

## Picture Tube

SHORT RECTANGULAR GLASS TYPE  
LOW-VOLTAGE ELECTROSTATIC FOCUS

ALUMINIZED SCREEN  
MAGNETIC DEFLECTION

With Heater Having Controlled Warm-Up Time

## DATA

## General:

Heater, for Unipotential Cathode:

|                                 |      |       |
|---------------------------------|------|-------|
| Voltage (AC or DC) . . . . .    | 6.3  | volts |
| Current at 6.3 volts. . . . .   | 0.45 | amp   |
| Warm-up time (Average). . . . . | 11   | sec   |

Direct Interelectrode Capacitances:

|                                         |                          |                                |
|-----------------------------------------|--------------------------|--------------------------------|
| Grid No.1 to all other electrodes . . . | 6                        | $\mu\text{f}$                  |
| Cathode to all other electrodes . . . . | 5                        | $\mu\text{f}$                  |
| External conductive coating to ultor. . | { 1500 max.<br>1000 min. | $\mu\text{f}$<br>$\mu\text{f}$ |

Faceplate, Spherical. . . . . Filterglass

Light transmission (Approx.). . . . . 77%

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.):

Diagonal. . . . . 110°

Horizontal. . . . . 105°

Vertical. . . . . 87°

Electron Gun. . . . . Type Requiring No Ion-Trap Magnet

Tube Dimensions:

Overall length. . . . . 10-11/16"  $\pm$  1/4"

Greatest width. . . . . 15-5/8"  $\pm$  1/8"

Greatest height . . . . . 12-3/4"  $\pm$  1/8"

Diagonal. . . . . 16-9/16"  $\pm$  1/8"

Neck length . . . . . 3-9/16"  $\pm$  1/8"

Radius of curvature of faceplate  
(External surface). . . . . 20-3/4"

Screen Dimensions (Minimum):

Greatest width. . . . . 14-3/4"

Greatest height . . . . . 11-11/16"

Diagonal. . . . . 15-3/4"

Projected area. . . . . 155 sq. in.

Weight (Approx.). . . . . 10 lbs

Operating Position. . . . . Any

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

Bulb. . . . . J132-1/2 A/B

Socket. . . . . Ucinite Part No.115446, or equivalent

Base. . . . . Small-Button Neoeightar 7-Pin, Arrangement 1,  
(JEDEC No.B7-208)



# 17DXP4

Basing Designation for BOTTOM VIEW. . . . . 8JR

Pin 1—Heater

Pin 2—Grid No.1

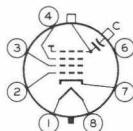
Pin 3—Grid No.2

Pin 4—Grid No.3

Pin 6—Internal

Connection—  
Do Not Use

Pin 7—Cathode



Pin 8—Heater

Cap—Ultror

(Grid No.4,  
Collector)

C—External  
Conductive  
Coating

## GRID-DRIVE<sup>▲</sup> SERVICE

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

### Maximum and Minimum Ratings, Design-Center Values:

|                                          |                                                     |
|------------------------------------------|-----------------------------------------------------|
| ULTOR VOLTAGE. . . . .                   | { 16000 max. volts<br>12000 <sup>#</sup> min. volts |
| GRID-No.3 (FOCUSING) VOLTAGE . . . . .   | 650 max. volts                                      |
| GRID-No.2 VOLTAGE. . . . .               | { 550 max. volts<br>300 min. 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 ( $E_{c4k}$ ) between 12000 and 16000 volts  
and grid-No.2 voltage ( $E_{c2k}$ ) between 400 and 550 volts*

Grid-No.3 Voltage for  
focus§ . . . . . 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  
(Peak positive). . . . . Same value as determined for  
 $E_{c1k}$  except video drive is a  
positive voltage

