# RCA 7263 Vidicon

**Low-Power (0.6-Watt) Heater**

600-Line Resolution

For use under severe shock and vibration, high humidity, and altitudes up to 50,000 feet in small, compact, transistorized TV cameras

## Data

### General:

- **Heater, for Unipotential Cathode:**
  - Voltage: \(6.3 \pm 10\%\) ac or dc volts
  - Current: 0.095 amp
- **Direct Interelectrode Capacitance:**
  - Target to all other electrodes: 4.6 \(\mu\)f
- **Spectral Response:** See Curves
- **Photoconductive Layer:**
  - Maximum useful diagonal of rectangular image (4 x 3 aspect ratio): 0.62"
  - Orientation of quality rectangle—Proper orientation is obtained when the horizontal scan is essentially parallel to the plane passing through the tube axis and short index pin.
- **Focusing Method:** Magnetic
- **Deflection Method:** Magnetic
- **Overall Length:** 5.12" ± 0.06"
- **Greatest Diameter:** 1.125" ± 0.010"
- **Weight (Approx.):** 2 oz
- **Operating Position:** Any
- **Bulb:** T6
- **Base Connector:** Cinch No.54A18088, or equivalent
- **Base:** Small-Button Ditetral 8-Pin (JEDEC No.EB-11)
- **Basing Designation for BOTTOM VIEW:** .8HM

### Maximum Ratings, Absolute-Maximum Values:

- For altitudes up to 50,000 feet and scanned area of 1/2" x 3/8"

- **GRID-No.3 & GRID-No.4 VOLTAGE:** 350 max. volts
- **GRID-No.2 VOLTAGE:** 350 max. volts
- **GRID-No.1 VOLTAGE:**
  - Negative-bias value: 125 max. volts
  - Positive-bias value: 125 max. volts
- **PEAK HEATER-CATHODE VOLTAGE:**
  - Heater negative with respect to cathode: 125 max. volts
  - Heater positive with respect to cathode: 10 max. volts

\* See next page.
DARK CURRENT: 0.25 max. \( \mu A \)
PEAK TARGET CURRENT: 0.55 max. \( \mu A \)

FACEPLATE:
- Illumination: 1000 max. ft-c
- Temperature (Operating or storage): 60 max. \( ^{\circ}C \)

**Typical Operation:**

*For scanned area of 1/2" x 3/8" and faceplate temperature of 30° to 35° C*

Grid-No. 4 (Decelerator) \&
Grid-No. 3 (Beam-Focus-Electrode\*) Voltage: 250\(^{\circ} \) to 300 volts

Grid-No. 2 (Accelerator) Voltage: 300 volts

Grid-No. 1 Voltage for picture cutoff: -45 to -100 volts

Average "Gamma" of Transfer Characteristic for signal-output current between 0.02 \( \mu A \) and 0.2 \( \mu A \): 0.65

Visual Equivalent Signal-to-Noise Ratio (Approx.): 300:1

Minimum Peak-to-Peak Blanking Voltage:
- When applied to grid No. 1: 75 volts
- When applied to cathode: 20 volts

Field Strength at Center of Focusing Coil (Approx.): 40 gauss

Field Strength of Adjustable Alignment Coil: 0 to 4 gauss

**Maximum-Sensitivity Operation for Live-Scene Pickup**

Faceplate Illumination (Highlight): 2 ft-c

Maximum Target Voltage required to produce dark current of 0.2 \( \mu A \) in any tube: 110 volts

Target Voltage\‡: 60 to 100 volts

Dark Current\*: 0.2 \( \mu A \)

Target Current (Highlight): 0.4 to 0.5 \( \mu A \)

Signal-Output Current: Peak: 0.2 to 0.3 \( \mu A \)

Average: 0.08 to 0.1 \( \mu A \)

**Average-Sensitivity Operation for Live-Scene Pickup**

Faceplate Illumination (Highlight): 15 ft-c

Maximum Target Voltage required to produce dark current of 0.02 \( \mu A \) in any tube: 60 volts

Target Voltage\‡: 30 to 50 volts

Dark Current: 0.02 \( \mu A \)

Target Current (Highlight): 0.3 to 0.4 \( \mu A \)

\*\: See next page.
**Signal-Output Current:**

<table>
<thead>
<tr>
<th>Peak</th>
<th>0.3 to 0.4 µA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>0.1 to 0.2 µA</td>
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</tbody>
</table>

