RCA-7200 is a multiplier phototube intended especially for the detection and measurement of ultraviolet radiation, and in other applications involving low-level radiation sources. It employs an envelope consisting of a fused-silica section and a graded-seal section. The fused-silica section transmits radiant energy in the ultraviolet region down to and below 2000 angstroms.

The spectral response of the 7200 covers the range from about 1800 to 6000 angstroms, as shown in Fig.1. Maximum response occurs at approximately 3300 angstroms. The 7200, therefore, has high sensitivity to blue-rich light and negligible sensitivity to red radiation.

**DATA**

**General:**
- Spectral Response: S-19
- Wavelength of Maximum Response: 3300 ± 500 angstroms
- Cathode:
  - Minimum projected length: 0.94 inch
  - Minimum projected width: 0.31 inch
- Direct Interelectrode Capacitances (Approx.):
  - Anode to cathode: 4.4 μf
  - Anode to all other electrodes: 6.0 μf
- Maximum Overall Length: 5.69"
- Maximum Seated Length: 5.12"
- Length from Base Seat to Center of Useful Cathode Area: 3.94 ± 0.09"
- Maximum Diameter: 1.31"
- Bulb (Fused-Silica Section with Graded Seal Base): Small-Shell Submagnal 11-Pin (JEFCO No. B11-B8)
- Non-hygrosopic
- Socket: Amphenol Part No. 76RS-11T, or equivalent
- Operating Position: Any
- Weight (Approx.): 1.8 oz

**Maximum Ratings, Absolute Values:**
- SUPPLY VOLTAGE BETWEEN ANODE AND CATHODE (DC or Peak AC): 1250 max. volts
- SUPPLY VOLTAGE BETWEEN ANODE AND DYNODE NO. 9 (DC or Peak AC): 250 max. volts
- AVERAGE ANODE CURRENT: 0.5 max. ma
- AMBIENT TEMPERATURE RANGE: -80 to +75 °C

**Characteristics:**

Under conditions with dc supply voltage (E) across a voltage divider providing 1/10 of E between cathode and dynode No. 1; 1/10 of E for each succeeding dynode stage; and 1/10 of E between dynode No. 9 and anode.

With E = 1000 volts dc (except as noted)

<table>
<thead>
<tr>
<th>Min.</th>
<th>Median</th>
<th>Max.</th>
</tr>
</thead>
</table>

**Sensitivity:**
- Radiant, at 3300 angstroms: 65000 μA/μW
- Cathode Radiant, at 3300 angstroms: 0.065 μA/μW
- Luminous: At 0 cps...
  - 15 40 300 amp/lumen
  - 20 40 μA/lumen
- Current Amplification: 100000
- Equivalent Anode Dark Current Input: 2 x 10^-10 2 x 10^-9 lumen
- Equivalent Noise Input: Luminous:
  - At +25°C: 7.5 x 10^-13 lumen
  - At +70°C: 4 x 10^-14 lumen
  - Ultraviolet:
    - At +25°C: 6.6 x 10^-16 watt
    - At +70°C: 4 x 10^-17 watt

- On plane perpendicular to the indicated direction of incident light.
- *Averaged over any interval of 30 seconds maximum.
- *For conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2800°K. A light input of 10 micromicrons is used. The load resistor has a value of 0.01 megohm.
- *For conditions same as shown under (*) except that the value of light flux is 0.01 lumen and 100 volts are applied between cathode and all other electrodes connected together as anode.
- *Supply voltage (E) adjusted to give a luminous sensitivity of 20 amperes per lumen. Dark current caused by thermionic emission and ion feedback may be reduced by the use of a refrigerant.
- *For maximum signal-to-noise ratio, operation with a supply voltage (E) below 1000 volts is recommended.
- *Under the following conditions: Supply voltage (E) is 1000 volts, external shield operated at -1000 volts with respect to anode, 250°C tube temperature, ac-amplifier bandwidth of 1 cycle per second, tungsten light source at color temperature of 2870°K. Interrupted at 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.
- *Determined under the same conditions as shown under (*) except that use is made of monochromatic source having radiation of 2537 angstroms.
DEFINITIONS

Radiant Sensitivity. The quotient of output current by incident radiant power of a given wavelength, at constant electrode voltages.

Cathode Radiant Sensitivity. The quotient of current leaving the photocathode by incident radiant power of a given wavelength.

Luminous Sensitivity. The quotient of output current by incident luminous flux, at constant electrode voltages.

Cathode Luminous Sensitivity. The quotient of current leaving the photocathode by the incident luminous flux.

Current Amplification. Ratio of the output current to the photocathode current, at constant electrode voltages.

Equivalent Anode-Dark-Current Input. The quotient of the anode dark current by the luminous sensitivity.

Equivalent Noise Input. That value of incident luminous flux or incident radiant power which when modulated in a stated manner produces an rms output current equal to the rms noise current within a specified bandwidth.

Fig. 1 – Tentative Spectral Sensitivity Characteristic of Type 7200 which has S-19 Response. Curve is shown for Equal Values of Radiant Flux at All Wavelengths.

Fig. 2 – Average Anode Characteristics of Type 7200.

The use of an average anode current well below the maximum rated value of 0.5 milliampere is recommended when stability of operation is important.

Electrostatic and/or magnetic shielding of the 7200 may be necessary.

The high voltages at which the 7200 is operated are very dangerous. Before any part of the circuit is touched, the power-supply switch should be turned off and both terminals of any capacitors grounded.
LUMINOUS SENSITIVITY IS VARIED BY ADJUSTING THE SUPPLY VOLTAGE ($E$) ACROSS VOLTAGE DIVIDER WHICH PROVIDES $\frac{1}{10}$ OF $E$ PER STAGE.
LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP OPERATED AT A COLOR TEMPERATURE OF 2870° K.
DASHED PORTION INDICATES INSTABILITY.
TUBE TEMPERATURE = 28° C.

Fig. 3 - Typical Anode-Dark-Current Characteristic of Type 7200.

SUPPLY VOLTAGE ($E$) ACROSS VOLTAGE DIVIDER PROVIDING $\frac{1}{10}$ OF $E$ BETWEEN CATHODE AND DYNODE #1; $\frac{1}{10}$ OF $E$ FOR EACH SUCCEEDING DYNODE STAGE; AND $\frac{1}{10}$ OF $E$ BETWEEN DYNODE #9 AND ANODE

Fig. 4 - Characteristics of Type 7200.
DIMENSIONAL OUTLINE

NOTE 1: CENTER LINE OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM THE PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE.


SOCKET CONNECTIONS
Bottom View

Device connections shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.