

FEDERAL POWER TRIODE

Type F-5619

20 Kilowatts Plate Dissipation



GENERAL DATA

DESCRIPTION:

The F-5619 by Federal is a three-electrode tube designed for use as a radio-frequency amplifier, oscillator, or Class B modulator. It is ruggedly constructed to meet the severe conditions of radio-frequency heating service. The anode (heavy wall design) is water-cooled, capable of dissipating 20 kilowatts. The cathode is a pure tungsten filament. Maximum ratings apply up to 22.5 megacycles. Operation at 45 megacycles is permissible with plate voltage and input reduced to one-half maximum ratings.

Electrical:

▶ Filament Voltage	11.0 Volts
▶ Filament Current	176 Amperes
▶ Filament Starting Current	270 Amperes Max.
▶ Filament Cold Resistance	.0052 Ohms
▶ Peak Cathode Current	12.4 Amperes
▶ Amplification Factor,	19.5
$I_b = 1.25$ Amp.	
$E_c = -100$ Volts	
▶ Interelectrode Capacitances	
Grid-Plate	24 $\mu\mu\text{f}$
Grid-Filament	30 $\mu\mu\text{f}$
Plate-Filament	1 $\mu\mu\text{f}$

Mechanical:

▶ Mounting Position—	
Vertical, Anode Down	
▶ Type of Cooling—Water	
and Forced Air	
Water Flow on Anode	8 GPM
Maximum Outgoing	
Water Temperature	70° C
Air Flow on Bulb*	50 CFM
Maximum Glass	
Temperature	160° C
▶ Net Weight,	
Approx.	6 Pounds

*Operation at frequencies above 15 Mc may require air-flow onto the dish center in order to hold the temperature of the seals and dish below 160° C. The blower required should deliver 50 C.F.M. through a 3" nozzle.



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Precision craftsmanship was initiated by Federal in the earliest days of tube manufacture, and has been maintained ever since.

Maximum Ratings and Typical Operating Conditions

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum Ratings

DC Plate Voltage	12,500 Volts
Maximum Signal DC Plate Current**	3 Amperes
Maximum Signal Plate Input**	32.5 Kilowatts
Plate Dissipation**	20 Kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	12,000 Volts
DC Grid Voltage	—600 Volts
Peak A-F Grid to Grid Voltage	2,380 Volts
Zero Signal DC Plate Current	0.6 Ampere
Maximum Signal DC Plate Current	4.5 Amperes
Effective Load Resistance, Plate to Plate	5,900 Ohms
Maximum Signal Driving Power, Approximate	160 Watts
Maximum Signal Power Output, Approximate	36 Kilowatts

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

RADIO-FREQUENCY POWER AMPLIFIER —CLASS B TELEPHONY

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

Maximum Ratings

DC Plate Voltage	12,500 Volts
DC Plate Current	1.5 Amperes
Plate Input	16 Kilowatts
Plate Dissipation	16 Kilowatts

Typical Operation

DC Plate Voltage	10,000 Volts
DC Grid Voltage	—500 Volts
Peak R-F Grid Voltage	490 Volts
DC Plate Current	0.8 Ampere
Driving Power, Approximate†	70 Watts
Power Output, Approximate	2.8 Kilowatts

†At crest of a-f cycle with modulation factor of 1.0.

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

DC Plate Voltage	10,500 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	1.5 Amperes
DC Grid Current	0.45 Ampere
Plate Input	15 Kilowatts
Plate Dissipation	13.3 Kilowatts

Typical Operation

DC Plate Voltage	10,000 Volts
DC Grid Voltage	—1,300 Volts
Peak R-F Grid Voltage	1,930 Volts
DC Plate Current	1.4 Amperes
DC Grid Current, approx.	0.15 Ampere
Driving Power, approx.	280 Watts
Power Output, approx.	11.9 Kilowatts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

(Key-down conditions per tube without modulation)*

Maximum Ratings

DC Plate Voltage	12,500 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	3 Amperes
DC Grid Current	0.45 Ampere
Plate Input	32.5 Kilowatts
Plate Dissipation	20 Kilowatts

Typical Operation

DC Plate Voltage	8,000	10,000	12,000
Filament Voltage	10.5	10.7	10.9
DC Grid Voltage	—680	—870	—1,170
Peak R-F Grid Voltage	1,300	1,620	2,130
DC Plate Current	1.5	2	2.5
DC Grid Current, approx.	.19	.20	.22
Driving Power, approx.	250	320	470
Power Output, approx.	9.2	15	22.5

