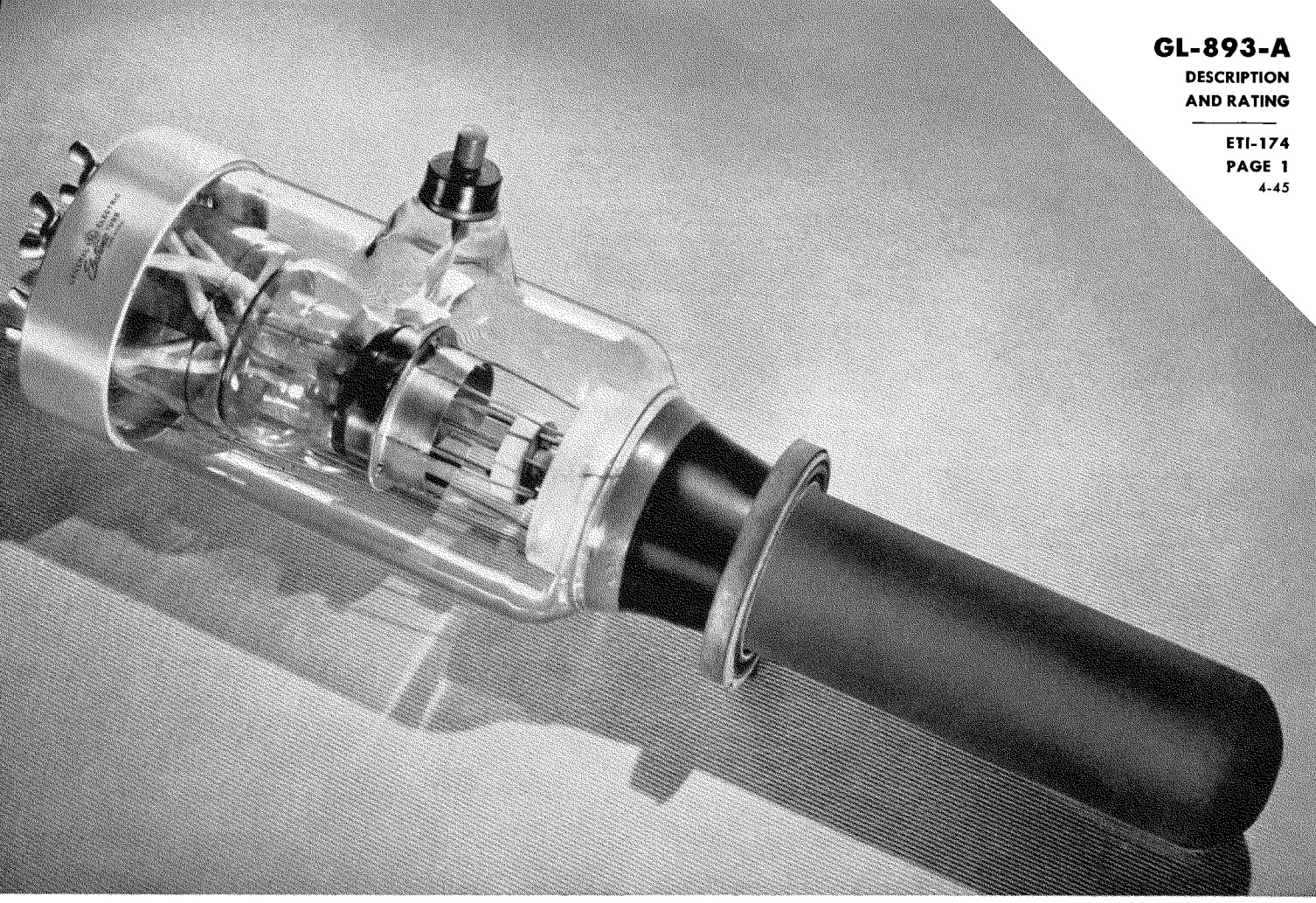


PLIOTRON

DESCRIPTION

The GL-893-A is a three-electrode, water-cooled vacuum tube designed for use as a radio-frequency amplifier, oscillator, or Class B modulator. A particular advantage of this tube is the unique construction of the filament which permits operation from single-phase, three-phase, or six-phase alternating current, or from direct current, for all classes of service.

