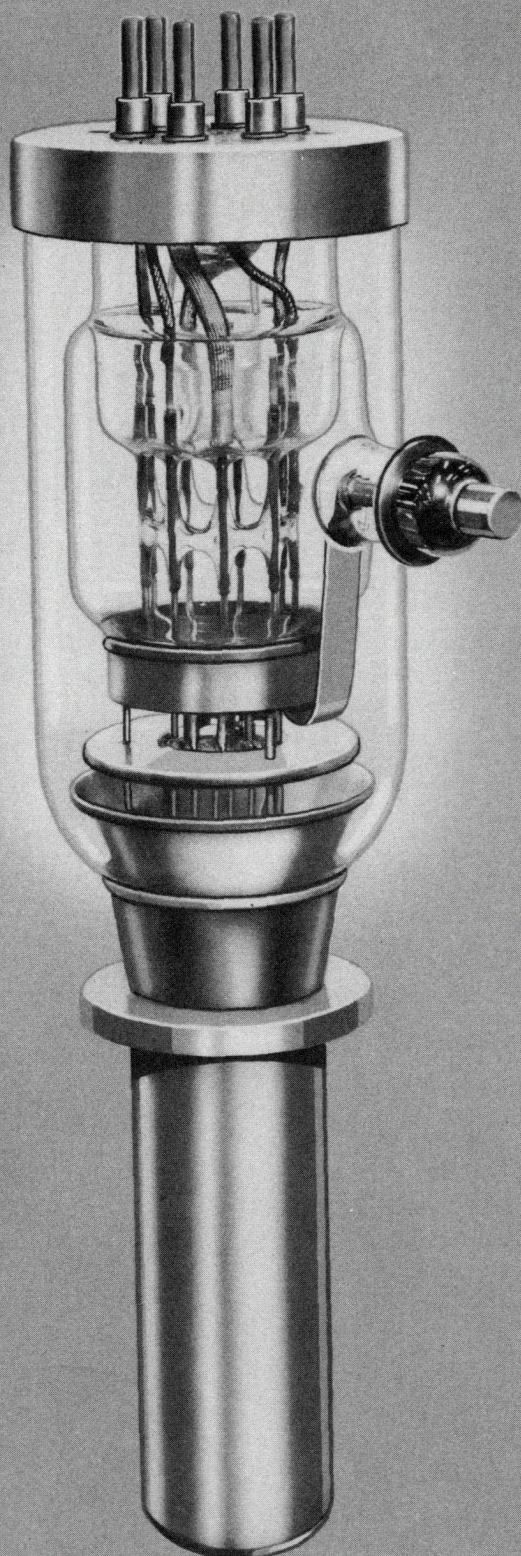


## Type F-9C28

40 Kilowatts Plate Dissipation



## GENERAL DATA

## DESCRIPTION:

Federal's F-9C28 is a three-electrode tube designed for use as a modulator in Class AB<sub>1</sub> circuits. The anode is water-cooled, capable of dissipating 40 kilowatts. The cathode is a thoriated tungsten multi-strand filament and may be operated on DC, 1 $\phi$ , 3 $\phi$ , or 6 $\phi$  AC excitation. Maximum ratings apply for audio-frequency use only.

## Electrical:

|                                                                          |                |
|--------------------------------------------------------------------------|----------------|
| ► Filament Voltage§                                                      | 15 Volts       |
| ► Filament Current§                                                      | 135 Amperes    |
| ► Filament Starting Current§                                             | 200 Amps. max. |
| ► Filament Cold Resistance§                                              | .019 Ohms      |
| ► Peak Cathode Current                                                   | 45 Amperes     |
| ► Amplification Factor,<br>$E_c = -1,600 \text{ V}; I_b = 3.0 \text{ A}$ | 4.75           |

## ► Interelectrode Capacitances

|                |                  |
|----------------|------------------|
| Grid-Plate     | 45 $\mu\text{f}$ |
| Grid-Filament  | 56 $\mu\text{f}$ |
| Plate-Filament | 20 $\mu\text{f}$ |

§Single phase excitation.

## Mechanical:

|                                                           |               |
|-----------------------------------------------------------|---------------|
| ► Mounting Position—<br>Vertical, Anode Down              |               |
| ► Type of Cooling—Water<br>Minimum Water Flow<br>on Anode | 20 GPM        |
| Maximum Outgoing<br>Water Temperature                     | 70° C         |
| Maximum Glass<br>Temperature                              | 150° C        |
| ► Net Weight, approx.                                     | 11 1/2 Pounds |

# FEDERAL POWER TRIODE

## Type F-9C28

40 Kilowatts Plate Dissipation



The F-9C28 is Federal's thoriated tungsten filament low  $\mu$  modulator tube for use in conjunction with the F-9C30.

