Rogers Electronic Tubes & Components

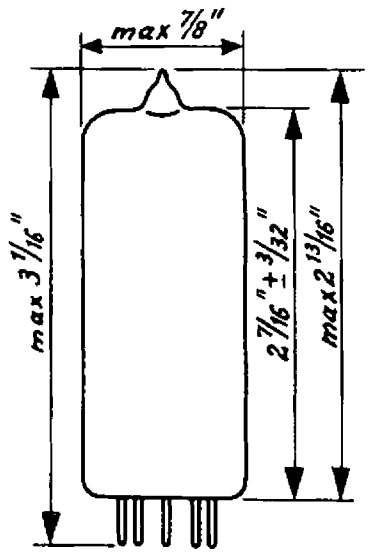
32A8

Description : Triode pentode; triode section for use as A.F. amplifier; pentode section for use as A.F. output tube.

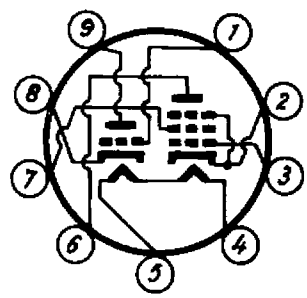
MECHANICAL DATA

Cathode	coated, unipotential
Base	E9-1
Bulb	T6 1/2
Outline	6-4
Basing	9EX
Mounting position	any

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

HEATER DATA

Heater voltage	32 volts
Heater current	150 mamps

DIRECT INTERELECTRODE CAPACITANCES

Triode section

Grid to all other elements except plate		2.7 uuF
Plate to all other elements except grid		4.3 uuF
Plate to grid		4.2 uuF
Grid to heater	max.	0.02 uuF

Pentode section

Grid No.1 to all other elements except plate		9.3 uuF
Plate to all other elements except grid No.1		8.0 uuF
Plate to grid No. 1	max.	0.3 uuF
Grid No.1 to heater	max.	0.3 uuF

from JEDEC release #2556, Aug. 3, 1959

DIRECT INTERELECTRODE CAPACITANCES (continued)

Between triode and pentode section

Triode plate to pentode grid No. 1	max.	0.02 uuF
Triode grid to pentode plate	max.	0.02 uuF
Triode grid to pentode grid No. 1	max.	0.025 uuF
Triode plate to pentode plate	max.	0.25 uuF

MAXIMUM RATINGS (design center values)

Pentode section

Plate voltage without plate current	550 volts max.
Plate voltage	250 volts max.
Plate dissipation	7 watts max.
Grid No.2 voltage without current	550 volts max.
Grid No. 2 voltage	250 volts max.
Grid No. 2 dissipation	1.8 watts max.
Peak grid No. 2 dissipation	3.2 watts max.
Cathode current	50 mamps max.
Grid No.1 circuit resistance with automatic bias	2 megohms max.
Grid No.1 circuit resistance with fixed bias	1 megohm max.
Voltage between heater and cathode	200 volts max.
Circuit resistance between heater and cathode	20000 ohms max.

Triode section

Plate voltage without plate current	550 volts max.
Plate voltage	250 volts max.
Plate dissipation	1 watt max.
Cathode current	15 mamps max.
Grid circuit resistance with automatic bias	3 megohms max.
Grid circuit resistance with fixed bias	1 megohm max.
Voltage between heater and cathode	200 volts max.
Circuit resistance between heater and cathode	20000 ohms max.
Grid circuit impedance (freq. = 50 c/s)	0.5 megohm max.

TYPICAL CHARACTERISTICS

Pentode section

Plate voltage	100	170	200	200 volts
Grid No. 2 voltage	100	170	200	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	15000	16000	20500	20000	ohms
Amplification factor of grid No.2 with respect to grid No. 1	10	9.5	9.5	9.5	

Triode section

Plate voltage	100	volts
Grid voltage	0	volts
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	200	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
Load resistance	3900	3900	5600	5600	ohms
Power output at a harmonic 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)
Required input A.F.voltage at a power output of 50 milliwatts	0.65	0.59	0.56	0.60	volts (rms)