TECHNICAL INFORMATION

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

GENERAL CHARACTERISTICS

Electrical

Filament voltage, per strand	10	volts
Filament current, per terminal	61	amperes

Average Characteristics

Amplification factor (E_b = 15 kv, I_b = 1.0 amp, E_c = −300, E_f = 20 a-c)	36	
Grid-plate transconductance (E_b = 15 kv, I_b = 1.0 amp, E_c = −300, E_f = 20 a-c)	16000	micromhos
Direct interelectrode capacitances:		
Grid-plate	33	micromicrofarads
Input	48	micromicrofarads
Output	3.0	micromicrofarads
Frequency for maximum ratings	5	megacycles

Electronic TUBE

GENERAL ELECTRIC

TECHNICAL INFORMATION (CONT'D)

Mechanical

Type of cooling	water and forced air
Maximum outlet temperature	70 centigrade
Water flow	8–15 gal per min
Air flow to stem	2 cu ft per min
Gasket	Cat. no. 5182028P2
Net weight, approx	12 pounds
Shipping weight, approx	27 pounds
Operating position	vertical, anode down

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

CLASS B AUDIO-FREQUENCY POWER AMPLIFIER (TWO TUBES)

D-c plate voltage	12000	15000	18000	20000 max volts
Max signal plate current, per tube*				4.0 max amperes
D-c max signal plate input, per tube*				60 max kilowatts
Plate dissipation, per tube*				20 max kilowatts
D-c grid voltage	−260	−350	−450	volts
Peak a-f grid input voltage	1480	1560	1720	volts
Zero signal plate current	0.8	0.8	0.8	ampere
Max signal plate current	7.0	6.0	5.5	amperes
Max signal plate input*	84.0	90.0	99.0	kilowatts
Max signal driving power, approx	220	190	140	watts
Effective load resistance, plate-to-plate	4000	6000	8000	ohms
Max signal plate power output	52.0	60.0	70.0	kilowatts

CLASS B RADIO-FREQUENCY POWER AMPLIFIER

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

D-c plate	12000	15000	15000	20000 max volts
D-c grid voltage	−250	−340	−340	volts
D-c plate current	1.5	1.5	2.0	2.0 max amperes
Plate input				32 max kilowatts
Plate dissipation				20 max kilowatts
Peak r-f grid input voltage	350	395	450	volts
Driving power, approx**	130	150	200	watts
Plate power output	6	7.5	10	kilowatts

CLASS C RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—PLATE-MODULATED

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

D-c plate voltage	10000	10000	12000	12000 max volts
D-c grid voltage	−800	−800	−1000	−3000 max volts
D-c plate current	1.5	2.0	2.0	2.0 max amperes
D-c grid current, approx	0.10	0.16	0.14	0.4 max ampere
Plate input				24 max kilowatts
Plate dissipation				12 kilowatts
Peak r-f grid input voltage, approx	1200	1280	1500	volts
Driving power, approx	120	210	210	watts
Plate power output	11	15	18	kilowatts

CLASS C RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Key-down conditions per tube without modulation#

D-c plate voltage	12000	15000	18000	20000 max volts
D-c grid voltage	−800	−900	−1000	−3000 max volts
D-c plate current	3.5	3.6	3.6	4.0 max amperes
D-c grid current, approx	0.26	0.25	0.21	0.4 max ampere
Plate input				70 max kilowatts
Plate dissipation				20 max kilowatts
Peak r-f grid input voltage, approx	1430	1520	1630	volts
Driving power, approx	360	370	340	watts
Plate power output	30	40	50	kilowatts

