



7200

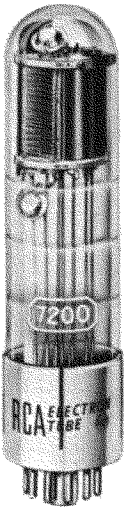
MULTIPLIER PHOTOTUBE

Sturdy Structure

**9-Stage Type
S-19 Response**
TENTATIVE DATA

5.69" Max. Length

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 $\pm$ 500 angstroms
Cathode:
Minimum projected length[•]. 0.94 inch
Minimum projected width[•]. 0.31 inch
Direct Interelectrode Capacitances (Approx.):
Anode to dynode No. 9 4.4 μ f
Anode to all other electrodes. 6.0 μ f
Maximum Overall Length 5.69"
Maximum Seated Length. 5.12"
Length from Base Seat to
Center of Useful Cathode Area. 3.94" $\pm$ 0.09"
Maximum Diameter 1.31"
Bulb Fused-Silica Section with Graded Seal
Base Small-Shell Submagnal 11-Pin (JETEC No. B11-88)
Non-hygroscopic
Socket Amphenol Part No. 78RS-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 $^{\circ}$ 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)

	Min.	Median	Max.	
Sensitivity:				
Radiant, at				
3300 angstroms.	-	65000	-	μ a/ μ W
Cathode Radiant, at				
3300 angstroms.	-	0.065	-	μ a/ μ W
Luminous:†				
At 0 cps.	15	40	300	amp/lumen
Cathode luminous	20	40	-	μ a/lumen
Current Amplification.	-	1000000	-	
Equivalent Anode Dark Current Input [‡]	-	2×10^{-10}	2×10^{-9}	lumen
Equivalent Noise Input:				
Luminous [*] —				
At +25 $^{\circ}$ C	-	7.5×10^{-13}	-	lumen
At -78 $^{\circ}$ C	-	4×10^{-14}	-	lumen
Ultraviolet†—				
At +25 $^{\circ}$ C	-	6.6×10^{-16}	-	watt
At -78 $^{\circ}$ C	-	4×10^{-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 2870 $^{\circ}$ K. A light input of 10 microlumens is used. The load resistor has a value of 0.01 megohm.

• For conditions the 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, 25 $^{\circ}$ C tube temperature, ac-amplifier bandwidth of 1 cycle per second, tungsten light source at color temperature of 2870 $^{\circ}$ 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.

† 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.

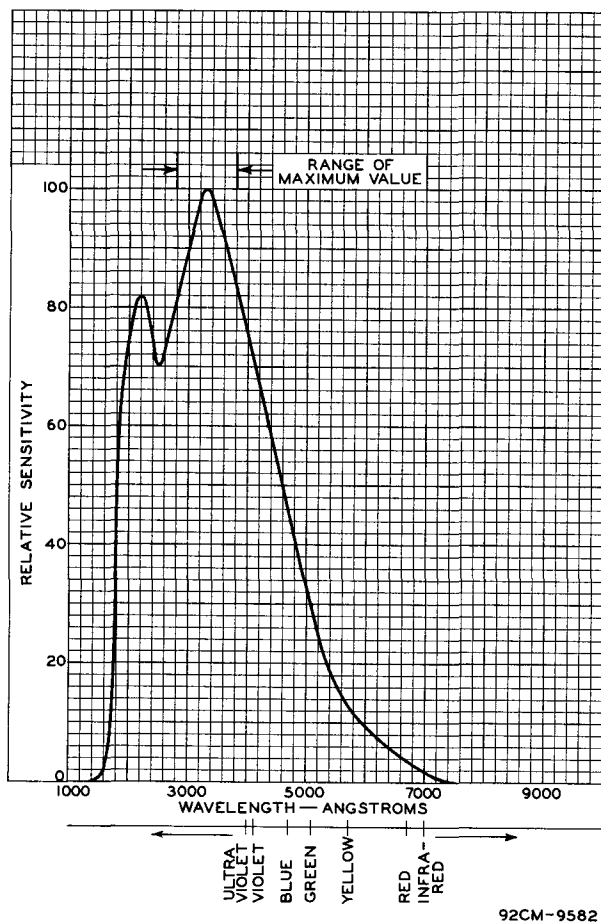


Fig. 1 - Tentative Spectral Sensitivity Characteristic of Type 7200 which has S-19 Response. Curve is shown for Equal Values of Radiant Flux at All Wavelengths.

OPERATING CONSIDERATIONS

The maximum ratings in the tabulated data are limiting values above which the serviceability of the 7200 may be impaired from the viewpoint of life and satisfactory performance. Therefore,

the equipment designer has the responsibility of determining an average design value below each absolute rating by an amount such that the absolute values will never be exceeded under any usual condition of supply-voltage variation, load variation, or manufacturing variation in the equipment itself.

