TWIN PENTODE
MINIATURE TYPE

COATED UNIPOTENTIAL CATHODE
HEATER
3.15 VOLTS  600±40 MA.
AC OR DC
ANY MOUNTING POSITION

THE 3BU8 IS A MINIATURE MULTISECTION TUBE WHICH INCORPORATES SEPARATE PLATES AND NUMBER 3 GRIDS FOR THE TWO SECTIONS TOGETHER WITH A COMMON SCREEN, NUMBER 1 GRID, AND CATHODE. THE TUBE IS INTENDED FOR USE AS A COMBINED SYNC-AGC TUBE IN TELEVISION RECEIVERS. IN THIS SERVICE, WHEN USED IN CONJUNCTION WITH SUITABLE CIRCUITRY, ONE SECTION OF THE 3BU8 FUNCTIONS AS SYNC SEPARATOR AND SYNC CLIPPER, WHILE THE OTHER SECTION IS USED TO GENERATE THE AUTOMATIC-GAIN-CONTROL VOLTAGE. IN ADDITION, BY UTILIZING THE COMMON, #1 GRID, NOISE PULSES CAN BE SUPPRESSED FROM BOTH SYNCHRONIZING AND AUTOMATIC-GAIN-CONTROL CIRCUITS. THERMAL CHARACTERISTICS OF THE HEATER ARE CONTROLLED SUCH THAT HEATER VOLTAGE SURGES DURING THE WARM-UP CYCLE ARE MINIMIZED PROVIDED IT IS USED WITH OTHER TYPES WHICH ARE SIMILARLY CONTROLLED. EXCEPT FOR HEATER RATINGS THE 3BU8 IS IDENTICAL TO THE 6BU8.

DIRECT INTERELECTRODE CAPACITANCES — APPROX.
WITHOUT EXTERNAL SHIELD

GRID #1 TO PLATE (EACH SECTION)
GRID #1 TO ALL
GRID #3 TO ALL (EACH SECTION)
PLATE TO ALL (EACH SECTION)
GRID #3 (SECTION 1) TO GRID #3 (SECTION 2) MAX.

1.9 pf
6.0 pf
3.6 pf
3.0 pf
0.015 pf

RATINGS

MAXIMUM PLATE VOLTAGE (EACH SECTION) 500 VOLTS
MAXIMUM SCREEN VOLTAGE 150 VOLTS
MAXIMUM POSITIVE DC GRID #3 VOLTAGE (EACH SECTION) 3.0 VOLTS
MAXIMUM NEGATIVE DC GRID #3 VOLTAGE (EACH SECTION) 50 VOLTS
MAXIMUM PEAK POSITIVE GRID #3 VOLTAGE (EACH SECTION) 50 VOLTS
MAXIMUM NEGATIVE DC GRID #1 VOLTAGE 50 VOLTS
MAXIMUM PLATE DISSIPATION (EACH SECTION) 1.1 VOLTS
MAXIMUM SCREEN DISSIPATION 0.75 VOLTS
MAXIMUM DC CATHODE CURRENT 12 MA.

CONTINUED ON FOLLOWING PAGE

INDICATES A CHANGE.
RATINGS — CONT'D

MAXIMUM HEATER-CATHODE VOLTAGE:

<table>
<thead>
<tr>
<th>Component</th>
<th>Maximum Heated V</th>
<th>Maximum Peak V</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEATER POSITIVE WITH RESPECT TO CATHODE</td>
<td>100 VOLS</td>
<td>200 VOLS</td>
</tr>
<tr>
<td>HEATER NEGATIVE WITH RESPECT TO CATHODE</td>
<td>200 VOLS</td>
<td></td>
</tr>
</tbody>
</table>

MAXIMUM GRID #1 CIRCUIT RESISTANCE: 0.5 MEGOHMS
MAXIMUM GRID #3 CIRCUIT RESISTANCE (EACH SECTION): 0.5 MEGOHMS
HEATER WARM-UP TIME*: 11.0 SECONDS

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

BOTH SECTIONS OPERATING

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE (EACH SECTION)</td>
<td>100 VOLS</td>
<td>100 VOLS</td>
</tr>
<tr>
<td>SCREEN VOLTAGE</td>
<td>67.5 VOLS</td>
<td>67.5 VOLS</td>
</tr>
<tr>
<td>GRID #3 VOLTAGE</td>
<td>-10 VOLS</td>
<td>0 VOLS</td>
</tr>
<tr>
<td>GRID #1 VOLTAGE</td>
<td>** VOLS</td>
<td>** VOLS</td>
</tr>
<tr>
<td>PLATE CURRENT (EACH SECTION)</td>
<td>6.5 MA.</td>
<td>3.3 MA.</td>
</tr>
<tr>
<td>SCREEN CURRENT</td>
<td>6.6 MA.</td>
<td>7.8 MA.</td>
</tr>
</tbody>
</table>

EACH SECTION SEPARATELY

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>100 VOLS</td>
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</tr>
<tr>
<td>SCREEN VOLTAGE</td>
<td>67.5 VOLS</td>
<td>67.5 VOLS</td>
</tr>
<tr>
<td>GRID #3 VOLTAGE</td>
<td>0 VOLS</td>
<td>0 VOLS</td>
</tr>
<tr>
<td>GRID #1 VOLTAGE</td>
<td>** VOLS</td>
<td>** VOLS</td>
</tr>
<tr>
<td>GRID #3 TRANSCONDUCTANCE</td>
<td>---</td>
<td>180 MMHOS</td>
</tr>
<tr>
<td>GRID #1 TRANSCONDUCTANCE</td>
<td>5500 VOLS</td>
<td>--- MMHOS</td>
</tr>
<tr>
<td>PLATE CURRENT</td>
<td>---</td>
<td>2.2 MA.</td>
</tr>
<tr>
<td>GRID #3 VOLTAGE (APPROX.) Ib=400MA</td>
<td>---</td>
<td>-0.45 VOLS</td>
</tr>
<tr>
<td>GRID #1 VOLTAGE (APPROX.) Ib=400MA</td>
<td>---</td>
<td>2.3 VOLS</td>
</tr>
</tbody>
</table>

*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.

