

# JOINT ELECTRON TUBE ENGINEERING COUNCIL



650 SALMON TOWER  
11 WEST FORTY-SECOND STREET  
NEW YORK 36, N. Y.  
TELEPHONE: LONGACRE 5-3450

Announcement  
of  
Electron Device Type Registration

Release No. 1734

September 10, 1956

The Joint Electron Tube Engineering Council announces the registration of the following tube type designation

6BM8

according to the ratings and characteristics found on the attached data sheets on the application of

Rogers Majestic Electronics  
Leaside, Toronto 17, Ontario



# 6BM8

## TRIODE PENTODE

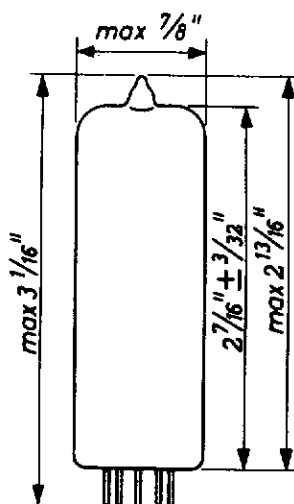
Triode section for use as frame oscillator and A.F. voltage amplifier

Pentode section for use as frame output tube and audio output tube

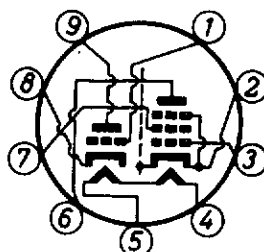
## MECHANICAL DATA

Cathode	Coated unipotential
Base	E9-1
Bulb	T6 $\frac{1}{2}$
Mounting position	Any
RETMA basing designation	9EX

### TUBE OUTLINE



### BOTTOM VIEW OF BASE



### BASE PIN No.

### ELEMENT

- |   |   |
|---|---|
| 1 | Triode grid                                   |
| 2 | Pentode cathode and grid No.3 internal shield |
| 3 | Pentode grid No.1                             |
| 4 | Heater  |
| 5 | Heater  |
| 6 | Pentode plate                                 |
| 7 | Grid No.2                                     |
| 8 | Triode cathode                                |
| 9 | Triode plate                                  |

## ELECTRICAL DATA

### HEATER DATA

Heater voltage	6.3 volts
Heater current	0.78 amp

## DIRECT INTERELECTRODE CAPACITANCES

### Triode section

Grid to all other elements except plate	2.7 $\mu$ F
Plate to all other elements except grid	4.0 $\mu$ F
Plate to grid	4.0 $\mu$ F
Grid to heater	max. 0.1 $\mu$ F

DIRECT INTERELECTRODE CAPACITANCES (continued)Pentode section

Grid No.1 to all other elements	9.3 $\mu\text{F}$
Plate to all other elements	8 $\mu\text{F}$
Grid No.1 to plate	max. 0.3 $\mu\text{F}$
Grid No.1 to heater	max. 0.3 $\mu\text{F}$

Between triode and pentode sections

Triode plate to pentode grid No.1	max. 0.02 $\mu\text{F}$
Triode grid to pentode plate	max. 0.02 $\mu\text{F}$
Triode grid to pentode grid No.1	max. 0.025 $\mu\text{F}$
Triode plate to pentode plate	max. 0.25 $\mu\text{F}$

MAXIMUM RATINGS (Design center values)Pentode section

Plate voltage without plate current	900 volts
Plate voltage	600 volts
Peak plate voltage	2500 volts <sup>1)</sup>
Peak inverse plate voltage	500 volts
Peak plate current <sup>2)</sup>	
Plate dissipation at a plate voltage lower than 250 volts	7 watts
Plate dissipation at a plate voltage higher than 250 volts	5 watts
Grid No.2 voltage without current	550 volts
Grid No.2 voltage	300 volts
Grid No.2 dissipation	1.8 watts
Peak grid No.2 dissipation	3.2 watts
Cathode current	50 mamps
Grid No.1 circuit resistance with automatic bias	2 megohms
Grid No.1 circuit resistance with fixed bias	1 megohm
Voltage between heater and cathode	100 volts
Circuit resistance between heater and cathode	20 000 ohms

1) Maximum pulse duration 4% of one cycle with a maximum of 0.8 milli second.

2) See page 4

## MAXIMUM RATINGS (Design Center Values; continued)

### Triode section

Plate voltage without plate current	550 volts
Plate voltage	300 volts
Peak plate voltage	600 volts <sup>1)</sup>
Plate dissipation	1 watt
Cathode current	15 mamps
Peak cathode current	3)
Grid circuit resistance with automatic bias	2 megohms <sup>4)</sup>
Grid circuit resistance with fixed bias	1 megohm
Voltage between heater and cathode	100 volts
Circuit resistance between heater and cathode	20 000 ohms

## TYPICAL CHARACTERISTICS

### Pentode section

Plate voltage	100	170	200	200 volts
Grid No.2 voltage	100	170	170	200 volts
Grid No.1 bias	-6.0	-11.5	-12.5	-16 volts
Plate current	26	41	35	35 mamps
Grid No.2 current	5.0	8.0	6.5	7.0 mamps
Transconductance	6800	7500	6800	6400 micromhos
Plate resistance	15 000	16 000	20 500	20 000 ohms
Amplification factor of grid No.2 with respect to grid No.1	10	9.5	9.5	9.5

<sup>1)</sup> Maximum pulse duration 4% of one cycle with a maximum of 0.8 milli second

<sup>3)</sup> Optimum peak cathode current as frame oscillator  
To allow for tube spread, for deterioration during life and for emission drop at underheating the set should be designed so that with a peak cathode current of 100 milliamps it still operates satisfactorily (max. pulse duration 4% of a cycle, with a maximum of 0.8 millisecc.). It is recommended that the amplitude of the peak currents occurring with fresh tubes be limited automatically to this max. value of 100 milli-amps (e.g. by non-bypassed resistor in the grid or anode lead).

<sup>4)</sup> With grid current biasing the maximum permissible value of the grid circuit resistance is 22 megohms

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## TYPICAL CHARACTERISTICS (continued)

### Triode section

Plate voltage	100 volts
Grid voltage	0 volt
Plate current	3.5 mamps
Transconductance	2500 micromhos
Amplification factor	70

### OPERATING CHARACTERISTICS OF THE PENTODE SECTION as audio output tube, class A

Plate voltage	100	170	200	200 volts
Grid No.2 voltage	100	170	170	200 volts
Grid No.1 bias	-6.0	-11.5	-12.5	-16 volts
Plate current	26	41	35	35 mamps
Grid No.2 current	5.0	8.0	6.5	7.0 mamps
Transconductance	6800	7500	6800	6400 micromhos
Plate resistance	15 000	16 000	20 500	20 000 ohms
Amplification factor of grid No.2 with respect to grid No.1	10	9.5	9.5	9.5
A.C. load resistance	3900	3900	5600	5600 ohms
Output power at a distortion of 10%	1.05	3.3	3.4	3.5 watts
Required input A.F. voltage	3.8	6.0	5.8	6.6 volts(rms)

### 2) Peak plate current of the pentode section in frame output application

To allow for tube spread and for deterioration during life the circuit should be designed around a peak plate current not exceeding 85 mamps at a plate voltage of 50 volts and a grid No.2 voltage of 170 volts. At underheating (heater voltage 5.3 volts) a peak anode current of 70 mamps should be taken into consideration at a plate voltage of 50 volts and a grid No.2 voltage of 170 volts, and a peak anode current of 80 mamps at a plate voltage of 50 volts and a grid No.2 voltage of 190 volts. The peak plate current of an average new tube is 135 mamps at a plate voltage of 50 volts, a grid No.2 voltage of 170 volts and a grid No.1 current of 0.3  $\mu$ amp.

