



TRIODE

The GL-5513 is a three-electrode tube designed for use as a grounded-grid Class B radio-frequency amplifier and Class C amplifier and oscillator. The anode is forced-air cooled and is capable of dissipat-

ing 1200 watts. The cathode is a thoriated-tungsten filament. Maximum ratings apply up to 220 megacycles.

TECHNICAL INFORMATION

GENERAL

Electrical

	Minimum	Bogey	Maximum
Filament Voltage.....	6.0	6.3	6.6 Volts
Filament Current at Bogey Voltage.....	—	⊕30	— Amperes
Filament Starting Current.....	—	—	□55 Amperes
Filament Cold Resistance.....	—	□0.026	— Ohms
Filament Heating Time.....	□30	—	— Seconds
Amplification Factor, $I_b = 0.4$ amperes, $E_c = +10$ volts.....	—	⊕49	—
Peak Cathode Current*.....	—	—	□5 Amperes
Direct-Interelectrode Capacitances			
Grid-Plate.....	—	⊕10.5	— $\mu\mu f$
Grid-Filament.....	—	⊕14.4	— $\mu\mu f$
Plate-Filament**.....	—	⊕0.09	— $\mu\mu f$

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

**Measured with a 10-inch outside diameter metal disk placed on the grid seal.


Electronic
TUBE

GENERAL  ELECTRIC

Supersedes ETX-220A dated 4-49

TECHNICAL INFORMATION (CONT'D)

Mechanical

Mounting Position—Vertical, Anode Down

Air Flow

Through Radiator

Plate Dissipation.....	700	1000	1200 Max	Watts
Air Flow.....	40	47	55 Min	Cubic Feet per Minute
Static Pressure.....	1.0	1.3	1.5	Inches Water
Filament—Terminal Seals.....			5 Min	Cubic Feet per Minute
Incoming Air Temperature.....			45 Max	C
Radiator Hub Temperature.....			□180 Max	C
Glass Temperature at Any Point.....			150 Max	C
Net Weight, approximate.....			3¾	Pounds

Forced-air cooling to be maintained through radiator and on filament seals for one minute minimum after removal of all voltages. Forced-air cooling to be applied to filament terminal seals and through radiator before any voltages are applied.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

RADIO-FREQUENCY POWER AMPLIFIER—CLASS B

Carrier Conditions per Tube for Use with a Maximum Modulation Factor of 1.0

Maximum Ratings, Absolute Values

DC Plate Voltage.....	4000 Max	Volts
DC Plate Current.....	±0.83 Max	Amperes
Plate Input.....	1800 Max	Watts
Plate Dissipation.....	1200 Max	Watts

Typical Operation	Grounded-Cathode Circuit		Grounded-Grid Circuit		
	□	⊕	□	⊕	
DC Plate Voltage.....	2500	3000	2500	3000	Volts
DC Grid Voltage.....	—20	±25	—20	±25	Volts
Peak RF Grid Voltage.....	□95	±115	□95	±115	Volts
Peak RF Plate Voltage.....	□950	□1200	□950	□1200	Volts
DC Plate Current.....	□0.375	±0.470	□0.375	±0.470	Amperes
DC Grid Current, approximate.....	□0.040	±0.042	□0.040	±0.042	Amperes
Driving Power, approximate†.....	□25	±34	—	—	Watts
Carrier.....	—	—	□31.5	□47	Watts
Crest†.....	—	—	□132	□187	Watts
Power Output.....	□277	±437	□305‡	±480‡	Watts

RADIO-FREQUENCY AMPLIFIER—CLASS B TELEVISION SERVICE

Synchronizing-Level Conditions per Tube unless Otherwise Specified

Maximum Ratings, Absolute Values

DC Plate Voltage.....	3000 Max	Volts
DC Plate Current.....	1.2 Max	Amperes
Plate Input.....	3300 Max	Watts
Plate Dissipation.....	1200 Max	Watts

Typical Operation—Grounded-Grid Circuit up to 220 Megacycles

Bandwidth 5 Megacycles

DC Plate Voltage.....	±2000	Volts
DC Grid Voltage.....	±20	Volts
Peak RF Driving Voltage		
Synchronizing Level.....	□240	Volts
Pedestal Level.....	□180	Volts
Peak RF Plate Voltage		
Synchronizing Level.....	□1260	Volts
Pedestal Level.....	□955	Volts
DC Plate Current		
Synchronizing Level.....	□0.967	Amperes
Pedestal Level.....	□0.680	Amperes

