

# Photomultiplier Tube

## S-4 RESPONSE

### FLEXIBLE LEADS

### SIDE-ON, 9-STAGE TYPE

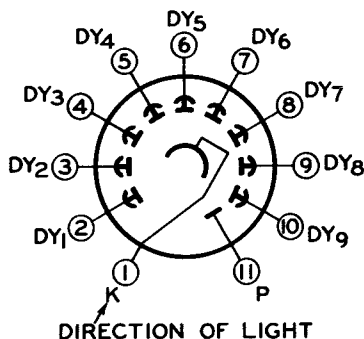
*For AC- or DC-Operated Control Applications  
Which Require High Luminous Sensitivity*

### GENERAL

|                                                     |                                                              |
|-----------------------------------------------------|--------------------------------------------------------------|
| Spectral Response . . . . .                         | S-4                                                          |
| Wavelength of Maximum Response . . . . .            | .4000 $\pm$ 500 angstroms                                    |
| Cathode, Opaque . . . . .                           | Cs-Sb ←                                                      |
| Minimum projected length <sup>a</sup> . . . . .     | 15/16 in                                                     |
| Minimum projected width <sup>a</sup> . . . . .      | 5/16 in                                                      |
| Window . . . . .                                    | Lime Glass, (Corning <sup>b</sup> No.0080), or equivalent ←  |
| Dynode Material . . . . .                           | Cs-Sb ←                                                      |
| Direct Interelectrode Capacitances (Approx.)        |                                                              |
| Anode-to-dynode No.9 . . . . .                      | 3.8 pF                                                       |
| Anode to all other electrodes . . . . .             | 4.8 pF                                                       |
| Maximum Overall Length . . . . .                    | 2-3/4 in                                                     |
| Excluding semiflexible leads                        |                                                              |
| Maximum Envelope Length . . . . .                   | 2-1/4 in                                                     |
| Excluding tip                                       |                                                              |
| Length . . . . .                                    | 1-1/4 $\pm$ 3/32 in                                          |
| From envelope seal to center of useful cathode area |                                                              |
| Maximum Diameter . . . . .                          | 1-3/16 in                                                    |
| Operating Position . . . . .                        | Any                                                          |
| Weight (Approx.) . . . . .                          | 2 oz                                                         |
| Envelope . . . . .                                  | JEDEC T9                                                     |
| Magnetic Shield . . . . .                           | Perfection Mica Co., <sup>c</sup> No.P-107,<br>or equivalent |

### TERMINAL DIAGRAM (Bottom View)

|                       |
|-----------------------|
| Lead 1 - Photocathode |
| Lead 2 - Dynode No.1  |
| Lead 3 - Dynode No.2  |
| Lead 4 - Dynode No.3  |
| Lead 5 - Dynode No.4  |
| Lead 6 - Dynode No.5  |
| Lead 7 - Dynode No.6  |
| Lead 8 - Dynode No.7  |
| Lead 9 - Dynode No.8  |
| Lead 10 - Dynode No.9 |
| Lead 11 - Anode       |



### ABSOLUTE-MAXIMUM RATINGS

#### DC or Peak AC Supply Voltage

|                                              |         |
|----------------------------------------------|---------|
| Between anode and cathode . . . . .          | 1250 V  |
| Between anode and dynode No.9 . . . . .      | 250 V   |
| Between consecutive dynodes . . . . .        | 250 V ← |
| Between dynode No.1 and cathode . . . . .    | 250 V ← |
| Average Anode Current <sup>d</sup> . . . . . | 0.1 mA  |
| Ambient Temperature . . . . .                | 75 °C ← |

← Indicates a change.



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 V dc

|                                           | Min | Typ                 | Max                  |      |
|-------------------------------------------|-----|---------------------|----------------------|------|
| Sensitivity                               |     |                     |                      |      |
| Radiant, at 4000 angstroms. .             | -   | 3.4x10 <sup>4</sup> | -                    | A/W  |
| Luminous, at 0 c/s <sup>e</sup> . . . . . | 5   | 35                  | 250                  | A/1m |
| Dark Current to any Electrode .           | -   | -                   | 7.5x10 <sup>-7</sup> | A    |
| At 25°C                                   |     |                     |                      |      |

