PLIOTRON

DESCRIPTION

GL-833-A is a three-electrode transmitting tube of the high-mu type for use as a radio-frequency amplifier, oscillator, and Class B modulator. Because of its high perveance, the 833-A can be operated at high plate efficiency with low driving power.

Designed in a new way with post terminals which provide a sturdy structure and make bases unnecessary, the 833-A has a minimum amount of insulation within the tube. The anode is supported directly from its post terminal at the top of the tube. Short, heavy-current leads are used to connect the anode and the grid to their respective terminals in order to carry the high circulating r-f current at the high frequencies and to minimize internal lead inductance.

As a result of its construction, the 833-A provides exceptional efficiency at high frequencies. It can be operated in Class C telegraph service with maximum input of 2000 watts at frequencies as high as 30 megacycles, and with reduced input at frequencies as high as 75 megacycles.

TECHNICAL INFORMATION

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

GENERAL CHARACTERISTICS

Number of electrodes	3	
Electrical		
Filament voltage	10	volts
Filament current	10	amperes

GE Electronic TUBE

TECHNICAL INFORMATION (CONT'D)

Average characteristics

Amplification factor	35	
Direct interelectrode capacitances		
Grid-plate	6.3	micromicrofarads
Grid-filament	12.3	micromicrofarads
Plate-filament	8.5	micromicrofarads
Frequency for maximum ratings	30	megacycles

Mechanical

Type of cooling	Convection or forced air	
Maximum ambient temperature, convection-cooled	60	centigrade
Net weight, approx	1	pound
Shipping weight, approx	3	pounds
Operating position	Vertical with filament terminals down or horziontal with plane of electrodes vertical.	

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

CLASS B AUDIO-FREQUENCY POWER AMPLIFIER (TWO TUBES)

	Typical Operation			Maximum Ratings			
	CCS	*	ICAS *	CCS	*	ICAS *	
D-c plate voltage	3000	4000	4000	3000	4000	4000	volts
Max signal plate current, per tube†				500	500	500	milliamperes
D-c max signal plate input, per tube†				1125	1600	1800	watts
Plate dissipation†				300	400	450	watts
D-c grid voltage‡	−70	−100	−100				volts
Peak a-f grid input voltage	400	480	510				volts
Zero signal plate current	100	100	100				milliamperes
Max signal plate current	750	800	900				milliamperes
Max signal driving power, approx	20	29	38				watts
Effective load, plate to plate	9500	12000	11000				ohms
Maximum signal plate power output, approx	1650	2400	2700				watts
Load resistance, per tube	2375	3000	2750				ohms

CLASS B RADIO-FREQUENCY POWER AMPLIFIER

Carrier conditions per tube for use with a max modulation factor of 1.0		*	*		*	*	
D-c plate voltage	3000	4000	4000	3000	4000	4000	volts
D-c grid voltage‡	−70	−120	−120				volts
D-c plate current	150	150	150	300	300	300	milliamperes
Plate input				450	600	675	watts
Plate dissipation				300	400	450	watts
Peak r-f grid input voltage	90	120	130				volts
Driving power§△, approx.	10	14	21				watts
Plate power output, approx	150	225	250				watts
D-c grid current, approx△	2	2	3				milliamperes

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	2500	3000	4000	2500	3000	4000	volts
D-c grid voltage π	−300	−300	−325	−500	−500	−500	volts
	4000	3600	3600				ohms
D-c plate current	335	415	450	400	450	450	milliamperes
D-c grid current, approx	75△	85△	90△	100	100	100	milliamperes
Plate input				835	1250	1800	watts
Plate dissipation				200	270	350	watts
Driving power△, approx	30	37	42				watts
Plate power output, approx	635	1000	1500				watts
Peak r-f grid voltage	460	490	520				volts

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS (CONT'D)

CLASS C RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Key-down conditions per tube without modulation □

