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MULTIPLIER PHOTOTUBE

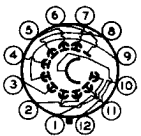
10-STAGE, DORMER-WINDOW TYPE WITH SEMITRANS-PARENT CATHODE ON REFLECTIVE SUBSTRATE AND S-17 RESPONSE

DATA

General:

Spectral Response. S-17
 Wavelength of Maximum Response 4900 ± 500 angstroms
 Cathode, Semitransparent on Reflective Substrate:
 Shape. Rectangular on concave spherical surface
 Minimum projected length on plane
 of window. 0.65 in.
 Minimum projected width on plane
 of window. 0.5 in.
 Direct Interelectrode Capacitances (Approx.):
 Anode to dynode No.10. 4 μuf
 Anode to all other electrodes. 7 μuf
 Maximum Overall Length. 3.75"
 Maximum Seated Length. 3.25"
 Length from Base Seat to Center of Window Area. 2.69" ± 0.19"
 Diameter. 1.50" ± 0.06"
 Operating Position Any
 Weight (Approx.) 3 oz
 Bulb T12 with Special End Contour
 Socket Eby No.9058, or equivalent
 Base Ultrashort Small-Shell Duodecal 12-Pin
 (JETEC No.B12-186), Non-hygroscopic

Basing Designation for BOTTOM VIEW 12AH

- | | | |
|---------------------|--|----------------------|
| Pin 1 - Dynode No.1 |  | Pin 7 - Dynode No.10 |
| Pin 2 - Dynode No.3 | | Pin 8 - Dynode No.8 |
| Pin 3 - Dynode No.5 | | Pin 9 - Dynode No.6 |
| Pin 4 - Dynode No.7 | | Pin 10 - Dynode No.4 |
| Pin 5 - Dynode No.9 | | Pin 11 - Dynode No.2 |
| Pin 6 - Anode | | Pin 12 - Cathode |

DIRECTION OF LIGHT:
INTO DORMER WINDOW

Maximum Ratings, Absolute Values:

For altitudes up to 60,000 feet

ANODE-SUPPLY VOLTAGE (DC or Peak AC) 1250 max. volts
 SUPPLY VOLTAGE BETWEEN DYNODE No.10
 AND ANODE (DC or Peak AC). 250 max. volts
 DYNODE-No.1 SUPPLY VOLTAGE
 (DC or Peak AC). 300 max. volts
 AVERAGE ANODE CURRENT* 20 max. μa
 AMBIENT-TEMPERATURE RANGE. -50 to +75 $^{\circ}\text{C}$

*: See next page.



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Characteristics Range Values for Equipment Design:

Under conditions with supply voltage (E) across voltage divider providing $1/11$ of E per stage

With $E = 1000$ volts (except as noted)

	Min.	Median	Max.	
Sensitivity:				
Radiant, at 4900 angstroms.	-	27200	-	$\mu\text{a}/\mu\text{W}$
Cathode radiant, at 4900 angstroms	-	0.085	-	$\mu\text{a}/\mu\text{W}$
Luminous ¹	10	40	300	amp/lumen
Cathode luminous:				
With tungsten light source ²	100	125	-	$\mu\text{a}/\text{lumen}$
With blue light source ³	0.006	-	-	μa
Current Amplification	-	320000	-	
Equivalent Anode-Dark-				
Current Input ⁴	-	4×10^{-10}	-	lumen
Equivalent Noise Input ⁵	-	1.1×10^{-11}	-	lumen

¹ Averaged over any interval of 30 seconds maximum.

² For conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2870°K . A light input of 1 microlumen is used. The load resistor has a value of 0.01 megohm.

³ For conditions the same as shown under (²) except that the value of light flux is 0.001 lumen and 100 volts are applied between cathode and all other electrodes connected together as anode.

⁴ Under the following conditions: Light incident on the cathode is transmitted through a blue filter (Corning Glass Code No. 5113 polished to 1/2 stock thickness) from a tungsten-filament lamp operated at a color temperature of 2870°K . The value of light flux on the filter is 0.001 lumen. The load resistor has a value of 0.01 megohm, and 100 volts are applied between cathode and all other electrodes connected together as anode.

⁵ For spectral characteristic of this source, see sheet SPECTRAL CHARACTERISTIC OF 2870°K LIGHT SOURCE AND SPECTRAL CHARACTERISTIC OF LIGHT FROM 2870°K SOURCE AFTER PASSING THROUGH INDICATED BLUE FILTER AT front of this Section.

⁶ Measured at a tube temperature of 25°C and with the 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.

⁷ For maximum signal-to-noise ratio, operation with a supply voltage (E) below 1000 volts is recommended.

⁸ Under the following conditions: Supply voltage (E) is 1000 volts, 25°C tube temperature, ac-amplifier bandwidth of 1 cycle per second, tungsten light source at 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. The output current is measured through a filter which passes only the fundamental frequency of the pulses.

