



21CXP4

21CXP4 PICTURE TUBE

RECTANGULAR GLASS TYPE

ALUMINIZED SCREEN

LOW-VOLTAGE ELECTROSTATIC FOCUS

MAGNETIC DEFLECTION

LOW GRID-No.2 VOLTAGE

CATHODE-DRIVE TYPE

*With heater having controlled warm-up time***DATA****General:**

Heater, for Unipotential Cathode:

Voltage. 6.3 ac or dc volts

Current. $0.6 \pm 10\%$ amp

Warm-up time (Average) 11 sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of Receiving Tube Section.

Direct Interelectrode Capacitances:

Grid No.1 to all other electrodes. 6 μf Cathode to all other electrodes. 5 μf
 External conductive coating to ultor. $\begin{cases} 2500 \text{ max.} \\ 2000 \text{ min.} \end{cases}$ μf

Faceplate, Spherical Filterglass

Light transmission (Approx.) 74%

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

Fluorescence White

Phosphorescence. White

Persistence. Short

Focusing Method. Electrostatic

Deflection Method. Magnetic

Deflection Angles (Approx.):

Diagonal 90° Horizontal 85° Vertical 68°

Electron Gun Type Requiring No Ion-Trap Magnet

Tube Dimensions:

Overall length $18" \pm 3/8"$ Greatest width $20-1/4" \pm 1/8"$ Greatest height. $16-3/8" \pm 1/8"$ Diagonal $21-3/8" \pm 1/8"$ Neck length. $5-1/2" \pm 3/16"$ Radius of curvature of faceplate (External surface). . $33"$

Screen Dimensions (Minimum):

Greatest width $19-1/16"$ Greatest height. $15-1/16"$ Diagonal $20-1/4"$

Projected area 262 sq. in.

Weight (Approx.) 24 lbs

Operating Position Any

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

Bulb J171D2/E1

 Base Small-Shell Duodecal 6-Pin, Arrangement 1
 (JEDEC Group 4, No.B6-63), or
 Short Small-Shell Duodecal 6-Pin
 (JEDEC Group 4, No.B6-203)

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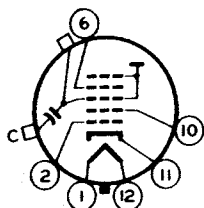


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Basing Designation for BOTTOM VIEW 12L

Pin 1-Heater
 Pin 2-Grid No.1
 Pin 6-Grid No.4
 Pin 10-Grid No.2
 Pin 11-Cathode
 Pin 12-Heater



Cap-Ultor
 (Grid No.3,
 Grid No.5,
 Collector)
 C-External
 Conductive
 Coating

CATHODE-DRIVE[■] SERVICE

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

Maximum Ratings, Design-Center Values:

ULTOR-TO-GRID-No.1 VOLTAGE	{20000 max. 12000 [■] min.	volts volts
GRID-No.4-TO-GRID-No.1 VOLTAGE:		
Positive value	1000 max.	volts
Negative value	500 max.	volts
GRID-No.2-TO-GRID-No.1 VOLTAGE	64 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 ultor-to-grid-No.1 voltage (E_{c5g1}) between 12000 and 20000 volts and grid-No.2-to-grid-No.1 voltage (E_{c2g1}) between 40 and 64 volts

Grid-No.4-to-Grid-No.1 Voltage for focus [§]	0 to 350	volts
Cathode-to-Grid-No.1 Voltage (E_{kg1}) for visual extinction of focused raster [▲]	See Raster-Cutoff-Range Chart	
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):		
White-level value		
(Peak negative)	Same value as determined for E_{kg1} except video drive is a negative voltage	

■, §, ▲: See next page.



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Grid-No.4 Current.	-25 to +25	μ a
Grid-No.2 Current.	-15 to +15	μ a
Field Strength of Adjustable Centering Magnet*.	0 to 8	gausses

Examples of Use of Design Ranges:

<i>With ultor-to-grid-No.1 voltage of</i>	<i>18000</i>	<i>volts</i>
<i>and grid-No.2-to-grid-No.1 voltage of</i>	<i>50</i>	<i>volts</i>

Grid-No.4-to-Grid-No.1 Voltage for focus.	0 to 350	volts
Cathode-to-Grid-No.1 Voltage for visual extinction of focused raster.	32 to 47	volts
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):		
White-level value.	-32 to -47	volts

Maximum Circuit Values:

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

* This value is a working design-center minimum. The equivalent ~~absolute minimum~~ ultor-to-grid-No.1 voltage is 11,000 volts, below which the serviceability of the 21CXP4 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-to-grid-No.1 voltage is never less than 11,000 volts.

