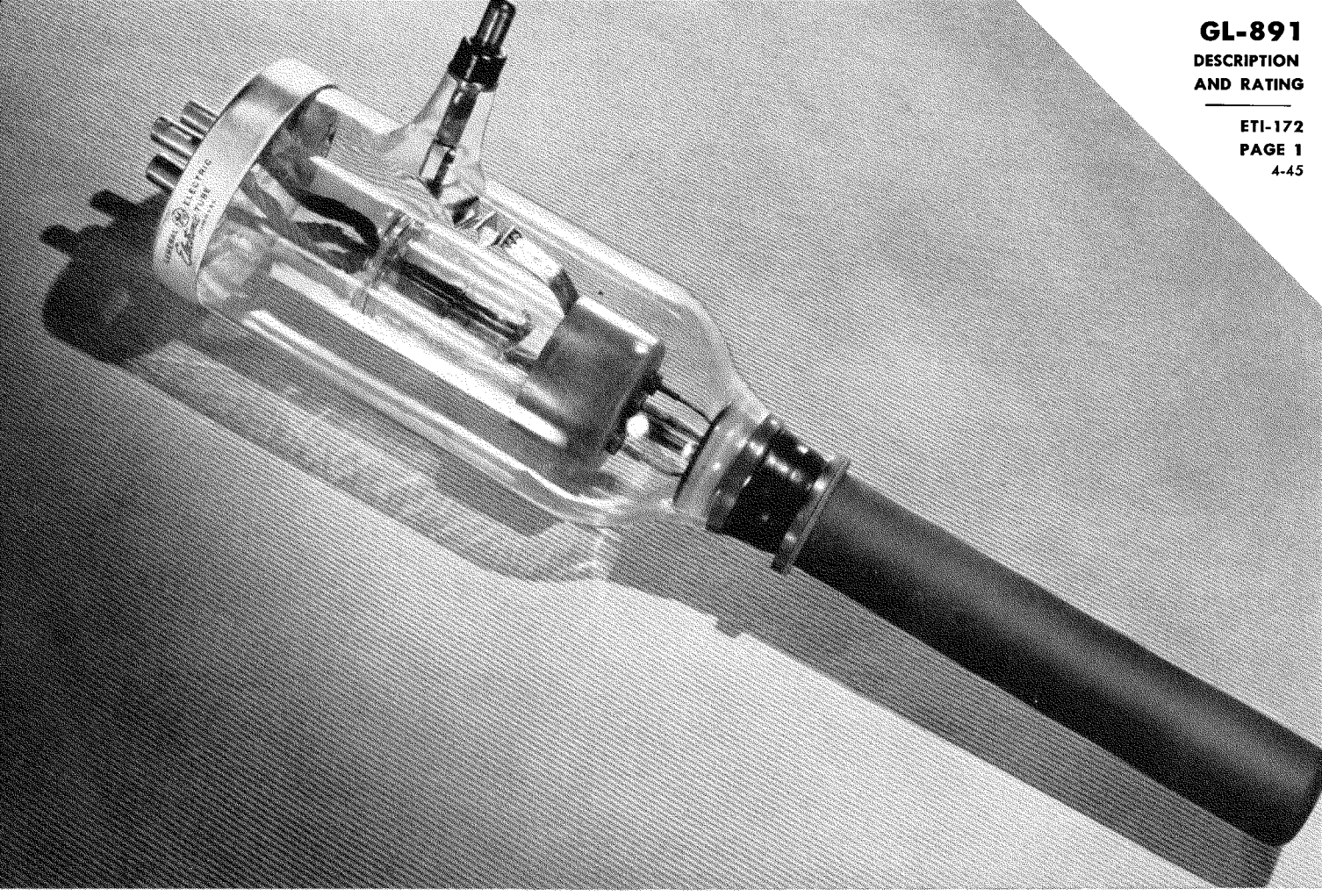


PLIOTRON

DESCRIPTION

The GL-891 is a three-electrode transmitting tube of the double-filament type for use as a radio-frequency power amplifier, oscillator, Class A modulator and Class B modulator. The construction of the filament permits operation from two-phase or single-phase alternating current as well as from direct current, for all classes of service. The plate is water-cooled and is capable of dissipating 4 to 7.5 kilowatts depending on the service in which the tube is used.