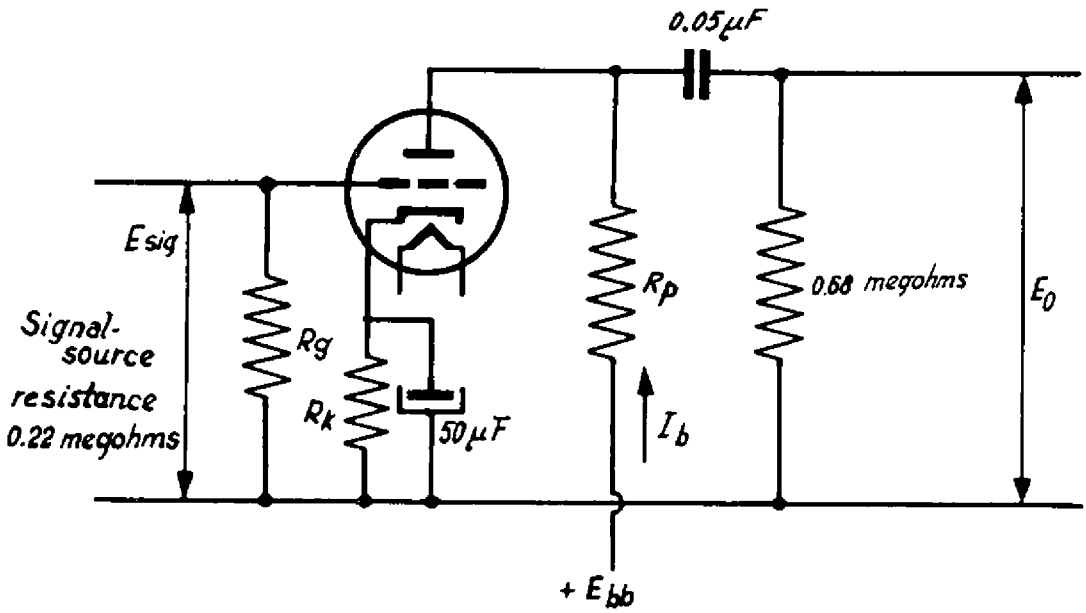
MICROPHONY

The triode section can be used without special precautions against microphonic effect in circuits in which an input voltage of at least 10 millivolts gives an output power of 50 milliwatts.

HUM

In order to statisfy the hum requirement for the triode section of -60 db at an output power of 50 milliwatts, the input voltage for 50 milliwatts output must be higher than 10 millivolts when the grid circuit impedance at 50 cycles/second $\leq$ 0.5 megohm. In this case the A.C.voltage between pin 5 and cathode must be zero. When the A.C.voltage between pin 5 and cathode is 12.6 volts, the input voltage for 50 milliwatts output must be at least 20 millivolts.

