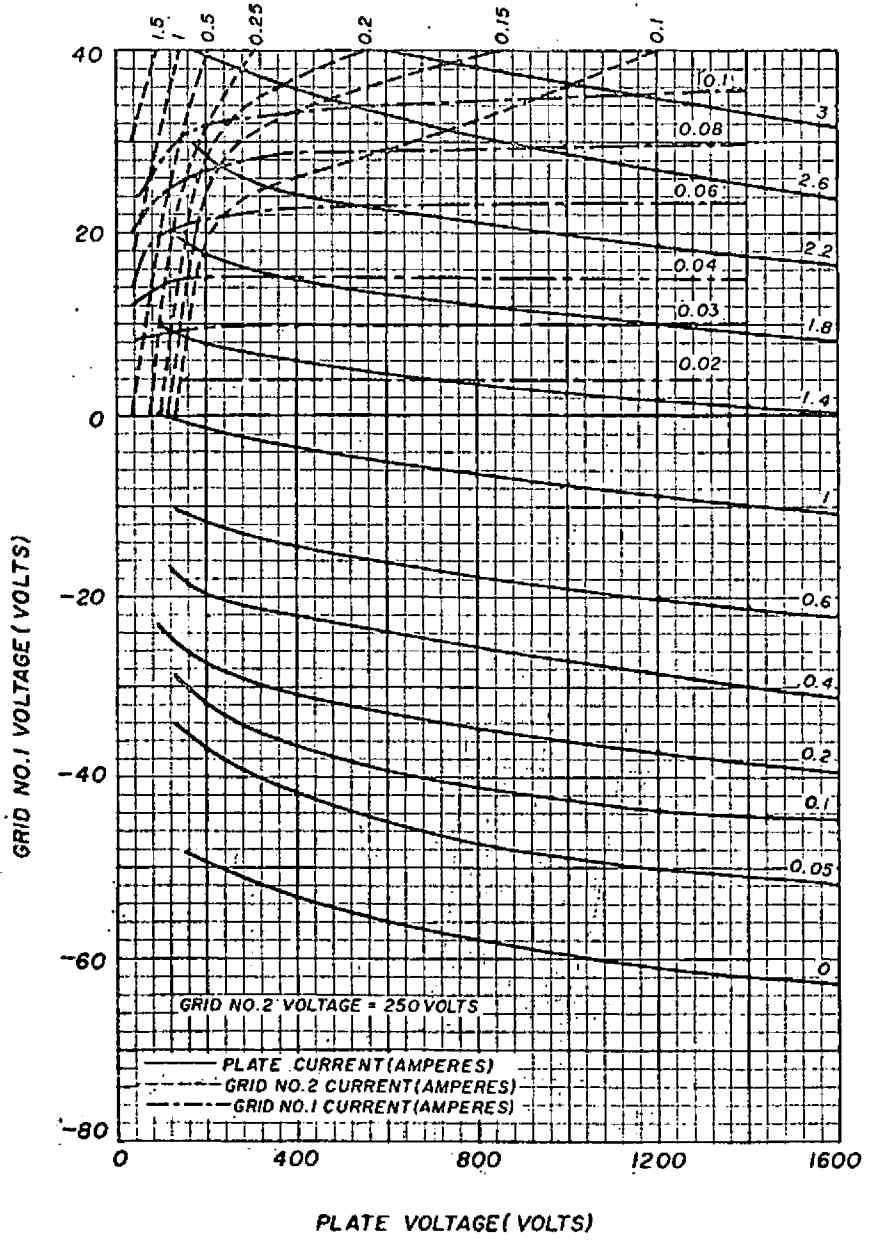

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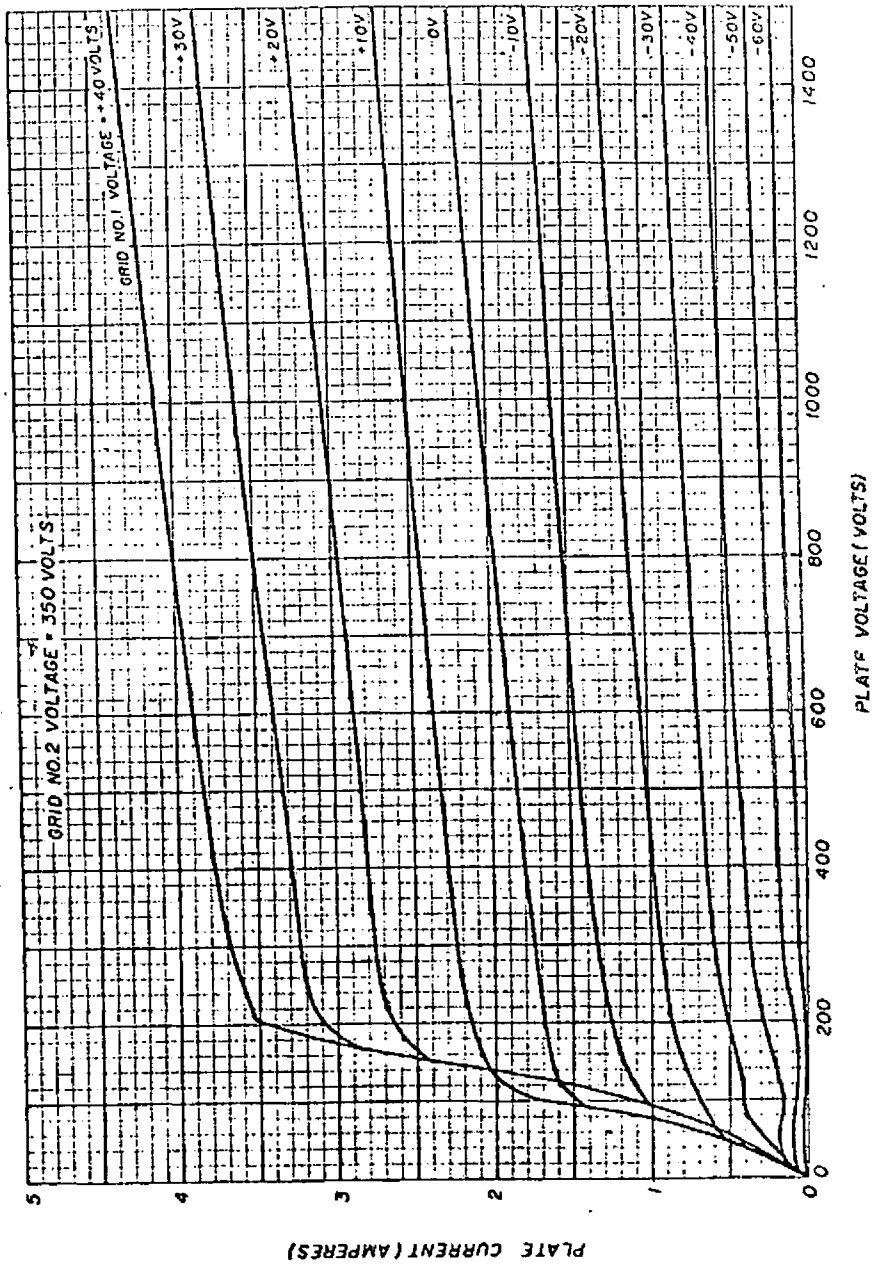
PLATE CHARACTERISTICS



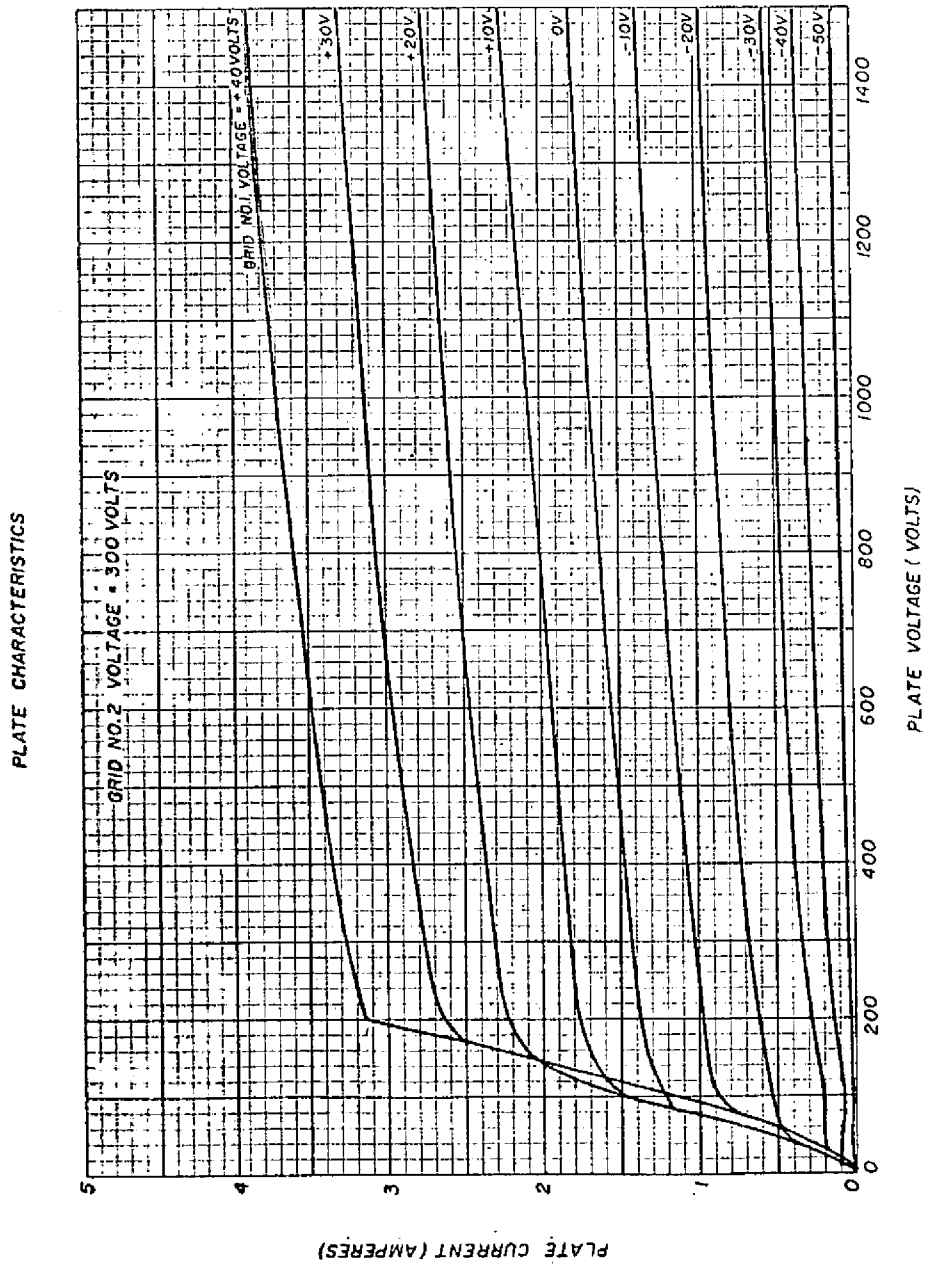


PLATE CHARACTERISTICS
GRID NO.2 VOLTAGE = 300 VOLTS
