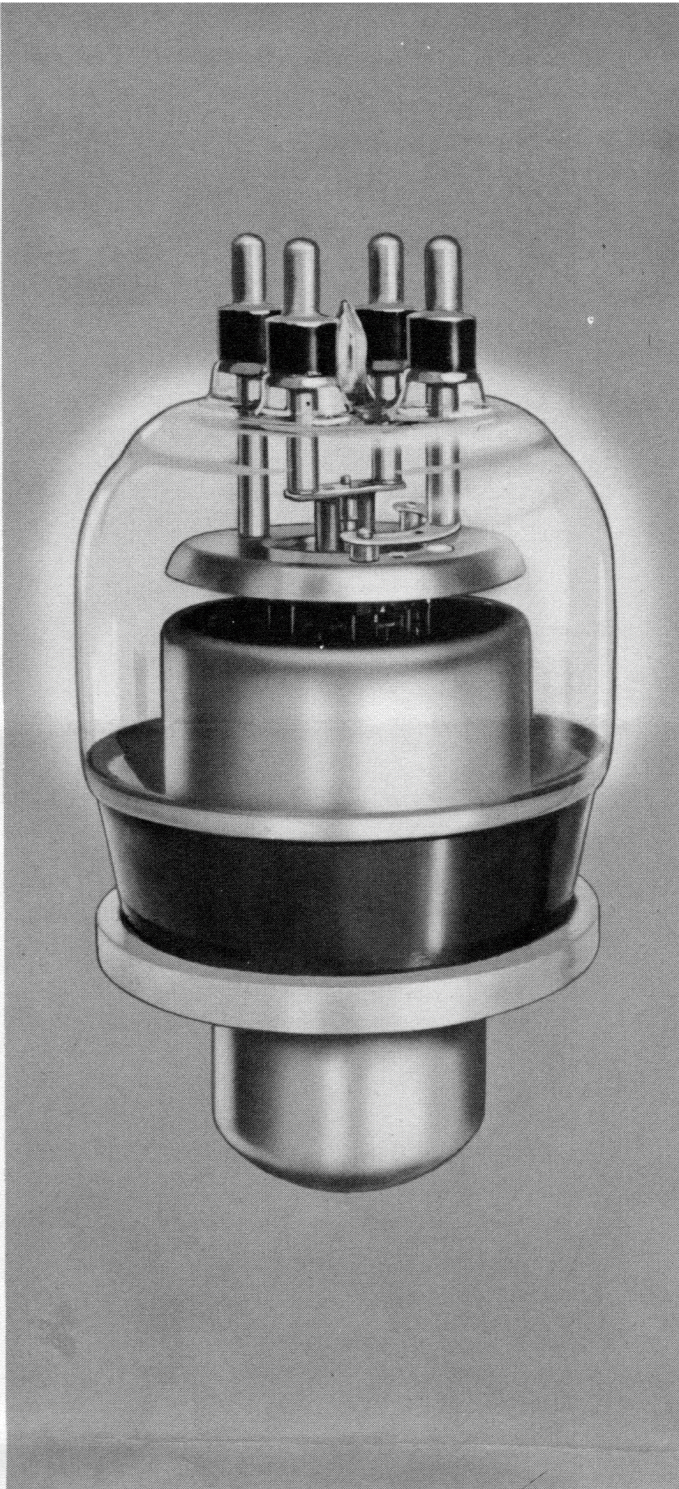


FEDERAL POWER TRIODE Type F-5658

20 Kilowatts Plate Dissipation



In the development and production of vacuum tubes Federal carries on extensive laboratory experimentation: new techniques, new processes, new applications.

GENERAL DATA

DESCRIPTION:

Federal's F-5658 is a three-electrode tube built for use as a radio-frequency amplifier, oscillator, or a Class B modulator. The anode is water-cooled, capable of dissipating 20 kilowatts. The cathode is a pure tungsten filament. The design of the terminal mount connections and the re-entrant anode minimize lead inductance, make the tube particularly suitable for high-frequency applications up to 15 megacycles at full ratings, 45 megacycles at reduced ratings.