	Typical Operation			Maximum Ratings			
	CCS	*	ICAS *	CCS	*	CAS *	
D-c plate voltage	3000	4000	4000	3000	4000	4000	volts
D-c grid voltage #	−200	−200	−225	−500	−500	−500	volts
	3500	2650	2400				ohms
	425	380	380				ohms
D-c plate current	415	450	500	500	500	500	milliamperes
D-c grid current, approx	55△	75△	95△	100	100	100	milliamperes
Plate input				1250	1800	2000	watts
Plate dissipation				300	400	450	watts
Peak r-f grid input voltage, approx	360	375	415				volts
Driving power△, approx	20	26	35				watts
Plate power output, approx	1000	1440	1600				watts

*Forced-air cooling required at these conditions of operation. When forced-air cooling is required an air flow of 40 cfm from a two-inch diameter nozzle directed vertically downward on bulb between grid and plate seals is required. Bulb temperature between grid and plate seals must not exceed 145 C. For conditions of operation where forced-air cooling is not required, adequate free circulation of air around the tube is necessary for satisfactory operation.

†Averaged over any audio-frequency cycle of sine-wave form.

‡For a-c filament supply.

§At crest of audio-frequency cycle.

△Subject to wide variations depending on the impedance of the load circuit. High-impedance load circuits require more grid current and driving power to obtain the desired output. Low-impedance circuits need less grid current and driving power, but plate circuit efficiency is sacrificed. The driving stage should have a tank circuit of good regulation and should be capable of delivering considerably more than the required driving power.

πObtained by grid resistor of value shown or by partial self-bias methods.

□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.

#Obtained from fixed supply, by grid resistor (3500, 2650, 2400), or by cathode resistor (425, 380, 380).

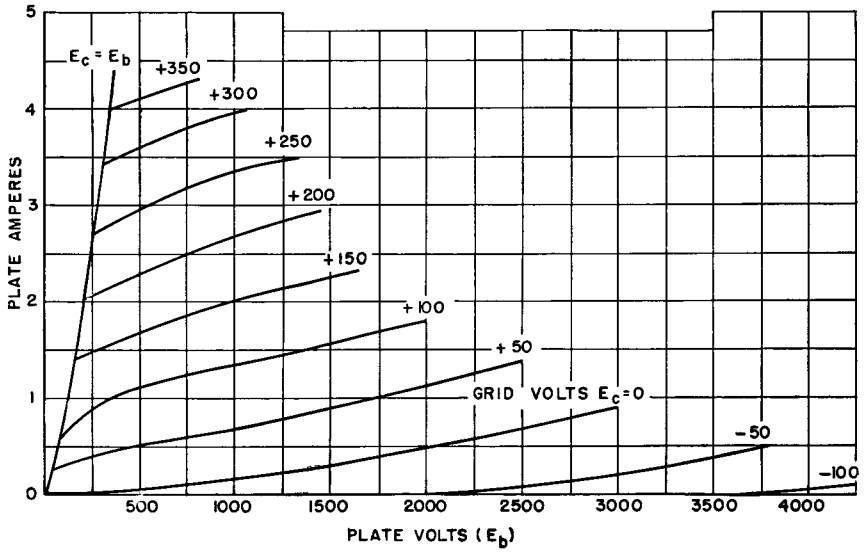
APPLICATION NOTES

The GL-833-A 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 100 megacycles for the various classes of service. Special attention should be given to adequate ventilation of the bulb at these frequencies.

	Natural Cooling			Forced-air Cooling			
Frequency	30	50	75	20	50	75	megacycles
Maximum permissible percentage of maximum rated plate voltage and plate input							
Class B, r-f	100	98	94	100	97	93	per cent
Class C, plate-modulated	100	90	72	100	83	65	per cent
Class C	100	90	72	100	83	65	per cent

