

# Beam Power Tube

## GENERAL DATA

### Electrical:

Heater Characteristics and Ratings (*Design-Maximum Values*):

Voltage (AC or DC) . . . . .  $6.3 \pm 0.6$  volts

Current at heater volts = 6.3 . . . . . 0.800 amp

Peak heater-cathode voltage:

Heater negative with respect to cathode . . . . . 200 max. volts

Heater positive with respect to cathode . . . . . 200<sup>a</sup> max. volts

Direct Interelectrode Capacitances (Approx.):<sup>b</sup>

Grid No.1 to plate . . . . . 0.25  $\mu\text{mf}$

Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . . 10  $\mu\text{mf}$

Plate to cathode & grid No.3, grid No.2, and heater . . . . . 5  $\mu\text{mf}$

### Mechanical:

Operating Position . . . . . Any

Type of Cathode . . . . . Coated Unipotential

Maximum Overall Length . . . . . 3-5/16"

Maximum Seated Length . . . . . 2-3/4"

Maximum Diameter . . . . . 1-9/32"

Dimensional Outline . . . . . See *General Section*

Bulb . . . . . T9

Bases (Alternates):

Intermediate-Shell Octal with External Barriers:

8-Pin (JEDEC Group 1, No.B8-142)

7-Pin, Arrangement 2 (JEDEC Group 1, No.B7-233)

Short Intermediate-Shell Octal with External Barriers:

7-Pin, Arrangement 2 (JEDEC Group 1, No.B7-238)

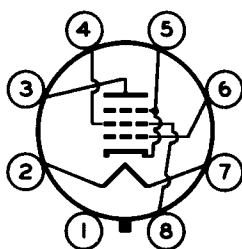
Basing Designation for BOTTOM VIEW . . . . . 8KQ

Pin 1—No Internal Connection<sup>c</sup>

Pin 2—Heater

Pin 3—Plate

Pin 4—Grid No.2



Pin 5—Cathode, Grid No.3

Pin 6—Grid No.1

Pin 7—Heater

Pin 8—Grid No.2

## AF POWER AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, *Design-Maximum Values*:

PLATE VOLTAGE . . . . . 550 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . . 440 max. volts

CATHODE CURRENT . . . . . 85 max. ma

GRID-No.2 INPUT . . . . . 3.3<sup>d</sup> max. watts

PLATE DISSIPATION . . . . . 19 max. watts



## Typical Operation and Characteristics:

|                                           |       |            |
|-------------------------------------------|-------|------------|
| Plate Voltage . . . . .                   | 300   | volts      |
| Grid-No.2 Voltage . . . . .               | 300   | volts      |
| Grid-No.1 (Control-Grid) Voltage. . . . . | -10   | volts      |
| Peak AF Grid-No.1 Voltage . . . . .       | 10    | volts      |
| Zero-Signal Plate Current . . . . .       | 60    | ma         |
| Max.-Signal Plate Current . . . . .       | 75    | ma         |
| Zero-Signal Grid-No.2 Current . . . . .   | 8     | ma         |
| Max.-Signal Grid-No.2 Current . . . . .   | 15    | ma         |
| Plate Resistance (Approx.) . . . . .      | 29000 | ohms       |
| Triode Amplification Factor . . . . .     | 16.8  |            |
| Transconductance. . . . .                 | 10200 | $\mu$ mhos |
| Load Resistance . . . . .                 | 3000  | ohms       |
| Total Harmonic Distortion . . . . .       | 13    | %          |
| Max.-Signal Power Output. . . . .         | 11    | watts      |

## Maximum Circuit Values:

|                                     |          |        |
|-------------------------------------|----------|--------|
| Grid-No.1-Circuit Resistance:       |          |        |
| For fixed-bias operation. . . . .   | 0.3 max. | megohm |
| For cathode-bias operation. . . . . | 1 max.   | megohm |

## PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

|                                           |                       |       |
|-------------------------------------------|-----------------------|-------|
| PLATE VOLTAGE . . . . .                   | 550 max.              | volts |
| GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . . | 440 max.              | volts |
| CATHODE CURRENT . . . . .                 | 85 max.               | volts |
| GRID-No.2 INPUT . . . . .                 | 3.3 <sup>d</sup> max. | watts |
| PLATE DISSIPATION . . . . .               | 19 max.               | watts |