## OPERATING CHARACTERISTICS OF THE TRIODE SECTION as A.F. voltage amplifier

Internal source impedance 0.22 megohm

Grid leak of the following tube 0.68 megohm

$E_{bb}$ volts	$R_k$ ohms	$R_p$ meg- ohms	$R_g$ meg- ohms	$I_p$ mamps	$E_o^{4)}$ volts rms	$\frac{E_o}{E_{sig}}$	Total harmonic distortion (%)
200	2200	0.22	3	0.52	26	52	1.6 <sup>5)</sup>
170	2700	0.22	3	0.43	25	51	2.3 <sup>5)</sup>
100	2700	0.22	3	0.23	15	47	4.0 <sup>5)</sup>
200	0	0.1	22	1.05	24	50	1.5 <sup>6)</sup>
170	0	0.1	22	0.86	19	49	1.4 <sup>6)</sup>
100	0	0.1	22	0.37	8	42	1.3 <sup>5)</sup>
200	0	0.22	22	0.61	25	55	1.4 <sup>6)</sup>
170	0	0.22	22	0.50	20	53	1.4 <sup>6)</sup>
100	0	0.22	22	0.22	9	46	1.5 <sup>5)</sup>

<sup>4)</sup>Maximum A.F. output voltage

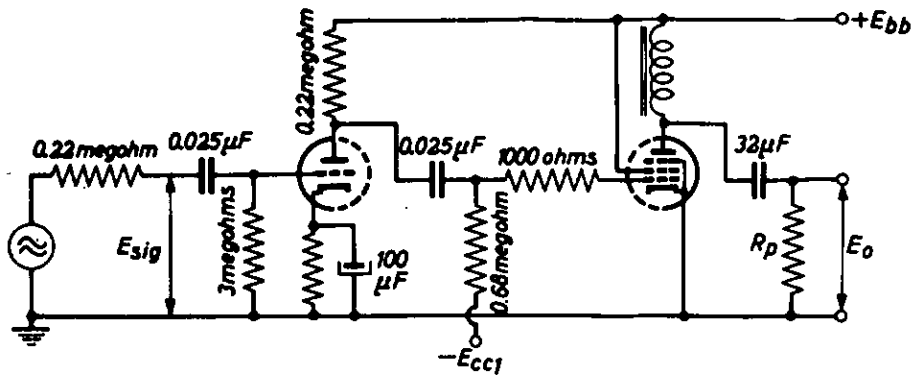
<sup>5)</sup>The total harmonic distortion at lower output voltages is about proportional to the output voltage.

<sup>6)</sup>Between  $E_o = 5$  volts (rms) and the maximum output voltage the total harmonic distortion is about constant. At lower output voltages the total harmonic distortion is about proportional to the output voltage

### MICROPHONY AND HUM

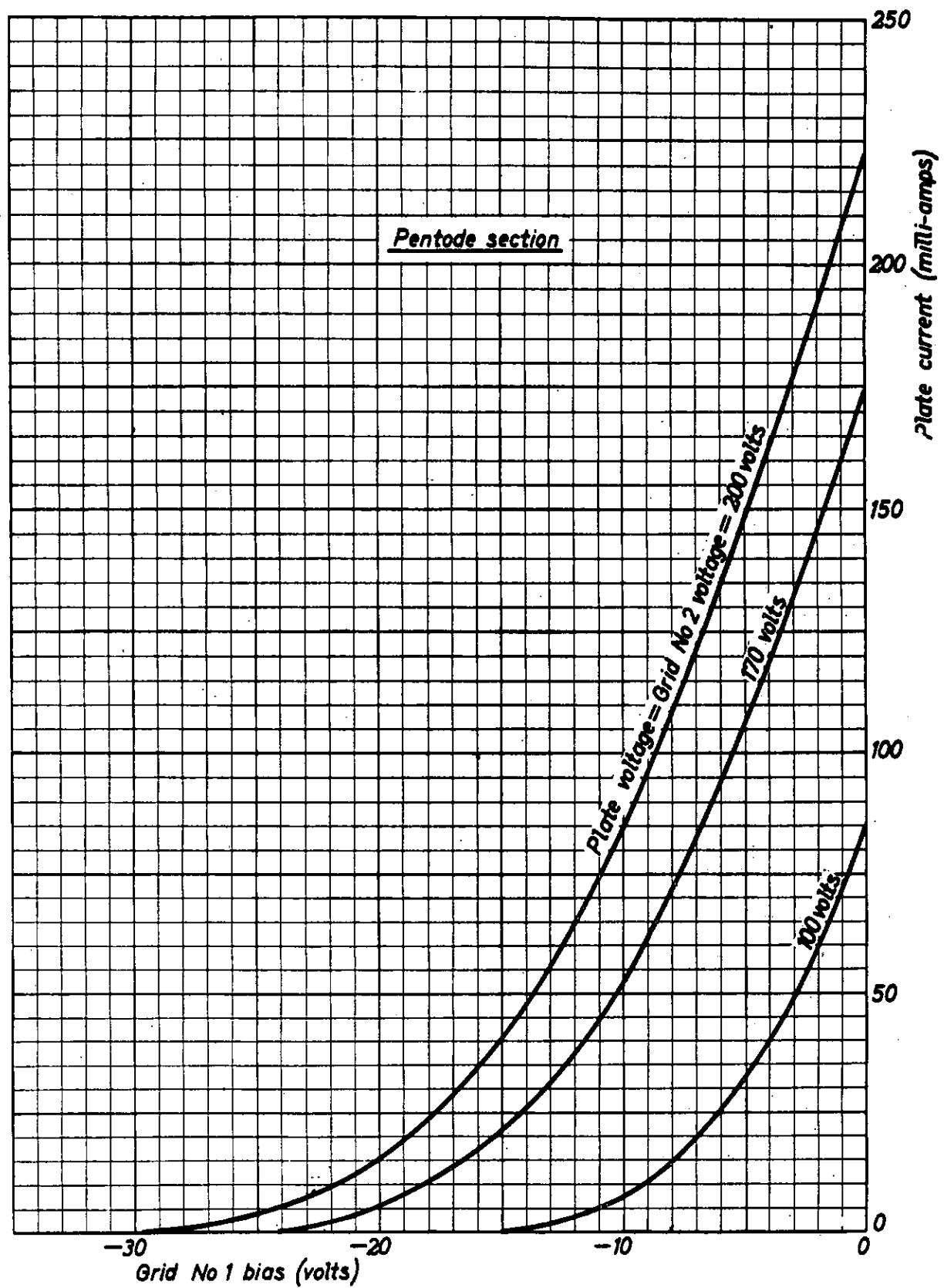
The triode section can be used without special precautions against microphony and hum in circuits with a 5% loud-speaker when the input voltage required for an output power of 50 mwatts of the output tube is higher than 10 mvolts. The A.C. voltage between heater pin 4 and the cathode should not exceed 6.3 volts (rms) in this case and the grid circuit impedance at 50 c/s should not exceed 0.5 megohm

