

DESCRIPTION AND RATING

TRANSMITTING TUBE GL-6183

The GL-6183 is a four-electrode transmitting tube featuring a metal-and-ceramic envelope designed for use as a power amplifier or oscillator in grounded-grid circuits with both grids maintained at radio-frequency ground potential. The output circuit is connected between the anode and the screen grid. The anode is capable of dissipating one and one-half kilowatts. Cooling is accomplished by forced air with the radiator an integral part of the anode. The cathode is indirectly heated and thorium coated. Maximum ratings apply up to 900 megacycles.

When used as a Class B grounded-grid broadband television amplifier this tube has a useful synchronizing peak-power output of one kilowatt at 900 megacycles; in narrow band Class C service the output is one kilowatt of continuous power as an amplifier or oscillator. Because of its ratings, the tube is also well adapted to use in dielectric-heating equipment.

High operating efficiency is assured because of the small size and close spacing of the tube electrodes, the ring-seal construction, and the low-loss factor due to the gold-over-silver-plated external parts and the ceramic insulator. In addition, the grounded-grid construction eliminates the necessity for neutralization in a properly designed circuit. The small size of the GL-6183 permits compact mounting, and the ring-seal construction allows quick plug-in installation.

TECHNICAL INFORMATION

GENERAL

<u>Electrical Data</u>	Minimum	Bogey	Maximum	
Heater Voltage*	---	6.3	6.8	Volts
Heater Current at Bogey Voltage	---	24	---	Amperes
Heater Starting Current	---	---	36	Amperes
Heater Cold Resistance	---	0.022	---	Ohm
Cathode Heating Time	1	---	---	Minute
Amplification Factor, G_2 to G_1				
$E_b = 500$ Volts, $I_b = 0.250$ Ampere	---	10	---	
Peak Cathode Current†	---	---	4	Amperes
Direct Interelectrode Capacitances				
Cathode - Plate‡	---	0.03	---	uuf
Input, G_2 tied to G_1	---	16.0	---	uuf
Output, G_2 tied to G_1 §	---	4.6	---	uuf

Mechanical Data

Mounting Position - Vertical

Air Flow

Through Radiator

See drawing in Instruction Book for form of air duct

Plate Dissipation 1.5 Kilowatts

Air Flow 60 Min Cu Ft per Min

Static Pressure 1.5 Inches Water

Screen-grid to Control-grid Seals

2 Min Cu Ft per Min

Heater to Cathode Seals

12 Min Cu Ft per Min

Incoming Air Temperature

45 Max C

Radiator Hub Temperature at Fin Adjacent to Anode Seal

180 Max C

Ceramic Temperature at any Point

200 Max C

from RTMA releases #1069, March 19, 1952 & #1069A, Feb. 6, 1953



Mechanical Data (Cont'd)

Net Weight

3.6 Pounds

Forced-air cooling to be applied before and during the application of any voltages. Forced-air cooling must be maintained for 1 minute after the removal of all voltages.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Radio-frequency Amplifier - Class B Television Service

Synchronizing-level conditions per tube unless otherwise specified

Maximum Ratings, Absolute Values

D-c Plate Voltage	4000 Max	Volts
D-c Grid-No. 2 Voltage	600 Max	Volts
D-c Plate Current	0.7 Max	Ampere
Plate Input	2.5 Max	Kilowatts
Grid-No. 2 Input	25 Max	Watts
Plate Dissipation	1.5 Max	Kilowatts
Grid-No. 1 Dissipation	16 Max	Watts

Typical Operation - Grounded-grid Circuit up to 900 Megacycles

Band Width 6 Megacycles

D-c Plate Voltage	3500	Volts
D-c Grid-No. 2 Voltage	500	Volts
D-c Grid-No. 1 Voltage	-40	Volts
Peak R-f Plate Voltage		
Synchronizing Level	2500	Volts
Pedestal Level	1875	Volts
Peak R-f Grid Voltage		
Synchronizing Level	110	Volts
Pedestal Level	70	Volts
D-c Plate Current		
Synchronizing Level	0.520	Ampere
Pedestal Level	0.360	Ampere
D-c Grid-No. 2 Current (Pedestal Level)	0.035	Ampere
D-c Grid-No. 1 Current		
Synchronizing Level	0.110	Ampere
Pedestal Level	0.035	Ampere
Driving Power at Tube, approximate		
Synchronizing Level	100	Watts
Pedestal Level	25	Watts
Power Output, approximate		
Synchronizing Level	1000	Watts
Pedestal Level	560	Watts