Electrical:

▶ Filament Voltage	12 Volts
▶ Filament Current	290 Amperes
▶ Filament Starting Current	450 Amperes max.
▶ Filament Cold Resistance	.0036 Ohms
▶ Amplification Factor, at $I_b = 2.0$ amps., $E_c = -100$ volts	20.5
▶ Interelectrode Capacitances	
Grid-Plate	24 $\mu\mu\text{f}$
Grid-Filament	39 $\mu\mu\text{f}$
Plate-Filament	2 $\mu\mu\text{f}$

Mechanical:

▶ Mounting Position—	Vertical, anode down
▶ Type of Cooling—	Water and Forced Air
Water Flow on Anode	15 GPM
Maximum Outgoing Water Temperature	70° C
Air Flow (to bulb and seals) from a 3-inch diameter nozzle	50 CFM
Maximum Glass Temperature	160° C
▶ Net Weight, approximate	7 Pounds

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Maximum Ratings vs. Operating Frequency

Frequency	15	30	45 Megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input			
Class C—Unmodulated	100	75	50 Per Cent

Maximum Ratings and Typical Operating Conditions

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum Ratings, Absolute Values

DC Plate Voltage	12,500 Volts
Maximum Signal DC Plate Current†	5 Amperes
Maximum Signal Plate Input†	40 Kilowatts
Plate Dissipation†	15 Kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	7,500	10,000 Volts
DC Grid Voltage	—340	—450 Volts
Peak A-F Grid-to-Grid Voltage	1,450	1,680 Volts
Zero Signal DC Plate Current	1.0	1.0 Amperes
Maximum Signal DC Plate Current	6.7	7.0 Amperes
Effective Load Resistance, Plate to Plate	2,300	3,100 Ohms
Maximum Signal Driving Power, Approx.	490	540 Watts
Maximum Signal Power Output, Approx.	31.5	46 Kilowatts

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

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	12,500 Volts
DC Plate Current	4 Amperes
Plate Input	32 Kilowatts
Plate Dissipation	20 Kilowatts

Typical Operation

DC Plate Voltage	7,500	10,000 Volts
DC Grid Voltage	—340	—460 Volts
Peak R-F Grid Voltage	570	595 Volts
DC Plate Current	3.3	2.75 Amperes
DC Grid Current, approximate	.013	.009 Amperes
Driving Power, approximate‡	1,250	900 Watts
Power Output, approximate	8	9 Kilowatts

‡At crest of audio-frequency 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, Absolute Values

DC Plate Voltage	10,500 Volts
DC Grid Voltage	—1,600 Volts
DC Plate Current	3.6 Amperes
DC Grid Current	0.8 Amperes
Plate Input	36 Kilowatts
Plate Dissipation	12 Kilowatts

Typical Operation

DC Plate Voltage	10,000 Volts
DC Grid Voltage	—1,200 Volts
Peak R-F Grid Voltage	1,840 Volts
DC Plate Current	3.6 Amperes
DC Grid Current, approximate	0.64 Amperes
Driving Power, approximate	1,100 Watts
Power Output, approximate	27 Kilowatts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

(Key-down conditions per tube without amplitude modulation)¶

Maximum Ratings, Absolute Values

DC Plate Voltage	12,500 Volts
DC Grid Voltage	—1,600 Volts
DC Plate Current	5.0 Amperes
DC Grid Current	0.8 Amperes
Plate Input	60 Kilowatts
Plate Dissipation	20 Kilowatts

Typical Operation

DC Plate Voltage	10,000	12,000 Volts
DC Grid Voltage	—710	—870 Volts
Peak R-F Grid Voltage		
Voltage	1,230	1,460 Volts
DC Plate Current	3.8	4.5 Amperes
DC Grid Current, approximate	0.5	0.55 Amperes
Driving Power, approximate	600	800 Watts
Power Output, approximate	28	40 Kilowatts