GL-833-A

AVERAGE PLATE CHARACTERISTICS, E_f = 10.0 VOLTS A-C



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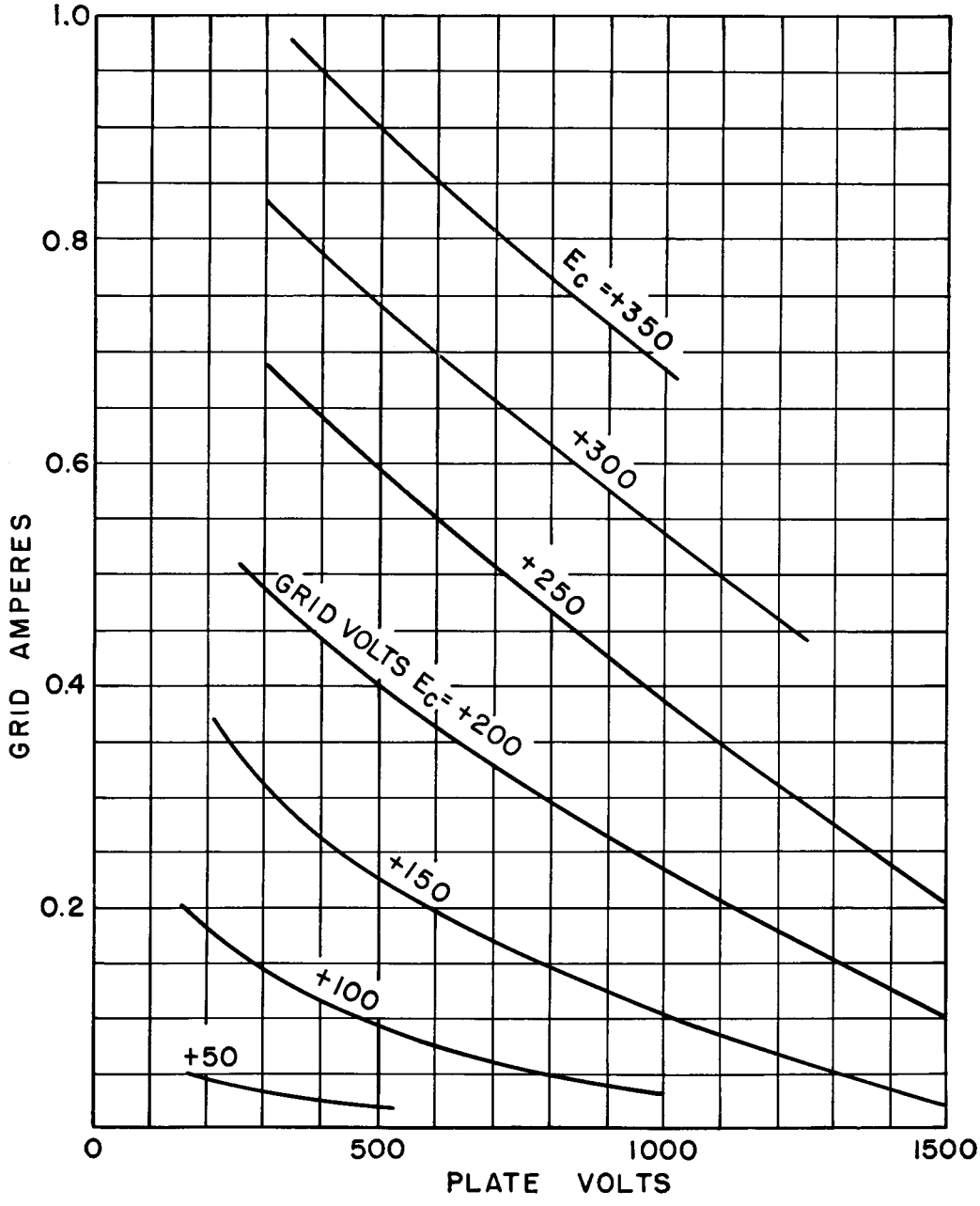

GL-833-A TYPICAL CHARACTERISTICS (E_f = 10 VOLTS A-C)