GRID NO.1 VOLTAGE = +40VOLTS
+30V
+20V
+10V
0V
-10V
-20V
-30V
-40V
-50V
PLATE CURRENT (AMPERES)
PLATE VOLTAGE (VOLTS)
0
1
2
3
4
5
200
400
600
800
1000
1200
1400

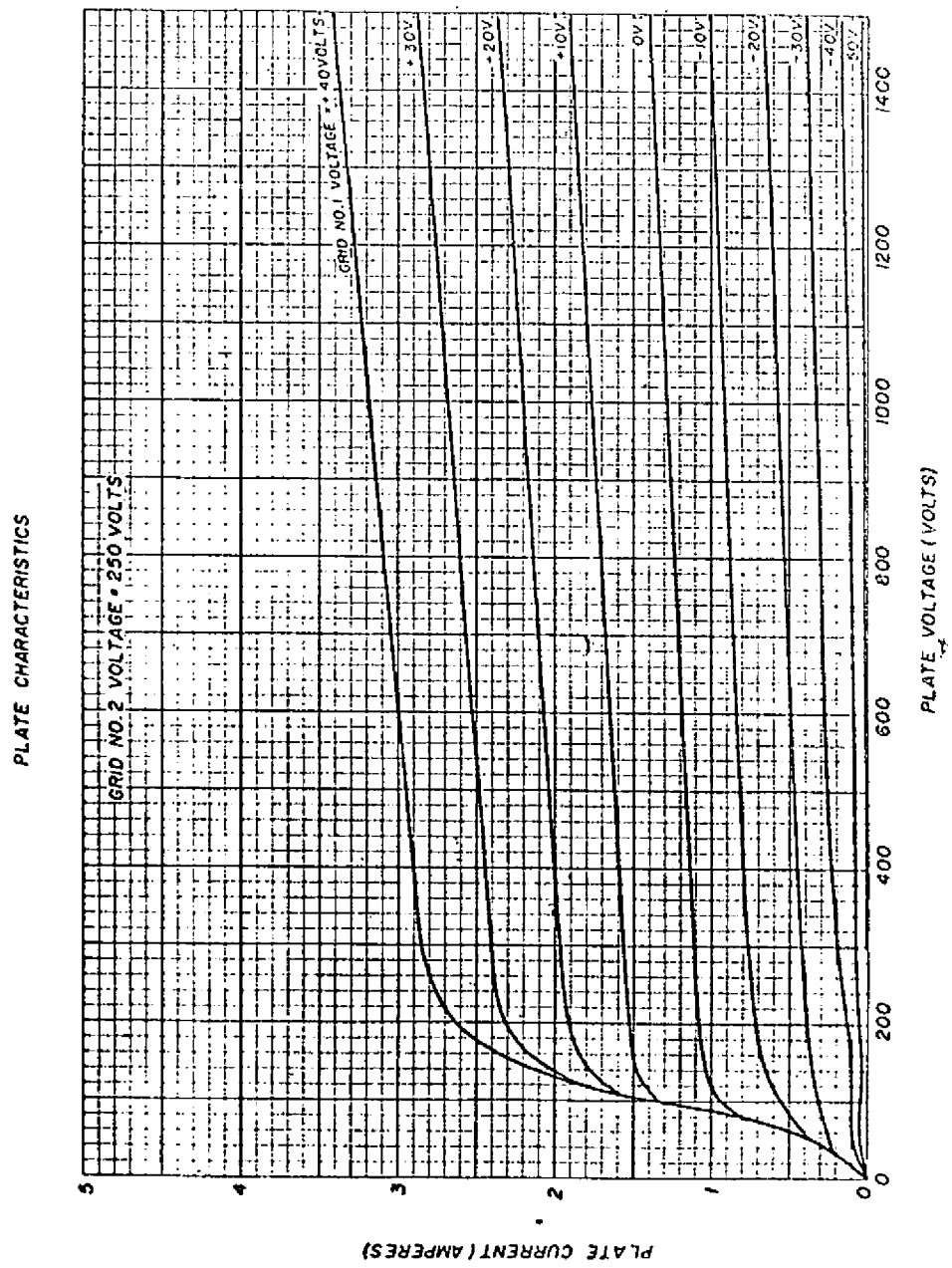
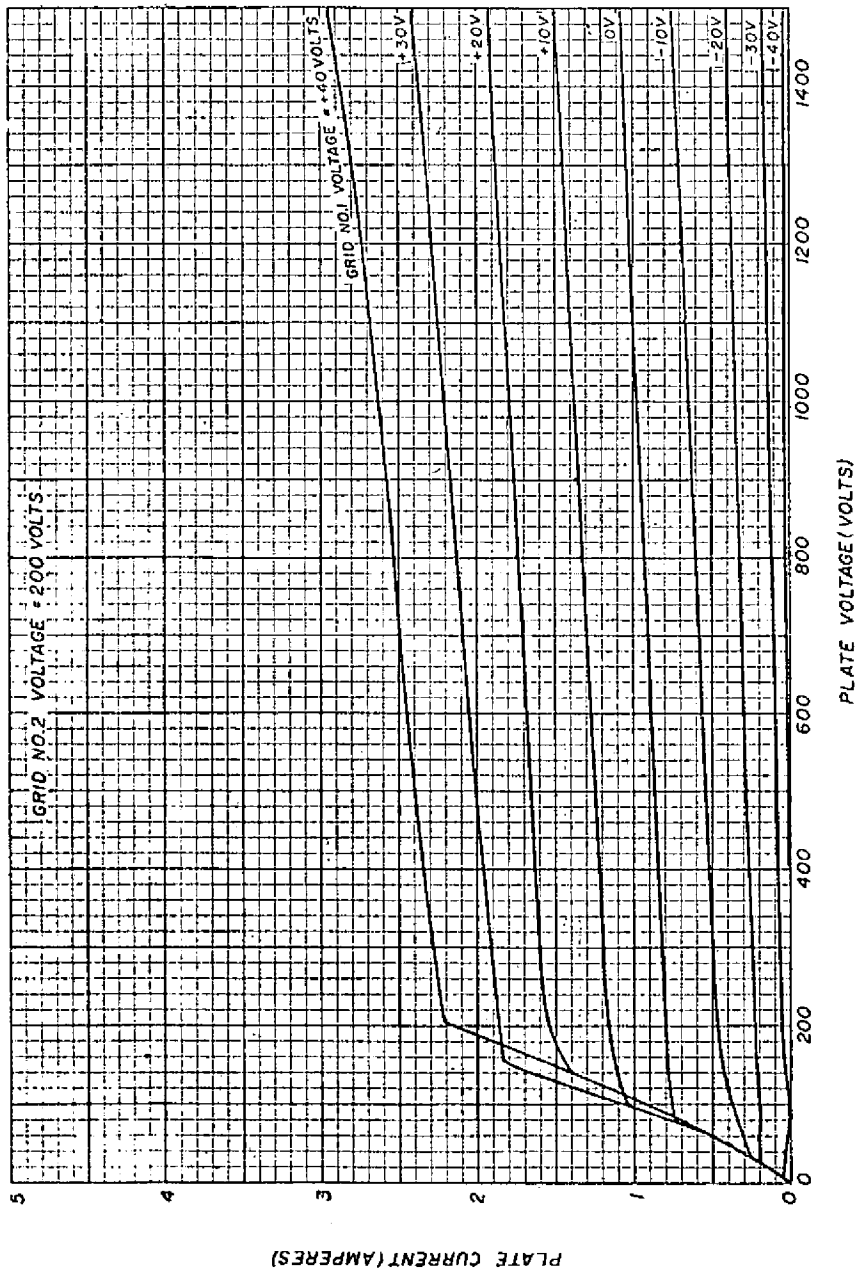


PLATE CHARACTERISTICS
