**17DSP4**

**PICTURE TUBE**

RECTANGULAR GLASS TYPE  
ALUMINIZED SCREEN  
LOW-VOLTAGE ELECTROSTATIC FOCUS  
MAGNETIC DEFLECTION

*With heater having controlled warm-up time*

### DATA

**General:**

Heater, for Unipotential Cathode:

<table>
<thead>
<tr>
<th>Voltage (AC or DC)</th>
<th>6.3 volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>0.6 amp</td>
</tr>
<tr>
<td>Warm-up time (Average)</td>
<td>11 sec</td>
</tr>
</tbody>
</table>

Direct Interelectrode Capacitances:

<table>
<thead>
<tr>
<th>Grid No.1 to all other electrodes</th>
<th>6 μf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathode to all other electrodes</td>
<td>5 μf</td>
</tr>
<tr>
<td>External conductive coating to ultor.</td>
<td>1500 max. μf; 1000 min. μf</td>
</tr>
</tbody>
</table>

Faceplate, Spherical: Filterglass

Light transmission (Approx.): 78%

Phosphor (For curves, see front of this section): P4—Sulfide Type Aluminized

Fluorescence: White

Phosphorescence: White

Persistence: Medium-Short

Focusing Method: Electrostatic

Deflection Method: Magnetic

Deflection Angles (Approx.):

<table>
<thead>
<tr>
<th>Diagonal.</th>
<th>110°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>105°</td>
</tr>
<tr>
<td>Vertical</td>
<td>87°</td>
</tr>
</tbody>
</table>

Electron Gun: Type Requiring No Ion-Trap Magnet

**Tube Dimensions:**

<table>
<thead>
<tr>
<th>Overall length</th>
<th>11-1/4&quot; ± 3/16&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatest width</td>
<td>15-5/8&quot; ± 1/8&quot;</td>
</tr>
<tr>
<td>Greatest height</td>
<td>12-3/4&quot; ± 1/8&quot;</td>
</tr>
<tr>
<td>Diagonal</td>
<td>16-9/16&quot; ± 1/8&quot;</td>
</tr>
<tr>
<td>Neck length</td>
<td>4-1/8&quot; ± 1/8&quot;</td>
</tr>
<tr>
<td>Radius of curvature of faceplate (External surface)</td>
<td>20-3/4&quot;</td>
</tr>
</tbody>
</table>

**Screen Dimensions (Minimum):**

<table>
<thead>
<tr>
<th>Greatest width</th>
<th>14-3/4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatest height</td>
<td>11-11/16&quot;</td>
</tr>
<tr>
<td>Diagonal</td>
<td>15-3/4&quot;</td>
</tr>
<tr>
<td>Projected area</td>
<td>155 sq. in.</td>
</tr>
</tbody>
</table>

Weight (Approx.): 10 lbs

Operating Position: Any

Cap: Recessed Small Cavity (JEDEC No.J1-21)

Bulb: J132-1/2 A1/B1

Socket: Ucinite Part No.115446, or equivalent
PICTURE TUBE

Base. . . . . Small-Button Neoeightar 7-Pin, Arrangement 1, (JEDEC No.87-208)
Basing Designation for BOTTOM VIEW. . . . . . . . . . . 8HR

Pin 1-Heater
Pin 2-Grid No.1  (Grid No.3,
Pin 3-Grid No.2  Grid No.5,
Pin 4-Grid No.4  Collector)
Pin 6-Grid No.1  C-External
Pin 7-Cathode  Conductive
Pin 8-Heater  Coating

GRID-DRIVE® SERVICE

Unless otherwise specified, voltage values are positive with respect to cathode

Maximum and Minimum Ratings, Design-Center Values:

ULTOR VOLTAGE . . . . . . . . . . . . . {18000 max. volts
{12000 min. volts

GRID-No.4 (FOCUSING) VOLTAGE:
Positive value . . . . . . . . . . . 1000 max. volts
Negative value . . . . . . . . . . . 500 max. volts

GRID-No.2 VOLTAGE . . . . . . . . . . 500 max. volts

GRID-No.1 VOLTAGE:
Negative-peak value . . . . . . . . . 200 max. volts
Negative-bias value . . . . . . . . . 140 max. volts
Positive-bias value . . . . . . . . . 0 max. volts
Positive-peak value . . . . . . . . . 2 max. volts

PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode:
During equipment warm-up period not exceeding 15 seconds . . . . . . 410 max. volts
After equipment warm-up period . . . . . . 180 max. volts
Heater positive with respect to cathode . . . . . . 180 max. volts

Equipment Design Ranges:

With any ultor voltage ($E_{c4}$) between 12000* and 18000 volts and grid-No.2 voltage ($E_{c2k}$) between 200 and 500 volts

Grid-No.4 Voltage for focus$\S$. . . . . . . . . . . . . 0 to 400 volts

Grid-No.1 Voltage ($E_{c1k}$) for visual extinction of focused raster . . . . . . See Raster-Cutoff-Range Chart for Grid-Drive Service