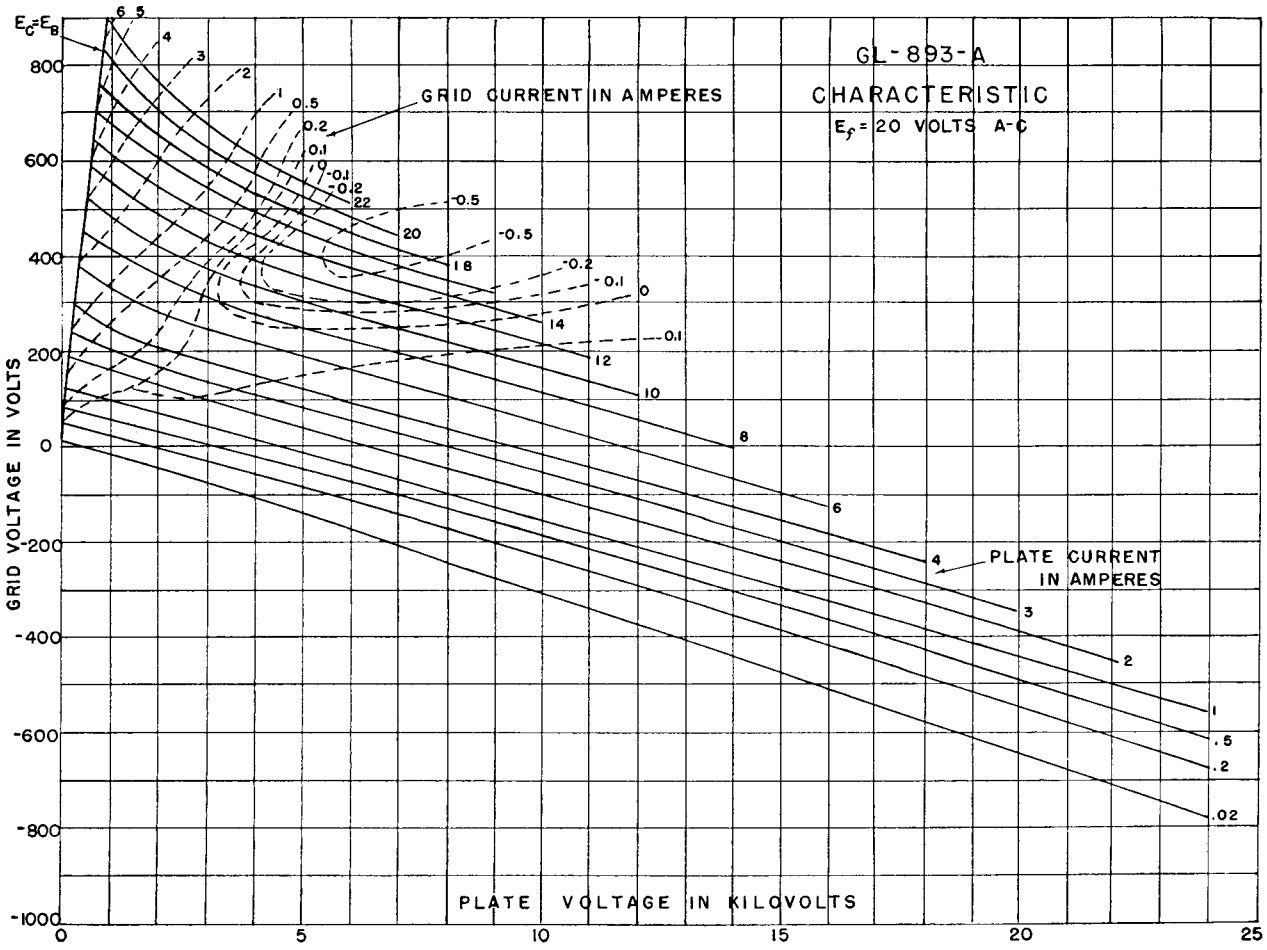
*Averaged over any audio-frequency cycle.
**At crest of audio-frequency cycle.
#Modulation, essentially negative, may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

