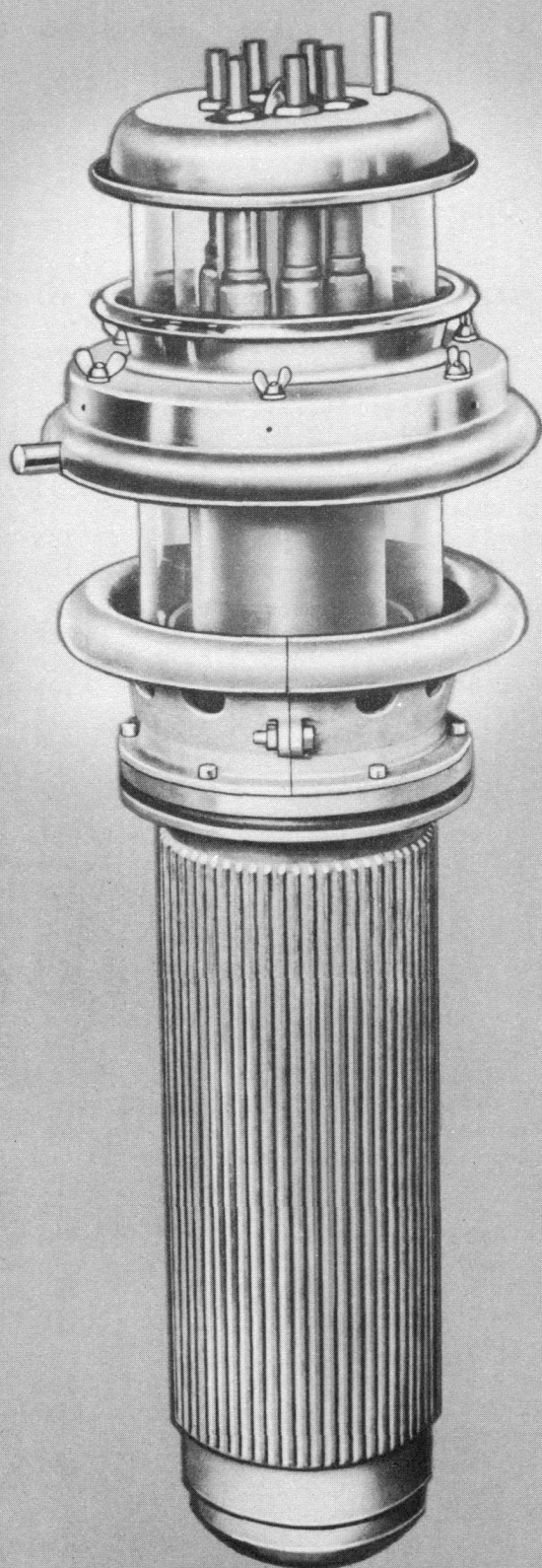


# FEDERAL POWER TRIODE

## Type F-134

### 150 Kilowatts Plate Dissipation



## GENERAL DATA

### DESCRIPTION:

Type F-134 is a three-electrode tube designed and manufactured by Federal for use as a radio-frequency amplifier, oscillator, or Class B modulator. The anode is water-cooled, capable of dissipating 150 Kilowatts. The cathode is a pure tungsten filament. Maximum ratings apply up to 22 megacycles.

### Electrical:

|                                                        |                    |
|--------------------------------------------------------|--------------------|
| ► Filament Voltage                                     | 25 Volts           |
| ► Filament Current                                     | 650 Amperes        |
| ► Filament Starting Current                            | 1,000 Amperes max. |
| ► Filament Cold Resistance                             | .0022 Ohms         |
| ► Peak Cathode Current                                 | 120 Amperes        |
| ► Amplification Factor, at<br>$E_c = -200V$ $I_b = 5A$ | 21                 |
| ► Interelectrode Capacitances                          |                    |
| Grid-Plate                                             | 105 $\mu\mu f$     |
| Grid-Filament                                          | 140 $\mu\mu f$     |
| Plate-Filament                                         | 4 $\mu\mu f$       |

