

# Multiplier Phototube

9-STAGE, SIDE-ON TYPE

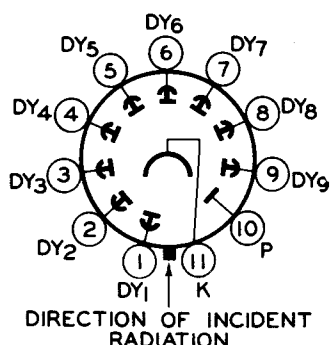
S-8 RESPONSE

**Especially Useful in Colorimetric and Spectroscopic Applications. High Sensitivity to Green-and-Blue Rich Light**

## General:

|                                                                             |                                                                             |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Spectral Response. . . . .                                                  | S-8                                                                         |
| Wavelength of Maximum Response . . . .                                      | 3650 $\pm$ 500 angstroms                                                    |
| Cathode, Opaque. . . . .                                                    | Cesium-Bismuth                                                              |
| Minimum projected length <sup>a</sup> . . . . .                             | 15/16"                                                                      |
| Minimum projected width <sup>a</sup> . . . . .                              | 5/16"                                                                       |
| Window . . . . .                                                            | Lime Glass <sup>b</sup>                                                     |
| Dynode Material. . . . .                                                    | Cesium-Antimony                                                             |
| Direct Interelectrode Capacitances (Approx.):                               |                                                                             |
| Anode to dynode No.9 . . . . .                                              | 4.4 pf                                                                      |
| Anode to all other electrodes. . . . .                                      | 6.0 pf                                                                      |
| Maximum Overall Length . . . . .                                            | 3-11/16"                                                                    |
| Maximum Seated Length. . . . .                                              | 3-1/8"                                                                      |
| Length from Base Seat to Center<br>of Useful Cathode Area . . . . .         | 1-15/16" $\pm$ 3/32"                                                        |
| Maximum Diameter . . . . .                                                  | 1-5/16"                                                                     |
| Operating Position . . . . .                                                | Any                                                                         |
| Weight (Approx.) . . . . .                                                  | 1.6 oz                                                                      |
| Bulb . . . . .                                                              | T9                                                                          |
| Socket . . . . .                                                            | Amphenol <sup>c</sup> No.78S11T, or equivalent                              |
| Magnetic Shield. Perfection Mica Co. <sup>d</sup> No.P-101-2, or equivalent |                                                                             |
| Base . . . . .                                                              | Small-Shell Submagnal 11-Pin (JEDEC Group 2,<br>No.B11-88), Non-hygroscopic |
| Basing Designation for BOTTOM VIEW . . . . .                                | 11K                                                                         |

- 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



## Maximum Ratings, Absolute-Maximum Values:

|                                                                         |           |       |
|-------------------------------------------------------------------------|-----------|-------|
| Supply Voltage Between Anode and Cathode (DC or Peak AC). . . . .       | 1250 max. | volts |
| Supply Voltage Between Dynode No.9 and Anode (DC or Peak AC). . . . .   | 250 max.  | volts |
| Supply Voltage Between Consecutive Dynodes (DC or Peak AC). . . . .     | 250 max.  | volts |
| Supply Voltage Between Dynode No.1 and Cathode (DC or Peak AC). . . . . | 250 max.  | volts |
| Average Anode Current <sup>e</sup> . . . . .                            | 1 max.    | ma    |
| Ambient Temperature. . . . .                                            | 50 max.   | °C    |

← Indicates a change.



**RADIO CORPORATION OF AMERICA**  
Electronic Components and Devices

Harrison, N. J.

DATA 1  
10-63

## → Characteristics Range Values:

Under conditions with 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 (Except as noted)

|                                               | Min.                 | Typ.                  | Max.                  |      |
|-----------------------------------------------|----------------------|-----------------------|-----------------------|------|
| Sensitivity:                                  |                      |                       |                       |      |
| Radiant, at 3650 angstroms. . .               | -                    | 750                   | -                     | a/w  |
| Cathode radiant,                              |                      |                       |                       |      |
| at 3650 angstroms. . . . .                    | -                    | $2.3 \times 10^{-3}$  | -                     | a/w  |
| Luminous, at 0 cps <sup>f</sup> . . . . .     | 0.115                | 1                     | 16                    | a/lm |
| Cathode luminous <sup>g</sup> . . . . .       | $1.5 \times 10^{-6}$ | $3 \times 10^{-6}$    | -                     | a/lm |
| Current Amplification. . . . .                | -                    | $3.3 \times 10^5$     | -                     |      |
| Equivalent Anode-Dark-Current                 |                      |                       |                       |      |
| Input at a luminous sensi-                    |                      |                       |                       |      |
| tivity of 0.4 a/lm <sup>h,j</sup> . . . . .   | -                    | $7.5 \times 10^{-9}$  | $3.75 \times 10^{-7}$ | lm   |
| Equivalent Noise Input <sup>k</sup> . . . . . | -                    | $7.5 \times 10^{-12}$ | -                     | lm   |