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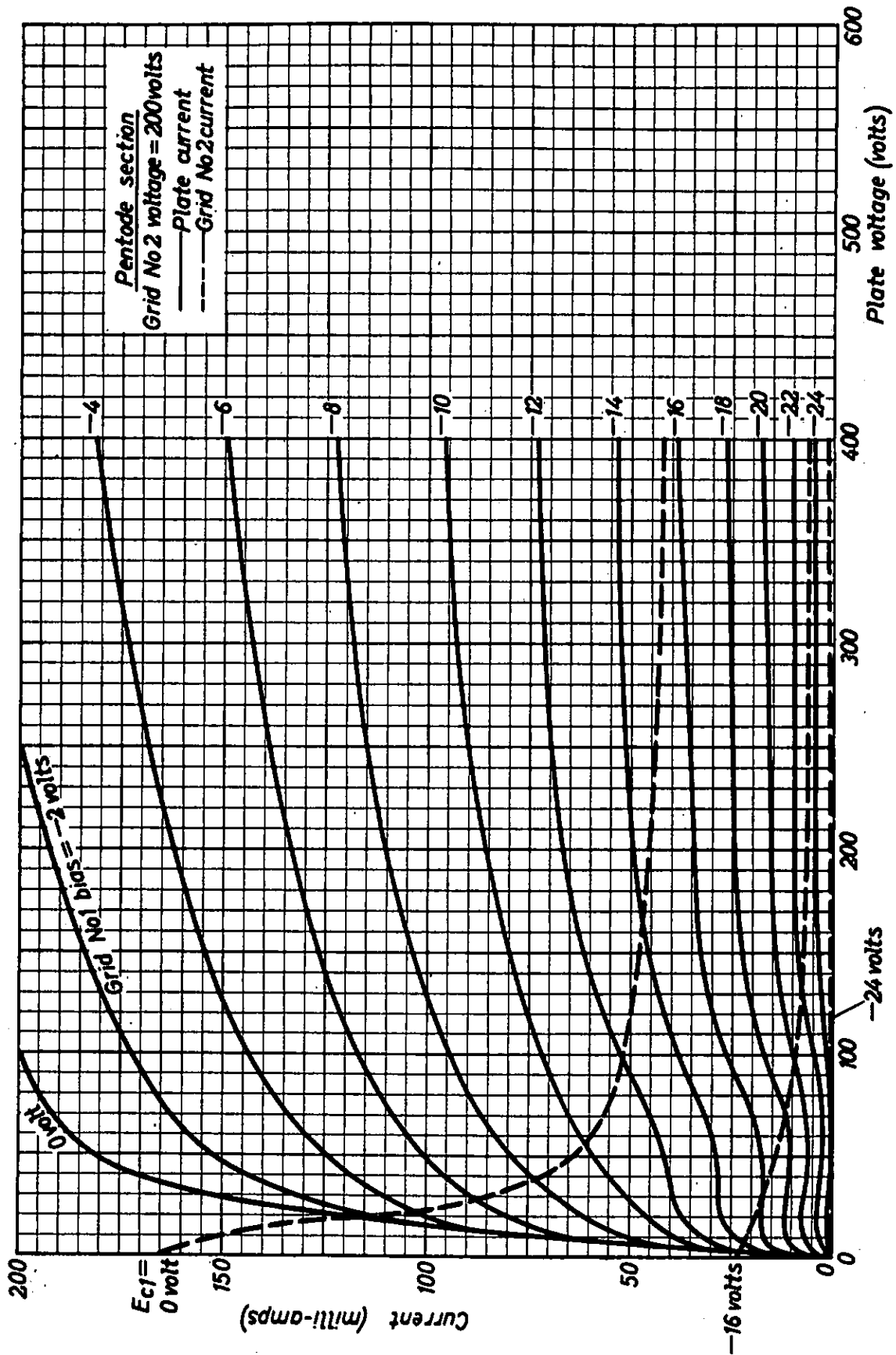
Circuit diagram of triode section as A.F. amplifier and pentode section as transformerless audio output tube.

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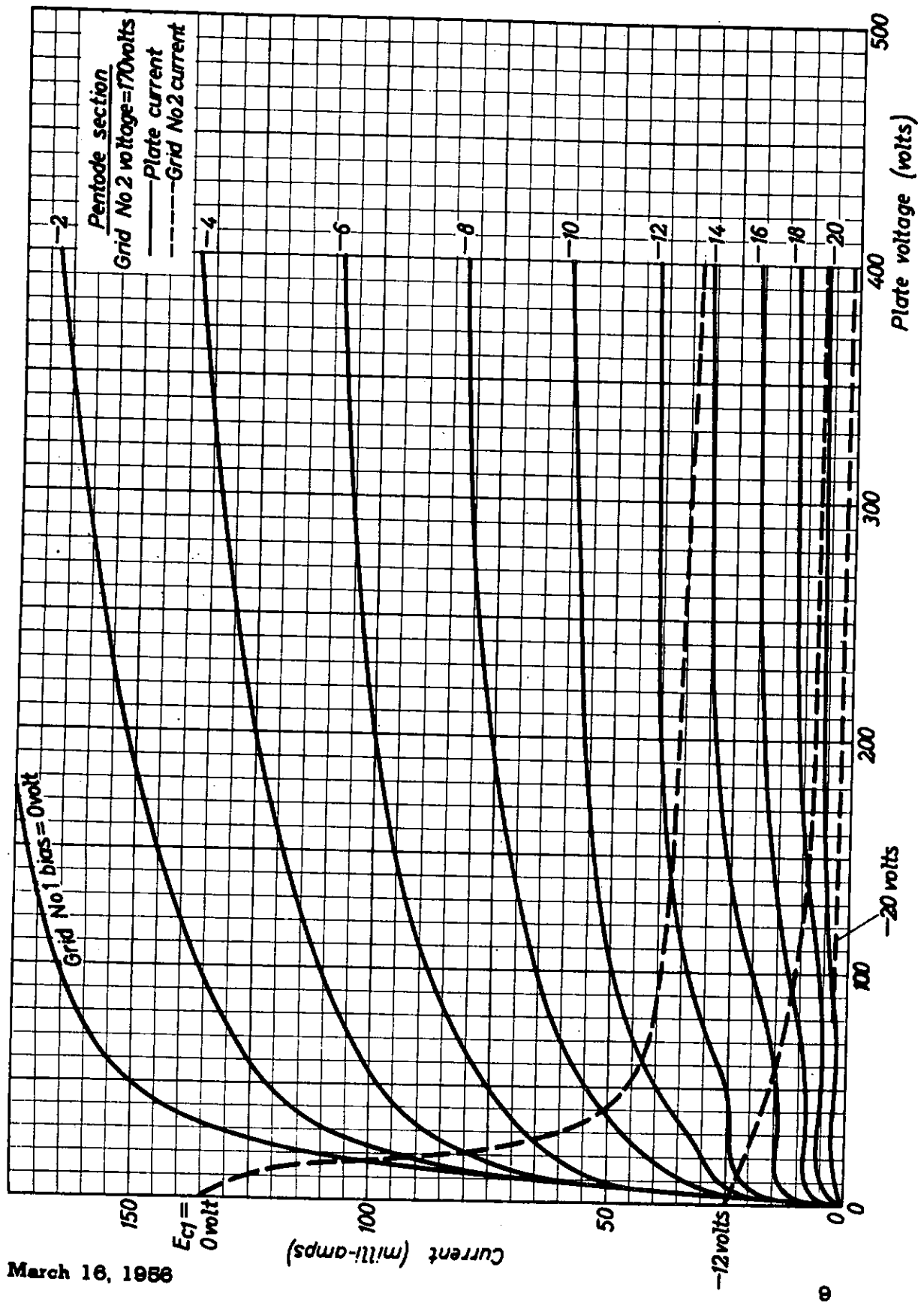