**Minimum-Lag Operation for Film Pickup**

<table>
<thead>
<tr>
<th>Faceplate Illumination (Highlight)</th>
<th>100 ft-c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Target Voltage required to produce dark current of 0.004 µA in any tube</td>
<td>30 volts</td>
</tr>
<tr>
<td>Target Voltage†</td>
<td>15 to 25 volts</td>
</tr>
<tr>
<td>Dark Current.</td>
<td>0.004 µA</td>
</tr>
<tr>
<td>Target Current (Highlight)‡</td>
<td>0.3 to 0.4 µA</td>
</tr>
<tr>
<td>Signal-Output Current:§</td>
<td>0.3 to 0.4 µA</td>
</tr>
<tr>
<td>Average</td>
<td>0.1 to 0.2 µA</td>
</tr>
</tbody>
</table>

* This capacitance, which effectively is the output impedance of the 7263, is increased when the tube is mounted in the deflecting- yoke and focusing-coil assembly. The resistive component of the output impedance is in the order of 100 megohms.

* Beam focus is obtained by combined effect of grid-No.3 voltage which should be adjustable over indicated range, and a focusing coil having an average field strength of 40 gausses.

* Definition, focus uniformity, and picture quality decrease with decreasing grid-No.4 and grid-No.3 voltage. In general, grid No.4 and grid No.3 should be operated above 250 volts.

* With no blanking voltage on grid No.1.

* Measured with high-gain, low-noise, cascode-input-type amplifier having bandwidth of 5 Mc. Because the noise in such a system is predominately of the high-frequency type, the visual equivalent signal-to-noise ratio is taken as the ratio of highlight video-signal current to rms noise current, multiplied by a factor of 3.

* The alignment coil should be located on the tube so that its center is at a distance of 3-11/16 inches from the face of the tube, and be positioned so that its axis is coincident with the axis of the tube, the deflecting yoke, and the focusing coil.

** The target voltage for each 7263 must be adjusted to that value which gives the desired operating dark current.

† Indicated range for each type of service serves only to illustrate the operating target-voltage range normally encountered.

▲ The deflecting circuits must provide extreme linear scanning for good black-level reproduction. Dark-current signal is proportional to the scanning velocity. Any change in scanning velocity produces a black-level error in direct proportion to the change in scanning velocity.

■ Video amplifiers must be designed properly to handle target currents of this magnitude to avoid amplifier overload or picture distortion.

* Defined as the component of the target current after the dark-current component has been subtracted.

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**SPECIAL PERFORMANCE DATA**

In connection with the following tests, sample 7263's will maintain resolution as determined with a RETMA Resolution Chart, or equivalent, and will faithfully reproduce all resolution wedges and grey scales of the chart.

**Vibration Tests:**

These tests are performed under conditions for *Average-Sensitivity Operation for Live-Scene Pickup* on a sample lot.
of tubes from each production run. Tubes and their associated components§ are vibrated on apparatus providing dynamic conditions similar to those described in MIL-E-52724, paragraph 4.7.1.

Resonance. Tubes and associated components§ are vibrated (per the method of MIL-E-52724, paragraph 4.7.1.1) for 1 hour at +25°C, for 15 minutes at 0°C, and for 15 minutes at +55°C.

Cycling. Tubes and associated components§ are vibrated (per the method of MIL-E-52724, paragraph 4.7.1.2 pertaining to specimen without vibration isolators) for 1 hour at +25°C, for 15 minutes at 0°C, and for 15 minutes at +55°C.

Temperature-Pressure (Altitude) Tests:
Tubes and associated components§ are subjected (per the method of MIL-E-5400*, paragraph 3.2.20, 3.2.20.1, and 3.2.20.1.1) to the separate and combined effects of varying temperature 0°C to +55°C and varying barometric pressure 30 to 3.4 inches of mercury. The pressures correspond to sea level and to an altitude of 50,000 feet, respectively.

Shock Tests:
These tests are performed with no voltages applied and on a sample lot of tubes from each production run. Tubes and their associated components§ are subjected in these tests (per MIL-E-5400*, paragraph 3.2.21.2.1) to 18 impact shocks of 15 g consisting of 3 shocks in opposite directions along each of three mutually perpendicular axes of the tube. Each shock impulse has a duration of 11 ± 1 milliseconds with a maximum impact acceleration occurring at approximately 5.5 milliseconds.

Temperature-Humidity Tests:
These tests are performed with no voltages applied to the 7263. The 7263 and associated components§ are subjected (per the method of MIL-E-5400*, paragraph 3.2.20.2B) to relative humidities up to and including 100 per cent at temperatures up to and including +50°C.