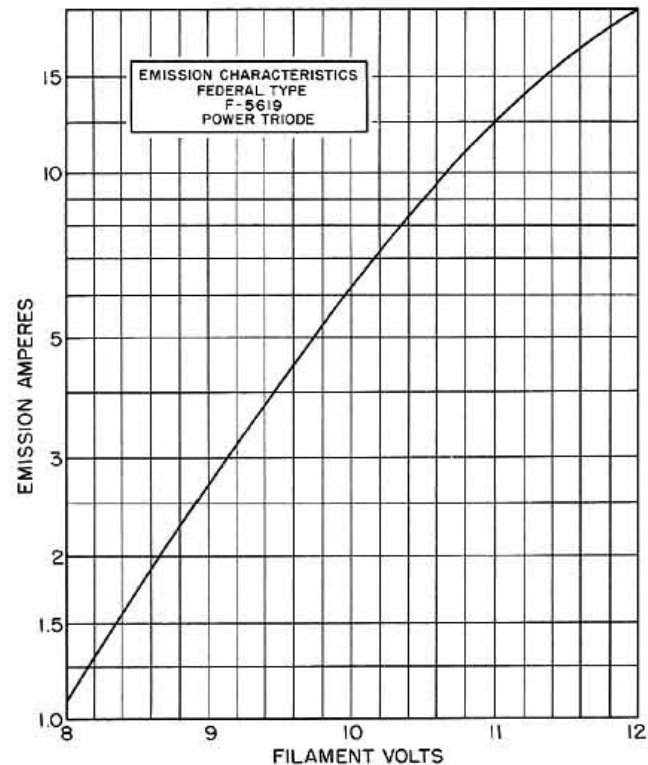
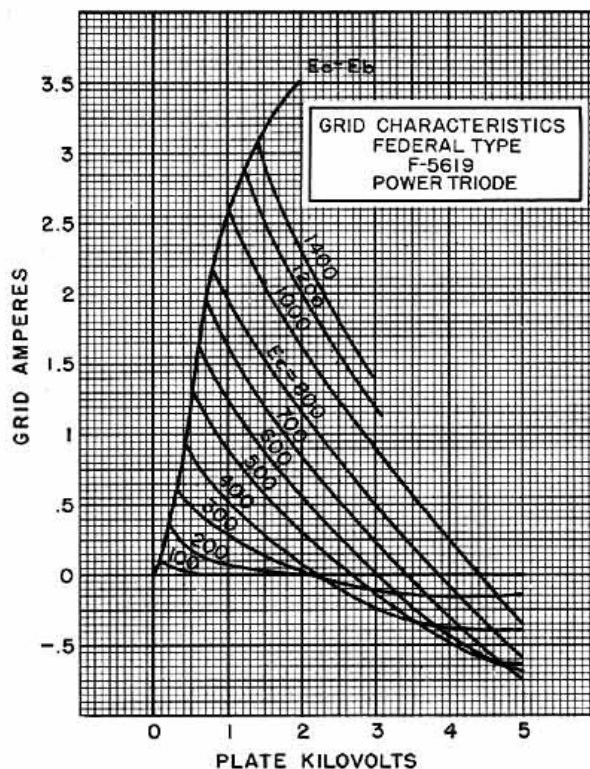
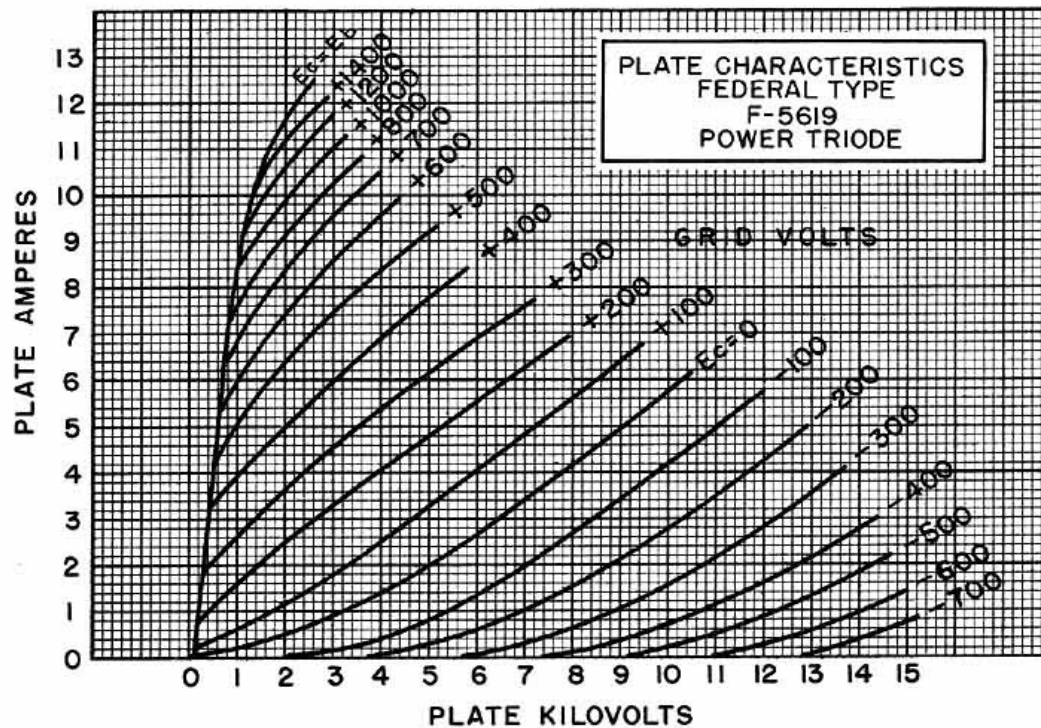
*Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

