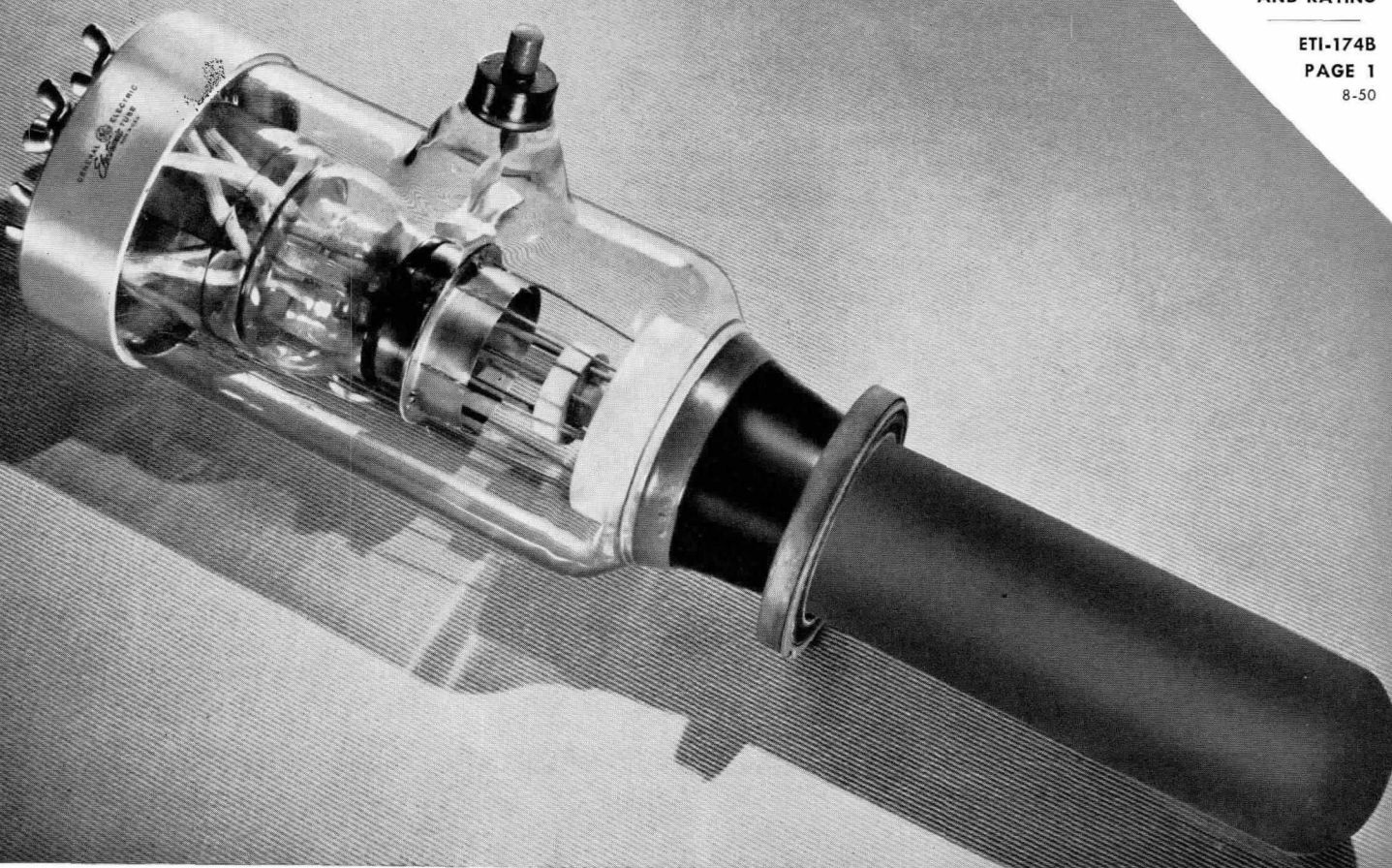




PLIOTRON

DESCRIPTION

The GL-893-A is a three-electrode tube designed for use as a radio-frequency amplifier, oscillator, or Class B modulator. The anode is water-cooled

and capable of dissipating 20 kilowatts. The cathode is a pure-tungsten filament. Maximum ratings apply up to 5 megacycles.