Grid-No.1 Video Drive from Raster Cutoff (Black level):
White-level value . . . . . . . . . . . Same value as determined for $E_{c1k}$ except video drive is a positive voltage
(Peak positive) . . . . . . . . . . .
Grid-No.4 Current .............. -25 to +25 \(\mu\)a
Grid-No.2 Current .............. -15 to +15 \(\mu\)a
Field Strength of Adjustable Centering Magnet* .... 0 to 8 gausses

Examples of Use of Design Ranges:
With ultor voltage of 16000 volts and grid-No.2 voltage of 300 volts
Grid-No.4 Voltage for focus .............. 0 to 400 volts
Grid-No.1 Voltage for visual extinction of focused raster ....... -38 to -72 volts
Grid-No.1 Video Drive from Raster Cutoff (Black level):
White-level value .............. 38 to 72 volts

Maximum Circuit Values:
Grid-No.1—Circuit Resistance .............. 1.5 max. megohms

CATHODE-DRIVE® SERVICE

Unless otherwise specified, voltage values are positive with respect to grid No.1

Maximum and Minimum Ratings, Design-Center Values:

ULTOR-TO-GRID-No.1 VOLTAGE .............. \(\{18000\) max. volts
GRID-No.4-TO-GRID-No.1 (FOCUSING) VOLTAGE:
Positive value .............. 1000 max. volts
Negative value .............. 500 max. volts
GRID-No.2-TO-GRID-No.1 VOLTAGE .............. 640 max. volts
GRID-No.2-TO-CATHODE VOLTAGE .............. 500 max. volts
CATHODE-TO-GRID-No.1 VOLTAGE:
Positive-peak value .............. 200 max. volts
Positive-bias value .............. 140 max. volts
Negative-bias value .............. 0 max. volts
Negative-peak value .............. 2 max. volts
PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode:
During equipment warm-up period not exceeding 15 seconds ........ 410 max. volts
After equipment warm-up period ........ 180 max. volts
Heater positive with respect to cathode ........ 180 max. volts
Equipment Design Ranges:

With any utor-to-grid-No.1 voltage \( V_{EG1} \) between 12000 and 18000 volts and grid-No.2-to-grid-No.1 voltage \( V_{EG2} \) between 225 and 640 volts

Grid-No.4-to-Grid-No.1 Voltage for focus\$ \hspace{1em} 0 \text{ to } 400 \text{ volts}

Cathode-to-Grid-No.1 Voltage (\( E_{KG1} \)) for visual extinction of focused raster \hspace{1em} \text{See Raster-Cutoff-Range Chart for Cathode-Drive Service}

Cathode-to-Grid-No.1 Video Drive from Raster Cutoff

\hspace{1em} \begin{align*}
\text{Black level:} & \hspace{1em} \text{White-level value} \\
\text{Peak negative} & \hspace{1em} \text{Same value as determined for} E_{KG1} \text{ except video drive is a negative value}
\end{align*}

Grid-No.4 Current \hspace{1em} -25 \text{ to } +25 \mu A

Grid-No.2 Current \hspace{1em} -15 \text{ to } +15 \mu A

Field Strength of Adjustable Centering Magnet\* \hspace{1em} 0 \text{ to } 8 \text{ gausses}

Examples of Use of Design Ranges:

With utor-to-grid-

\hspace{1em} No.1 voltage of 16000 \hspace{1em} 16000 \text{ volts}

and grid-No.2-to-grid-

\hspace{1em} No.1 voltage of 300 \hspace{1em} 400 \text{ volts}

Grid-No.4-to-Grid-No.1 Voltage for focus \hspace{1em} 0 \text{ to } 400 \hspace{1em} 0 \text{ to } 400 \text{ volts}

Cathode-to-Grid-No.1 Voltage for visual extinction of focused raster \hspace{1em} 35 \text{ to } 63 \hspace{1em} 43 \text{ to } 78 \text{ volts}

Cathode-to-Grid-No.1 Video Drive from Raster Cutoff

\hspace{1em} \begin{align*}
\text{Black level:} & \hspace{1em} \text{White-level value} \\
\text{Peak negative} & \hspace{1em} -35 \text{ to } -63 \hspace{1em} -43 \text{ to } -78 \text{ volts}
\end{align*}

Maximum Circuit Values:

Grid-No.1-Circuit Resistance \hspace{1em} 1.5 \text{ max. megohms}

\* Grid drive is the operating condition in which the video signal varies the grid-No.1 potential with respect to cathode.

\* This value is a working design-center minimum. The equivalent absolute minimum utor (or utor-to-grid-No.1) voltage is 11,000 volts, below which the serviceability of the 17DSP4 will be impaired. The equipment designer has the responsibility of determining a minimum design value such that under the worst probable operating conditions involving supply-voltage variation and equipment variation the absolute minimum utor (or utor-to-grid-No.1) voltage is never less than 11,000 volts.

