# Beam Power Tube

**HIGH POWER SENSITIVITY**
**90 WATTS CW INPUT (ICAS)**
**UP TO 60 Mc**
**CONTROLLED ZERO-BIAS**
**PLATE CURRENT**

**RCA "DARK HEATER"**
**60 WATTS CW INPUT (ICAS)**
**AT 175 Mc**
**CONTROLLED POWER OUTPUT**
**AT REDUCED HEATER VOLTAGE**

**For RF Power Amplifier and Oscillator Service and as an AF Power Amplifier and Modulator in Both Mobile and Fixed Equipment. The 6146A is Unilaterally Interchangeable with the 6146.**

## GENERAL DATA

### Electrical:

| | | |
|---|---|---|
| Heater, for Unipotential Cathode: | | |
| Voltage (Ac or DC)[a] | 6.3 | volts |
| Current at heater volts = 6.3 | 1.25 | amp |
| Transconductance, for plate volts = 200, grid-No.2 volts = 200, and plate ma. = 100 | 7000 | μmhos |
| Mu-Factor, Grid No.2 to Grid No.1 for plate volts = 200, grid-No.2 volts = 200, and plate ma. = 100. | 4.5 | |
| Direct Interelectrode Capacitances:[b] | | |
| Grid No.1 to plate | 0.24 max. | pf |
| Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater | 13.0 | pf |
| Plate to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater | 8.5 | pf |

### Mechanical:

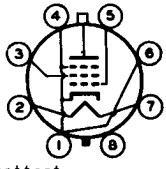
| | |
|---|---|
| Operating Position | Any |
| Maximum Overall Length | 3-13/16" |
| Seated Length | 3-1/8" ± 1/8" |
| Maximum Diameter | 1-23/32" |
| Weight (Approx.) | 2.3 oz |
| Bulb | T12 |
| Cap | Small (JEDEC No.C1-1) |

Bases (Alternates):
- Large-Wafer Octal with Sleeve:
  8-Pin (JEDEC Group 1, No.B8-86)
- Large-Wafer Octal with External Barriers and Sleeve:
  8-Pin (JEDEC Group 1, No.B8-98)
- Small-Wafer Octal with Sleeve:
  8-Pin (JEDEC Group 1, No.B8-150)
- Small-Wafer Octal with External Barriers and Sleeve:
  8-Pin (JEDEC Group 1, No.B8-159)

# 6146A

Basing Designation for BOTTOM VIEW. . . . . 7CK

Pin 1 – Cathode, Grid No.3, Internal Shield
Pin 2 – Heater
Pin 3 – Grid No.2
Pin 4 – Same as Pin 1



Pin 5 – Grid No.1
Pin 6 – Same as Pin 1
Pin 7 – Heater
Pin 8 – Base Sleeve Cap – Plate

Bulb temperature (At hottest point on bulb surface). . . . . 220 max. °C

## AF POWER AMPLIFIER & MODULATOR — Class $AB_1$[c]

**Maximum Ratings,** *Absolute-Maximum Values:*

| | *CCS*[d] | *ICAS*[e] | |
|---|---|---|---|
| DC PLATE VOLTAGE. . . . . | 600 max. | 750 max. | volts |
| DC GRID-No.2 VOLTAGE. . . . . | 250 max. | 250 max. | volts |
| MAX.-SIGNAL DC PLATE CURRENT[f] . | 125 max. | 135 max. | ma |
| MAX.-SIGNAL PLATE INPUT[f]. . . . | 60 max. | 85 max. | watts |
| MAX.-SIGNAL GRID-No.2 INPUT[f]. . | 3 max. | 3 max. | watts |
| PLATE DISSIPATION[f]. . . . . | 20 max. | 25 max. | watts |
| PEAK HEATER-CATHODE VOLTAGE: | | | |
| Heater negative with respect to cathode. . . . . | 135 max. | 135 max. | volts |
| Heater positive with respect to cathode. . . . . | 135 max. | 135 max. | volts |

**Typical CCS Push-Pull Operation:**

*Values are for 2 tubes*

| | | | | |
|---|---|---|---|---|
| DC Plate Voltage. . . . . | 400 | 500 | 600 | volts |
| DC Grid-No.2 Voltage[g] . . . . . | 190 | 185 | 180 | volts |
| DC Grid-No.1 Voltage: | | | | |
| From fixed-bias source. . . . | -40 | -40 | -45 | volts |
| Peak AF Grid-No.1-to-Grid-No.1 Voltage[h]. . . . . | 80 | 80 | 90 | volts |
| Zero-Signal DC Plate Current. . | 63 | 57 | 26 | ma |
| Max.-Signal DC Plate Current. . | 228 | 215 | 200 | ma |
| Zero-Signal DC Grid-No.2 Current . . . . . | 2.5 | 2 | 1 | ma |
| Max.-Signal DC Grid-No.2 Current . . . . . | 25 | 25 | 23 | ma |
| Effective Load Resistance (Plate to plate). . . . . | 4000 | 5500 | 7000 | ohms |
| Max.-Signal Driving Power (Approx.) . . . . . | 0 | 0 | 0 | watts |
| Max.-Signal Power Output (Approx.) . . . . . | 55 | 70 | 82 | watts |

