Photomultiplier Tubes

2-INCH DIAMETER—8053
3-INCH DIAMETER—8054
5-INCH DIAMETER—8055

S-11 RESPONSE
10-STAGE, HEAD-ON TYPE

VENETIAN-BLIND DYNODE STRUCTURE

For Use in Scintillation Counters for the Detection and Measurement of Nuclear Radiation

GENERAL

Spectral Response
Wavelength of Maximum Response 4400 ± 500 angstroms
Cathode, Semitransparent Cesium-Antimony
Shape
Minimum area
8053 2.20 sq. in
8054 5.27 sq. in
8055 15.0 sq. in
Minimum diameter
8053 1.68 in
8054 2.59 in
8055 4.38 in
Window Lime glass, Corning® No. 0080, or equivalent
Shape
Plano-Plano
Index of refraction at 4360 angstroms 1.523

Dynodes

Substrate Copper-Beryllium
Secondary-Emitting Surface Beryllium-Oxide
Structure Venetian-Blind

Direct Interelectrod Capacitances (Approx.)
Anode to dynode No.10 7 pF
Anode to all other electrodes 8.5 pF

Maximum Overall Length
8053 5.81 in
8054 6.31 in
8055 7.69 in

Seated Length
8053 4.87 ± 0.19 in
8054 5.38 ± 0.18 in
8055 6.75 ± 0.19 in

Maximum Diameter
8053 2.31 in
8054 3.06 in
8055 5.31 in

Envelope
8053 T16
8054 J24
8055 J42

Socket Cinch® No. 3M14, or equivalent

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.
Magnetic Shield
8053 .................................. JAN No. S-2004, or equivalent
8054 .................................. JAN No. 3M14, or equivalent
8055 .................................. See footnote (d)
Operating Position .................. Any
Weight (Approx.)
8053 .................................. 7 oz
8054 .................................. 9 oz
8055 .................................. 1 lb 7 oz
Base .................................. Medium-Shell Diheptal I4-Pin
(JEDEC Group 5, No.B14-38)

TERMINAL DIAGRAM (Bottom View)

Unless indicated otherwise, the following ratings
and characteristic range values apply to all types

ABSOLUTE-MAXIMUM RATINGS

DC Supply Voltage
Between anode and cathode ........... 2000 V
Between anode and dynode No.10 ...... 300 V
Between consecutive dynodes ....... 250 V
Between dynode No.1 and cathode .... 600 V
Between focusing electrode and cathode ... 600 V
Average Anode Current ............... 2 mA
Ambient Temperature................. 75 °C
CHARACTERISTICS RANGE VALUES

Under conditions with dc supply voltage (E) across a voltage divider providing 1/6 of E between cathode and dynode No.1; 1/12 of E for each succeeding dynode stage; and 1/12 of E between anode and dynode No.10, except as noted. Focusing-electrode voltage is adjusted to that value between 50 and 100 per cent of dynode-No.1 potential (referred to cathode) which provides maximum anode current.