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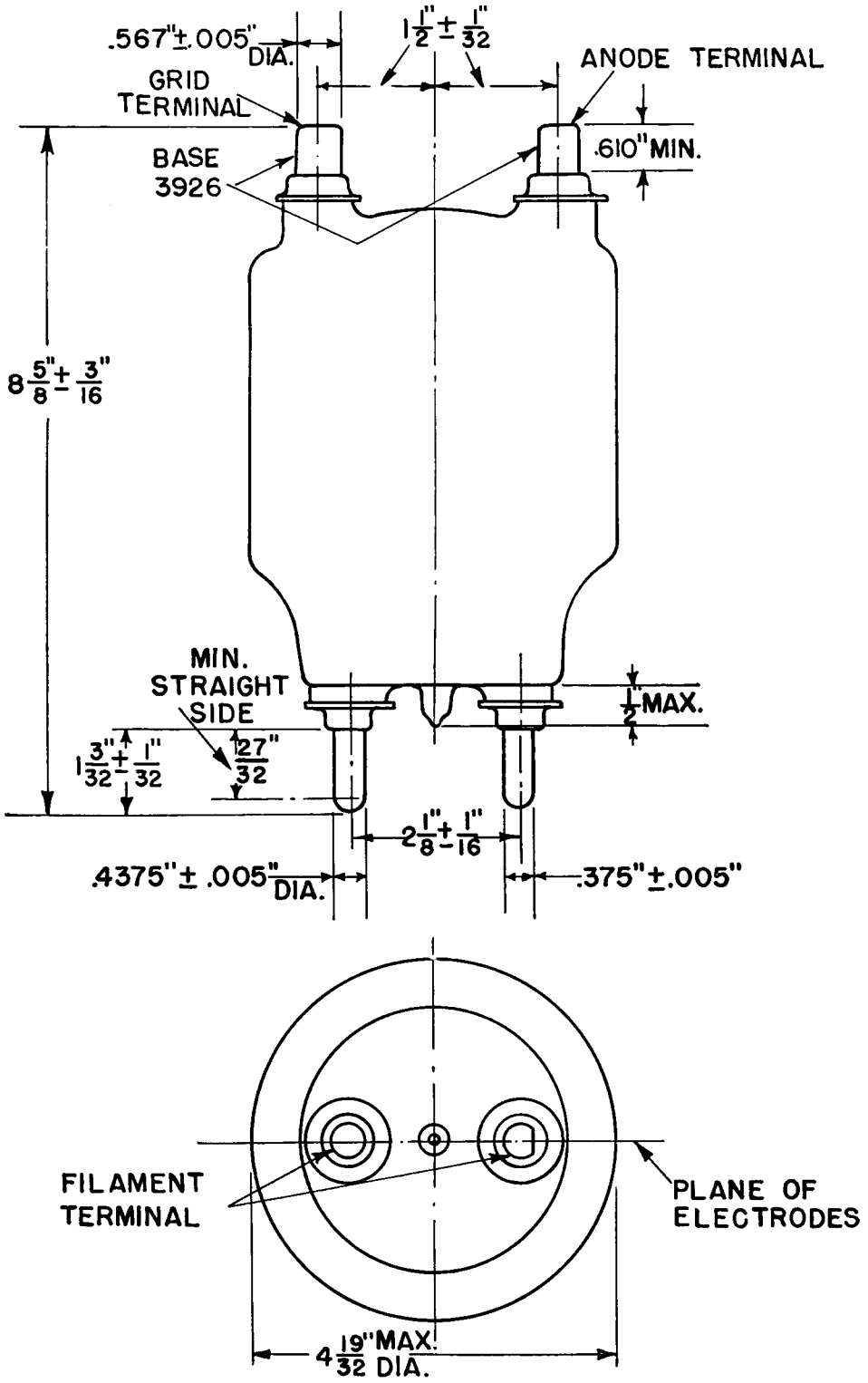

OUTLINE
GL-833-A PLIOTRON

NOTE: THE HORIZONTAL ANGLE BETWEEN THE PLANE DETERMINED BY THE AXIS OF THE FILAMENT TERMINALS AND THE PLANE DETERMINED BY THE AXIS OF THE GRID AND ANODE CAPS IS NOT MORE THAN 5 DEGREES

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