TECHNICAL INFORMATION (CONT'D)

DC Grid Current		
Synchronizing Level.....	☐ 0.180	Amperes
Pedestal Level.....	☐ 0.105	Amperes
Driving Power at Tube, approximate		
Synchronizing Level.....	☐ 223	Watts
Pedestal Level.....	☐ 183	Watts
Power Output, approximate		
Synchronizing Level†.....	☐ 1125	Watts
Pedestal Level‡.....	☐ 662	Watts

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 Values

DC Plate Voltage.....	⊕3200 Max	Volts
DC Grid Voltage.....	⊕—250 Max	Volts
DC Plate Current.....	⊕0.83 Max	Amperes
DC Grid Current.....	⊕0.250 Max	Amperes
Plate Input.....	2100 Max	Watts
Plate Dissipation.....	800 Max	Watts

Typical Operation	Grounded-Cathode Circuit	Grounded-Grid Circuit	
DC Plate Voltage.....	⊕2800	⊕2800	Volts
DC Grid Voltage.....	⊕—150	⊕—150	Volts
Peak RF Grid Voltage.....	⊕332	⊕332	Volts
Peak RF Plate Voltage.....	☐ 2100	☐ 2100	Volts
DC Plate Current.....	⊕0.60	⊕0.60	Amperes
DC Grid Current, approximate.....	⊕0.104	⊕0.104	Amperes
Driving Power, approximate.....	⊕31	⊕202‡	Watts
Power Output, approximate.....	⊕1080	⊕1250 π	Watts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

Key-Down Conditions per Tube Without Amplitude Modulation§

Maximum Ratings, Absolute Values

DC Plate Voltage.....	4000 Max	Volts
DC Grid-No. 1 Voltage.....	⊕—250 Max	Volts
DC Plate Current.....	1.0 Max	Amperes
DC Grid Current.....	⊕0.250 Max	Amperes
Plate Input.....	3600 Max	Watts
Plate Dissipation.....	1200 Max	Watts

Typical Operation	Grounded-Cathode Circuit	Grounded-Grid Circuit	
DC Plate Voltage.....	3000 3750	3000 3750	Volts
DC Grid-No. 1 Voltage.....	⊕—100 ⊕—150	⊕—100 ⊕—150	Volts
Peak RF Grid-No. 1 Voltage.....	⊕245 ⊕250	⊕245 ⊕250	Volts
Peak RF Plate Voltage.....	☐ 2140 ☐ 2950	☐ 2140 ☐ 2950	Volts
DC Plate Current.....	⊕0.98 ⊕0.94	⊕0.98 ⊕0.94	Amperes
DC Grid-No. 1 Current, approximate.....	⊕0.164 ⊕0.159	⊕0.164 ⊕0.159	Amperes
Driving Power, approximate.....	⊕56 ⊕64	⊕340 ⊕377	Watts
Power Output, approximate.....	⊕1760 ⊕2370	⊕2040 ⊕2690	Watts