With E = 750 volts (Except as noted)

|                                           | Min.                 | Typ.                 | Max. |      |
|-------------------------------------------|----------------------|----------------------|------|------|
| Sensitivity:                              |                      |                      |      |      |
| Radiant, at 3650 angstroms. . .           | -                    | 110                  | -    | a/w  |
| Cathode radiant,                          |                      |                      |      |      |
| at 3650 angstroms. . . . .                | -                    | $2.3 \times 10^{-3}$ | -    | a/w  |
| Luminous, at 0 cps <sup>f</sup> . . . . . | 0.016                | 0.145                | 1.85 | a/lm |
| Cathode luminous <sup>g</sup> . . . . .   | $1.5 \times 10^{-6}$ | $3 \times 10^{-6}$   | -    | a/lm |
| Current Amplification. . . . .            | -                    | $4.8 \times 10^4$    | -    |      |

a On plane perpendicular to the indicated direction of incident light and passing through the major axis of the tube.

b Corning No.0080, Corning Glass Works, Corning, New York, or equivalent.

c Made by Amphenol Electronics Corporation, 1830 South 54th Avenue, Chicago 54, Illinois.

d Made by Magnetic Shield Division, Perfection Mica Co., 1829 Civic Opera Bldg., 20 North Wacker Drive, Chicago 6, Illinois.

e Averaged over any interval of 30 seconds maximum.

f Under the following conditions: The light source is a tungsten-filament lamp having a lime-glass envelope. It is operated at a color temperature of 2870° K and a light input of 10 microlumens is used.

g Under the following conditions: The light source is a tungsten-filament lamp having a lime-glass envelope. It is operated at a color temperature of 2870° K. The value of light flux is 0.01 lumen and 100 volts are applied between cathode and all other electrodes connected as anode.

h At a tube temperature of 25° C. Dark current may be reduced by use of a refrigerant.

j For maximum signal-to-noise ratio, operation with a supply voltage (E) below 1000 volts is recommended.

k Under the following conditions: Supply voltage (E) is as shown, 25° C tube temperature, external shield connected to cathode, bandwidth 1 cycle per second, tungsten-light source at a color temperature of 2870° 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.

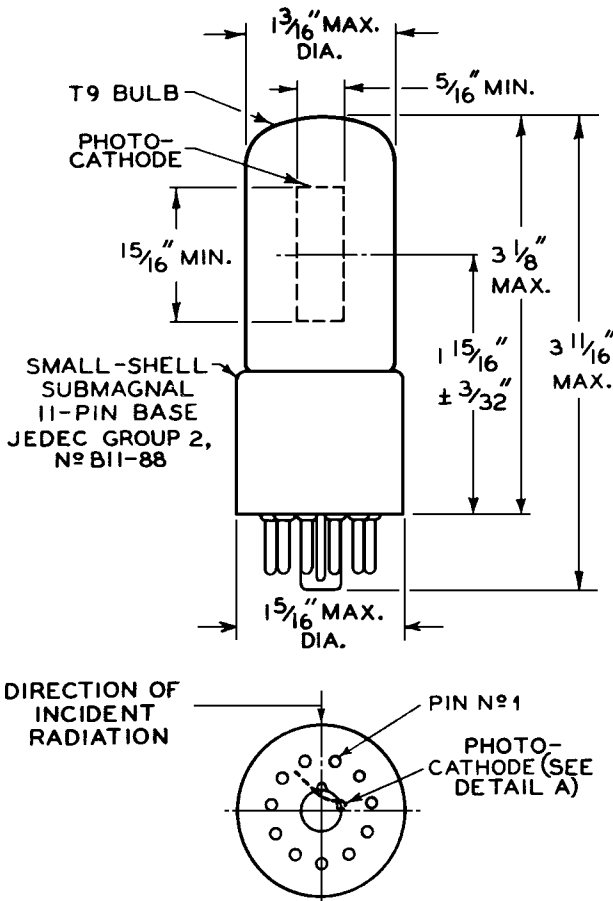
→ Indicates a change.