**Typical ICAS Push-Pull Operation:**

*Values are for 2 tubes*

| | | | |
|---|---|---|---|
| DC Plate Voltage. . . . . | 600 | 750 | volts |
| DC Grid-No.2 Voltage[g] . . . . . | 200 | 195 | volts |

| | | | |
|---|---|---|---|
| DC Grid-No.1 Voltage: | | | |
| From fixed-bias source. . . . . | -50 | -50 | volts |
| Peak AF Grid-No.1-to-Grid-No.1 Voltage[h]. . . . . | 100 | 100 | volts |
| Zero-Signal DC Plate Current. . . . . | 28 | 23 | ma |
| Max.-Signal DC Plate Current. . . . . | 229 | 220 | ma |
| Zero-Signal DC Grid-No.2 Current. . . | 1 | 1 | ma |
| Max.-Signal DC Grid-No.2 Current. . . | 27 | 26 | ma |
| Effective Load Resistance (Plate to plate). . . . . | 6000 | 8000 | ohms |
| Max.-Signal Driving Power (Approx.) . | 0 | 0 | watts |
| Max.-Signal Power Output (Approx.). . | 95 | 120 | watts |

**Maximum Circuit Values (CCS or ICAS):**

Grid-No.1-Circuit Resistance under any condition:[j]

| | |
|---|---|
| With fixed bias . . . . . | 0.1 max. megohm |
| With cathode bias . . . . . | Not recommended |

## AF POWER AMPLIFIER & MODULATOR — Class $AB_2$[k]

**Maximum Ratings,** *Absolute-Maximum Values:*

| | *CCS* | *ICAS* | |
|---|---|---|---|
| DC PLATE VOLTAGE. . . . . | 600 max. | 750 max. | volts |
| DC GRID-No.2 VOLTAGE. . . . . | 250 max. | 250 max. | volts |
| MAX.-SIGNAL DC PLATE CURRENT[f] . | 125 max. | 135 max. | ma |
| MAX.-SIGNAL PLATE INPUT[f]. . . . | 62.5 max. | 90 max. | watts |
| MAX.-SIGNAL GRID-No.2 INPUT[f]. . | 3 max. | 3 max. | watts |
| PLATE DISSIPATION[f]. . . . . | 20 max. | 25 max. | watts |
| PEAK HEATER-CATHODE VOLTAGE: | | | |
| Heater negative with respect to cathode. . . . . | 135 max. | 135 max. | volts |
| Heater positive with respect to cathode. . . . . | 135 max. | 135 max. | volts |

**Typical CCS Push-Pull Operation:**

*Values are for 2 tubes*

| | | | | |
|---|---|---|---|---|
| DC Plate Voltage. . . . . | 400 | 500 | 600 | volts |
| DC Grid-No.2 Voltage[g] . . . . . | 175 | 175 | 165 | volts |
| DC Grid-No.1 Voltage: | | | | |
| From fixed-bias source. . . . | -41 | -44 | -44 | volts |
| Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . . | 95 | 102 | 97 | volts |
| Zero-Signal DC Plate Current. . | 33 | 27 | 22 | ma |
| Max.-Signal DC Plate Current. . | 232 | 242 | 207 | ma |
| Zero-Signal DC Grid-No.2 Current . . . . . | 1.1 | 0.7 | 0.6 | ma |
| Max.-Signal DC Grid-No.2 Current . . . . . | 18 | 18 | 17 | ma |
| Max.-Signal DC Grid-No.1 Current . . . . . | 1.6 | 1.9 | 1.1 | ma |
| Effective Load Resistance (Plate to plate). . . . . | 3700 | 4600 | 6800 | ohms |
| Max.-Signal Driving Power (Approx.)[m]. . . . . | 0.2 | 0.3 | 0.2 | watt |

| | | | | |
|---|---|---|---|---|
| Max.-Signal Power Output (Approx.) | 62 | 83 | 90 | watts |

**Typical ICAS Push-Pull Operation:**

*Values are for 2 tubes*

| | | | |
|---|---|---|---|
| DC Plate Voltage | 600 | 750 | volts |
| DC Grid-No.2 Voltage[g] | 190 | 165 | volts |
| DC Grid-No.1 Voltage: From fixed-bias source | -48 | -46 | volts |
| Peak AF Grid-No.1-to-Grid-No.1 Voltage | 109 | 108 | volts |
| Zero-Signal DC Plate Current | 28 | 22 | ma |
| Max.-Signal DC Plate Current | 270 | 240 | ma |
| Zero-Signal DC Grid-No.2 Current | 1.2 | 0.3 | ma |
| Max.-Signal DC Grid-No.2 Current | 20 | 20 | ma |
| Max.-Signal DC Grid-No.1 Current | 2 | 2.6 | ma |
| Effective Load Resistance (Plate to plate) | 5000 | 7400 | ohms |
| Max.-Signal Driving Power (Approx.)[m] | 0.3 | 0.4 | watt |
| Max.-Signal Power Output (Approx.) | 113 | 131 | watts |