OPERATING CHARACTERISTICS OF THE TRIODE SECTION AS A.F. AMPLIFIER

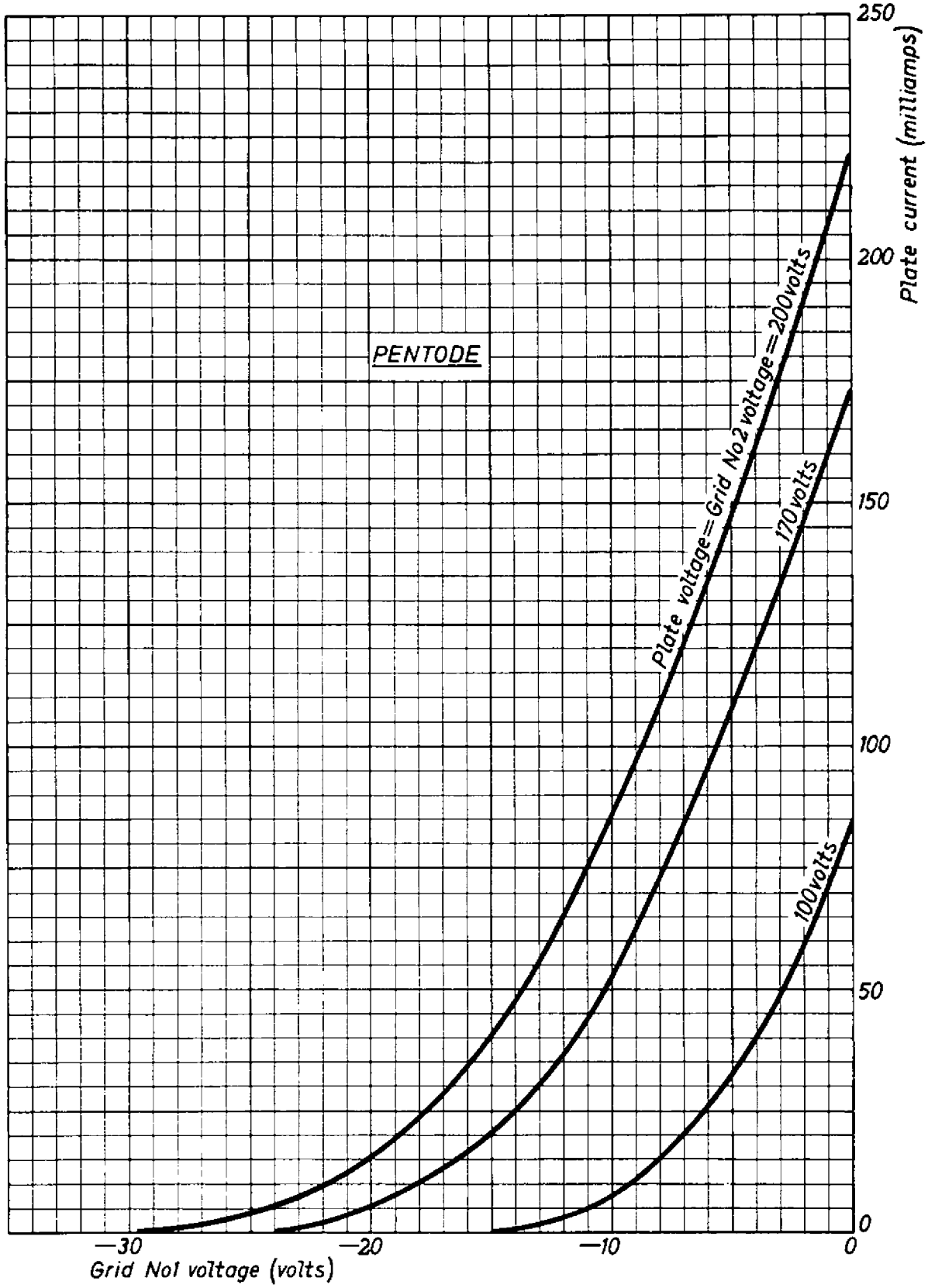


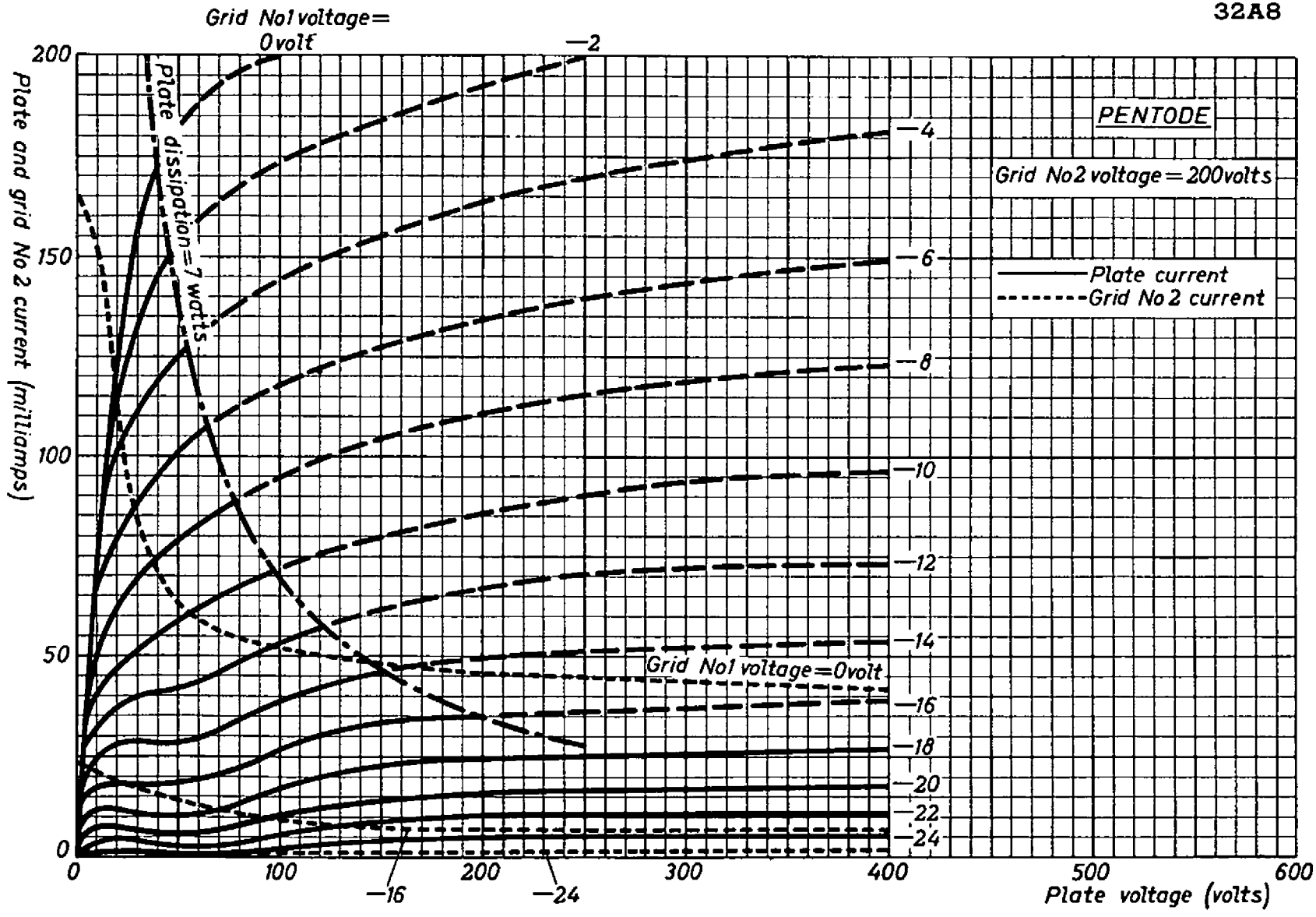
Ebb volts	R_g megohms	R_k ohms	R_p megohms	I_b mamps	E_o volts(rms)	$\frac{E_o}{E_{sig}}$ (1	total harmonics
200	3	2200	0.22	0.52	26	52	1.6 (2
170	3	2700	0.22	0.43	25	51	2.3 (2
100	3	2700	0.22	0.23	15	47	4.0 (2
200	22	0	0.1	1.05	24	50	1.5 (3
170	22	0	0.1	0.86	19	49	1.4 (3
100	22	0	0.1	0.37	8	42	1.3 (2
200	22	0	0.22	0.61	25	55	1.4 (3
170	22	0	0.22	0.50	20	53	1.4 (3
100	22	0	0.22	0.22	9	46	1.5 (2

