Power Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
Voltage (AC or DC) ........................................ 6.3 volts
Current .................................................. 0.76 amp
Direct Inter-electrode Capacitances (Approx.):
Grid No.1 to plate .......................................... 0.5 \( \mu f \)
Grid No.1 to cathode & grid No.3, grid No.2, and heater .................................................. 10.8 \( \mu f \)
Plate to cathode & grid No.3, grid No.2, and heater .................................................. 6.5 \( \mu f \)
Grid No.1 to heater ........................................... 0.25 \( \mu f \)

Characteristics, Class A\textsuperscript{1} Amplifier:
Plate Voltage ............................................... 250 volts
Grid-No.2 Voltage .......................................... 250 volts
Grid-No.1 Voltage .......................................... -7.3 volts
Mu-Factor, Grid No.2 to Grid No.1 ........................... 19.5
Plate Resistance (Approx.) .................................. 40000 \( \Omega \)
Transconductance ............................................. 11300 \( \mu \Omega \hbox{mhos} \)
Plate Current .............................................. 48 ma
Grid-No.2 Current .......................................... 5.5 ma

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"
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 .......................... 9CV

Pin 1—Internal Connection—Do Not Use
Pin 2—Grid No.1
Pin 3—Cathode, Grid No.3
Pin 4—Heater
Pin 5—Heater
Pin 6—Same as Pin 1
Pin 7—Plate
Pin 8—Same as Pin 1
Pin 9—Grid No.2

PUSH-PULL AF POWER AMPLIFIER — Class A\textsuperscript{1}

Maximum Ratings, Design-Center Values:
PLATE VOLTAGE ............................................ 400 max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE ......................... 300 max. volts
CATHODE CURRENT ....................................... 65 max. ma
PLATE DISSIPATION ....................................... 12 max. watts
ZERO-SIGNAL GRID-No.2 INPUT .......................... 2 max. watts

RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 1
3-61
MAX.—SIGNAL GRID-No.2 INPUT. 4 max. watts
PEAK HEATER—CATHODE VOLTAGE:
Heater negative with respect to cathode. 100 max. volts
Heater positive with respect to cathode. 100 max. volts

**Typical Operation:**
*Values are for 2 tubes*

Plate Voltage. 400 volts
Grid-No.2 Voltage. 300 volts
Grid-No.1 Voltage. -15 volts
Peak AF Grid-No.1 Voltage. 14.8 volts
Zero-Signal Plate Current. 15 ma
Max.—Signal Plate Current. 105 ma
Zero-Signal Grid-No.2 Current. 1.6 ma
Max.—Signal Grid-No.2 Current. 25 ma
Effective Load Resistance (Plate to plate) 8000 ohms
Total Harmonic Distortion. 4 %
Max.—Signal Power Output. 24 watts

**Maximum Circuit Values:**
Grid-No.1-Circuit Resistance:
For fixed-bias operation 0.3 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
  CATHODE CURRENT 65 max. ma
  PLATE DISSIPATION 12 max. watts
  ZERO—SIGNAL GRID-No.2 INPUT. 2 max. watts
  MAX.—SIGNAL GRID-No.2 INPUT. 4 max. watts

- **PEAK HEATER—CATHODE VOLTAGE:**
  Heater negative with respect to cathode. 100 max. volts
  Heater positive with respect to cathode. 100 max. volts

**Typical Operation:**
*Values are for 2 tubes*

Plate Supply Voltage 375 volts
Grid-No.2 Supply Voltage 220 ohms
Cathode Resistor 17.7 volts
Zero-Signal Cathode Current. 70 ma
Max.—Signal Cathode Current. 81 ma
Effective Load Resistance (Plate to plate) 11000 ohms
Total Harmonic Distortion. 3 %
Max.—Signal Power Output. 16.5 watts

*Indicates a change.*
Maximum Circuit Values:

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

a Without external shield.
b 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.
OPERATION CHARACTERISTICS

$E_f = 6.3$ VOLTS
PLATE VOLTS = 250
GRID-N°2 VOLTS = 250
GRID-N°1 VOLTS = -7.3
AF GRID-N°1 VOLTS (RMS) = 4.4

POWER OUTPUT

DISTORTION

TOTAL HARMONIC DISTORTION—PER CENT

POWER OUTPUT—WATTS

TOTAL HARMONIC DISTORTION—PER CENT

EFFECTIVE LOAD RESISTANCE—OHMS

2000 4000 6000 8000 10000

92CM-9902
POWER PENTODE
9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
  Voltage (AC or DC)..................... 6.3 volts
  Current............................. 0.76 amp