APPLICATION NOTES

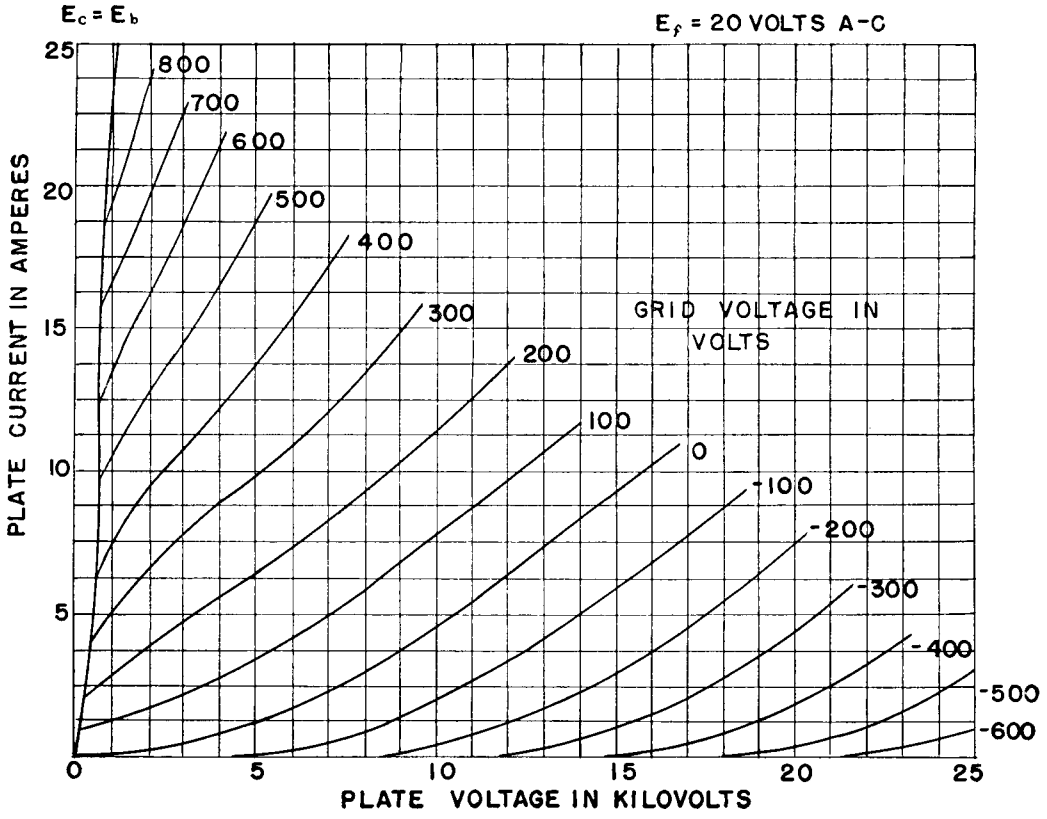
GL-893-A can be operated at maximum ratings in all classes of service at frequencies as high as 5 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced as the frequency is raised. (Other maximum ratings are the same as shown under CHARACTERISTICS and RATINGS.) The tabulation below shows the highest percentage of maximum plate voltage and power input that can be used up to 40 megacycles for the various classes of service. Special attention should be given to adequate ventilation of the bulb at these frequencies.

FREQUENCY	5	20	40	megacycles
Maximum permissible percentage of maximum rated plate voltage and plate input:				
Class B radio-frequency				
Plate voltage	100	85	65	per cent
Plate input	100	82	73	per cent
Class C plate-modulated				
Plate voltage	100	80	64	per cent
Plate input	100	75	64	per cent
Class C				
Plate voltage	100	80	60	per cent
Plate input	100	66	50	per cent

Plate series protective resistors						
Series resistor	10	20	40	80	100	ohms
Maximum power output of rectifier	40	100	250	640	1600	kilowatts

