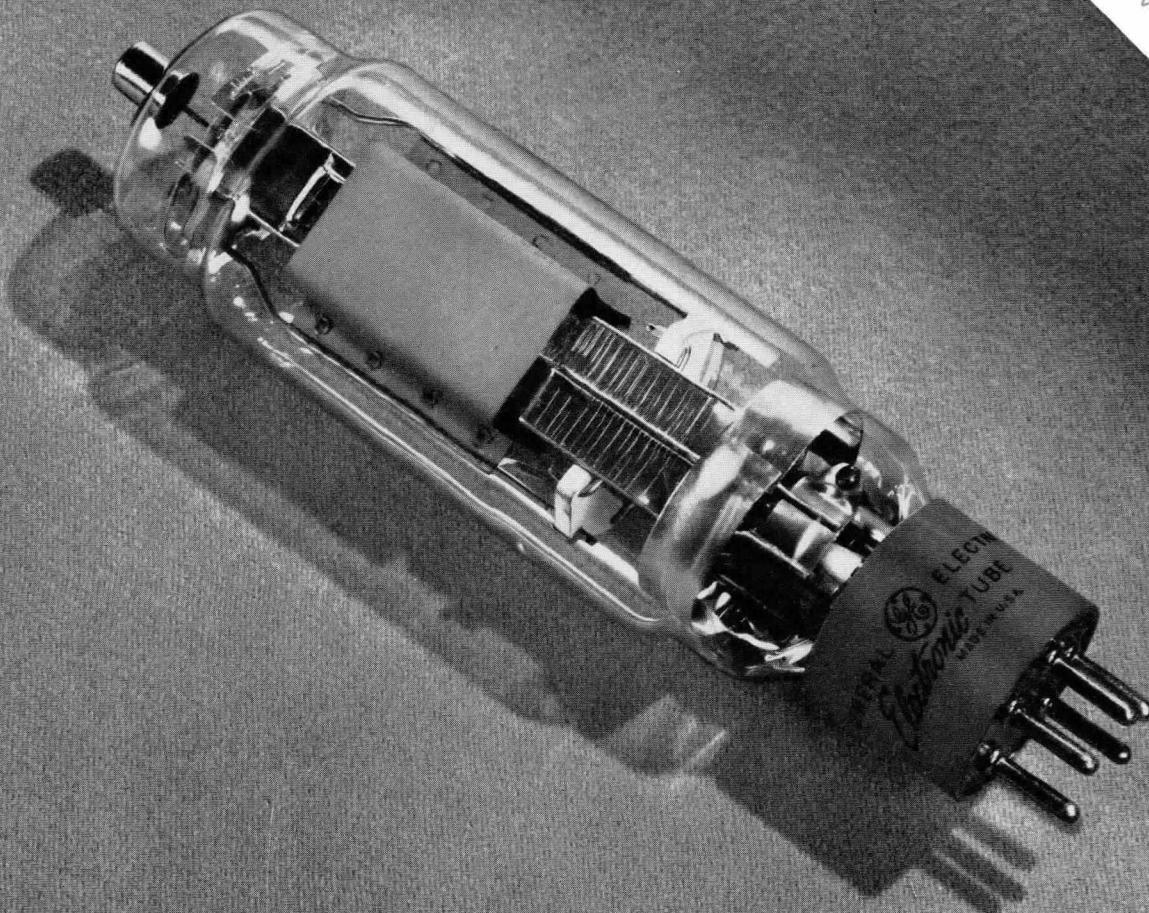




BEAM POWER TUBE

DESCRIPTION

The GL-828 is a beam power amplifier tube designed particularly for use as a Class AB₁ audio-frequency amplifier. The high power sensitivity of the 828 allows it to be used in radio-frequency services

with very little driving power. Neutralization is generally unnecessary in properly shielded circuits. This tube can be operated at maximum ratings at frequencies as high as 30 megacycles.

