TWIN PENTODE
MINIATURE TYPE

COATED UNIPOTENTIAL CATHODE

HEATER
4.2 VOLTS
450 MA.
AC OR DC
ANY MOUNTING POSITION

GLASS BULB
SMALL BUTTON
9 PIN BASE E9-1
OUTLINE DRAWING
JEDEC 5-3

THE 48UB 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 48UB 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 48UB is identical to the 68UB.

DIRECT INTERELECTRODE CAPACITANCES – APPROX.

GRID #3 TO PLATE (EACH SECTION) 1.9 pf
GRID #1 TO ALL 6.0 pf
GRID #3 TO ALL (EACH SECTION) 3.6 pf
PLATE TO ALL (EACH SECTION) 3.0 pf
GRID #3 (SECTION 1) TO GRID #3 (SECTION 2) MAX. 0.015 pf

RATINGS

MAXIMUM PLATE VOLTAGE (EACH SECTION) 300 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 WATTS
MAXIMUM SCREEN DISSIPATION 0.75 WATTS
MAXIMUM DC CATHODE CURRENT 12 MA.

CONTINUED ON FOLLOWING PAGE

--- Indicates a change.
RATINGS — CONT'D

MAXIMUM HEATER-CATHODE VOLTAGE:

| HEATER POSITIVE WITH RESPECT TO CATHODE | 100 VOLTS |
| DC COMPONENT | 200 VOLTS |
| TOTAL DC AND PEAK | |

HEATER NEGATIVE WITH RESPECT TO CATHODE

| TOTAL DC AND PEAK | 260 VOLTS |

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 |

| PLATE VOLTAGE (EACH SECTION) | 100 VOLTS |
| SCREEN VOLTAGE | 67.5 VOLTS |
| GRID #3 VOLTAGE (EACH SECTION) | 0 VOLTS |
| GRID #4 VOLTAGE | ** |
| PLATE CURRENT (EACH SECTION) | 6.5 MA. |
| SCREEN CURRENT | 3.3 MA. |
| CATHODE CURRENT | 7.8 MA. |

EACH SECTION SEPARATELY A

| PLATE VOLTAGE | 100 VOLTS |
| SCREEN VOLTAGE | 67.5 VOLTS |
| GRID #3 VOLTAGE | 0 VOLTS |
| GRID #4 VOLTAGE | ** |
| GRID #3 TRANSCONDUCTANCE | 180 \( \mu \)MOS |
| GRID #4 TRANSCONDUCTANCE | 500 \( \mu \)MOS |
| PLATE CURRENT | 2.2 MA. |
| GRID #3 VOLTAGE (APPROX.) \( I_b=100 \mu \)AMS | 4.5 VOLTS |
| GRID #4 VOLTAGE (APPROX.) \( I_b=100 \mu \)AMS | 2.5 VOLTS |

* HEATER WARM-UP TIME IS DEFINED AS THE TIME REQUIRED FOR THE VOLTAGE ACROSS THE HEATER TO REACH 90% 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 100 \( \mu \)AMS D-C.

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

DESIGN—MAXIMUM RATINGS ARE THE LIMITING VALUES EXPRESSED WITH RESPECT TO BOGIE TUBES AT WHICH SATISFACTORY TUBE LIFE CAN BE EXPECTED TO OCCUR. TO OBTAIN SATISFACTORY CIRCUIT PERFORMANCE, THEREFORE, THE EQUIPMENT DESIGNER MUST ENSURE THAT NO DESIGN—MAXIMUM VALUE IS EXCEEDED WITH A BOGIE 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 the 4BU8 is identical to the 6BU8.
4BU8

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

\[ E_f = 4.2 \text{ Volts} \]
\[ E_b = 150 \text{ Volts} \]
\[ E_c3 = 0 \text{ Volts} \]
4BU8

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

$E_f = 4.2$ Volts
$E_b = 150$ Volts
$E_{c3} = 0$ Volts

---

4BU8

BOTH SECTIONS OPERATING

$E_f = 4.2$ Volts
$E_b = 150$ Volts (Each Section)
$E_{c3} = 0$ Volts (Each Section)
48U8

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

$E_f = 4.2$ Volts
$E_{C3} = 0$ Volts
$E_{C2} = 67.5$ Volts

$I_{C4} = 0.5$ Ma.

0.25
0.10
0.05
0.01

PLATE (I_b) CURRENT - MILLIAMPERES

PLATE VOLTS

48U8

BOTH SECTIONS OPERATING

$E_f = 4.2$ Volts
$E_b = 100$ Volts (Ea. Sec.)
$E_{C2} = 67.5$ Volts
$I_{C4} = 0.1$ Milliamperes

NOTE:
CURVES ALSO APPLY WHEN SECTIONS ARE REVERSED.

$I_{C2} @ E_{C3}$ (Section 2) = 0 THRU -5.0 Volts

$I_{C2} @ E_{C3}$ (Section 2) = -5.0 Volts

PLATE (I_b) OR SCREEN (I_{C2}) CURRENT - MILLIAMPERES

GRID #3 VOLTS (SECTION 1)
4BU8

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

\[ E_F = 4.2 \text{ Volts} \]
\[ E_{C2} = 67.5 \text{ Volts} \]
\[ I_{C4} = 0.1 \text{ mA} \]

4BU8

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

\[ E_F = 4.2 \text{ Volts} \]
\[ E_{C3} = 0 \text{ Volts} \]
\[ E_{C2} = 67.5 \text{ Volts} \]

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

TUNG-SOL ELECTRIC INC. ELECTRON TUBE DIVISION BLOOMFIELD, NEW JERSEY, U.S.A. FEBRUARY 1, 1957 PLATE 4897
4BU8

Both sections operating

$E_f = 4.2$ Volts

$E_b = 150$ Volts (Each Section)

$E_{c3} = 0$ Volts (Each Section)