### Maximum Ratings and Typical Operating Conditions

#### AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS AB<sub>1</sub>

##### Maximum Ratings, Absolute Values

|                                  |               |
|----------------------------------|---------------|
| DC Plate Voltage                 | 15,000 Volts  |
| Maximum Signal DC Plate Current† | 10 Amperes    |
| Maximum Signal Plate Input†      | 100 Kilowatts |
| Plate Dissipation†               | 40 Kilowatts  |

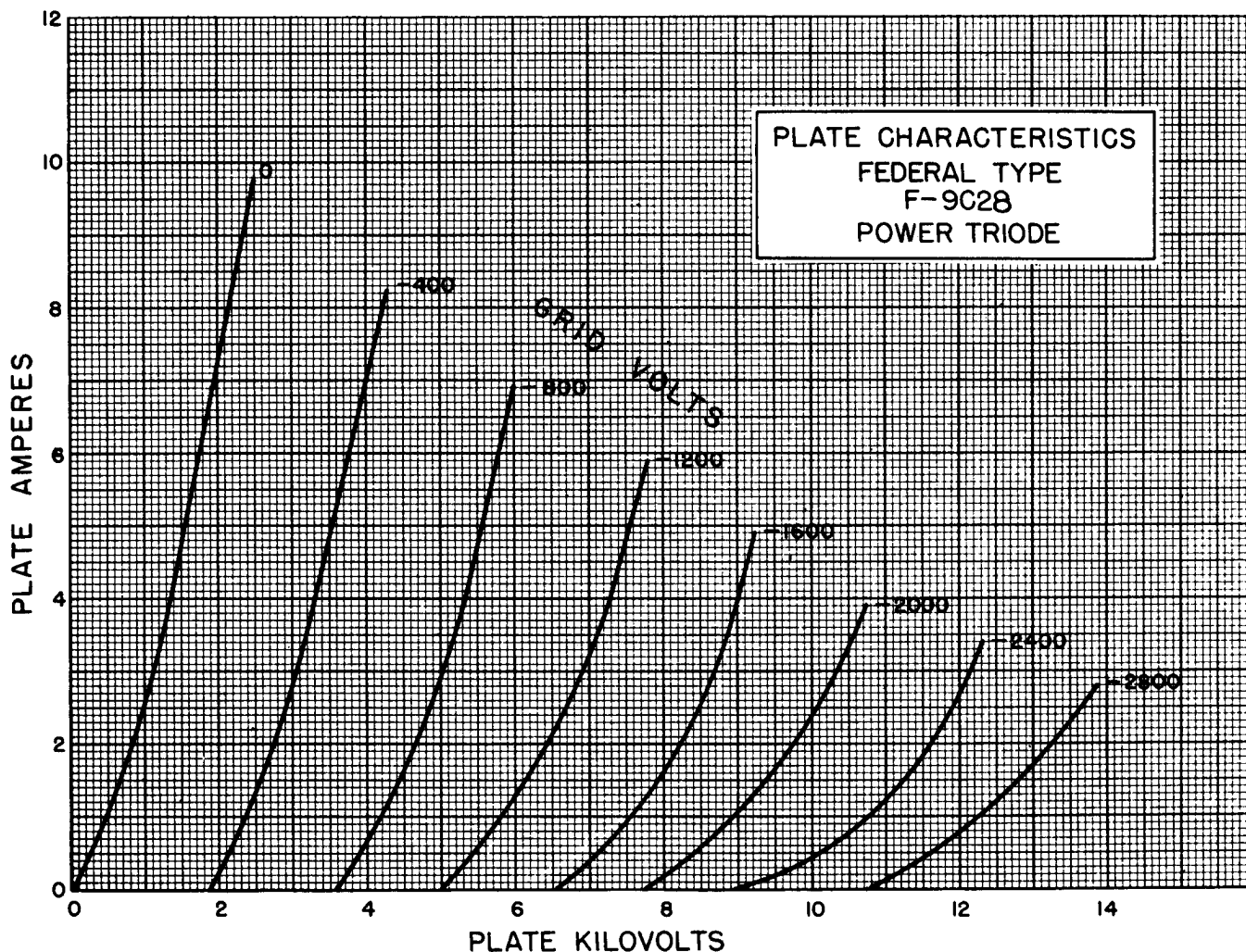
##### Typical Operation

(Unless otherwise specified, values are for two tubes)

|                  |        |              |
|------------------|--------|--------------|
| DC Plate Voltage | 10,000 | 12,000 Volts |
| DC Grid Voltage  | -2,200 | -2,600 Volts |

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

|                                           |       |              |
|-------------------------------------------|-------|--------------|
| Peak A-F Grid to Grid Voltage             | 4,380 | 5,160 Volts  |
| Zero-Signal DC Plate Current              | 1.2   | 1.4 Amperes  |
| Maximum Signal DC Plate Current           | 7.2   | 5.6 Amperes  |
| Effective Load Resistance, Plate to Plate | 2,600 | 4,500 Ohms   |
| Maximum Signal Driving Power              | 0     | 0 Watts      |
| Maximum Signal Power Output               | 39    | 39 Kilowatts |

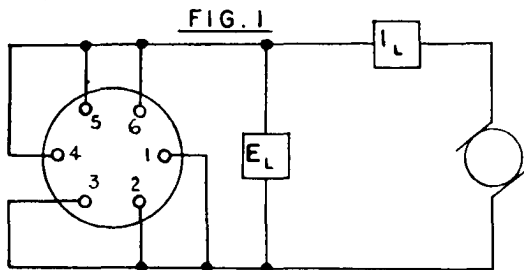


Up to 100 kilowatts of audio power  
is available . . . from two Federal  
F-9C28 tubes in a Class AB modulator.