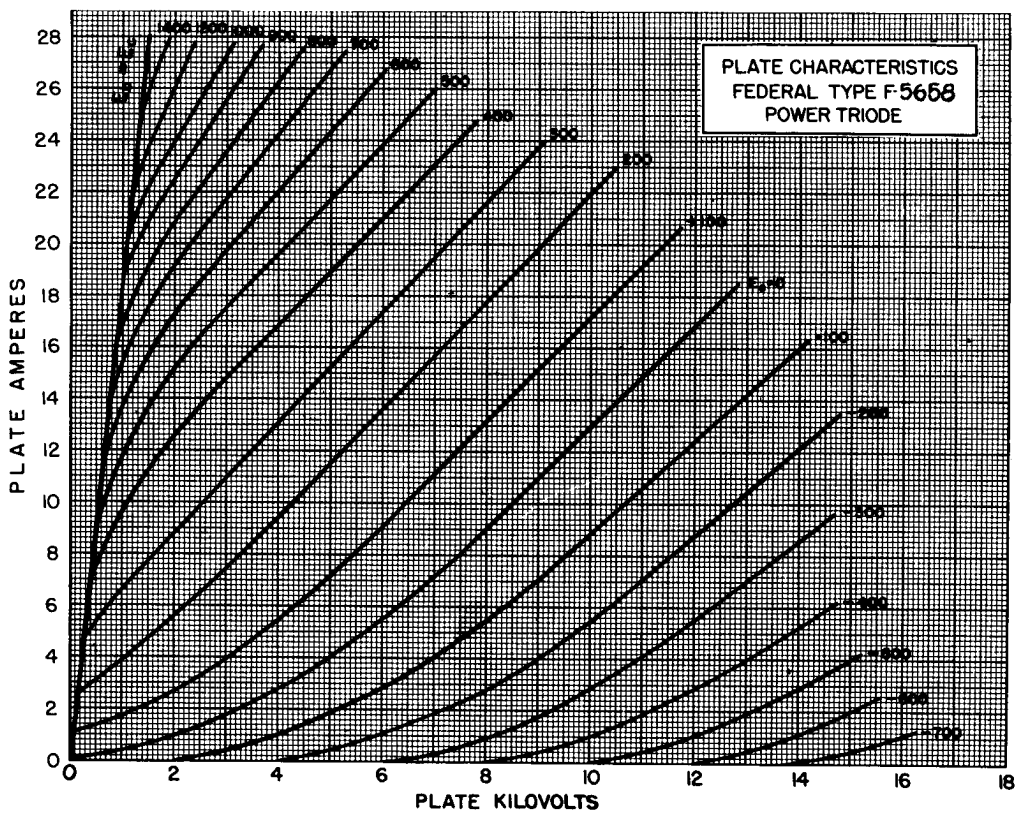
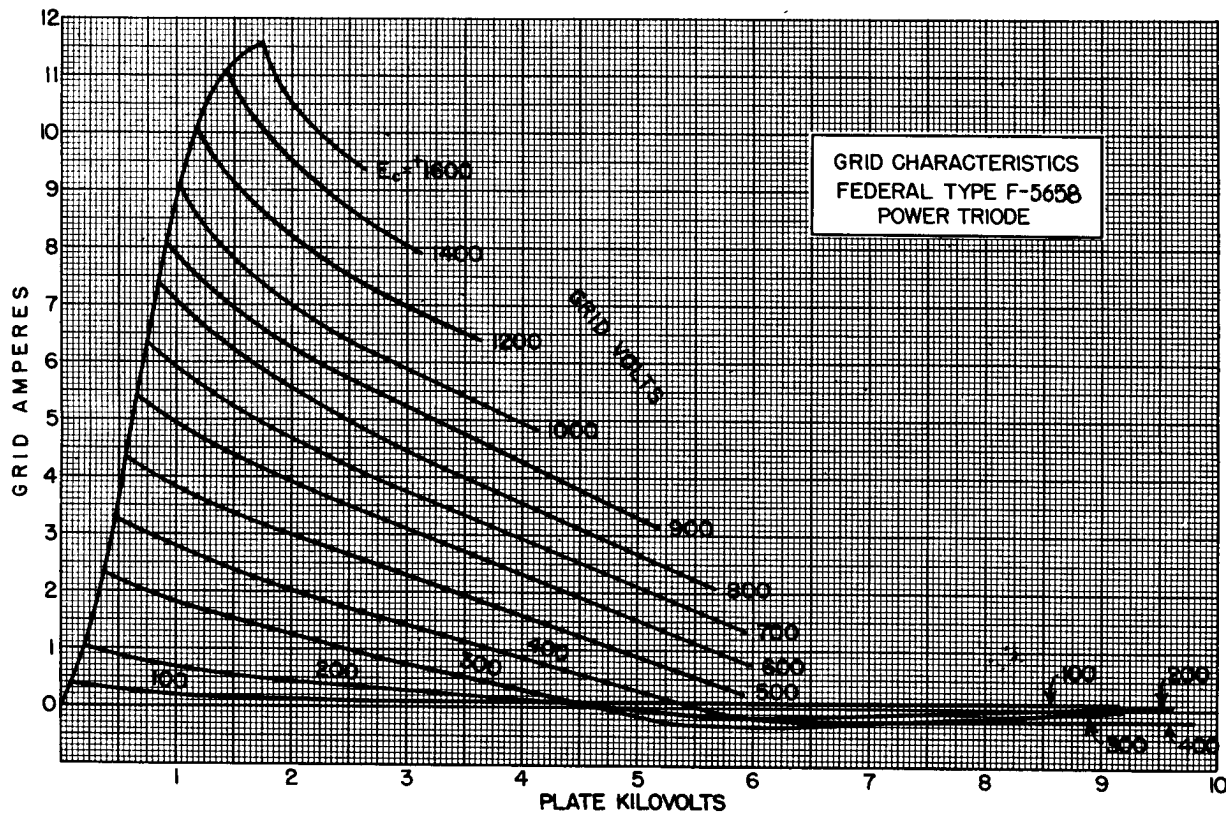
¶Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of carrier conditions.