## Typical Operation:

Values are for 2 tubes

|                                                 | Fixed Bias |       |     |       |     | Cathode Bias |       |
|-------------------------------------------------|------------|-------|-----|-------|-----|--------------|-------|
| Plate Supply                                    |            |       |     |       |     |              |       |
| Voltage . . . . .                               | 300        | 350   | 400 | 450   | 450 | 450          | volts |
| Grid-No.2 Supply                                |            |       |     |       |     |              |       |
| Voltage . . . . .                               | 300        | 350   | 350 | 350   | 400 | 400          | volts |
| Grid-No.1 (Control-Grid)                        |            |       |     |       |     |              |       |
| Voltage . . . . .                               | -12.5      | -15.5 | -16 | -16.5 | -21 | -            | volts |
| Cathode Resistor.                               | -          | -     | -   | -     | -   | 200          | ohms  |
| Peak AF Grid-No.1-to-Grid-No.1 Voltage. . . . . | 25         | 31    | 32  | 33    | 42  | 28           | volts |
| Zero-Signal Plate Current . . . . .             | 86         | 92    | 85  | 77    | 66  | 82           | ma    |
| Max.-Signal Plate Current . . . . .             | 116        | 130   | 143 | 153   | 144 | 94           | ma    |
| Zero-Signal Grid-No.2 Current. . . . .          | 12.6       | 13    | 11  | 9.6   | 9.4 | 11.5         | ma    |
| Max.-Signal Grid-No.2 Current. . . . .          | 26         | 28.6  | 27  | 27    | 30  | 22           | ma    |

|                                                     |      |      |      |      |      |      |       |
|-----------------------------------------------------|------|------|------|------|------|------|-------|
| Effective Load Resistance (Plate to plate). . . . . | 6600 | 6600 | 6600 | 6600 | 6600 | 9000 | ohms  |
| Total Harmonic Distortion. . . . .                  | 2.5  | 2    | 1.5  | 1.5  | 1.5  | 2    | %     |
| Max.-Signal Power Output. . . . .                   | 23   | 30   | 37   | 43   | 45   | 28   | watts |

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . . 0.3 max. megohm

For cathode-bias operation. . . . . 1 max. megohm

### PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

*Grid-No.2 of each tube connected to tap on plate winding of output transformer*

### Maximum Ratings, Design-Maximum Values:

|                                           |                  |      |       |
|-------------------------------------------|------------------|------|-------|
| PLATE VOLTAGE . . . . .                   | 550              | max. | volts |
| GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . . | 440              | max. | volts |
| CATHODE CURRENT . . . . .                 | 85               | max. | ma    |
| GRID-No.2 INPUT . . . . .                 | 3.3 <sup>d</sup> | max. | watts |
| PLATE DISSIPATION . . . . .               | 19               | max. | watts |

### Typical Operation:

*Values are for 2 tubes*

|                                                     | <i>Fixed Bias</i> | <i>Cathode Bias</i> |       |
|-----------------------------------------------------|-------------------|---------------------|-------|
| Plate Supply Voltage. . . . .                       | 400               | 425                 | volts |
| Grid-No.2 Supply Voltage. . . . .                   | <sup>e</sup>      | <sup>e</sup>        | volts |
| Grid-No.1 (Control-Grid) Voltage. . . . .           | -20.5             | -                   | volts |
| Cathode Resistor. . . . .                           | -                 | 185                 | ohms  |
| Peak AF Grid-No.1 to Grid-No.1 Voltage. . . . .     | 41                | 42                  | volts |
| Zero-Signal Plate Current . . . . .                 | 80                | 88                  | ma    |
| Max.-Signal Plate Current . . . . .                 | 138               | 104                 | ma    |
| Zero-Signal Grid-No.2 Current . . . . .             | 11.5              | 13                  | ma    |
| Max.-Signal Grid-No.2 Current . . . . .             | 26.4              | 17.5                | ma    |
| Effective Load Resistance (Plate to plate). . . . . | 6600              | 6600                | ohms  |
| Total Harmonic Distortion . . . . .                 | 1                 | 2                   | %     |
| Max.-Signal Power Output. . . . .                   | 32                | 26                  | watts |

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . . 0.3 max. megohm

For cathode-bias operation. . . . . 1 max. megohm

<sup>a</sup> The dc component must not exceed 100 volts.

<sup>b</sup> Without external shield.

<sup>c</sup> On the 7-Pin bases, pin 1 is omitted.



- d Grid-No.2 input may be permitted to reach 6 watts during the periods of maximum input of speech and music signals. For efficient operation of grid No.2, the two grid-No.2 terminals, pins 4 and 8, should be externally tied together.
- e Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center-tap (B+) so as to apply 40 per cent of the plate signal voltage to grid No.2 of each output tube.