### Mechanical:

|                                               |           |
|-----------------------------------------------|-----------|
| ► Mounting Position—                          |           |
| Vertical, anode down                          |           |
| ► Type of Cooling—Water and<br>Forced Air (1) |           |
| Minimum Water Flow on<br>Anode                | 40 GPM.   |
| Maximum Outgoing Water<br>Temperature         | 70° C     |
| Air Flow                                      |           |
| To Grid Air Ring (2)                          | 80 CFM    |
| To Filament Seals (3)                         | 40 CFM    |
| Maximum Glass<br>Temperature                  | 150° C    |
| ► Net Weight, approx.                         | 80 Pounds |

(1) Water and air cooling should continue for 5 minutes after removal of power.

(2) Air pressure of 6 psi required to deliver 80 CFM at 14.7 psi and 20° C.

(3) Air pressure of 0.25 psi at entrance of 9-foot length of 3/8-inch I.D. hose to deliver 40 CFM at 14.7 psi and 20° C.

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Federal's F-134 has exhibited proven performance over a period of years in 200 KW high level modulated short-wave transmitters.

## 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† | 24 Amps.     |
| Maximum Signal Plate Input†      | 400 KW       |
| Plate Dissipation†               | 150 KW       |

#### Typical Operation

(Unless otherwise specified, values are for two tubes)

|                                           |        |        |              |
|-------------------------------------------|--------|--------|--------------|
| DC Plate Voltage                          | 12,000 | 14,000 | 14,000 Volts |
| DC Grid Voltage                           | —500   | —600   | —600 Volts   |
| Peak A-F Grid-to-Grid Voltage             | 1,920  | 1,960  | 3,100 Volts  |
| Zero Signal DC Plate Current              | 4.0    | 4.0    | 4.0 Amps.    |
| Maximum Signal DC Plate Current           | 22     | 17.2   | 41 Amps.     |
| Effective Load Resistance, Plate to Plate | 2,600  | 4,300  | 680 Ohms     |
| Max. Signal Driving Power, approx.        | 540    | 500    | 3,400 Watts  |
| Max. Signal Power Output, approx.         | 155    | 155    | 355 KW       |

†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  | 12 Amps.     |
| Plate Input       | 200 KW       |
| Plate Dissipation | 150 KW       |

#### Typical Operation

|                          |              |
|--------------------------|--------------|
| DC Plate Voltage         | 18,000 Volts |
| DC Grid Voltage          | —600 Volts   |
| Peak R-F Grid Voltage    | 1370 Volts   |
| DC Plate Current         | 9.6 Amps.    |
| DC Grid Current, approx. | 0.0 Amps.    |
| Driving Power, approx.‡  | 1.2 KW       |
| Power Output, approx.    | 54 KW        |

‡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   | —4,000 Volts |
| DC Plate Current  | 12 Amps.     |
| DC Grid Current   | 2 Amps.      |
| Plate Input       | 165 KW       |
| Plate Dissipation | 100 KW       |

#### Typical Operation, Grounded Filament Circuit

|                          |        |              |
|--------------------------|--------|--------------|
| DC Plate Voltage         | 14,000 | 14,000 Volts |
| DC Grid Voltage          | —1,600 | —1,600 Volts |
| Peak R-F Grid Voltage    | 2,340  | 2,500 Volts  |
| DC Plate Current         | 9.8    | 11.8 Amps.   |
| DC Grid Current, approx. | 0.6    | 1.0 Amps.    |
| Driving Power, approx.   | 1.4    | 3.0 KW       |
| Power Output, approx.    | 108    | 126 KW       |

#### Typical Operation, Grounded Grid Circuit

|                          |              |
|--------------------------|--------------|
| DC Plate Voltage         | 12,000 Volts |
| DC Grid Voltage          | —1,400 Volts |
| DC Plate Current         | 10 Amps.     |
| DC Grid Current, approx. | 1.0 Amp.     |
| Driving Power, approx.*  | 17.5 KW      |
| Power Output**           | 105 KW       |

\*The carrier of the driver modulated 100 per cent.

