

## Power Triode

## FORCED-AIR COOLED

## GENERAL DATA

## Electrical:

Filament, Multistrand Thoriated Tungsten:

|                                       |                       |
|---------------------------------------|-----------------------|
| Excitation. . . . .                   | Single-Phase AC or DC |
| Voltage <sup>a</sup> . . . . .        | 11 ± 5% volts         |
| Current at heater volts = 11. . . . . | 285 amp               |
| Minimum heating time. . . . .         | 15 sec                |

Amplification Factor for grid volts =

|                                 |    |
|---------------------------------|----|
| -50, plate amperes = 2. . . . . | 40 |
|---------------------------------|----|

Direct Interelectrode Capacitances

(Approx.):

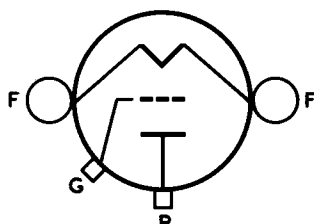
|                             |     |    |
|-----------------------------|-----|----|
| Grid to plate . . . . .     | 50  | μf |
| Grid to filament. . . . .   | 90  | μf |
| Plate to filament . . . . . | 1.5 | μf |

## Mechanical:

|                                 |                           |
|---------------------------------|---------------------------|
| Operating Position. . . . .     | Vertical, filament end up |
| Maximum Overall Length. . . . . | 25"                       |
| Maximum Diameter. . . . .       | 17"                       |
| Weight (Approx.). . . . .       | 228 pounds                |
| Radiator. . . . .               | Integral part of tube     |
| Air Jacket. . . . .             | RCA-241F1                 |

F—Filament

G—Grid



P—Plate

## Thermal:

Air Flow:

*Through radiator*—The specified air flow for various plate dissipations as indicated below should be delivered by a blower vertically upward through the radiator before and during the application of any voltages. Filament power, plate power, and air may be removed simultaneously.

|                            |      |      |      |              |
|----------------------------|------|------|------|--------------|
| Plate Dissipation. . . . . | 15   | 20   | 25   | kw           |
| Air Flow . . . . .         | 1100 | 1450 | 1800 | cfm          |
| Static Pressure. . . . .   | 0.85 | 1.5  | 2.2  | in. of water |

*To filament seals*. . . . . 10 min. cfm

The specified air flow should be directed from a 1-1/4"-diameter nozzle into the filament header before and during the application of any voltages to limit the temperature of the filament seals to the maximum value.

← Indicates a change.



|                                                          |          |    |
|----------------------------------------------------------|----------|----|
| Input Air Temperature (To radiator) . . . . .            | 45 max.  | °C |
| Radiator Temperature. . . . .                            | 180 max. | °C |
| Bulb Temperature. . . . .                                | 180 max. | °C |
| Seal Temperature (Filament, grid,<br>and plate). . . . . | 165 max. | °C |

### AF POWER AMPLIFIER and MODULATOR — Class B

#### Maximum CCS<sup>b</sup> Ratings, Absolute-Maximum Values:

|                                                     |            |       |
|-----------------------------------------------------|------------|-------|
| DC PLATE VOLTAGE. . . . .                           | 15000 max. | volts |
| MAX.—SIGNAL DC PLATE CURRENT <sup>c</sup> . . . . . | 6 max.     | amp   |
| MAX.—SIGNAL PLATE INPUT <sup>c</sup> . . . . .      | 90 max.    | kw    |
| PLATE DISSIPATION <sup>c</sup> . . . . .            | 25 max.    | kw    |