GRID NO.2 VOLTAGE = 250 VOLTS
GRID NO.1 VOLTAGE = +40VOLTS
+30V
+20V
+10V
0V
-10V
-20V
-30V
-40V
-50V
PLATE CURRENT (AMPERES)
PLATE VOLTAGE (VOLTS)
0
1
2
3
4
5
200
400
600
800
1000
1200
1400

PLATE CHARACTERISTICS



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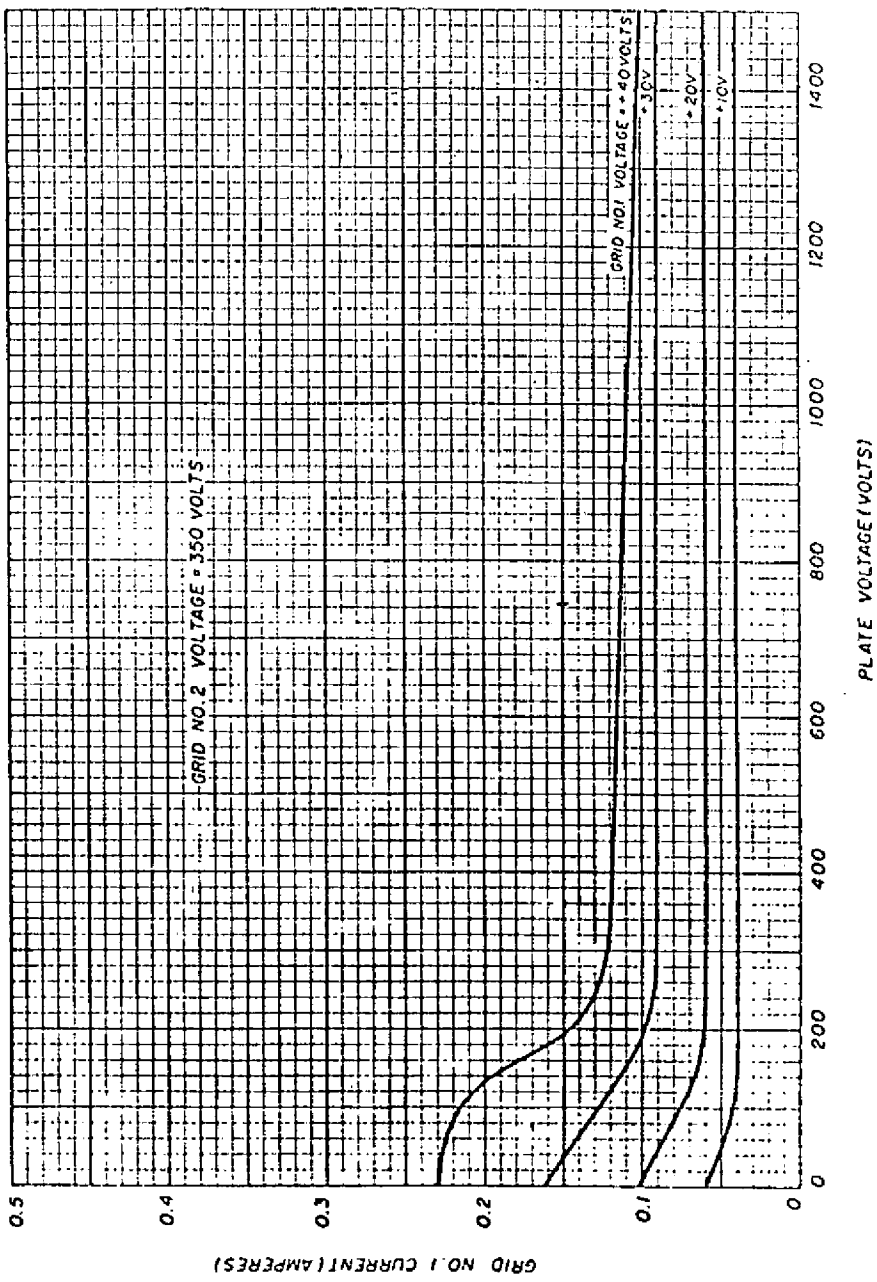