TECHNICAL INFORMATION

These data are for reference only. For design information refer to specifications.

GENERAL CHARACTERISTICS

Electrical

Cathode—Filamentary, two-unit type

Excitation, 1ϕ a-c, 2ϕ a-c, or d-c

Voltage, per unit	11	volts
Current, per unit	60	amperes
Amplification factor	8	
Direct interelectrode capacitances, approximate:		
Grid-plate	27	micromicrofarads
Grid-filament	19	micromicrofarads
Plate-filament	2	micromicrofarads

Mechanical

Mounting position ..... vertical, anode down

Cooling: Water flow of 3 to 8 gallons per minute must start before application of any voltages and continue for at least 5 minutes after removal of voltages. Water temperature must not exceed 70 C under any conditions of operation.

GE Electronic TUBE

GENERAL ELECTRIC

TECHNICAL INFORMATION (CONT'D)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

CLASS A AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR

	Typical Operation	Maximum Ratings	
D-c plate voltage		12000	volts
Plate input		7.5	kilowatts
Plate dissipation		7.5	kilowatts
D-c voltage	8000		volts
D-c grid voltage*	−630		volts
Peak a-f grid voltage	700		volts
D-c plate current	0.9		ampere
Load resistance	5200		ohms
U.P.O. (5% second harmonic)	2		kilowatts

CLASS B AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR

D-c plate voltage				15000	volts
Max signal d-c plate current†				2.0	amperes
Max signal plate input†				20	kilowatts
Plate dissipation†				5	kilowatts
D-c plate voltage	6000	10000	12500		volts
D-c grid voltage*	−600	−1100	−1450		volts
Peak a-f grid-to-grid voltage	2200	3400	3960		volts
Zero signal d-c plate current	0.5	0.5	0.4		ampere
Max signal d-c plate current	2.3	3.2	2.8		amperes
Load resistance (per tube)	1250	1600	2500		ohms
Effective load resistance (plate to plate)	5000	6400	10000		ohms
Max signal driving power, approx.	260	324	350		watts
Max signal power output, approx.	8	20	22		kilowatts

Unless otherwise specified, values are for two tubes.

CLASS B RADIO-FREQUENCY POWER AMPLIFIER—TELEPHONY

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

D-c plate voltage				15000	volts
D-c plate current				1.0	ampere
Plate input				10	kilowatts
Plate dissipation				6	kilowatts
D-c plate voltage	6000	10000	14000		volts
D-c grid voltage**	−600	−1130	−1600		volts
Peak r-f grid voltage	600	830	1000		volts
D-c plate current	0.7	0.8	0.56		ampere
Driving power, approx.#	82	0	0		watts
Power output, approx.	1	2	2.275		kilowatts

CLASS C PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER—TELEPHONY

Carrier conditions per tube for use with a max modulation factor of 1.0

D-c plate voltage				8000	volts
D-c grid voltage				−3000	volts
D-c plate current				1.0	ampere
D-c grid current				0.15	ampere
Plate input				8	kilowatts
Plate dissipation				4	kilowatts
D-c plate voltage		6000	8000		volts
D-c grid voltage		−2000	−2400		volts
Peak r-f grid voltage		2650	3100		volts
D-c plate current		0.75	0.78		ampere
D-c grid current, approximate		0.1	0.08		ampere
Driving power, approx.		260	260		watts
Power output, approx.		3.5	5		kilowatts