With E = 1500 volts except as noted

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiant$^g$, at 4400 angstroms</td>
<td>-</td>
<td>3.4x10$^4$</td>
<td>-</td>
</tr>
<tr>
<td>8053</td>
<td>8054, 8055</td>
<td>3.5x10$^4$</td>
<td>-</td>
</tr>
<tr>
<td>Cathode Radiant$^h$ at 4400 angstroms</td>
<td>-</td>
<td>0.056</td>
<td>-</td>
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<tr>
<td>8053</td>
<td>8054, 8055</td>
<td>0.064</td>
<td>-</td>
</tr>
<tr>
<td>8055</td>
<td>-</td>
<td>0.088</td>
<td>-</td>
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<td>Luminous:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>With tungsten light source$^j$</td>
<td>9</td>
<td>42</td>
<td>220</td>
</tr>
<tr>
<td>8053</td>
<td>8054, 8055</td>
<td>43</td>
<td>220</td>
</tr>
<tr>
<td>8055</td>
<td>-</td>
<td>44</td>
<td>220</td>
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<tr>
<td>With blue light source$^k$</td>
<td>9x10$^{-6}$</td>
<td>4.2x10$^{-5}$</td>
<td>2.2x10$^{-4}$</td>
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<tr>
<td>8053</td>
<td>8054, 8055</td>
<td>4.3x10$^{-5}$</td>
<td>2.2x10$^{-4}$</td>
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<tr>
<td>8055</td>
<td>-</td>
<td>4.4x10$^{-5}$</td>
<td>2.2x10$^{-4}$</td>
</tr>
<tr>
<td>Cathode Luminous:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>With tungsten light source$^l$</td>
<td>-</td>
<td>7x10$^{-5}$</td>
<td>-</td>
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<tr>
<td>8053</td>
<td>8054, 8055</td>
<td>8x10$^{-5}$</td>
<td>-</td>
</tr>
<tr>
<td>8055</td>
<td>-</td>
<td>1.1x10$^{-4}$</td>
<td>-</td>
</tr>
<tr>
<td>With blue light source$^m$</td>
<td>6x10$^{-8}$</td>
<td>7x10$^{-8}$</td>
<td>-</td>
</tr>
<tr>
<td>8053</td>
<td>8054, 8055</td>
<td>8x10$^{-8}$</td>
<td>-</td>
</tr>
<tr>
<td>8055</td>
<td>-</td>
<td>1.1x10$^{-7}$</td>
<td>-</td>
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<tr>
<td>Cathode Quantum Efficiency at 4400 angstroms:</td>
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<td>8053</td>
<td>8054, 8055</td>
<td>16</td>
<td>-</td>
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<td>8055</td>
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<td>18</td>
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<tr>
<td>Current Amplification</td>
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<td>8053</td>
<td>8054, 8055</td>
<td>25</td>
<td>-</td>
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<td>8055</td>
<td>-</td>
<td>6x10$^5$</td>
<td>-</td>
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<tr>
<td>Anode Dark Current$^p$</td>
<td>4x10$^{-9}$</td>
<td>7x10$^{-9}$</td>
<td>A</td>
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</tbody>
</table>

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.
DATA 2
4-67
<table>
<thead>
<tr>
<th>Property</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
<td>Equivalent Anode-Dark Current Input</td>
<td>(-4.4 \times 10^{-10})</td>
<td>(7.8 \times 10^{-10})</td>
<td>(1) mW</td>
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<td>Equivalent Noise Input</td>
<td>(-5.5 \times 10^{-13})</td>
<td>(9.7 \times 10^{-13})</td>
<td>(1) mW</td>
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<tr>
<td>Pulse-Height Resolution</td>
<td>(-3.4 \times 10^{-12})</td>
<td>(1 \times 10^{-11})</td>
<td>(1) mW</td>
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<tr>
<td>Mean Gain Deviation</td>
<td>7.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>With count rate change</td>
<td>of 10,000 to 1,000 Hz</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>For a period of 16 hours at a</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>count rate of 10,000 Hz</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Anode-Pulse Rise Time</td>
<td>8053</td>
<td>(-1.2 \times 10^{-8})</td>
<td>s</td>
</tr>
<tr>
<td></td>
<td>8054, 8055</td>
<td>(-1.4 \times 10^{-8})</td>
<td>s</td>
</tr>
<tr>
<td>Electron Transit Time</td>
<td>8053</td>
<td>(-5.9 \times 10^{-8})</td>
<td>s</td>
</tr>
<tr>
<td></td>
<td>8054, 8055</td>
<td>(-6.5 \times 10^{-8})</td>
<td>s</td>
</tr>
</tbody>
</table>

\(a\) Made by Corning Glass Works, Corning, New York. 14830

\(b\) Made by Cintex Manufacturing Company, 1026 South Homan Avenue, Chicago, Illinois. 60624

\(c\) Made by JAN Hardware Manufacturing Corp., 30-01, Queens Blvd., Long Island City I, N. Y.