Radio-frequency Power Amplifier and Oscillator - Class C Telegraphy

Key-down conditions per tube without amplitude modulation^π

Maximum Ratings, Absolute Values

D-c Plate Voltage	4000 Max	Volts
D-c Grid-No. 2 Voltage	600 Max	Volts
D-c Grid-No. 1 Voltage	-150 Max	Volts
D-c Plate Current	0.7 Max	Ampere
D-c Grid-No. 1 Current	0.10 Max	Ampere
Plate Input	2.5 Max	Kilowatts
Grid-No. 2 Input	25 Max	Watts
Plate Dissipation	1.5 Max	Kilowatts
Grid-No. 1 Dissipation	16 Max	Watts

Typical Operation

D-c Plate Voltage	4000	Volts
D-c Grid-No. 2 Voltage	600	Volts
D-c Grid-No. 1 Voltage	-120	Volts

Radio-frequency Power Amplifier and Oscillator - Class C Telegraphy
Key-down conditions per tube without amplitude modulation^π (Cont'd)

Typical Operation (Cont'd)

Peak R-f Plate Voltage, approximate	2750	Volts
Peak R-f Grid-No. 1 Voltage	195	Volts
D-c Plate Current	0.550	Ampere
D-c Grid-No. 2 Current	0.035	Ampere
D-c Grid-No. 1 Current, approximate	0.065	Ampere
Driving Power, approximate	150	Watts
Power Output, approximate ^Δ	1200	Watts

* The cathode of the GL-6183, because of transit-time effects which raise the temperature of the cathode is subjected to considerable back bombardment in ultra-high-frequency service. The amount of heating due to bombardment is a function of the operating conditions and frequency, and must be compensated for by a reduction of the heater input to prevent overheating of the cathode with resulting short life. For long life, the GL-6183 should be put in operation with rated heater voltage. After the circuit has been adjusted for proper tube operation, the heater voltage should be reduced to a value slightly above that at which circuit performance is affected. At a frequency of 900 megacycles and with typical operating conditions the heater voltage can be reduced to approximately 5 volts. At lower frequencies, the reduction will be less. Minor circuit readjustment may be necessary after this adjustment.

† Represents maximum useable cathode current (plate current plus current to each grid) for any condition of operation.

