

FEDERAL POWER TRIODE

Type F-891-R

4 Kilowatts Plate Dissipation



The name "Federal" always has been synonymous with leadership in tube development and construction.

GENERAL DATA

DESCRIPTION:

Federal's F-891-R is a three-electrode tube engineered for use as a radio-frequency power amplifier, oscillator, and Class B modulator. The anode is forced-air-cooled, capable of dissipating 4 kilowatts. The cathode, a pure tungsten filament, is designed and built to permit operation from single-phase or two-phase alternating current, and from direct current. Maximum ratings apply up to 1.6 megacycles. Operation is permissible up to 20 megacycles at reduced ratings.

Electrical:

▶ Filament Voltage	22 Volts
▶ Filament Current	60 Amperes
▶ Filament Starting Current	120 Amperes Max.
▶ Filament Cold Resistance	.031 Ohms
▶ Peak Cathode Current	9 Amperes
▶ Amplification Factor, $E_c = -50 \text{ V}; I_b = 0.45 \text{ A}$	8.5
▶ Interelectrode Capacitances	
Grid-Plate	28 μf
Grid-Filament	19 μf
Plate-Filament	2.5 μf

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)	4 3.2 2.4
Air Flow—Cubic	
Feet per Min.	450 380 300
Pressure—Inches	
Water	0.5 0.36 0.2
Maximum Glass	
Temperature	150° C
Max. Radiator Temperature	
(Measured in Well)	180° C
▶ Net Weight,	
Approximate	46 Pounds

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Maximum Ratings and Typical Operating Conditions

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum Ratings, Absolute Values

DC Plate Voltage	10,000 Volts
Maximum Signal DC Plate Current†	2 Amperes
Maximum Signal Plate Input†	10.5 Kilowatts
Plate Dissipation†	3.5 Kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	6,000	8,000 Volts
DC Grid Voltage	-630	-860 Volts
Peak A-F Grid-to-Grid Voltage	2,060	2,260 Volts
Zero Signal DC Plate Current	0.5	0.5 Amperes
Maximum Signal DC Plate Current	2.5	2.1 Amperes
Effective Load Resistance, Plate to Plate	5,000	8,000 Ohms
Maximum Signal Driving Power, Approx.	110	50 Watts
Maximum Signal Power Output, Approx.	8	10 Kilowatts

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

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

(Key-down conditions per tube without amplitude Modulation)‡

Maximum Ratings, Absolute Values

DC Plate Voltage	10,000 Volts
DC Grid Voltage	-3,000 Volts
DC Plate Current	2 Amperes
DC Grid Current	0.15 Amperes
Plate Input	15 Kilowatts
Plate Dissipation	4 Kilowatts

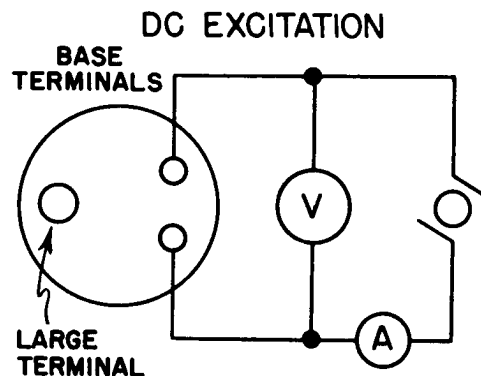
Typical Operation

DC Plate Voltage	8,000	10,000 Volts
DC Grid Voltage	-1,800	-2,000 Volts
Peak R-F Grid Voltage	2,400	2,700 Volts
DC Plate Current	1.14	1.33 Amperes
DC Grid Current, approximate	0.09	0.14 Amperes
Driving Power, approximate	215	375 Watts
Power Output, approximate	6.5	10 Kilowatts

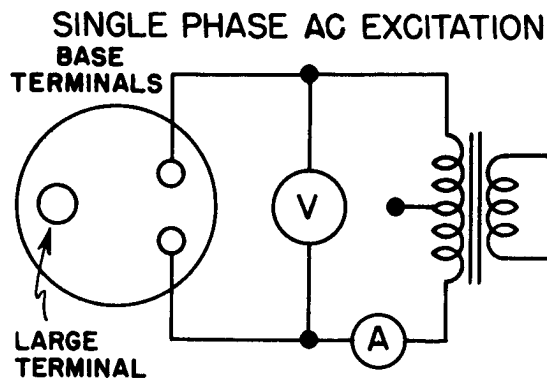
‡Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of carrier conditions.