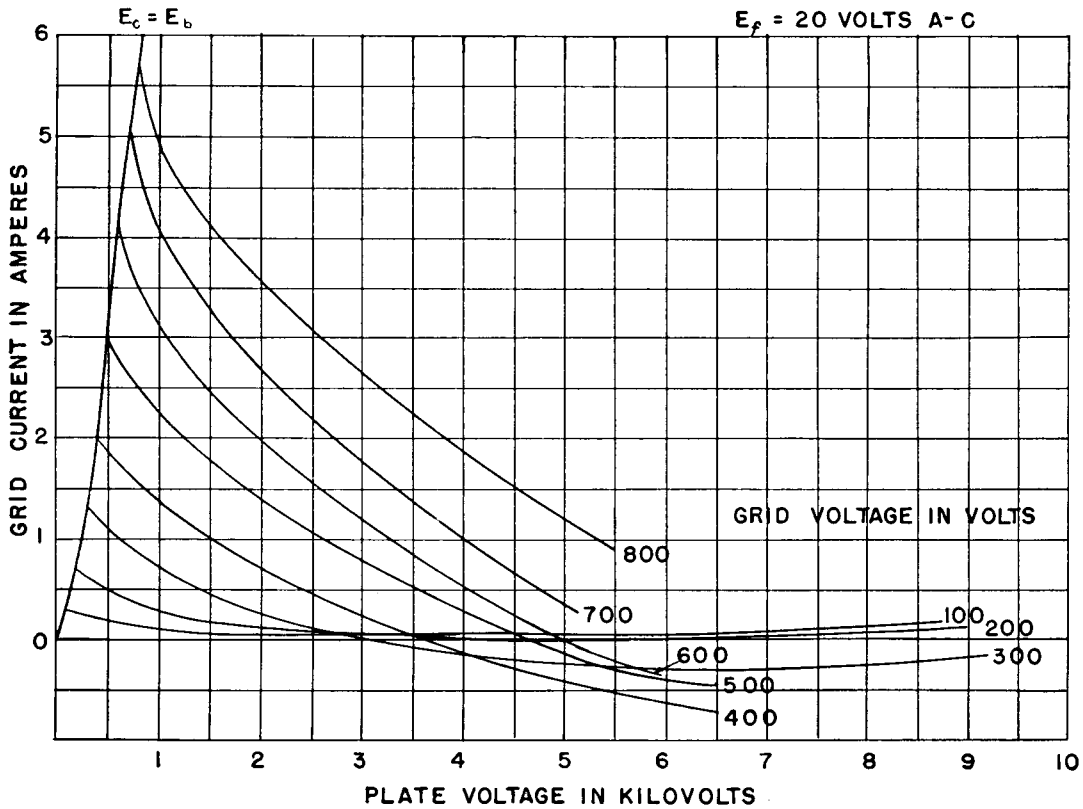


GL-893-A AVERAGE PLATE CHARACTERISTIC



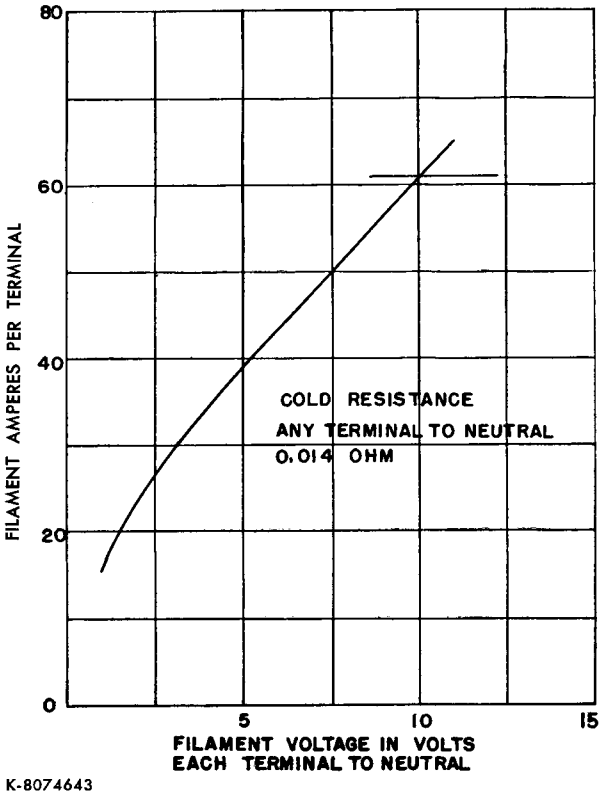
K-8074645 5-6-44

GL-893-A TYPICAL GRID-PLATE TRANSFER CHARACTERISTIC



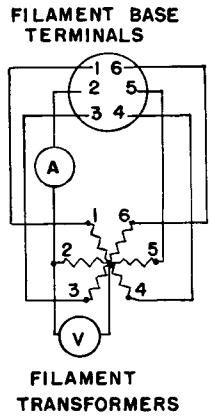
K-8074644 5-6-44

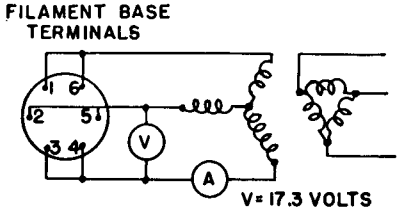
GL-893-A AVERAGE FILAMENT CHARACTERISTIC