**Maximum Circuit Values (CCS or ICAS):**

Grid-No.1-Circuit Resistance:[n]

| | |
|---|---|
| With fixed bias | 30000 max. ohms |
| With cathode bias | Not recommended |

## LINEAR RF POWER AMPLIFIER — CLass AB$_1$
## Single-Sideband Suppressed-Carrier Service

| | *CCS* | *ICAS* | |
|---|---|---|---|
| **Maximum Ratings,** *Absolute-Maximum Values up to 60 Mc:* | | | |
| DC PLATE VOLTAGE | 600 max. | 750 max. | volts |
| DC GRID-No.2 VOLTAGE | 250 max. | 250 max. | volts |
| MAX.-SIGNAL DC PLATE CURRENT | 125 max. | 135 max. | ma |
| MAX.-SIGNAL PLATE INPUT | 60 max. | 85 max. | watts |
| MAX.-SIGNAL GRID-No.2 INPUT | 3 max. | 3 max. | watts |
| PLATE DISSIPATION | 20 max. | 25 max. | watts |
| PEAK HEATER-CATHODE VOLTAGE: | | | |
| Heater negative with respect to cathode | 135 max. | 135 max. | volts |
| Heater positive with respect to cathode | 135 max. | 135 max. | volts |

**Typical "Single-Tone" Operation:[p]**

| | *At 60 Mc* | | | | |
|---|---|---|---|---|---|
| DC Plate Voltage | 400 | 600 | 600 | 750 | volts |
| DC Grid-No.2 Voltage[q] | 190 | 180 | 200 | 195 | volts |
| DC Grid-No.1 Voltage[r] | -40 | -45 | -50 | -50 | volts |
| Zero-Signal DC Plate Current | 32 | 13 | 14 | 12 | ma |
| Effective RF Load Resistance | 2000 | 3500 | 3000 | 4000 | ohms |

| | CCS | | ICAS | | |
|---|---|---|---|---|---|
| Max.-Signal DC Plate Current. | 114 | 100 | 115 | 110 | ma |
| Max.-Signal DC Grid-No.2 Current . . . . . | 12 | 11 | 14 | 13 | ma |
| Max.-Signal Peak RF Grid-No.1 Voltage . . . . . | 40 | 45 | 50 | 50 | volts |
| Max.-Signal Driving Power (Approx.) . . . . . | 0 | 0 | 0 | 0 | watts |
| Max.-Signal Power Output (Approx.) . . . . . | 27 | 41 | 48 | 60 | watts |

**Maximum Circuit Values (CCS or ICAS):**

Grid-No.1-Circuit Resistance:[j]

| | |
|---|---|
| With fixed bias . . . . . | 30000 max. ohms |
| With cathode bias . . . . . | Not recommended |

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

*Carrier conditions per tube for use with a maximum modulation factor of 1 and at frequencies up to 60 Mc*

| | CCS | ICAS | |
|---|---|---|---|
| **Maximum Ratings,** *Absolute-Maximum Values:* | | | |
| *For maximum plate voltage and maximum plate input above 60 Mc, see Rating Chart I* | | | |
| DC PLATE VOLTAGE. . . . . | 480 max. | 600 max. | volts |
| DC GRID-No.2 VOLTAGE. . . . . | 250 max. | 250 max. | volts |
| DC GRID-No.1 VOLTAGE. . . . . | -150 max. | -150 max. | volts |
| DC PLATE CURRENT. . . . . | 117 max. | 125 max. | ma |
| DC GRID-No.1 CURRENT. . . . . | 3.5 max. | 4 max. | ma |
| PLATE INPUT . . . . . | 45 max. | 67.5 max. | watts |
| GRID-No.2 INPUT . . . . . | 2 max. | 2 max. | watts |
| PLATE DISSIPATION . . . . . | 13.3 max. | 16.7 max. | watts |
| PEAK HEATER-CATHODE VOLTAGE: | | | |
| Heater negative with respect to cathode. . . . . | 135 max. | 135 max. | volts |
| Heater positive with respect to cathode. . . . . | 135 max. | 135 max. | volts |
| **Typical Operation:** | | | |
| DC Plate Voltage. . . . . | 400 475 | 600 | volts |
| DC Grid-No.2 Voltage:[s] | | | |
| From a grid-No.2 series resistor of: | | | |
| 33000 ohms. . . . . | 150 - | - | volts |
| 51000 ohms. . . . . | - 135 | - | volts |
| 56000 ohms. . . . . | - - | 150 | volts |
| DC Grid-No.1 Voltage:[t] | | | |
| From a grid-No.1 resistor of 27000 ohms . . . . . | -87 -77 | -87 | volts |
| Peak RF Grid-No.1 Voltage . . . | 107 95 | 107 | volts |
| DC Plate Current. . . . . | 112 94 | 112 | ma |
| DC Grid-No.2 Current. . . . . | 7.8 6.4 | 7.8 | ma |
| DC Grid-No.1 Current (Approx.). | 3.4 2.8 | 3.4 | ma |

| | CCS | | ICAS | |
|---|---|---|---|---|
| Driving Power (Approx.) | 0.4 | 0.3 | 0.4 | watt |
| Power Output (Approx.) | 32 | 34 | 52 | watts |

