



24BAP4

PICTURE TUBE

Low-Voltage Electro-
static Focus
110° Magnetic Deflection

Aluminized Screen
Low-Grid-No.2-Voltage Type
for Cathode-Drive Operation

21-7/16" x 16-7/8" Screen
24-1/8" Max. Bulb Diagonal
16-3/16" Max. Length

TENTATIVE DATA

RCA-24BAP4 is a directly viewed, rectangular glass picture tube having a 24-inch diagonal envelope. Employing a 110°-diagonal deflection angle and low-voltage electrostatic focus, it is intended primarily for use in cathode-drive applications.

through the wide deflection angle with only slightly more power than is required to scan a tube with 90° deflection angle.

The 24BAP4 has a spherical filterglass faceplate; an aluminized screen 21-7/16" x 16-7/8" with slightly curved sides and rounded corners; a minimum projected screen area of 332 square inches; a maximum overall length of 16-3/16"; an external conductive bulb coating; and an integral glass-button base having straight-through leads fitted with an indexing plug.



Featured in the 24BAP4 is an electron gun that has improved cathode-drive sensitivity; that requires no ion-trap magnet; and that minimizes deflection distortion.

The neck of the 24BAP4 has a diameter of only 1-1/8 inches which makes possible the use of a deflecting yoke having high deflection sensitivity and permits deflection of the beam

DATA

General:

Heater, for unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.6	amp
Direct Interelectrode Capacitances:		
Grid No.1 to all other electrodes	6	μf
Cathode to all other electrodes	5	μf
External conductive coating to ultor*	{ 2500 max.	μf
	{ 2000 min.	μf
Faceplate, Spherical		Filterglass
Light transmission (Approx.)		76%
Phosphor	P4—Sulfide Type	
	Aluminized	
Fluorescence		White
Phosphorescence		White
Persistence		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	15-7/8" ± 5/16"	
Greatest width	22-11/16" ± 1/8"	
Greatest height	18-1/2" ± 1/8"	
Diagonal	24" ± 1/8"	
Neck length	5-7/16" ± 1/8"	
Screen Dimensions (Minimum):		
Greatest width	21-7/16"	
Greatest height	16-7/8"	
Diagonal	22-13/16"	
Projected area	332 sq. in.	
Cap	Recessed Small Cavity (JEDEC No. J1-21)	
Bulb	J192 C1/D1	



Socket Ucinite Part No.115446, or equivalent
 Base Small-Button Eightair 7-Pin, Arrangement 2,
 (JEDEC NO.87-183)
 Weight (Approx.) 28 lbs
 Operating Position Any

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. volts 12000 [Ⓜ] min. 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	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 50 and 64 volts

Grid-No.4-to-Grid-No.1 Voltage for Focus [§]	0 to 400	volts
Cathode-to-Grid-No.1 Voltage (E_{k1}) 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_{k1} except video drive is a negative voltage	
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:

With ultor-to-grid-No.1 voltage of	16000	20000	volts
and grid-No.2-to-grid-No.1 voltage of	50	64	volts
Grid-No.4-to-Grid-No.1 Voltage for Focus	0 to 400	0 to 400	volts
Cathode-to-Grid-No.1 Voltage for Visual Extinction of Focused Raster	32 to 47	42 to 58	volts
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):			
White-level value	-32 to -47	-42 to -58	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
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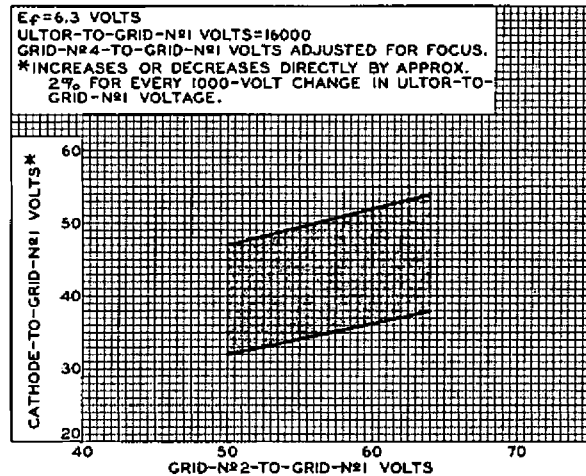
[•] The "ultor" in a cathode-ray tube is the electrode to which is applied the highest dc voltage for accelerating the electrons in the beam prior to its deflection. In the 24BAP4, the ultor function is performed by grid No.5. Since grid No.5, grid No.3, and collector are connected together within the 24BAP4, they are collectively referred to simply as "ultor" for convenience in presenting data and curves.

[■] 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 11000 volts below which the serviceability of the 24BAP4 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 11000 volts.

[§] The grid-No.4-to-grid-No.1 voltage required for optimum focus of any individual tube may have a value anywhere between 0 and 400 volts; 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.

[▲] 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 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.



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Fig. 1 - Raster-Cutoff-Range Chart for Type 24BAP4.

OPERATING CONSIDERATIONS

The maximum ratings in the tabulated data are established in accordance with the following definition of the Design-Center Rating System for rating electron devices.

Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey electron device of a specified type as defined by its published data, and should not be exceeded under normal conditions.

The device manufacturer chooses these values to provide acceptable serviceability of the device in average applications, taking responsibility for normal changes in operating conditions due to rated supply voltage variation*, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in device characteristics.

The equipment manufacturer should design so that initially no design-center value for the intended service is exceeded with a bogey device in equipment operating at the stated normal supply voltage.*

X-Ray Warning. When operated at ultor voltages up to 16 kilovolts, the 24BAP4 does not produce any harmful x-ray radiation. However, because the rating of this type permits operation at voltages as high as 22 kilovolts (absolute maximum value), shielding of the 24BAP4 for

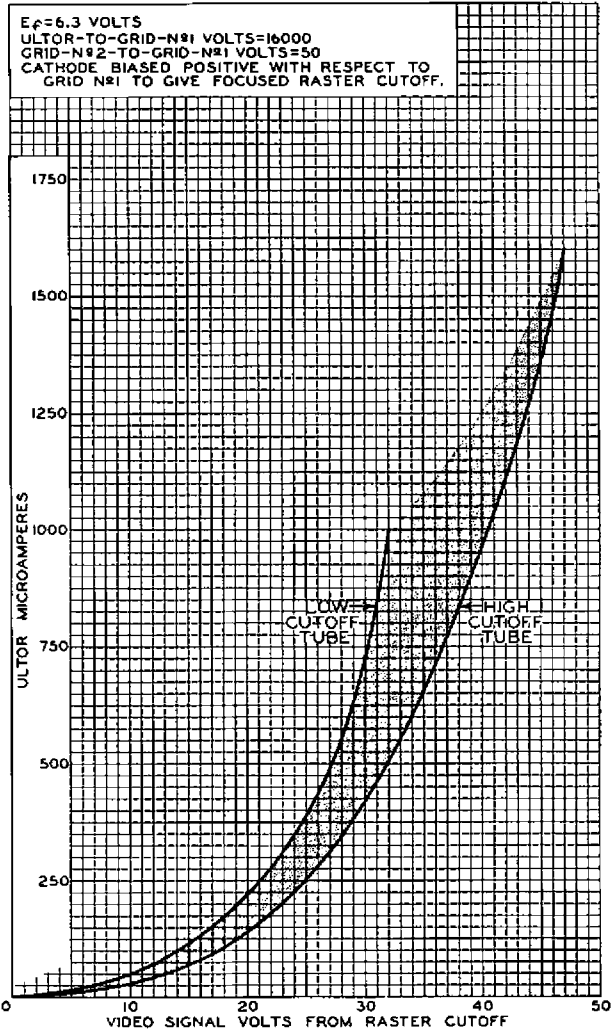
* For an AC power source, 117 volts \pm 10% is accepted U.S.A. practice.



x-ray radiation may be needed to protect against possible injury from prolonged exposure at close range whenever the operating conditions involve voltages in excess of 16 kilovolts.

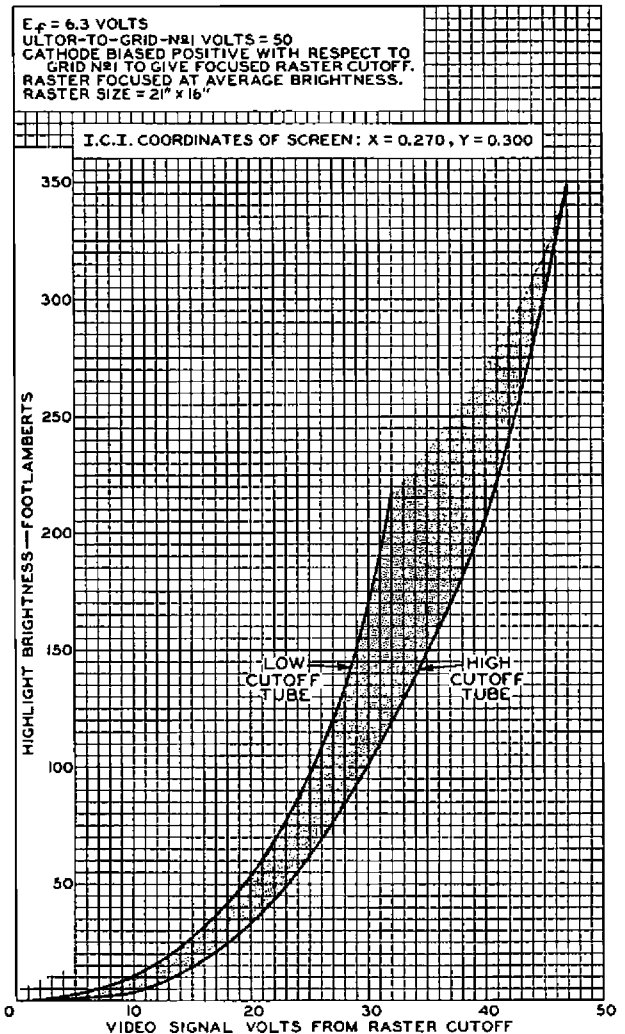
Shatter-Proof Cover Over the Tube Face. Following conventional picture-tube practice, it is recommended

that the cabinet be provided with a shatter-proof, glass cover over the face of the 24BAP4 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.



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Fig. 2 - Cathode-Drive Characteristics of Type 24BAP4.

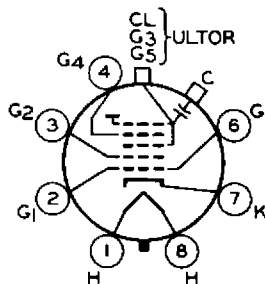


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Fig. 3 - Cathode-Drive Characteristics of Type 24BAP4.

SOCKET CONNECTIONS
Bottom View

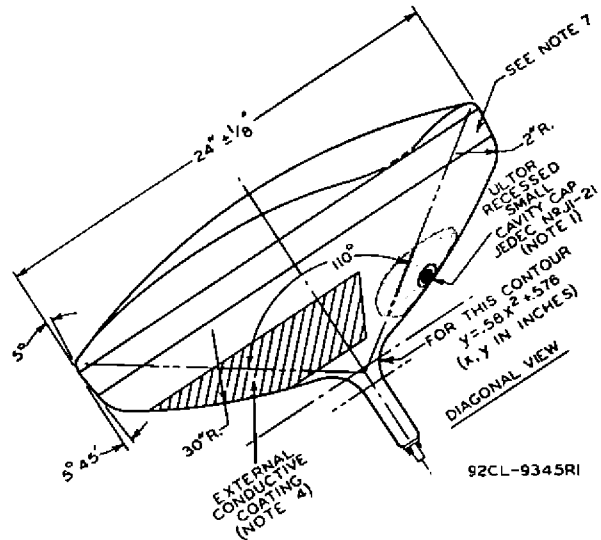
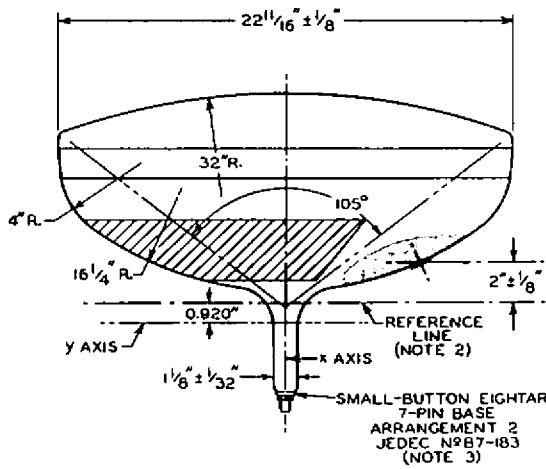
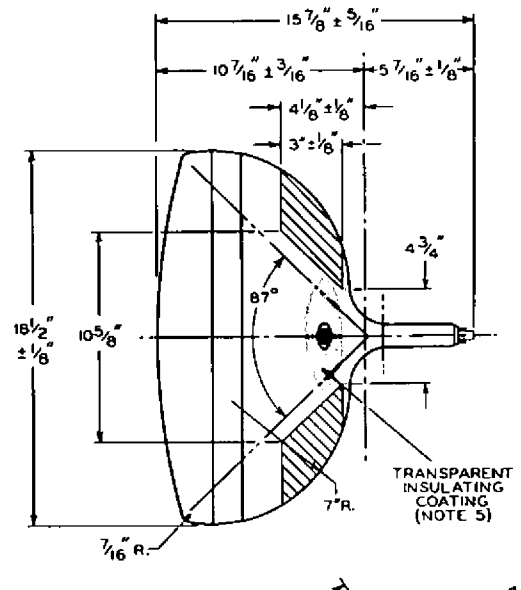
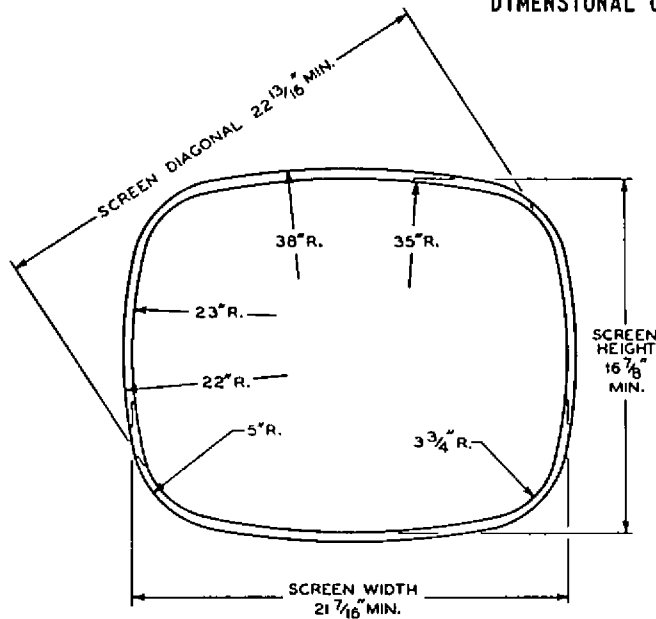
- PIN 1: HEATER
- PIN 2: GRID No.1
- PIN 3: GRID No.2
- PIN 4: GRID No.4
- PIN 6: GRID No.1



- PIN 7: CATHODE
- PIN 8: HEATER
- CAP: ULTOR (Grid No.3, Grid No.5, Collector)
- C: EXTERNAL CONDUCTIVE COATING



DIMENSIONAL OUTLINE



NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN NO. 3 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 NO. 4.

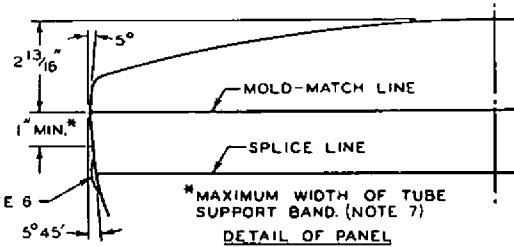
NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JEDEC NO. G126 AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY THE INTERSECTION OF THE PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

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 $1\text{--}3/4$ INCHES.

NOTE 4: EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

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

NOTE 6: BULGE AT SPLICE-LINE SEAL MAY INCREASE THE INDICATED MAXIMUM VALUE FOR ENVELOPE WIDTH, DIAGONAL, AND



SEE NOTE 6

* MAXIMUM WIDTH OF TUBE SUPPORT BAND. (NOTE 7)

DETAIL OF PANEL

HEIGHT BY NOT MORE THAN $1/8$ INCH, BUT AT ANY POINT AROUND THE SEAL, THE BULGE WILL NOT PROTRUDE MORE THAN $1/16$ INCH BEYOND THE ENVELOPE SURFACE AT THE MOLD-MATCH LINE.

NOTE 7: WIDTH OF UNDISTURBED REGION BETWEEN MOLD-MATCH LINE AND SPLICE LINE IS 1 INCH MINIMUM. THIS SHOULD BE THE MAXIMUM WIDTH OF TUBE SUPPORT BAND.

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