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

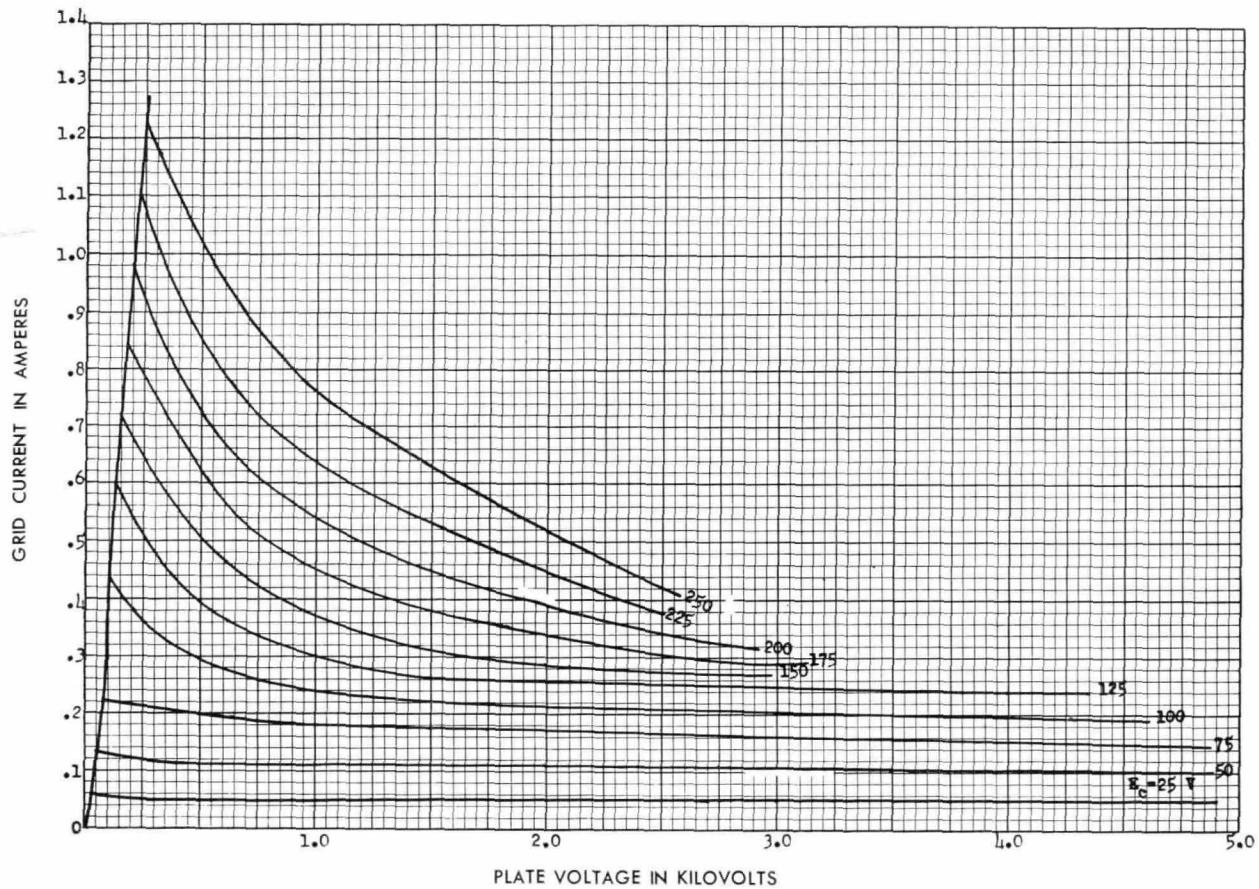
‡ Includes power transferred from driver stage.

π The carrier of the driver modulated 100 percent.

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

⊕ Denotes change.

☐ Denotes addition.