\*\*Includes power transferred from driver stage.

### 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   | —4,000 Volts |
| DC Plate Current  | 24 Amps.     |
| DC Grid Current   | 2 Amps.      |
| Plate Input       | 450 KW       |
| Plate Dissipation | 150 KW       |

#### Typical Operation

|                          |        |        |              |
|--------------------------|--------|--------|--------------|
| DC Plate Voltage         | 18,000 | 19,000 | 19,000 Volts |
| DC Grid Voltage          | —2,000 | —2,200 | —2,200 Volts |
| Peak R-F Grid Voltage    |        |        |              |
| Voltage                  | 3,000  | 3,400  | 3,600 Volts  |
| DC Plate Current         | 14.5   | 17.8   | 20.1 Amps.   |
| DC Grid Current, approx. | 1.0    | 1.1    | 1.8 Amps.    |
| Driving Power, approx.   | 3      | 3.8    | 6 KW         |
| Power Output, approx.    | 200    | 250    | 300 KW       |

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

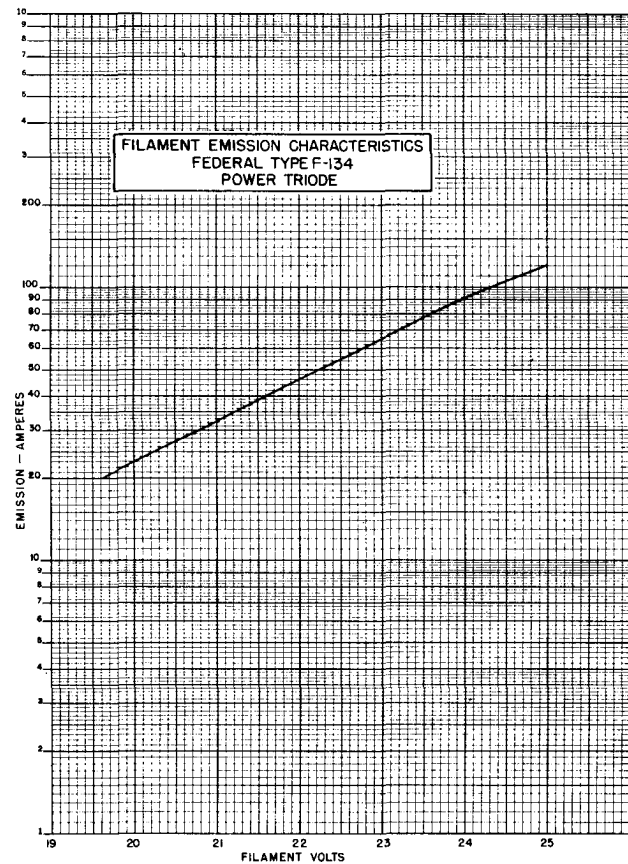
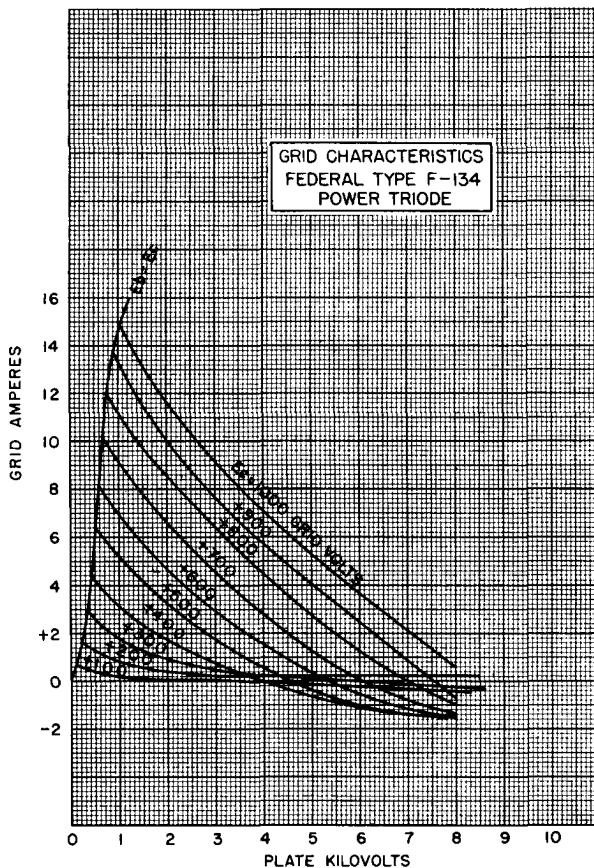
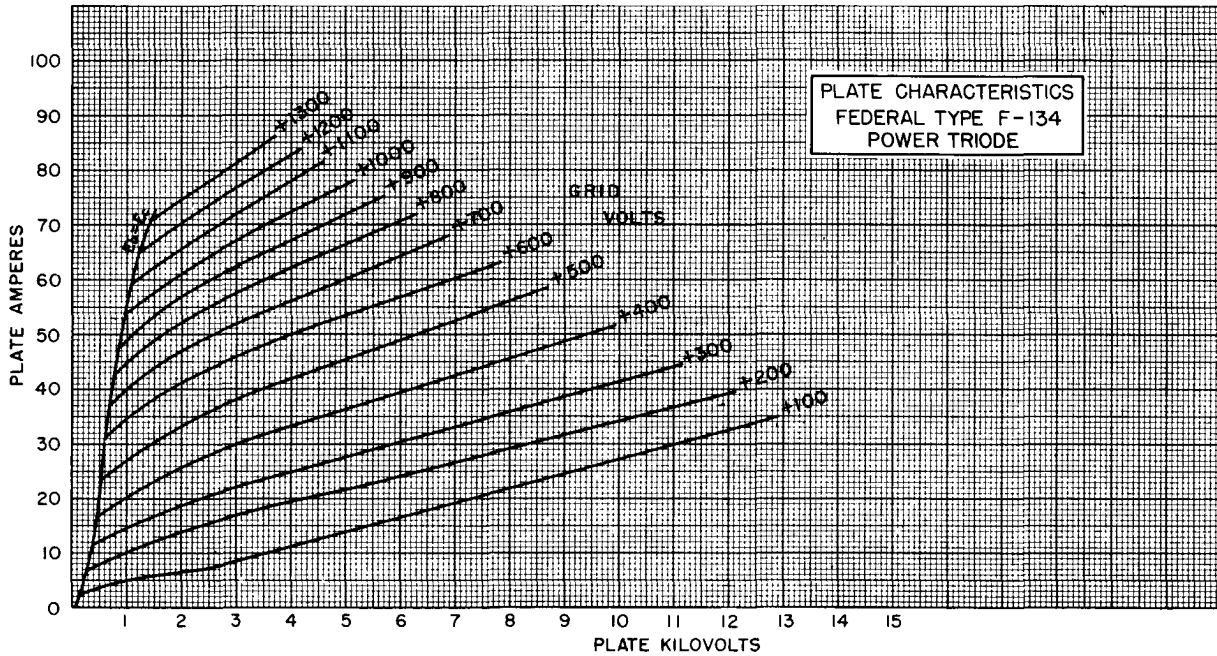


Up to 300 KW of R-F power is available from a single F-134 tube—for use in industrial heating applications.