**FEDERAL POWER TRIODE**

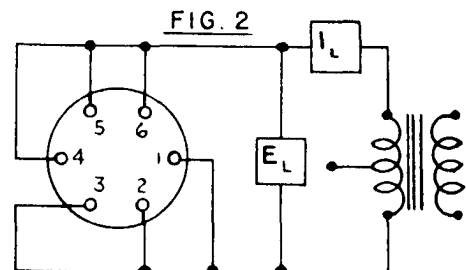
**Type F-9C28**

**40 Kilowatts Plate Dissipation**



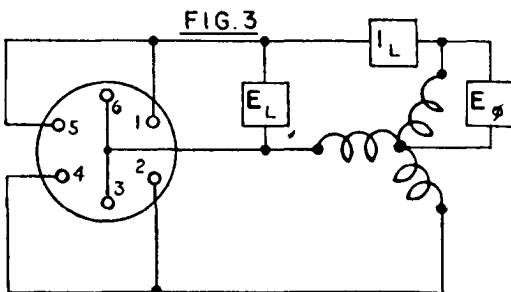
**D.C. CONNECTION**

$E_L = 'X' \text{ VOLTS D.C.}$   
 $I_L = 'Y' \text{ AMPS. D.C.}$



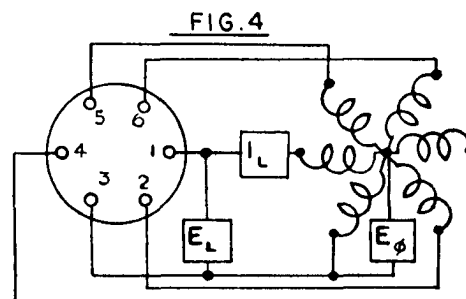
**SINGLE-PHASE A.C. CONNECTION**

$E_L = 'X' \text{ VOLTS A.C.}$   
 $I_L = 'Y' \text{ AMPS. A.C.}$



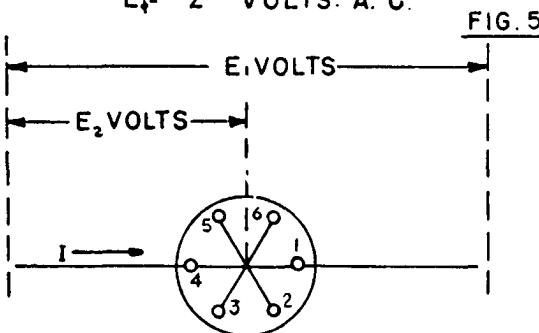
**THREE-PHASE A.C. CONNECTION**

$E_L = 'X' \text{ VOLTS A.C.}$   
 $I_L = 'Y' \text{ AMPS. A.C.}$   
 $E_\phi = 'Z' \text{ VOLTS. A.C.}$



**SIX-PHASE A.C. CONNECTION**

$E_L = 'X' \text{ VOLTS A.C.}$   
 $I_L = 'Y' \text{ AMPS. A.C.}$   
 $E_\phi = 'Z' \text{ VOLTS. A.C.}$



**INTERNAL CONNECTION OF FILAMENTS**

NUMBERS 1 TO 6 INCLUSIVE ON  
CONNECTIONS DENOTE BASE  
TERMINALS.

$E_1 = 'U' \text{ VOLTS D.C. OR A.C.}$   
TERMINAL TO TERMINAL  
VOLTAGE.

$E_2 = 'V' \text{ VOLTS D.C. OR A.C.}$   
VOLTAGE PER FILAMENT  
STRAND *i.e.* FROM  
TERMINAL TO COMMON  
TERMINAL CONNECTION.

$I = 'W' \text{ AMPERES CURRENT PER}$   
FILAMENT TERMINAL.

| FIG. | U  | V   | W  | X   | Y   | Z   |
|------|----|-----|----|-----|-----|-----|
| 1    |    |     |    | 15  | 135 |     |
| 2    |    |     |    | 15  | 135 |     |
| 3    |    |     |    | 13  | 90  | 7.5 |
| 4    |    |     |    | 7.5 | 45  | 7.5 |
| 5    | 15 | 7.5 | 45 |     |     |     |

**MULTI-PHASE FILAMENT CONNECTIONS**

## 40 Kilowatts Plate Dissipation

[illegible]