§ Tube socket such as Clinch No. 54A18088 and RCA Assembly No. 200S3U501, or equivalent, which consists of the deflecting coils, focusing coil, alignment coil, shield, and target connector.
† 1 January 1956.

OPERATING CONSIDERATIONS

The target connection is made by a suitable spring contact bearing against the edge of the target flange. This spring contact may conveniently be provided as part of the focusing coil design.

Support for the 7263 should be provided such that, under vibration and shock, the tube will not be displaced with respect
to the focusing, deflecting, and alignment fields. Suitable support is provided for the tube and its socket in the RCA Deflection Assembly 200SDU501, or equivalent. Orientation of the 7263 in its support should be such that the horizontal scan is essentially parallel to the plane passing through the tube axis and short index pin.

![Diagram of the 7263 Vidicon tube](image)

- **Faceplate Diameter**: 1.125" ± 0.016" DIA.
- **Target Flange**: 0.500"
- **Flange Length**: 0.125"
- **Axial Length**: 5.12" ± 0.06" DIA.
- **Plug Diameter**: 1.020" ± 0.030" ± 0.035" DIA.

**Small-Button Ditecra 8-Pin Base**

JEDEC NRE8-11

92CS-9885
TYPICAL LIGHT-TRANSFER CHARACTERISTICS

ILLUMINATION: UNIFORM OVER PHOTOCONDUCTIVE LAYER.
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30°C APPROX.

2870° K TUNGSTEN ILLUMINATION ON TUBE FACE — FOOT — CANDLES

TYPICAL PERSISTENCE CHARACTERISTIC

INITIAL HIGHLIGHT SIGNAL-OUTPUT MICROAMPERES = 0.3
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30°C APPROX.

PERCENT OF INITIAL SIGNAL
AFTER DARK PULSE OF 1/20 SECOND
TYPICAL PERSISTENCE CHARACTERISTICS

INITIAL HIGHLIGHT SIGNAL-OUTPUT MICROAMPERES = 0.3
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30° C APPROX.

Time After Illumination is Removed—Milliseconds

Signal-Output Current—Per Cent of Initial Value

100
90
80
70
60
50
40
30
20
10
0
50
100
150
200
250
300
SPECTRAL-SENSITIVITY CHARACTERISTICS

CURVE A: FOR EQUAL VALUES OF SIGNAL-OUTPUT CURRENT AT ALL WAVELENGTHS.
SIGNAL-OUTPUT MICROAMPERES FROM SCANNED AREA OF $\frac{1}{2}'' \times \frac{3}{4}'' = 0.02$
DARK CURRENT (MICROAMPERES) = 0.02

CURVE B: SPECTRAL CHARACTERISTIC OF AVERAGE HUMAN EYE.

CURVE C: FOR EQUAL VALUES OF SIGNAL-OUTPUT CURRENT WITH RADIANT FLUX FROM TUNGSTEN SOURCE AT 2870° K.

MICROAMPERES/MICROWATT OF RADIANT ENERGY (CURVE A)

WAVELENGTH-ANGSTROMS

RANGE OF MAXIMUM VALUE

RELATIVE SENSITIVITY (CURVES B & C)

ULTRA VIOLET Violet BLUE GREEN YELLOW RED INFRA RED

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

HIGHLIGHT SIGNAL - OUTPUT MICROAMPERES = 0.2
DARK CURRENT (MICROAMPERES) = 0.2
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"

CURVE A: RELATIVE TARGET VOLTAGE REQUIRED
TO MAINTAIN DARK CURRENT OF 0.2 µA.

CURVE B: 2870°K INCANDESCENT ILLUMINATION
REQUIRED TO PRODUCE SIGNAL-OUTPUT
CURRENT OF 0.2 µA.

CURVE C: PERSISTENCE (LAG) CHARACTERISTIC
FOR AN INITIAL SIGNAL-OUTPUT CURRENT
OF 0.2 µA.
DARK-CURRENT RANGE

SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30°C APPROX.

TARGET VOLTS

0.001 0.01 0.1 1 10

DARK CURRENT — MICROAMPERES

0.001 0.01 0.1 1 10 100 1000
TYPICAL CHARACTERISTIC

ILLUMINATION: 2870°K INCANDESCENT.
HIGHLIGHT SIGNAL-OUTPUT MICROAMPERES = 0.3
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30° C APPROX.

DARK CURRENT — MICROAMPERES

92CS-9493