THE 6DT6 IS A SHARP CUTOFF PENTODE IN THE 7 PIN MINIATURE CONSTRUCTION. IT IS INTENDED FOR USE AS AN FM DETECTOR IN TELEVISION RECEIVERS. DESIGNED SO THAT GRID #2 AND GRID #5 CAN EACH BE USED AS INDEPENDENT SHARP CUTOFF CONTROL ELECTRODES, THE TUBE MAY ALSO BE USED IN DELAY CIRCUITS, GAIN-CONTROLLED AMPLIFIER CIRCUITS, AND MIXER CIRCUITS. WITH THE EXCEPTION OF HEATER WARM-UP TIME AND HEATER CHARACTERISTICS, IT IS IDENTICAL TO THE 30T6.

DIRECT INTERELECTRODE CAPACITANCES — APPROX.
WITH EXTERNAL SHIELD, #3È, CONNECTED TO CATHODE

<table>
<thead>
<tr>
<th>Capacitance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid #1 to Plate</td>
<td>0.02</td>
</tr>
<tr>
<td>Grid #1 to Grid #3</td>
<td>0.1</td>
</tr>
<tr>
<td>Grid #3 to All Other Electrodes</td>
<td>6.1</td>
</tr>
<tr>
<td>Grid #1 to Grid #2, Grid #3, Heater, and Internal Shield and Cathode</td>
<td>5.8</td>
</tr>
<tr>
<td>Grid #3 to Plate</td>
<td>1.4</td>
</tr>
</tbody>
</table>

RATINGS
INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM

FM DETECTOR SERVICE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Voltage</td>
<td>6.3±10% ± VOLTS</td>
</tr>
<tr>
<td>Maximum Plate Voltage</td>
<td>330 ± VOLTS</td>
</tr>
<tr>
<td>Maximum Grid #3 (Suppressor) Voltage</td>
<td>28 ± VOLTS</td>
</tr>
<tr>
<td>Maximum Grid #2 Supply Voltage</td>
<td>330 ± VOLTS</td>
</tr>
<tr>
<td>Maximum Grid #2 (Screen) Voltage</td>
<td>SEE RATING CHART</td>
</tr>
<tr>
<td>Maximum Grid #1 (Control-Grid) Voltage: Positive Bias Value</td>
<td>0 ± VOLTS</td>
</tr>
<tr>
<td>Maximum Plate Dissipation</td>
<td>1.7 ± WATTS</td>
</tr>
<tr>
<td>Maximum Grid #2 Input:</td>
<td></td>
</tr>
<tr>
<td>For Grid #2 Voltages up to 165 Volts</td>
<td>1.1 ± WATTS</td>
</tr>
<tr>
<td>For Grid #2 Voltages between 165 and 330 Volts</td>
<td>SEE RATING CHART</td>
</tr>
<tr>
<td>Maximum Heater-Cathode Voltage:</td>
<td></td>
</tr>
<tr>
<td>Heater Negative With Respect to Cathode</td>
<td>200 ± VOLTS</td>
</tr>
<tr>
<td>Heater Positive With Respect to Cathode</td>
<td>200 ± VOLTS</td>
</tr>
<tr>
<td>Heater Warm-Up Time (Approx.)*</td>
<td>11 SECONDS</td>
</tr>
</tbody>
</table>

*The DC component must not exceed 100 volts.

*Heater Warm-Up Time is defined as the time required for the voltage across the heater to reach 80% of its rated voltage after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance of value 3 times the nominal heater operating resistance.

CONTINUED ON FOLLOWING PAGE
TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A1 AMPLIFIER

HEATER VOLTAGE 6.5 x 10⁻⁴ VOLTS
HEATER CURRENT 0.5 AMP.
PLATE SUPPLY VOLTAGE 150 VOLTS
GRID #3 SUPPLY VOLTAGE 0 VOLTS
GRID #2 SUPPLY VOLTAGE 100 VOLTS
CATHODE-BIAS RESISTOR 560 OHMS
PLATE RESISTANCE (APPROX.) 0.15 MEGOHM
TRANSCONDUCTANCE:
GRID #1 TO PLATE 800 MUH
GRID #1 TO PLATE 515 MUH
GRID #1 VOLTAGE (APPROX.) FOR PLATE CURRENT OF 10 MA 4.5 VOLTS
GRID #3 VOLTAGE (APPROX.) FOR PLATE CURRENT OF 10 MA 3.5 VOLTS
PLATE CURRENT 1.1 MA.
GRID #2 CURRENT 2.1 MA.

TYPICAL OPERATION IN THE ACCOMPANYING LOCKED-OSCILLATOR,
QUADRATURE-GRID DETECTOR CIRCUIT
AT A CARRIER FREQUENCY OF 4.5 MC:

<table>
<thead>
<tr>
<th>INPUT SIGNAL TO GRID OF DRIVER TUBE</th>
<th>15</th>
<th>200</th>
<th>500</th>
<th>MV RMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE SUPPLY VOLTAGE</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>VOLTS</td>
</tr>
<tr>
<td>GRID #3 VOLTAGE [OBTAINED FROM A 560000-OMH RESISTOR]</td>
<td>-5</td>
<td>-6</td>
<td>-6.4</td>
<td>VOLTS</td>
</tr>
<tr>
<td>GRID #2 SUPPLY VOLTAGE</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>VOLTS</td>
</tr>
<tr>
<td>CATHODE-BIAS RESISTOR</td>
<td>560</td>
<td>560</td>
<td>560</td>
<td>OHMS</td>
</tr>
<tr>
<td>PLATE LOAD RESISTOR</td>
<td>0.27</td>
<td>0.27</td>
<td>0.27</td>
<td>MEGOHM</td>
</tr>
<tr>
<td>PLATE CURRENT</td>
<td>0.25</td>
<td>0.22</td>
<td>0.21</td>
<td>MA.</td>
</tr>
<tr>
<td>GRID #2 CURRENT</td>
<td>3.4</td>
<td>5.5</td>
<td>6</td>
<td>MA.</td>
</tr>
<tr>
<td>GRID #1 CURRENT</td>
<td>0.015</td>
<td>0.6</td>
<td>0.8</td>
<td>MA.</td>
</tr>
</tbody>
</table>

BANDWIDTH:
* FOR A TOTAL HARMONIC DISTORTION OF 10 PERCENT
  69 120 118 KC

* AM REJECTION (APPROX.):
  33 29 28 DB

* AUDIO OUTPUT VOLTAGE (RMS, APPROX.):
  WITH ± 7.5-KC DEVIATION FROM
  MEAN VALUE OF 4.5 MC
  5.5 5.5 7.5 VOLTS

  WITH ± 25-KC DEVIATION FROM
  MEAN VALUE OF 4.5 MC
  17 21 23 VOLTS

TOTAL HARMONIC DISTORTION:
  WITH ± 25-KC DEVIATION FROM
  MEAN VALUE OF 4.5 MC
  2 3 4 PERCENT

SENSITIVITY:
  WITH ±7.5-KC DEVIATION FROM
  MEAN VALUE OF 4.5 MC
  5C MILLIVOLTS

  WITH ±25-KC DEVIATION FROM
  MEAN VALUE OF 4.5 MC
  15C MILLIVOLTS

MAXIMUM CIRCUIT VALUES:

GRID #1 CIRCUIT RESISTANCE:
  FOR FIXED-BIAS OPERATION
  0.25 MEGOHM

GRID #3 CIRCUIT RESISTANCE:
  FOR CATHODE-BIAS OPERATION
  0.5 MEGOHM

* RATIO OF THE AUDIO OUTPUT VOLTAGE PRODUCED BY 30-PERCENT AMPLITUDE MODULATION OF THE 4.5-KC CARRIER FREQUENCY TO THE AUDIO OUTPUT PRODUCED BY ± 25-KC DEVIATION FROM THE 4.5-KC CARRIER FREQUENCY, WITH A MODULATING FREQUENCY OF 400 CPS IN BOTH CASES.

* SIGNAL LEVEL AT WHICH DETECTOR CIRCUIT WILL HANDLE THE INDICATED DEVIATION IN FREQUENCY FROM THE MEAN VALUE OF 4.5 MC, BEFORE DISTORTION OCCURS.

→ INDICATES A CHANGE.
TUNG-SOL

LOCKED-OSCILLATOR, QUADRATURE-GRID DETECTOR CIRCUIT UTILIZING TYPE 6DT6

\[ \begin{align*}
C_1 &: 47 \mu F, 400 \text{ VOLS} \\
C_2, C_3 &: 0.03 \mu F, 400 \text{ VOLS} \\
C_4 &: 0.01 \mu F, 200 \text{ VOLS} \\
C_5 &: 1 \mu F, 200 \text{ VOLS} \\
C_6 &: 0.05 \mu F, 200 \text{ VOLS} \\
C_7 &: 100 \text{ TO } 1000 \mu F, 400 \text{ VOLS} \\
C_8 &: 0.01 \mu F, 400 \text{ VOLS} \\
L_2 &: \text{SLUG-TUNED INDUCTOR WITH Q OF 50 AND TUNABLE TO 4.5-MC.} \\
R_1 &: 100000 \text{ OHMS, 0.5 WATT} \\
R_2 &: 12000 \text{ OHMS, 0.5 WATT} \\
R_3 &: 1000 \text{ OHMS, 0.5 WATT} \\
R_4 &: 560 \text{ OHMS, 0.5 WATT} \\
R_5 &: 560000 \text{ OHMS, 0.5 WATT} \\
R_6 &: 270000 \text{ OHMS, 0.5 WATT} \\
R_7 &: 0.5 \text{ MEGOHM POTentiOMETER} \\
T_1 &: \text{SLUG-TUNED, BIFILAR WOUND IF TRANSFORMER WITH RATIO OF 3:1:3.5, Q \geq 50, AND TUNABLE TO 4.5-MC WITH TUBE AND WIRING CAPACITANCE.}
\end{align*} \]
6DT6
PENTODE
Performance in
Locked-Oscillator, Quadrature-Grid
Detector Circuit

AM Rejection
Audio Output

SIGNAL INPUT TP DRIVER TUBE - MILLIVOLTS (RMS)

6DT6
PENTODE
This Curve Also Applies
To Types In Which Grids
#2 & #4 Are Connected
Within The Tube

GRID #2 VOLTAGE EXPRESSED AS % OF
MAXIMUM GRID #2 SUPPLY VOLTAGE RATING

Maximum Operating
Conditions

Area Of
Permissible operation