Federal tubes have always been known for their *plus* values: an extra rugged construction, a longer life of service.

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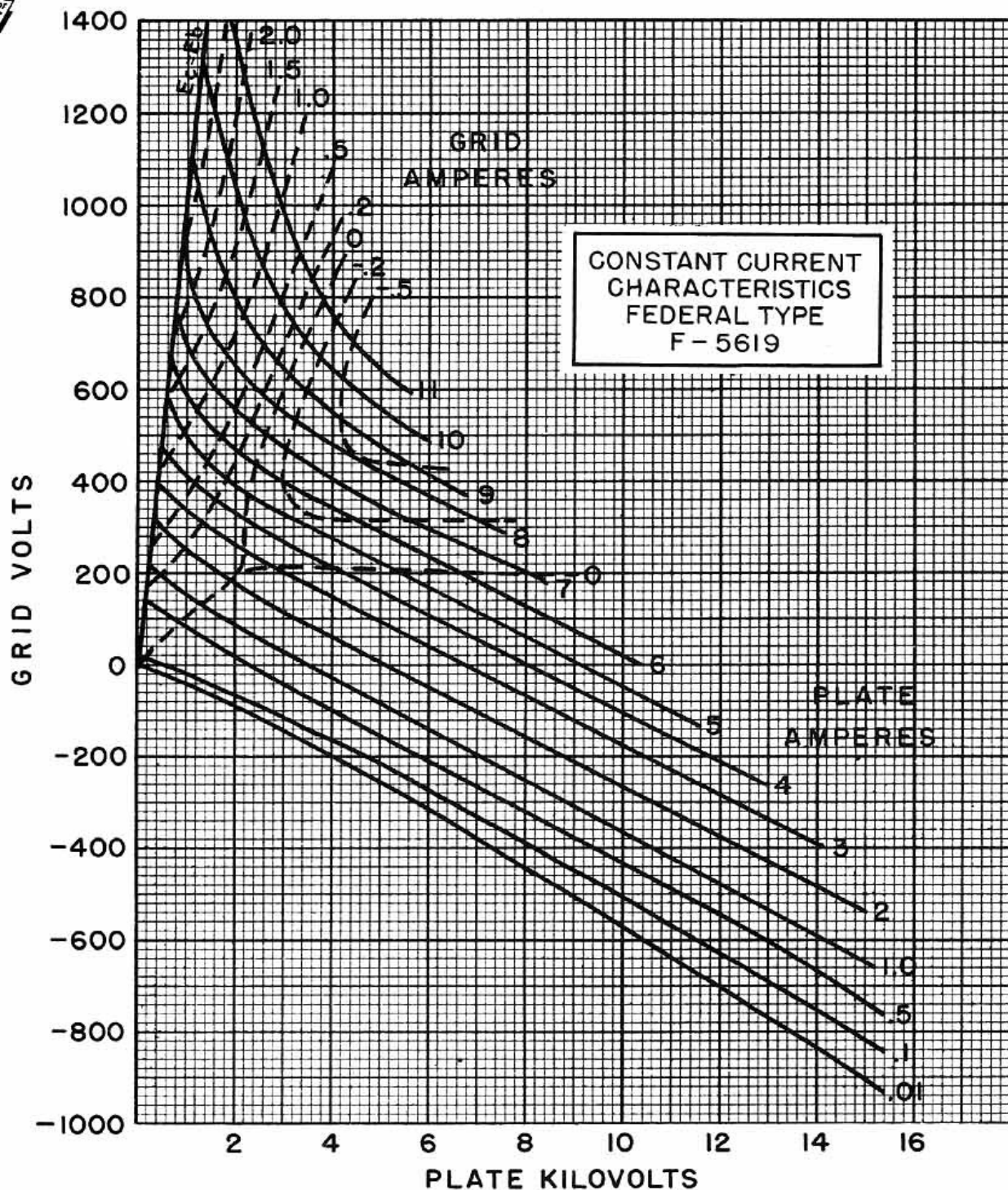


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