GRID NO.1 CHARACTERISTICS



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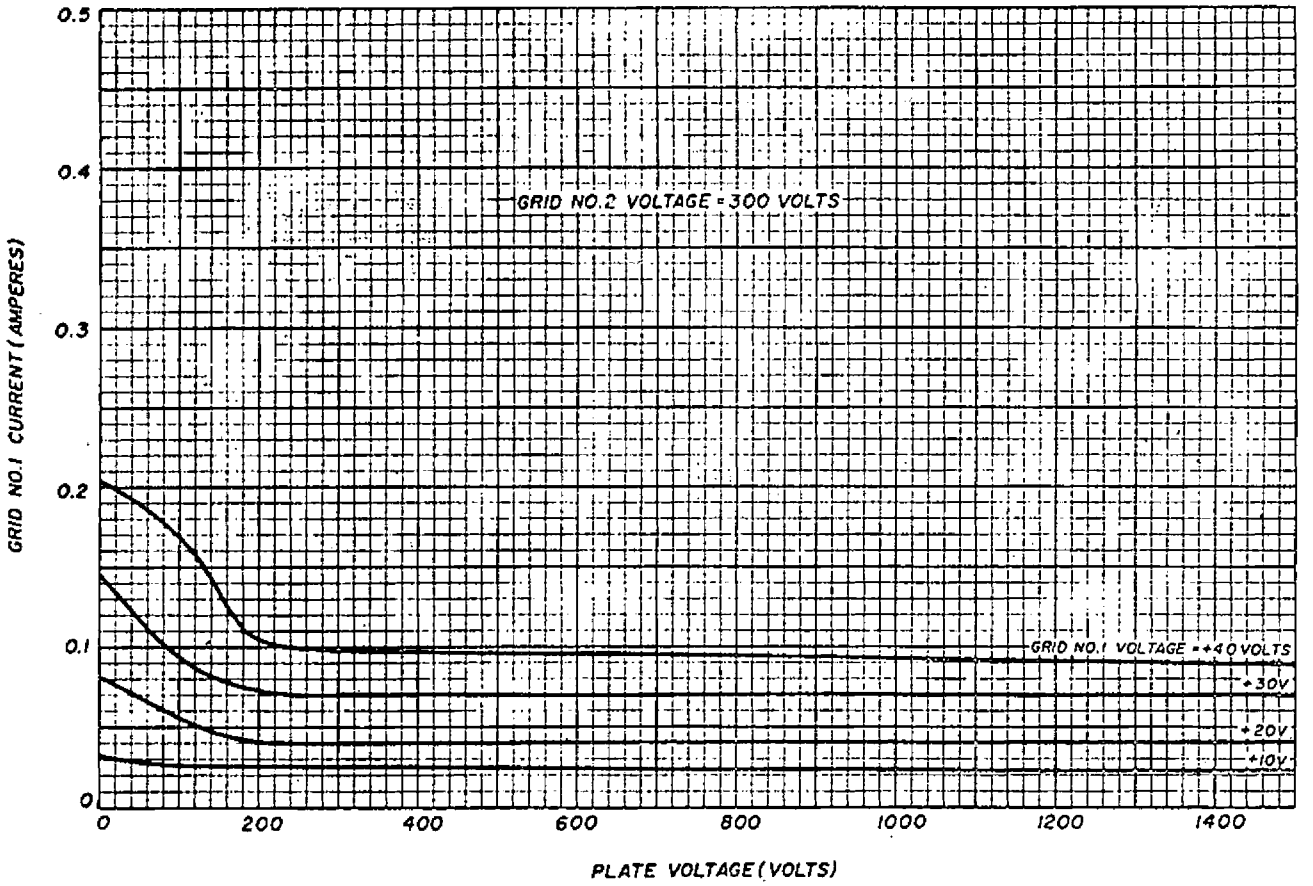

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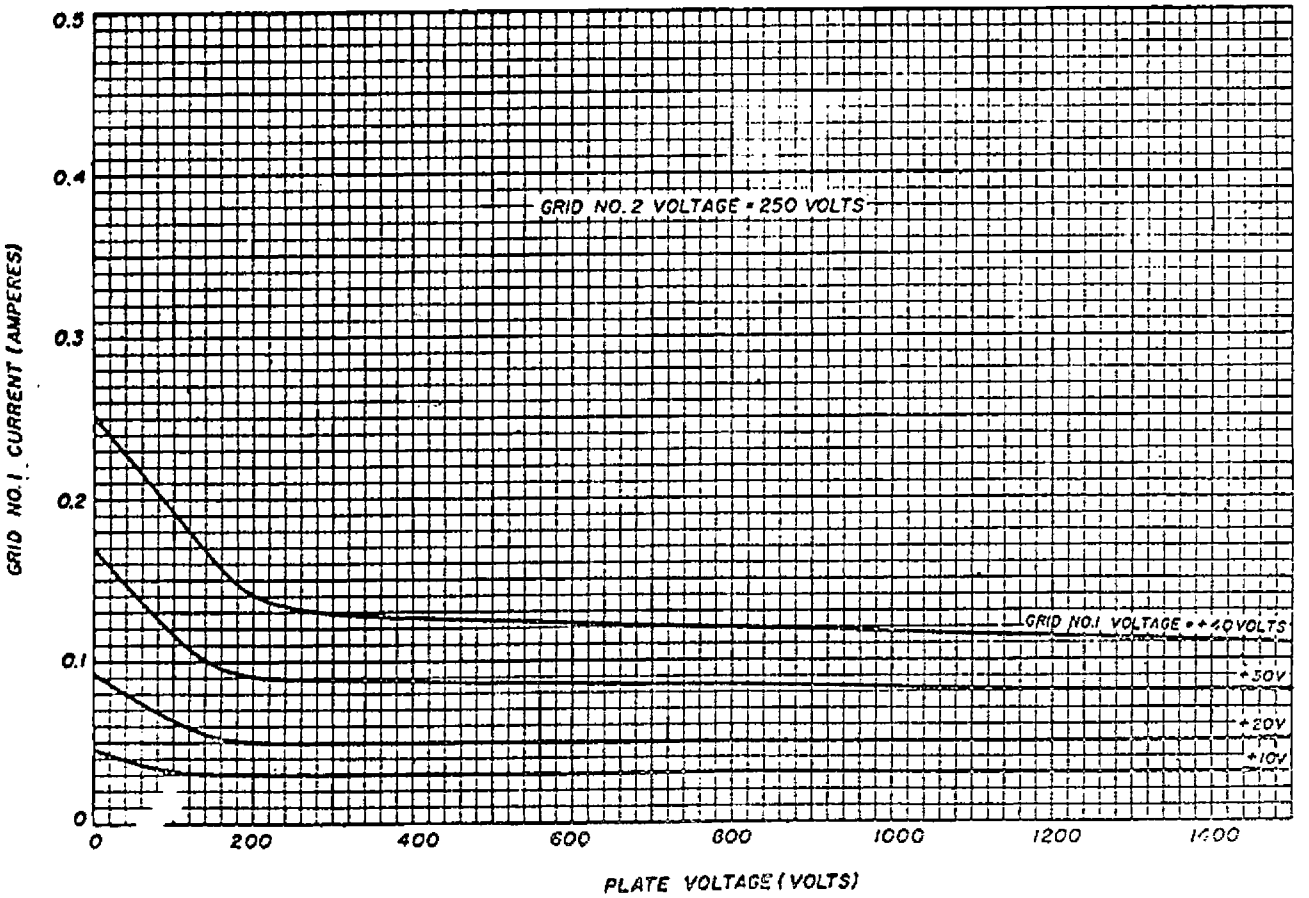

