

## GENERAL DATA

### DESCRIPTION:

Federal's F-891 is a three-electrode tube designed for use as a modulator, amplifier, and oscillator. The anode is water-cooled, capable of dissipating 6 kilowatts. The cathode is a pure tungsten filament. Maximum ratings apply up to 1.6 megacycles, with operation up to 20 megacycles permissible at reduced ratings.

### Electrical:

▶ Filament Voltage	22 Volts
▶ Filament Current	60 Amperes
▶ Filament Starting Current	120 Amperes max.
▶ Filament Cold Resistance	0.031 Ohms
▶ Peak Cathode Current	9 Amperes
▶ Amplification Factor,	
$I_b = 0.75$ amps.,	
$E_c = -500$ volts	8.5
▶ Interelectrode Capacitances	
Grid-Plate	27 $\mu\mu\text{f}$
Grid-Filament	19 $\mu\mu\text{f}$
Plate-Filament	2 $\mu\mu\text{f}$

### Mechanical:

▶ Mounting Position—	
Vertical, anode down	
▶ Type of Cooling—Water	
Minimum Water Flow on Anode	3 GPM
Maximum Outgoing Water	
Temperature	70° C
Maximum Glass Temperature	150° C
▶ Net Weight, approximate	3 1/2 Pounds



# FEDERAL POWER TRIODE

## Type F-891

6 Kilowatts Plate Dissipation



### Maximum Ratings vs. Operating Frequency

Frequency	1.6	7.5	20.0 Megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input	100	75	50 Per Cent
Class C—Telegraphy	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	15,000 Volts
Maximum Signal DC Plate Current†	2.0 Amperes
Maximum Signal Plate Input†	20 Kilowatts
Plate Dissipation†	5 Kilowatts

##### Typical Operation

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	6,000	10,000	12,500 Volts
DC Grid Voltage	-630	-1,100	-1,450 Volts
Peak A-F Grid to Grid Voltage	2,060	3,060	3,760 Volts
Zero Signal DC Plate Current	0.5	0.5	0.4 Amperes
Max. Signal DC Plate Current	2.5	2.4	2.5 Amperes
Effective Load Resistance (plate to plate)	5,000	10,000	12,000 Ohms
Max. Signal Driving Power, approx.	110	225	245 Watts
Max. Signal Power Output, approx.	8	16	22 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

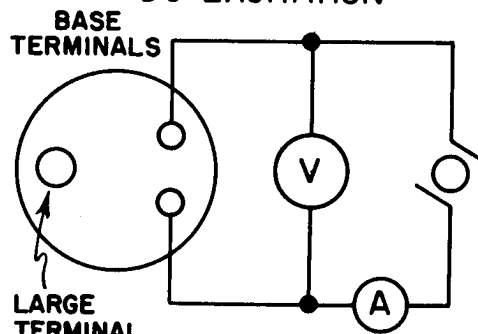
DC Plate Voltage	12,000 Volts
DC Grid Voltage	-3,000 Volts
DC Plate Current	2.0 Amperes
DC Grid Current	0.15 Amperes
Plate Input	18 Kilowatts
Plate Dissipation	6 Kilowatts

##### Typical Operation

DC Plate Voltage	8,000	10,000 Volts
DC Grid Voltage	-1800	-2,000 Volts
Peak R-F Grid Voltage	2400	2,700 Volts
DC Plate Current	1.15	1.33 Amperes
DC Grid Current, approx.	0.09	0.14 Amperes
Driving Power, approx.	215	375 Watts
Power Output, approx.	6.5	10 Kilowatts

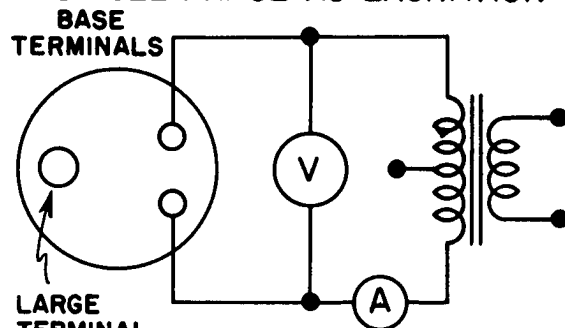
†Modulation essentially negative may be used, if the positive peak of the envelope does not exceed 115 per cent of carrier conditions.

