

FEDERAL POWER TRIODE

Type F-124-R

20 Kilowatts Plate Dissipation



GENERAL DATA

DESCRIPTION:

Federal's F-124-R is a three-electrode tube engineered to serve as a radio-frequency amplifier, oscillator, or as a Class B modulator. The forced-air-cooled anode is capable of dissipating 20 kilowatts. The cathode is a pure tungsten multi-strand filament and may be operated on direct current, single-phase, three-phase, or six-phase alternating current excitation. Maximum ratings apply up to 20 megacycles.

Electrical:

▶ Filament Voltage§	27.2 Volts
▶ Filament Current§	205.5 Amperes
▶ Filament Starting Current§	308 Amperes max.
▶ Filament Cold Resistance§	.015 Ohms
▶ Peak Cathode Current	35 Amperes
▶ Amplification Factor,	
$E_c = -200V \quad I_b = 1.6A$	40.5
▶ Interelectrode Capacitances	
Grid-Plate	40 μmf
Grid-Filament	46 μmf
Plate-Filament	5.6 μmf

§Single phase excitation.

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	20	16	12
Minimum Air Flow			
—Cubic Feet per Minute	2,100	1,600	1,200
Pressure—Inches			
Water	2.15	1.24	0.70
Maximum Glass Temperature			150° C
▶ Net Weight, approximate			202 Lbs.

It's in Federal's design where efficient tube performance gets its start. It's in the tube's performance in service where Federal's authentic design reveals its merits.

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Federal's engineers are ready to consult with you on the application of Federal tubes to your designs. Write, phone or wire to arrange your conference date.

Maximum Ratings and Typical Operating Conditions

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum Ratings, Absolute Values

DC Plate Voltage	20,000 Volts
Maximum Signal DC Plate Current†	5 Amperes
Maximum Signal Plate Input†	50 Kilowatts
Plate Dissipation†	20 Kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	10,000 Volts
DC Grid Voltage	—200 Volts
Peak A-F Grid-to-Grid Voltage	1,600 Volts
Zero Signal DC Plate Current	0.5 Amperes
Maximum Signal DC Plate Current	6.0 Amperes
Effective Load Resist., Plate to Plate	3,750 Ohms
Max. Sig. Driving Power, approx.	360 Watts
Max. Sig. Power Output, approx.	39 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	20,000 Volts
DC Plate Current	3.5 Amperes
Plate Input	30 Kilowatts
Plate Dissipation	20 Kilowatts

Typical Operation

DC Plate Voltage	17,500 Volts
DC Grid Voltage	—360 Volts
Peak R-F Grid Voltage	120 Volts
DC Plate Current	1.68 Amperes
DC Grid Current, approximate	0.00 Amperes
Driving Power, approximate‡	80 Watts
Power Output, approximate	10 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	14,000 Volts
DC Grid Voltage	—3,000 Volts
DC Plate Current	3.5 Amperes
DC Grid Current	1.0 Amperes
Plate Input	60 Kilowatts
Plate Dissipation	15 Kilowatts

Typical Operation

DC Plate Voltage	12,000 Volts
DC Grid Voltage	—900 Volts
Peak R-F Grid Voltage	1,630 Volts
DC Plate Current	2.8 Amperes
DC Grid Current, approximate	0.18 Amperes
Driving Power, approximate	275 Watts
Power Output, approximate	26.2 Kilowatts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

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

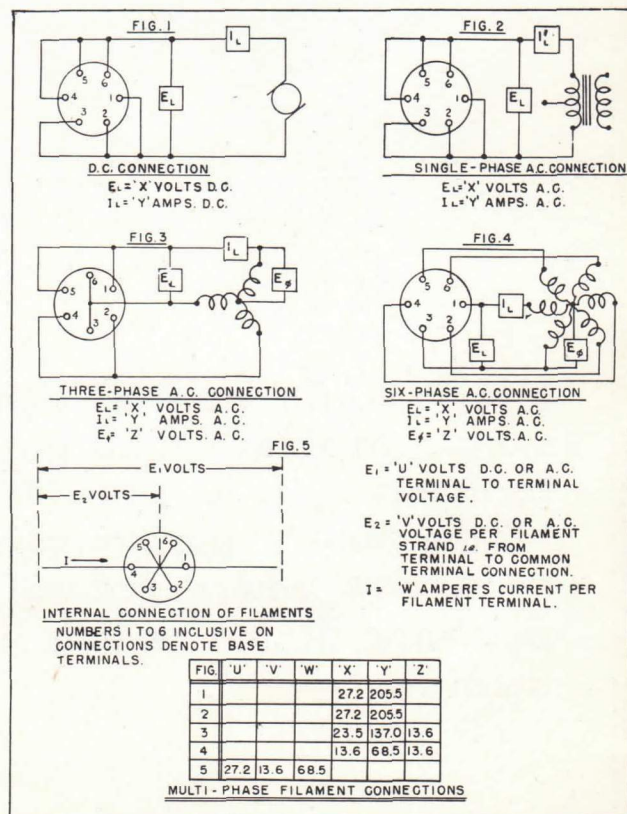
Maximum Ratings, Absolute Values

DC Plate Voltage	20,000 Volts
DC Grid Voltage	—3,000 Volts
DC Plate Current	7 Amperes
DC Grid Current	1 Ampere
Plate Input	100 Kilowatts
Plate Dissipation	20 Kilowatts