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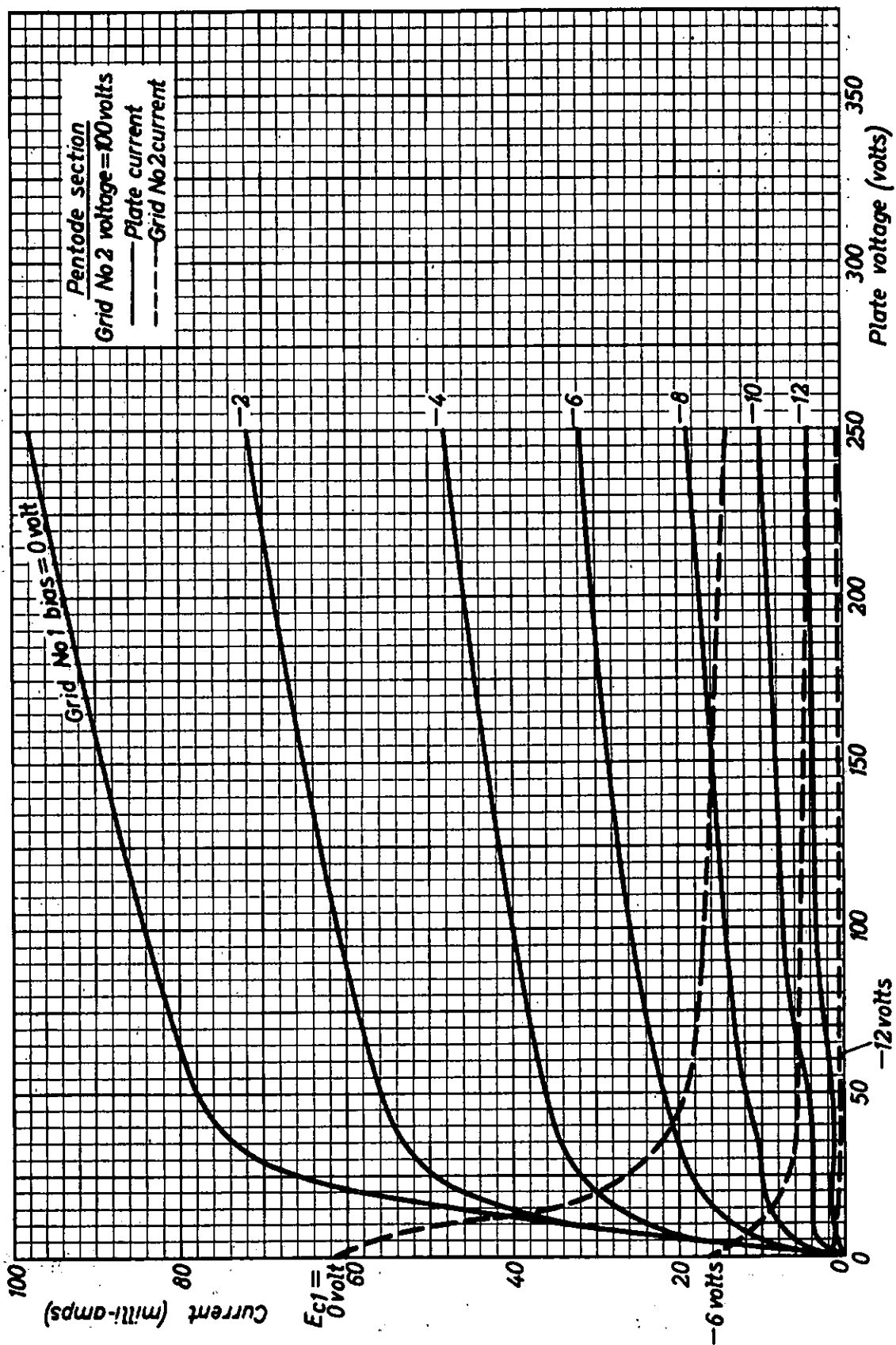