CLASS C RADIO-FREQUENCY POWER AMPLIFIER—TELEGRAPHY

Key-down conditions per tube without modulation##

	Typical Operation		Maximum Ratings	
D-c plate voltage			12000	volts
D-c grid voltage			−3000	volts
D-c plate current			2.0	amperes
D-c grid current			0.15	ampere
Plate input			18	kilowatts
Plate dissipation			6	kilowatts
D-c plate voltage	8000	10000		volts
D-c grid voltage	−1800	−2000		volts
Peak r-f grid voltage	2500	2900		volts
D-c plate current	1.1	1.45		ampere
D-c grid current, approx.	0.06	0.105		ampere
Driving power, approx.	150	310		watts
Power output, approx.	6.5	10		kilowatts

†Averaged over any audio-frequency cycle.
*With a-c filament supply.
**With d-c filament supply.
#At crest of a-f cycle with modulation factor of 1.0.
##Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

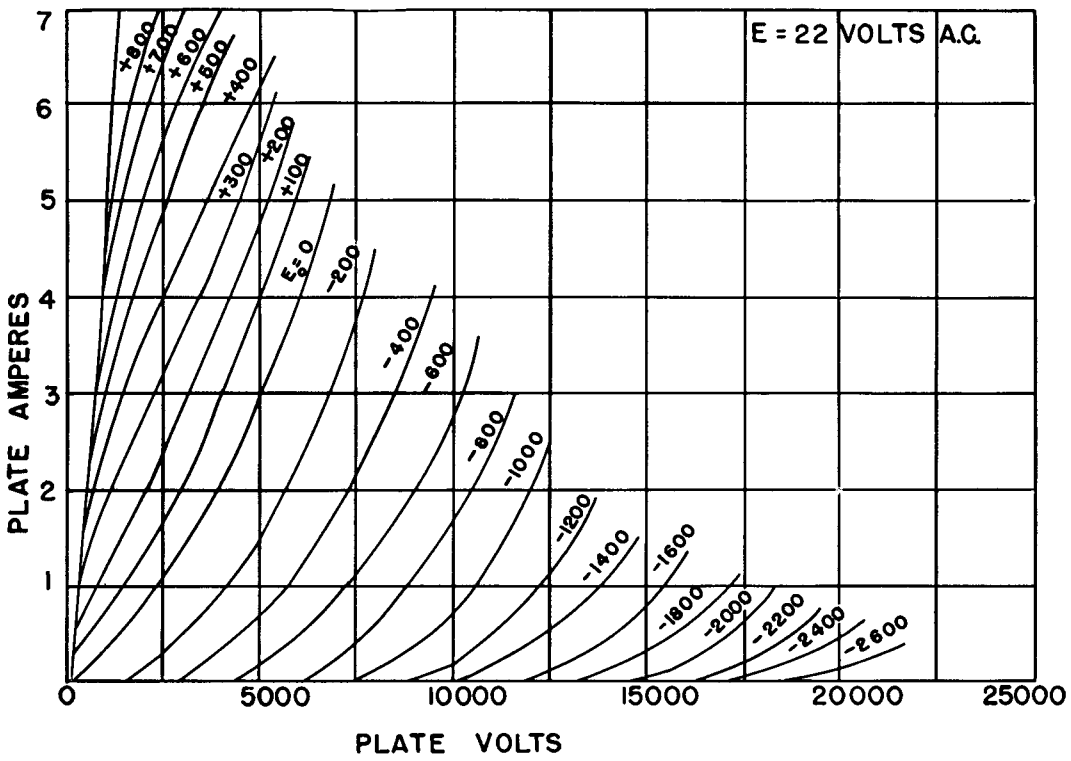
APPLICATION NOTES

GL-891 can be operated at maximum ratings in all classes of service at frequencies as high as 1.6 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced as the frequency is raised. (Other maximum ratings are the same as shown under MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS.) The tabulation shows the highest percentage of maximum plate voltage and power input that can be used up to 20 mc for the various classes of service. Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	1.6	7.5	20	megacycles

Maximum permissible percentage of maximum rated plate voltage and plate input:

Class B telephony	100	82	72	per cent
Class C (telephony, plate modulated)	100	75	65	per cent
(telegraphy)	100	75	50	per cent



