Beam Power Tube

9-PIN MINIATURE TYPE
For High-Fidelity Audio-Amplifier Applications

GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
Voltage (AC or DC) .................. 6.3 ± 10% volts
Current at 6.3 volts .................. 0.45 amp
Direct Interelectrode Capacitances:
Grid No.1 to plate .................. 0.4 max. µf
Grid No.1 to cathode & grid No.3,
grid No.2, and heater .............. 9 µf
Plate to cathode & grid No.3,
grid No.2, and heater .............. 6 µf

Characteristics, Class A1 Amplifier:
Plate Voltage ..................... 250 volts
Grid-No.2 Voltage ................ 250 volts
Grid-No.1 Voltage ................ -15 volts
Plate Resistance (Approx.) ....... 73000 ohms
Transconductance ................. 4800 µmhos
Plate Current ..................... 46 ma
Grid-No.2 Current ................. 3.5 ma
Grid-No.1 Voltage (Approx.) for
plate μa = 100 ................... -40 volts

Mechanical:
Operating Position .................. Any
Maximum Overall Length ............. 3-1/16"
Maximum Seated Length ............. 2-13/16"
Length, Base Seat to Bulb Top (Excluding tip) 2-7/16" ± 3/32"
Maximum Diameter .................. 0.750" to 0.875"
Dimensional Outline ................. See General Section
Bulb .................................. T6-1/2
Base .................................. Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW ........ 9EU

Pin 1—Grid No.2
Pin 2—No Connection
Pin 3—Grid No.1
Pin 4—Heater
Pin 5—Heater
Pin 6—Grid No.1
Pin 7—Grid No.3, Cathode
Pin 8—Grid No.2
Pin 9—Plate

PUSH-PULL AF POWER AMPLIFIER — Class AB1

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE ..................... 440 max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE ....... 330 max. volts

RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.
GRID-No. 2 INPUT  2 max. watts
PLATE DISSIPATION  12 max. watts

PEAK HEATER-CATHODE VOLTAGE:
  Heater negative with respect to cathode.. 200 max. volts
  Heater positive with respect to cathode.. 200 max. volts

BULB TEMPERATURE (At hottest point on bulb surface)...... 250 max. °C

Typical Operation with Fixed Bias:

Values are for 2 tubes

Plate Voltage 250 350 400 volts
Grid-No. 2 Voltage  250 280 290 volts
Grid-No. 1 (Control-Grid) Voltage◆ -15 -22 -25 volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage 30 44 50 volts
  Zero-Signal Plate Current  92 58 50 ma
  Max.-Signal Plate Current  105 106 107 ma
  Zero-Signal Grid-No. 2 Current  7 3.5 2.5 ma
  Max.-Signal Grid-No. 2 Current  16 14 13.7 ma
  Effective Load Resistance (Plate to plate). 8000 7500 8000 ohms
  Total Harmonic Distortion. 2 1.5 2 %
  Max.-Signal Power Output  12.5 20 24 watts

Typical Operation with Cathode Bias:

Values are for 2 tubes

Plate Supply Voltage  300 310 volts
Grid-No. 2 Supply Voltage  300 310 volts
Cathode Resistor  230 270 ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage  48 55 volts
  Zero-Signal Plate Current  80 77 ma
  Max.-Signal Plate Current  96 92 ma
  Zero-Signal Grid-No. 2 Current  6 5 ma
  Max.-Signal Grid-No. 2 Current  14 14 ma
  Effective Load Resistance (Plate to plate). 5500 6000 ohms
  Total Harmonic Distortion. 2 4 %
  Max.-Signal Power Output  15 17 watts

Maximum Circuit Values:

Grid-No. 1-Circuit Resistance:
  For fixed-bias operation  0.5 max. megohm
  For cathode-bias operation  1 max. megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB1

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

Maximum Ratings, Design-Maximum Values:

PLATE AND GRID-No. 2 (SCREEN-GRID)
  SUPPLY VOLTAGE  410 max. volts

Indicates a change.
BEAM POWER TUBE
9-PIN MINIATURE TYPE
For high-fidelity audio-amplifier applications

GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
Voltage. 6.3 ac or dc volts
Current. 0.45 amp
Direct Interelectrode Capacitances:
Grid No.1 to plate 0.7 max. μf
Grid No.1 to cathode & grid No.3,
grid No.2, and heater. 8 μf
Plate to cathode & grid No.3,
grid No.2, and heater. 8.5 μf

Characteristics, Class A, Amplifier:
Plate Voltage. 250 volts
Grid-No.2 (Screen-Grid) Voltage. 250 volts
Grid-No.1 (Control-Grid) Voltage. −15 volts
Plate Resistance (Approx.) 73000 ohms
Transconductance. 4800 μhos
Plate Current. 46 ma
Grid-No.2 Current. 3.5 ma
Grid-No.1 Voltage (Approx.) for
plate current of 100 μa. −40 volts

Mechanical:
Operating Position. Any
Maximum Overall Length. 2-5/8" 
Maximum Seated Length. 2-3/8"
Length, Base Seat to Bulb Top (Excluding tip). 2" ± 3/32"
Maximum Diameter. 7/8"
Dimensional Outline. See General Section
Bulb. Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. 9EU

Pin 1—Grid No.2
Pin 2—No Connection
Pin 3—Grid No.1
Pin 4—Heater
Pin 5—Heater
Pin 6—Grid No.1
Pin 7—Grid No.3, Cathode
Pin 8—Grid No.2
Pin 9—Plate

PUSH-PULL AF POWER AMPLIFIER — Class AB1

Maximum Ratings, Design-Center Values:
PLATE VOLTAGE. 400 max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. 300 max. volts
GRID-No.2 INPUT. 2 max. watts
PLATE DISSIPATION. 12 max. watts

See next page.
### BEAM POWER TUBE

**PEAK HEATER-CATHODE VOLTAGE:**
- Heater negative with respect to cathode: 200 max. volts
- Heater positive with respect to cathode: 200\(^*\) max. volts

**BULB TEMPERATURE (At hottest point on bulb surface):** 250 max. °C

### Typical Operation with Fixed Bias:

<table>
<thead>
<tr>
<th>Values are for 2 tubes</th>
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</thead>
<tbody>
<tr>
<td><strong>Plate Voltage</strong></td>
</tr>
<tr>
<td><strong>Grid-No.2 Voltage</strong></td>
</tr>
<tr>
<td><strong>Grid-No.1 (Control-Grid) Voltage</strong></td>
</tr>
<tr>
<td><strong>Peak AF Grid-No.1-to-Grid-No.1 Voltage</strong></td>
</tr>
<tr>
<td><strong>Zero-Signal Plate Current</strong></td>
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<tr>
<td><strong>Max.-Signal Plate Current</strong></td>
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<tr>
<td><strong>Zero-Signal Grid-No.2 Current</strong></td>
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<tr>
<td><strong>Max.-Signal Grid-No.2 Current</strong></td>
</tr>
<tr>
<td><strong>Effective Load Resistance (Plate to plate)</strong></td>
</tr>
<tr>
<td><strong>Total Harmonic Distortion</strong></td>
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<tr>
<td><strong>Max.-Signal Power Output</strong></td>
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</tbody>
</table>

### Typical Operation with Cathode Bias:

<table>
<thead>
<tr>
<th>Values are for 2 tubes</th>
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</thead>
<tbody>
<tr>
<td><strong>Plate-Supply Voltage</strong></td>
</tr>
<tr>
<td><strong>Grid-No.2 Supply Voltage</strong></td>
</tr>
<tr>
<td><strong>Cathode Resistor</strong></td>
</tr>
<tr>
<td><strong>Peak AF Grid-No.1-to-Grid-No.1 Voltage</strong></td>
</tr>
<tr>
<td><strong>Zero-Signal Plate Current</strong></td>
</tr>
<tr>
<td><strong>Max.-Signal Plate Current</strong></td>
</tr>
<tr>
<td><strong>Zero-Signal Grid-No.2 Current</strong></td>
</tr>
<tr>
<td><strong>Max.-Signal Grid-No.2 Current</strong></td>
</tr>
<tr>
<td><strong>Effective Load Resistance (Plate to plate)</strong></td>
</tr>
<tr>
<td><strong>Total Harmonic Distortion</strong></td>
</tr>
<tr>
<td><strong>Max.-Signal Power Output</strong></td>
</tr>
</tbody>
</table>