Typical Operation

DC Plate Voltage	15,000 Volts
DC Grid Voltage	—1,000 Volts
Peak R-F Grid Voltage	2,040 Amperes
DC Plate Current	4.3 Amperes
DC Grid Current, approximate	0.47 Amperes
Driving Power, approximate	700 Watts
Power Output, approximate	50 Kilowatts

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

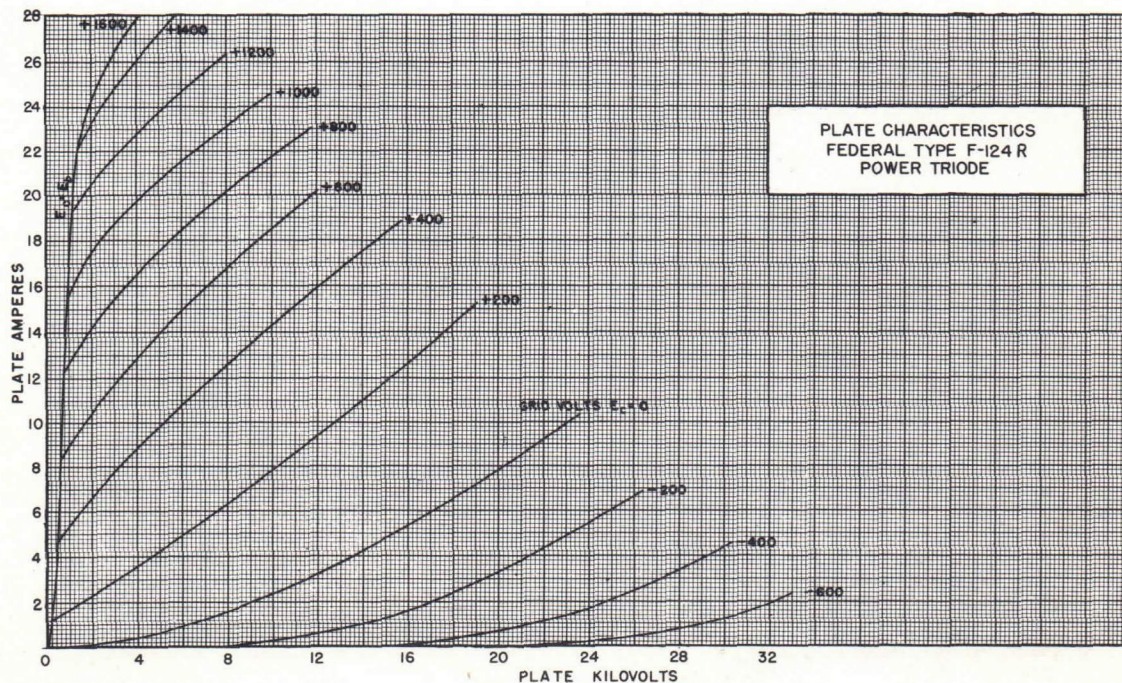
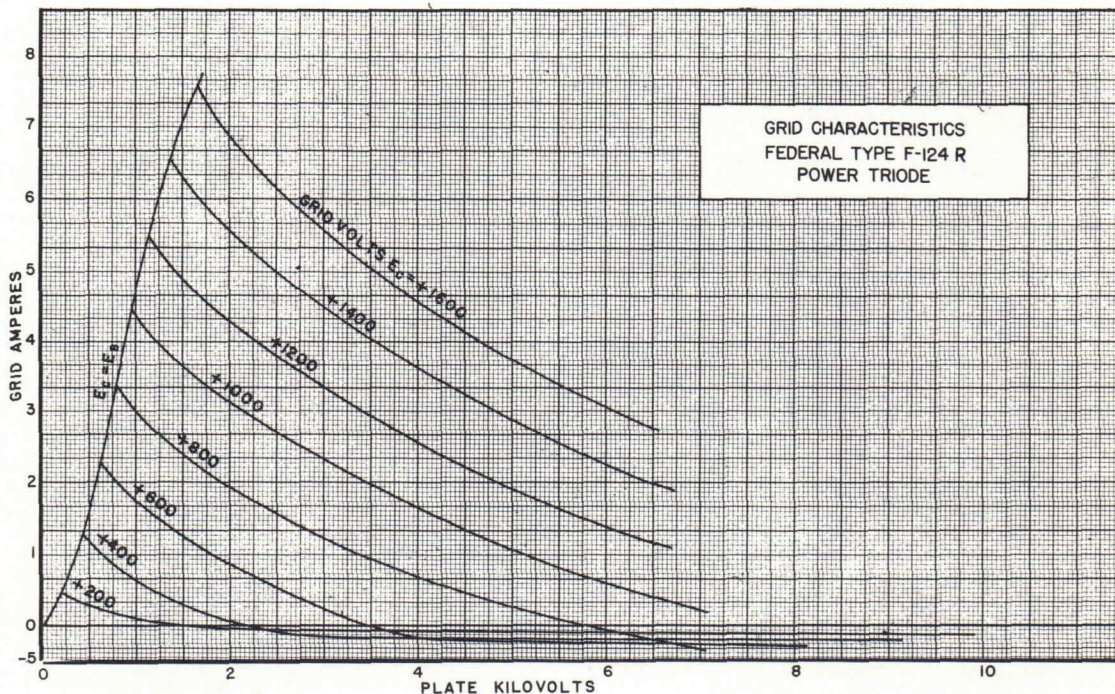