**Maximum Circuit Value (CCS or ICAS):**

Grid-No.1-Circuit Resistance[u] . . . . . 30000 max. ohms

## RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy[v] and RF POWER AMPLIFIER — Class C FM Telephony

**Maximum Ratings,** *Absolute-Maximum Values:*

| | CCS | ICAS | |
|---|---|---|---|
| *At frequencies up to 60 Mc. and maximum plate input above 60 Mc, see Rating Chart II.* | *For maximum plate voltage* | | |
| DC PLATE VOLTAGE | 600 max. | 750 max. | volts |
| DC GRID-No.2 VOLTAGE | 250 max. | 250 max. | volts |
| DC GRID-No.1 VOLTAGE | -150 max. | -150 max. | volts |
| DC PLATE CURRENT | 140 max. | 150 max. | ma |
| DC GRID-No.1 CURRENT | 3.5 max. | 4 max. | ma |
| PLATE INPUT | 67.5 max. | 90 max. | watts |
| GRID-No.2 INPUT | 3 max. | 3 max. | watts |
| PLATE DISSIPATION | 20 max. | 25 max. | watts |
| PEAK HEATER-CATHODE VOLTAGE: | | | |
| Heater negative with respect to cathode | 135 max. | 135 max. | volts |
| Heater positive with respect to cathode | 135 max. | 135 max. | volts |

**Typical Operation:**

| *As amplifier up to 60 Mc* | | | | | |
|---|---|---|---|---|---|
| DC Plate Voltage | 500 | 600 | 600 | 750 | volts |
| DC Grid-No.2 Voltage:[w] | | | | | |
| From a grid-No.2 series resistor of: | | | | | |
| 36000 ohms | 170 | – | – | – | volts |
| 51000 ohms | – | 150 | – | – | volts |
| 43000 ohms | – | – | 180 | – | volts |
| 56000 ohms | – | – | – | 160 | volts |
| DC Grid-No.1 Voltage:[x] | | | | | |
| From a grid-No.1 resistor of: | | | | | |
| 27000 ohms | -66 | – | – | – | volts |
| 20000 ohms | – | -58 | – | -62 | volts |
| 24000 ohms | – | – | -71 | – | volts |
| From cathode resistor of: | | | | | |
| 430 ohms | – | – | -71 | – | volts |
| 470 ohms | -66 | -58 | – | -62 | volts |
| Peak RF Grid-No.1 Voltage | 84 | 73 | 91 | 79 | volts |
| DC Plate Current | 135 | 112 | 150 | 120 | ma |
| DC Grid-No.2 Current | 9 | 9 | 10 | 11 | ma |
| DC Grid-No.1 Current (Approx.) | 2.5 | 2.8 | 2.8 | 3.1 | ma |
| Driving Power (Approx.) | 0.2 | 0.2 | 0.3 | 0.2 | watt |
| Power Output (Approx.) | 48 | 52 | 66 | 70 | watts |

| | CCS | ICAS | |
|---|---|---|---|
| **Typical Operation:** | | | |
| *As amplifier up to 175 Mc* | | | |
| DC Plate Voltage | 320 | 400 | volts |
| DC Grid-No.2 Voltage:[w] | | | |
| From grid-No.2 series resistor of: | | | |
| 13000 ohms | 180 | – | volts |
| 20000 ohms | – | 190 | volts |
| DC Grid-No.1 Voltage:[x] | | | |
| From a grid-No.1 resistor of: | | | |
| 27000 ohms | -51 | – | volts |
| 24000 ohms | – | -54 | volts |
| From cathode resistor of | | | |
| 330 ohms | -51 | -54 | volts |
| Peak RF Grid-No.1 Voltage | 64 | 68 | volts |
| DC Plate Current | 140 | 150 | ma |
| DC Grid-No.2 Current | 10 | 10.4 | ma |
| DC Grid-No.1 Current (Approx.) | 2 | 2.2 | ma |
| Driving Power (Approx.) | 3 | 3 | watts |
| Power Output (Approx.) | 25 | 35 | watts |

| | | |
|---|---|---|
| **Maximum Circuit Values (CCS or ICAS):** | | |
| Grid-No.1 Circuit Resistance[u] | 30000 max. | ohms |

[a] Heater voltage fluctuations will cause variations in power output. See *Test No.8* under *Characteristics Range Values*.