**WITH GRID CURRENT ADJUSTED FOR 300 MA D-C.

A* WITH PLATE AND GRID #3 OF OPPOSITE SECTION GROUNDED.

DESIGN-MAXIMUM RATINGS ARE THE LIMITING VALUES EXPRESSED WITH RESPECT TO ROGUE TUBES AT WHICH SATISFACTORY TUBE LIFE CAN BE EXPECTED TO OCCUR. TO OBTAIN SATISFACTORY CIRCUIT PERFORMANCE, THEREFORE, THE EQUIPMENT DESIGNER MUST ESTABLISH THE CIRCUIT DESIGN SO THAT NO DESIGN-MAXIMUM VALUE IS EXCEEDED WITH A ROGUE TUBE UNDER THE WORST PROBABLE OPERATING CONDITIONS WITH RESPECT TO SUPPLY-VOLTAGE VARIATION, EQUIPMENT COMPONENT VARIATION, EQUIPMENT CONTROL ADJUSTMENT, LOAD VARIATION, AND ENVIRONMENTAL CONDITIONS.

SIMILAR TYPE REFERENCE: Except for heater ratings and heater warm-up time the 3B08 is identical to the 6B08.
3BU8

EACH SECTION SEPARATELY WITH PLATE AND GRID #3 OF OPPOSITE SECTION GROUNDED

$E_f = 3.15$ Volts
$E_{c3} = 0$ Volts
$E_{c2} = 67.5$ Volts

$I_{c4} = 0.5$ Ma.

0.25
0.10
0.05
0.01

PLATE (Ib) CURRENT - MILLIAMPERES

PLATE VOLTS

3BU8

BOTH SECTIONS OPERATING

$E_f = 3.15$ Volts
$E_b = 100$ Volts (Ea. Sec.)
$E_{c2} = 67.5$ Volts
$E_{c4} = 0.1$ Milliamperes

NOTE: CURVES ALSO APPLY WHEN SECTIONS ARE REVERSED.

$E_{c3}$ (Section 2) = -5.0 Volts
$E_{c3}$ (Section 2) = 0
$E_{c3}$ (Section 2) = -5.0 THRU 5.0 Volts

GRID #3 VOLTS (SECTION 1)
3BU8

EACH SECTION SEPARATELY WITH PLATE AND GRID #3 OF OPPOSITE SECTION GROUNDED

\[ E_F = 3.15 \text{ Volts} \]
\[ E_{C2} = 67.5 \text{ Volts} \]
\[ I_{C4} = 0.1 \text{ Ma.} \]

GRID #2 MILLIAMPERES

GRID #3 MILLIAMPERES

PLATE VOLTS

3BU8

EACH SECTION SEPARATELY WITH PLATE AND GRID #3 OF OPPOSITE SECTION GROUNDED,

\[ E_F = 3.15 \text{ Volts} \]
\[ E_{C3} = 0 \text{ Volts} \]
\[ E_{C2} = 67.5 \text{ Volts} \]

\[ E_{C4} = +1.0 \text{ Volts} \]

SCREEN CURRENT - MILLIAMPERES

PLATE VOLTS
3BU8

Both sections operating

\[ E_f = 3.15 \text{ Volts} \]
\[ E_b = 150 \text{ Volts (Each Section)} \]
\[ E_{C3} = 0 \text{ Volts (Each Section)} \]

3BU8

Both sections operating

\[ E_f = 3.15 \text{ Volts} \]
\[ E_b = 150 \text{ Volts} \]
\[ E_{C4} = 0.1 \text{ Milliamperes} \]
3BU8

EACH SECTION SEPARATELY WITH PLATE AND GRID #3 OF OPPOSITE SECTION GROUNDED

$E_f = 3.15 \text{ Volts}$

$E_b = 150 \text{ Volts}$

$E_{C3} = 0 \text{ Volts}$

GRID #1 VOLTS

-5 -4 -3 -2 -1 0

PLATE (lb) - MILLIAMPERES

8 6 4 2

$E_{C}=150 \text{ Volts}$

3BU8

EACH SECTION SEPARATELY WITH PLATE AND GRID #3 OF OPPOSITE SECTION GROUNDED

$E_f = 3.15 \text{ Volts}$

$E_b = 150 \text{ Volts}$

$I_{C4} = 0.1 \text{ Milliamperes}$

GRID #3 VOLTS

-8 -6 -4 -2 0 +2 +4 +6

SCREEN ($I_{C2}$) - MILLIAMPERES

20 15 10 5 0

$I_{b}\theta E_{C3}=150 \text{ Volts}$

$125$

$100$

$75$

$67.5$

$50$

$25$
3BU8

Each section separately with plate and grid #3 of opposite section grounded

\[ E_f = 3.15 \text{ Volts} \]
\[ E_b = 150 \text{ Volts} \]
\[ E_{c3} = 0 \text{ Volts} \]

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3BU8

Both sections operating

\[ E_f = 3.15 \text{ Volts} \]
\[ E_b = 150 \text{ Volts (Each Section)} \]
\[ E_{c3} = 0 \text{ Volts (Each Section)} \]