IP22

# MULTIPLIER PHOTOTUBE

IP22



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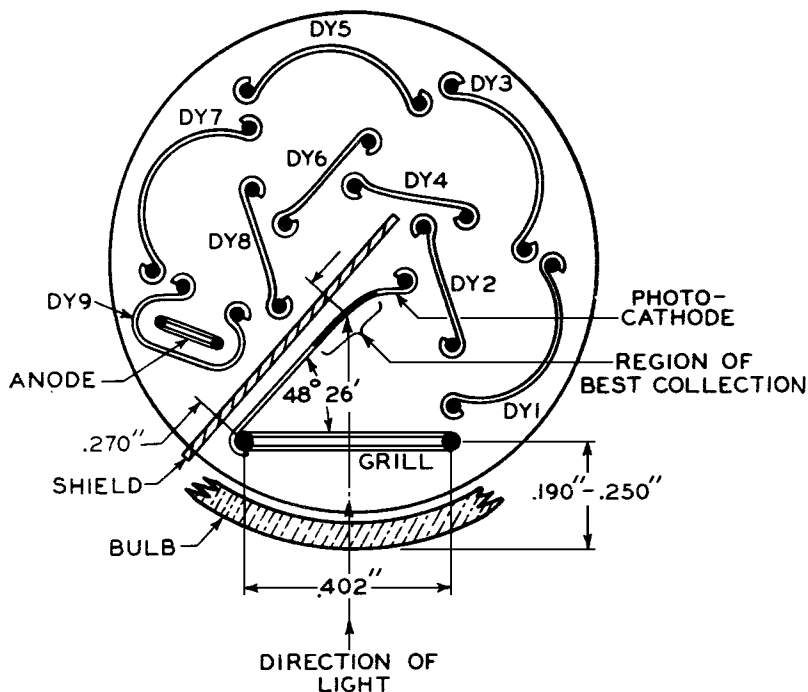
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IP22