With E = Adjustable 60 c/s ac voltage

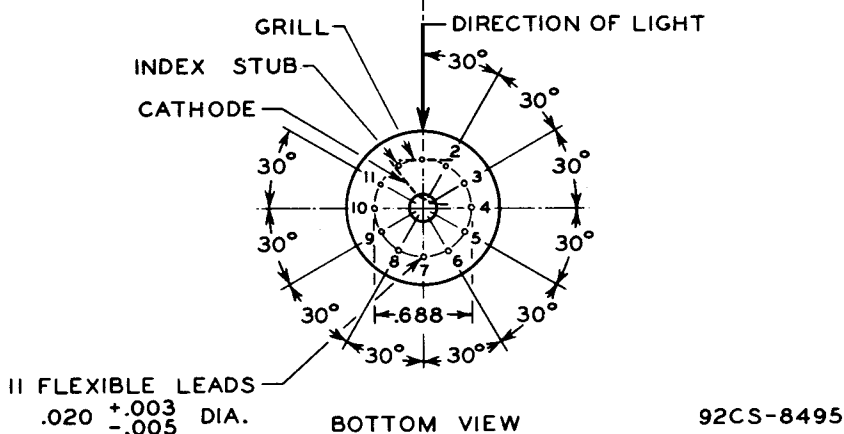
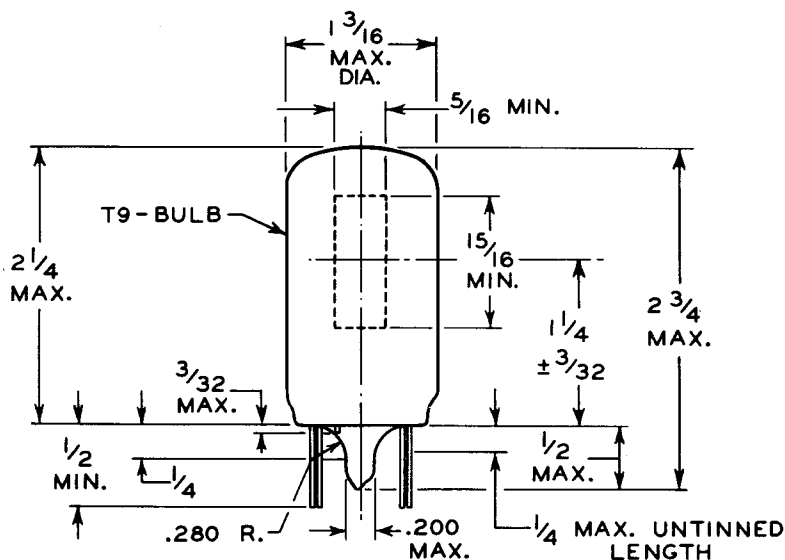
|                                               | Min | Typ | Max                  |   |
|-----------------------------------------------|-----|-----|----------------------|---|
| → Anode-to-Cathode Voltage <sup>f</sup> . . . |     |     |                      |   |
| RMS Values . . . . .                          | 535 | 775 | 1000                 | V |
| Anode Dark Current <sup>g</sup> . . . . .     | -   | -   | 2.5x10 <sup>-7</sup> | A |
| At 25°C                                       |     |     |                      |   |

- <sup>a</sup> On plane perpendicular to the indicated direction of incident light and passing through the major axis of the tube.
- <sup>b</sup> Made by Corning Glass Works, Corning, New York.
- <sup>c</sup> Made by Magnetic Shield Division, Perfection Mica Co., 1829 Civic Opera Bldg., 20 North Wacker Drive, Chicago 6, Illinois.
- <sup>d</sup> Averaged over any interval of 30 seconds maximum.
- <sup>e</sup> 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.
- <sup>f</sup> 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 1 microlumen is used. Supply Voltage (E) is adjusted to give an anode current of 7.5 microamperes.
- <sup>g</sup> For conditions same as (f) except no radiant flux on photocathode.

→ Indicates a change.