§ The grid-No.4-to-grid-No.1 voltage required for focus of any individual tube is independent of ultor current and will remain essentially constant for values of ultor-to-grid-No.1 voltage or grid-No.2-to-grid-No.1 voltage within design ranges shown for these items.

▲ The cathode-to-grid-No.1 voltage (E_{k1}) will increase by approximately 2 per cent for every 1000-volt increase in ultor-to-grid-No.1 voltage and will decrease by approximately 2 per cent for every 1000-volt decrease in ultor-to-grid-No.1 voltage.

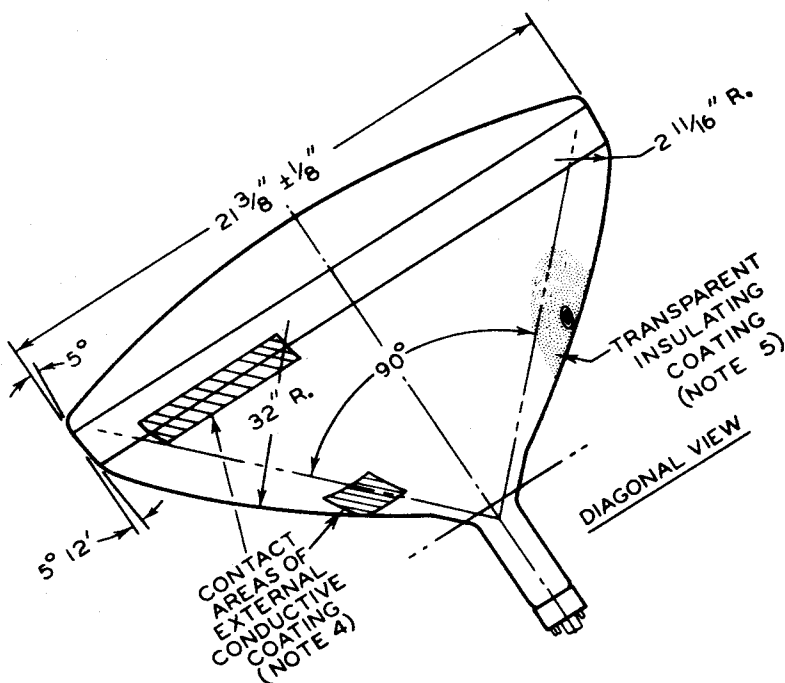
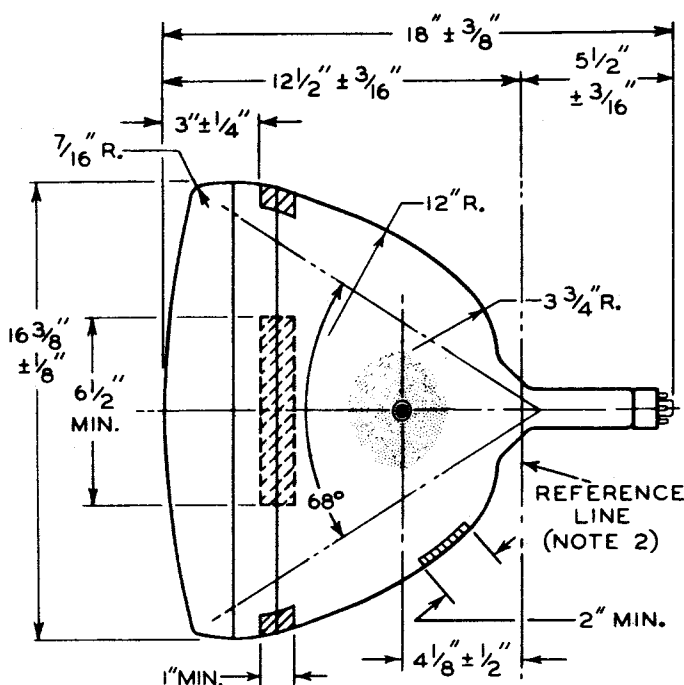
* Distance from *Reference Line* for suitable PM centering magnet should not exceed $2\frac{1}{2}$ ". Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having a $3/8$ -inch radius concentric with the center of the tube face. It is to be noted that the earth's magnetic field can cause as much as $1/2$ -inch deflection of the spot from the center of the tube face.

