

**PENTAGRID CONVERTER**

<table>
<thead>
<tr>
<th>Heater</th>
<th>Coated Unipotential Cathode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>6.3 a-c or d-c volts</td>
</tr>
<tr>
<td>Current</td>
<td>0.3 amp.</td>
</tr>
</tbody>
</table>

**Direct Inter electrode Capacitances:**

<table>
<thead>
<tr>
<th>Capacitance</th>
<th>6SA7</th>
<th>6SA7-GT/G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid #3 to All Other Electrodes (R-F Input)</td>
<td>9.5</td>
<td>11.5</td>
</tr>
<tr>
<td>Plate to All Other Electrodes (Mixer Output)</td>
<td>12</td>
<td>11.5</td>
</tr>
<tr>
<td>Grid #1 to All Other Electrodes (Osc. Input)</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Grid #3 to Plate</td>
<td>0.13</td>
<td>0.5</td>
</tr>
<tr>
<td>Grid #3 to Grid #1</td>
<td>0.15</td>
<td>0.4</td>
</tr>
<tr>
<td>Grid #1 to Plate</td>
<td>0.06</td>
<td>0.2</td>
</tr>
<tr>
<td>Grid #1 to Shell, Grid #5, and All Other Electrodes except Cathode</td>
<td>4.4</td>
<td>-</td>
</tr>
<tr>
<td>Cathode &amp; Grid #5</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Grid #1 to Cathode</td>
<td>2.6</td>
<td>-</td>
</tr>
<tr>
<td>Grid #1 to Cathode &amp; Grid #5</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Cathode to Shell, Grid #5, and All Other Electrodes except Grid #1</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Cathode and Grid #5 to All Other Electrodes except Grid #1</td>
<td>-</td>
<td>14</td>
</tr>
</tbody>
</table>

**Maximum Overall Length**

| 2-5/8" | 3-5/16" |

**Maximum Seated Height**

| 2-1/16" | 2-3/4" |

**Maximum Diameter**

| 1-5/16" | 1-5/16" |

**Bulb**

Metal Shell MT-6 T-9

**Base**

Small Wafer Octal 8-Pin Interm. Sh. Octal 8-Pin

**Pin 1**

[Diagram]

**Pin 2** - Heater

**Pin 3** - Plate

**Pin 4** - Grids #2 & #4

**Pin 5** - Grid #1

**Pin 6**

[Diagram]

**Pin 7** - Heater

**Pin 8** - Grid #3

**Mounting Position**

Any

**Maximum And Minimum Ratings Are Design-Center Values**

**CONVERTER SERVICE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>300 max. volts</td>
</tr>
<tr>
<td>Grids #2 &amp; #4 Voltage</td>
<td>100 max. volts</td>
</tr>
<tr>
<td>Grids #2 &amp; #4 Supply Voltage</td>
<td>300 max. volts</td>
</tr>
<tr>
<td>Grid #3 Voltage</td>
<td>0 min. volts</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>1.0 max. watt</td>
</tr>
<tr>
<td>Screen Dissipation</td>
<td>1.0 max. watt</td>
</tr>
<tr>
<td>Total Cathode Current</td>
<td>14 max. ma.</td>
</tr>
</tbody>
</table>

* In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

** With shell connected to cathode.

▲ With external shield connected to cathode.

* For self-excited oscillator.

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Jan. 1, 1943

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
6SA7, 6SA7-GT/G
PENTAGRID CONVERTER

(continued from preceding page)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Self-excitation*</th>
<th>Separate Excitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Grids #2 &amp; #4 Vol.</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Grid #3 (Control) Vol.</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Grid #1 Resistor</td>
<td>0</td>
<td>-2</td>
</tr>
<tr>
<td>Plate Res. (Approx.)</td>
<td>20000</td>
<td>20000</td>
</tr>
<tr>
<td>Conversion Transcond.</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Conversion Transcond. (Approx.)†</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Plate Current</td>
<td>425</td>
<td>425</td>
</tr>
<tr>
<td>Grids #2 &amp; #4 Current</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>Grid #1 Current</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Cathode Current</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

* Characteristics are approximate only and are shown for a Hartley circuit with a feedback of approximately 2 volts peak in the cathode circuit.