Precision craftsmanship in the manufacture of power tubes was practiced by Federal at the birth of the industry; Federal has continued the habit ever since.

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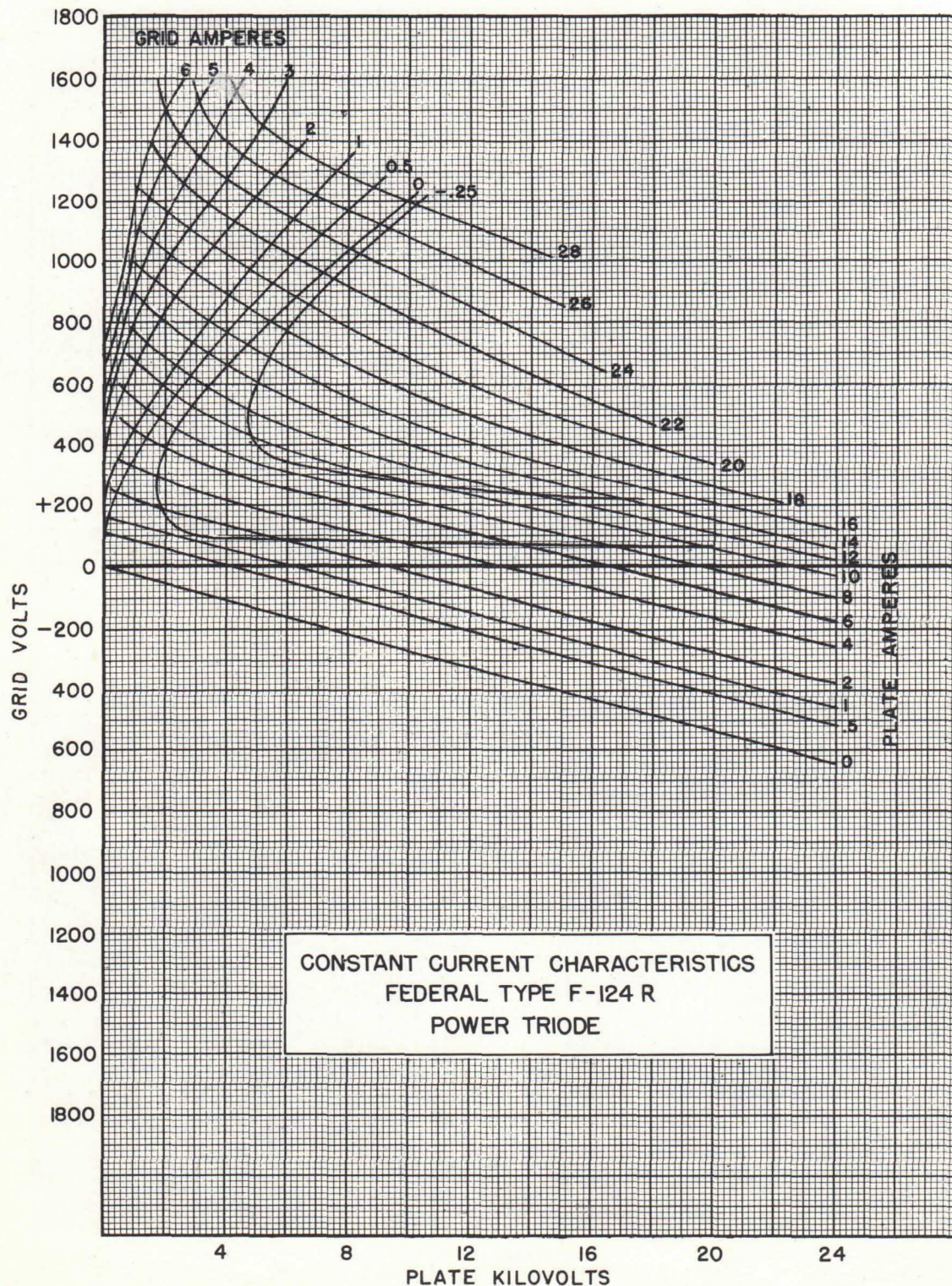
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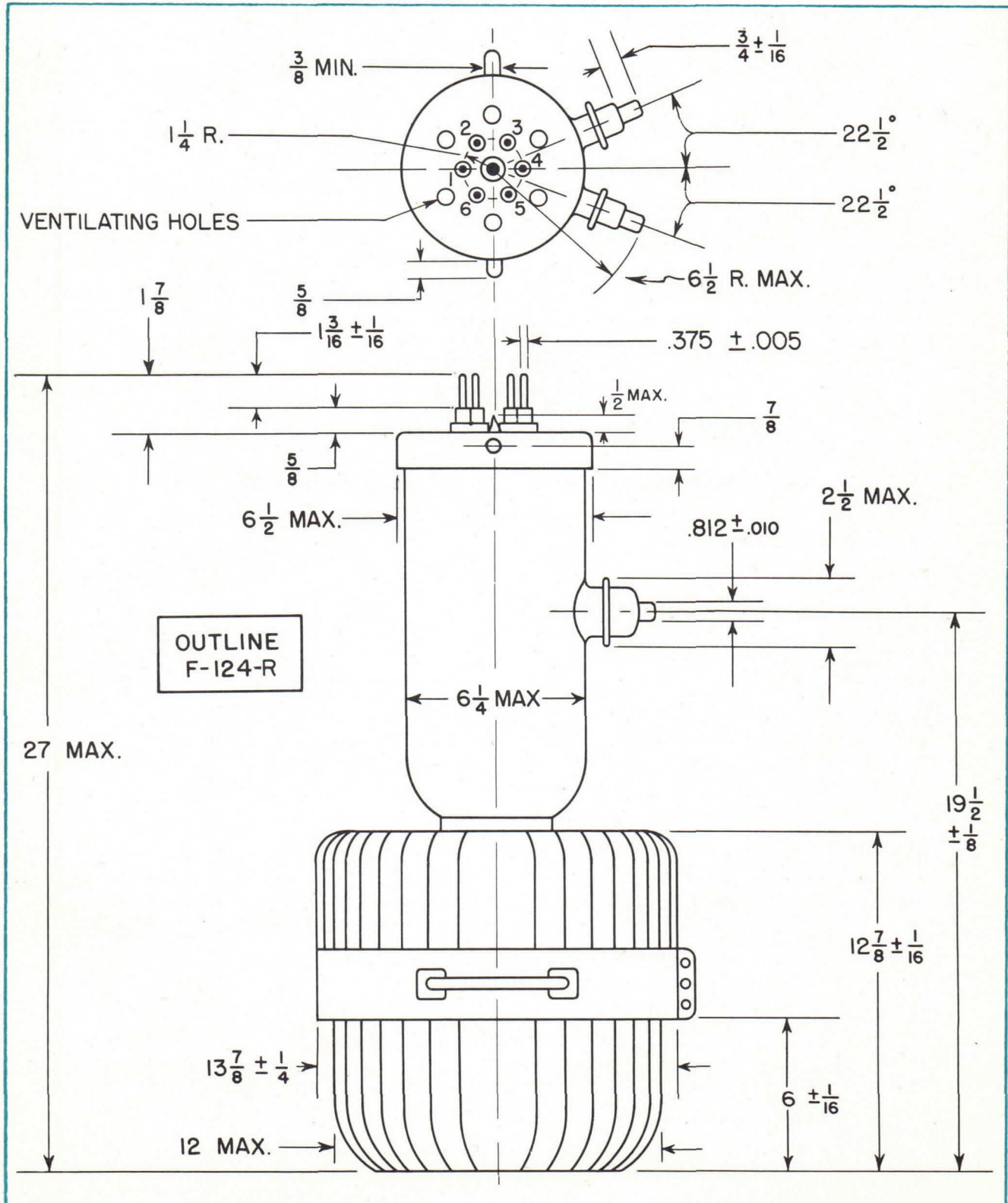
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Over and over again, Federal sales tell the factual story of Federal's tube achievements and success in unusual applications.



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**There is an extra margin of performance
in every Federal tube.**