#### Typical Operation:

*Values are for 2 tubes*

|                                                          |       |       |       |
|----------------------------------------------------------|-------|-------|-------|
| Filament Voltage. . . . .                                | 10    | 11    | volts |
| DC Plate Voltage. . . . .                                | 10200 | 15000 | volts |
| DC Grid Voltage . . . . .                                | -220  | -320  | volts |
| Peak AF Grid-to-Grid Voltage. . . . .                    | 900   | 1600  | volts |
| Zero-Signal DC Plate Current. . . . .                    | 0.6   | 0.6   | amp   |
| Max.—Signal DC Plate Current. . . . .                    | 5.8   | 10    | amp   |
| Effective Load Resistance<br>(Plate to plate). . . . .   | 3600  | 3320  | ohms  |
| Max.—Signal Driving Power (Approx.) <sup>d</sup> . . . . | 120   | 600   | watts |
| Max.—Signal Power Output (Approx.). . . .                | 37    | 100   | kw    |

### PLATE-MODULATED RF POWER AMPLIFIER — Class C Telephony

*Carrier conditions per tube for use  
with a max. modulation factor of 1*

#### Maximum CCS<sup>b</sup> Ratings, Absolute-Maximum Values:

|                             |            |       |
|-----------------------------|------------|-------|
| DC PLATE VOLTAGE. . . . .   | 12500 max. | volts |
| DC GRID VOLTAGE . . . . .   | -2000 max. | volts |
| DC PLATE CURRENT. . . . .   | 4.5 max.   | amp   |
| DC GRID CURRENT . . . . .   | 1 max.     | amp   |
| PLATE INPUT . . . . .       | 55 max.    | kw    |
| PLATE DISSIPATION . . . . . | 17 max.    | kw    |

#### Typical Operation:

*At 1.6 Mc*

|                                                |       |       |       |
|------------------------------------------------|-------|-------|-------|
| Filament Voltage. . . . .                      | 10    | 11    | volts |
| DC Plate Voltage. . . . .                      | 10200 | 12500 | volts |
| DC Grid Voltage: <sup>e</sup>                  |       |       |       |
| From a fixed supply of. . . . .                | -1500 | -1500 | volts |
| From a grid resistor of . . . . .              | 2100  | 1500  | ohms  |
| Peak RF Grid Voltage. . . . .                  | 2070  | 2180  | volts |
| DC Plate Current. . . . .                      | 3.3   | 4     | amp   |
| DC Grid Current (Approx.) . . . . .            | 0.72  | 1     | amp   |
| Driving Power (Approx.) <sup>f</sup> . . . . . | 1350  | 1960  | watts |
| Power Output (Approx.). . . . .                | 28    | 40    | kw    |

## RF POWER AMPLIFIER and OSCILLATOR — Class C Telegraphy

*Key-down conditions per tube without modulation<sup>g</sup>***Maximum CCS<sup>b</sup> Ratings, Absolute-Maximum Values:**

|                            |            |       |
|----------------------------|------------|-------|
| DC PLATE VOLTAGE. . . . .  | 15000 max. | volts |
| DC GRID VOLTAGE. . . . .   | -2000 max. | volts |
| DC PLATE CURRENT. . . . .  | 8 max.     | amp   |
| DC GRID CURRENT. . . . .   | 1 max.     | amp   |
| PLATE INPUT. . . . .       | 100 max.   | kw    |
| PLATE DISSIPATION. . . . . | 25 max.    | kw    |

**Typical Operation:***At 1.6 Mc*

|                                                |       |       |       |
|------------------------------------------------|-------|-------|-------|
| Filament Voltage. . . . .                      | 10    | 11    | volts |
| DC Plate Voltage. . . . .                      | 12500 | 15000 | volts |
| DC Grid Voltage: <sup>h</sup>                  |       |       |       |
| From a fixed supply of. . . . .                | -1250 | -1500 | volts |
| From a cathode resistor of. . . . .            | 190   | 225   | ohms  |
| From a grid resistor of. . . . .               | 1300  | 1500  | ohms  |
| Peak RF Grid Voltage. . . . .                  | 1970  | 2270  | volts |
| DC Plate Current. . . . .                      | 5.8   | 6     | amp   |
| DC Grid Current (Approx.) . . . . .            | 0.95  | 1     | amp   |
| Driving Power (Approx.) <sup>f</sup> . . . . . | 1700  | 2040  | watts |
| Power Output (Approx.) . . . . .               | 55    | 70    | kw    |

<sup>a</sup> When the 5671 is operated at less than maximum ratings, the filament voltage may be reduced to 9.75 volts.