## MULTIPLIER PHOTOTUBE

DETAIL A

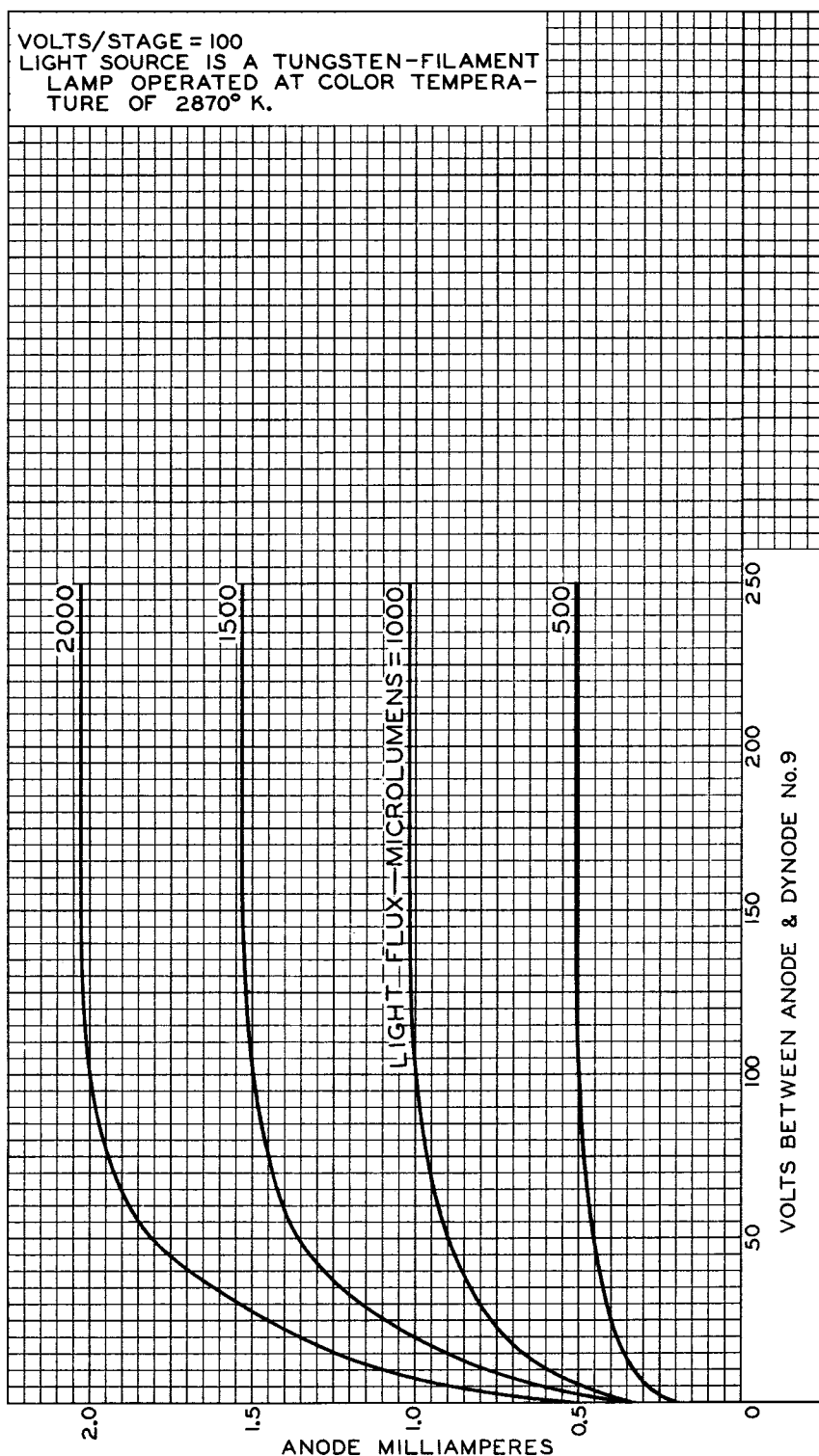


92CS-8674R1

**NOTE 1:** CENTER LINE OF BULB WILL NOT DEVIATE MORE THAN  $2^{\circ}$  IN ANY DIRECTION FROM THE PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE.

**NOTE 2:** THE MAXIMUM ANGULAR VARIATION BETWEEN THE PLANE THROUGH PINS I AND II AND THE PLANE OF THE GRILL WILL NOT EXCEED  $6^{\circ}$ .

