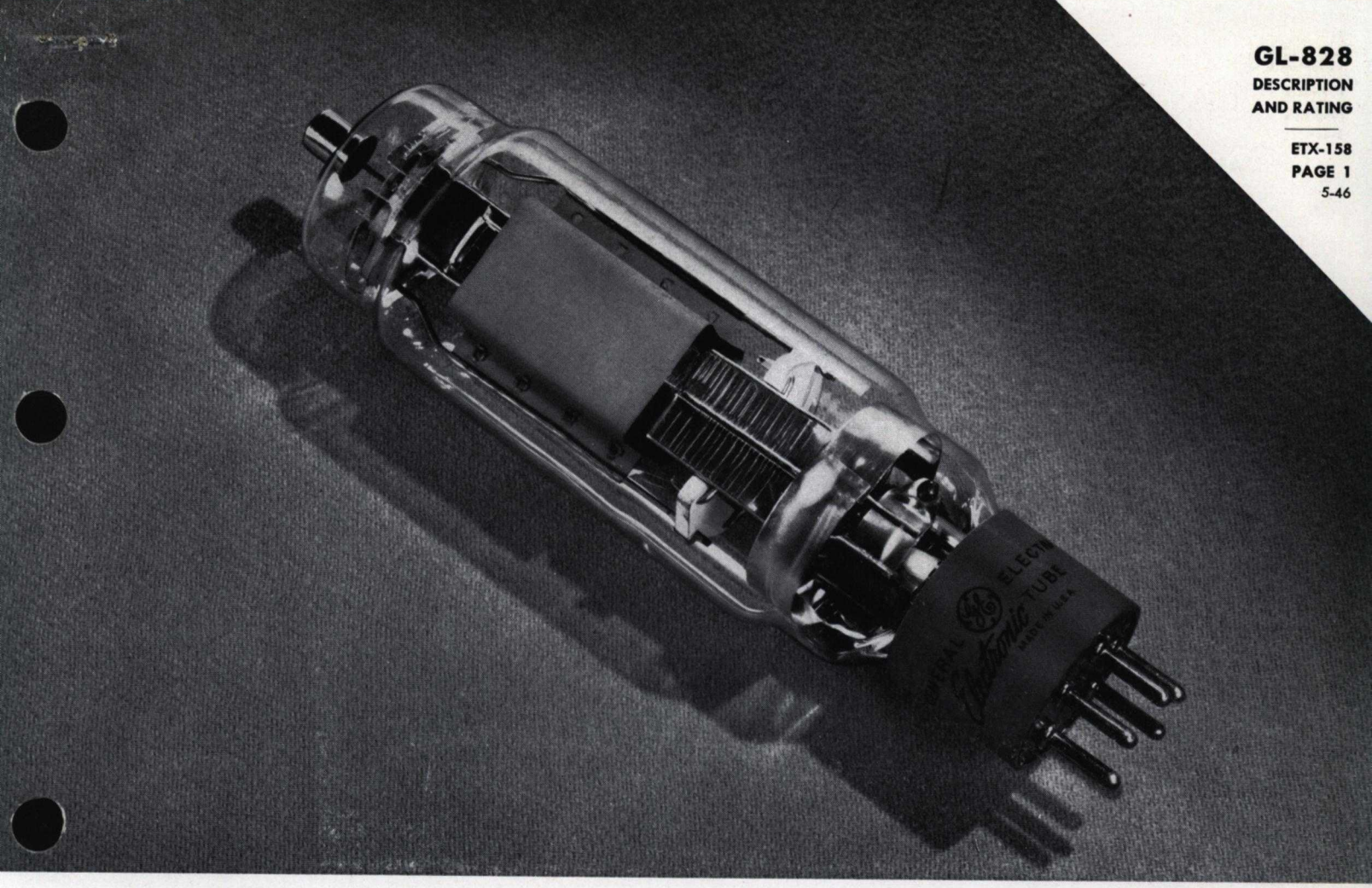


BEAM POWER TUBE

DESCRIPTION

The GL-828 is a beam power amplifier tube designed particularly for use as a Class AB_1 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	

GE Electronic TUBE

GENERAL ELECTRIC

TECHNICAL INFORMATION (CONT'D)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

CLASS AB_1 AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR

	Typical Operation		Maximum Ratings △		
	CCS	ICAS	CCS	ICAS	
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.