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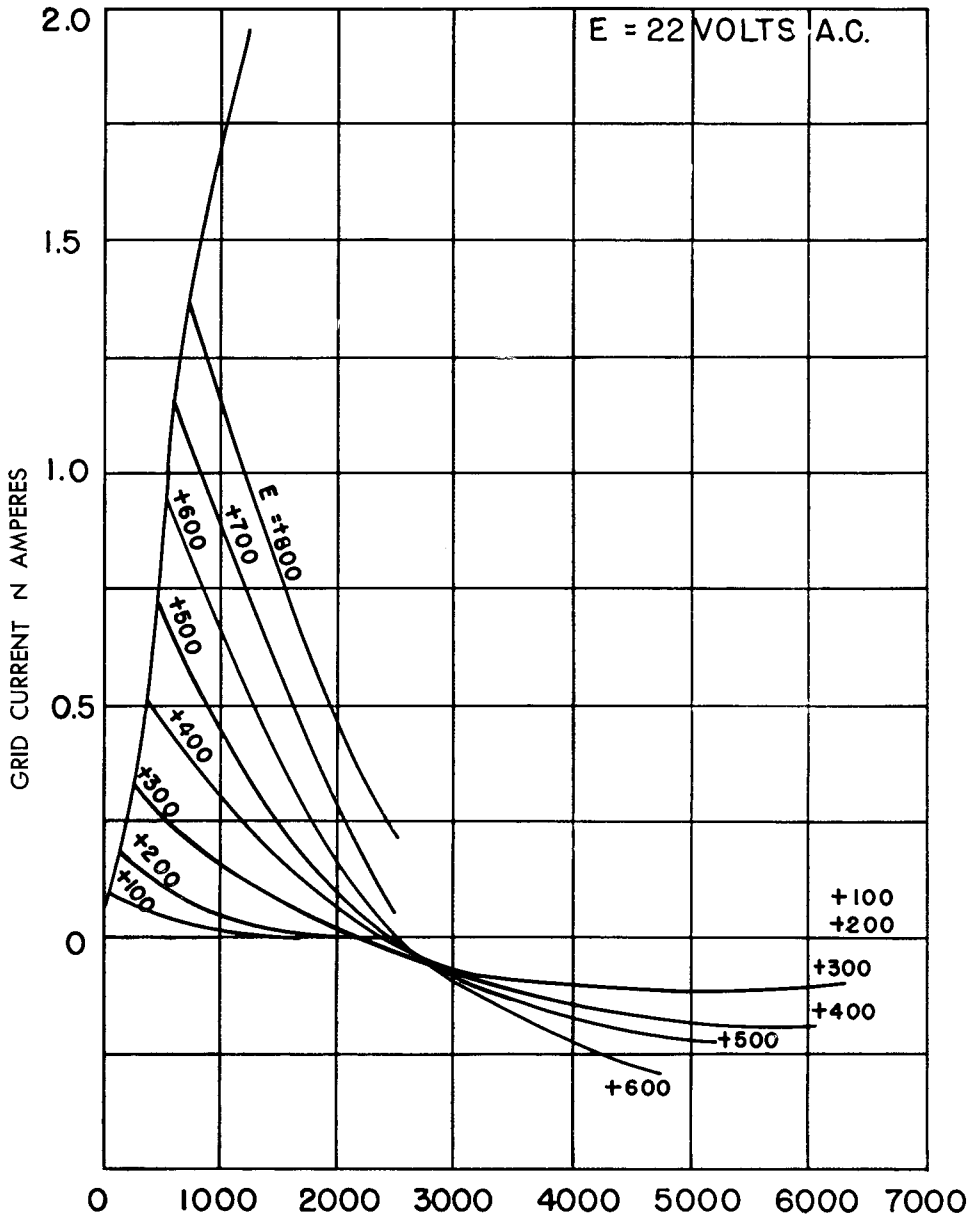
GL-891 AVERAGE PLATE CHARACTERISTICS