Maximum Ratings vs. Operating Frequency

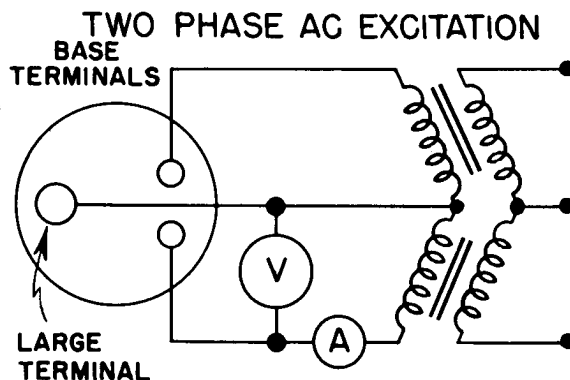
Frequency	1.6	7.5	20 Megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input			
Class C—Telegraphy	100	75	50 Per Cent



V = 22 VOLTS
A = 60 AMPERES



V = 22 VOLTS
A = 60 AMPERES



V = 11 VOLTS
A = 60 AMPERES

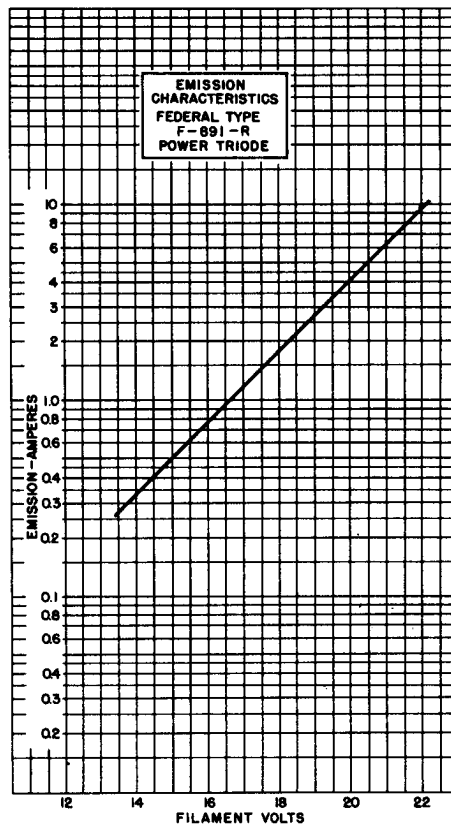
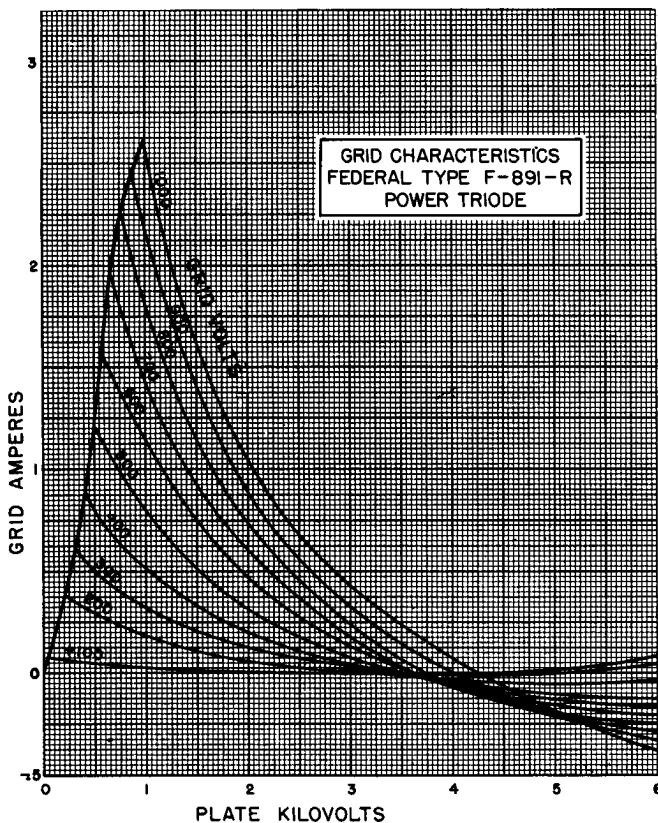
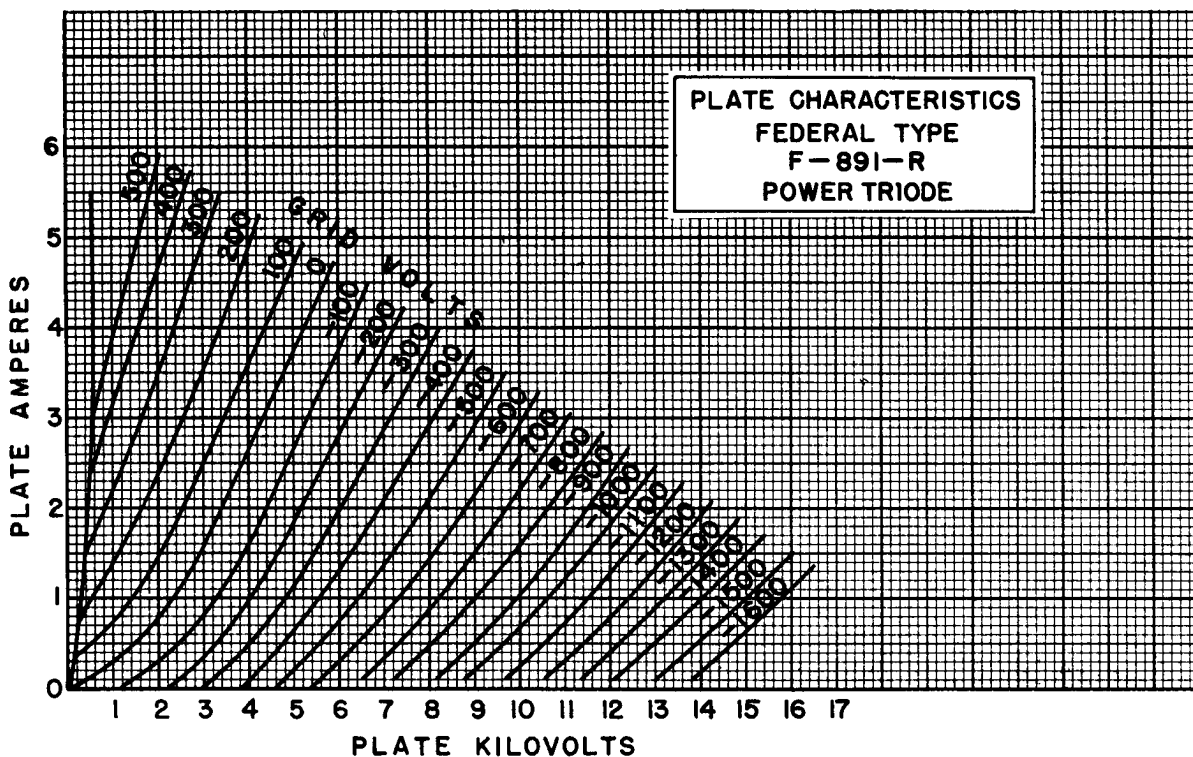
FEDERAL F-891-R
FILAMENT CONNECTIONS