\(d\) Magnetic shielding material in the form of foil or tape as available from Magnetic Shield Division, Perfection Mica Company, 1322 N. Elston Ave., Chicago 22, Ill., 60622, or equivalent.

\(e\) Averaged over any interval of 30 seconds maximum.

\(f\) Tube operation at or below room temperature is recommended.

\(g\) This value is calculated from the typical luminous sensitivity rating using a conversion factor of 804 lumens per watt.

\(h\) This value is calculated from the typical cathode luminous sensitivity rating using a conversion factor of 804 lumens per watt.

\(i\) These values are calculated as shown below:

Luminous Sensitivity \((A/\text{lum})\) = \(\frac{0.10 \times \text{Light Flux of 1} \times 10^{-5}}{(\text{lm})}\)

The value of 0.10 is the average value of the ratio of the anode current measured under the conditions specified in footnote \((k)\) to the anode current measured under the same conditions, but with the blue filter removed.

\(k\) Under the following conditions: Light incident on the cathode is transmitted through a blue filter (Corning C.S. No.5-58, polished to 1/2 stock thickness) from a tungsten-filament lamp having a lime-glass envelope. The lamp is operated at a color temperature of 2670°K. The value of light flux incident on the filter is 10 micromicrolums.

\(l\) This value is calculated as shown below:

Cathode Luminous Sensitivity \((A/\text{lum})\) = \(\frac{0.10 \times \text{Light Flux of 0.01}}{(\text{lm})}\)

The value of 0.10 is the average value of the ratio of the cathode current measured under the conditions specified in footnote \((m)\) to the cathode current measured under the same conditions but with the blue filter removed.

\(m\) Under the following conditions: Light incident on the cathode is transmitted through a blue filter (Corning C.S. No.5-58, polished to 1/2 stock thickness) from a tungsten-filament lamp having a lime-glass envelope. The lamp is operated at a color temperature of 2670°K. The value of light flux incident on the filter is 0.01 lumen and 200 volts are applied between cathode and all other electrodes connected as anode.
At a tube temperature of 220°C. Light incident on the cathode is transmitted through a blue filter (Corning C.S. No. 5-58), polished to 1/2 stock thickness from a lime-glass envelope, tungsten-filament lamp operating at 2870°C. The light flux incident on the filter is 10 microlumens. The supply voltage is adjusted to anode current of 9 microamperes. Sensitivity of these types under these conditions is approximately equivalent to 9 amperes per lumen. Dark current is measured with no light incident on the tube.

With supply voltage E adjusted to give an equivalent luminous sensitivity of 9 amperes per lumen.

At 4400 angstroms. This value is calculated from the EADC/ value in lumens using a conversion factor of 804 lumens per watt.

This value is calculated from the ENI value in watts using a conversion factor of 804 lumens per watt.

At 4400 angstroms. Under the following conditions: Supply voltage E is as shown, 220°C tube temperature, external shield connected to cathode band, 1 Hz light source as shown under (k) interrupted at a low audio frequency to produce incident radiation pulses alternating between zero and the value stated. The "on" period of the pulse is equal to the "off" period. The output current is measured through a filter which passes only the fundamental frequency of the pulses.

With the following voltage distribution: 3/13 of E between cathode and dynode No. 1, 1/13 of E for each succeeding dynode stage, and 1/13 of E between dynode No. 10 and anode. Focusing-electrode voltage is adjusted to that value between 50 and 100 per cent of dynode No. 1 potential (referred to cathode) which provides maximum anode current.

Pulse height resolution is defined as the quotient of the full width of the photopake at half height by the pulse height at maximum count rate under the following conditions: The 662 keV photon from an isotope of cesium having a constant mass of 137 (Cäs137) and a cylindrical 3 inch x 3 inch thallium-activated sodium iodide scintillator [NaI(TI)]-type 12DI2 are used. This scintillator is manufactured by the Harshaw Chemical Corporation, 1945 East 97 Street, Cleveland 6, Ohio, and is rated by the manufacturer as having a phototube capability of 7.5%.