GL-891 GRID-CURRENT CHARACTERISTICS ($E_f = 22$ VOLTS A-C)

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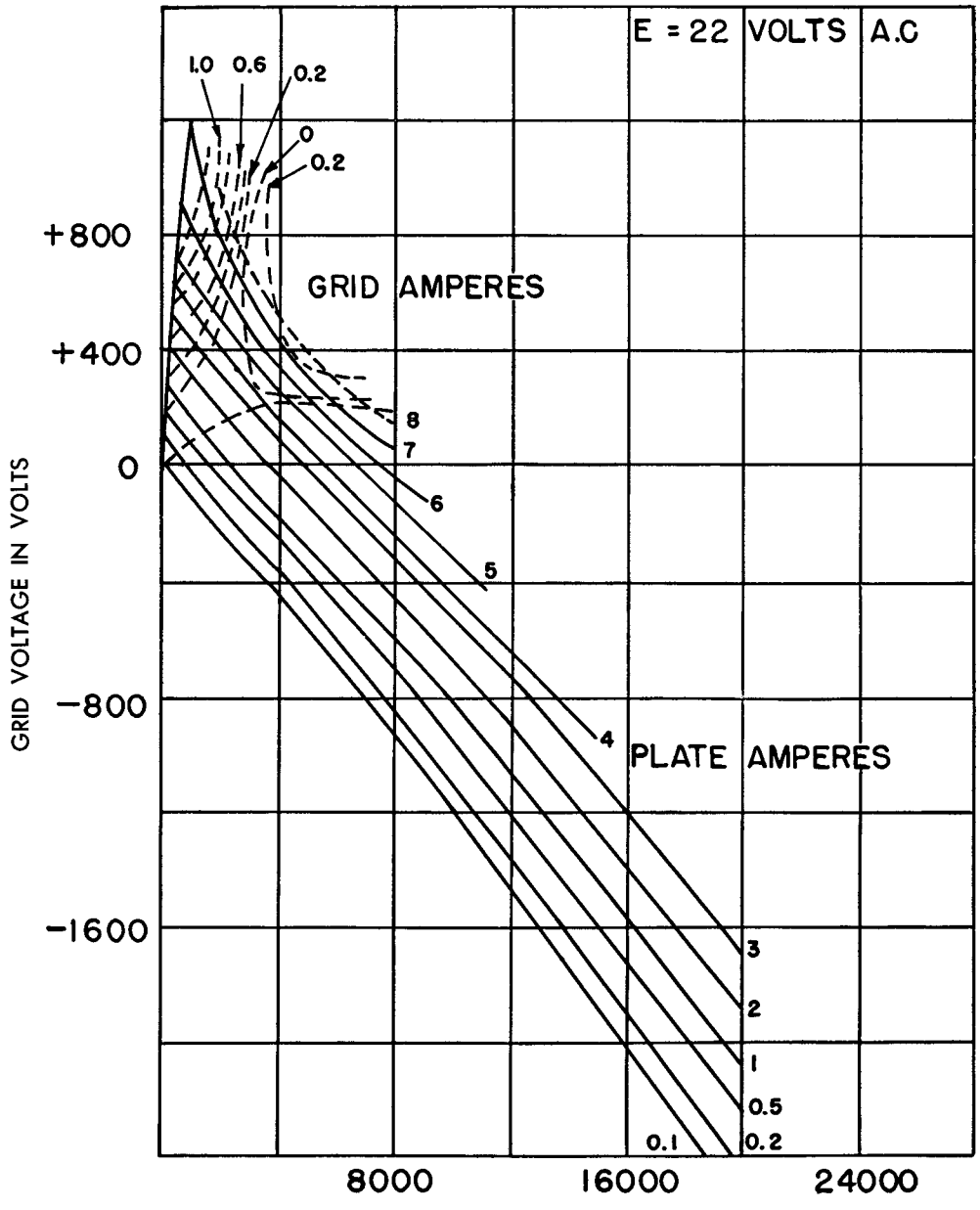