March 16, 1986

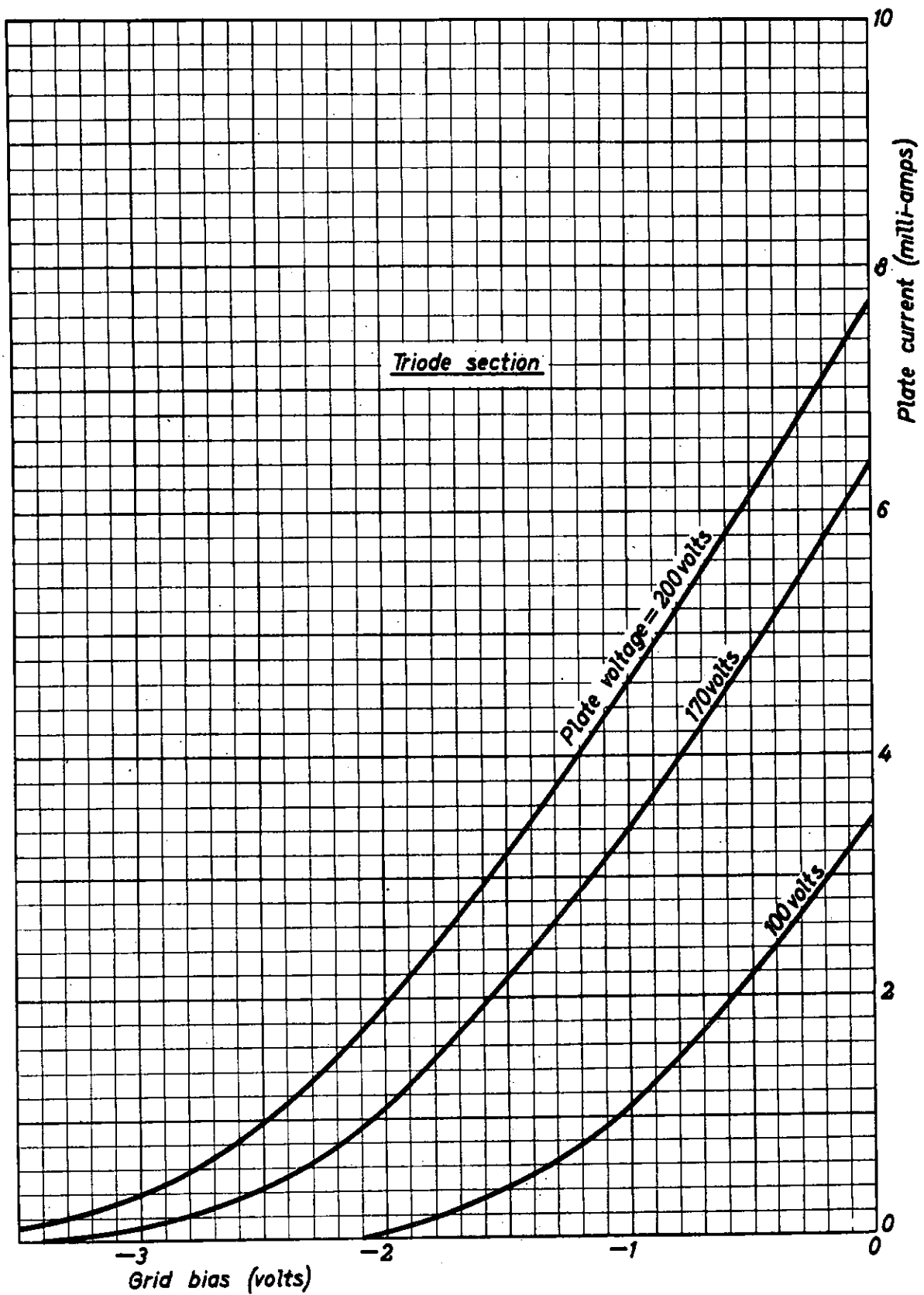
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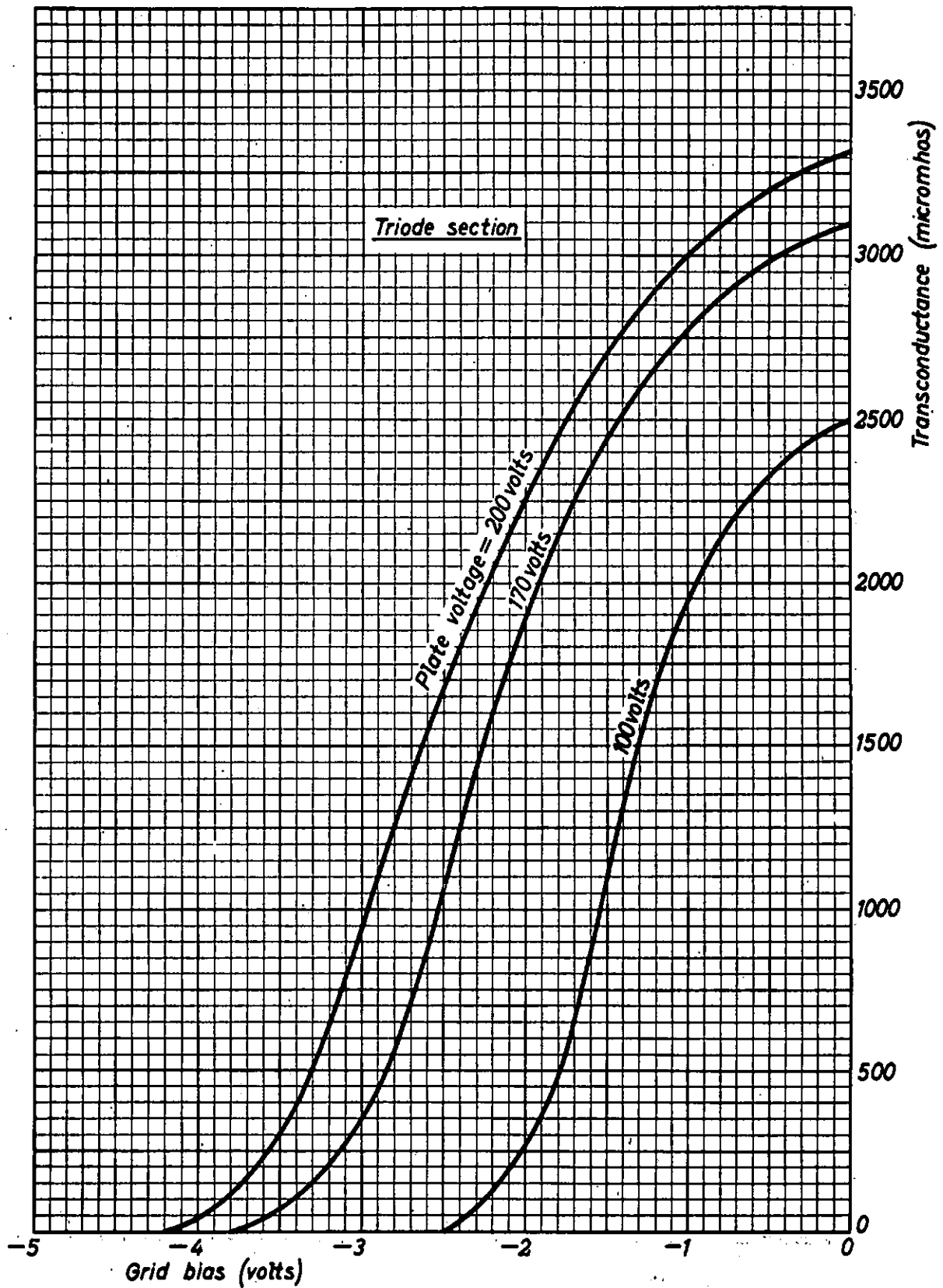
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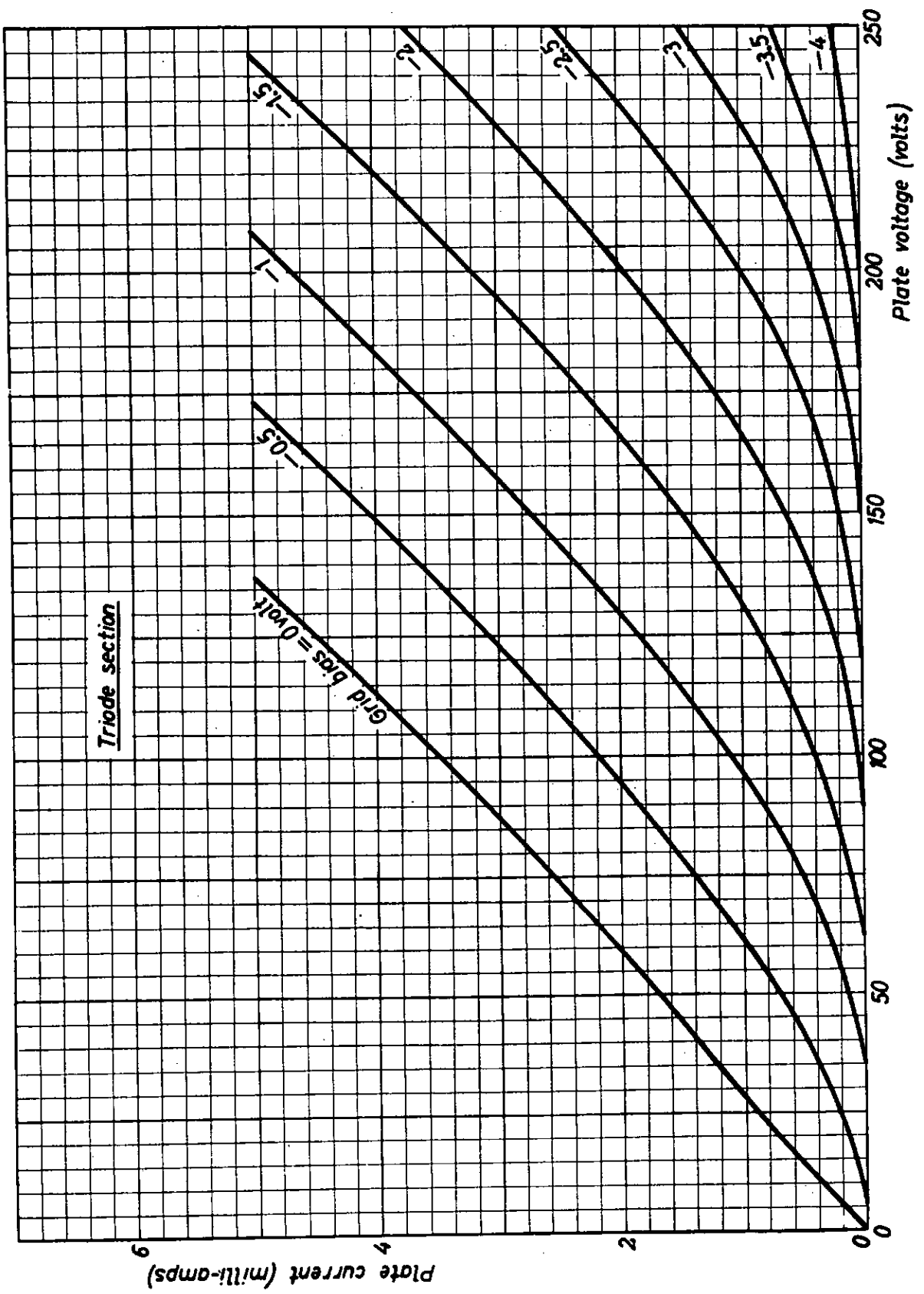