SPECIAL PERFORMANCE DATA

4-Hour Stability Life Performance:

This test is performed on each 7029. Before this test is made, the tube is kept in total darkness for 24 hours. Under conditions with supply volts $E = 1000$, tube temperature of 25°C , and light flux adjusted to give an



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anode current = 10 microamperes within 1 minute after turning on light source, the tube is operated for 4 hours. At the end of this period the anode current will not increase by more than 1 microampere nor decrease by more than 1.5 microamperes.

OPERATING CONSIDERATIONS

The *operating stability* of the 7029 is dependent on the magnitude of the anode current and its duration. When the 7029 is operated at high values of anode current, a drop in sensitivity (sometimes called fatigue) may be expected. The extent of the drop below the tabulated sensitivity values depends on the severity of the operating conditions. After a period of idleness, the 7029 usually recovers a substantial percentage of such loss in sensitivity.

The use of an average anode current well below the maximum rated value of 20 microamperes is recommended when stability of operation is important. When greater stability is required, the anode current should not exceed 10 microamperes.

Electrostatic and/or magnetic shielding of the 7029 may be necessary. It is to be noted that the use of an external magnetic and/or electrostatic shield at high negative potential presents a safety hazard unless the shield is connected through a high impedance in the order of 10 megohms to the potential. If the shield is not so connected, *extreme care should be observed in providing adequate safeguards to prevent personnel from coming in contact with the high potential of the shield.*

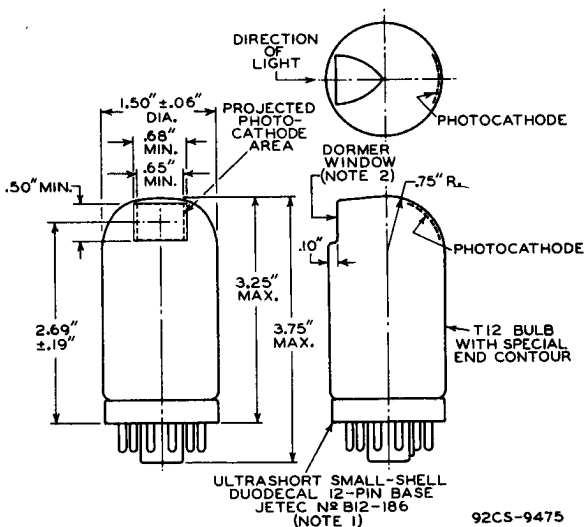
SPECTRAL-SENSITIVITY CHARACTERISTIC
of Phototube having S-17 Response
is shown at the front of this Section

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

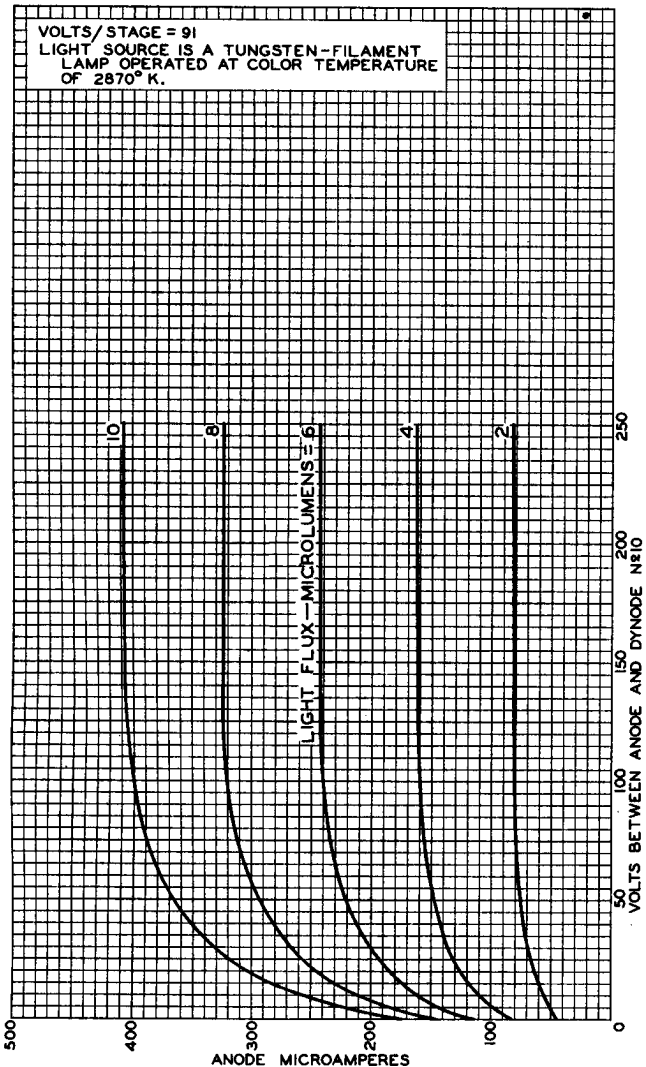
NOTE 2: DORMER WINDOW IS ON OPPOSITE SIDE OF TUBE FROM BASE KEY.