GL-891 CONSTANT CURRENT PLATE AND GRID CHARACTERISTICS ($E_f = 22$ VOLTS A-C)

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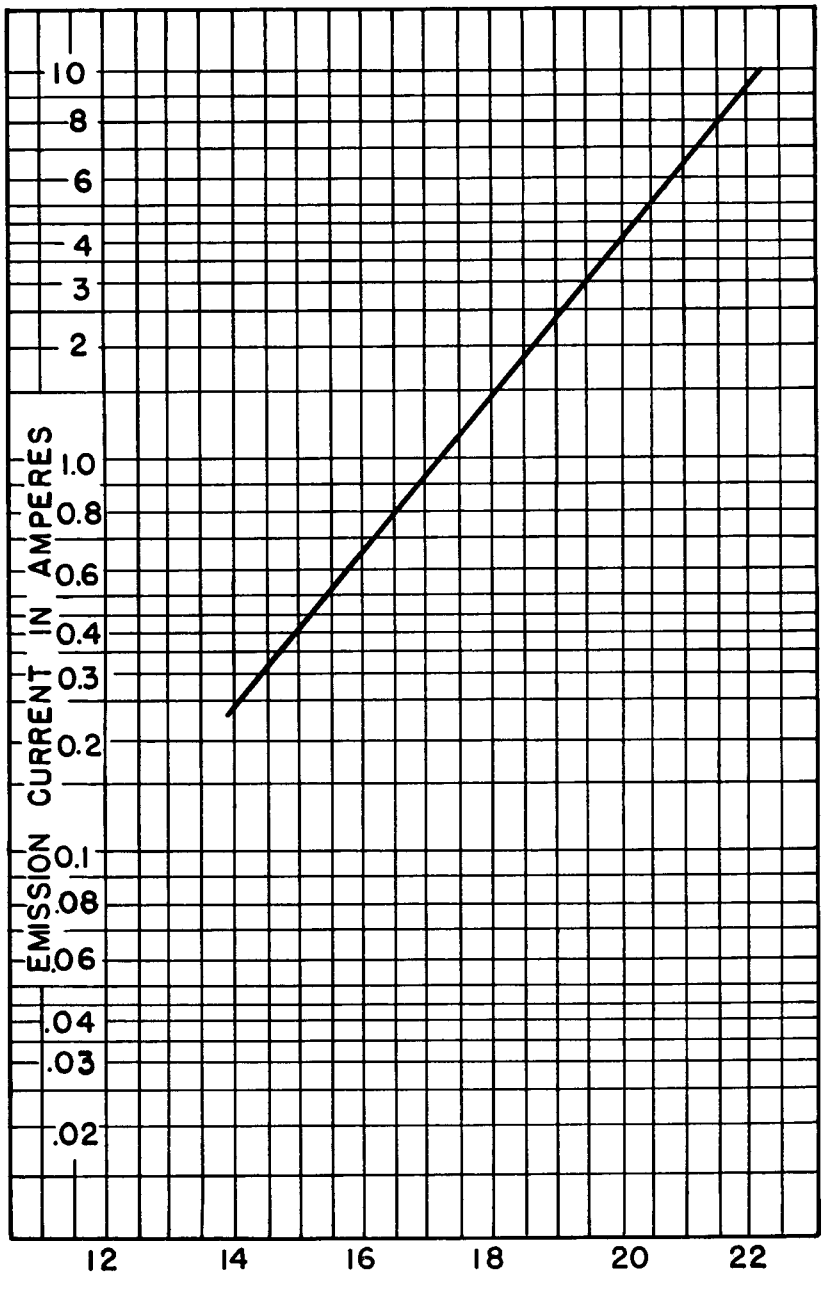

