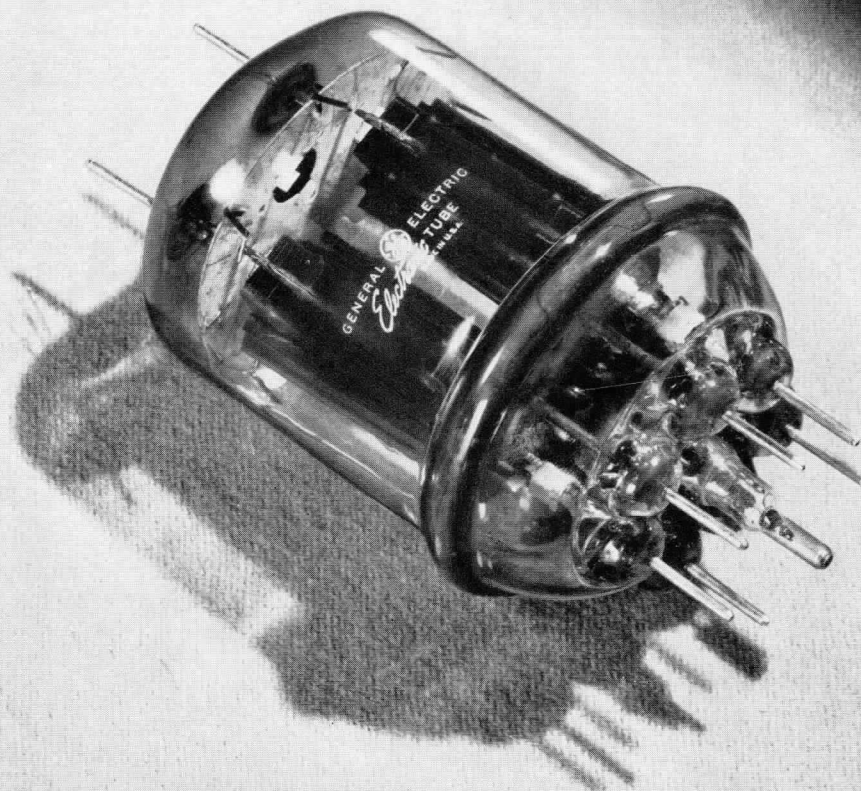




BEAM POWER TUBE

The GL-829-B is a five-electrode transmitting tube for use as an amplifier, modulator, and oscillator. The anode can dissipate 30 watts, and

cooling is accomplished by radiation. The cathode is the indirectly heated type. Maximum ratings apply up to 200 megacycles.

TECHNICAL INFORMATION

GENERAL

Electrical	Series	Parallel
Heater Voltage.....	12.6	6.3 $\pm 10\%$ Volts
Heater Current at Bogey Voltage.....	1.125	2.25 Amperes
Transconductance, each unit, $E_b = 250$ vdc, $E_c2 = 175$ vdc, $I_b = 60$ ma. dc.....		8500 Micromhos
Amplification Factor, each unit, $G2-G1$, $E_b = 225$ vdc, $E_c2 = 225$ vdc, $I_b = 60$ ma. dc.....		.9
Direct Interelectrode Capacitances, each unit		
Grid-No. 1 to Plate (With External Shield up to Flange Seal).....	0.12	uuf
Input.....	14.5	uuf
Output.....	7.0	uuf
Grid-No. 2 to Cathode Capacitance, including internal Grid-No. 2 bypass capacitor, approximate.....	65	uuf
Mechanical		
Mounting Position		
Vertical, base up or down		
Horizontal, plane of each plate vertical		
Net Weight, approximate.....	2.5	Ounces

GENERAL  ELECTRIC

Supersedes ETX-159, dated 5-46


Electronic
TUBE

TECHNICAL INFORMATION (CONT'D)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS AB₁