◆ TECHNICAL INFORMATION

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

GENERAL

Electrical Data	Minimum	Bogey	Maximum
Filament voltage (single-phase excitation)* ●		20	21 volts
Filament current at bogey voltage (Single-phase excitation)* ●	175	183	190 amperes
Filament starting current (Single-phase excitation)		...	275 amperes
Filament cold resistance (Single-phase excitation)		.0093	... ohm
Amplification factor, $I_b = 1.0$ amp, $E_c = -100$ v.	28	34.5	41
Interelectrode capacitances			
Grid-plate	28.5	33	37.5 uuf
Grid-filament	39.5	48	56.5 uuf
Plate-filament	2.0	3.0	4.0 uuf

◆ Technical information completely revised.


Electronic
TUBE

GENERAL  ELECTRIC

Supersedes ETI-174A dated 12-45

TECHNICAL INFORMATION (CONT'D)

Mechanical Data

Mounting position	vertical, anode down
Type of cooling	water and forced air
Water flow on anode	15 GPM
Maximum outgoing water temperature	70 C
Required air flow to stem*	2 CFM
Maximum glass temperature	150 C
Net weight, approximate	12 pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum ratings, absolute values			CCS†
D-c plate voltage	20000 max		volts
Maximum signal d-c plate current‡	4.0 max		amperes
Maximum signal plate input‡	60 max		kilowatts
Plate dissipation‡	20 max		kilowatts
Typical operation			CCS†
Unless otherwise specified, values are for 2 tubes			
D-c plate voltage	12000	15000	18000 volts
D-c grid voltage	−260	−350	−450 volts
Peak a-f grid-to-grid voltage	1480	1560	1720 volts
Zero signal d-c plate current	0.8	0.8	0.8 ampere
Maximum signal d-c plate current	7.0	6.0	5.5 amperes
Effective load resistance, plate to plate	4000	6000	8000 ohms
Maximum signal driving power, approximate	220	190	140 watts
Maximum signal power output, approximate	52	60	70 kilowatts

RADIO-FREQUENCY POWER AMPLIFIER—CLASS B

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

Maximum ratings, absolute values	CCS†		
D-c plate voltage	20000 max	volts	
D-c plate current	2.0 max	amperes	
Plate input	32 max	kilowatts	
Plate dissipation	20 max	kilowatts	
Typical operation	CCS†		
D-c plate voltage	12000	15000	15000 volts
D-c grid voltage	-250	-340	-340 volts
Peak r-f grid voltage	350	395	450 volts
D-c plate current	1.5	1.5	2.0 amperes
D-c grid current, approximate	35	30	50 milliamperes
Driving power, approximate Δ	130	150	200 watts
Power output, approximate	6	7.5	10 kilowatts

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

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

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

TECHNICAL INFORMATION (CONT'D)

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

Key-down conditions per tube without amplitude modulation¶

Maximum ratings, absolute values		CCS†	
D-c plate voltage	20,000 max	volts	
D-c grid voltage	—3000 max	volts	
D-c plate current	4.0 max	amperes	
D-c grid current	0.4 max	amperes	
Plate input	70 max	kilowatts	
Plate dissipation	20 max	kilowatts	

Typical operation		CCS‡		
D-c plate voltage	12,000	15,000	18,000	volts
D-c grid voltage	—800	—900	—1000	volts
Peak r-f grid voltage	1430	1520	1630	volts
D-c plate current	3.5	3.6	3.6	amperes
D-c grid current, approximate	0.26	0.25	0.21	amperes
Driving power, approximate	360	370	340	watts
Power output, approximate	30	40	50	kilowatts

*Air flow to be directed into stem through tubing in center of base. The flow of stem cooling air must continue 5 minutes after removal of filament and plate power.

● See drawing filament connections and excitation circuits, K-8639686.

†CCS = Continuous commercial service.

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

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

¶ Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

Maximum ratings apply up to 5 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	5	20	40 megacycles
Class B r-f			
Percentage of maximum rated plate voltage	100	85	65 per cent
Percentage of maximum rated plate input	100	82	73 per cent
Class C plate modulated			
Percentage of maximum rated plate voltage	100	80	64 per cent
Percentage of maximum rated plate input	100	75	64 per cent
Class C			
Percentage of maximum rated plate voltage	100	80	60 per cent
Percentage of maximum rated plate input	100	66	50 per cent