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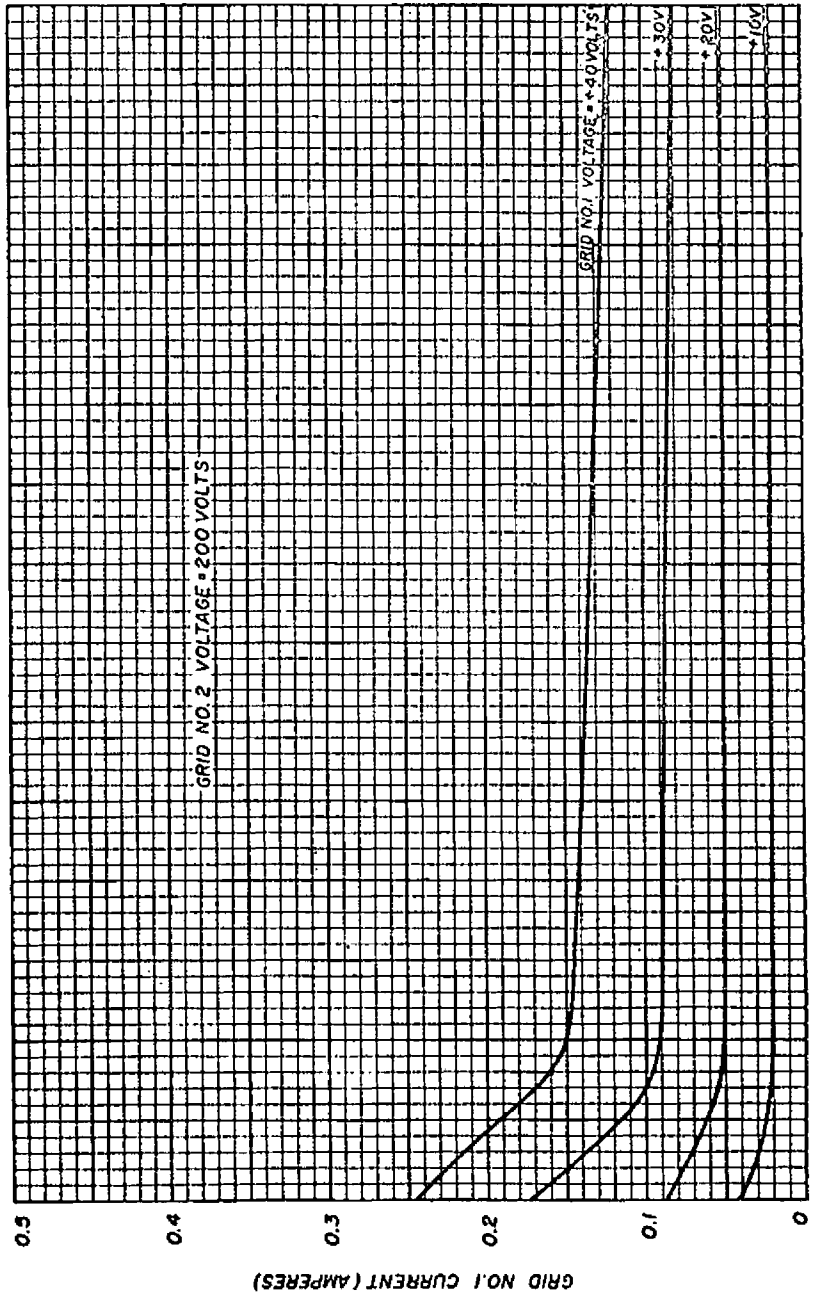

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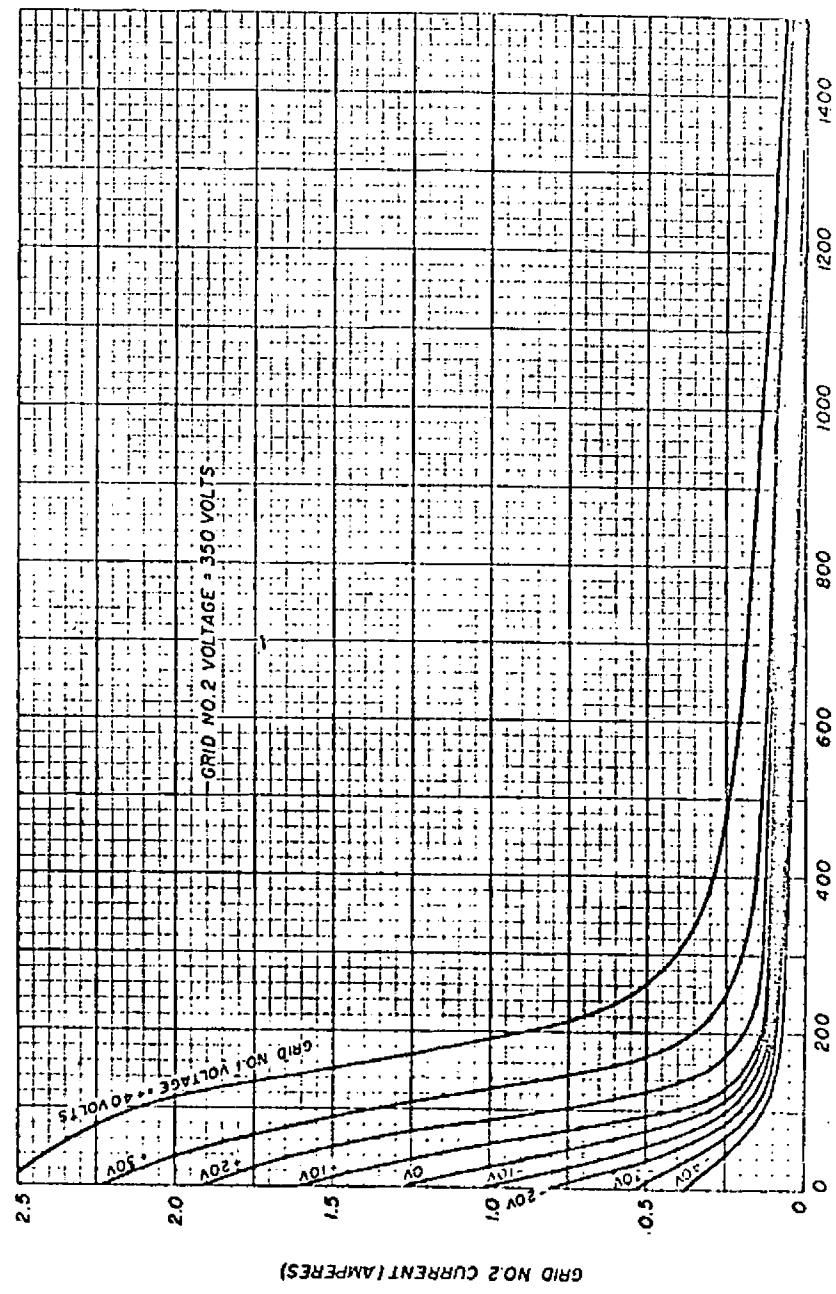

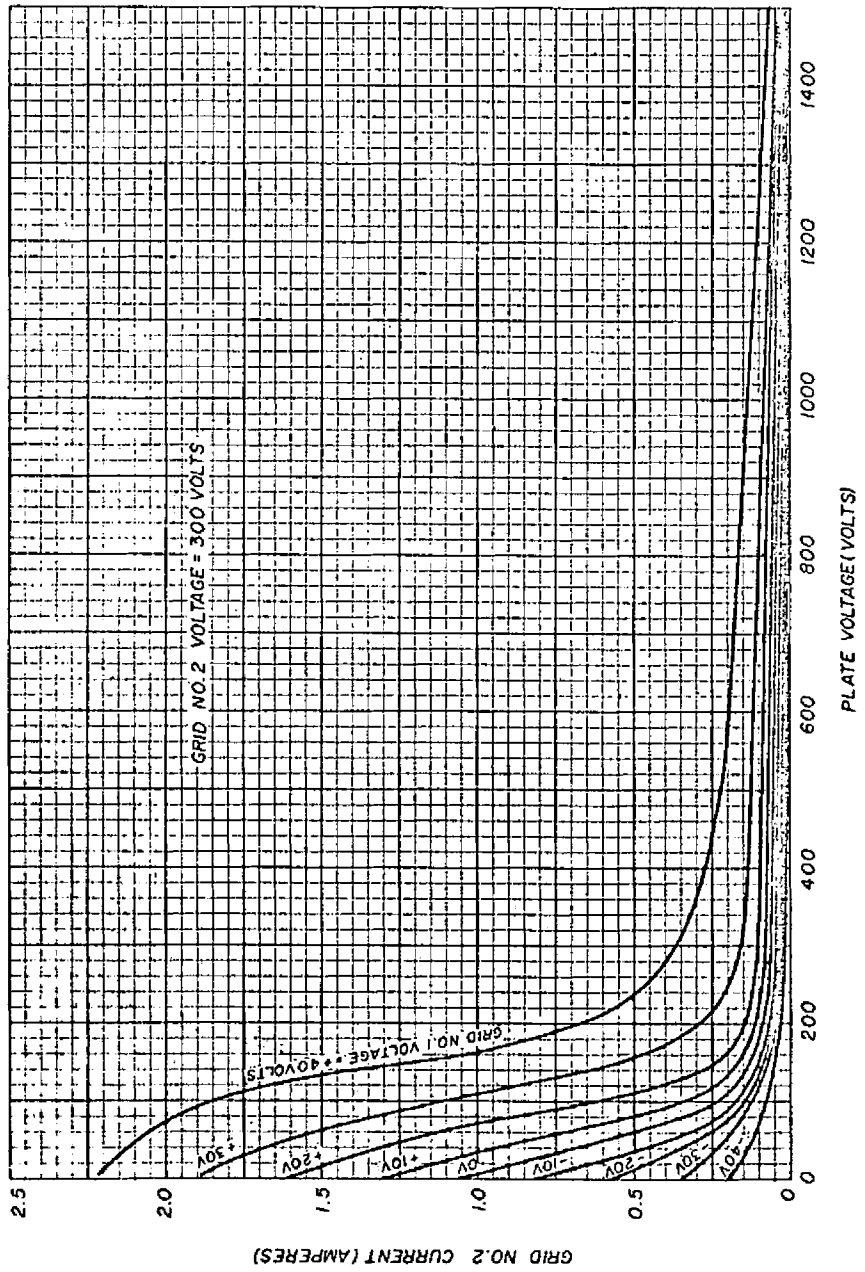
GRID NO.2 CHARACTERISTICS
GRID NO.2 VOLTAGE = 300 VOLTS