TECHNICAL INFORMATION

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

GENERAL CHARACTERISTICS

Number of electrodes.....	5
Electrical	
Cathode-Filamentary	
Filament voltage.....	10 volts
Filament current.....	3.25 amperes
Grid-plate transconductance, for anode current of 43 ma.....	4500 micromhos
Direct interelectrode capacitances	
Grid-plate, with external shielding.....	0.05 micromicrofarad
Input.....	13.5 micromicrofarads
Output.....	14.5 micromicrofarads
Mechanical	
Base or terminal description.....	medium 5-pin
Net weight, approximate.....	3 ounces
Shipping weight, approximate.....	3 pounds
Mounting position.....	vertical, base down— horizontal, plane of electrodes vertical


Electronic
TUBE

GENERAL  ELECTRIC

TECHNICAL INFORMATION (CONT'D)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

	Typical Operation		Maximum Ratings Δ	
	CCS	ICAS	CCS	ICAS
CLASS AB ₁ AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR				
D-c plate voltage.....	1700	2000	1750	2000 volts
D-c suppressor voltage.....	60	60	100	100 volts
Maximum signal plate current*.....			150	150 milliamperes
D-c maximum signal plate input*.....			225	270 watts
Screen input*.....			16	23 watts
Plate dissipation*.....			70	80 watts
D-c grid voltage†.....	-120	-120		volts
D-c screen voltage‡.....	750	750	750	750 volts
Peak a-f grid-to-grid voltage.....	240	240		volts
Zero signal plate current.....	50	50		milliamperes
Maximum signal plate current.....	248	270		milliamperes
D-c suppressor current.....	9	9		milliamperes
Zero signal screen current.....	4	2		milliamperes
Maximum signal screen current.....	43	60		milliamperes
Load resistance, per plate.....	4050	4625		ohms
Effective load, plate-to-plate.....	16200	18500		ohms
Maximum signal plate power output.....	300**	385		watts

CLASS B RADIO-FREQUENCY POWER AMPLIFIER

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

D-c plate voltage.....	1250	1500	1250	1500 volts
D-c grid voltage†.....	75	75	100	100 volts
D-c grid voltage‡.....	-50	-50		volts
D-c screen voltage.....	400	400	400	400 volts
D-c plate current.....	84	80	100	100 milliamperes
D-c suppressor current.....	4	4		milliamperes
D-c screen current.....	5	5		milliamperes
Plate input.....			105	120 watts
Suppressor input.....			5	5 watts
Screen input.....			11	11 watts
Plate dissipation.....			70	80 watts
Peak r-f grid-to-grid voltage.....	52	50		volts
Driving power, approximate§.....	0.5	0.4		watt
Plate power output.....	36	41		watts

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

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

D-c plate voltage.....	1250	1500	1250	1500 volts
D-c suppressor voltage.....	75	75	100	100 volts
D-c grid voltage.....	-150	-150	-300	-300 volts
D-c screen voltage.....	400	400	400	400 volts
D-c plate current.....	84	80	100	100 milliamperes
D-c suppressor current.....	4	3.5		milliamperes
D-c grid current, approximate.....	1.6	1.3		milliamperes
D-c screen current.....	5	4		milliamperes
Plate input.....			105	120 watts
Suppressor input.....			5	5 watts
Screen input.....			11	11 watts
Plate dissipation.....			70	80 watts
Peak r-f grid-to-grid voltage, approximate.....	165	165		volts
Peak a-f grid voltage.....	94	94		volts
Driving power, approximate§.....	2.5	2.5		watts
Plate power output.....	36	41		watts

TECHNICAL INFORMATION (CONT'D)

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

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

	Typical Operation		Maximum Ratings	
	CCS	ICAS	CCS	ICAS
D-c plate voltage.....	1000	1250	1000	1250 volts
D-c suppressor voltage.....	75	75	100	100 volts
D-c grid voltage of.....	-140	-140	-300	-300 volts
From a grid resistor of.....	14000	11700		ohms
D-c screen voltage.....	400	400	400	400 volts
From a series resistor of ♦.....	26000	30000		ohms
D-c plate current.....	135	160	135	160 milliamperes
D-c suppressor current.....	13	15		milliamperes
D-c grid current, approximate.....	10	12	15	15 milliamperes
D-c screen current.....	23	28		milliamperes
Plate input.....			135	200 watts
Suppressor input.....			5	5 watts
Screen input.....			11	11 watts
Plate dissipation.....			47	70 watts
Peak r-f grid-to-grid voltage, approximate.....	230	250		volts
Driving power, approximate.....	2.1	2.7		watts
Plate power output.....	100	150		watts

CLASS C RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Key-down conditions per tube without modulation π