The Cs137 source is in direct contact with the metal end of the scintillator. The face plate end of the crystal is coupled to the types by a coupling fluid such as Dow Corning Corp., Type DC200 (viscosity of 60,000 centistokes) - manufactured by the Dow Corning Corp., Midland, Michigan, or equivalent.

Mean Gain Deviation is defined as follows:

\[ \text{MGD} = \frac{1}{n} \sum_{i=1}^{n} \left( \frac{p - p_i}{p} \right) \times 100 \]

where \( p \) = mean pulse height \( p_i \) = pulse height at the \( i \)th reading \( n \) = total number of readings

Under the following conditions: The scintillator and Cs137 radiation source of (v) are employed. The radiation source is initially centered on the major axis of the tube and the scintillator, at a point providing a pulse count rate of 10,000 Hz. The pulse height of the photopake is measured under this condition. Next, the radiation source is moved rapidly, in approximately 30 seconds, to a new position that is equivalent to a count rate of 1,000 Hz. The new position is also centered in the major axis of the tube. The pulse height is measured under this condition is measured. Mean gain deviation is defined as shown in (w).

Under the same conditions as shown in (x) except the tube is operated for a period of 1/2 hour with the radiation source located at the point providing a pulse count rate of 10,000 Hz. Following this time interval, the pulse height is sampled at this count rate at 1-hour intervals for a period of 5 hours. Mean gain deviation is defined as shown in (w).

Measured between 10 per cent and 90 per cent of maximum anode pulse height. This anode-pulse rise time is primarily a function of transit time, photopeak, and is measured under conditions with the incident light fully illuminating the photocathode.

The electron transit time is the time interval between the arrival of a delta function light pulse at the entrance window of the tube and the time at which the output pulse at the anode terminal reaches peak amplitude. The transit time is measured under conditions with the incident light fully illuminating the photocathode.
OPERATING CONSIDERATIONS

The base pins of these types fit a diheptal 14-contact socket, such as Cinch No. 3M14, or equivalent. The socket should be made of high-grade, low-leakage material, and should be installed so that incident light falls on the face end of the tube.

The operating stability of these types is dependent on the magnitude of the anode current. The use of an average anode current well below the maximum rated value of 2 milliamperes is recommended when stability of operation is important. When stability is of prime importance, the use of an average anode current of 10 microamperes or less, commensurate with satisfactory output signal, is recommended.

Electrostatic and magnetic shielding of these types may be required in some applications. When a shield is used, it must be at cathode potential.

The high voltages at which these types are operated are very dangerous. Care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Precautions should include the enclosure of high-potential terminals and the use of interlock switches to break the primary circuit of the high-voltage power supply when access to the apparatus is required.

Accompanying Typical Voltage-Divider Arrangements are recommended for use with these types. Recommended resistance values for the voltage dividers range from 10,000 ohms per stage to 1,000,000 ohms per stage. The choice of resistance values for any voltage-divider network is usually a compromise. If low values of resistance per stage are utilized, the power drawn from the regulated power supply and the required power rating of the resistors increase. Phototube noise may also increase due to heating if the divider network is mounted near the photocathode. The use of resistance values near 1 megohm per stage may cause deviation from linearity if the voltage-divider current is not maintained at a value of at least 10 times that of the maximum value of anode current, and may limit anode-current response to pulsed light. The latter effect may be reduced by connecting capacitors between the tube socket terminals for dynodes No. 7 and No. 8, dynodes No. 8 and No. 9, dynodes No. 9 and No. 10, and between dynode No. 10 and anode return. In addition to nonlinearity and pulse-limiting effects, the use of resistance values exceeding 1 megohm per stage make these types more susceptible to leakage effects between terminals with possible resulting deviation in interstage voltage leading to a loss of current amplification.
R₁ through R₁₂: 470,000 ohms, 1/2 watt
R₁₃: 5 megohms, 1/2 watt, adjustable