To satisfy the demand of industrial heating services, Federal's F-5658 uses rugged Kovar grid and filament seals.

FEDERAL POWER TRIODE

Type F-5658

20 Kilowatts Plate Dissipation

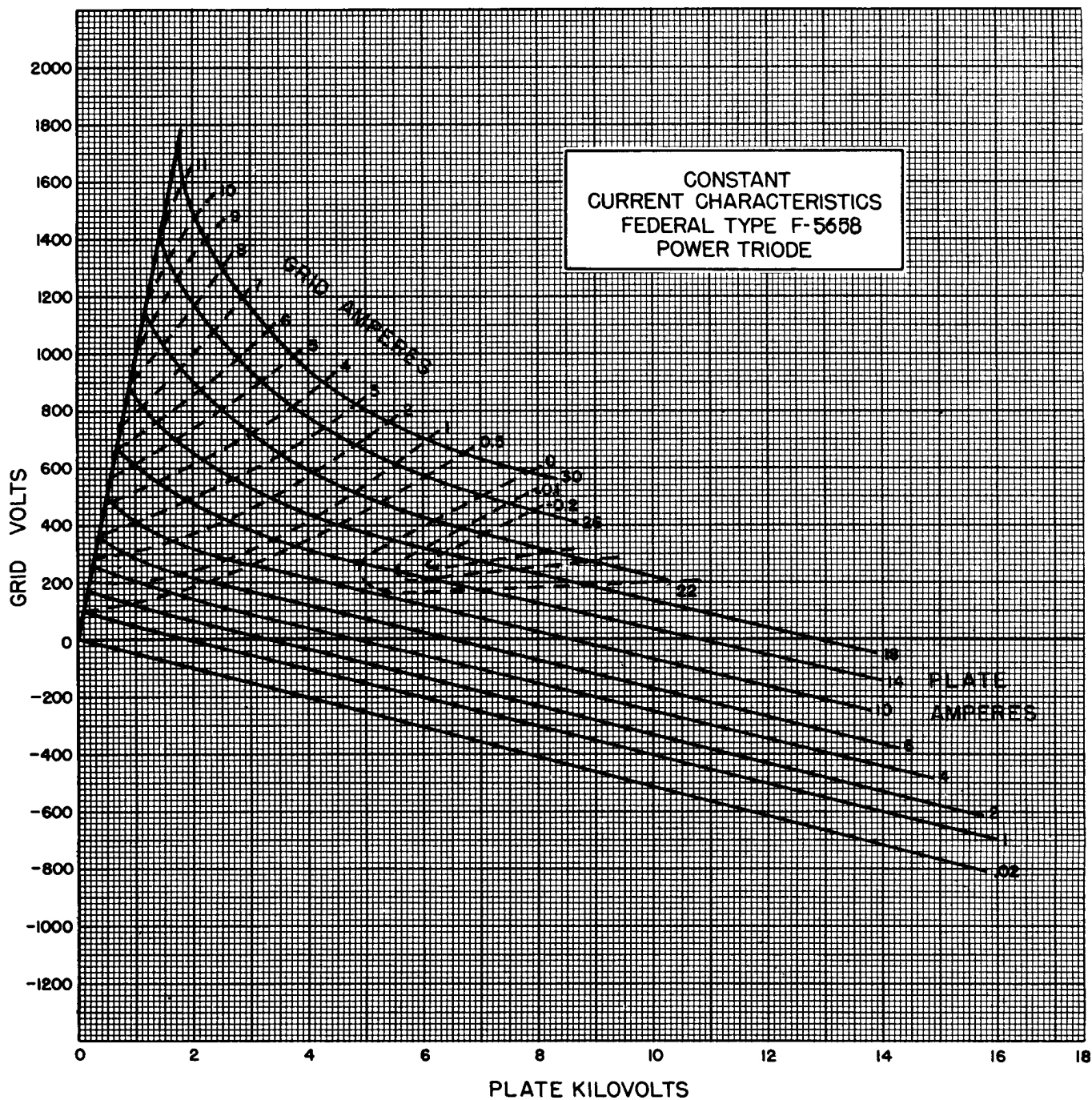


FEDERAL POWER TRIODE Type F-5658

20 Kilowatts Plate Dissipation



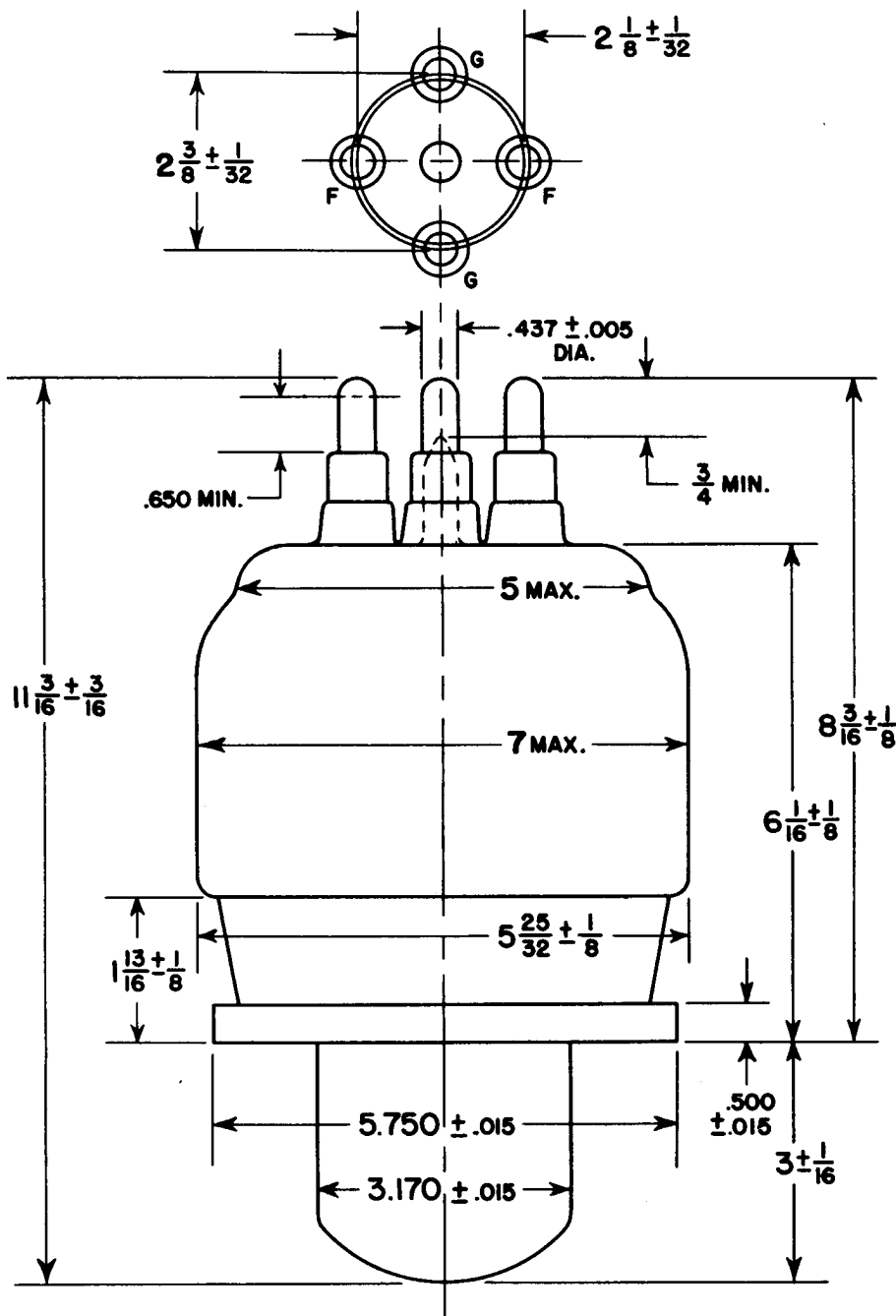
Backed by years of engineering and manufacturing experience, Federal tubes have consistently set the world's standards of performance in broadcast service.



More than 100,000 letters requesting copies of Federal's *Handbook of Tube Operation* have been received from engineers in all parts of the world. Would you care for a copy?

FEDERAL POWER TRIODE Type F-5658

20 Kilowatts Plate Dissipation



OUTLINE DRAWING
F-5658





**Federal Always Has
Made Better Tubes**