GL-891 AVERAGE FILAMENT EMISSION CHARACTERISTIC

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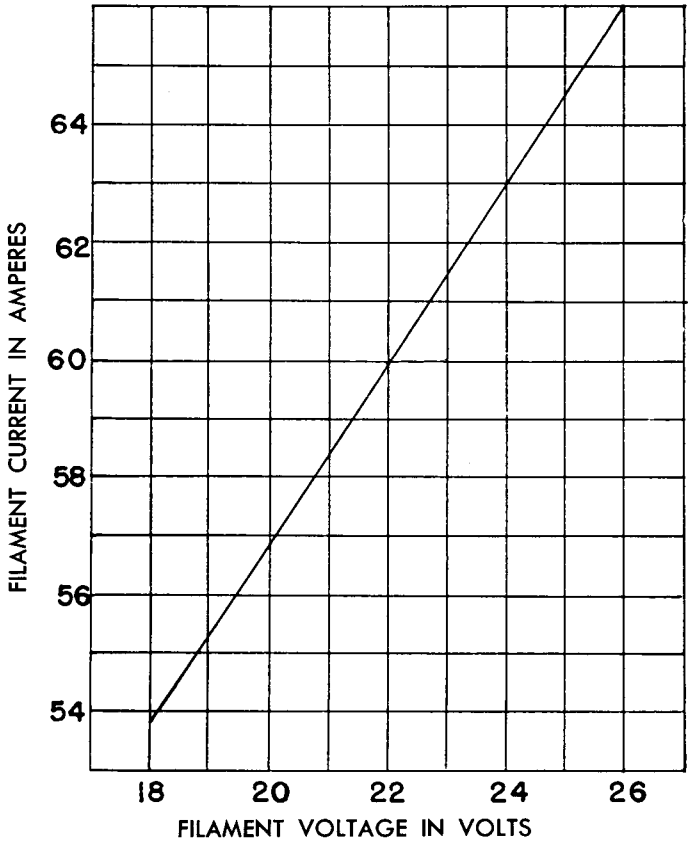

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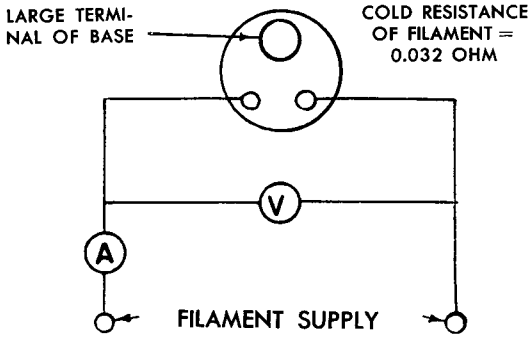
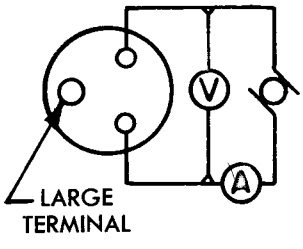