**Note 1:** Supply voltage should be adjustable between approximately 800 and 2000 volts dc.

**Note 2:** Component values are dependent upon nature of application and output signal desired.
TYPICAL VOLTAGE-DIVIDER ARRANGEMENT
FOR SCINTILLATION-COUNTING APPLICATIONS

8053  8054  8055

\[\begin{align*}
C_1 &: 0.05 \mu F, \ 500 \text{ volts (dc working)} \\
C_2 &: 0.02 \mu F, \ 500 \text{ volts (dc working)} \\
C_3 &: 0.01 \mu F, \ 500 \text{ volts (dc working)} \\
C_4 &: 0.005 \mu F, \ 500 \text{ volts (dc working)} \\
C_5 \text{ and } C_6 &: 0.005 \mu F, \ 3000 \text{ volts (dc working)} \\
R_1 \text{ through } R_{10} &: 470,000 \text{ ohms, 1/2 watt} \\
R_{11} \text{ and } R_{12} &: 750,000 \text{ ohms, 1/2 watt} \\
R_{13} &: 5 \text{ megohms, 1/2 watt, adjustable} \\
R_{14} &: 1 \text{ megohm, 1/2 watt} \\
R_{15} &: 100,000 \text{ ohms, 1/2 watt} \\
\end{align*}\]

Note 1: Supply voltage should be adjustable between approximately 800 and 2000 volts dc.

Note 2: Capacitors \( C_1 \) through \( C_5 \) should be connected at tube socket for optimum high-frequency performance.

Note 3: Component values are dependent upon nature of application and output signal desired.
Center line of bulb will not deviate more than $2^\circ$ in any direction from the perpendicular erected at the center of bottom of the base.

Note: Within 2.59-inch diameter, deviation from flatness of external surface of faceplate will not exceed 0.010-inch from peak to valley.
DIMENSIONAL OUTLINE

8054

DIA.  3.00 ±.06

DIA.  2.59 MIN.

PHOTOCATHODE

FACEPLATE (SEE NOTE)

1.9 ±.1

1.09

.25 R. MAX.

.75 R.

J24 BULB

BASE
JEDEC GROUP 5
No. B14-38

DIA.  2.00 ±.06

DIA.  2.31 MAX.

92CM-11080R2

DIMENSIONS IN INCHES

Center line of bulb will not deviate more than 2° in any direction from the perpendicular erected at the center of bottom of the base.

Note: Within 2.59-inch diameter, deviation from flatness of external surface of faceplate will not exceed 0.010 inch from peak to valley.
Center line of bulb will not deviate more than 2° in any direction from the perpendicular erected at the center of bottom of the base.

Note: Within 4.38-inch diameter, deviation from flatness of external surface of faceplate will not exceed 0.010 inch from peak to valley.
Typical Time Resolution Characteristics

8053

- Dynode No. 1-to-Cathode Volts = 1/6 E
- Each succeeding dynode-stage Volts = 1/12 E
- Anode-to-dynode No. 10 Volts = 1/12 E

The focusing-electrode voltage is adjusted to that value between 50 and 100 per cent of dynode No. 1 potential (referred to cathode) which provides maximum anode current. Photocathode is fully illuminated.

Graph showing Transit Time and Rise Time as functions of supply volts (E) between anode and cathode.

8054

- Dynode No. 1—to—Cathode Volts = 1/6 E
- Each succeeding dynode-stage Volts = 1/12 E
- Anode-to-dynode No. 10 Volts = 1/12 E

The focusing-electrode voltage is adjusted to that value between 50 and 100 per cent of dynode No. 1 potential (referred to cathode) which provides maximum anode current. Photocathode is fully illuminated.

Graph showing Transit Time and Rise Time as functions of supply volts (E) between anode and cathode.
Typical Time Resolution Characteristics

DYNODE NO.1 TO CATHODE VOLTS = 1/6 E
EACH SUCCEEDING DYNODE STAGE VOLTS = 1/12 E
ANODE TO DYNODE NO. 10 VOLTS = 1/12 E
FOCUSING ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE BETWEEN 50 AND 100 PER CENT OF DYNODE-NO. 1 POTENTIAL (REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE CURRENT.
PHOTOCATHODE IS FULLY ILLUMINATED.

