**BEAM POWER TUBE**

36MC6

Novar type used for horizontal-deflection amplifier in color television receivers. Outlines section, 18D; requires novar 9-contact socket.

Heater Voltage (ac/dc) ........................................ 36 volts
Heater Current ...................................................... 0.45 ampere
Heater-Cathode Voltage
  Peak value ...................................................... ±200 max volts
  Average value ................................................ 100 max volts
Direct Interelectrode Capacitances:
  Grid No.1 to Plate ........................................ 1.0 pF
  Grid No.1 to Cathode, Heater, Grid No.2 and Grid No.3 ........................................ 40 pF
  Plate to Cathode, Heater, Grid No.2, and Grid No.3 ........................................ 16 pF

Class A1 Amplifier

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>Triode† Connection</th>
<th>Pentode Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>175</td>
<td>45</td>
</tr>
<tr>
<td>Peak Positive-Pulse Plate Voltage#</td>
<td>5000</td>
<td>—</td>
</tr>
<tr>
<td>Grid No.3 (Suppressor Grid)</td>
<td>—</td>
<td>30</td>
</tr>
<tr>
<td>Grid-No.2 (Screen-Grid) Voltage</td>
<td>175</td>
<td>110</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
<td>—21</td>
<td>0</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>Plate Resistance (Approx.)</td>
<td>—</td>
<td>6000</td>
</tr>
<tr>
<td>Transconductance</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Plate Current</td>
<td>—</td>
<td>1100††</td>
</tr>
<tr>
<td>Grid-No.2 Current</td>
<td>—</td>
<td>110††</td>
</tr>
<tr>
<td>Grid-No.1 Voltage for plate current of 1 mA</td>
<td>—125</td>
<td>—</td>
</tr>
</tbody>
</table>

**Horizontal-Deflection Amplifier**

For operation in a 525-line, 30-frame system

**MAXIMUM RATINGS** (Design-Maximum Values)

- DC Plate Supply Voltage .................. 990 volts
- Peak Positive-Pulse Plate Voltage# .......... 7500 volts
- Peak Negative-Pulse Plate Voltage .......... 1100 volts
- DC Grid-No.3 Voltage# .................. 75 volts
- DC Grid-No.2 Voltage .................. 250 volts
Peak Negative-Pulse Grid-No.1 Voltage ........................................ 330 volts
Peak Cathode Current ................................................................. 1400 mA
Average Cathode Current ............................................................ 400 mA
Grid-No.2 Input ............................................................................ 5 watts
Plate Dissipation** ........................................................................ 33 watts
Bulb Temperature (At hottest point) .................................................. 250 °C

MAXIMUM CIRCUIT VALUES
Grid-No.1-Circuit Resistance:
For cathode-bias operation ......................................................... 1 megohm
For grid-leak-bias operation ......................................................... 10 megohms
For fixed-bias operation ............................................................... 0.47 megohm

# Pulse duration must not exceed 15% of one horizontal scanning cycle (10 microseconds).
† Grid No.2 connected to plate.
‡ This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.
■ In this service, a positive value may be applied to grid No.3 to minimize “snivels” interference; a typical value for this voltage is 30 volts.
** A bias resistor or other means is required to protect the tube in absence of excitation.

Refer to chart at end of section.

Refer to chart at end of section.

DIODE—BEAM POWER TUBE 38HE7
Duodecar type used in television receiver applications. The diode unit is used for damper service and the beam power unit for horizontal-deflection amplifier service. Outlines section, 15D; requires duodecar 12-contact socket. Heater: volts (ac/dc), 37.8; amperes, 0.45; warm-up time, 11 seconds; maximum heater-cathode volts, ±200 peak, 100 average.

Beam Power Unit As Class A, Amplifier

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>Pentode Connection</th>
<th>Triode** Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>500</td>
<td>50</td>
</tr>
<tr>
<td>Grid-No.2 (Screen-Grid) Voltage</td>
<td>130</td>
<td>130</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
<td>0</td>
<td>-22</td>
</tr>
<tr>
<td>Plate Resistance (Approx.)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transconductance</td>
<td>-</td>
<td>6200</td>
</tr>
<tr>
<td>Plate Current</td>
<td>450</td>
<td>60</td>
</tr>
<tr>
<td>Grid-No.2 Current</td>
<td>-</td>
<td>2.8</td>
</tr>
<tr>
<td>Grid-No.1 Voltage (Approx.) for plate current of 1 mA</td>
<td>-80</td>
<td>-39</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>-</td>
<td>4.2</td>
</tr>
</tbody>
</table>

** Grid No.2 tied to plate.

Beam Power Unit as Horizontal-Deflection Amplifier
For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Ratings)
Plate Voltage ............................................................................ 500 volts
Peak Positive-Pulse Plate Voltage# ............................................. 5000 volts
Peak Negative-Pulse Plate Voltage ............................................ 0 volts
Grid-No.2 Voltage ..................................................................... 150 volts
DC Grid-No.1 Voltage, Negative-bias value ................................ 55 volts
Peak Negative-Pulse Grid-No.1 Voltage ...................................... 330 volts
Average Cathode Current ......................................................... 230 mA
Peak Cathode Current ............................................................... 800 mA
Plate Dissipation† ................................................................... 30 watts
Grid-No.2 Input ......................................................................... 3.5 watts

MAXIMUM CIRCUIT VALUE
Grid-No.1-Circuit Resistance ....................................................... 1 megohm