### Maximum Circuit Values:

- **Grid-No.1-Circuit Resistance:**
  - For fixed-bias operation: 0.5 max. megohm
  - For cathode-bias operation: 1 max. megohm

**PUSH-PULL AF POWER AMPLIFIER — Class AB1**

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

### Maximum Ratings, Design-Center Values:

- **PLATE AND GRID-No.2 (SCREEN-GRID SUPPLY VOLTAGE:** 375 max. volts

\(^*\): See next page.
BEAM POWER TUBE

GRID-No.2 INPUT ........................................ 1.75 max. watts
PLATE DISSIPATION ........................................ 12 max. watts
PEAK HEATER-CATHODE VOLTAGE:
  Heater negative with
    respect to cathode .................................. 200 max. volts
  Heater positive with
    respect to cathode .................................. 200\* max. volts
BULB TEMPERATURE (At hottest point
  on bulb surface) ..................................... 250 max. °C

Typical Operation:

Values are for 2 tubes

<table>
<thead>
<tr>
<th></th>
<th>Fixed Bias</th>
<th>Cathode Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate-Supply Voltage</td>
<td>375</td>
<td>370 volts</td>
</tr>
<tr>
<td>Grid-No.2 Supply Voltage</td>
<td>*</td>
<td># volts</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
<td>-33.5</td>
<td>- volts</td>
</tr>
<tr>
<td>Cathode Resistor</td>
<td>-</td>
<td>355 ohms</td>
</tr>
<tr>
<td>Peak AF Grid-No.1-to-Grid-No.1 Voltage</td>
<td>67</td>
<td>62 volts</td>
</tr>
<tr>
<td>Zero-Signal Cathode Current</td>
<td>62</td>
<td>74 ma</td>
</tr>
<tr>
<td>Max.-Signal Cathode Current</td>
<td>95</td>
<td>84 ma</td>
</tr>
<tr>
<td>Effective Load Resistance (Plate to plate)</td>
<td>12500</td>
<td>13000 ohms</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>1.5</td>
<td>1.2 %</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>18.5</td>
<td>15 watts</td>
</tr>
</tbody>
</table>

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
  For fixed-bias operation .................. 0.5 max. megohm
  For cathode-bias operation .......... 1 max. megohm

\* Without external shield.
\* The dc component must not exceed 100 volts.
\* 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.
\* 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 50 per cent of the plate signal voltage to grid No.2 of each output tube.
\# 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 supply 43 per cent of the plate signal voltage to grid No.2 of each output tube.
AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS
GRID - N°1 VOLTS = 0

Plate Milliamperes

Electron Tube Division
Radio Corporation of America, Harrison, New Jersey

92CM - 9380
E\text{f} = 6.3 \text{ VOLTS}
GRID-NR2 VOLTS = 250

PLATE (I_b) OR GRID-NR2 (I_C2) MILLIAMPERES

E\text{C1} = 0
E\text{C2} = 0
E\text{C1} = -20
E\text{C1} = -40
E\text{C1} = -60

GRID-NR1 VOLTS; E\text{C1} = -10

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM - 9389
OPERATION CHARACTERISTICS
PUSH-PULL CLASS AB1 OPERATION

$E_F = 6.3$ VOLTS
PLATE VOLTS = 350
GRID-Nº2 VOLTS = 280
GRID-Nº1 VOLTS = -22
AF GRID-Nº1-TO-GRID-Nº1
SIGNAL VOLTS (RMS) = 31.2

POWER OUTPUT - VOLTS

POWER OUTPUT - WATTS

EFFECTIVE LOAD RESISTANCE (PLATE TO PLATE) - OHMS

TOTAL HARMONIC DISTORTION - PER CENT

DISTORTION