Typical Characteristic of Output Current As a Function of Dynode-No.5 Volts

DYNODE No.1 TO CATHODE VOLTS = 200
VOLTS PER SUCCEEDING DYNODE STAGE EXCEPT FOR DYNODE-No.5 STAGE = 100
ANODE TO DYNODE No. 10 VOLTS = 100
FOCUSING ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE BETWEEN 50 AND 100 PER CENT OF DYNODE-NO. 1 POTENTIAL (REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE CURRENT.
ANODE IS AT GROUND POTENTIAL.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.
DATA 7
4-67
Typical Sensitivity and Current Amplification Characteristics

The DC supply voltage (E) is across a voltage divider providing 1/6 of E between cathode and dynode No. 1, 1/12 of E for each succeeding dynode stage, and 1/12 of E between anode and dynode No. 10. Focusing-electrode voltage is adjusted to that value between 50 and 100 per cent of dynode—No. 1 potential (referred to cathode) which provides maximum anode current.

Sensitivity—Amperes/Lumen (Color Temp. = 2870°K)

- Maximum Sensitivity
- Typical Amplification
- Typical Sensitivity
- Minimum Sensitivity

Current Amplification vs. Supply Volts (E) between Anode and Cathode

800, 9
1000, 10
11, 12
13, 14
1500, 16
17, 18
19
2000

92LM-1545
Typical Sensitivity and Current Amplification Characteristics

The d.c. supply voltage (E) is across a voltage divider providing 1/6 of E between cathode and dynode No. 1, 1/12 of E for each succeeding dynode stage, and 1/12 of E between anode and dynode No. 10. Focusing-electrode voltage is adjusted to that value between 50 and 100 per cent of dynode—No. 1 potential (referred to cathode) which provides maximum anode current.
Typical Sensitivity and Current Amplification Characteristics

THE DC SUPPLY VOLTAGE (E) IS ACROSS A VOLTAGE DIVIDER PROVIDING 1/6 OF E BETWEEN CATHODE AND DYNOE NO. 1; 1/12 OF E FOR EACH SUCCEEDING DYNOE STAGE; AND 1/12 OF E BETWEEN ANODE AND DYNOE NO. 10. FOCUSING-ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE BETWEEN 50 AND 100 PER CENT OF DYNOE-NO. 1 POTENTIAL (REFFERED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE CURRENT.

DATA 8
RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.
Typical Anode Characteristics

8053

DYNODE NO. 1-TO-CATHODE VOLTS = 250
EACH SUCCEEDING DYNODE-STAGE VOLTS = 125
FOCUSING-ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE
BETWEEN 50 AND 100 PER CENT OF DYNODE-NO. 1 POTENTIAL
(REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE
CURRENT.
LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP OPERATED AT
A COLOR TEMPERATURE OF 2870°K.
Typical Anode Characteristics

8054

DYNODE-NO.1-TO-CATHODE VOLTS = 250
EACH SUCCEEDING DYNODE-STAGE VOLTS = 125
FOCUSING-ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE BETWEEN 50 AND 100 PER CENT OF DYNODE-NO.1 POTENTIAL (REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE CURRENT.
LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP OPERATED AT A COLOR TEMPERATURE OF 2870°K.

DATA 9
RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.
Typical Anode Characteristics

8055

DYNODE NO. 1 TO CATHODE VOLTS = 250
EACH SUCCEEDING DYNODE STAGE VOLTS = 125
FOCUSING ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE BETWEEN 50 AND 100 PER CENT OF DYNODE NO. 1 POTENTIAL (REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE CURRENT.
LIGHT SOURCE IS A TUNGSTEN FILAMENT LAMP OPERATED AT A COLOR TEMPERATURE OF 2870°K
LUMINOUS SENSITIVITY IS VARIED BY ADJUSTMENT OF THE SUPPLY VOLTAGE (E).