## DIMENSIONAL OUTLINE



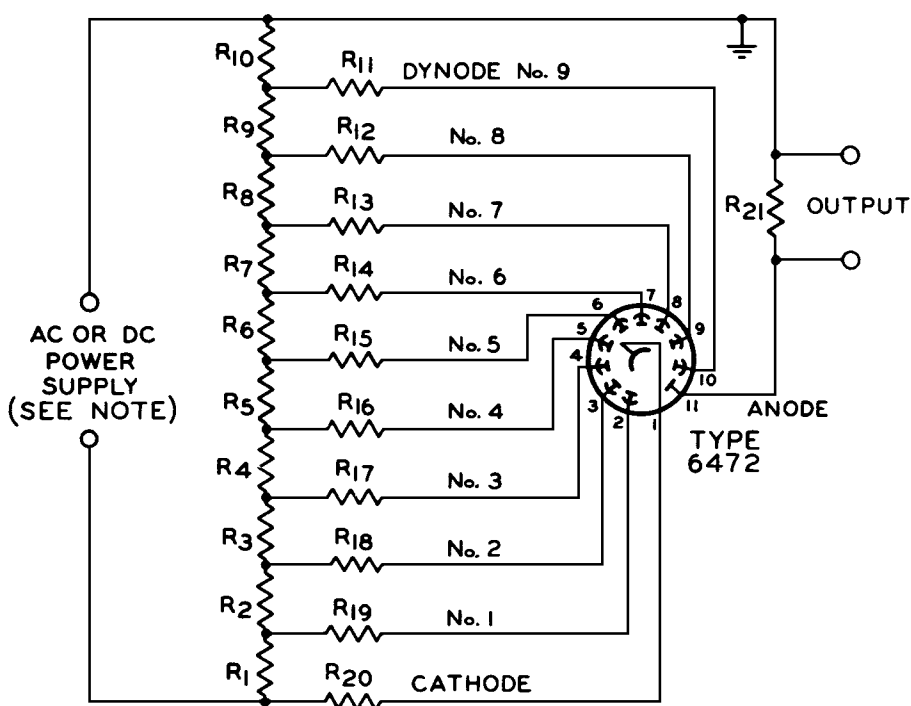
## DIMENSIONS IN INCHES

The angular variation between the plane through Lead No.1 and tube axis and the plane perpendicular to the plane of the grill will not exceed  $20^{\circ}$ .

SPECTRAL-SENSITIVITY CHARACTERISTIC  
of Phototube having S-4 Response  
is shown at front of this section