GL-893-A

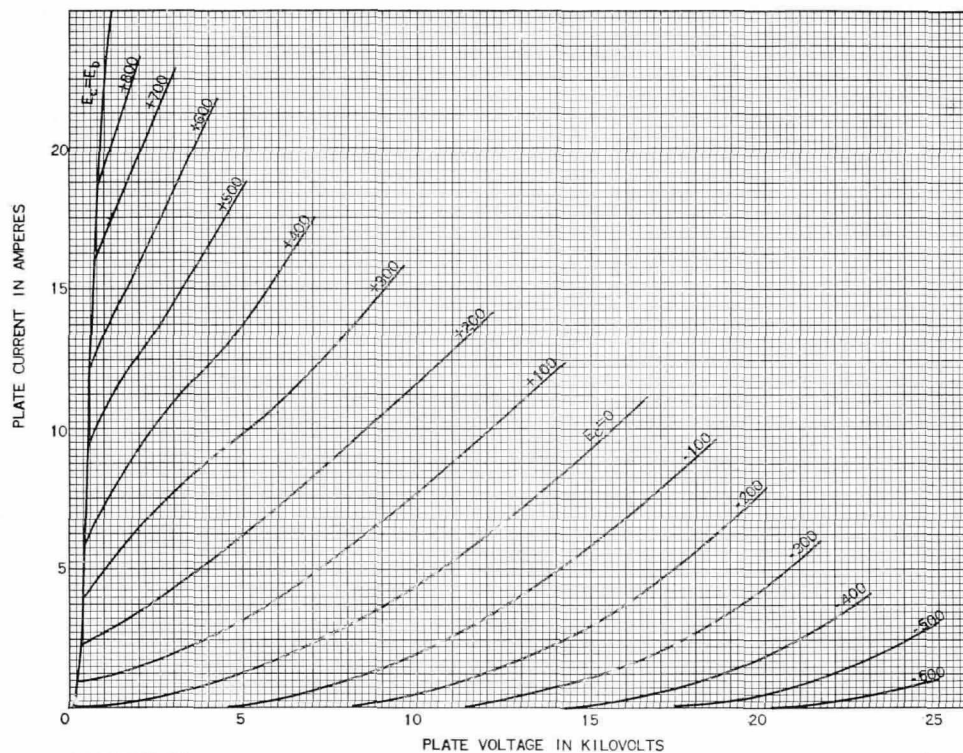
ETI-174B

PAGE 4

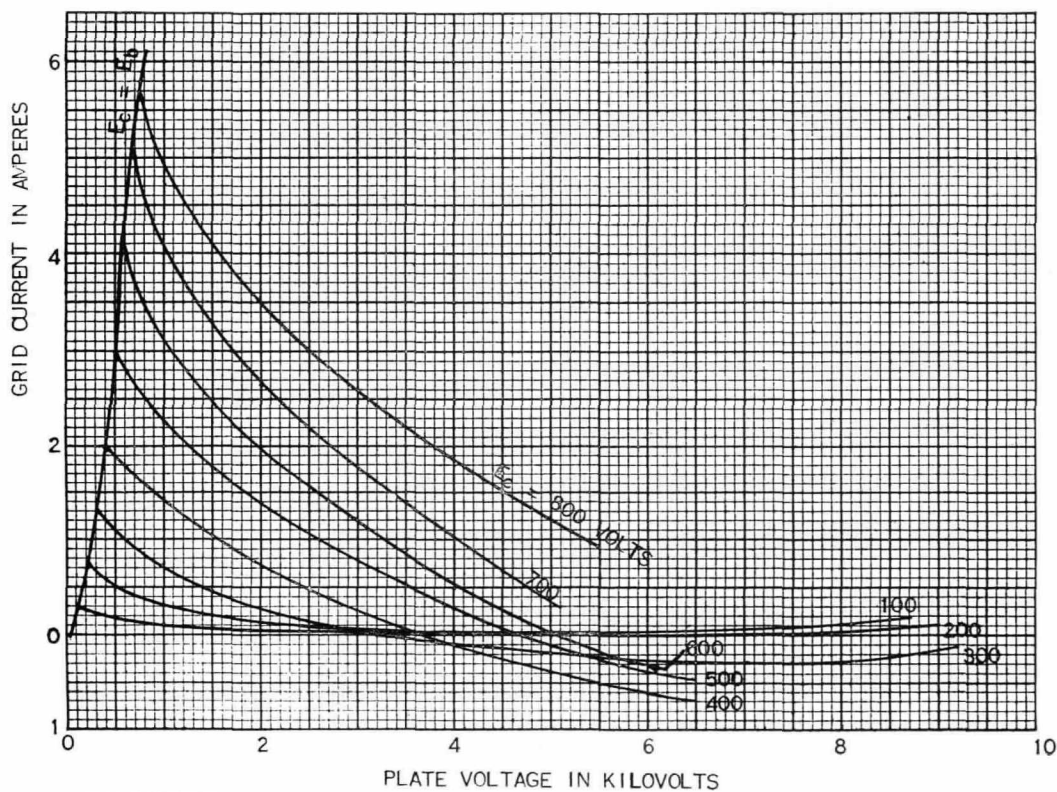
8-50

GL-893-A AVERAGE PLATE CHARACTERISTIC

$E_f = 20$ VOLTS A-C

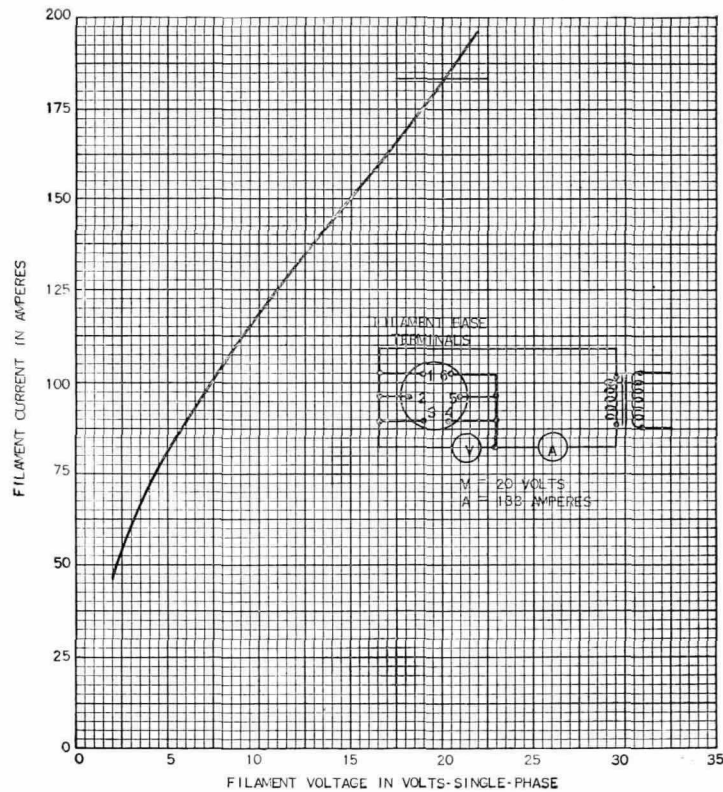


GL-893-A TYPICAL GRID-PLATE TRANSFER CHARACTERISTIC $E_f = 20$ VOLTS A-C