\$ The grid-No.4 (or grid-No.4-to-grid-No.1) voltage required for optimum focus of any individual tube will have a value between 0 and 400 volts independent of utor current and will remain essentially constant for values of utor (or utor-to-grid-No.1) voltage or grid-No.2 (or grid-No.2-to-grid-No.1) voltage within design ranges shown for these items.
Distance from Reference Line for suitable PM centering magnet should not exceed 2-1/8". Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having a 5/16-inch radius concentric with the center of the tube face. It is to be noted that the earth's magnetic field can cause as much as 1/2-inch deflection of the spot from the center of the tube face.

Cathode drive is the operating condition in which the video signal varies the cathode potential with respect to grid No. 1 and the other electrodes.

OPERATING CONSIDERATIONS

Shatter-Proof Cover Over the Tube Face. Following conventional picture-tube practice, it is recommended that the cabinet be provided with a shatter-proof, glass cover over the face of the 17DSP4 to protect it from being struck accidentally and to protect against possible damage resulting from tube implosion under some abnormal condition. This safety cover can also provide X-ray protection when required.

For X-ray shielding considerations, see sheet I-RAY PRECAUTIONS FOR CATHODE-RAY TUBES at front of this Section


NOTE 3: SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY. THE DESIGN OF THE SOCKET SHOULD BE SUCH THAT THE CIRCUIT WIRING CANNOT IMPRESS LATERAL STRAINS THROUGH THE SOCKET CONTACTS ON THE BASE PINS. BOTTOM CIRCUMFERENCE OF BASE WAFER WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 1-3/4".

NOTE 4: EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

NOTE 5: TO CLEAN THIS AREA, WIPE ONLY WITH SOFT DRY LINTLESS CLOTH.

NOTE 6: MEASURED 2-9/32" ± 1/32" FROM THE PLANE TANGENT TO THE SURFACE OF THE FACEPLATE AT THE TUBE AXIS.

NOTE 7: BULGE AT SPLICE-LINE SEAL MAY INCREASE THE INDICATED MAXIMUM VALUE FOR ENVELOPE WIDTH, DIAGONAL, AND HEIGHT BY NOT MORE THAN 1/4", BUT AT ANY POINT AROUND THE SEAL, THE BULGE WILL NOT PROTRUDE MORE THAN 1/8" BEYOND THE ENVELOPE SURFACE AT THE LOCATION SPECIFIED FOR DIMENSIONING THE ENVELOPE WIDTH, DIAGONAL, AND HEIGHT.

NOTE 8: THE TUBE SHOULD BE SUPPORTED ON BOTH SIDES OF THE BULGE. THE MECHANISM USED SHOULD PROVIDE CLEARANCE FOR THE MAXIMUM DIMENSIONS OF THE BULGE. SUPPORTS MUST BE SPACED FROM THE TUBE BY THE USE OF CUSHIONING PADS MADE OF MATERIAL SUCH AS ASPHALT-IMPREGNATED FELT, OR EQUIVALENT.
RASTER-CUTOFF-RANGE CHARTS
GRID-DRIVE SERVICE

$E_f = 6.3$ VOLTS
ULTOR VOLTS = 12000 TO 18000
GRID-Nr. 4 VOLTS ADJUSTED FOR FOCUS.

CATHODE-DRIVE SERVICE

$E_f = 6.3$ VOLTS
ULTOR-TO-GRID-Nr. 1 VOLTS = 12000 TO 18000
GRID-Nr. 2 TO-GRID-Nr. 1 VOLTS ADJUSTED FOR FOCUS.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE

E_f = 6.3 VOLTS
ULTOR-TO-GRID-N°1 VOLTS = 16000
CATHODE BIASED POSITIVE WITH
RESPECT TO GRID N°1 TO GIVE
FOCUSED RASTER CUTOFF.
RASTER FOCUSED
AT AVERAGE BRIGHTNESS.
RASTER SIZE = 14" x 10½"

GRID-DRIVE SERVICE

E_f = 6.3 VOLTS
ULTOR VOLTS = 16000
GRID N°1 BIASED NEGATIVE WITH
RESPECT TO CATHODE TO GIVE
FOCUSED RASTER CUTOFF.
RASTER FOCUSED
AT AVERAGE BRIGHTNESS.
RASTER SIZE = 14" x 10½"

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ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, MARRISON, NEW JERSEY

92CM-10380
AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE
$E_f = 6.3$ VOLTS
ULTOR-TO-GRID-№1
VOLTS = 12000 TO 18000
CATHODE BIASED POSITIVE WITH
RESPECT TO GRID №1 TO GIVE
FOCUSED RASTER CUTOFF.

GRID-DRIVE SERVICE
$E_f = 6.3$ VOLTS
ULTOR VOLTS = 12000 TO 18000
GRID №1 BIASED NEGATIVE WITH
RESPECT TO CATHODE TO GIVE
FOCUSED RASTER CUTOFF.

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CATHODE DRIVE
GRID DRIVE

---

ULTOR MILLIAMPERES

0.5
1
1.5
2
2.5

VIDEO SIGNAL VOLTS FROM RASTER CUTOFF

0
20
40
60
80

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92CM-10382