**TWIN PHOTOTUBE**

**GAS TYPE**

- **Cathodes**: Quarter-cylindrical, caesium-coated
- **Cathode Window Area (Each unit)**: 0.31 sq. in.
- **Direct Interelectrode Capacitances**:  
  - Anode to Cathode (Each unit): 1.5 μf  
  - Between Cathodes: 1.6 μf  
  - Between Anodes: 0.26 μf  
  - Maximum Overall Length: 4"  
  - Maximum Diameter: 1-3/16"  
  - Bulb: T-9  
  - Base: Small 4-pin

**MAXIMUM RATINGS and CHARACTERISTICS**

*All values are for each unit*

- **Anode-Supply Voltage (D.C. or Peak A.C.)**: 90 max. volts
- **Ambient Temperature**: 50 max. °C
- **Sensitivity**: *
  - At 100 cycles: 75 μamp./lumen
  - At 1000 cycles: 70 μamp./lumen
  - At 5000 cycles: 63 μamp./lumen
- **Gas Amplification Factor**: Not over 10

**D-C Resistance of Load:**

*With anode-supply voltage of 90 volts*

For d-c currents greater than 2.5 μamp., 4 min. megohms.

For d-c currents less than 2.5 μamp., No minimum

* Sensitivity is measured with a light input varied sinusoidally about a mean value from zero to a maximum of twice the mean. The sensitivity values shown are the ratios of the amplitude of variation in the current output to the amplitude of variation in the light input. The method of sensitivity measurement used is based on the approximation that sensitivity at 100 cycles is equal to sensitivity at 0 cycles. The measurements were made with a 90-volt supply, a 1-megohm load, and a mean light input of 0.015 lumen. The light source was a Mazda projection lamp operated at a filament color temperature of 2870 degrees Kelvin. The effect of interelectrode capacitance was made negligible.

** Gas Amplification Factor is given as a ratio of sensitivity at maximum anode voltage to sensitivity at a voltage sufficiently low (approximately 25 volts) to eliminate gas ionization effects.

< indicates a change.

DEC. 20, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.
TWIN PHOTOTUBE

TUBE MOUNTING POSITION
VERTICAL OR HORIZONTAL

T9 BULB
1/8 MAX.

SMALL 4-PIN BASE
1.165 MAX.

2 PINS
.156 ± .003 DIA.

2 PINS
.125 ± .003 DIA.

BOTTOM VIEW OF BASE
92C-4561

TYPICAL CIRCUIT FOR THE 920
WITH EITHER TRANSFORMER OR RESISTANCE COUPLING
FOR SOUND-ON-FILM REPRODUCTION

R1 = 400000 OHMS
R2 = 470000 OHMS
R3 = 0.1 TO 5 MEGOHMS
R4 = 1.0 TO 5 MEGOHMS
R5 = 0.1 TO 1.0 OHMS
C1 = 0.1 µF
C2 = 0.1 TO 1.0 µF
C3 = BY-PASS CONDENSER

THE LICENSE EXTENDED TO THE PURCHASER OF TUBES APPEARS IN THE LICENSE NOTICE ACCOMPANYING THESE INSTRUCTIONS. INFORMATION CONTAINED HERIN IS FURNISHED WITHOUT ASSUMING ANY OBLIGATIONS.

DEC. 20, 1938
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.
SPECTRAL SENSITIVITY CHARACTERISTICS

ANODE - SUPPLY VOLTS = 90
LOAD RESISTANCE = 1 MEGOHM

SENSITIVITY - MICROAMPERES PER MICROWATT RADIANT ENERGY

MAY 21, 1937
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4617R1
Gas Phototube

SIDE-ON, TWIN-UNIT TYPE HAVING S-1 RESPONSE

DATA

General:
Spectral Response .................. S-1
Wavelength of Maximum Response ... 8000 ± 1000 angstroms
Cathode (Each):
Shape .................................. Quarter-Cylindrical
Minimum projected length^a ........... 1-3/16"
Minimum projected width^a .......... 1/4"
Direct Interelectrode Capacitances (Approx.):
  Cathode to cathode^b .................. 1.8 μf
  Cathode to anode^c .................. 1.6 μf
  Anode to anode^d .................. 0.4 μf
Maximum Overall Length .................. 4"
Maximum Seated Length ................. 3-3/8"
Seated Length to Center of Cathodes ....... 2-1/8" ± 3/32"
Maximum Diameter .................. 1-3/16"
Operating Position .................. Any
Weight (Approx.) .................. 1.1 oz
Bulb .................................. T9
Socket .................................. Amphenol No.77-M1P-4-T, or equivalent
Base .................................. Small-Shell Small 4-Pin (JEDEC No.A4-5)
Basing Designation for BOTTOM VIEW .................. 4BG