## RECOMMENDED VOLTAGE-DIVIDER NETWORK FOR USE WITH TYPE 6472 IN HEADLIGHT-DIMMING SERVICE



92CS-8526

R1 R2 R3 R4 R5

R6 R7 R8 R9 R10: 1 megohm, 1/2 watt

R11: 2 megohms, 1/2 watt

R12: 5.1 megohms, 1/2 watt

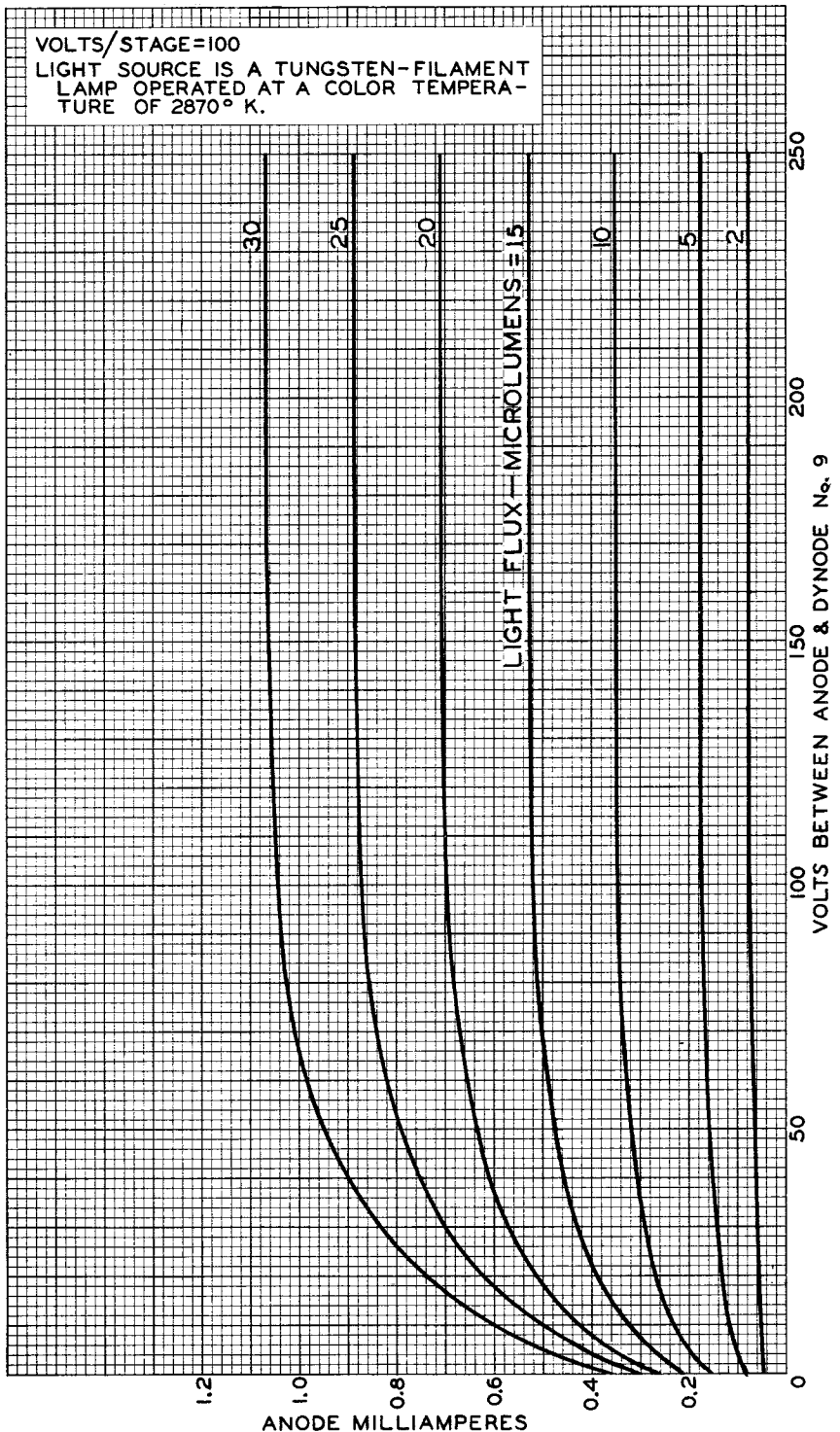
R13 R14 R15 R16

R17 R18 R19 R20: 8.2 megohms, 1/2 watt

R21: 820,000 ohms, 1/2 watt