#### DC EXCITATION



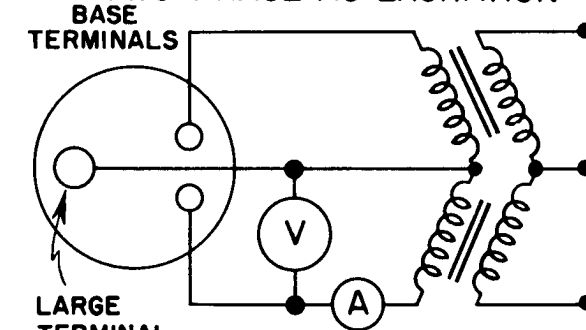
V = 22 VOLTS      A = 60 AMPERES

#### SINGLE PHASE AC EXCITATION



V = 22 VOLTS      A = 60 AMPERES

#### TWO PHASE AC EXCITATION



V = 11 VOLTS      A = 60 AMPERES

FEDERAL F-891  
FILAMENT CONNECTIONS

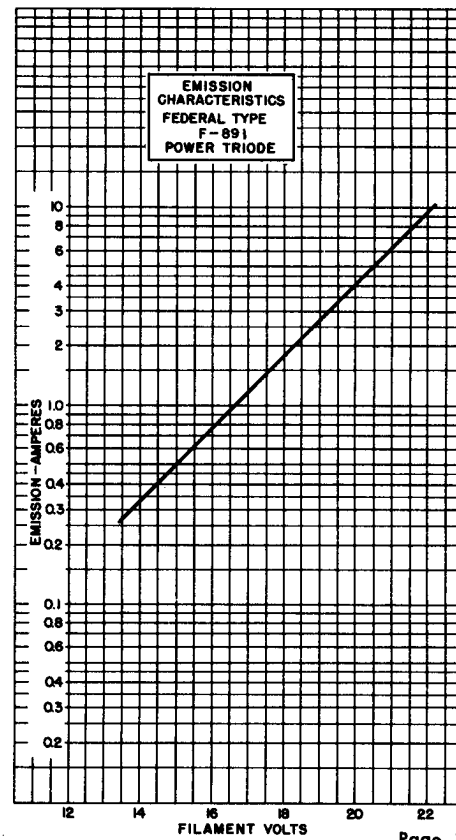
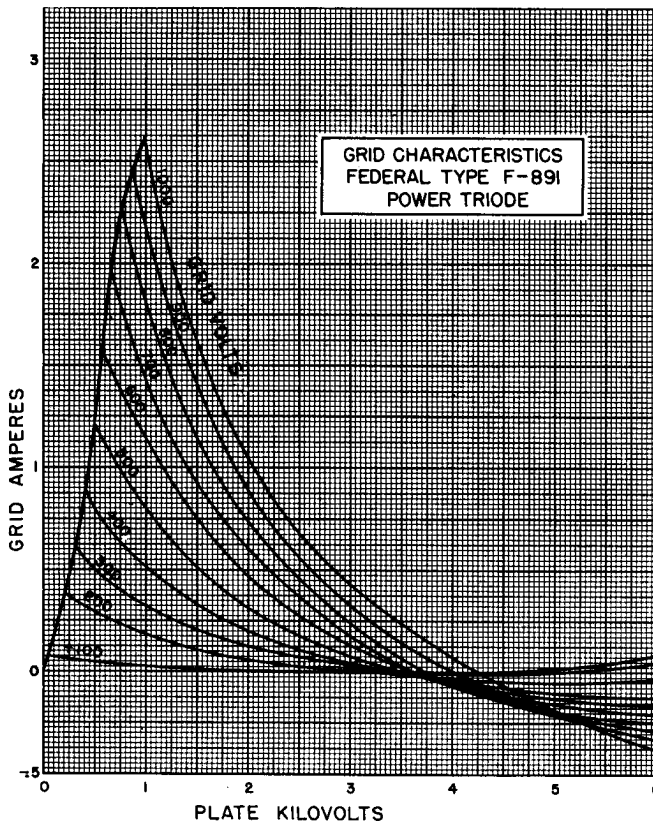
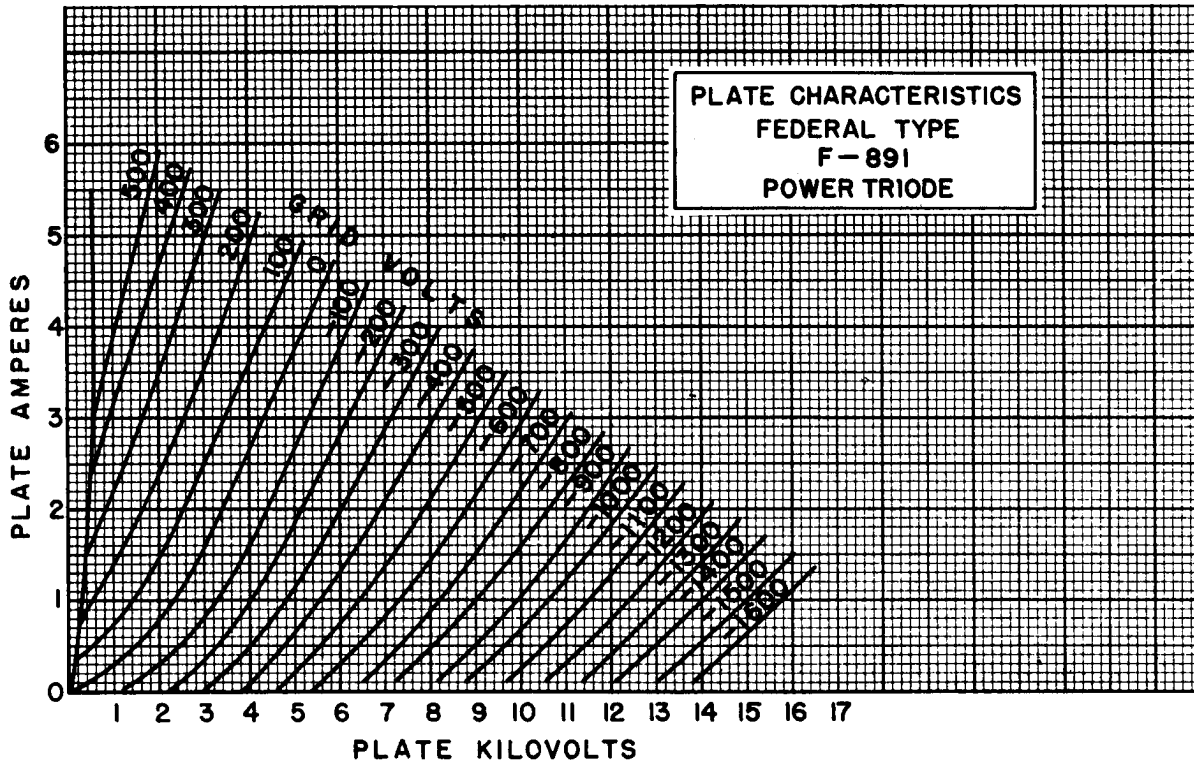


Federal's tube experience goes back to the pioneer days . . . one of the oldest manufacturers in the industry.