■ Drawing revised

GL-893-A AVERAGE FILAMENT CHARACTERISTIC
SINGLE-PHASE CONNECTION
COLD RESISTANCE = 0.0093 OHM

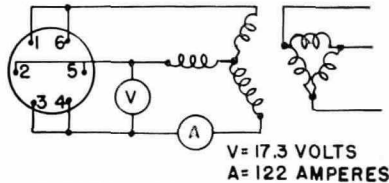
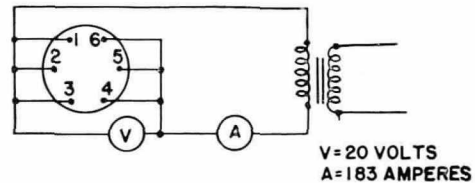
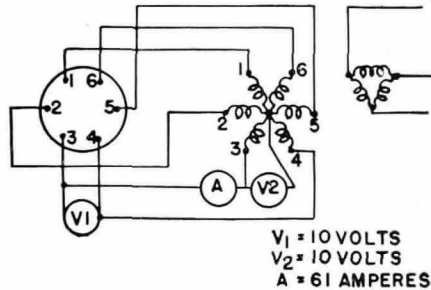
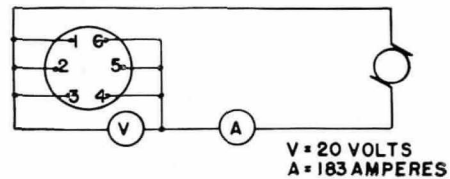