As in other Federal types, the F-891-R is manufactured under the most rigid quality control, assuring continuous performance according to rating.

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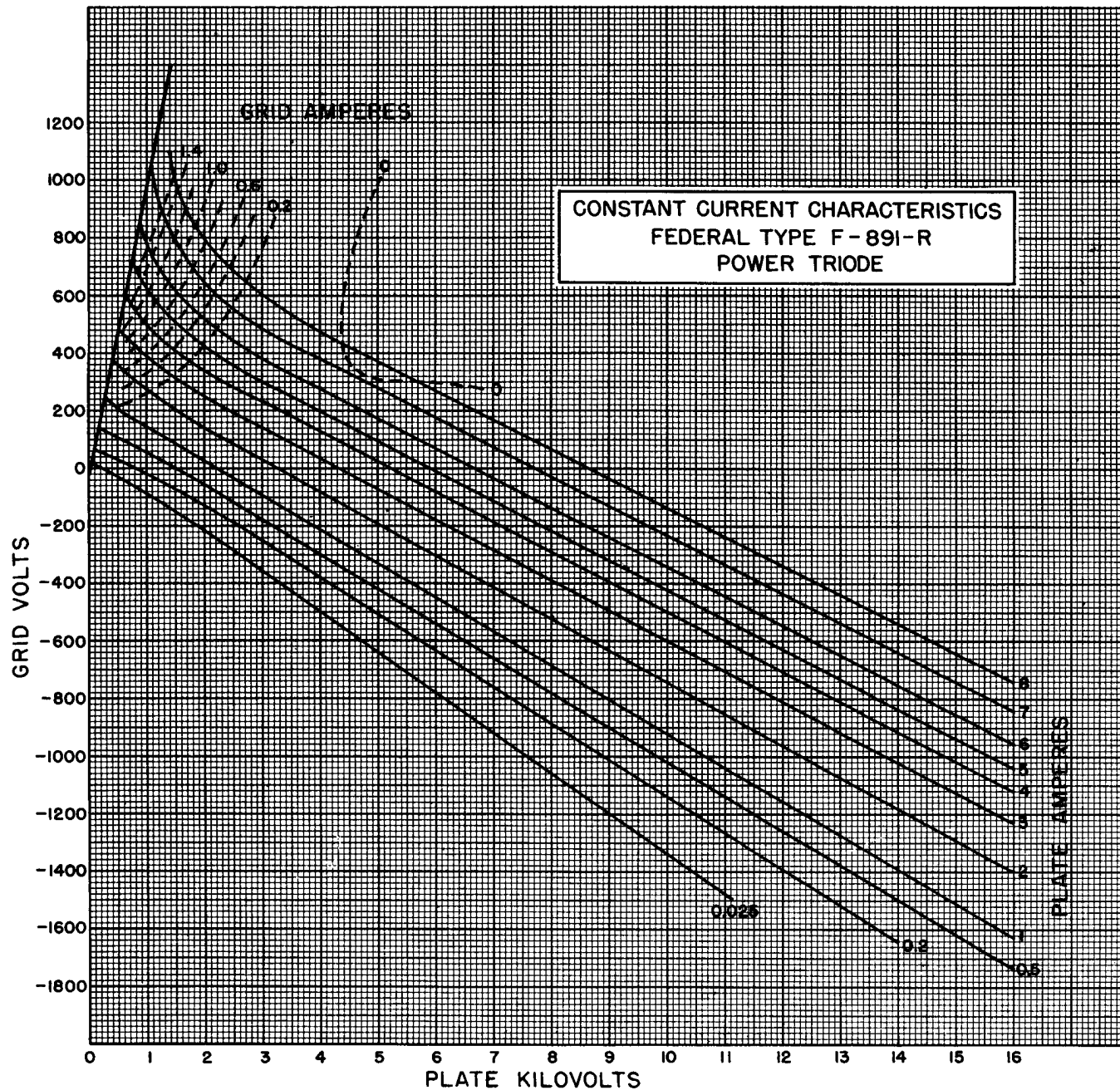
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In nation-wide service as a modulator in low powered transmitters, Federal's F-891-R is proving its exceptional abilities everywhere, every day.