	CCS*	
	Natural Cooling	
Maximum Ratings, Absolute Values		
DC Plate Voltage.....	600 Max	Volts
DC Grid-No. 2 Voltage.....	225 Max	Volts
Maximum-Signal DC Plate Current*.....	250 Max	Milliamperes
Maximum-Signal Plate Input*.....	100 Max	Watts
Maximum-Signal Grid-No. 2 Input*.....	7 Max	Watts
Plate Dissipation*.....	30 Max	Watts
Peak Heater-Cathode Voltage		
Heater Negative with Respect to Cathode.....	100 Max	Volts
Heater Positive with Respect to Cathode.....	100 Max	Volts
Bulb Temperature.....	235 Max	C
Typical Operation		
DC Plate Voltage.....	600	Volts
DC Grid-No. 2 Voltage†.....	200	Volts
DC Grid-No. 1 Voltage‡.....	—18	Volts
Peak AF Grid-No. 1 to Grid-No. 1 Voltage.....	36	Volts
Zero-Signal DC Plate Current.....	40	Milliamperes
Maximum-Signal DC Plate Current.....	100	Milliamperes
Zero-Signal DC Grid-No. 2 Current.....	4	Milliamperes
Maximum-Signal DC Grid-No. 2 Current.....	18	Milliamperes
Effective Load Resistance, Plate to Plate.....	13750	Ohms
Maximum-Signal Driving Power.....	0	Watts
Maximum-Signal Power Output.....	44	Watts

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

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

	CCS*		ICAS**		CCS*		ICAS**	
	Natural Cooling				Forced-Air Cooling			
Maximum Ratings, Absolute Values								
DC Plate Voltage.....	600 Max		600 Max		600 Max		600 Max	Volts
DC Grid-No. 2 Voltage.....	225 Max		225 Max		225 Max		250 Max	Volts
DC Grid-No. 1 Voltage.....	−175 Max		−175 Max		−175 Max		−175 Max	Volts
DC Plate Current.....	212 Max		212 Max		212 Max		240 Max	Milliamperes
DC Grid-No. 1 Current.....	15 Max		15 Max		15 Max		20 Max	Milliamperes
Plate Input.....	67.5 Max		90 Max		90 Max		120 Max	Watts
Grid-No. 2 Input.....	7 Max		7 Max		7 Max		**8 Max	Watts
Plate Dissipation.....	21 Max		28 Max		28 Max		40 Max	Watts
Peak Heater-Cathode Voltage								
Heater Negative with Respect to Cathode	100 Max		100 Max		100 Max		100 Max	Volts
Heater Positive with Respect to Cathode	100 Max		100 Max		100 Max		100 Max	Volts
Bulb Temperature.....	235 Max		235 Max		235 Max		235 Max	C
Typical Operation								
DC Plate Voltage.....	600		425	600	425	600	600	Volts
DC Grid-No. 2 Voltage#.....	200		200	200	200	200	200	Volts
	15500		6400	13300	6400	13300	13300	Ohms
DC Grid-No. 1 Voltage*** ⊕.....	−70		−60	−70	−60	−70	−80	Volts
	8700		5500	5800	5500	5800	5300	Ohms
Peak RF Grid-No. 1 to Grid-No. 1 Voltage	160		154	172	154	172	210	Volts
DC Plate Current.....	112		212	150	212	150	200	Milliamperes
DC Grid-No. 2 Current.....	26		35	30	35	30	30	Milliamperes
DC Grid-No. 1 Current, approximate....	8		11	12	11	12	15	Milliamperes
Driving Power, approximate.....	0.6		0.8	0.9	0.8	0.9	1.4	Watts
Power Output, approximate.....	50		63	70	63	70	85	Watts

TECHNICAL INFORMATION (CONT'D)