<sup>b</sup> CCS Continuous Commercial Service.

<sup>c</sup> Averaged over any audio-frequency cycle of sine-wave form.

<sup>d</sup> The driving stage should have good regulation and should be capable of supplying considerably more than the required driving power.

<sup>e</sup> Obtained from a fixed supply, grid resistor, or a combination of both.

<sup>f</sup> Low Frequency driving power is absorbed by the grid and grid resistor and does not include circuit losses. At higher frequencies the power furnished by the driver must be greater because of increased tube and circuit losses.

<sup>g</sup> Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

<sup>h</sup> Obtained from a fixed supply, a cathode resistor, a grid resistor, or from a combination of a fixed supply and self-bias.

**CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

|                                     | Note | Min. | Max. |                  |
|-------------------------------------|------|------|------|------------------|
| Filament Current. . . . .           | 1    | 265  | 305  | amp              |
| Amplification Factor. . . . .       | 1,2  | 35   | 45   |                  |
| Direct Interelectrode Capacitances: |      |      |      |                  |
| Grid to plate. . . . .              |      | 45   | 59   | $\mu\mu\text{f}$ |
| Grid to filament. . . . .           |      | 72   | 104  | $\mu\mu\text{f}$ |
| Plate to filament. . . . .          |      | 1.1  | 1.9  | $\mu\mu\text{f}$ |
| Plate Voltage. . . . .              | 1,3  | 3200 | 4200 | volts            |
| Plate Voltage. . . . .              | 1,4  | 6700 | 8700 | volts            |
| Grid Voltage. . . . .               | 1,5  | -310 | -490 | volts            |
| Grid Voltage. . . . .               | 1,6  | -    | 1100 | volts            |

← Indicates a change.



|                               | Note | Min. | Max. |     |
|-------------------------------|------|------|------|-----|
| Peak Cathode Current. . . . . | 7    | 50   | —    | amp |
| Grid Current. . . . .         | 1,6  | —    | 9.5  | amp |
| Useful Power Output . . . . . | 1,8  | 59   | —    | kw  |

Note 1: With 11 volts ac on filament.

Note 2: With dc grid voltage of -50 volts and dc plate voltage adjusted to give dc plate current of 2 amperes.

Note 3: With dc grid voltage of 0 volts and dc plate voltage adjusted to give dc plate current of 2 amperes.

Note 4: With dc grid voltage of -100 volts and dc plate voltage adjusted to give dc plate current of 2 amperes.

Note 5: With dc plate voltage of 15000 volts and dc grid voltage adjusted to give dc plate current of 50 ma.