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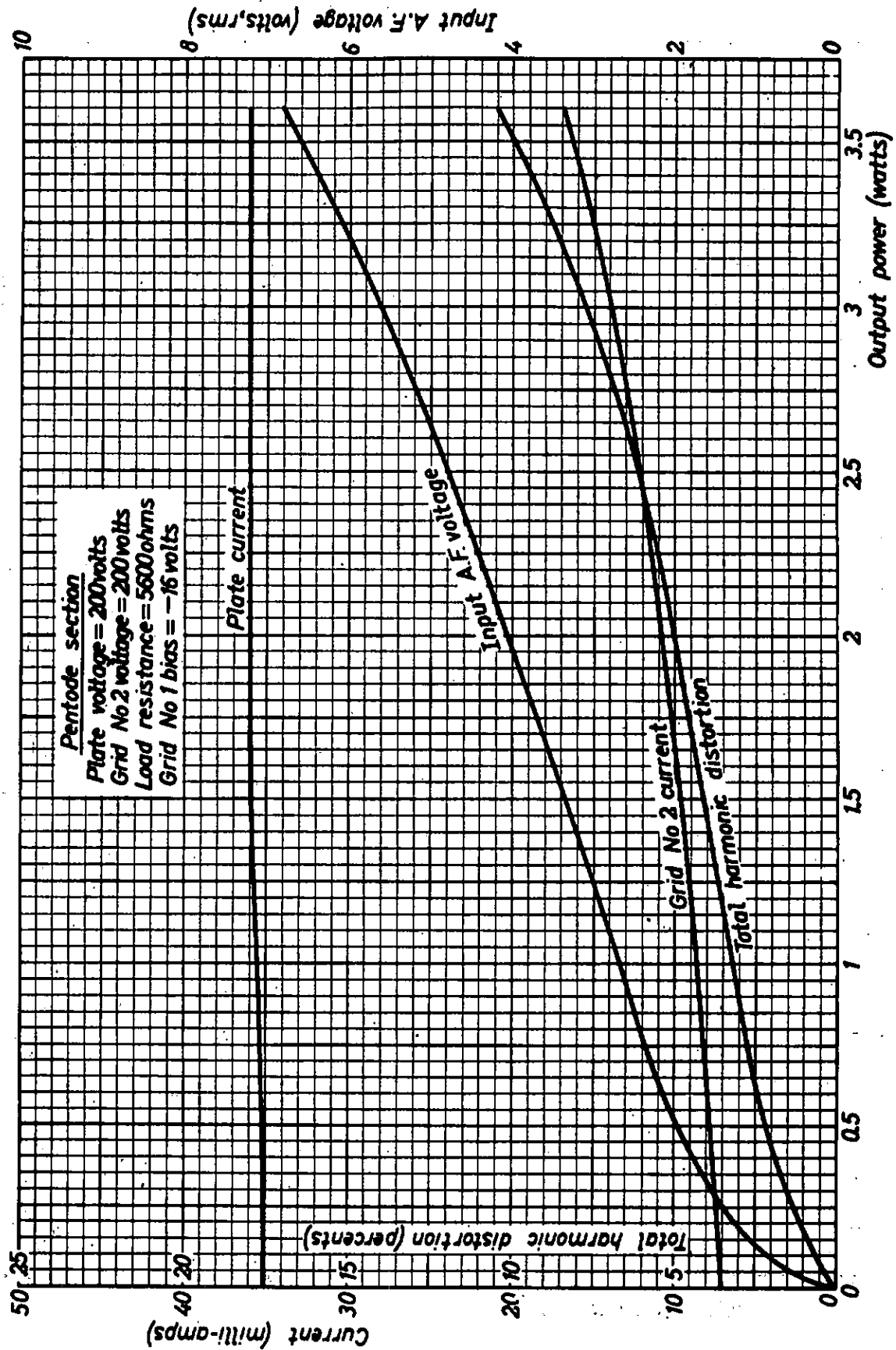