K-59087-72A287

Drawing revised

4-25-49

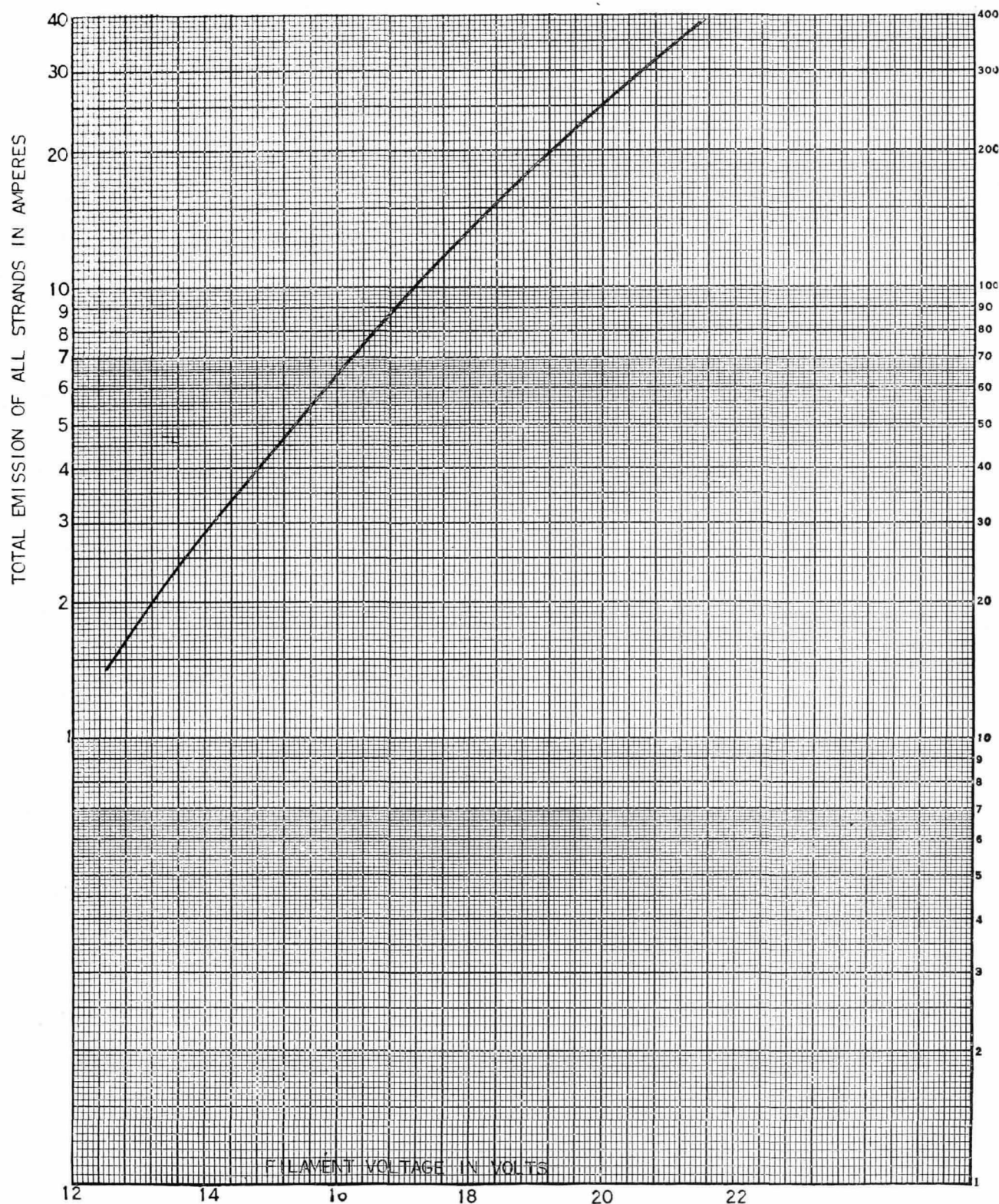
GL-893-A FILAMENT CONNECTIONS

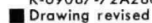
FILAMENT BASE
TERMINALSTHREE-PHASE A-C FILAMENT
EXCITATIONFILAMENT BASE
TERMINALSSINGLE-PHASE A-C FILAMENT
EXCITATIONFILAMENT BASE
TERMINALSSIX-PHASE A-C FILAMENT
EXCITATIONFILAMENT BASE
TERMINALS