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AVERAGE ANODE CHARACTERISTICS



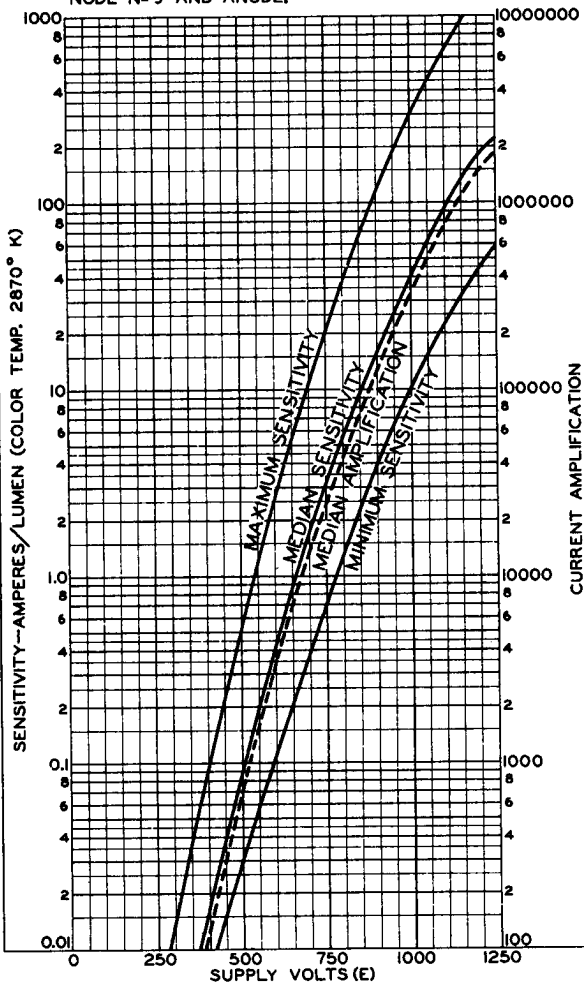
ANODE MICROAMPERES
ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9476

CHARACTERISTICS

SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING $1/11$ OF E BETWEEN CATHODE AND DYNODE N°1; $1/11$ OF E FOR EACH SUCCEEDING DYNODE STAGE; AND $1/11$ OF E BETWEEN DYNODE N°9 AND ANODE.

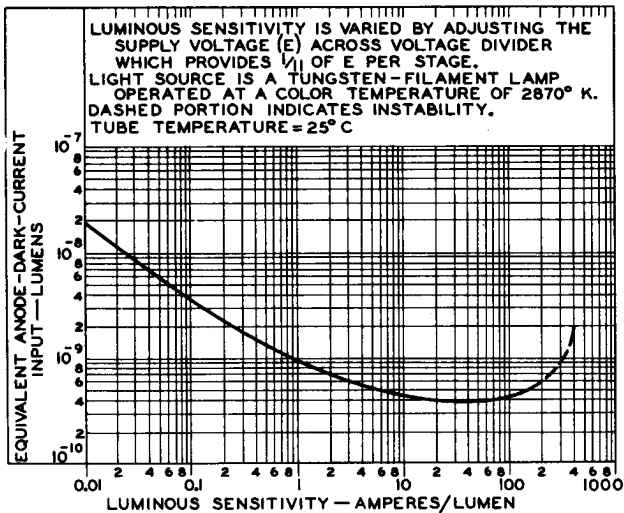




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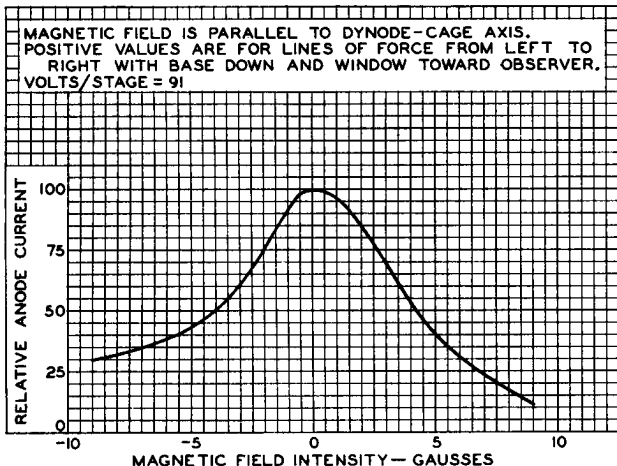
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TYPICAL ANODE-DARK-CURRENT CHARACTERISTIC



92CS-9478

EFFECT OF MAGNETIC FIELD ON ANODE CURRENT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CS-9479