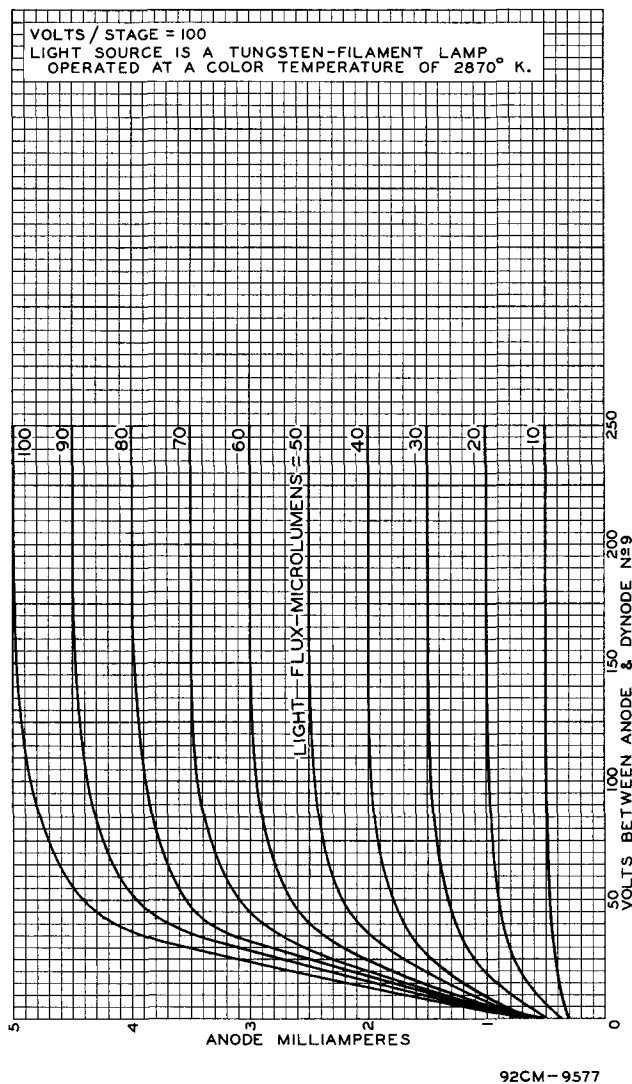


Fig. 2 - Average Anode Characteristics of Type 7200.

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.

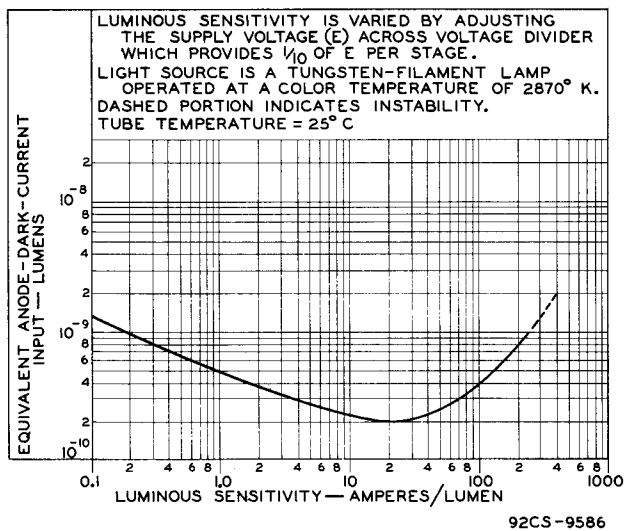


Fig.3 - Typical Anode-Dark-Current Characteristic of Type 7200.