[b] Without external shield.

[c] Subscript 1 indicates that grid-No.1 current does not flow during any part of the input cycle.

[d] Continuous Commercial Service.

[e] Intermittent Commercial and Amateur Service.

[f] Averaged over any audio-frequency cycle of sine-wave form.

[g] Obtained preferably from a separate source or from the plate-voltage supply with a voltage divider.

[h] The driver stage should be capable of supplying the No.1 grids of the class $AB_1$ stage with the specified driving voltage at low distortion.

[j] The type of input coupling network used should not introduce too much resistance in the grid-No.1 circuit. Transformer or impedance coupling devices are recommended.

[k] Subscript 2 indicates that grid-No.1 current flows during some part of the input cycle.

[m] Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the $AB_2$ stage.

[n] To minimize distortion, the effective resistance per grid-No.1 circuit of the $AB_2$ stage should be held at a low value. For this purpose, the use of transformer coupling is recommended. In no case, however, should the total dc grid-No.1-circuit resistance exceed 30000 ohms when the 6146A is operated at maximum ratings. For operation at less than maximum ratings, the dc grid-No.1-circuit resistance may be as high as 100000 ohms.

[p] "Single-Tone" operation refers to that class of amplifier service in which the grid No.1 input consists of a monofrequency rf signal having constant amplitude. This signal is produced in a single-sideband suppressed-carrier system when a single audio frequency of constant amplitude is applied to the input of the system.

[q] Obtained preferably from a separate, well regulated source.

[r] Obtained from a fixed supply.

[s] Obtained preferably from a separate source modulated with the plate supply, or from the modulated plate supply through a series resistor.

[t] Obtained from grid-No.1 resistor or from a combination of grid-No.1 resistor with either fixed supply or cathode resistor.

[u] When grid No.1 is driven positive ang the 6146A is operated at maximum ratings, the total dc grid-No.1-circuit resistance should not exceed the specified value of 30000 ohms. If this value is insufficient to provide adequate bias, the additional required bias must be supplied by a cathode resistor or fixed supply. For operation at less than maximum ratings, the dc grid-No.1-circuit resistance may be as high as 100000 ohms.

[v] Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

[w] Obtained preferably from separate source, or from the plate-supply voltage with a voltage divider, or through a series resistor. A series grid-No.2 resistor should be used only when the 6146A is used in a circuit which is not keyed. Grid-No.2 voltage must not exceed 400 volts under key-up conditions.

[x] Obtained from fixed supply, by grid-No.1 resistor, by cathode resistor, or by combination methods.

## CHARACTERISTICS RANGE VALUES

| *Test No.* | *Note* | *Min.* | *Max.* | |
|---|---|---|---|---|
| 1. Heater Current . . . . . | 1 | 1.175 | 1.325 | amp |
| 2. Direct Interelectrode Capacitances: | | | | |
| Grid No.1 to plate . . . . | 2 | – | 0.24 | pf |
| Grid-No.1 to cathode & grid No.3 & internal shield, base sleeve, grid No.2, and heater . . . . . | 2 | 12.0 | 15.0 | pf |
| Plate to cathode & grid No.3 & internal shield, base sleeve, grid No.2, and heater . . . . . | 2 | 7.3 | 9.5 | pf |
| 3. Plate Current. . . . . | 1,3 | 46 | 94 | ma |
| 4. Zero-Bias Plate Current. . . | 1,4 | 330 | – | ma |
| 5. Grid-No.2 Current. . . . . | 1,3 | – | 5.5 | ma |
| 6. Dynamic Grid-No.2 Current. . | 1,5 | .3 | 21 | ma |
| 7. Useful Power Output I. . . . | 1,5 | 47 | – | watts |
| 8. Useful Power Output II . . . . . | See *Note 6* | | | |

Note 1: With 6.3 volts ac on heater.

Note 2: Without external shield.

Note 3: With dc plate volts = 300, dc grid-No.2 volts = 200, and dc grid-No.1 volts = -33.

Note 4: With dc plate volts = 100, dc grid No.2 volts = 200, and dc grid No.1 volts = -100. Grid No.1 is square-wave pulsed at 1000 kc to zero volts. Limit value is peak-pulse current.

Note 5: In a single-tube, self-excited oscillator circuit, and with dc plate volts = 600, dc grid-No.2 volts = 180, grid-No.1 resistor (ohms) = 30000 ± 10%, dc plate ma. = 112, dc grid-No.1 ma. = 2 to 2.5, and frequency (Mc) = 15.

Note 6: With conditions in test No.7 reduce heater voltage to 5 volts. Useful power output shall be at least 90 per cent of that at heater volts = 6.3.