PUSH-PULL RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

Key-down conditions per tube without modulation♦

	CCS●		ICAS●●		CCS●		ICAS●●	
Maximum Ratings, Absolute Values	Natural Cooling				Forced-air Cooling			
DC Plate Voltage.....	750	Max	750	Max	750	Max	750	Max Volts
DC Grid-No. 2 Voltage.....	225	Max	225	Max	225	Max	250	Max Volts
DC Grid-No. 1 Voltage.....	—175	Max	—175	Max	—175	Max	—175	Max Volts
DC Plate Current.....	240	Max	240	Max	240	Max	240	Max Milliamperes
DC Grid-No. 1 Current.....	15	Max	15	Max	15	Max	20	Max Milliamperes
Plate Input.....	90	Max	120	Max	120	Max	150	Max Watts
Grid-No. 2 Input.....	7	Max	7	Max	7	Max	8	Max Watts
Plate Dissipation.....	30	Max	40	Max	40	Max	45	Max Watts
Peak Heater-Cathode Voltage								
Heater Negative with Respect to Cathode	100	Max	100	Max	100	Max	100	Max Volts
Heater Positive with Respect to Cathode	100	Max	100	Max	100	Max	100	Max Volts
Bulb Temperature.....	265	Max	265	Max	235	Max	235	Max C
Typical Operation								
DC Plate Voltage.....	750		500	750	500	750	750	Volts
DC Grid-No. 2 Voltage Δ.....	200		200	200	200	200	200	Volts
	16200		9300	18300	9300	18300	16200	Ohms
DC Grid-No. 1 Voltage ¶ ⊕.....	—50		—45	—55	—45	—55	—50	Volts
	6300		3750	4600	3750	4600	3100	Ohms
	310		160	270	160	270	200	Ohms
Peak RF Grid-No. 1 to Grid-No. 1 Voltage	120		124	140	124	140	150	Volts
DC Plate Current.....	120		240	160	240	160	200	Milliamperes
DC Grid-No. 2 Current.....	34		32	30	32	30	34	Milliamperes
DC Grid-No. 1 Current, approximate...	8		12	12	12	12	16	Milliamperes
Driving Power, approximate.....	0.45		0.7	0.8	0.7	0.8	1.1	Watts
Power Output, approximate.....	65		83	87	83	87	110	Watts

The GL-829-B can be operated at frequencies as high as 200 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 250 megacycles for the various classes of service. Special attention should be given to shielding, cooling and radio-frequency by-passing at these frequencies.

Frequency.....	200	250	Megacycles
Maximum permissible percentage of maximum rated plate voltage and plate input			
Class C Telephony, plate modulated.....	100	89	Percent
Class C Telegraphy.....	100	89	Percent

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

†Preferably obtained from a separate source, or from the plate-voltage supply with a voltage divider.

‡The type of input-coupling network used should not introduce too much resistance in the grid-No. 1 circuit. Transformer or impedance coupling devices are recommended. When grid-No. 1 is operated in the negative region with fixed bias, the d-c grid-No. 1 circuit resistance should not exceed 100,000 ohms. Cathode-bias is not recommended.

**In ICAS applications at frequencies less than 20 megacycles where duty-factor does not exceed 0.2, maximum "on" period does not exceed 30 seconds, and average modulation factor does not exceed 0.25, maximum grid-No. 2 input of 12 watts is permitted.

Obtained from a separate source modulated with the plate supply, or from the modulated plate supply through a series resistor of the value shown.

***Obtained from a grid resistor of value shown (per tube) 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% of the carrier conditions.

• Continuous Commercial Service.