D-C FILAMENT EXCITATION

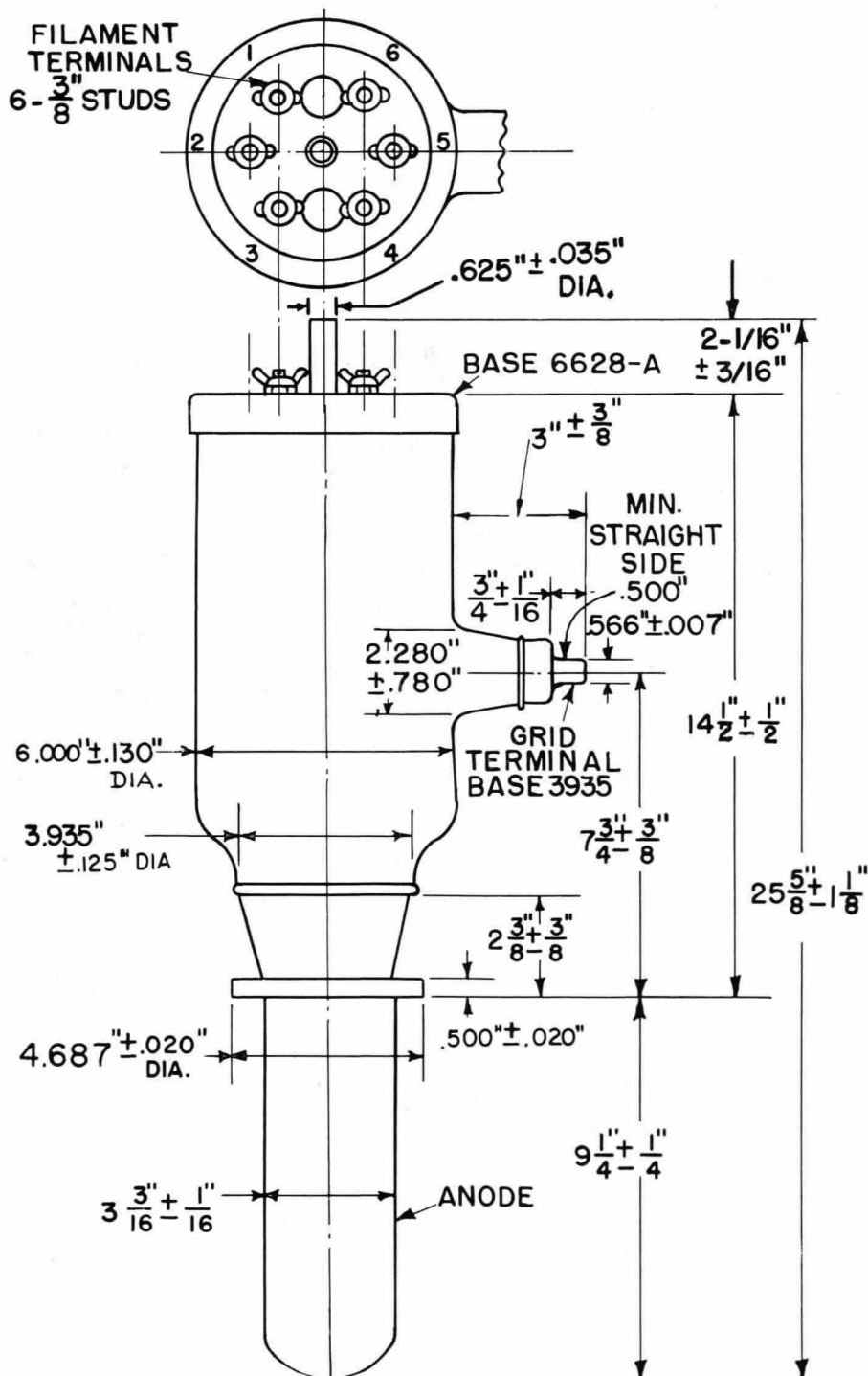
NOTE: TERMINALS MUST BE CONNECTED IN
CORRECT PHASE RELATION AS SHOWN

■ GL-893-A
AVERAGE FILAMENT EMISSION CHARACTERISTIC
SINGLE-PHASE FILAMENT CONNECTION



$$E_f = 20 \text{ VOLTS A-C}$$


■ GL-893-A OUTLINE



K-5344783
 ■ Drawing revised

12-8-49

Tube Divisions, Electronics Department

GENERAL  **ELECTRIC**

Schenectady, N. Y.