## MAXIMUM RATINGS vs OPERATING FREQUENCY

| OPERATING FREQUENCY Mc | MAXIMUM PERMISSIBLE PERCENTAGE OF MAXIMUM-RATED PLATE VOLTAGE & PLATE INPUT | | | |
|---|---|---|---|---|
| | TELEPHONY | | TELEGRAPHY | |
| | Class C Plate-Modulated | | Class C Unmodulated | |
| | *Voltage* | *Input* | *Voltage* | *Input* |
| 60 | 100 | 100 | 100 | 100 |
| 80 | 84 | 92 | 84 | 92 |
| 125 | 65 | 78 | 65 | 78 |
| 150 | 58 | 72 | 58 | 72 |
| 160 | 56 | 70 | 56 | 70 |
| 175 | 53 | 67 | 53 | 67 |

## OPERATING CONSIDERATIONS

The maximum bulb temperature of 220° C is a tube rating and is to be observed in the same manner as other ratings. The temperature may be measured with temperature-sensitive paint, such as Tempilaq. The latter is made by the Tempil Corporation, 132 W. 22nd Street, New York 11, N.Y.

To insure adequate cooling it is essential that free circulation of air be provided around the tube. In most cases, no additional air is required.

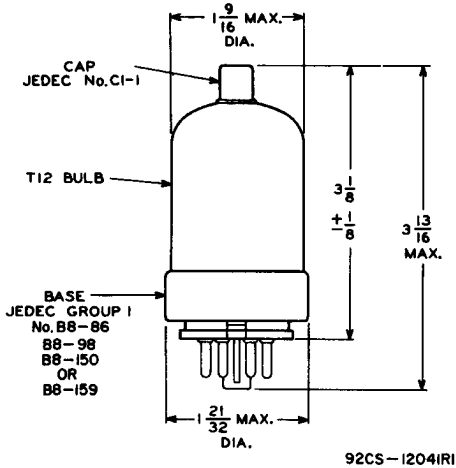
The plate shows no color when the 6146A is operated at full ratings under either CCS or ICAS conditions.

Connections to the plate should be made with a flexible lead to prevent any strain on the seal at the cap.

*During standby periods* in intermittent operation, it is recommended that the heater voltage be maintained at normal operating value when the period is less than 15 minutes, and that it be reduced to 80 per cent of normal when the period is between 15 minutes and 2 hours. For longer periods, the heater voltage should be turned off.

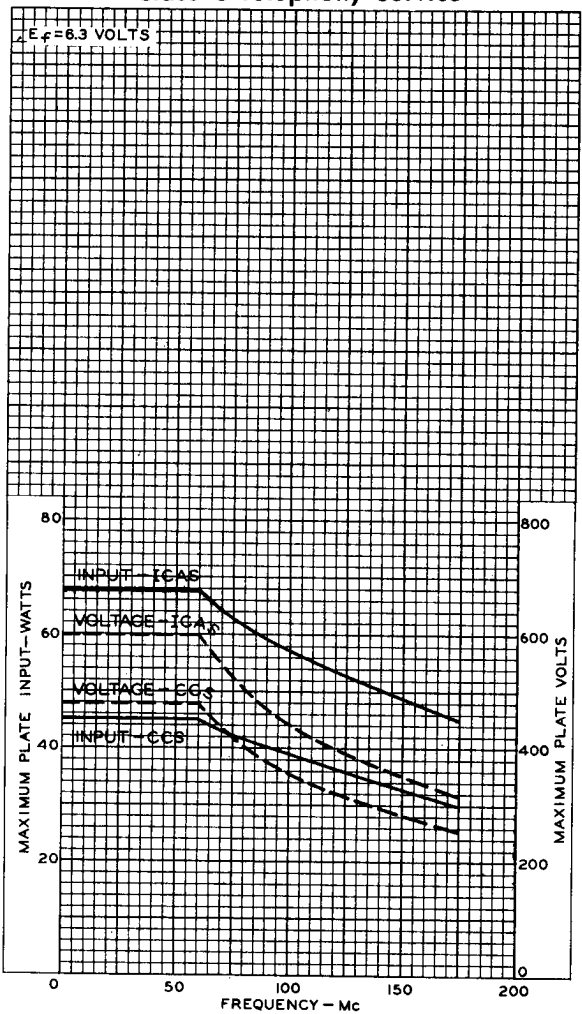
*The maximum-rated plate and grid-No.2 voltages of this tube are extremely dangerous.* Great care should be taken during the adjustment of circuits. The tube and its associated apparatus, especially all parts which may be at high potential above ground, should be housed in a protective enclosure. The protective housing should be designed with interlocks so that personnel can not possibly come in contact with any high-potential point in the electrical system. The interlock devices should function to break the primary circuit of the high-voltage supplies when any gate or door on the protective housing is opened, and should prevent the closing of the primary circuit until the door is again locked.