GRID CHARACTERISTICS
 $E_f = 6.3 \text{ VOLTS}$

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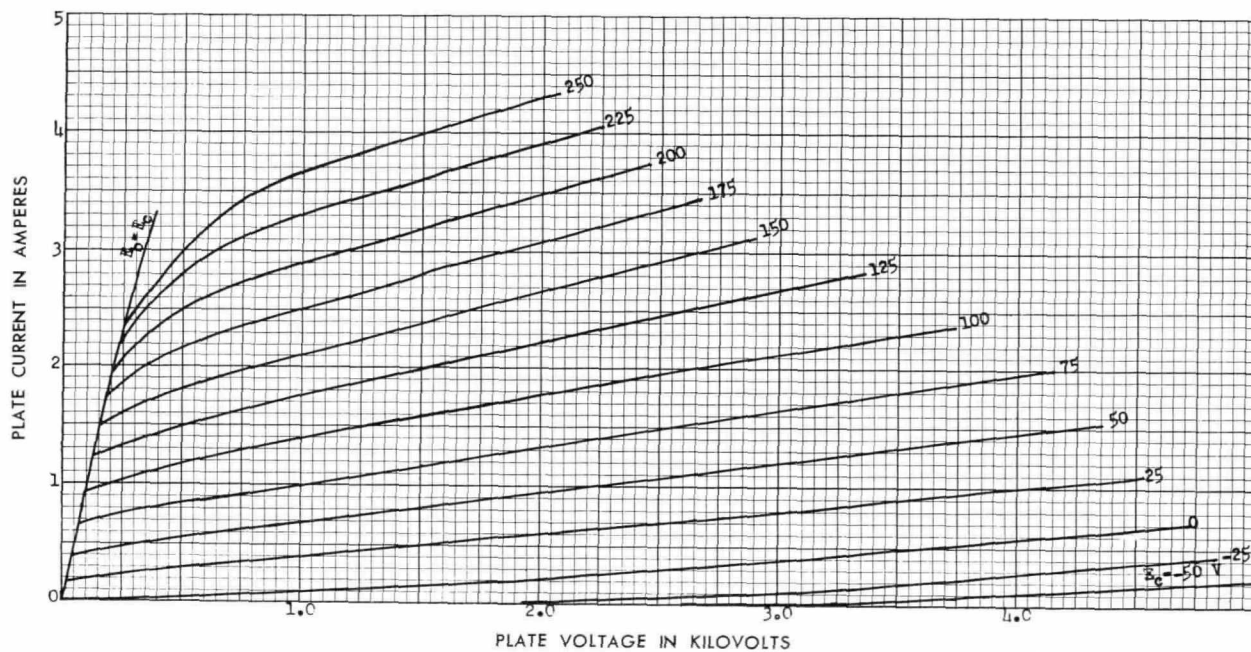
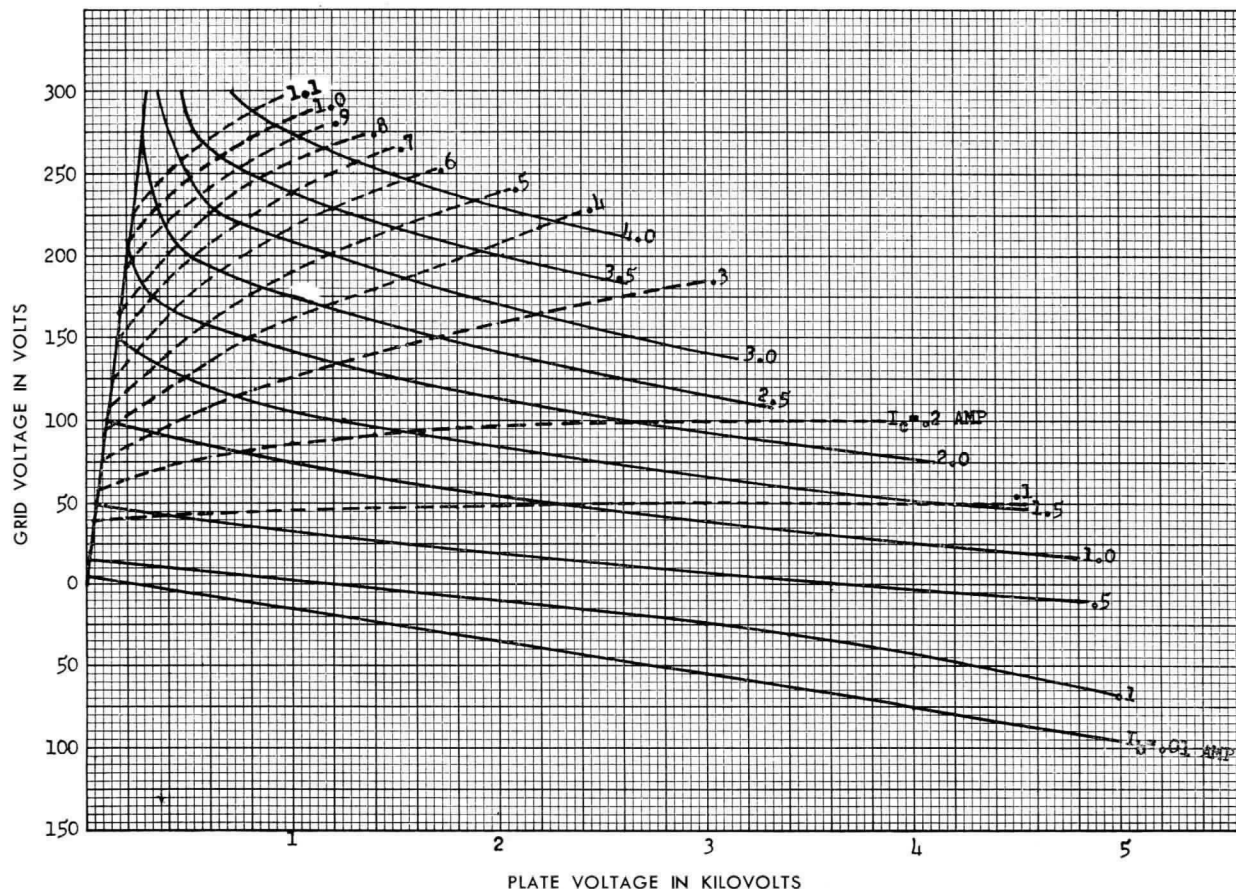