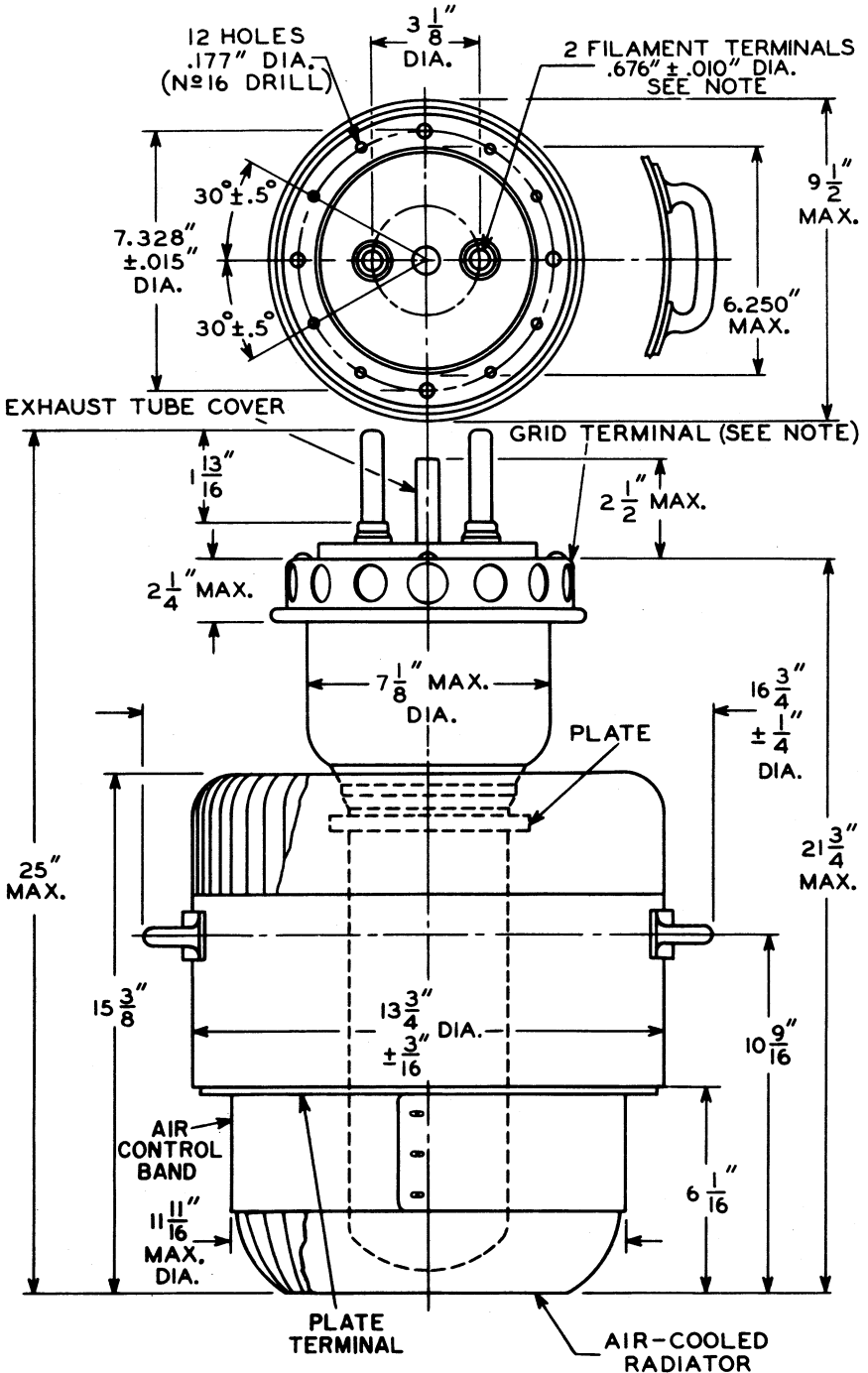
Note 6: With dc plate voltage of 2600 volts and instantaneous grid voltage adjusted to give instantaneous plate current of 35 amperes.

Note 7: Represents the maximum usable cathode current (plate current and grid current) for the tube under any condition of operation.

Note 8: In self-excited oscillator circuit and with dc plate voltage of 15000 volts, dc plate current of 6.6 amperes, dc grid current of 0.8 to 1.0 ampere, grid resistor of  $1600 \pm 10\%$  ohms, and frequency of 1.6 Mc.

### MAXIMUM RATINGS vs OPERATING FREQUENCY

| FREQUENCY                                                                | 10  | 18 | 25 | Mc |
|--------------------------------------------------------------------------|-----|----|----|----|
| MAXIMUM PERMISSIBLE PERCENTAGE OF MAXIMUM RATED PLATE VOLTAGE AND INPUT: |     |    |    |    |
| Class C Telephony (Plate-Modulated)                                      | 100 | 88 | 80 | %  |
| Class C Telegraphy                                                       | 100 | 88 | 80 | %  |