1) Measured at small input voltage

2) At lower output voltages the distortion is proportionally lower

3) At lower output voltages the distortion remains approx. constant up to V_o = 5 V_{eff}. At values < 5 V_{eff} the distortion is proportionally lower.


PENTODE
Plate voltage = Grid No2 voltage = 200volts
170volts
100volts
Plate current (milliamps)
250
200
150
100
50
0
—30
—20
—10
0
Grid No1 voltage (volts)


Grid No1 voltage = 0 volt
−2
−4
−6
−8
−10
−12
−14
−16
−18
−20
−22
−24
PENTODE
Grid No2 voltage = 200volts
Plate current
Grid No 2 current
Plate dissipation = 7 watts
Grid No1 voltage = 0volt
Plate and grid No 2 current (milliamps)
Plate voltage (volts)
0
50
100
150
200
300
400
500
600

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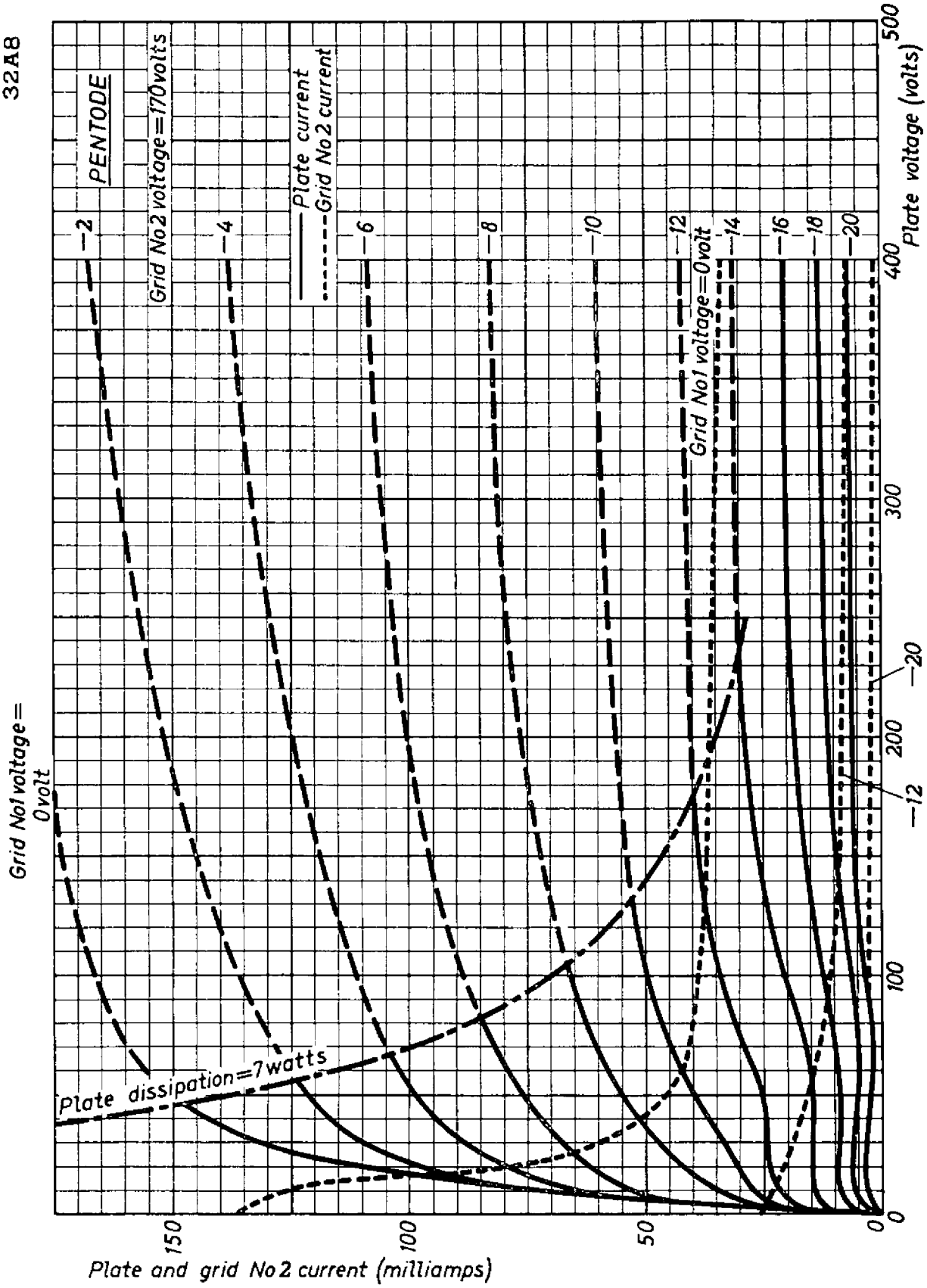