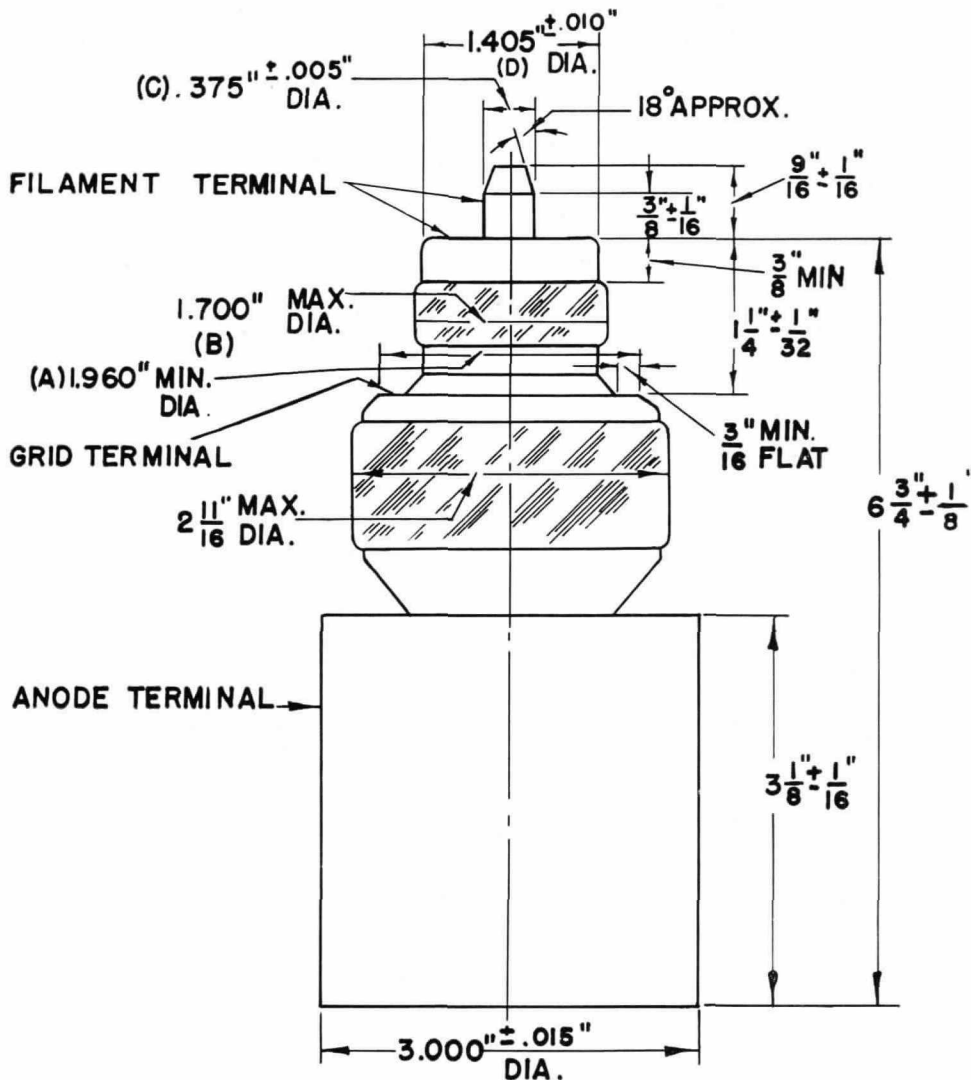
PLATE CHARACTERISTICS
 $E_f = 6.3 \text{ VOLTS}$

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CONSTANT CURRENT CURVES
 $E_f = 6.3$ VOLTS



DIMENSIONS "A" AND "B" ARE MAXIMUM AND MINIMUM DIMENSIONS OF ANY POINT ON THE CIRCUMFERENCE OF THE REFERENCED PART OF THE TUBE. THESE CIRCUMFERENCES SHALL BE CONCENTRIC WITH A ϕ ESTABLISHED THRU THE CENTER OF THE BOTTOM OF THE RADIATOR AND CENTER OF THE "D" DIAMETER. DIMENSION "C" TO BE HELD TO A MAXIMUM ECCENTRICITY OF .020" WITH THIS ϕ . DIMENSION "D" TO BE HELD TO A MAXIMUM ECCENTRICITY OF .050" WITH RESPECT TO CENTER LINE ESTABLISHED BY THE RADIATOR ALONE.

N-21210AZ

2-19-47

TUBE DEPARTMENT

GENERAL  ELECTRIC

Schenectady 5, N. Y.