Grid-No.3 Current. . . . . -25 to +25  $\mu$ a

Grid-No.2 Current. . . . . -15 to +15  $\mu$ a



Field Strength of Adjustable Centering Magnet . . . 0 to 12 gaussess

### Examples of Use of Design Ranges:

|                                                                    |            |            |       |
|--------------------------------------------------------------------|------------|------------|-------|
| With ultor voltage of                                              | 16000      | 16000      | volts |
| and grid-No.2 voltage of                                           | 400        | 500        | volts |
| Grid-No.3 Voltage for focus. . . . .                               | 0 to 400   | 0 to 400   | volts |
| Grid-No.1 Voltage for visual extinction of focused raster. . . . . | -34 to -63 | -43 to -78 | volts |
| Grid-No.1 Video Drive from Raster Cutoff (Black level):            |            |            |       |
| White-level value. . . . .                                         | 34 to 63   | 43 to 78   | volts |

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance. . . . . 1.5 max. megohms

### CATHODE-DRIVE<sup>■</sup> 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. . . . .                               | { 16000 max.              | volts |
|                                                                   | { 12000 <sup>■</sup> min. | volts |
| GRID-No.3-TO-GRID-No.1 (FOCUSING) VOLTAGE . . . . .               | 650 max.                  | volts |
| GRID-No.2-TO-GRID-No.1 VOLTAGE. . . . .                           | 690 max.                  | volts |
| GRID-No.2-TO-CATHODE VOLTAGE. . . . .                             | { 550 max.                | volts |
|                                                                   | { 300 min.                | 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 ultor-to-grid-No.1 voltage ( $E_{c4g1}$ ) between 12000 and 16000 volts and grid-No.2-to-grid-No.1 voltage ( $E_{c2g1}$ ) between 400 and 690 volts*

Grid-No.3-to-Grid-No.1 Voltage for focus<sup>§</sup>. . . . . 0 to 400 volts



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|                                                                                                                               |                                                                                         |  |         |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--|---------|
| Cathode-to-Grid-No.1<br>Voltage ( $E_{k_1}$ ) for<br>visual extinction<br>of focused raster. . . . .                          | See <i>Raster-Cutoff-Range Chart<br/>for Cathode-Drive Service</i>                      |  |         |
| Cathode-to-Grid-No.1<br>Video Drive from<br>Raster Cutoff<br>(Black level):<br>White-level value<br>(Peak negative) . . . . . | Same value as determined for<br>$E_{k_1}$ , except video drive is a<br>negative voltage |  |         |
| Grid-No.3 Current . . . . .                                                                                                   | -25 to +25                                                                              |  | $\mu$ a |
| Grid-No.2 Current . . . . .                                                                                                   | -15 to +15                                                                              |  | $\mu$ a |
| Field Strength of Adjust-<br>able Centering Magnet. . .                                                                       | 0 to 12                                                                                 |  | gausses |

## Examples of Use of Design Ranges:

|                                                                                                            |            |            |       |
|------------------------------------------------------------------------------------------------------------|------------|------------|-------|
| <i>With ultor-to-grid-</i>                                                                                 |            |            |       |
| No.1 voltage of                                                                                            | 16000      | 16000      | volts |
| <i>and grid-No.2 to-grid-</i>                                                                              |            |            |       |
| No.1 voltage of                                                                                            | 400        | 500        | volts |
| Grid-No.3 to-Grid-                                                                                         |            |            |       |
| No.1 Voltage<br>for focus . . . . .                                                                        | 0 to 400   | 0 to 400   | volts |
| Cathode-to-Grid-No.1<br>Voltage for visual<br>extinction of<br>focused raster. . . . .                     | 34 to 56   | 41 to 69   | volts |
| Cathode-to-Grid-No.1<br>Video Drive from<br>Raster Cutoff<br>(Black level):<br>White-level value . . . . . | -34 to -56 | -41 to -69 | volts |

## Maximum Circuit Values:

|                                       |                  |
|---------------------------------------|------------------|
| Grid-No.1-Circuit Resistance. . . . . | 1.5 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* ultor- or ultor-to-grid-No.1 voltage is 11,000 volts, below which the serviceability of the 17DXP4 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 ultor- or ultor-to-grid-No.1 voltage is never less than 11,000 volts.