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## Type F-891

6 Kilowatts Plate Dissipation



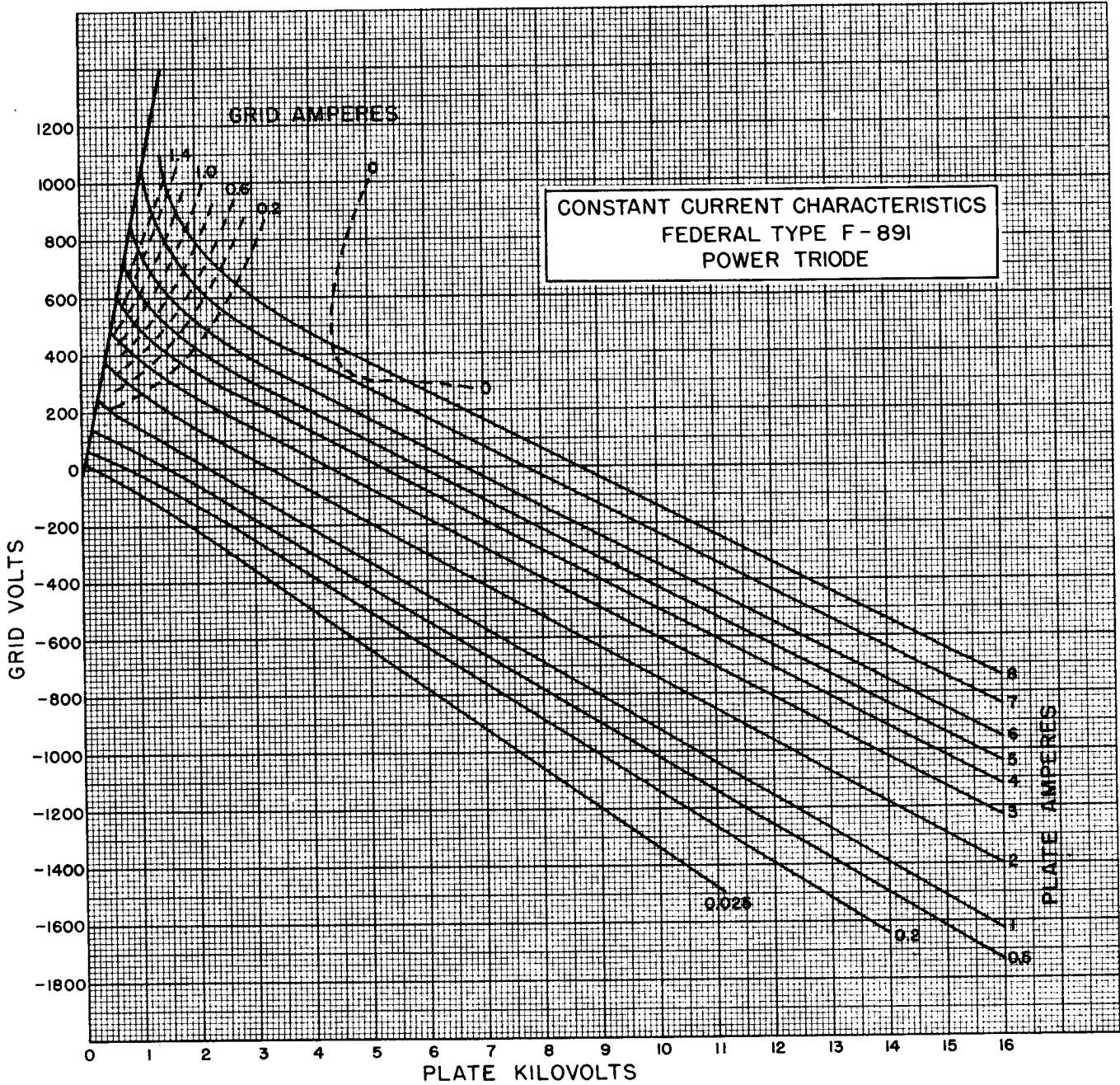
# FEDERAL POWER TRIODE

## Type F-891

6 Kilowatts Plate Dissipation



Federal tubes are in service around the world: Transmitting tubes, Industrial tubes, Rectifying tubes, Special Purpose tubes.