# FEDERAL POWER TRIODE

## Type F-134

### 150 Kilowatts Plate Dissipation



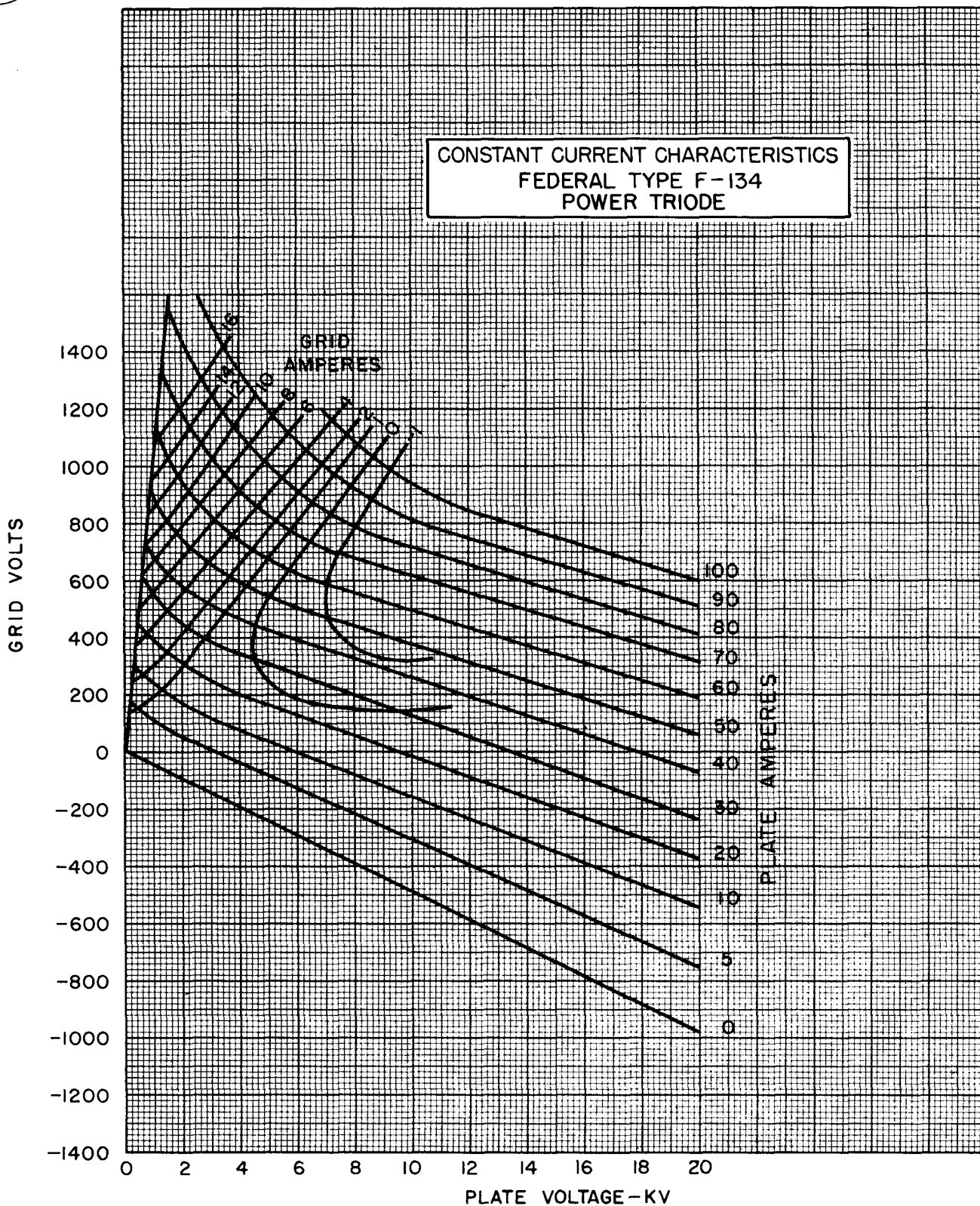
# FEDERAL POWER TRIODE

## Type F-134

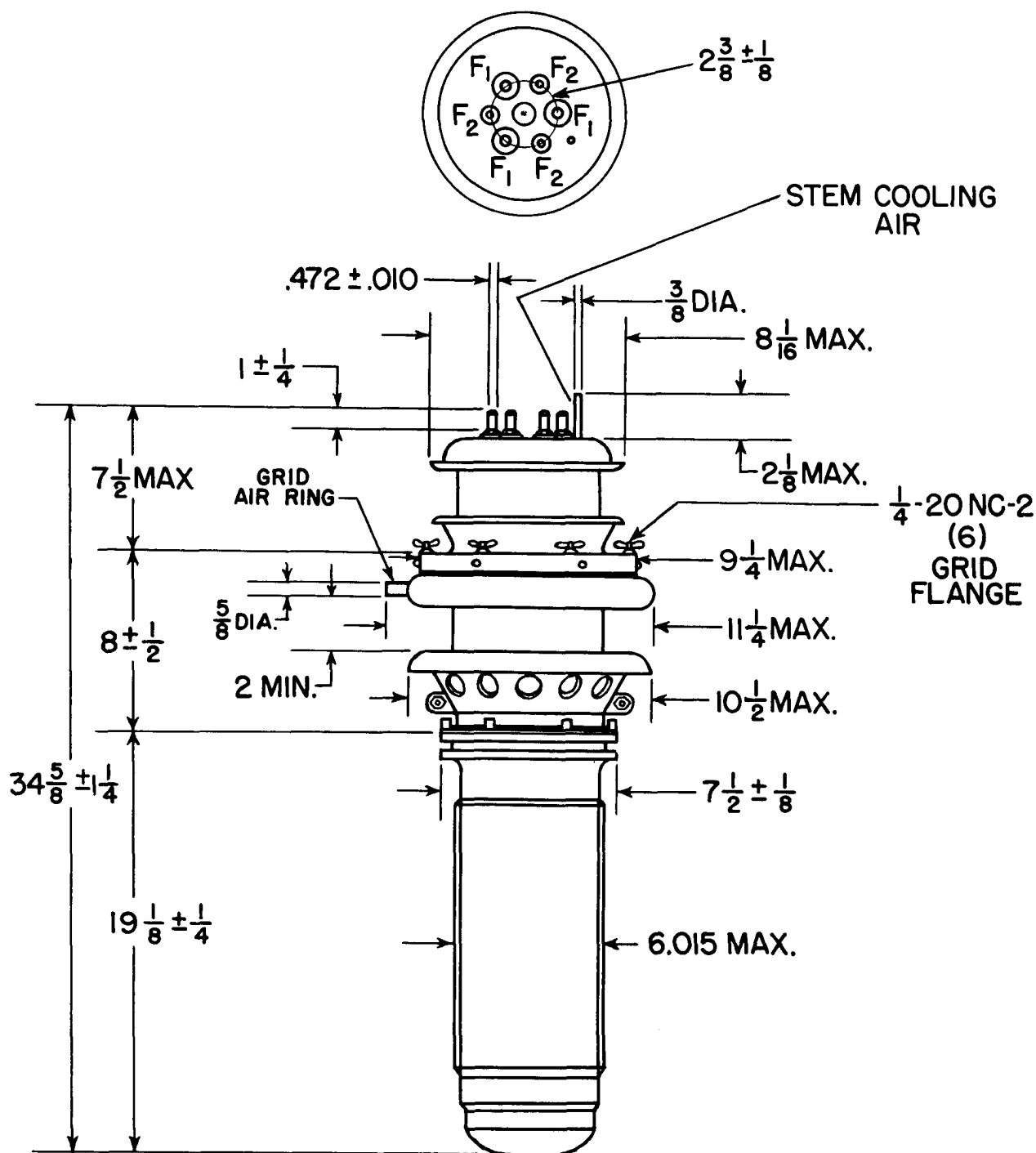
150 Kilowatts Plate Dissipation



The ring seal grid connection in the F-134 provides a low inductance grid lead and adaptability to grounded grid circuits.



# FEDERAL POWER TRIODE Type F-134 150 Kilowatts Plate Dissipation





***Federal Always Has  
Made Better Tubes***