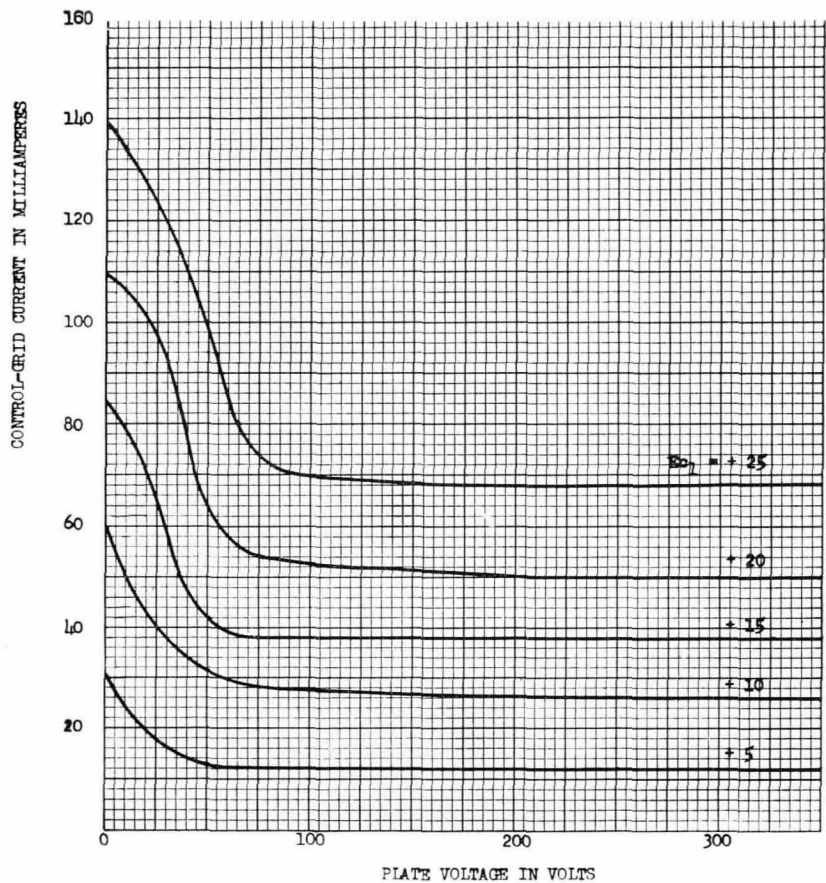
•• Intermittent Commercial and Amateur Service.

⊕ The grid-circuit resistance should never exceed 15,000 ohms (total) per tube; or 30,000 ohms per unit. Any additional bias required must be supplied by a cathode resistor or a fixed supply.

Δ Obtained from a separate source, or from the plate-voltage supply with a voltage divider, or through a series resistor of value shown. The grid-No. 2 voltage must not exceed 600 volts under key-up conditions.

¶ Obtained from a fixed supply or a grid resistor (3750, 4600, 3100) or cathode resistor (160, 270, 200) or by combination methods.

Shielding of the GL-829-B in an rf amplifier is required for stable operation. A convenient method of shielding is to mount the tube with one end through a hole in a metal plate so that the edge of the hole is close to the internal shield of the tube. Due to the importance, at the very-high-frequencies, of obtaining the shortest leads possible, rf bypassing must be accomplished close to the tube terminals. Ribbon leads acting as plates of the bypass capacitors are effective. All circuit returns should be made to the common cathode connection. RF chokes may be advisable in the voltage-supply leads.