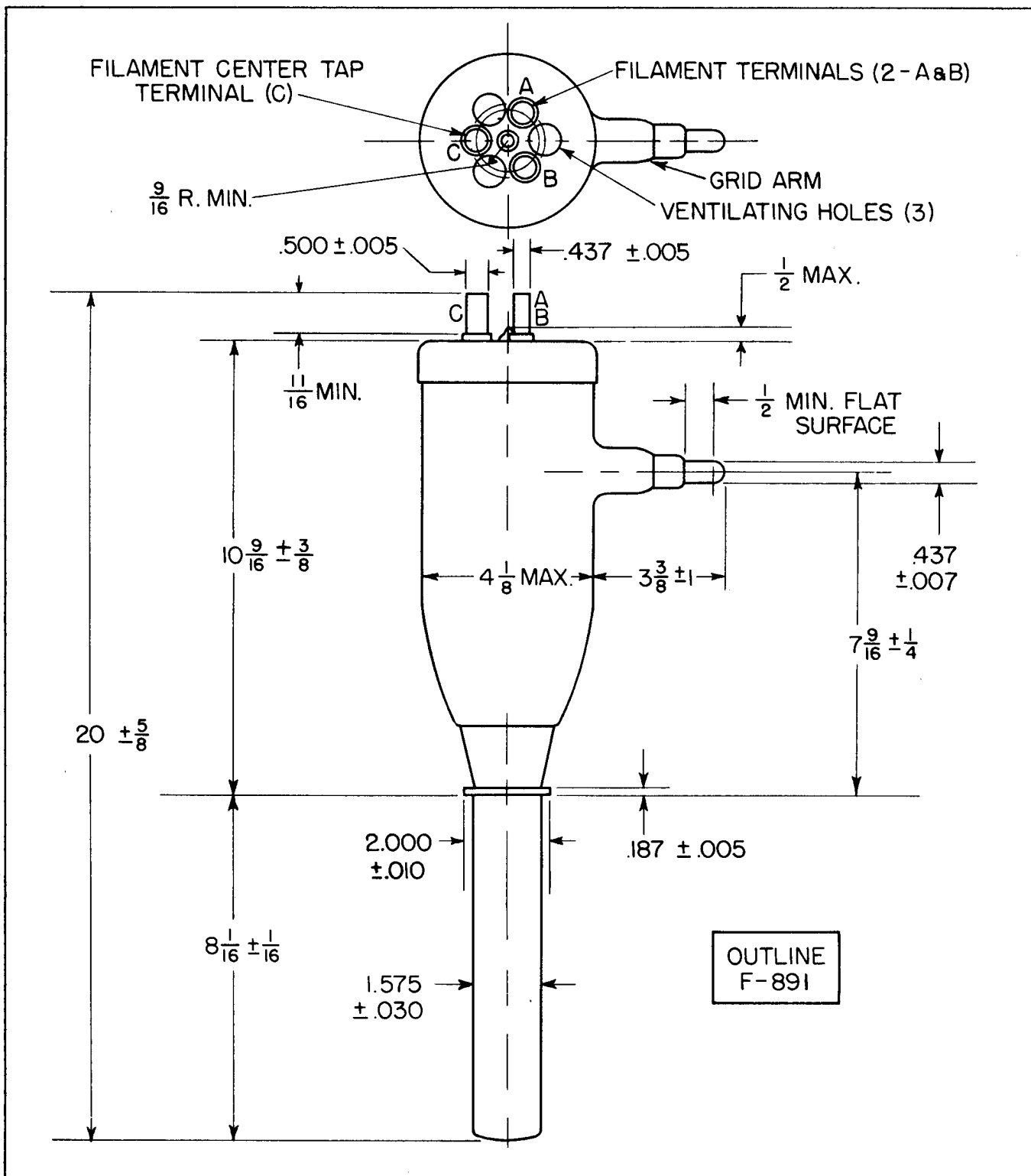


Long recognized as a maker of better tubes, Federal now leads with new production methods giving longer tube life.

# FEDERAL POWER TRIODE

## Type F-891

6 Kilowatts Plate Dissipation





**Federal Always Has  
Made Better Tubes**