D-c plate voltage.....	1250	1500	1250	1500 volts
D-c suppressor voltage.....	75	75	100	100 volts
D-c grid voltage.....			-300	-300 volts
From a fixed supply of.....	-95	-100		volts
From a cathode resistor of.....	415	430		ohms
From a grid resistor of.....	7900	8300		ohms
D-c screen voltage.....	400	400	400	400 volts
D-c plate current.....	160	180	160	180 milliamperes
D-c suppressor current.....	22	14		milliamperes
D-c grid current, approximate.....	12	12	15	15 milliamperes
D-c screen current.....	35	28		milliamperes
Plate input.....			200	270 watts
Suppressor input.....			5	5 watts
Plate dissipation.....			70	80 watts
Screen input.....			16	16 watts
Peak r-f grid-to-grid voltage, approximate.....	195	205		volts
Driving power, approximate.....	2.1	2.2		watts
Plate power output.....	150	200		watts

*Averaged over any a-f cycle of sine-wave form.

**Distortion only 1 per cent with 20 db of feedback to grid of driver.

†Grid voltages are given with respect to the midpoint of filament operated on a-c. If d-c is used, each stated value of grid voltage should be decreased by one-half the filament voltage and the circuit returns made to the negative end of the filament.

‡Zero-signal screen voltage must not exceed 775 volts.

§At crest of audio-frequency cycle with modulation factor of 1.0.

♦Connected to modulated plate voltage supply.

 π 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.

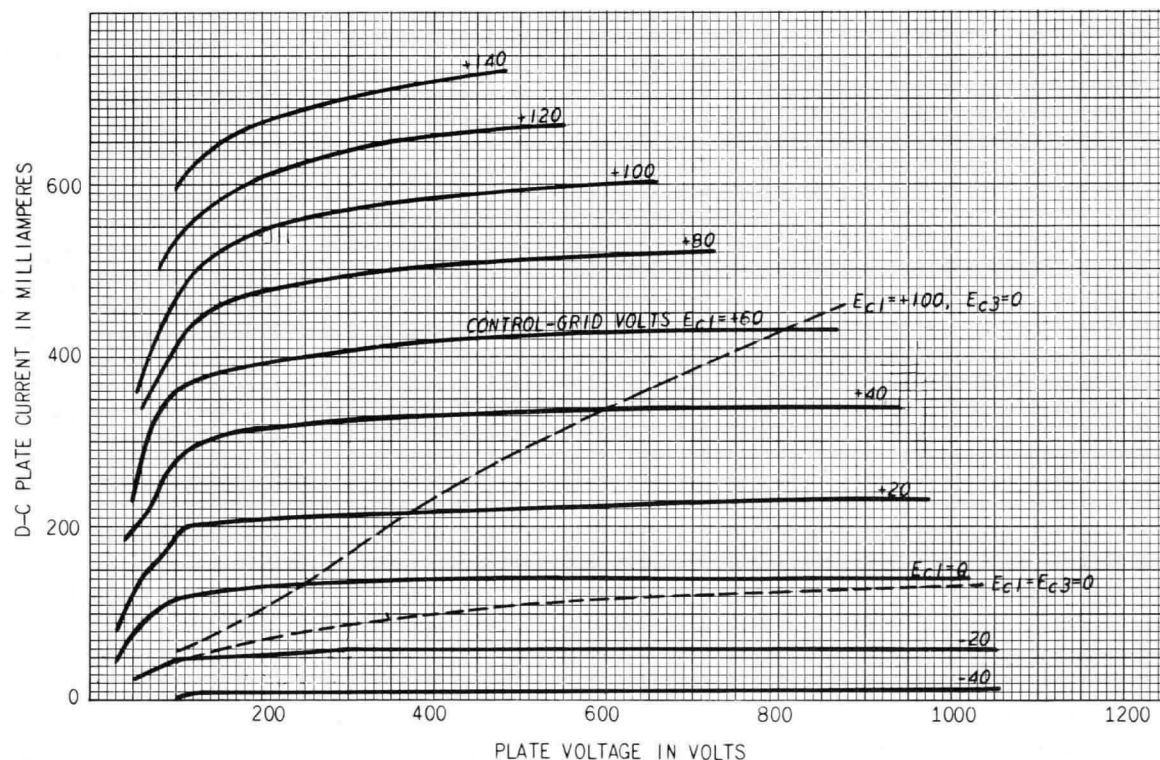
APPLICATION NOTES

△The GL-828 can be operated at frequencies as high as 30 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 above). The tabulation below shows the highest percentage of

maximum plate voltage and power input that can be used up to 75 megacycles for the various classes of service. Special attention should be given to shielding, radio-frequency by-passing, and adequate ventilation of the bulb at these frequencies.