† A bias resistor or other means is required to protect the tube in absence of excitation.
Damper Service—Diode Unit

For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Values)

<table>
<thead>
<tr>
<th></th>
<th>38HK7</th>
<th>53HK7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Inverse Plate Voltage#</td>
<td>4200</td>
<td>volts</td>
</tr>
<tr>
<td>Peak Plate Current</td>
<td>1200</td>
<td>mA</td>
</tr>
<tr>
<td>Average Plate Current</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>Heater-Cathode Voltage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak value</td>
<td>±200</td>
<td>volts</td>
</tr>
<tr>
<td>Average value</td>
<td>±100</td>
<td>volts</td>
</tr>
<tr>
<td>Bulb Temperature (at hottest point)</td>
<td>200 °C</td>
<td></td>
</tr>
</tbody>
</table>

CHARACTERISTICS, Instantaneous Value

Tube Voltage Drop for plate current of 350 mA ........................................ 21 volts

# Pulse duration must not exceed 15% of a horizontal scanning cycle (10 microseconds).

38HK7

DIODE—BEAM POWER TUBE

Duodecar type used in television receiver applications. The diode unit is used for damper service and the beam power unit for horizontal-deflection amplifier service. Outlines section, 15D; requires duodecar 12-contact socket. Type 53HK7 is identical with 38HK7 except for heater ratings.

Diode Unit:
- Plate to Cathode and Heater
- Cathode to Plate and Heater
- Heater to Cathode

Beam Power Unit:
- Grid No. 1 to Plate
- Grid No. 1 to Cathode, Heater, Grid No. 2, and Grid No. 3
- Plate to Cathode, Heater, Grid No. 2, and Grid No. 3

Beam Power Unit as Class A1 Amplifier

**Triode**

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>38HK7</th>
<th>53HK7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>130</td>
<td>1200</td>
</tr>
<tr>
<td>Grid-No. 2 Voltage</td>
<td>130</td>
<td>130</td>
</tr>
<tr>
<td>Grid-No. 1 Voltage</td>
<td>-22</td>
<td>0</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>4.2</td>
<td>0.45</td>
</tr>
<tr>
<td>Plate Resistance</td>
<td>6200</td>
<td>0</td>
</tr>
<tr>
<td>Transconductance</td>
<td>5800</td>
<td>0</td>
</tr>
<tr>
<td>Plate Current</td>
<td>450</td>
<td>0</td>
</tr>
<tr>
<td>Grid-No. 2 Current</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Grid-No. 1 Voltage (Approx.) for plate current of 1 mA</td>
<td>-66</td>
<td>-66</td>
</tr>
</tbody>
</table>

Beam Power Unit as Horizontal-Deflection Amplifier

For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Values)

<table>
<thead>
<tr>
<th></th>
<th>38HK7</th>
<th>53HK7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>500</td>
<td>volts</td>
</tr>
<tr>
<td>Peak Positive-Pulse Plate Voltage</td>
<td>5000</td>
<td>volts</td>
</tr>
<tr>
<td>Peak Negative-Pulse Plate Voltage</td>
<td>150</td>
<td>volts</td>
</tr>
<tr>
<td>DC Grid-No. 1 Voltage, Negative-bias value</td>
<td>55</td>
<td>volts</td>
</tr>
<tr>
<td>Peak Negative-Pulse Grid-No. 1 Voltage</td>
<td>330</td>
<td>volts</td>
</tr>
<tr>
<td>Average Cathode Current</td>
<td>230</td>
<td>mA</td>
</tr>
<tr>
<td>Peak Cathode Current</td>
<td>800</td>
<td>mA</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>10</td>
<td>watts</td>
</tr>
<tr>
<td>Grid-No. 2 Input</td>
<td>8.5</td>
<td>watts</td>
</tr>
</tbody>
</table>
MAXIMUM CIRCUIT VALUE
Grid-No.1-Circuit Resistance ........................................ 1 megohm
† A bias resistor or other means is required to protect the tube in absence of excitation.

Damper Service—Diode Unit
For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Values)
Peak Inverse Plate Voltage# ........................................ 4200 volts
Peak Plate Current .................................................. 1200 mA
Average Plate Current ............................................. 200 mA
Heater-Cathode Voltage:
Peak value .................................................. 4-200 −3700 volts
Average value ................................................ 1-100 −500 volts
Bulb Temperature (At hottest point) ................................ 200 °C
CHARACTERISTIC, Instantaneous Value
Tube Voltage Drop for plate current of 350 mA ..................... 16 volts
# Pulse duration must not exceed 15% of a horizontal scanning cycle (10 microseconds).

Refer to chart at end of section.
39/44
Refer to chart at end of section.
40
Refer to chart at end of section.
40KD6
For replacement use type 36KD6/40KD6.
Refer to type 6KG6A/EL509.
40KG6A/PL509
Refer to chart at end of section.
41
Refer to chart at end of section.
42
Refer to chart at end of section.
42EC4A/PY500
Refer to type 6KN6.
42KN6
Refer to chart at end of section.
43
Refer to chart at end of section.
45
Refer to chart at end of section.
45Z3
Refer to chart at end of section.
45Z5GT
Refer to chart at end of section.
46
Refer to chart at end of section.
47
Refer to chart at end of section.
48
Refer to chart at end of section.
49
Refer to chart at end of section.
50
Refer to chart at end of section.
50A5
Refer to chart at end of section.
50B5
Refer to chart at end of section.
50BM8/UCL82