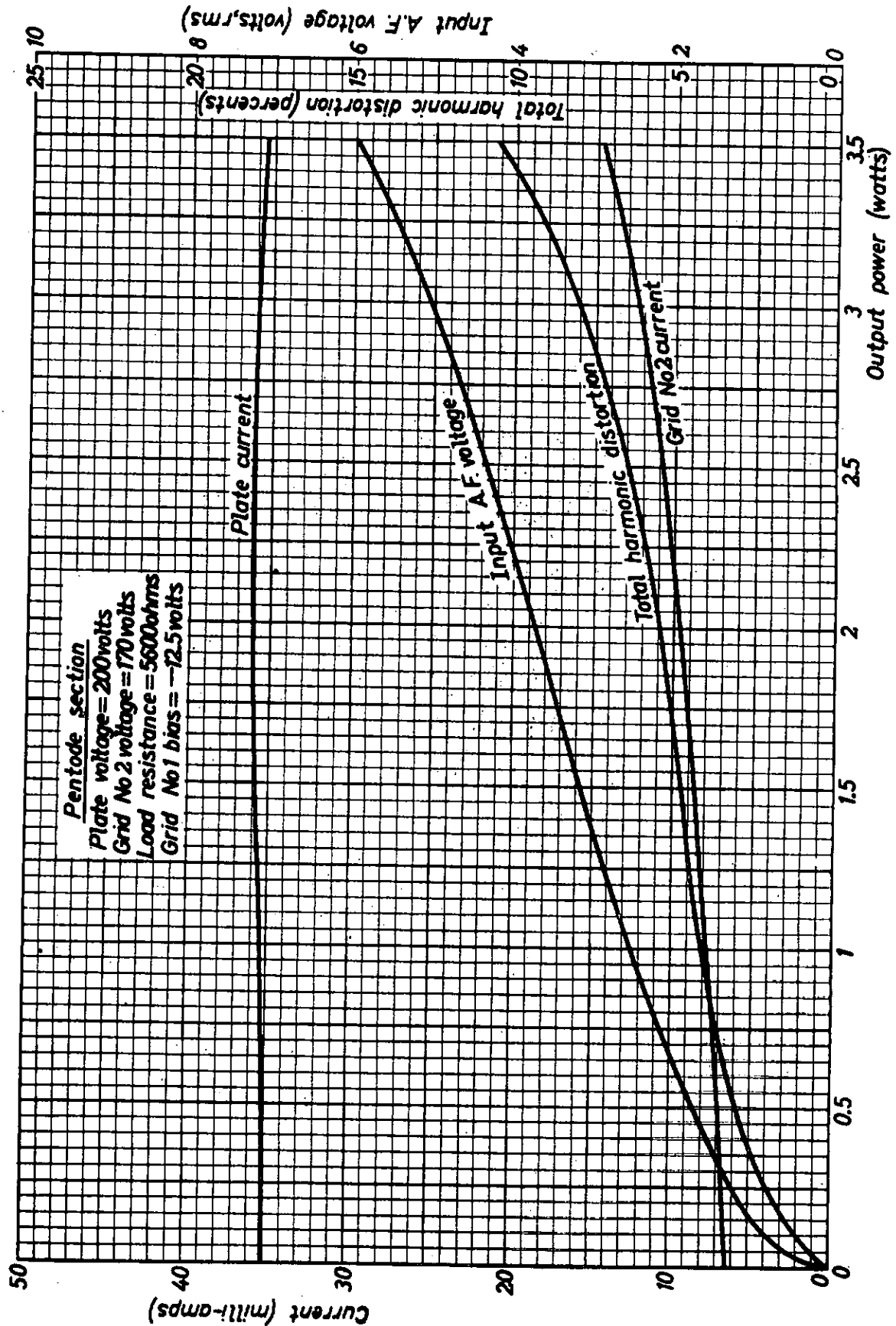
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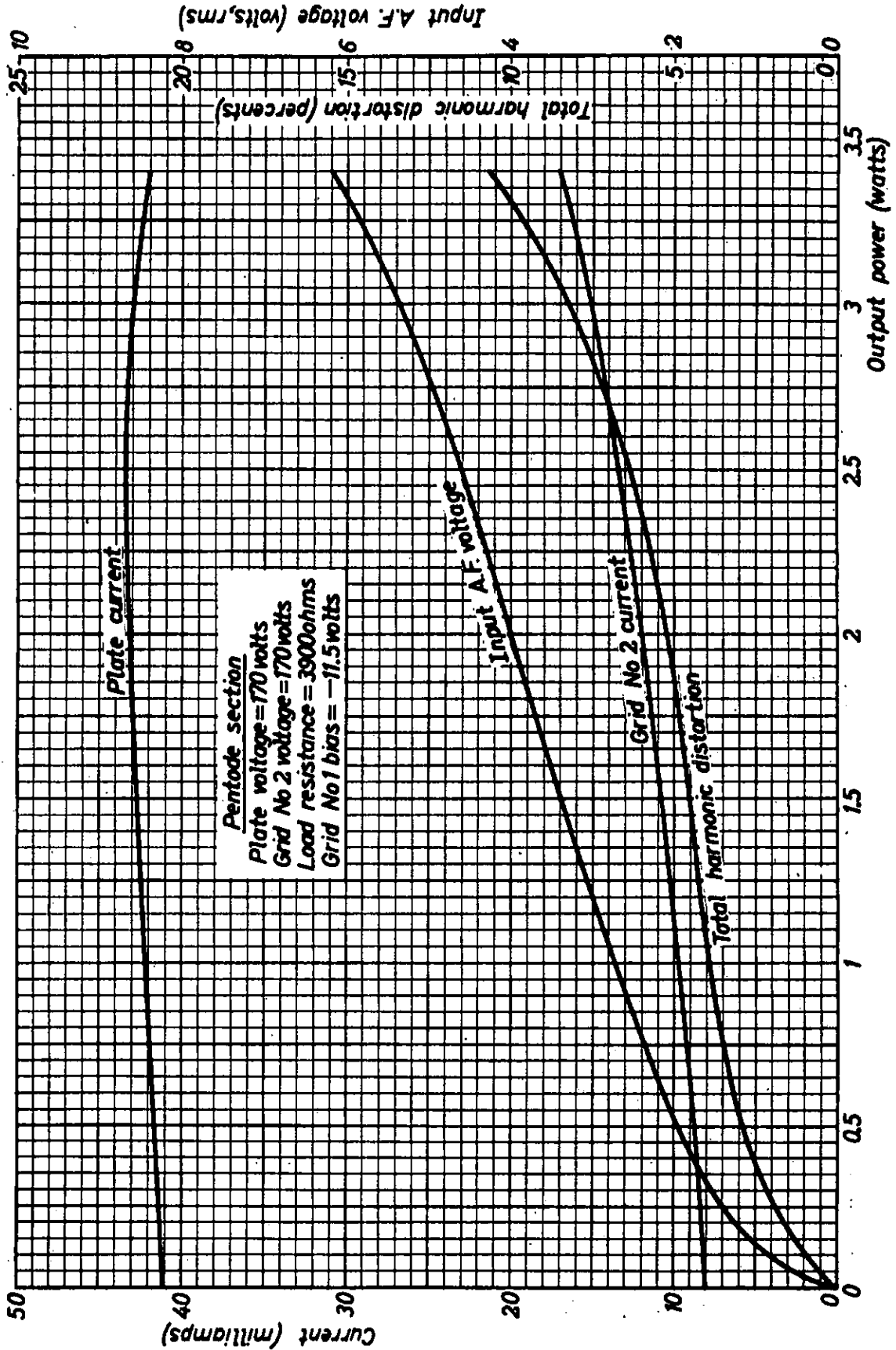
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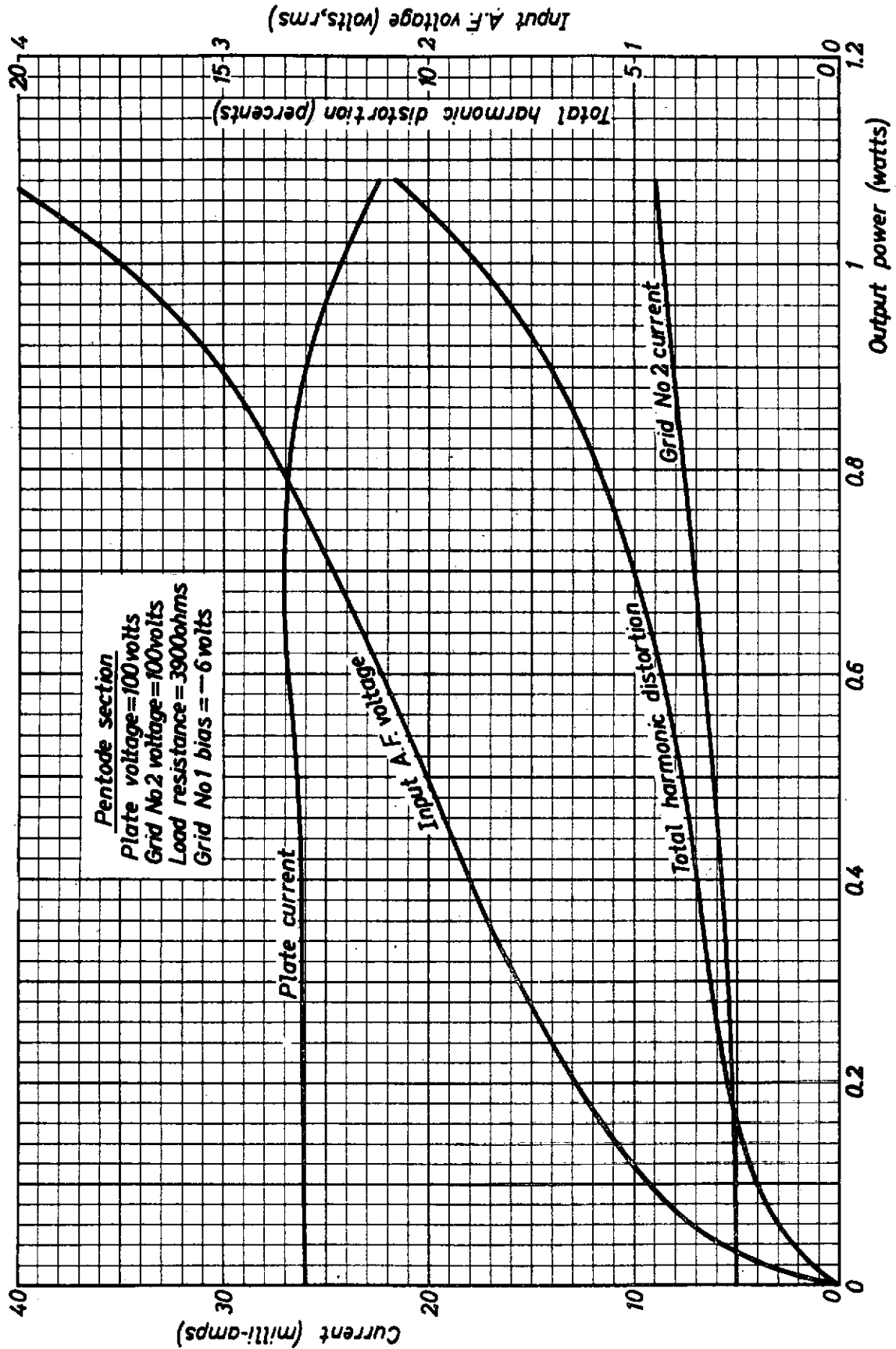