Frequency.....	30	50	75 megacycles
Maximum permissible percentage of maximum rated plate voltage and plate input			
Class B, r-f.....	100	90	80 per cent
Class C, grid-modulated.....	100	90	80 per cent
Class C, plate-modulated.....	100	80	65 per cent
Class C, telegraphy.....	100	80	65 per cent

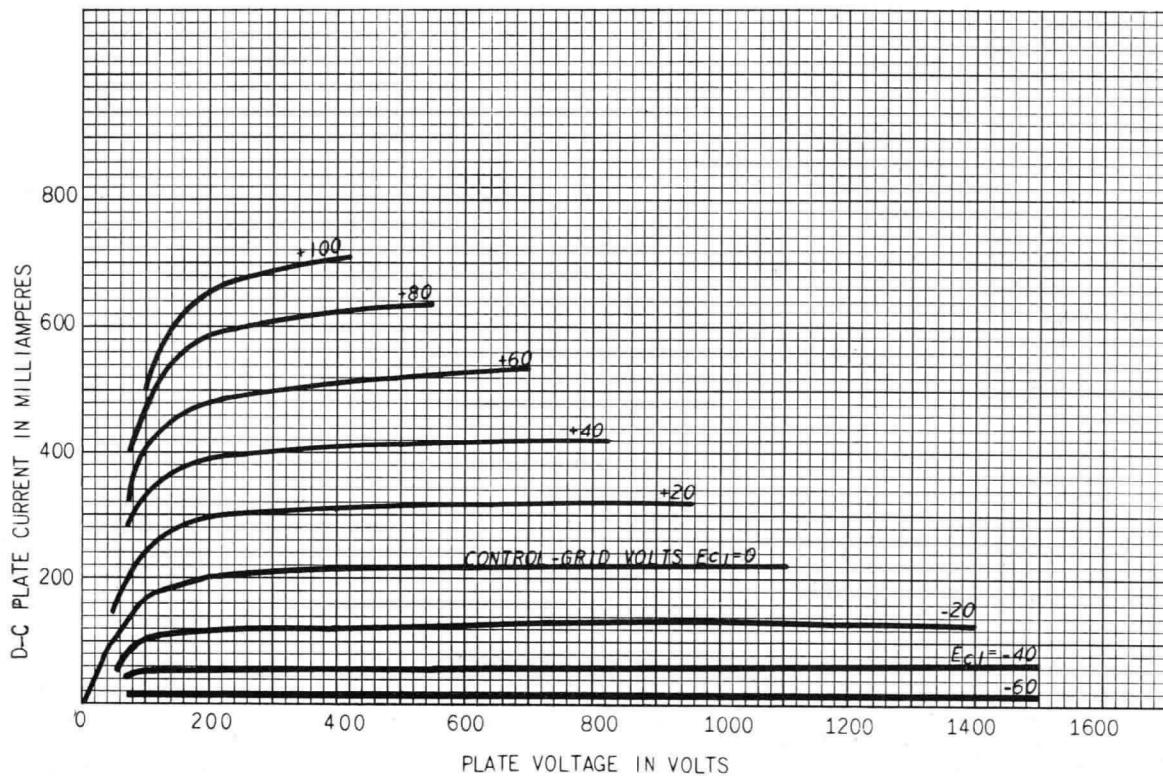
GL-828 AVERAGE PLATE CHARACTERISTICS

(E_f=10 VOLTS D-C, SCREEN VOLTS=300, SUPPRESSOR VOLTS (E_{c3})=75)