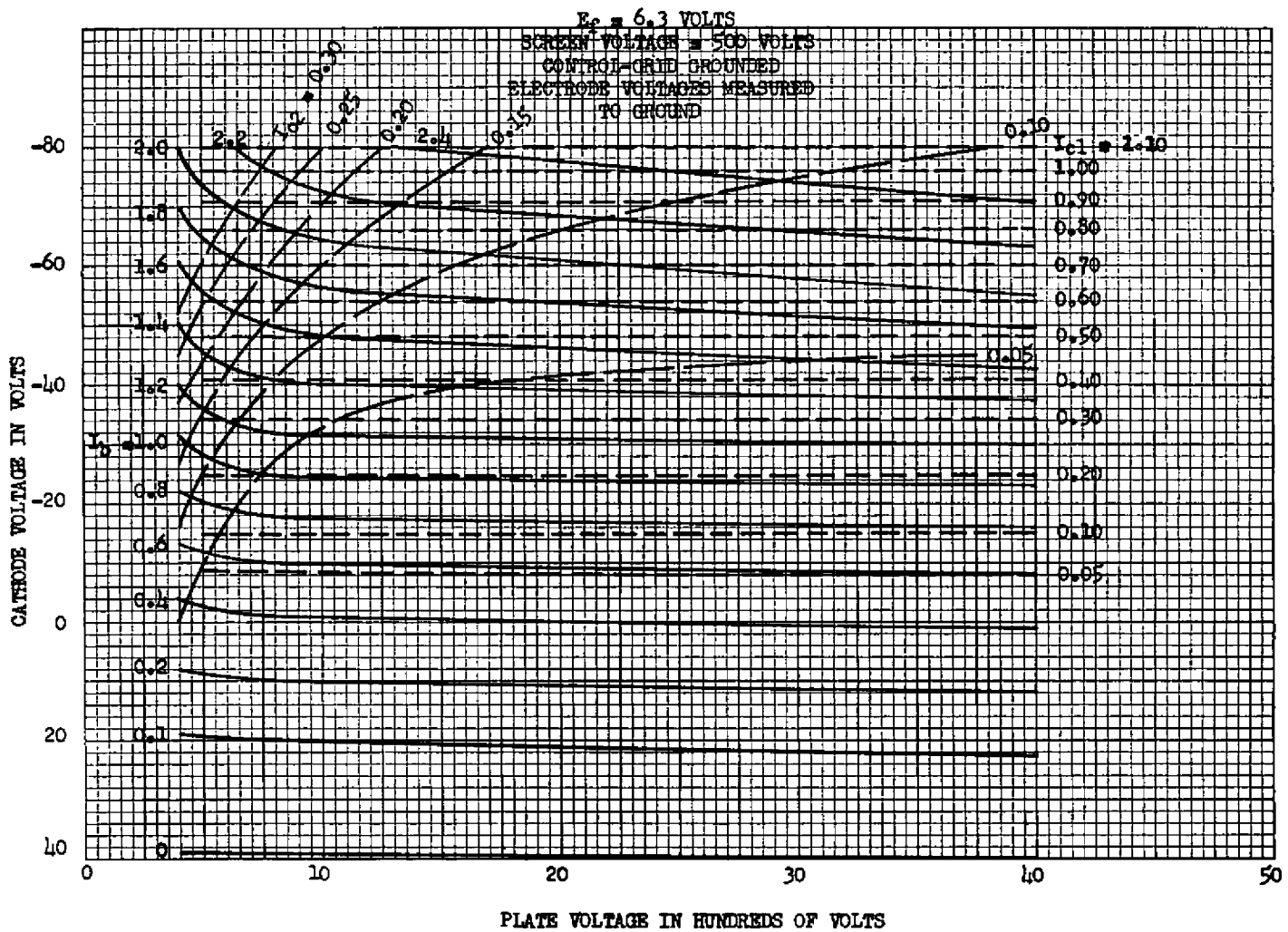
‡ Measured with a 6-inch diameter flat metal disk attached to the screen-grid ring. Control grid connected to the screen grid.

§ Output capacitance measured between anode and screen grid. Control grid connected directly to screen grid.

◇ Useful power output including power transferred from driver stage.

π Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 percent of the carrier conditions.

Δ Total anode power output including power transferred from driver stage.