GRID NO.1 VOLTAGE = +40VOLTS
+30V
+20V
+10V
0V
-10V
-20V
-30V
-40V
GRID NO.2 CURRENT (AMPERES)
2.5
2.0
1.5
1.0
0.5
0
PLATE VOLTAGE (VOLTS)
0
200
400
600
800
1000
1200
1400

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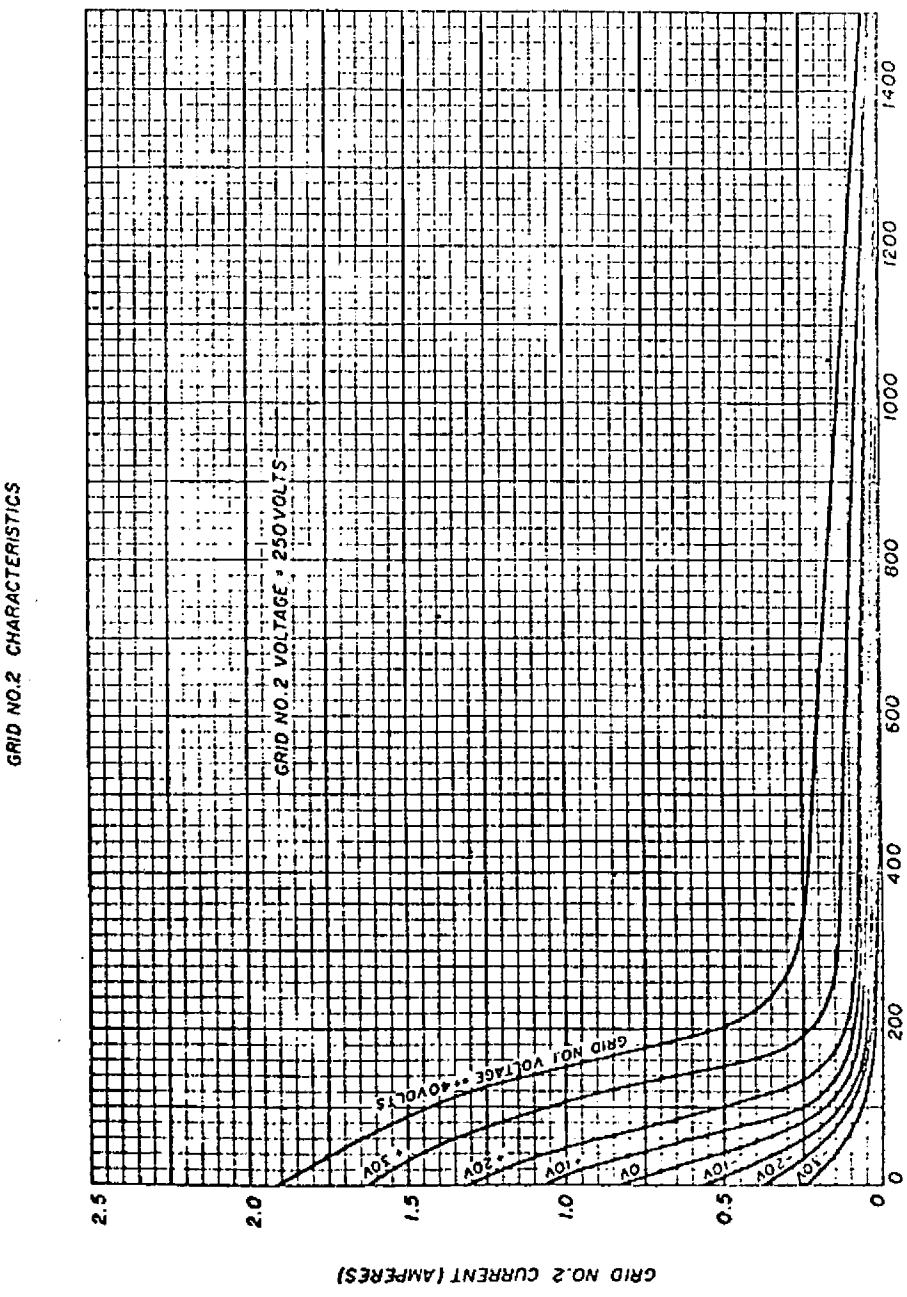