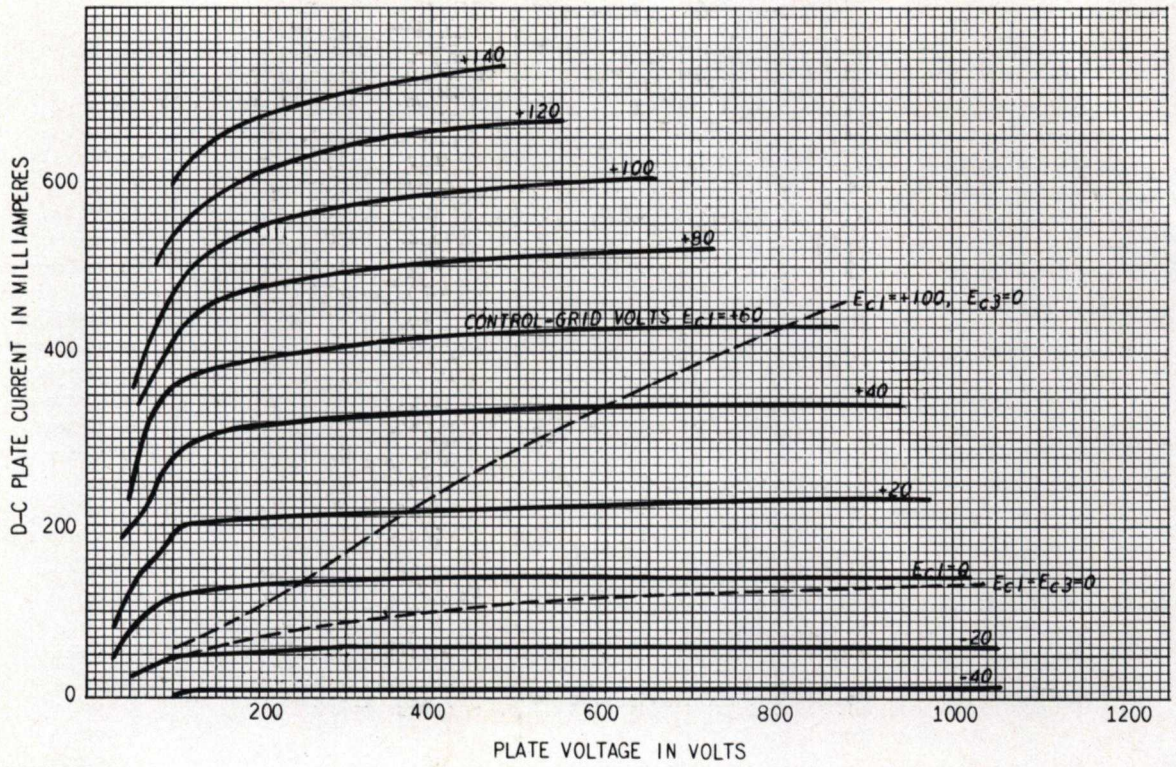
APPLICATION NOTES

△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 (Ec_3) = 75)