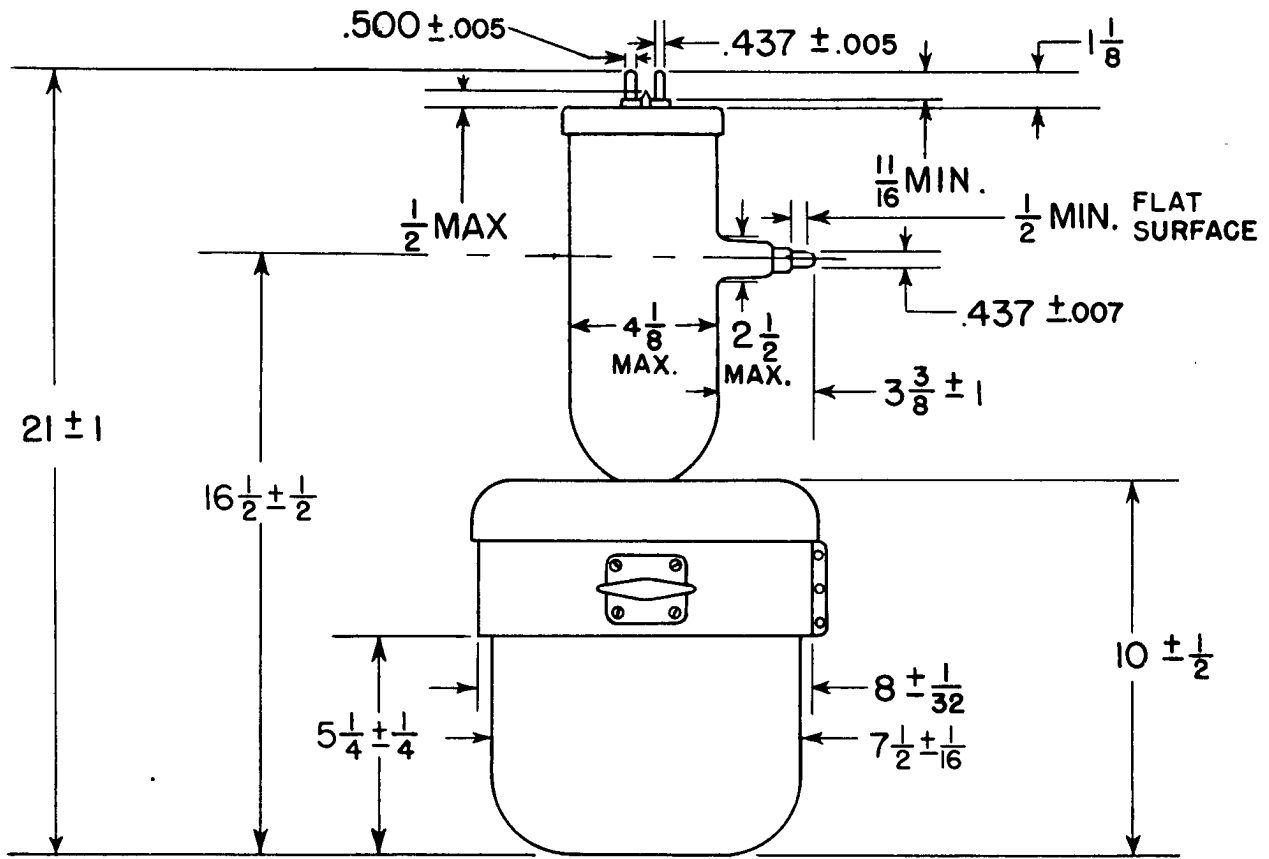
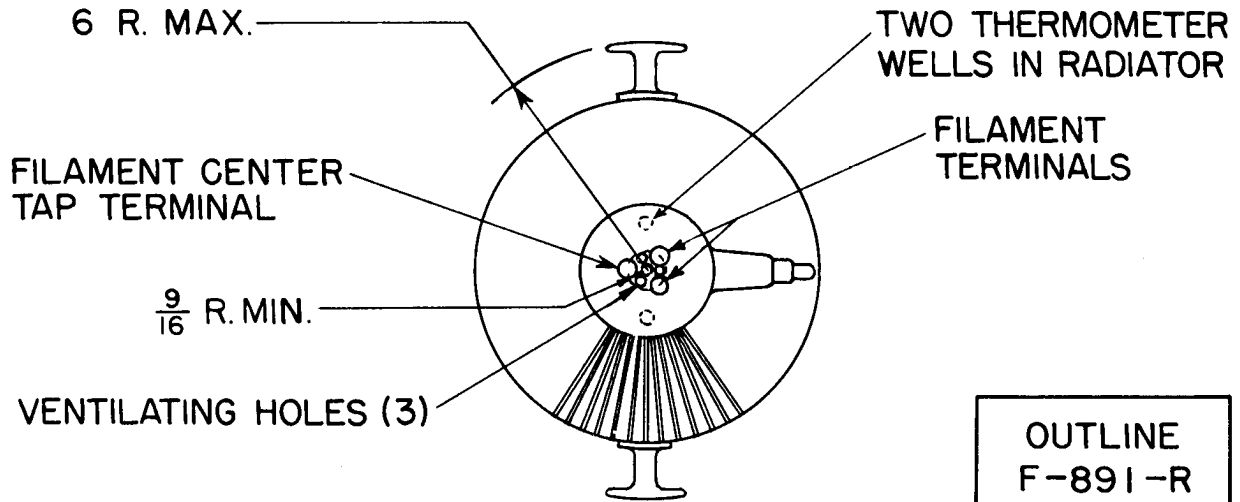


The all-round superiority of the F-891-R is due in part to the first-quality materials and components used *plus* first-rank engineering based on international experience.

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Federal Telephone and Radio Corporation

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**Federal Always Has
Made Better Tubes**