# 6146A



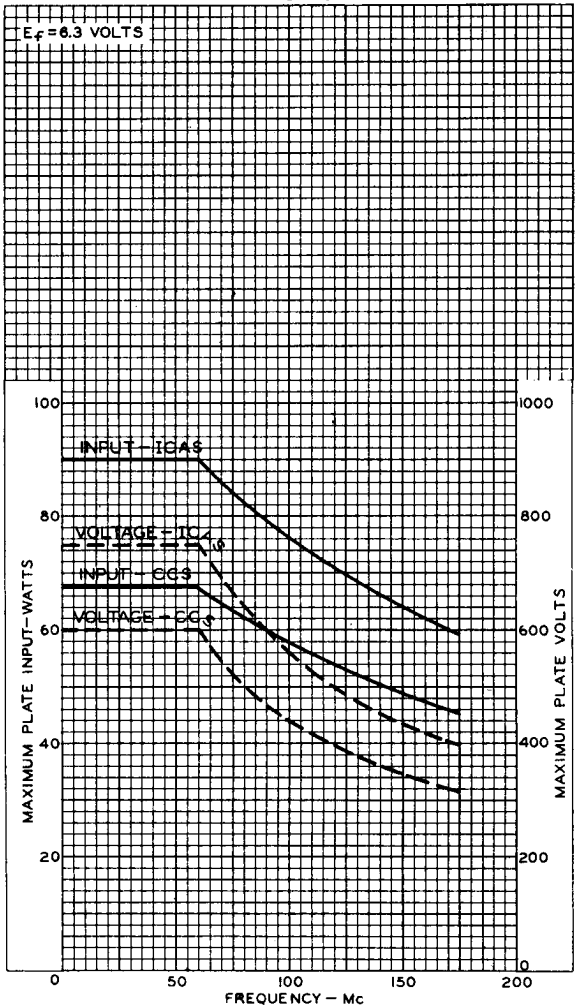

DIMENSIONS IN INCHES

## RATING CHART I
## Class C Telephony Service



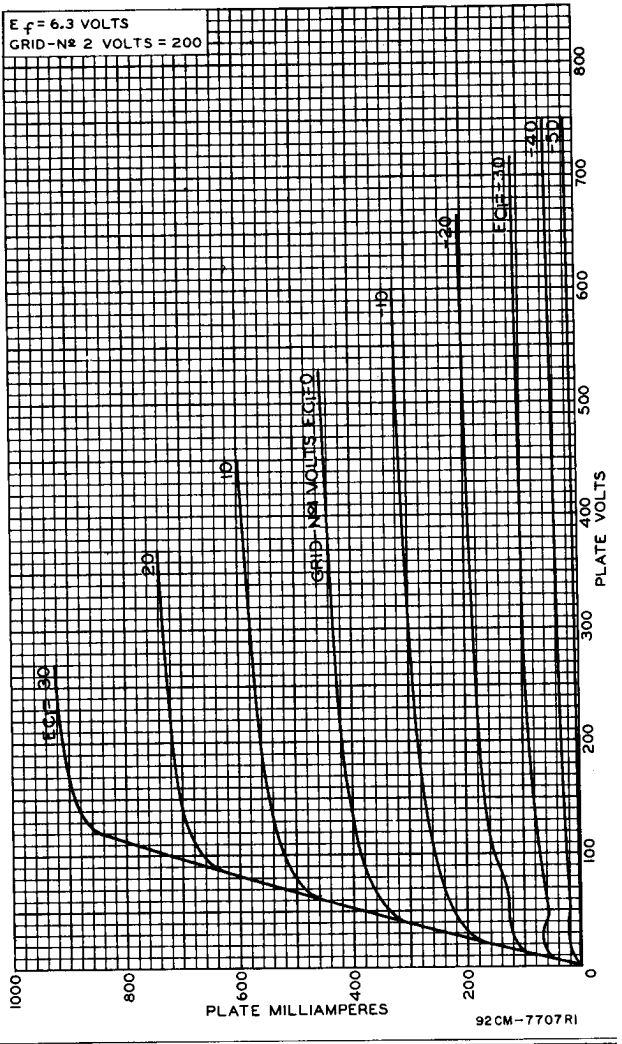

92CM-7712RI

## RATING CHART II
## Class C Telegraphy Service




92CM-7709R1

## TYPICAL PLATE CHARACTERISTICS



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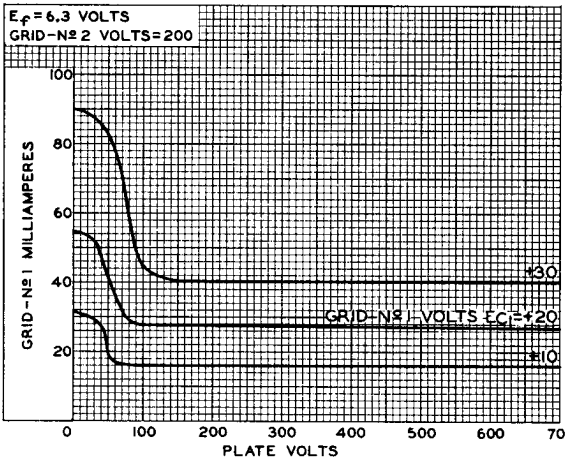