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



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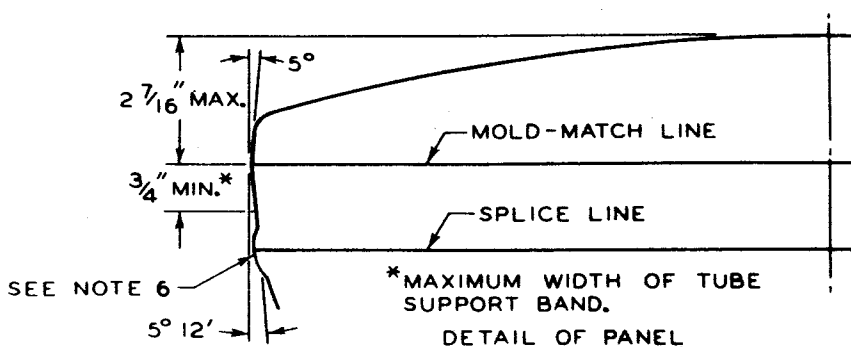
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NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN 6 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ULTOR TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF $\pm 30^\circ$. ULTOR TERMINAL IS ON SAME SIDE AS PIN 6.

NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JEDEC No. G-116 (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. BOTTOM CIRCUMFERENCE OF BASE SHELL WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 2-3/4".

NOTE 4: THE DRAWING SHOWS THE MINIMUM SIZE AND LOCATION OF THREE OF FOUR CONTACT AREAS OF THE EXTERNAL CONDUCTIVE COATING. IN ADDITION TO THE 2" x 2" MIN. CONTACT AREA SHOWN, A 6-1/2" x 1" MIN. CONTACT AREA IS PROVIDED IN THE VICINITY OF THE SPLICE LINE ON EACH LONG SIDE OF THE BULB AND ON AT LEAST ONE SHORT SIDE OF THE BULB AS SHOWN. THE ACTUAL AREA OF EXTERNAL CONDUCTIVE COATING WHICH CONNECTS ALL THE CONTACT AREAS WILL BE GREATER THAN THE CONTACT AREAS SO AS TO PROVIDE THE REQUIRED CAPACITANCE. EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

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

NOTE 6: BULGE AT SPLICE-LINE SEAL MAY INCREASE THE INDICATED MAXIMUM VALUE FOR ENVELOPE WIDTH, DIAGONAL, AND HEIGHT BY NOT MORE THAN 1/8", BUT AT ANY POINT AROUND THE SEAL, THE BULGE WILL NOT PROTRUDE MORE THAN 1/16" BEYOND THE ENVELOPE SURFACE AT THE MOLD-MATCH LINE.



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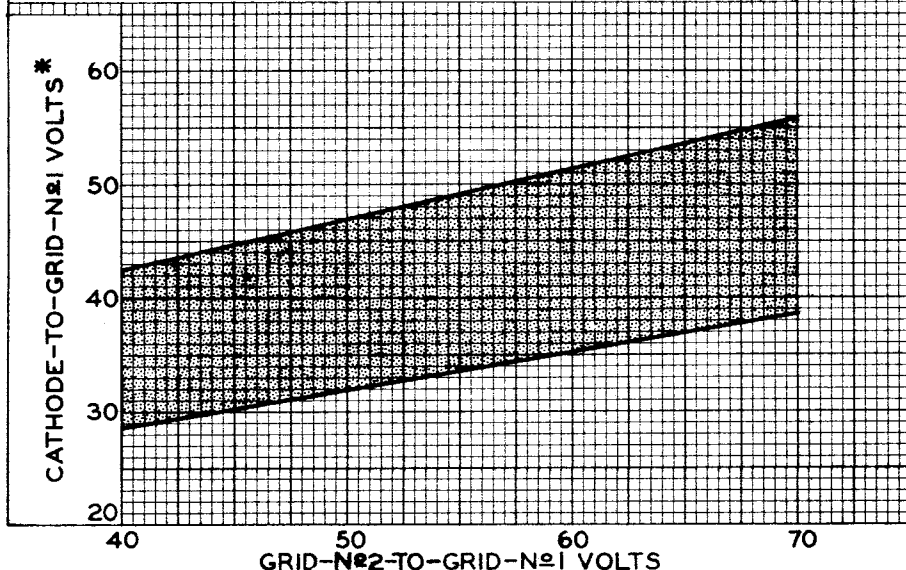
RASTER-CUTOFF-RANGE CHART

$E_f = 6.3$ VOLTS

ULTOR-TO-GRID-N ϕ 1 VOLTS = 18000

GRID-N ϕ 4-TO-GRID-N ϕ 1 VOLTAGE ADJUSTED FOR FOCUS.

*INCREASES OR DECREASES DIRECTLY BY APPROX. 2%
FOR EVERY 1000-VOLT CHANGE IN ULTOR-TO-GRID-N ϕ 1
VOLTAGE.



92CS-9911

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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CATHODE-DRIVE CHARACTERISTICS

 $E_f = 6.3$ VOLTS

ULTOR-TO-GRID-№1 VOLTS=18000

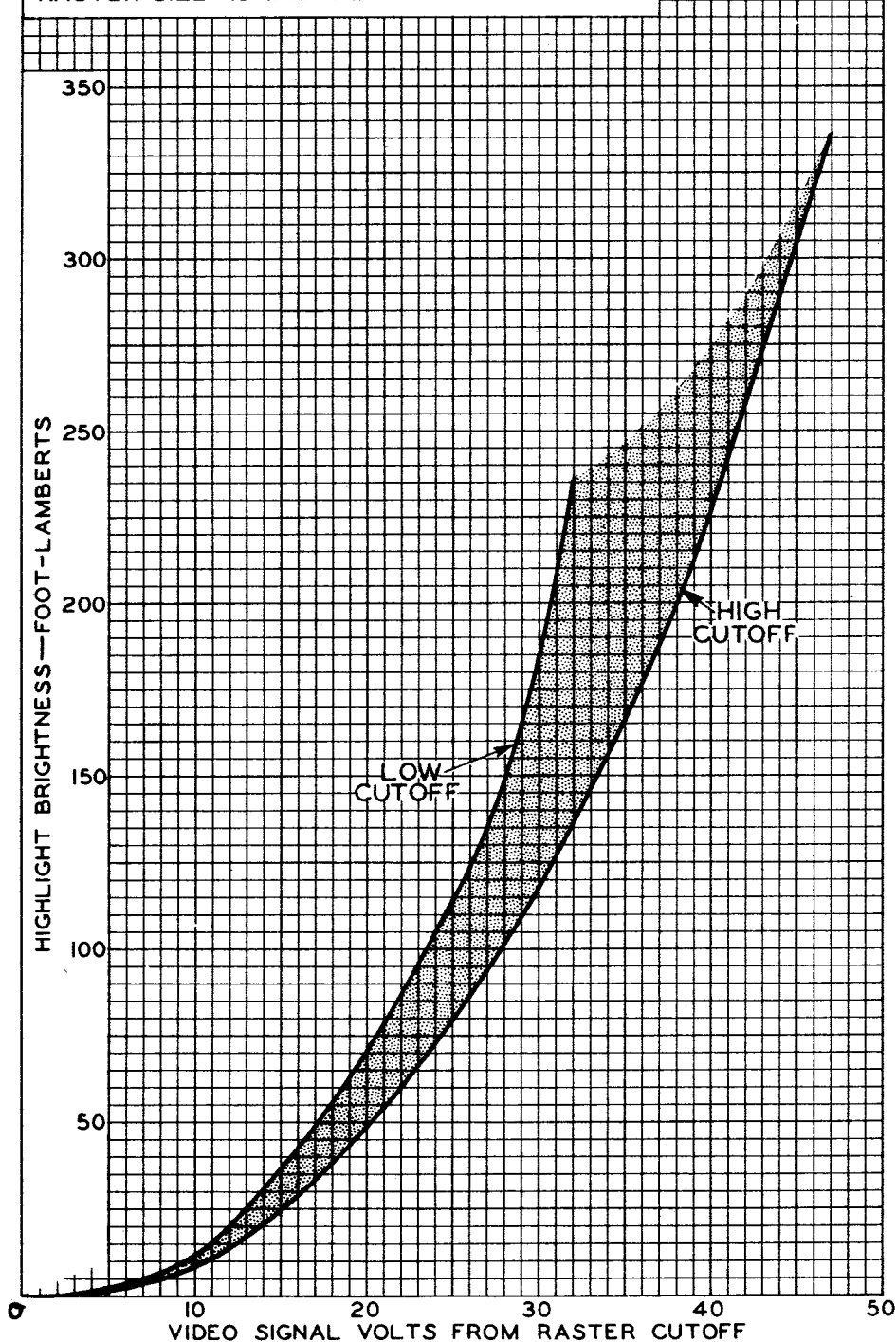
GRID-№2-TO-GRID-№1 VOLTS=50

CATHODE BIASED POSITIVE WITH RESPECT TO

GRID №1 TO GIVE FOCUSED RASTER CUTOFF.

RASTER FOCUSED AT AVERAGE BRIGHTNESS.

RASTER SIZE=18"x 13-1/2"





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CATHODE-DRIVE CHARACTERISTICS

$E_f = 6.3$ VOLTS
ULTOR-TO-GRID-Nº1 VOLTS = 18000
GRID-Nº2-TO-GRID-Nº1 VOLTS = 50
CATHODE BIASED POSITIVE WITH
RESPECT TO GRID Nº1 TO GIVE
FOCUSED RASTER CUTOFF.