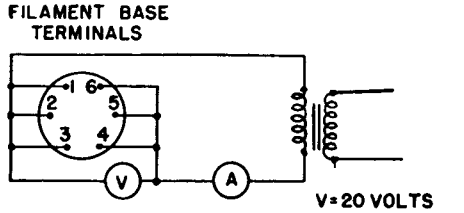
K-8074643

5-6-44

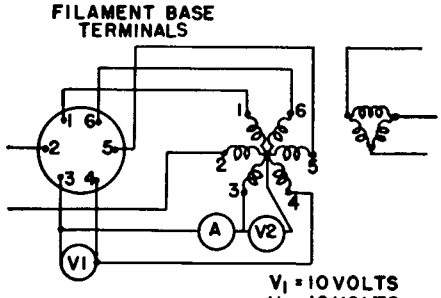




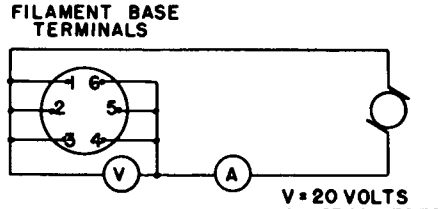
THREE-PHASE A-C FILAMENT EXCITATION



SINGLE-PHASE A-C FILAMENT EXCITATION



SIX-PHASE A-C FILAMENT EXCITATION



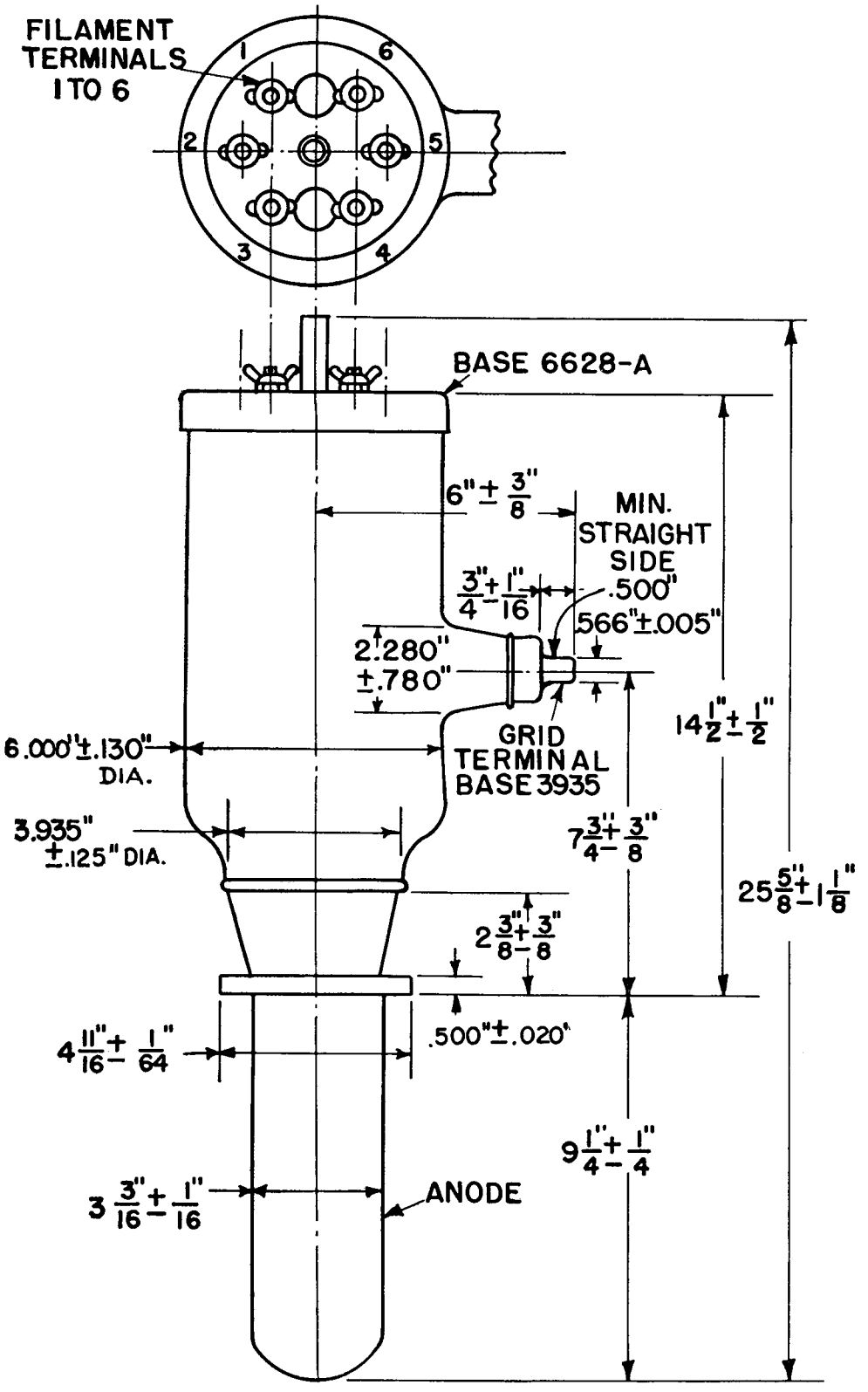
D-C FILAMENT EXCITATION

NOTE: TERMINALS MUST BE CONNECTED IN CORRECT PHASE RELATION AS SHOWN

K-8639686

10-28-44

GL-893-A FILAMENT CONNECTIONS



K-5344783

OUTLINE GL-893-A PLIOTRON

12-30-44

Electronics Department

GENERAL ELECTRIC

Schenectady, N. Y.