TYPICAL CHARACTERISTICS EACH UNIT
 $E_f = 12.6$ VOLTS SCREEN VOLTAGE = 200 VOLTS
SERIES-HEATER ARRANGEMENT

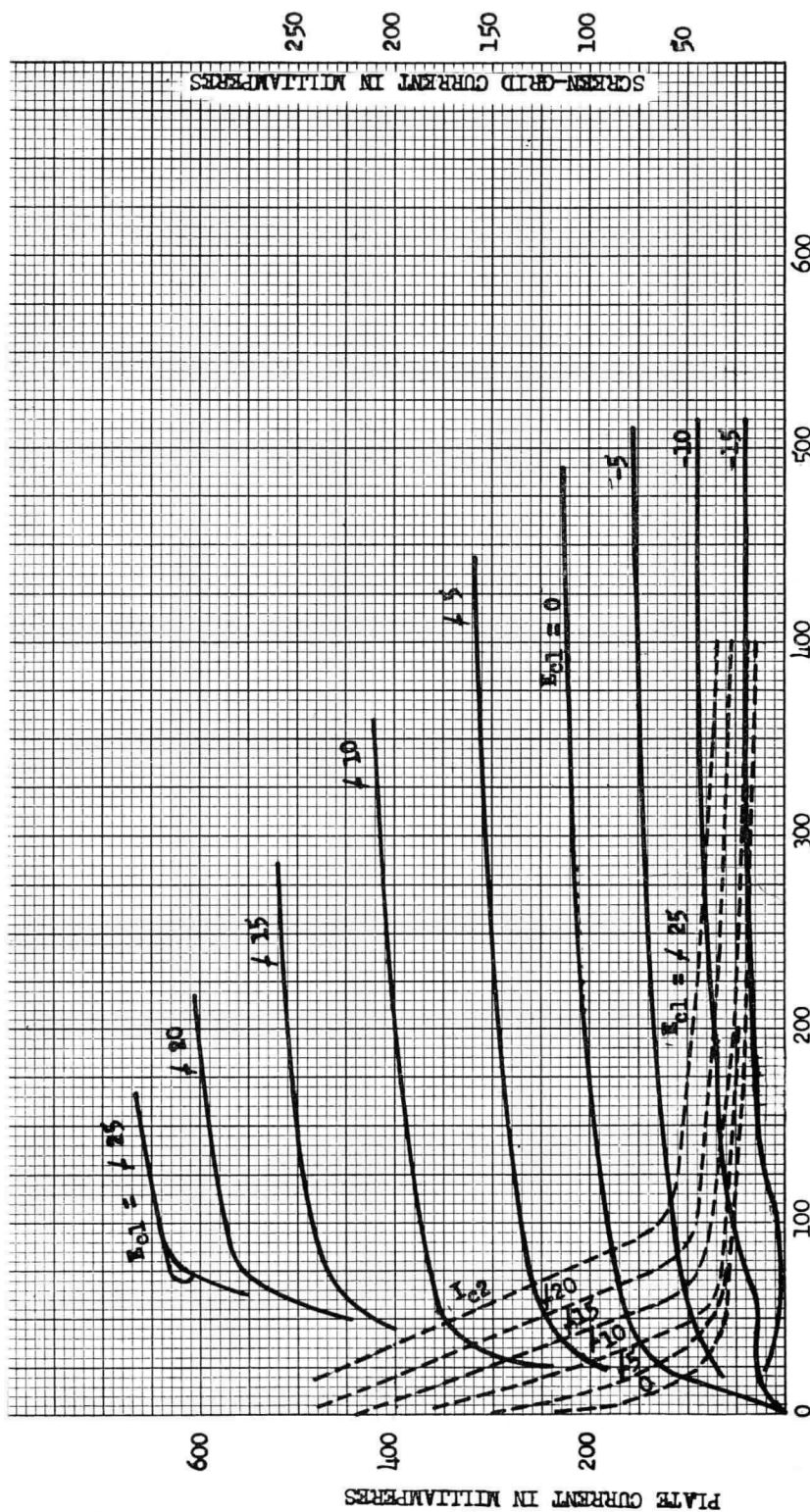


PLATE VOLTAGE IN VOLTS

AVERAGE PLATE CHARACTERISTICS EACH UNIT
 $E_r = 12.6$ VOLTS SCREEN VOLTAGE = 200 VOLTS
 SERIES-HEATER ARRANGEMENT

K-5966430

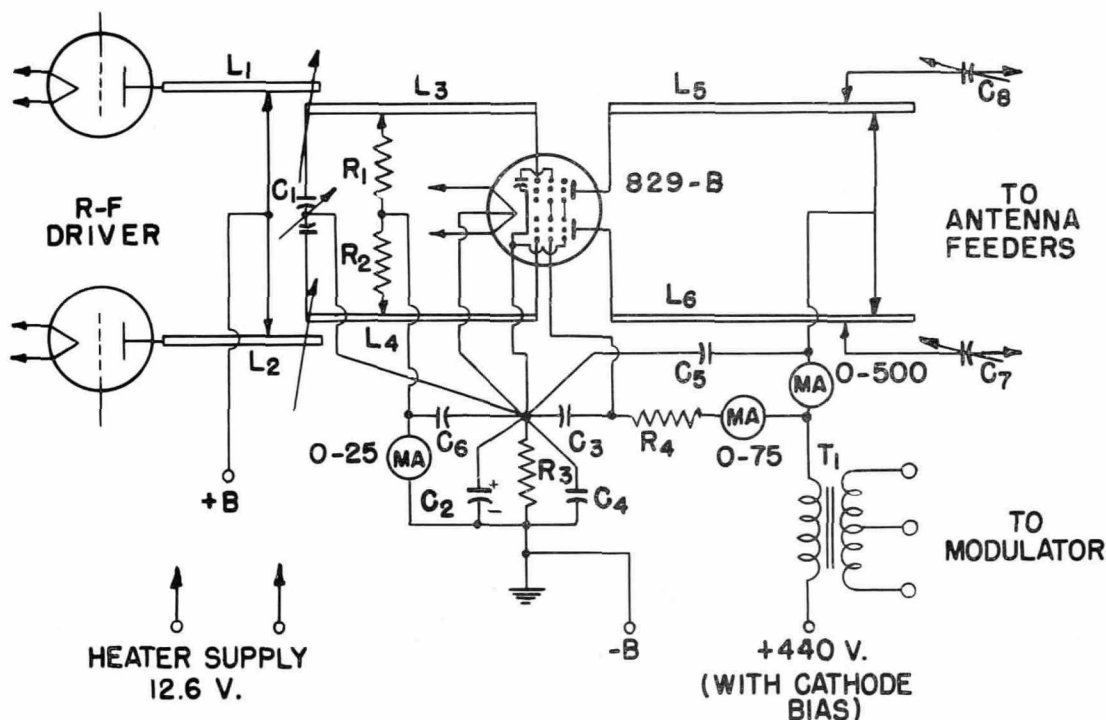
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GL-829-B

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$C_1 = 1.2$ TO $10 \mu\mu f$ PER SECTION

$C_2 = 25 \mu f$, 200 VOLTS

$C_3 C_4 C_5 C_6 = 500 \mu\mu f$, MICA

$C_7 C_8 = 3$ TO $35 \mu\mu f$

$R_1 R_2 = 7500$ TO 15000 OHMS, 1 WATT

$R_3 = 60$ OHMS, 10 WATTS

$R_4 = 6400$ OHMS, 15 WATTS

$T_1 =$ MODULATION TRANSFORMER