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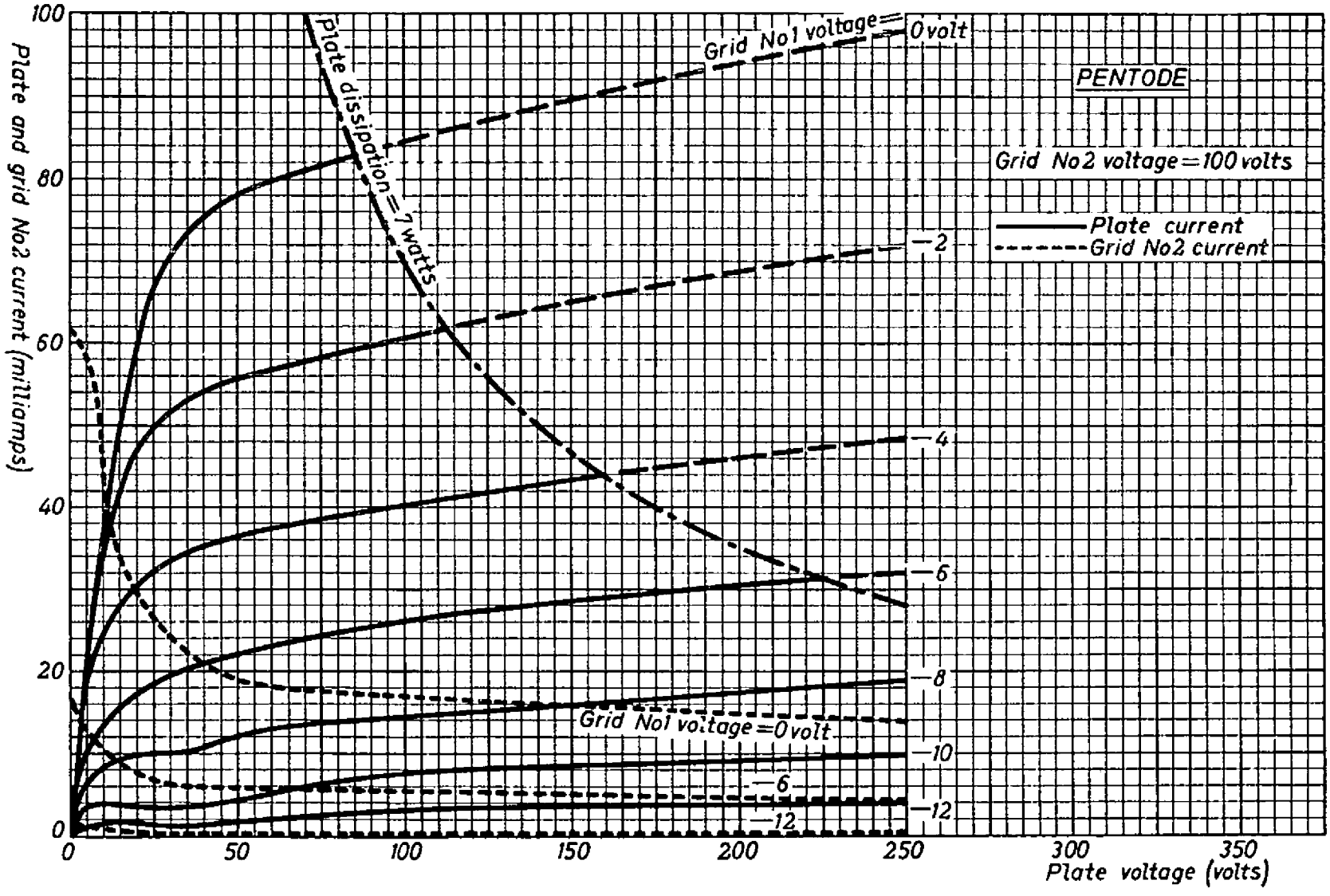
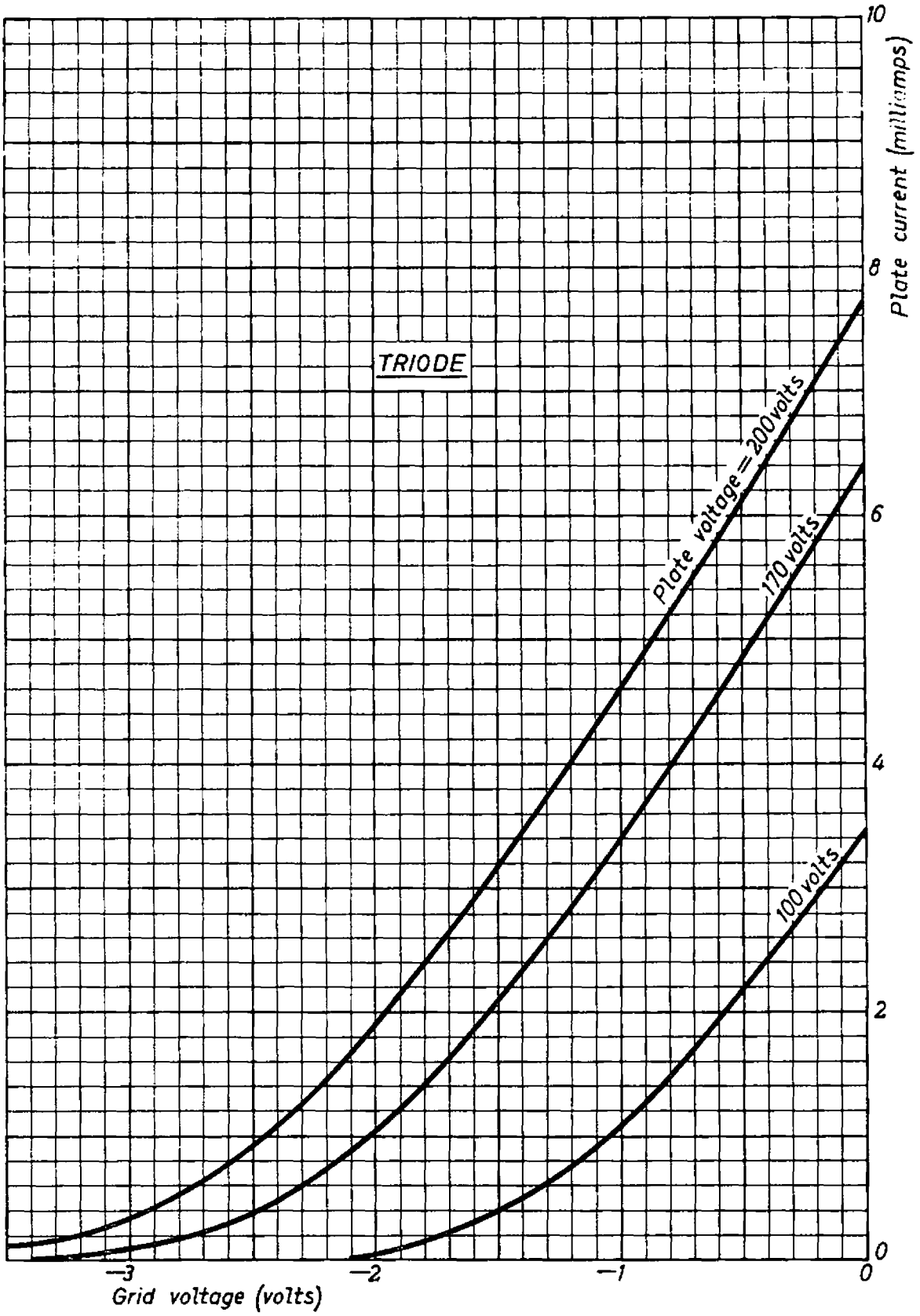
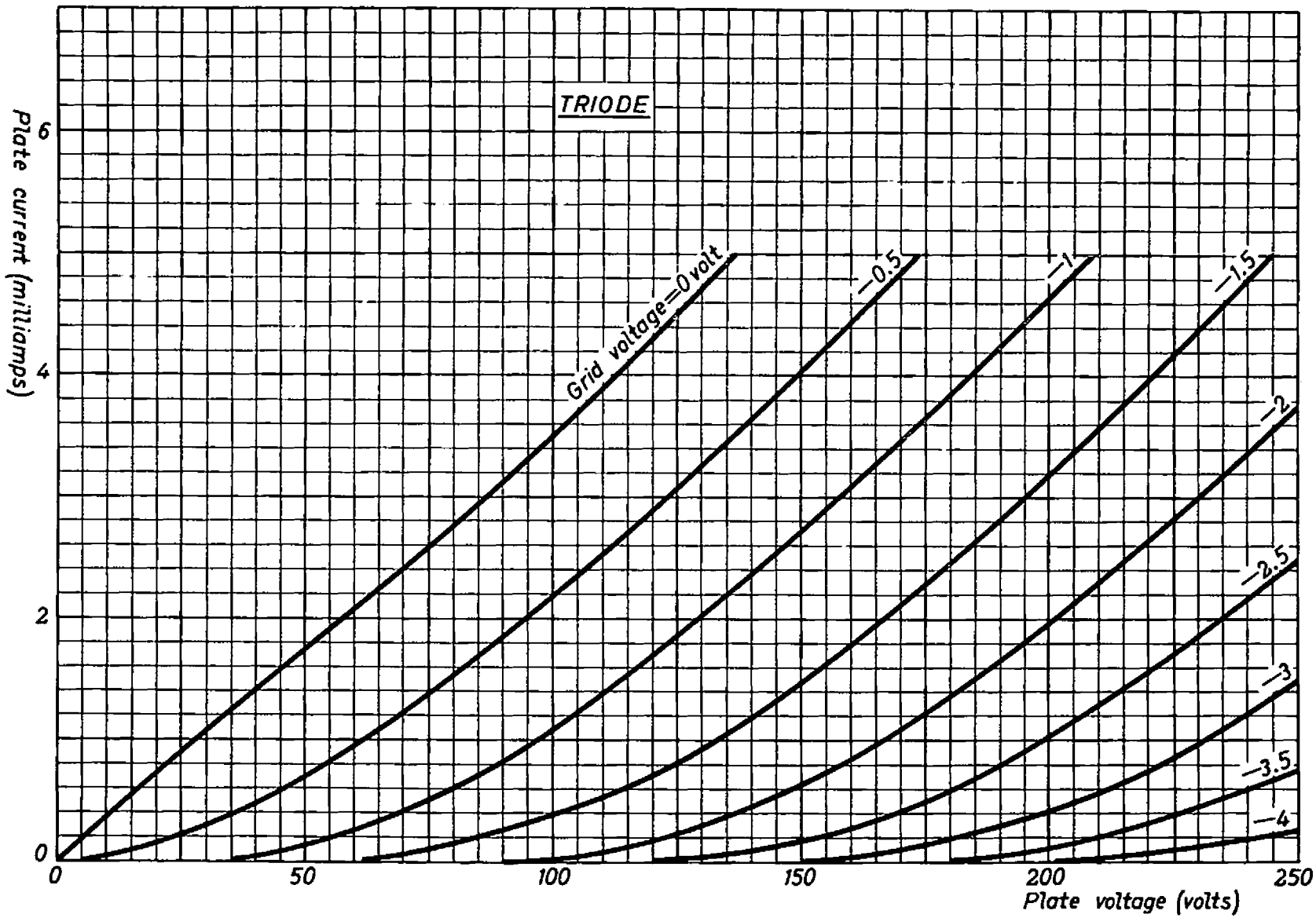
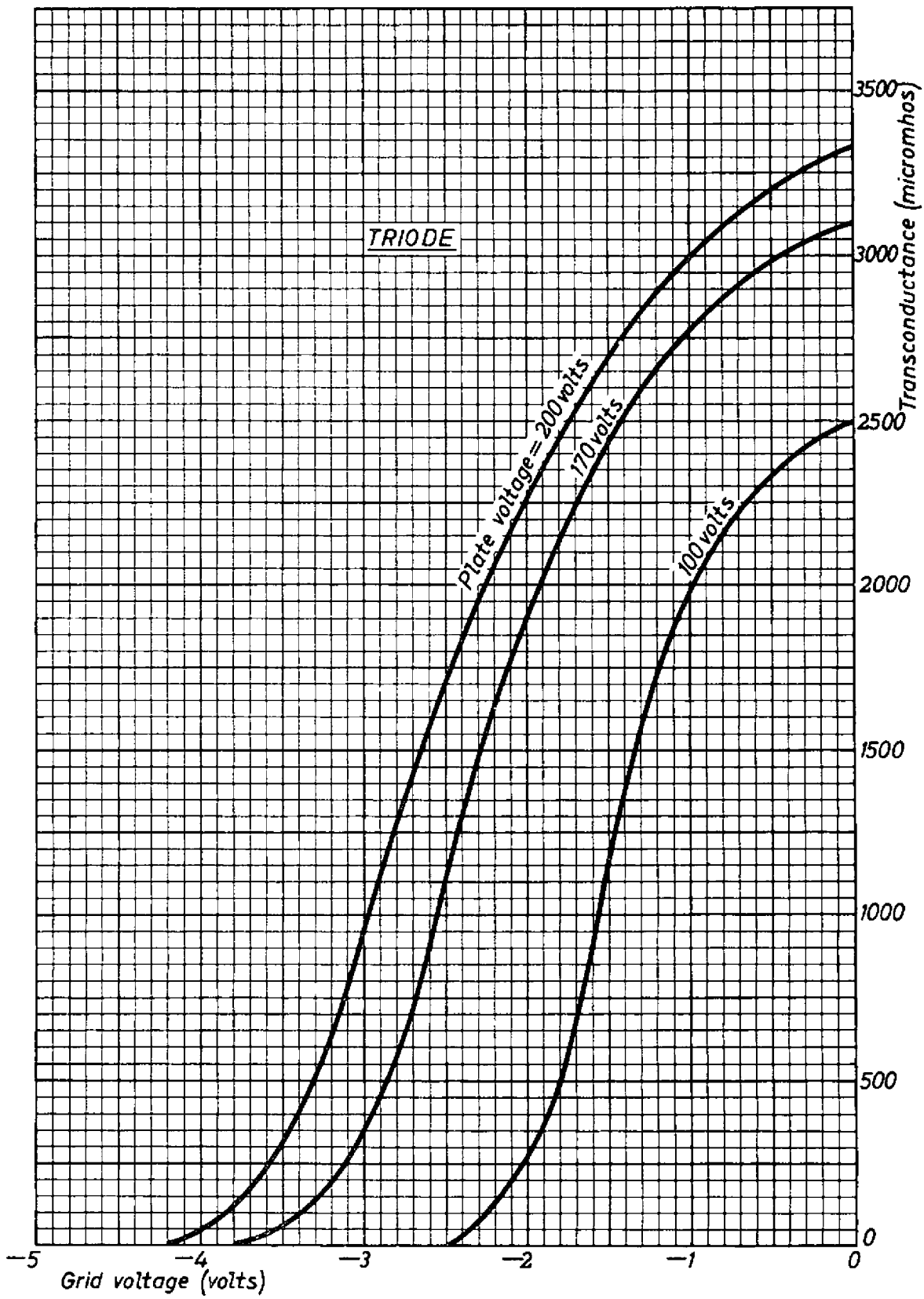

PENTODE
Grid No2 voltage=100 volts
Plate current
Grid No2 current
Plate dissipation=7 watts
Grid No1 voltage=0 volt
-2
-4
-6
-8
-10
-12
-6
-12
Grid No1 voltage=0 volt
Plate and grid No2 current (milliamps)
Plate voltage (volts)
0
20
40
60
80
100
0
50
100
150
200
250
300
350


TRIODE
Plate voltage = 200 volts
170 volts
100 volts
Plate current (milliamps)
10
8
6
4
2
0
−3
−2
−1
0
Grid voltage (volts)


TRIODE
Plate current (milliamps)
0
2
4
6
0
50
100
150
200
250
Plate voltage (volts)
Grid voltage=0 volt
−0.5
−1
−1.5
−2
−2.5
−3
−3.5
−4


TRIODE
Plate voltage = 200 volts
170 volts
100 volts
Transconductance (micromhos)
3500
3000
2500
2000
1500
1000
500
0
−5
−4
−3
−2
−1
0
Grid voltage (volts)