Direct Interelectrode Capacitances (Approx.):
  Grid No.1 to plate.................... 0.5 μf
  Grid No.1 to cathode & grid No.3,
     grid No.2, and heater............. 10.8 μf
  Plate to cathode & grid No.3,
     grid No.2, and heater............ 6.5 μf
  Grid No.1 to heater.................. 0.25 μf

Characteristics, Class A1 Amplifier:

  Plate Voltage.......................... 250 volts
  Grid-No.2 Voltage...................... 250 volts
  Grid-No.1 Voltage...................... -7.3 volts
  Mu-Factor, Grid No.2 to Grid No.1.... 19.5
  Plate Resistance (Approx.)............ 40000 ohms
  Transconductance...................... 11300 μmhos
  Plate Current......................... 48 ma
  Grid-No.2 Current..................... 5.5 ma

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"
  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........... 9CV

Pin 1—Internal Connection—
  Do Not Use
Pin 2—Grid No.1
Pin 3—Cathode,
     Grid No.3
Pin 4—Heater
Pin 5—Heater
Pin 6—Same as Pin 1
Pin 7—Plate
Pin 8—Same as Pin 1
Pin 9—Grid No.2

PUSH-PULL AF POWER AMPLIFIER — Class AB1

Maximum Ratings, Design-Center Values:

  PLATE VOLTAGE......................... 400 max. volts
  GRID-No.2 VOLTAGE..................... 300 max. volts
  CATHODE CURRENT...................... 65 max. ma
  PLATE DISSIPATION..................... 12 max. watts
  ZERO-SIGNAL GRID-No.2 INPUT........... 2 max. watts
  MAX.—SIGNAL GRID-No.2 INPUT........... 4 max. watts

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ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA 1
# 7189

## POWER PENTODE

### PEAK HEATER–CATHODE VOLTAGE:
- Heater negative with respect to cathode: 100 max. volts
- Heater positive with respect to cathode: 100 max. volts

### Typical Operation:

**Values are for a tube**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>400 volts</td>
</tr>
<tr>
<td>Grid-No.2 Voltage</td>
<td>300 volts</td>
</tr>
<tr>
<td>Grid-No.1 Voltage</td>
<td>-15 volts</td>
</tr>
<tr>
<td>Peak AF Grid-No.1 Voltage</td>
<td>14.8 volts</td>
</tr>
<tr>
<td>Zero-Signal Plate Current</td>
<td>15 ma</td>
</tr>
<tr>
<td>Max.-Signal Plate Current</td>
<td>105 ma</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current</td>
<td>1.6 ma</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current</td>
<td>25 ma</td>
</tr>
<tr>
<td>Effective Load Resistance</td>
<td>8000 ohms</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>4 %</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>24 watts</td>
</tr>
</tbody>
</table>

### Maximum Circuit Values:

- Grid-No.1-Circuit Resistance:
  - For fixed-bias operation: 0.3 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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>375 max. volts</td>
</tr>
<tr>
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<td>65 max. ma</td>
</tr>
<tr>
<td>PLATE DISSIPATION</td>
<td>12 max. watts</td>
</tr>
<tr>
<td>ZERO-SIGNAL GRID-No.2 INPUT</td>
<td>2 max. watts</td>
</tr>
<tr>
<td>MAX.-SIGNAL GRID-No.2 INPUT</td>
<td>4 max. watts</td>
</tr>
<tr>
<td>PEAK HEATER–CATHODE VOLTAGE:</td>
<td></td>
</tr>
</tbody>
</table>
- Heater negative with respect to cathode: 100 max. volts
- Heater positive with respect to cathode: 100 max. volts

### Typical Operation:

**Values are for a tube**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage</td>
<td>375 volts</td>
</tr>
<tr>
<td>Grid-No.2 Supply Voltage</td>
<td></td>
</tr>
<tr>
<td>Cathode Resistor</td>
<td>220 ohms</td>
</tr>
<tr>
<td>Peak AF Grid-No.1 Voltage</td>
<td>17.7 volts</td>
</tr>
<tr>
<td>Zero-Signal Plate Current</td>
<td>70 ma</td>
</tr>
<tr>
<td>Max.-Signal Plate Current</td>
<td>81 ma</td>
</tr>
<tr>
<td>Effective Load Resistance</td>
<td>11000 ohms</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>3 %</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>16.5 watts</td>
</tr>
</tbody>
</table>
Maximum Circuit Values:
Grid-No.1—Circuit Resistance:
   For cathode-bias operation. . . . . . . . 1 max. megohm

Without external shield.
 Obtained from taps on the primary winding of the output transformer.
The taps are located on each side of the center-tap (β+) so as to supply
43 per cent of the plate signal voltage to grid No.2 of each output tube.