K-9186059

1-9-46

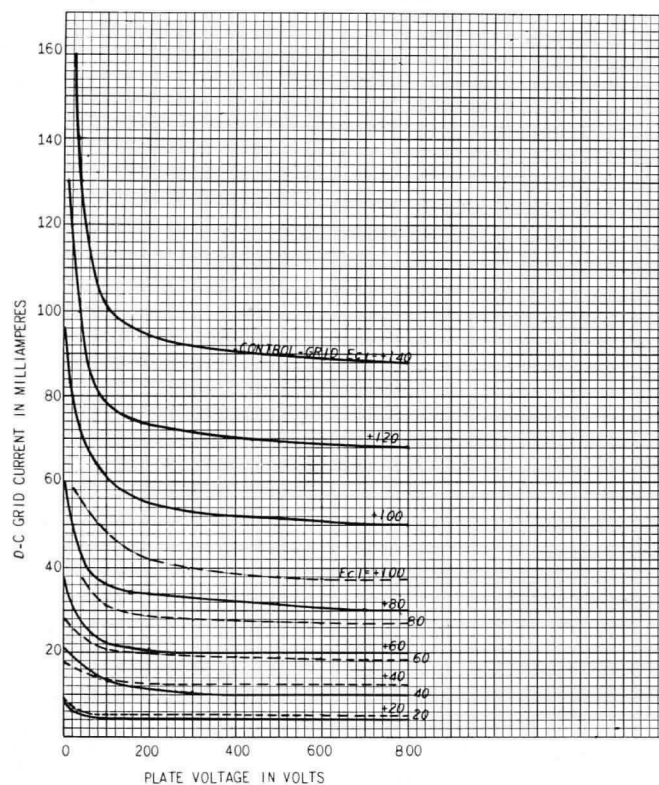
GL-828 AVERAGE PLATE CHARACTERISTICS

(E_f=10 VOLTS D-C, SCREEN VOLTS=400, SUPPRESSOR VOLTS (E_{c3})=75)

K-9186061

1-9-46

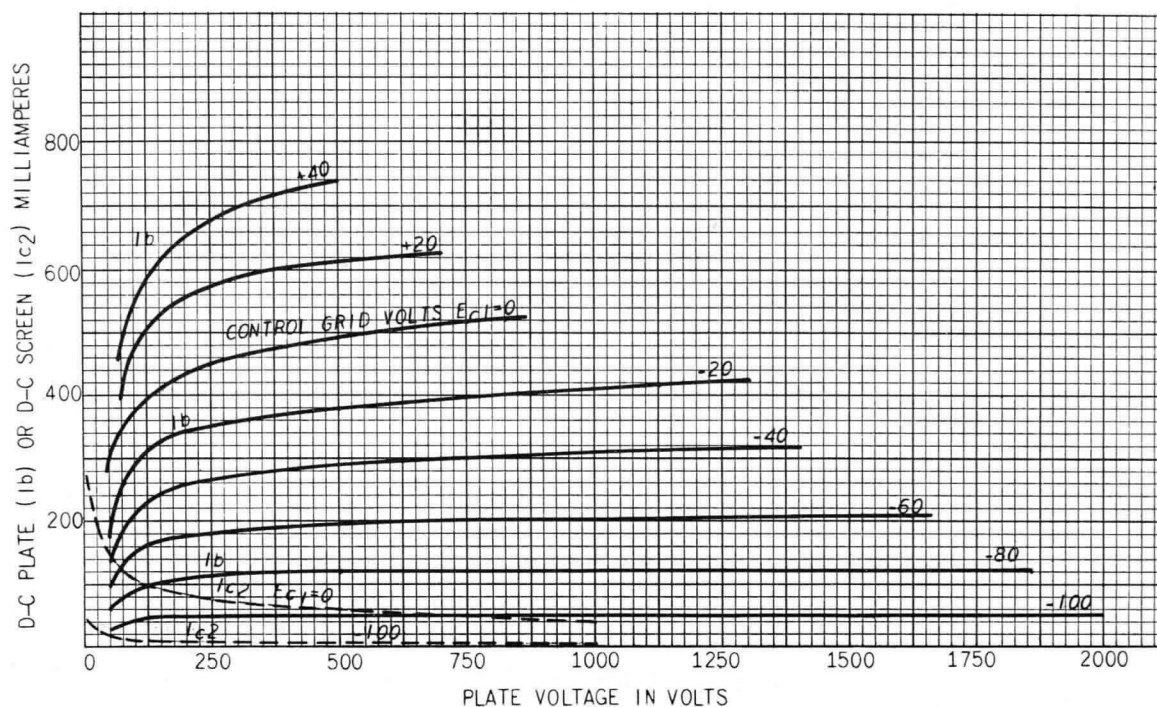
GL-828 TYPICAL CHARACTERISTICS

(E_f=10 VOLTS D-C, SCREEN VOLTS=300—, SCREEN VOLTS=400---, SUPPRESSOR VOLTS=75)