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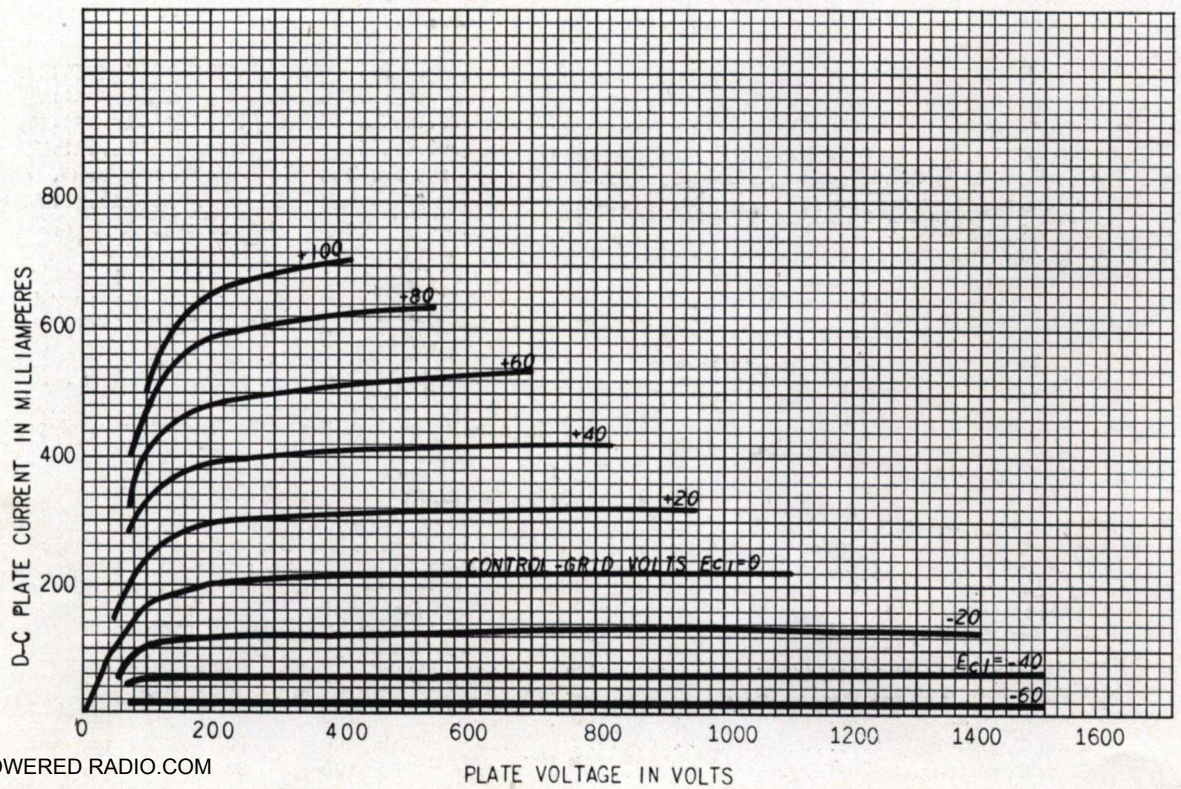
GL-828 AVERAGE PLATE CHARACTERISTICS

(E_f = 10 VOLTS D-C, SCREEN VOLTS = 400, SUPPRESSOR VOLTS (Ec_3) = 75)



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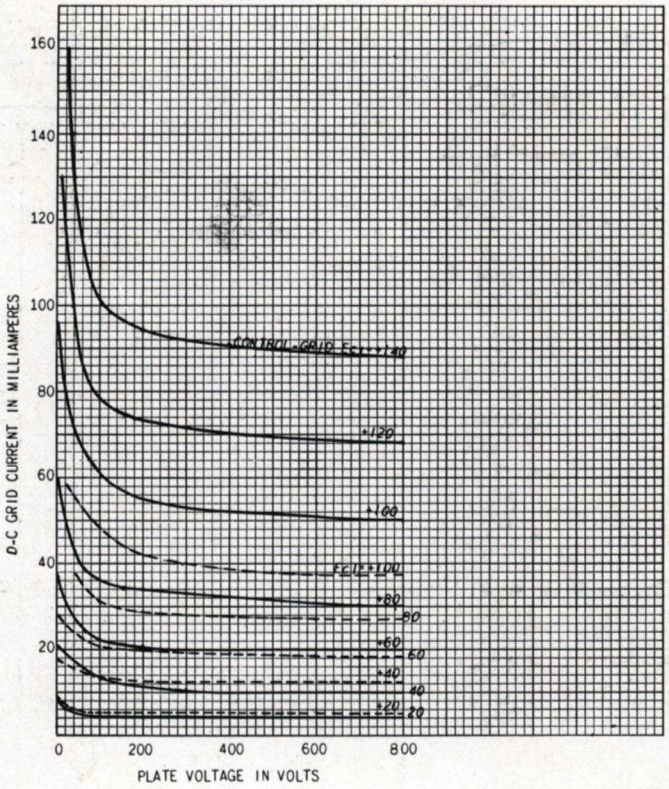
GL-828 TYPICAL CHARACTERISTICS