§ The grid-No.3 voltage required for optimum focus of any individual tube may have a value anywhere between 0 and 400 volts and is a function of the value of the ultor voltage, ultor current, and grid-No.2 voltage. It changes directly with the ultor voltage at the rate of approximately 46 volts for each 1000-volt change in ultor voltage; inversely with grid-No.2 voltage at the rate of about 60 volts for each 100-volt change in grid-No.2 voltage; and inversely with ultor current at the rate of about 60 volts for each 100-microampere change in ultor current. Because the 17DXP4 has a narrow depth of focus, it is necessary to provide means such as a potentiometer or a 4-tap switch for adjusting the focusing voltage. In general, commercially acceptable focus is obtained if the focusing voltage is within 75 volts of the value required for optimum focus and if the focusing voltage is maintained to within 75 volts of the optimum value during line-voltage fluctuations.



- Distance from *Reference Line* for suitable PM centering magnet should not exceed 2-1/4". 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.

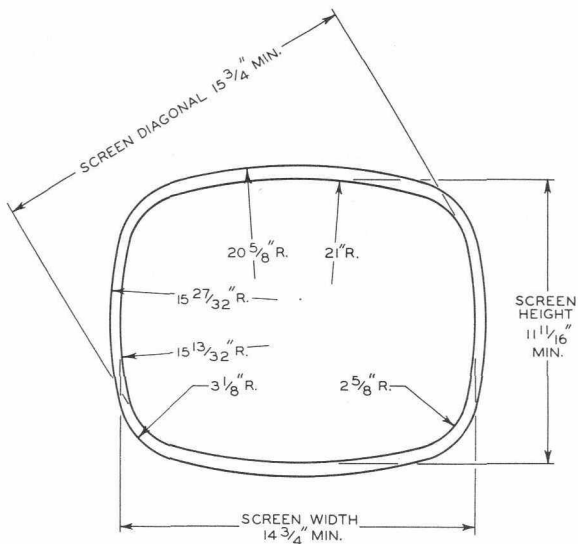
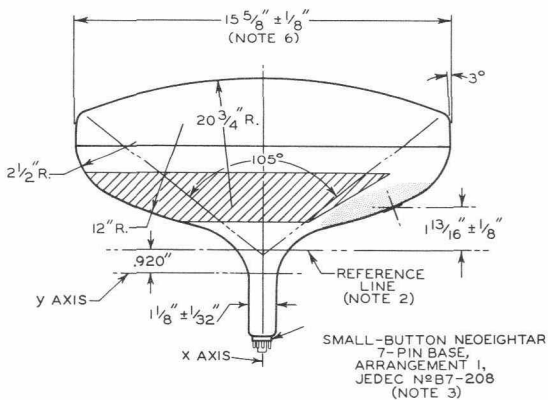
## OPERATING CONSIDERATIONS

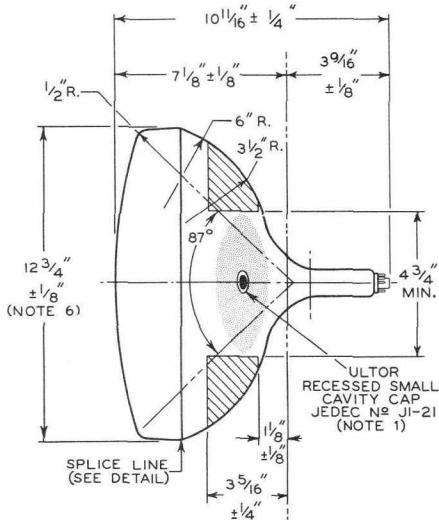
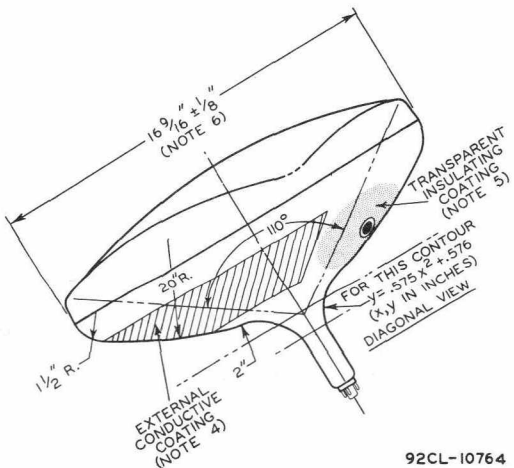
*Shatter-Proof Cover Over the Tube Face.* Following conventional picture-tube practice, it is recommended that the cabinet be provided with a shatter-proof, glass cover over the face of the 17DXP4 to protect it from being struck accidentally and to protect against possible damage resulting from tube implosion under some abnormal condition. This safety cover can also provide X-ray protection when required.