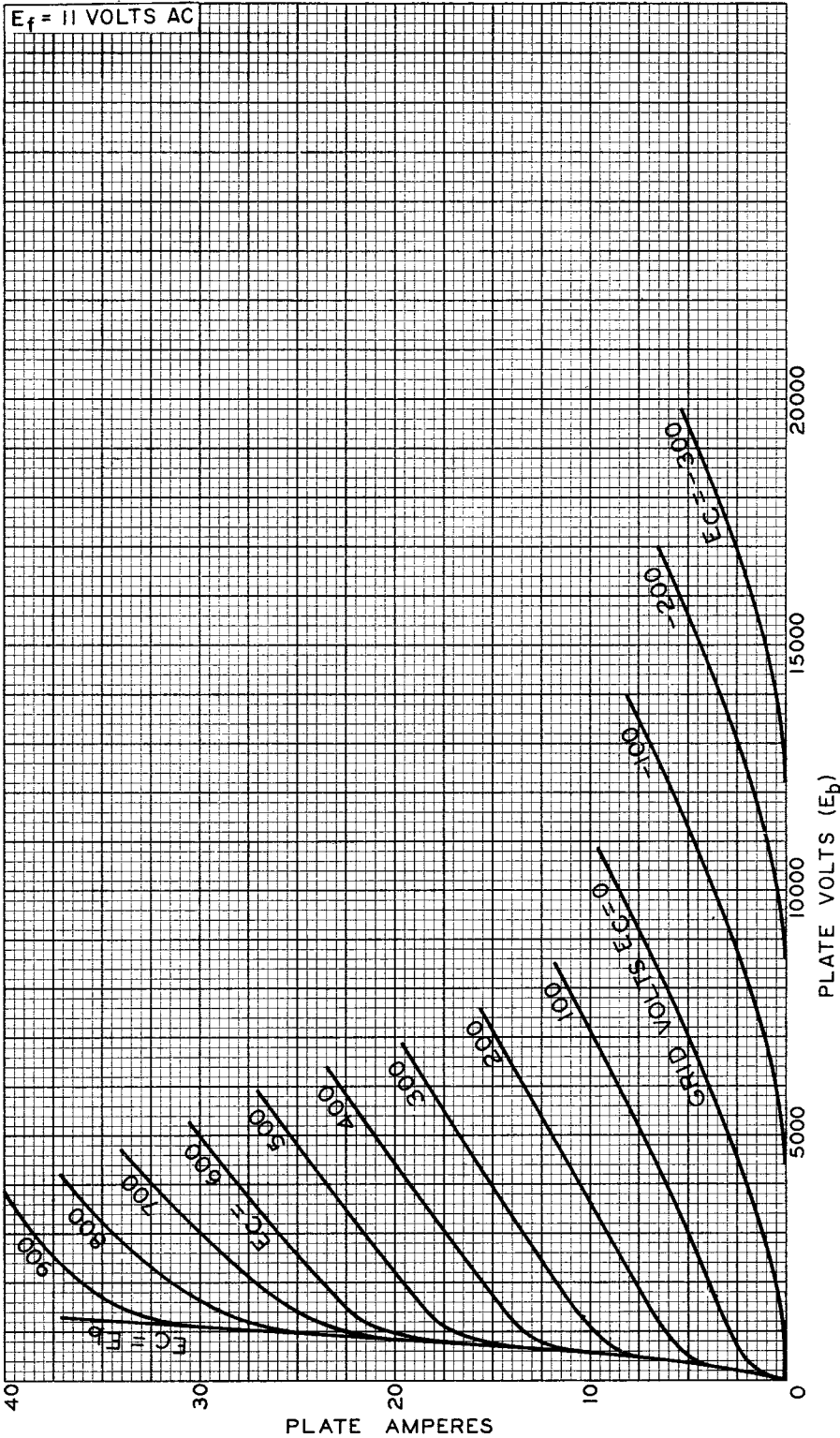


92CM-6897R3

NOTE: FLEXIBLE CONNECTIONS ARE REQUIRED.



