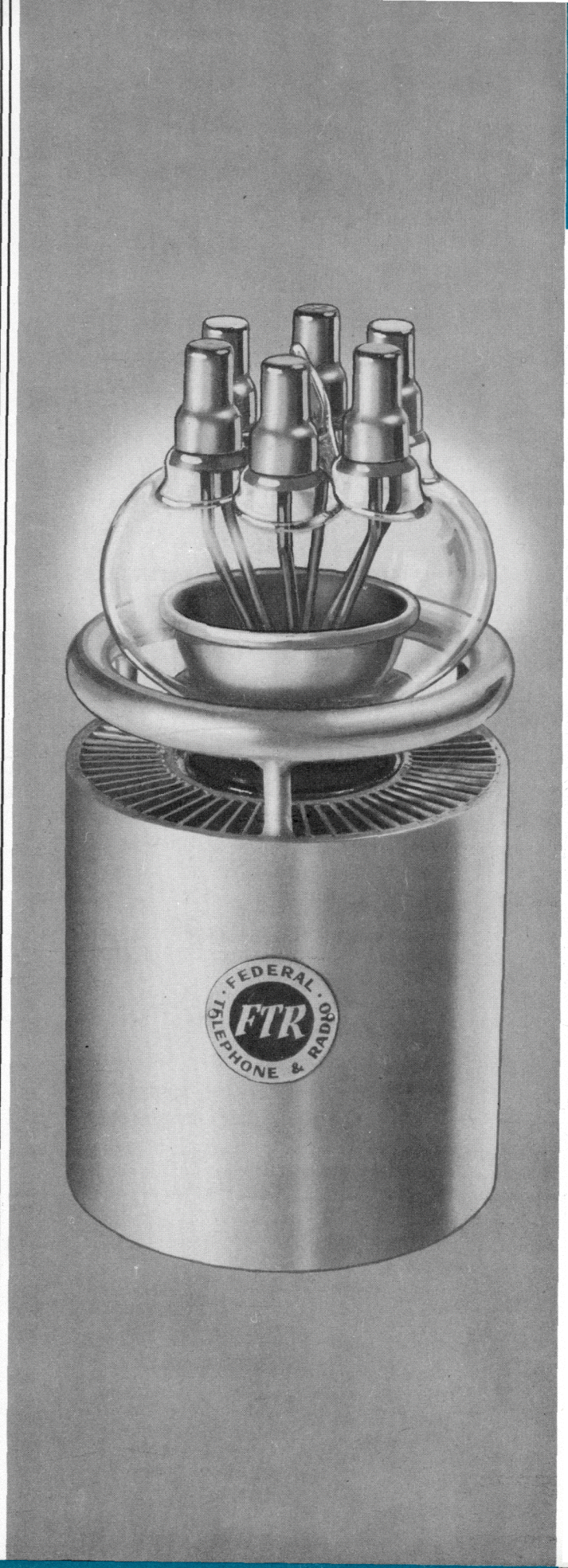
FEDERAL POWER TRIODE
Type F-5680
2.5 Kilowatts Plate Dissipation



GENERAL DATA

DESCRIPTION:

Federal's Type F-5680 is a three-electrode tube designed for use as a modulator, amplifier and oscillator. The relatively wide spacing between the elements, and the lack of internal insulators make this type tube especially suitable for high voltage pulse applications. The anode is air-cooled, capable of dissipating 2.5 kilowatts. The cathode is a thoriated tungsten filament. Maximum ratings apply up to 30 megacycles. Operation up to 50 megacycles is permissible at reduced ratings.

Electrical:

▶ Filament Voltage	13.0 Volts
▶ Filament Current	36 Amperes
▶ Filament Starting Current	72 Amperes
▶ Filament Cold Resistance	.040 Ohms
▶ Amplification Factor, Ec = —200 V, Ib = 0.2A	25
▶ Interelectrode Capacitances	
Grid-Plate	12.0 *uuf*
Grid-Filament	15.0 *uuf*
Plate-Filament	1.8 *uuf*

Mechanical:

▶ Mounting Position—Vertical, Anode Down			
▶ Type of Cooling—Forced Air			
Maximum Incoming Air Temperature			45° C
▶ Required Air Flow on Anode			
Plate Dissipation (Kilowatts)	2.5	2.0	1.5
Air Flow—Cubic Feet Per Min.	150	120	90
Pressure—Inches Water	2.5	1.6	0.9
Maximum Glass Temperature			150° C
▶ Net Weight, Approximate			5¼ Pounds

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Maximum Ratings vs. Operating Frequency

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

Maximum Ratings and Typical Operating Conditions

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum Ratings, Absolute Values

DC Plate Voltage	6,000 Volts
Maximum Signal DC Plate Current*	2.0 Amperes
Maximum Signal Plate Input*	6.0 Kilowatts
Plate Dissipation*	2.5 Kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—150 Volts
Peak A-F Grid-to-Grid Voltage	1,260 Volts
Zero Signal DC Plate Current	0.4 Amperes
Maximum Signal DC Plate Current	2.25 Amperes
Effective Load Resistance, Plate to Plate	4,000 Ohms
Maximum Signal Driving Power, Approximate	175 Watts
Maximum Signal Power Output, Approximate	7.2 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	6,000 Volts
DC Plate Current	1.5 Amperes
Plate Input	3.75 Kilowatts
Plate Dissipation	2.5 Kilowatts

Typical Operation

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—160 Volts
Peak R-F Grid Voltage	300 Volts
DC Plate Current	0.56 Amperes
DC Grid Current, Approximate	0.0 Amperes
Driving Power, Approximate**	47 Watts
Power Output, Approximate	1 Kilowatt

**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	5,000 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	1.5 Amperes
DC Grid Current	0.2 Amperes
Plate Input	7.5 Kilowatts
Plate Dissipation	1.6 Kilowatts

Typical Operation

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—800 Volts
Peak R-F Grid Voltage	1,370 Volts
DC Plate Current	0.74 Amperes
DC Grid Current, Approximate	0.10 Amperes
Driving Power, Approximate	130 Watts
Power Output, Approximate	2.7 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	6,000 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	2.0 Amperes
DC Grid Current	0.2 Amperes
Plate Input	12 Kilowatts
Plate Dissipation	2.5 Kilowatts

Typical Operation

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—800 Volts
Peak R-F Grid Voltage	1,510 Volts
DC Plate Current	1.4 Amperes
DC Grid Current, Approximate	0.16 Amperes
Driving Power, Approximate	225 Watts
Power Output, Approximate	6 Kilowatts

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

RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR—PULSED OPERATION

Maximum Ratings, Absolute Values

DC Plate Voltage	17,500 Volts
DC Grid Voltage	—5,000 Volts
Peak Cathode Current	35 Amperes
Plate Dissipation‡	1.2 Kilowatts
Duty Cycle	.030

‡Air Flow=75 CFM

Typical Operation

DC Plate Voltage	15,500 Volts
DC Grid Voltage (during pulse)	—750 Volts
DC Plate Current	0.20 Amperes
DC Grid Current	.013 Amperes
Duty Cycle	.023
Peak Power Output	90 Kilowatts