GL-891 AVERAGE FILAMENT CHARACTERISTIC

WITH D-C EXCITATION

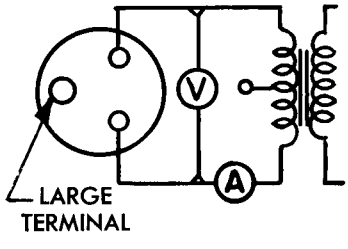
BASE TERMINALS



V = 22 VOLTS
A = 60 AMPERES

WITH SINGLE-PHASE A-C EXCITATION

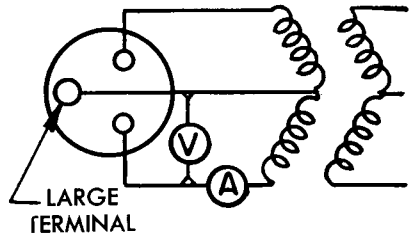
BASE TERMINALS



V = 22 VOLTS
A = 60 AMPERES

WITH TWO-PHASE A-C EXCITATION

BASE TERMINALS



V = 11 VOLTS
A = 60 AMPERES

GL-891 FILAMENT CONNECTIONS

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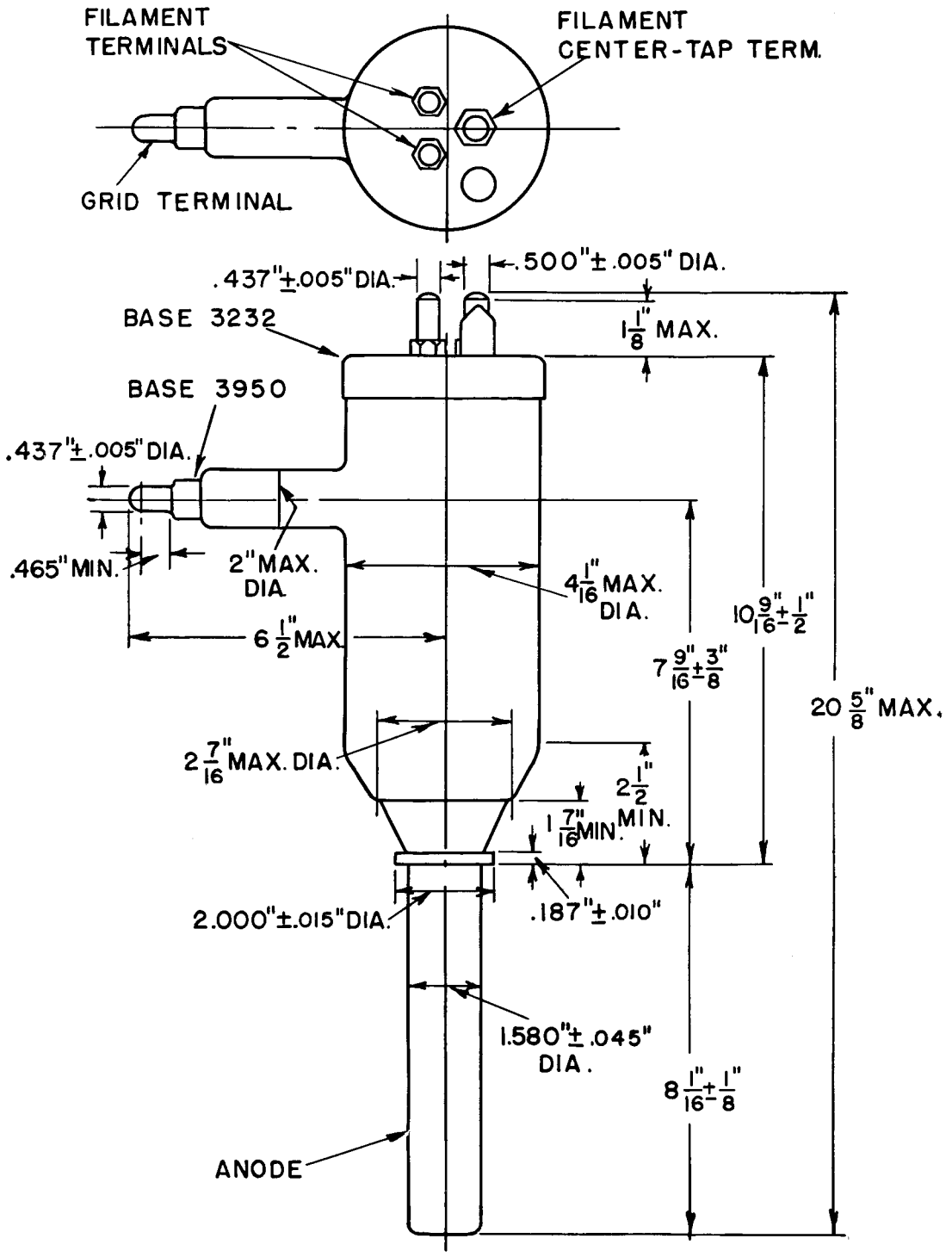

OUTLINE GL-891 PLIOTRON

K-6966979 9-23-44

Electronics Department
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