GRID NO.2 CHARACTERISTICS
GRID NO.2 VOLTAGE = 250VOLTS
GRID NO.1 VOLTAGE = +40VOLTS
+30V
+20V
+10V
0V
-10V
-20V
GRID NO.2 CURRENT (AMPERES)
2.5
2.0
1.5
1.0
0.5
0
PLATE VOLTAGE (VOLTS)
0
200
400
600
800
1000
1200
1400

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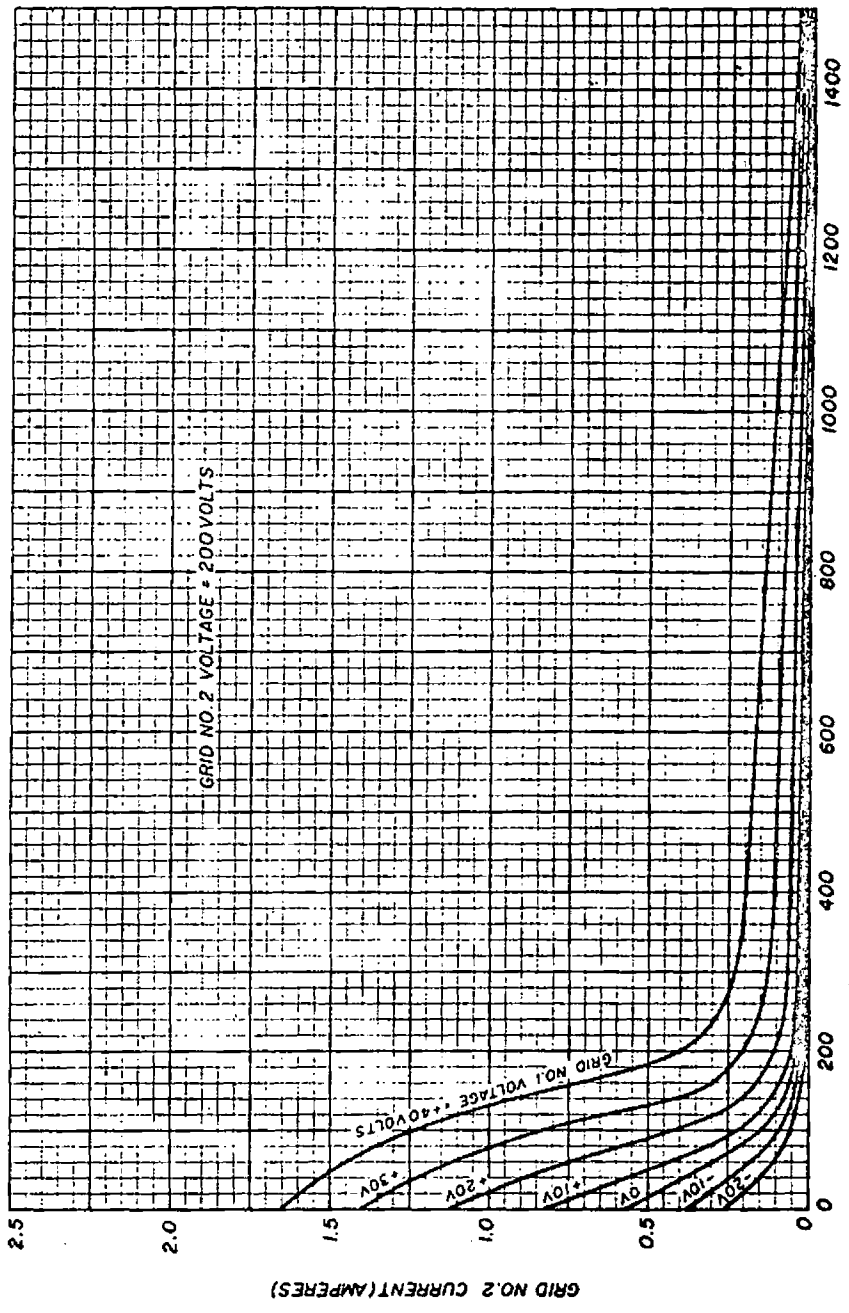
GRID NO.1 CHARACTERISTICS
GRID NO.2 VOLTAGE = 200 VOLTS
GRID NO.1 VOLTAGE +40 VOLTS
+30V
+20V
+10V
0V
-10V
-20V
2.5
2.0
1.5
1.0
0.5
0
0
200
400
600
800
1000
1200
1400
GRID NO.2 CURRENT (AMPERES)
PLATE VOLTAGE (VOLTS)