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



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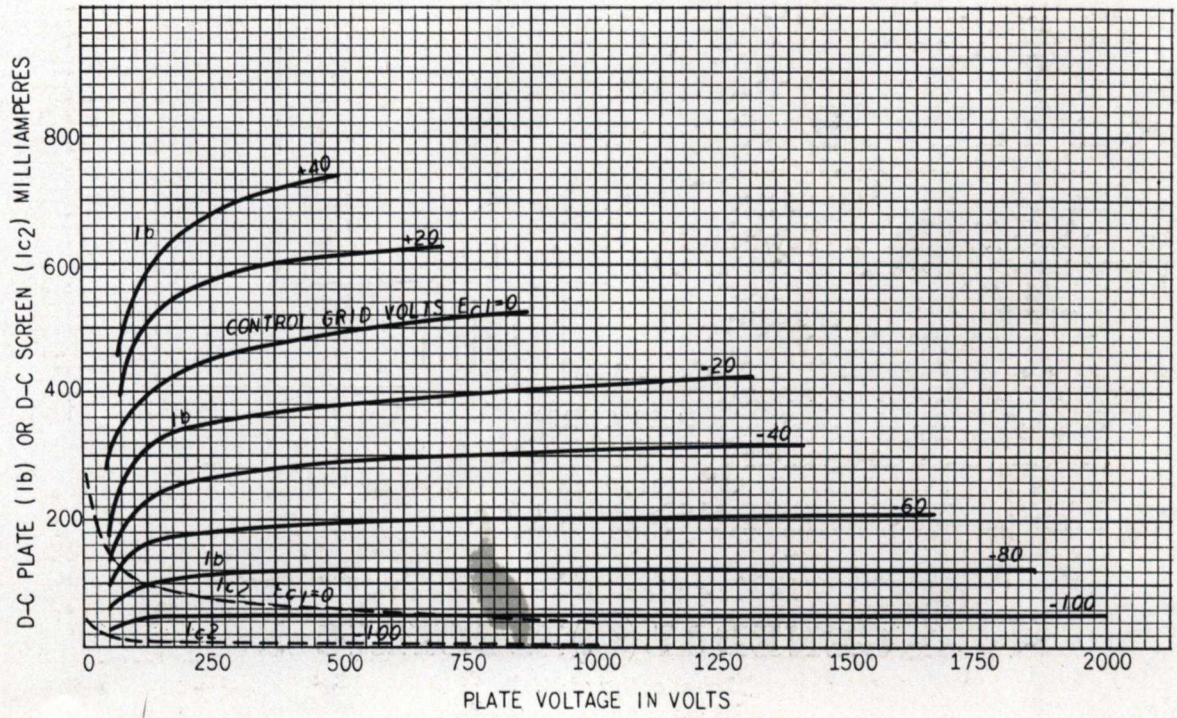
GL-828 AVERAGE PLATE CHARACTERISTICS

(E_f=10 VOLTS D-C, SCREEN VOLTS=750, SUPPRESSOR VOLTS (Ec_3)=60)