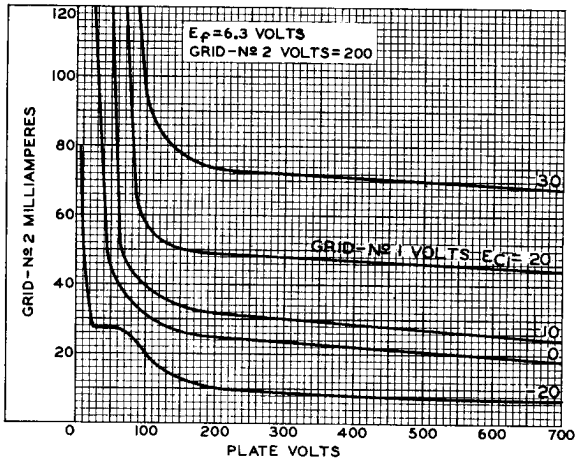



92CS-9617




92CS-9618

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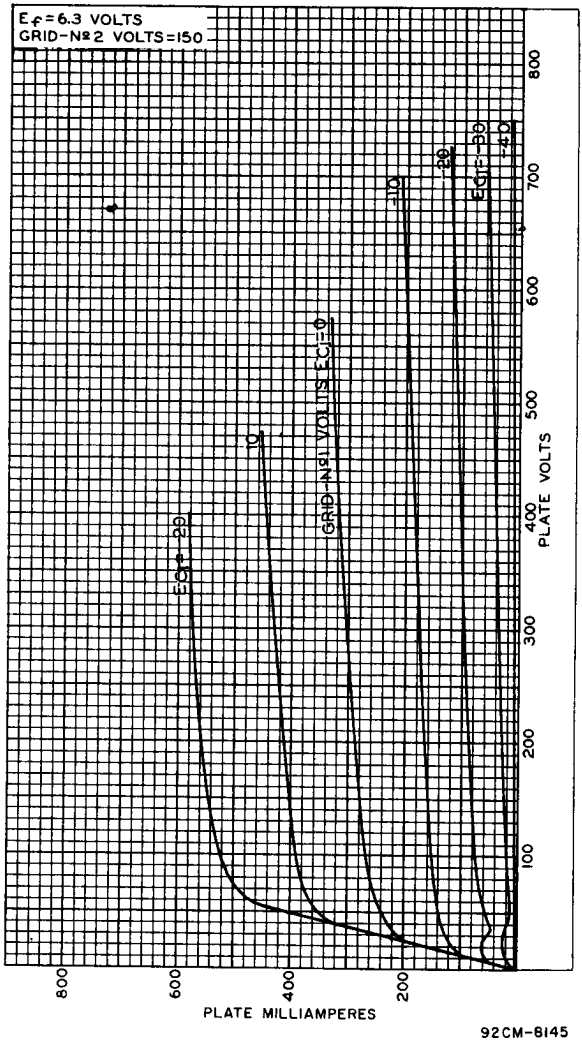


92CM-8145

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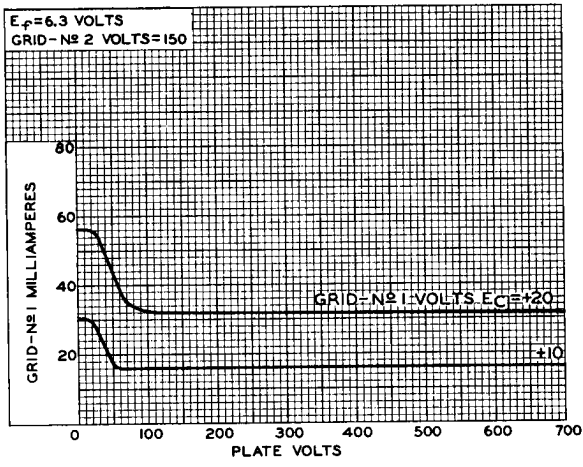
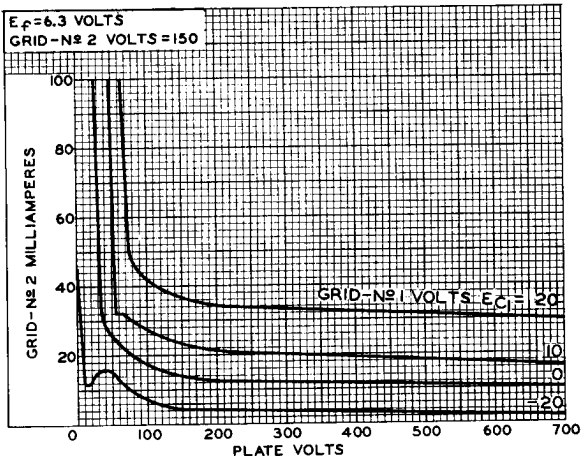



92CS-9619




92CS-9620