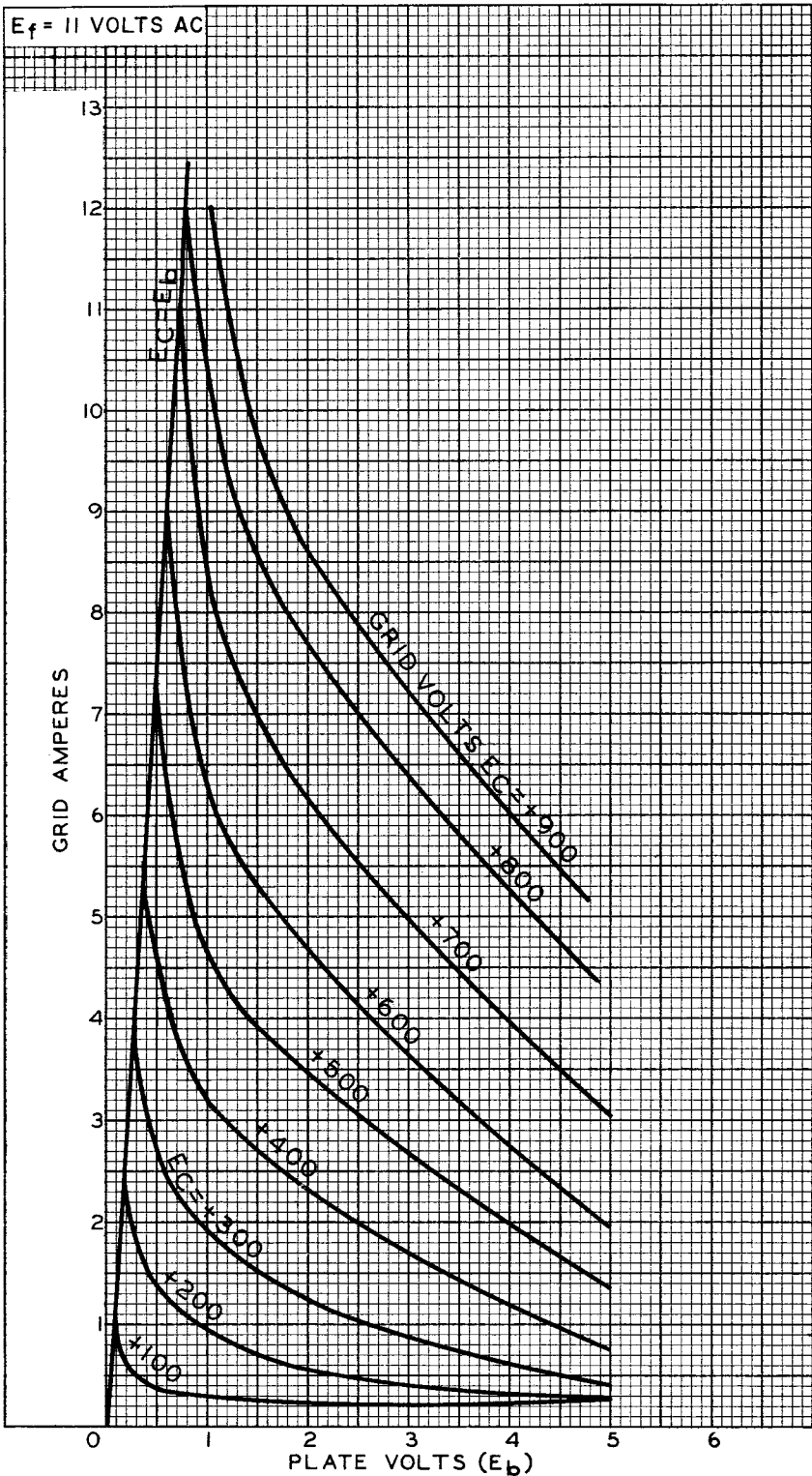
TYPICAL PLATE CHARACTERISTICS



92CM-6899RI



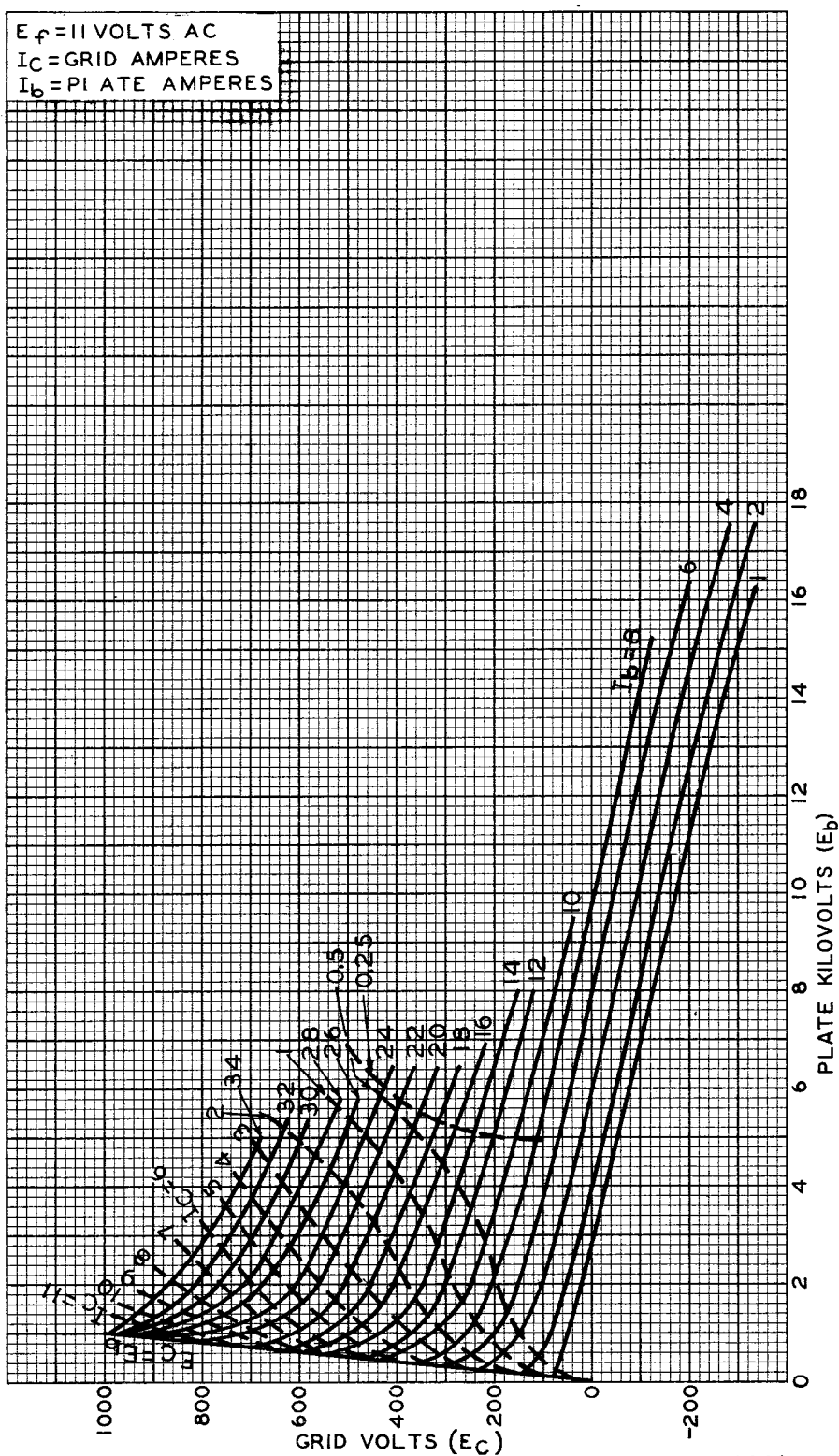
## TYPICAL CHARACTERISTICS



92CM-6900



## TYPICAL CONSTANT-CURRENT CHARACTERISTICS



92CM-6909