## TYPICAL ANODE CHARACTERISTICS

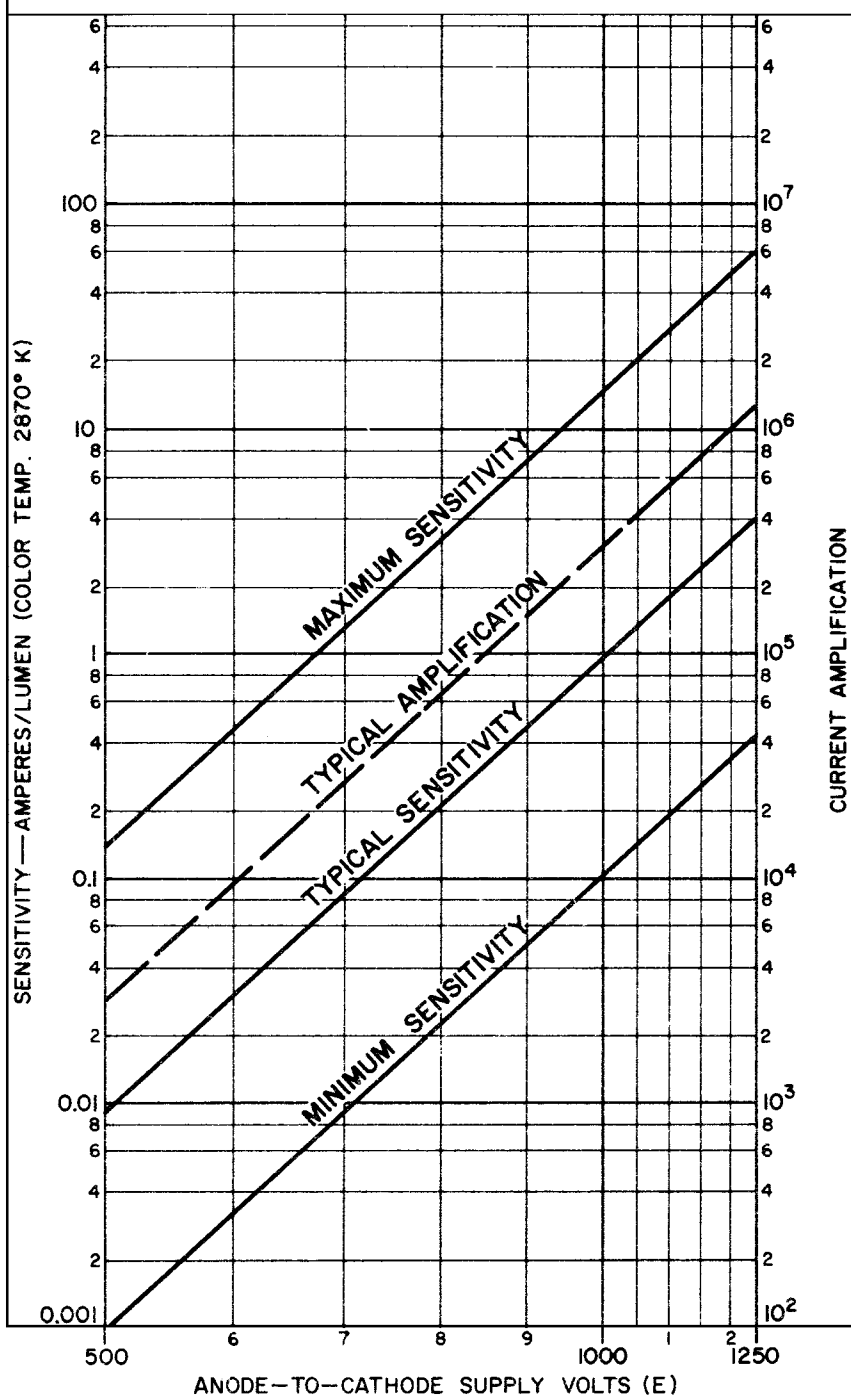


92CM-6585RI



# SENSITIVITY AND CURRENT AMPLIFICATION CHARACTERISTICS

SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING 1/10 OF E BETWEEN CATHODE AND DYNODE No.1; 1/10 OF E FOR EACH SUCCESSIVE DYNODE STAGE; AND 1/10 OF E BETWEEN DYNODE No. 9 AND ANODE.



92CM-9674RI

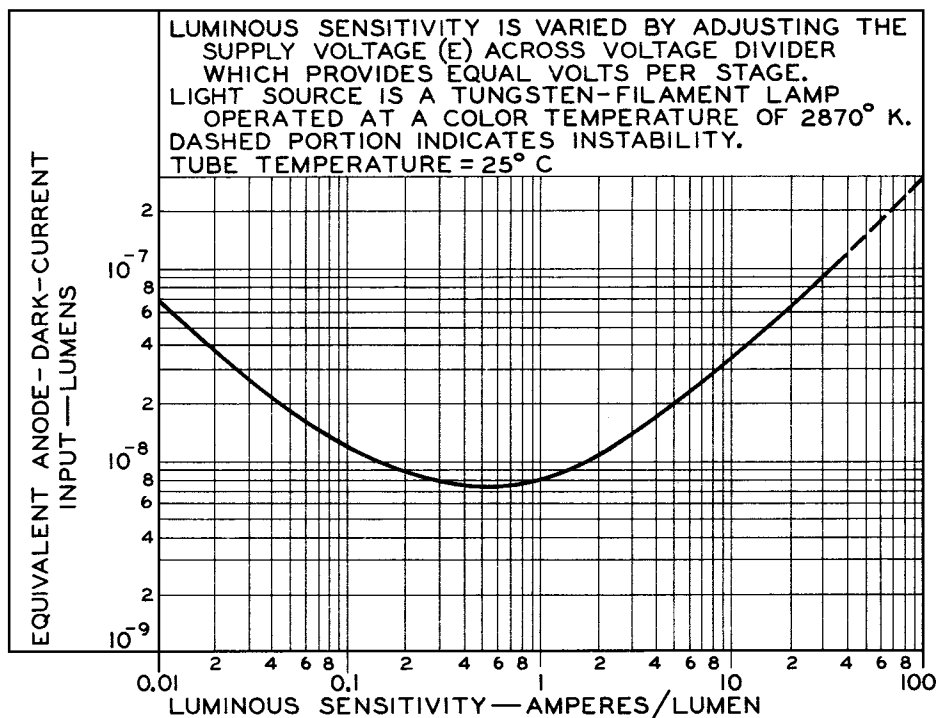




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## TYPICAL ANODE-DARK-CURRENT CHARACTERISTIC



92CS-9680

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY