RCA-24BAP4 is a directly viewed, rectangular glass picture tube having a 24-inch diagonal envelope. Employing an 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.

**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 ultimate:
  - 2500 max. µf
  - 2000 min. µf
- Faceplate, Spherical .................. Filterglass
- Light transmission (approx.) ............. 76%
- Phosphor, Pr-5Sulfide 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 .................. 28" ± 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.J-21)
- Bulb .................. J192 C1/D1

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RCA Corporation

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

24BAP4 U-59

Printed in U.S.A.
CATHODE-DRIVE Service

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

Maximum Ratings, Design-Center Values:

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Max. Volts</th>
<th>Min. Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid No. 4 to Grid No. 1 Voltage</td>
<td>12000</td>
<td>12000</td>
</tr>
<tr>
<td>Grid No. 4 to Grid No. 1 Voltage</td>
<td>10000</td>
<td>5000</td>
</tr>
<tr>
<td>Grid No. 2 to Grid No. 1 Voltage</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>CATHODE-TO-GRID No. 1 Voltage</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Positive Peak Value</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>Negative Peak Value</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Positive Bias Value</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Peak Heaters Voltage:
- Heater negative with respect to cathode: 180 max. volts
- Heater positive with respect to cathode: 180 max. volts

Equipment Design Ranges:

With any ulterior to grid No. 1 voltage (\(E_{CG1}\)) between 12000 and 20000 volts and grid No. 2 to grid No. 1 voltage (\(E_{CG2}\)) between 50 and 84 volts:
- Grid-No. 4 Current: 0 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 ulterior to grid No. 1 voltage of 16000, 20000 volts and grid No. 2 to grid No. 1 voltage of 50, 84 volts:
- CATHODE-TO-GRID No. 1 Voltage: 0 to 400, 0 to 400 volts
- CATHODE-TO-GRID No. 1 Voltage for Visual Extinction of Focused Raster: 32 to 47, 32 to 58 volts
- CATHODE-TO-GRID No. 1 Voltage for Raster Cutoff (Black Level): -32 to -47, -42 to -58 volts

Maximum Circuit Values:

Grid No. 1 Circuit Resistance: 1.5 max. megohms

- The "ulterior" in a cathode-ray tube is the electrode to which an applied highest dc voltage for accelerating the electrons in the beam prior to its deflection. In the 248AP4, the ulterior function is performed by grid No. 5. Since grid No. 5, grid No. 3, and collector are connected together within the 248AP4, they are collectively referred to simply as "ulterior" 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 ulterior-to-grid No. 1 voltage is 1000 volts below which the serviceability of the 248AP4 will be impaired. The equipment designer has the responsibility of determining a minimum design value such that under the worst probable conditions involving supply-voltage variation and equipment variation the absolute minimum ulterior-to-grid No. 1 voltage is never less than 1000 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 +25 volts; is independent of ulterior current; and will remain essentially constant for values of ulterior-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 FN 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 1/8-inch radius concentric with the center of the tube face. It should be noted that the earth's magnetic field can cause as much as 1/32-inch deviation of the spot from the center of the tube face.

- For an AC power source, 117 volts ± 10% is accepted U.S.A. practice.

Fig. 1 – Raster-Cutoff-Range Chart for Type 248AP4.

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 of a specified type indicated by the equipment 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 device operating at the stated normal supply voltage.

I-X-Ray Warning. When operated at ulterior values up to 16 kilovolts, the 248AP4 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 248AP4 is not recommended.
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 15 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.

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

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


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 PIN. 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: 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.

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

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