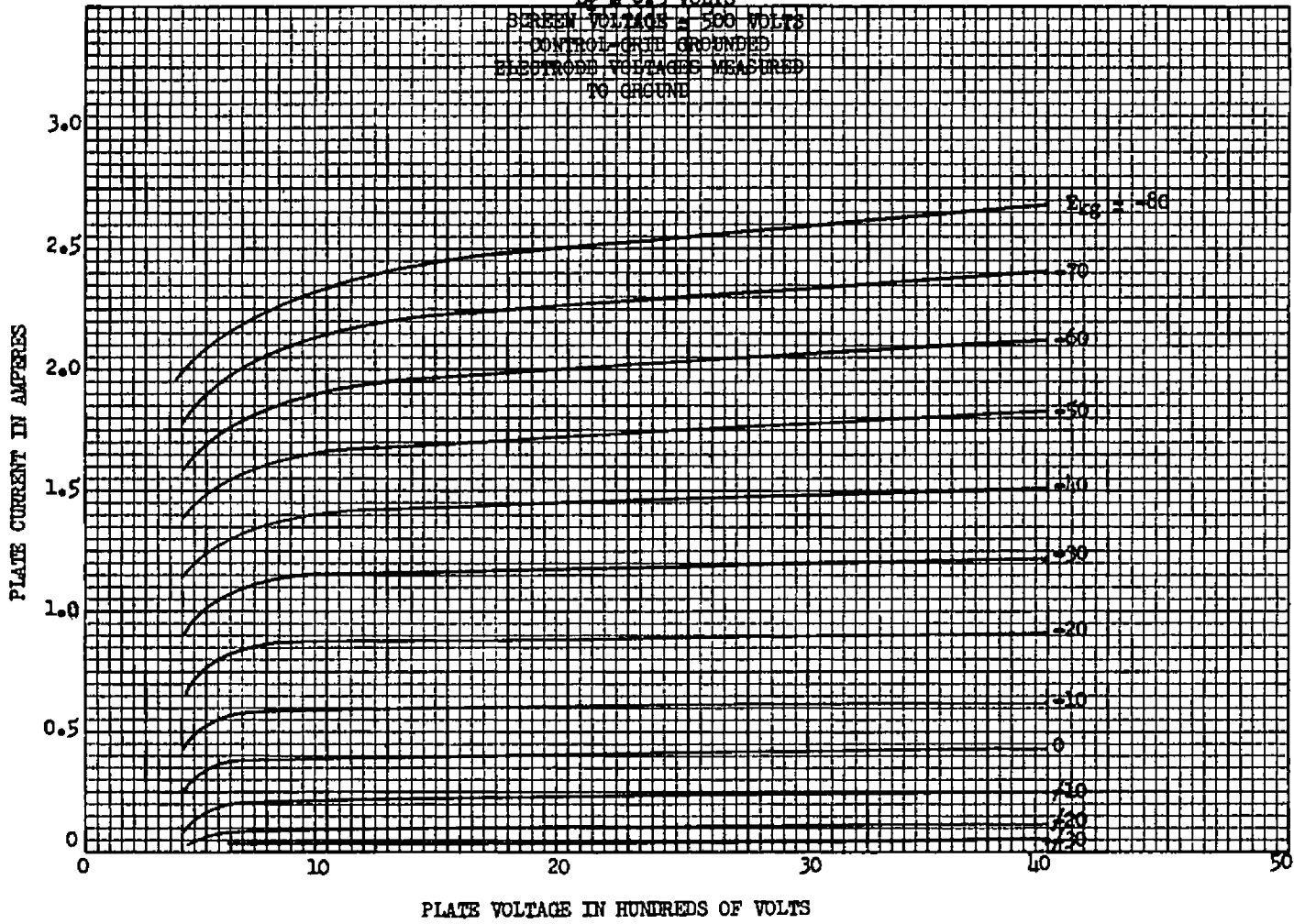


K-69087-72A458

February 21, 1952

GL-6183
 Constant-current Characteristics

$E_c = 6.3$ VOLTS
SCREEN VOLTAGE = 500 VOLTS
CONTROL GRID GROUNDED
ELECTRODE VOLTAGES MEASURED
TO GROUND



K-69087-72A464

February 21, 1952

GL-6183
Average Plate Characteristics

GENERAL  ELECTRIC
ELECTRONICS DIVISION, TUBE DEPARTMENT
SCHENECTADY, NEW YORK

As Registered

As Proposed

Typical Operation - Grounded-grid Circuit
up to 900 Megacycles
Band Width 6 Megacycles

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Bandwidth 6 Megacycles

Peak R-f Grid Voltage

Peak R-f Driving Voltage

Addition of new service:

Plate-modulated Radio-frequency Power Amplifier - Class C Telephony
Carrier Conditions with a Maximum Modulation Factor of 1.0