DYNOKE NO. 1-TO-CATHODE VOLTS * 1/6 E
EACH SUCCEEDING DYNOKE-STAGE VOLTS * 1/12 E
ANODE-TO-DYNOKE-NO. 10 VOLTS * 1/12 E
FOCUSING-ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE BETWEEN 50 AND 100 PER CENT OF DYNOKE-NO. 1 POTENTIAL (REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE CURRENT.

LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP OPERATED AT A COLOR TEMPERATURE OF 2870° K.
TUBE TEMPERATURE = 22° C.
Typical Effect of Magnetic Field on Anode Current

8053

DYNODE No.1-TO-CATHODE VOLTS = AS INDICATED
EACH SUCCEEDING DYNODE-STAGE VOLTS = 125
ANODE-TO-DYNODE No. 10 VOLTS = 125
FOCUSED-ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE
BETWEEN 50 AND 100 PER CENT OF DYNODE-No. 1 POTENTIAL
(REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE
CURRENT.
PHOTOCATHODE FULLY ILLUMINATED BY A POINT LIGHT SOURCE
POSITIONED APPROX. 1 FOOT FROM CENTER OF TUBE FACE.
MAGNETIC FIELD PARALLEL TO MAJOR AXIS OF TUBE.

MAGNETIC FIELD INTENSITY—GAUSS

8053

DYNODE No.1-TO-CATHODE VOLTS = AS INDICATED
EACH SUCCEEDING DYNODE-STAGE VOLTS = 125
ANODE-TO-DYNODE No. 10 VOLTS = 125
FOCUSED-ELECTRODE VOLTAGE IS ADJUSTED TO THAT VALUE
BETWEEN 50 AND 100 PER CENT OF DYNODE-No. 1 POTENTIAL
(REFERRED TO CATHODE) WHICH PROVIDES MAXIMUM ANODE
CURRENT.
PHOTOCATHODE FULLY ILLUMINATED BY A POINT LIGHT SOURCE
POSITIONED APPROX. 1 FOOT FROM CENTER OF TUBE FACE.
MAGNETIC FIELD PERPENDICULAR TO MAJOR AXIS OF TUBE.

MAGNETIC FIELD INTENSITY—GAUSS
Typical Effect of Magnetic Field on Anode Current

8054

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![Graph showing the effect of magnetic field on anode current](92CS-11188R2)

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**8055**

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![Graph showing the effect of magnetic field on anode current](92CS-11188R2)
Spectral Energy Distribution of 2870°K Light Source After Passing Through Indicated Filter

SPECTRAL CHARACTERISTIC OF LIGHT FROM 2870°K SOURCE AFTER PASSING THROUGH BLUE FILTER (CORNING C.S. No.5-58 POLISHED TO 1/2 STOCK THICKNESS). MAXIMUM FILTER TRANSMISSION OCCURS AT 4300 ANGSTROMS AND IS 60 PER CENT.
Typical Spectral Response Characteristics

8053

WAVELENGTH—ANGSTROMS

QUANTUM EFFICIENCY—PER CENT

RELATIVE SENSITIVITY—PER CENT

ABSOlUTE SENSITIVITY—MILLIAMPERES/WATT

92LMI53J

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

DATA 13
4-67
Typical Spectral Response Characteristics

WAVELENGTH — ANGSTROMS

RELATIVE SENSITIVITY

ABSOLUTE SENSITIVITY

QUANTUM EFFICIENCY

QUANTUM EFFICIENCY — PER CENT

RELATIVE SENSITIVITY — PER CENT

ABSOLUTE SENSITIVITY — MILLIAMPERES/WATT
Typical Spectral Response Characteristics

Quantum Efficiency—Per Cent
Relative Sensitivity—Per Cent
Absolute Sensitivity—Milliamperes/Watt

Wavelength—Angstroms