K-9033930

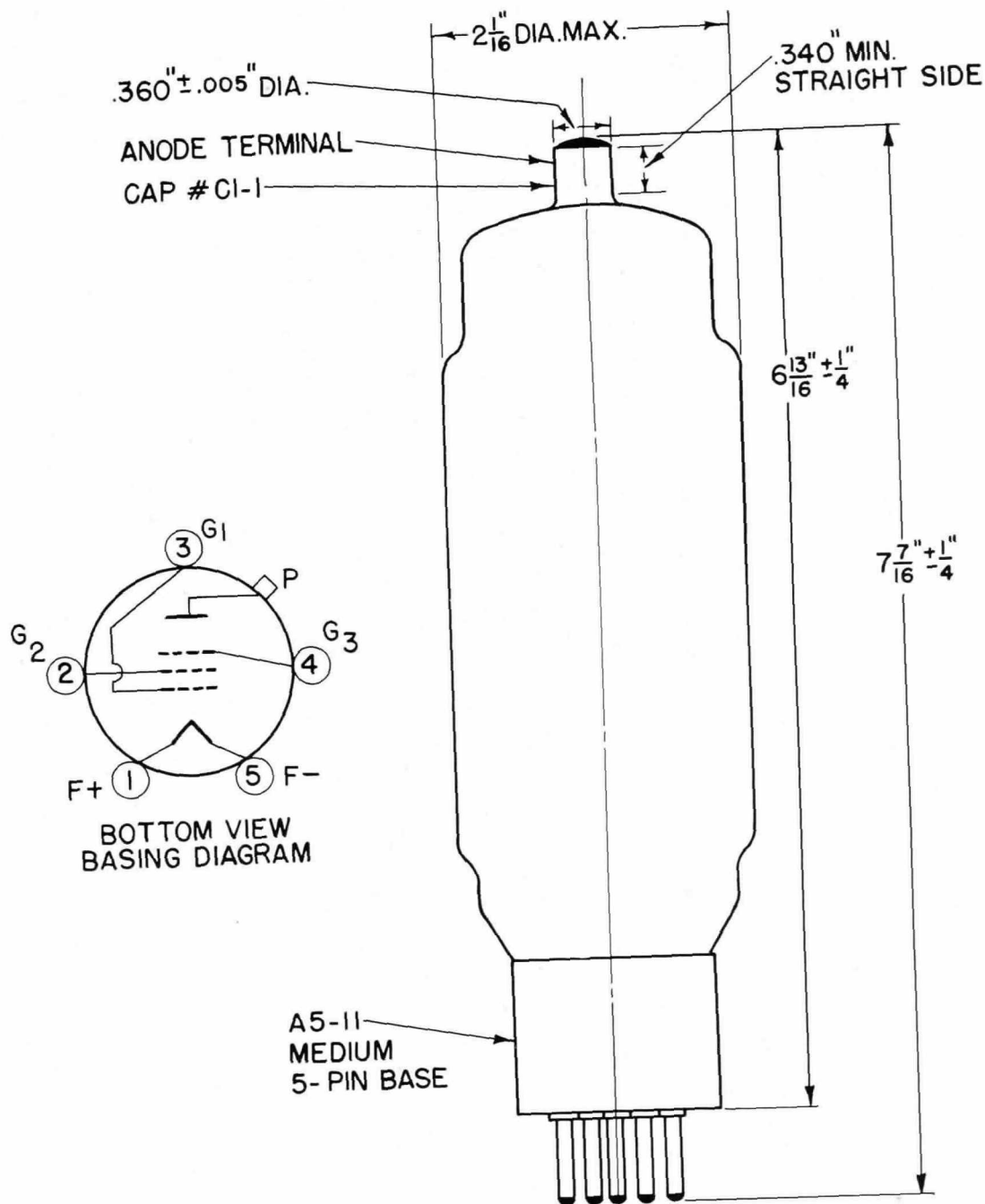
1-9-46

GL-828 AVERAGE PLATE CHARACTERISTICS

(E_f=10 VOLTS D-C, SCREEN VOLTS=750, SUPPRESSOR VOLTS (E_{c3}) = 60)

K-9186060

1-9-46



GL-828 OUTLINE

7-12-45

K-9033897

Electronics Department
GENERAL ELECTRIC
 Schenectady, N. Y.