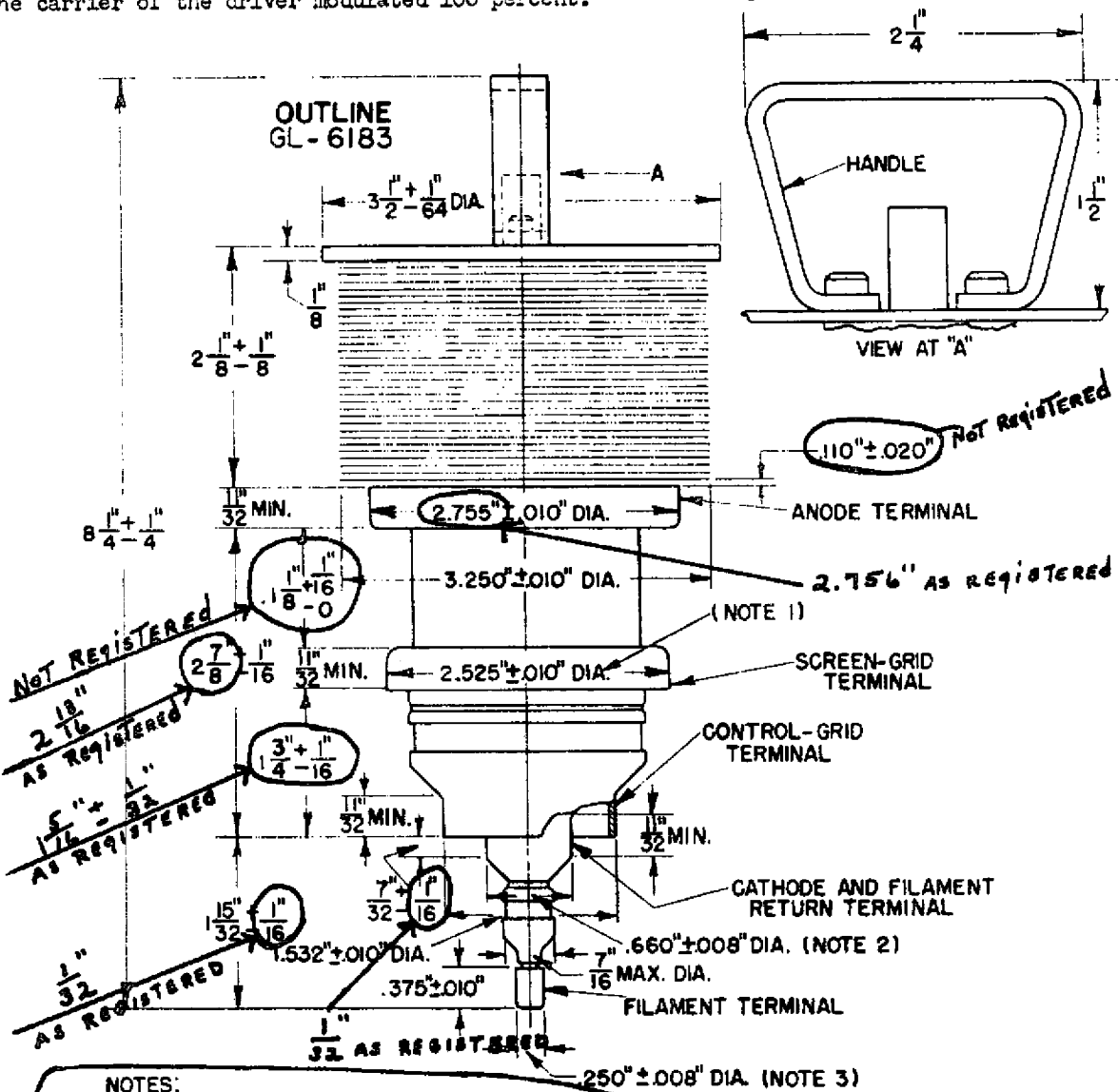
Maximum Ratings, Absolute Values

D-c Plate Voltage	3200 Max	Volts
D-c Grid-No. 2 Voltage	600 Max	Volts
D-c Grid-No. 1 Voltage	-120 Max	Volts
D-c Plate Current	0.35 Max	Ampere
D-c Grid-No. 1 Current	0.10 Max	Ampere
Plate Input	1.12 Max	Kilowatts
Grid-No. 2 Input	10 Max	watts
Plate Dissipation	1200 Max	Watts