**Note:** Adjustable between approximately 500 and 1000 volts dc or peak ac.

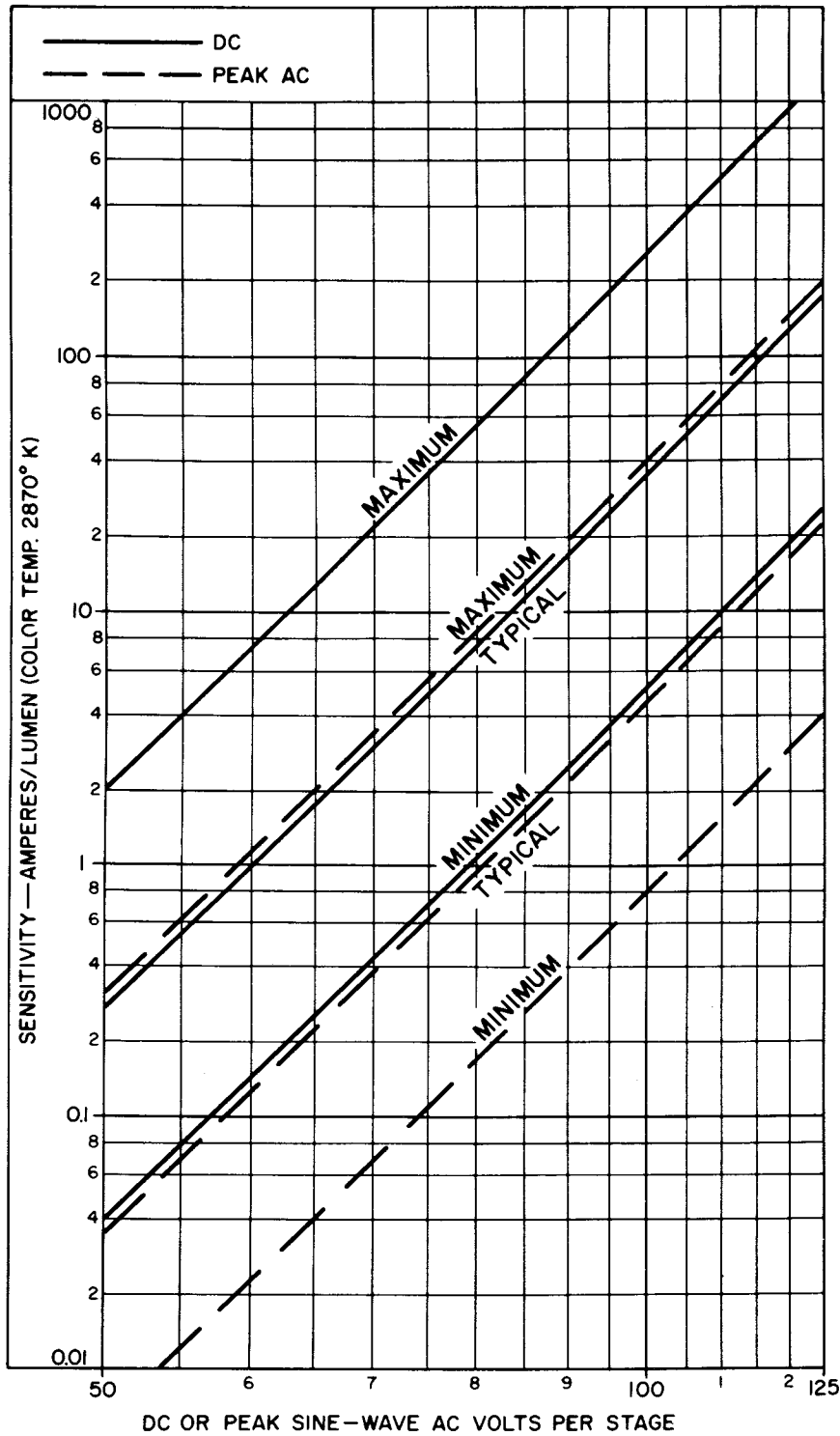
# Typical Anode Characteristics



92CM-8029R2



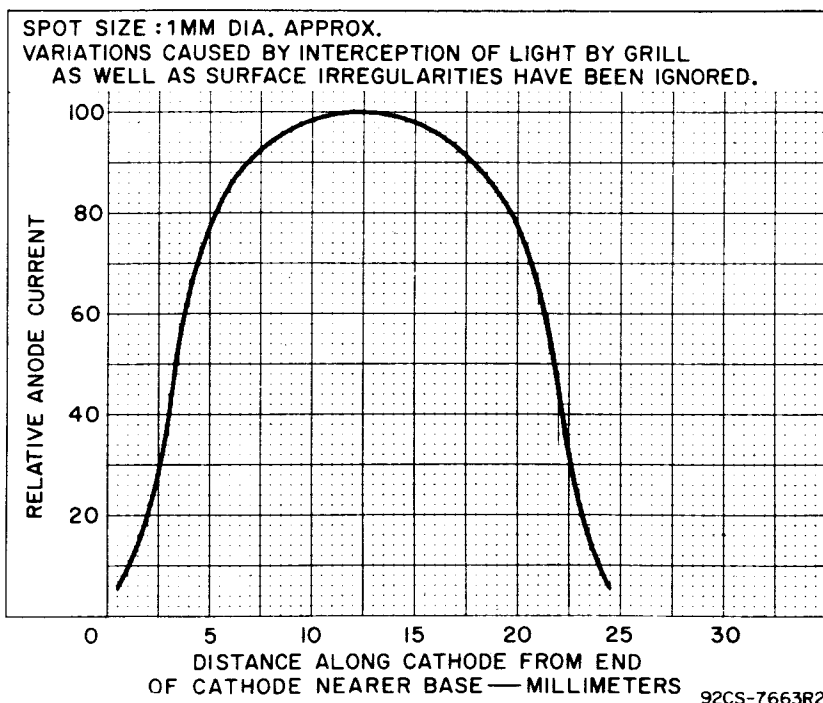
Range of Luminous Sensitivity



92CM-8027R2



## Variation in Photocathode Sensitivity Along Its Length



## Variation in Photocathode Sensitivity Across Its Projected Width in Plane of Grill