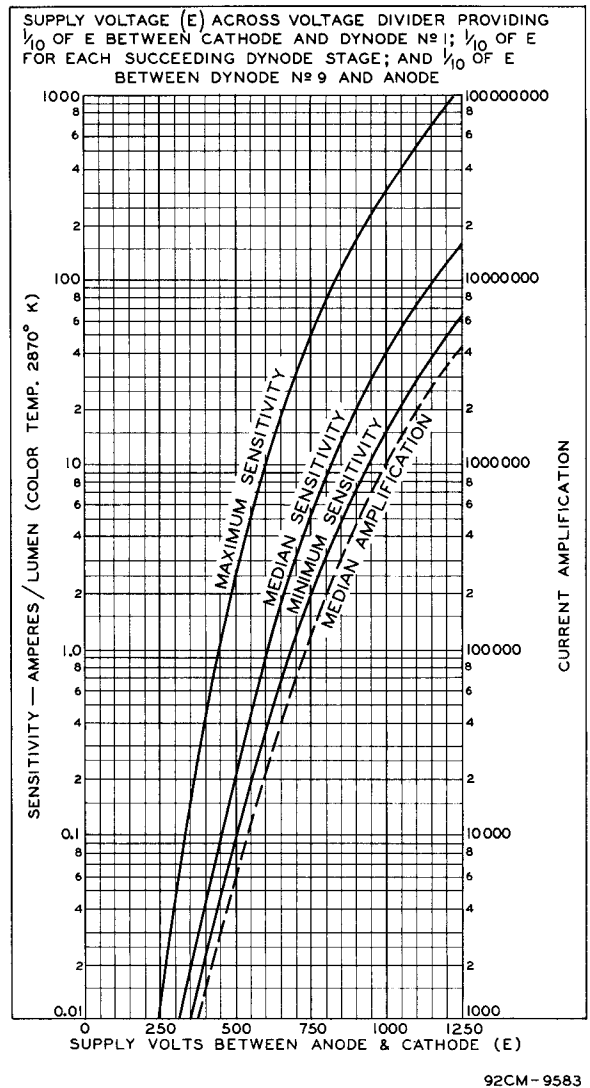
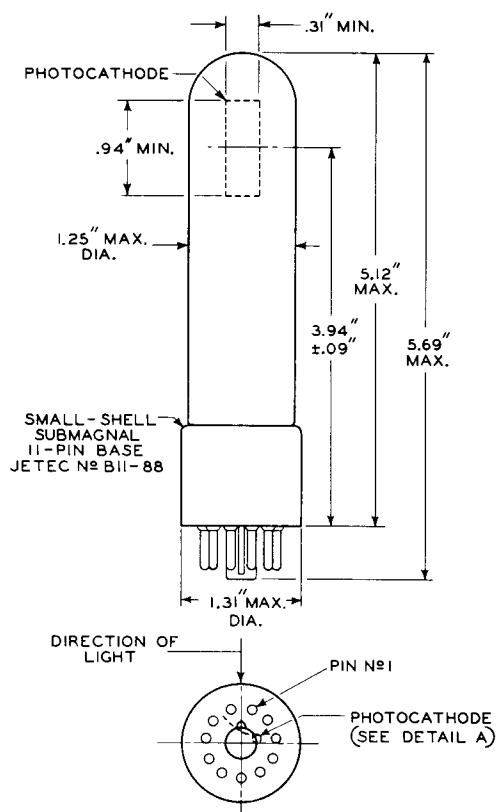


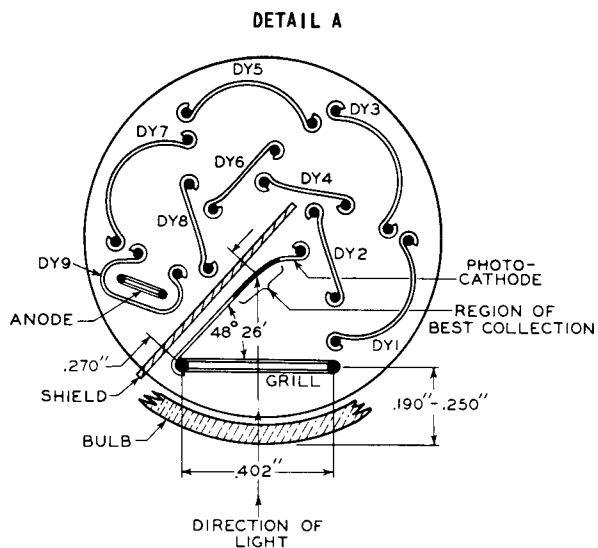
Fig.4 - Characteristics of Type 7200.



DIMENSIONAL OUTLINE



92CS-9581



92CS-8674R1

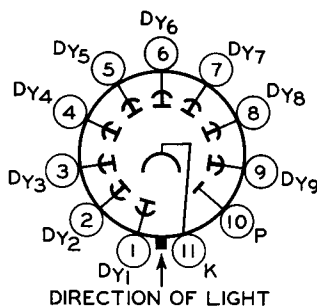
NOTE 1: CENTER LINE OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM THE PERPENDICULAR ERCTED AT CENTER OF BOTTOM OF BASE.

NOTE 2: THE MAXIMUM ANGULAR VARIATION BETWEEN THE PLANE THROUGH PINS No.1 AND No.11 AND THE PLANE OF THE GRILL WILL NOT EXCEED 6°.

SOCKET CONNECTIONS

Bottom View

- PIN 1: DYNODE No.1
- PIN 2: DYNODE No.2
- PIN 3: DYNODE No.3
- PIN 4: DYNODE No.4
- PIN 5: DYNODE No.5
- PIN 6: DYNODE No.6



- PIN 7: DYNODE No.7
- PIN 8: DYNODE No.8
- PIN 9: DYNODE No.9
- PIN 10: ANODE
- PIN 11: PHOTOCATHODE

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