† With Grid #3 bias of -95 volts.

NOTE: The transconductance between Grid #1 and Grids #2 & #4 connected to plate (not oscillating) is approximately 5000 µmhos under the following conditions: Grids #1, #3, and shell at 0 volts; Grids #2 & #4 and plate at 100 volts.

TYPICAL SELF-EXCITED CONVERTER CIRCUIT
FOR TYPE 6SA7

\[ C_d = \text{BY-PASS COND.} \]
\[ C_g = 50 \mu \text{uf} \]
\[ C_P = \text{PADDING COND.} \]
\[ C_t = \text{TUNING COND.} \]
\[ N_t = \text{TOTAL Turner in OSC. COIL} \]
\[ R_q = 20000 \text{ OHMS} \]

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

Jan. 1, 1943
OPERATION CHARACTERISTICS
WITH SELF-EXCITATION

$E_C = 6.3 \text{ VOLTS}$
PLATE VOLTS = 250
GRIDS NO. 2 & NO. 4 VOLTS = 100
GRID NO. 3 (CONTROL GRID) VOLTS = -1
GRID NO. 1 RESISTOR OHMS = 20000
$P = \text{PERCENTAGE RATIO OF } E_k \text{ TO } E_k + E_g: \text{SEE CIRCUIT}$

CONVERSION TRANSCONDUCTANCE ($g_{m}$) - MICROMOHMS

$E_N = 8.8 \text{ VOLTS RMS}$
$I_{R} = 0.75 \text{ MILLIAMPERES}$
$V_{P} = 7.5 \text{ VOLTS}$
$V_{C} = 7.5 \text{ VOLTS}$
$5.0$
$1.4 = 2 \text{ VOLTS PEAK}$

GRID NO. 1 MILLIAMPERES ($I_{C1}$)

NOV. 2, 1938
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4993
OPERATION CHARACTERISTIC
WITH SELF-EXCITATION

$E_f = 6.3$ VOLTS
PLATE VOLTS = 250
GRIDS N52 & N54 VOLTS = 100
GRID N53 (CONTROL GRID) VOLTS = 0
GRID N51 RESISTOR-OHM = 20000
GRID N51 MILLIAMPERES = 0.5

CONVERSION GAIN = R-F OUTPUT VOLTS

0 0.2 0.4 0.6
RESONANT LOAD IMPEDANCE - MEGOHMS

160 120 80 40
R-F INPUT VOLTS

APR. 25, 1941
RCA RADIOotron DIVISION
RCA MANUFACTURING COMPANY, INC.
CE-4994
OPERATION CHARACTERISTICS

- $E_f = 6.3$ VOLTS
- PLATE VOLTS = 250
- GRIDS No. 2 & No. 4 VOLTS = 100
- GRID No. 1 RESISTOR - OHMS = 20000
- OSCILLATOR VOLTAGE ADJUSTED TO GIVE
- GRID No. 1 CURRENT OF 0.5 MA.

GRID No. 3 (CONTROL GRID) VOLTS

CONVERSION TRANSCONDUCTANCE - MICROMOHRS

- -40 -30 -20 -10 0

OCT. 25, 1938
RCA RADIO TRON DIVISION
RCA MANUFACTURING COMPANY, INC.
92C-4989
OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION

$E_f = 6.3$ VOLTS
PLATE VOLTS = 250
GRIDS $N=2$ & $N=4$ VOLTS = 100
GRID $N=3$ (CONTROL GRID) VOLTS = -2
GRID $N=1$ RESISTOR-OHMS = 20000
GRID $N=1$ CURRENT VARIED BY ADJUSTMENT OF OSCILLATOR VOLTAGE

CONVERSION TRANSCONDUCTANCE ($g_c$) - MICROHOS

GRID $N=1$ MILLIAMPERES ($I_{C1}$)
CATHODE MILLIAMPERES
600
12
600
12
400
8
200
4

APR. 24, 1941
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.
92C-4990R1