Pin 1 - Photo-
cathode of
Unit No. 2
Pin 2 - Anode of
Unit No. 2
Pin 3 - Anode of
Unit No. 1
Pin 4 - Photo-
cathode of
Unit No. 1

DIRECTION OF RADIATION

Maximum Ratings, Absolute-Maximum Values:
Values are for Each Unit

<table>
<thead>
<tr>
<th></th>
<th>Rating I</th>
<th>Rating II</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANODE-SUPPLY VOLTAGE</td>
<td>70 max.</td>
<td>90 max.</td>
</tr>
<tr>
<td>(DC or Peak AC)</td>
<td></td>
<td>volts</td>
</tr>
<tr>
<td>AVERAGE CATHODE-CURRENT</td>
<td>30 max.</td>
<td>15 max.</td>
</tr>
<tr>
<td>DENSITY^e</td>
<td></td>
<td>μa/sq.in.</td>
</tr>
<tr>
<td>AVERAGE CATHODE CURRENT^e</td>
<td>4 max.</td>
<td>2 max.</td>
</tr>
<tr>
<td>AMBIENT TEMPERATURE</td>
<td>100 max.</td>
<td>100 max.</td>
</tr>
</tbody>
</table>

^Indicates a change.
## Characteristics:

Values are for each unit with an anode-supply voltage of 90 volts unless otherwise specified.

### Sensitivity:

- **Radiant, at 8000 angstroms:**
  - Min. 0.0094
  - Median
  - Max. amp/watt

- **Luminous:**
  - At 0 cps...
  - At 5000 cps...
  - At 10000 cps...
  - Min. 50
  - Median 100
  - Max. 175 µa/lumen
  - Min. 85
  - Median
  - Max. µa/lumen
  - Min. 74
  - Median
  - Max. µa/lumen

### Ratio of Luminous Sensitivities

(Unit No.1 to Unit No.2): 0.5 1.15 2.0

### Gas Amplification Factor

- Min. 9

### Anode Dark Current at 25°C

- Min. 0.1 µa

### Minimum Circuit Values:

Values are for each unit.

<table>
<thead>
<tr>
<th>Voltage of anode-supply</th>
<th>70 or less</th>
<th>90 volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Load Resistance:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For dc currents above 2 µa.</td>
<td>0.1 min.</td>
<td>-</td>
</tr>
<tr>
<td>For dc currents below 2 µa.</td>
<td>0 min.</td>
<td>-</td>
</tr>
<tr>
<td>For dc currents above 1 µa.</td>
<td>-</td>
<td>2.5 min.</td>
</tr>
<tr>
<td>For dc currents below 1 µa.</td>
<td>-</td>
<td>0.1 min.</td>
</tr>
</tbody>
</table>

### Notes:

- **a** On plane perpendicular to indicated direction of incident radiation.
- **b** With anodes grounded.
- **c** Each unit, with other unit grounded.
- **d** With cathodes grounded.
- **e** Averaged over any interval of 30 seconds maximum.
- **f** For conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2870° K. A dc anode supply of 90 volts and a 1-megohm load resistor are used. For the 0-cycle measurement, a light input of 0.04 lumen is used. For the 5000- and 10000-cycle measurements, the light input is varied sinusoidally about a mean value of 0.015 lumen from zero to a maximum of twice the mean value.
- **g** The ratio of luminous sensitivity at an anode-supply voltage of 90 volts to luminous sensitivity at anode-supply voltage of 25 volts. In each case, sensitivity is obtained under conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2870° K, the light input is 0.04 lumen, and the load resistor has a value of 1 megohm.

SPECTRAL-SENSITIVITY CHARACTERISTIC
OF PHOTOSENSITIVE DEVICE HAVING S-I RESPONSE
and

FREQUENCY-RESPONSE CHARACTERISTICS
OF GAS PHOTOTUBES
are shown at the front of this section

DIMENSIONAL OUTLINE
shown under Type 5584 also applies to the 920

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Indicates a change.
AVERAGE ANODE CHARACTERISTICS
Each Unit

LIGHT SOURCE IS A TUNGSTEN—FILAMENT LAMP OPERATED AT COLOR TEMPERATURE OF 2870° K.