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



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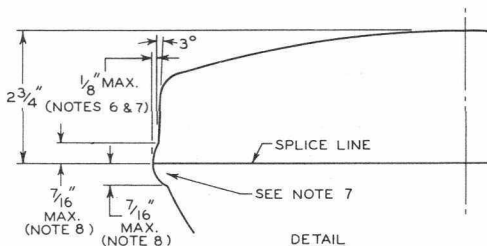




92CL-10764



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**NOTE 1:** THE PLANE THROUGH THE TUBE AXIS AND PIN 4 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ULTOR TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF  $\pm 30^\circ$ . ULTOR TERMINAL IS ON SAME SIDE AS PIN 4.

**NOTE 2:** WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JEDEC No. G-126 (SHOWN AT FRONT OF THIS SECTION) AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY THE INTERSECTION OF THE PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

**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  $1\frac{3}{4}"$ .

**NOTE 4:** EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

**NOTE 5:** TO CLEAN THIS AREA, WIPE ONLY WITH SOFT DRY LINT-LESS CLOTH.

**NOTE 6:** MEASURED  $2\text{--}9/32" \pm 1/32"$  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.

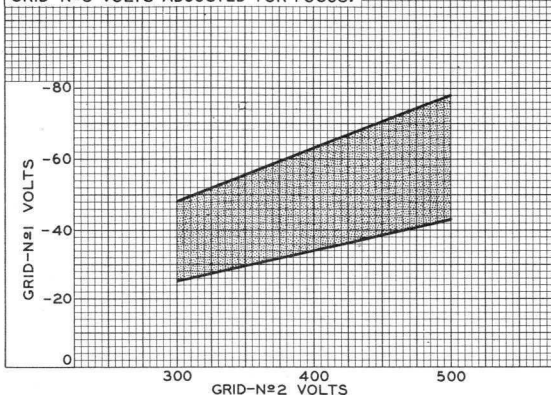
**NOTE 9:** NECK DIAMETER IS MAINTAINED TO AT LEAST  $2\text{--}7/16"$  FROM REFERENCE LINE.

# RASTER-CUTOFF-RANGE CHARTS Grid-Drive Service

$E_f = 6.3$  VOLTS

ULTOR VOLTS=12000 TO 16000

GRID-N $\phi$ 3 VOLTS ADJUSTED FOR FOCUS.



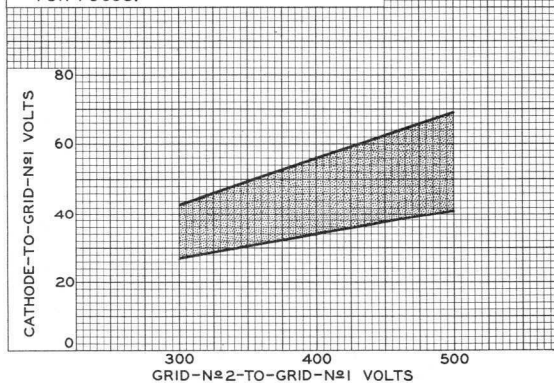
92CS-9930

## Cathode-Drive Service

$E_f = 6.3$  VOLTS

ULTOR-TO-GRID-N $\phi$ 1 VOLTS=12000 TO 16000

GRID-N $\phi$ 3-TO-GRID-N $\phi$ 1 VOLTS ADJUSTED FOR FOCUS.



92CS-9931