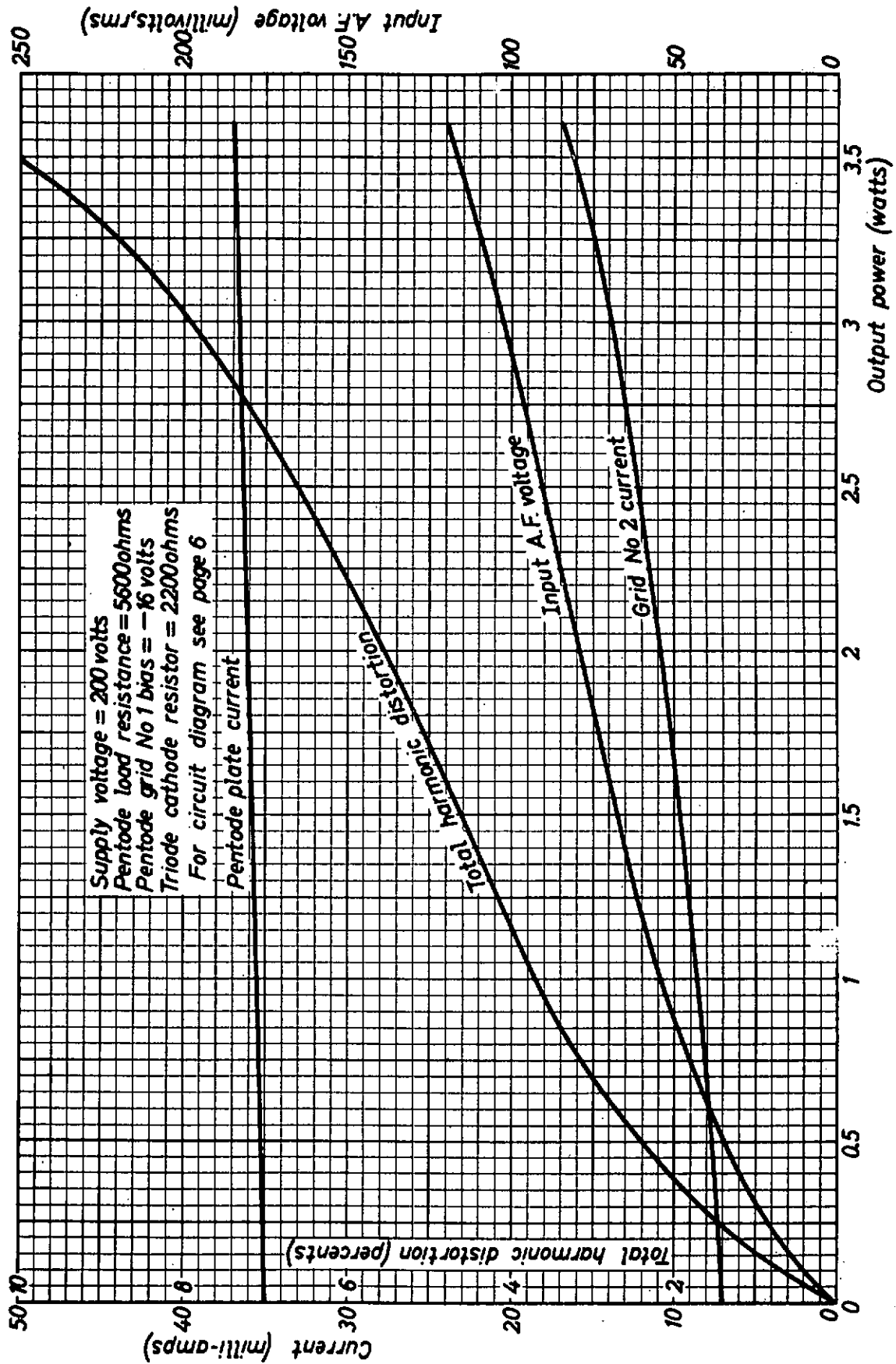
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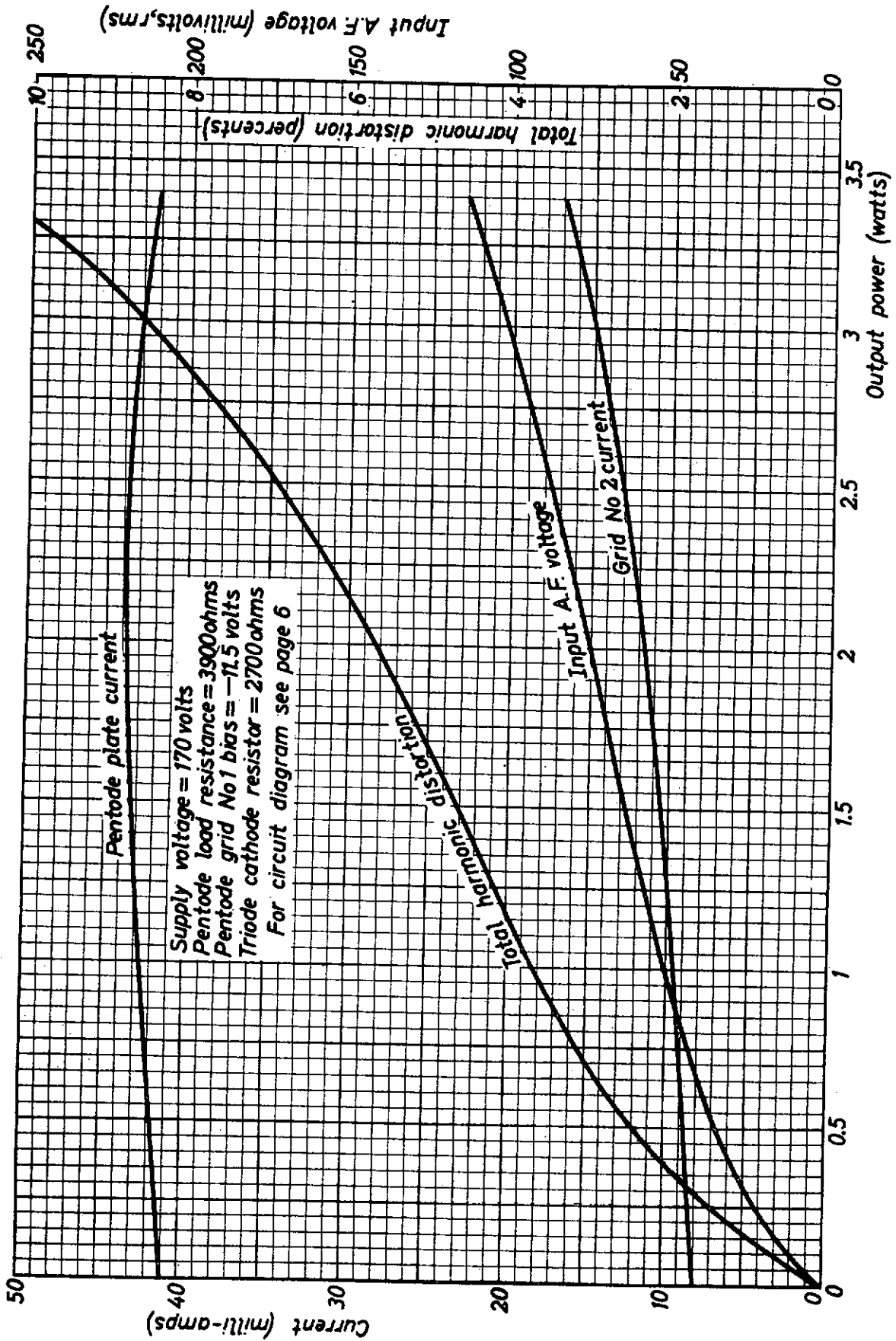


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