Typical Operation, Grounded-grid Circuit

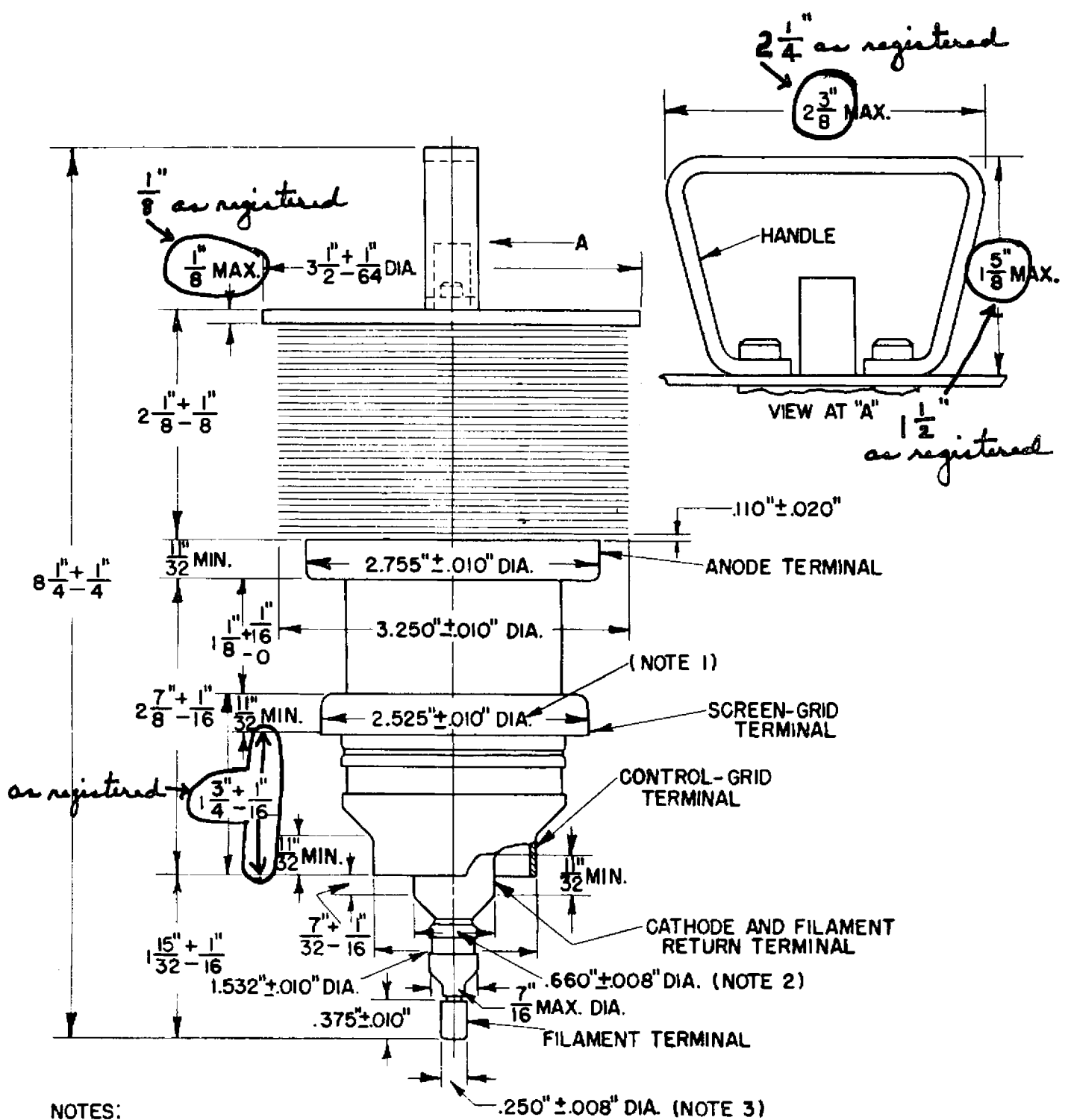
D-c Plate Voltage	3000	Volts
D-c Grid-No. 2 Voltage	500	Volts
D-c Grid-No. 1 Voltage	-100	Volts
Peak R-f Plate Voltage	2300	Volts
Peak R-f Driving Voltage	137	Volts
D-c Plate Current	0.25	Ampere
D-c Grid-No. 2 Current	0.01	Ampere
D-c Grid-No. 1 Current	approx 0.047	Ampere
Driving Power, approximate	36	watts
Power Output	565	watts

⚡ The carrier of the driver modulated 100 percent.



NOTES:
1. MAXIMUM ECCENTRICITY 0.010"
2. MAXIMUM ECCENTRICITY 0.015"
3. MAXIMUM ECCENTRICITY 0.030"
WITH RESPECT TO CENTERLINE DETERMINED BY CENTERS OF ANODE TERMINAL AND CONTROL-GRID TERMINAL.

NOT REGISTERED
RELEASE 1069A



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OUTLINE
GL-6183