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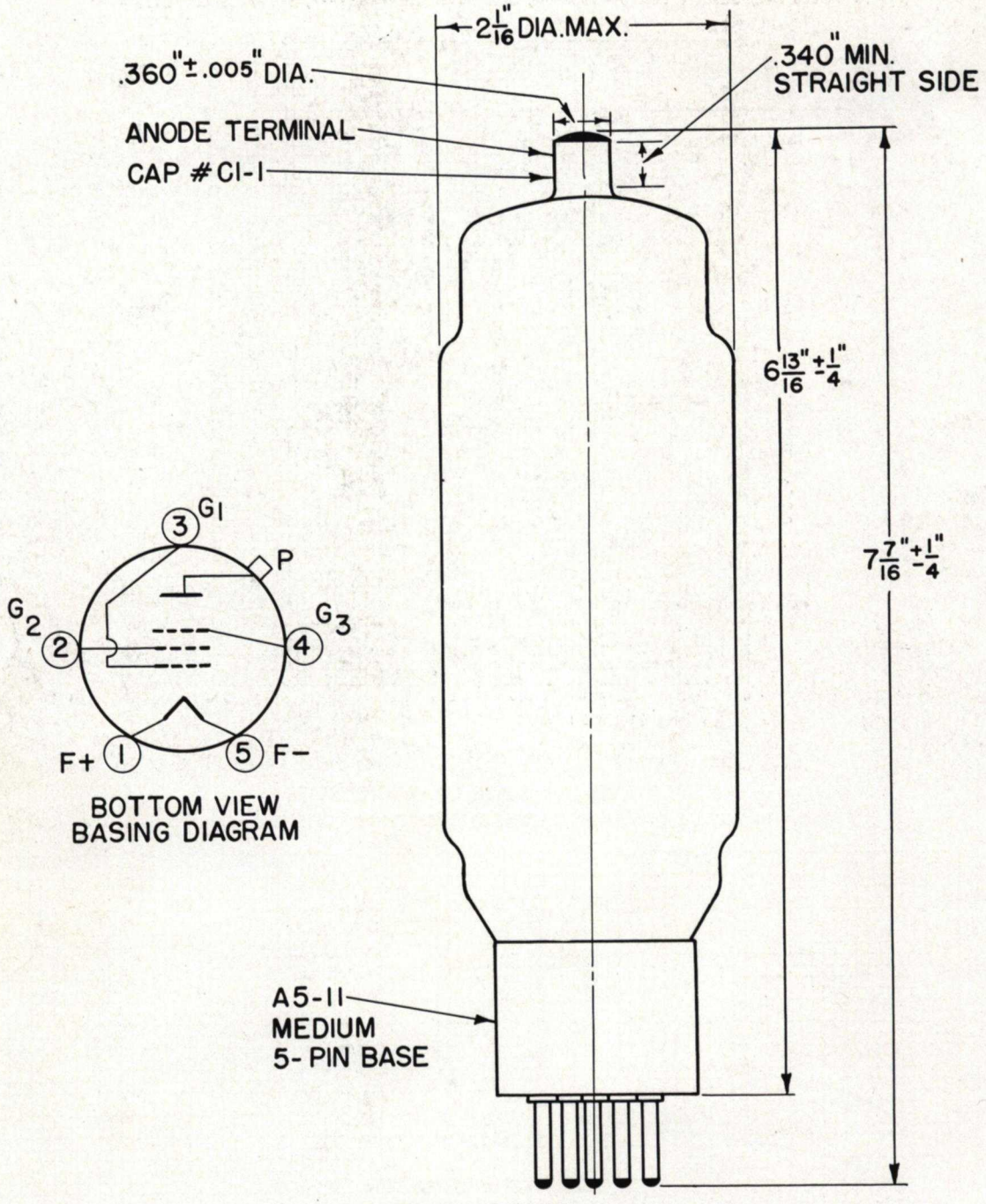

GL-828 OUTLINE

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Electronics Department

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