$L_1 L_2 =$ DIMENSIONS DEPENDENT ON TYPE OF DRIVER TUBE; APPROX. SAME AS $L_5 L_6$

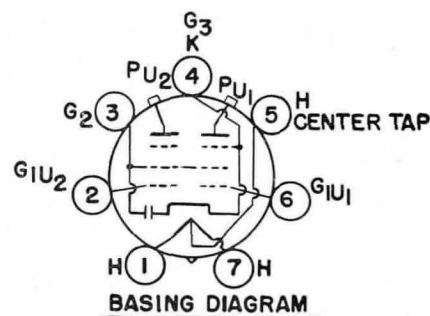
$L_3 L_4 = 1/4"$ DIA. COPPER TUBING, APPROX. 10" LONG AND SPACED APPROX. $7/8"$ BETWEEN CENTERS.

$L_5 L_6 = 3/8"$ DIA. COPPER TUBING, APPROX. 7" LONG AND SPACED APPROX. $7/8"$ BETWEEN CENTERS.

NOTE 1: ADJUST COUPLING OF $L_1 L_2$ AND $L_3 L_4$ FOR OPTIMUM GRID EXCITATION.

NOTE 2: GRID RESISTORS SHOULD BE ADJUSTED ON $L_3 L_4$ AT VOLTAGE NODE.

VHF PLATE-MODULATED
PUSH-PULL RF POWER AMPLIFIER
(OPERATING FREQUENCY APPROX. 200 MC)



NOTE 5: EXHAUST TIP WILL NOT EXTEND BEYOND THE PLANE WHICH PASSES THROUGH THE ENDS OF THE THREE LONGEST PINS.

GL-829-B

TUBE DEPARTMENT
GENERAL ELECTRIC
Schenectady 5, N. Y.