



6655-A

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MULTIPLIER PHOTOTUBE

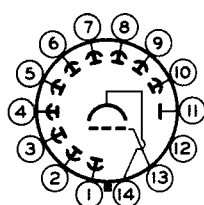
10-STAGE, HEAD-ON, FLAT-FACEPLATE TYPE WITH
1.68"-DIAMETER, CURVED, CIRCULAR, SEMITRANSSPARENT PHOTOCATHODE,
S-11 RESPONSE, AND HIGH-SECONDARY-EMISSION DYNODES

DATA

General:

Spectral Response.	S-11
Wavelength of Maximum Response	4400 $\pm$ 500 angstroms
Cathode, Semitransparent:	
Shape.	Curved Circular
Window:	
Area	2.2 sq. in.
Minimum diameter	1.68 in.
Index of refraction.	1.51
Direct Interelectrode Capacitances (Approx.):	
Anode to dynode No.10.	4.4 μf
Anode to all other electrodes.	7 μf
Maximum Overall Length	5.81"
Seated Length.	4.87" $\pm$ 0.19"
Maximum Diameter	2.31"
Operating Position	Any
Weight (Approx.)	5.2 oz
Bulb	T16
Base	Medium-Shell Diheptal 14-Pin
(JETEC Group 5, No.B14-38), Non-hygroscopic	
Basing Designation for BOTTOM VIEW	14AA

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



DIRECTION OF LIGHT:
INTO END OF BULB

Pin 10 - Dynode No.10
Pin 11 - Anode
Pin 12 - Internal
Connection—
Do Not Use
Pin 13 - Focusing
Electrode
Pin 14 - Cathode

Maximum Ratings, Absolute Values:

SUPPLY VOLTAGE BETWEEN ANODE AND CATHODE (DC or Peak AC).	1250 max. volts
SUPPLY VOLTAGE BETWEEN ANODE AND DYNODE No.10 (DC or Peak AC)	250 max. volts
DYNODE-No.1 SUPPLY VOLTAGE (DC or Peak AC).	300 max. volts
FOCUSING-ELECTRODE SUPPLY VOLTAGE (DC or Peak AC).	300 max. volts
AVERAGE ANODE CURRENT [■]	0.75 max. ma
AMBIENT TEMPERATURE.	75 max. °C

■: See next page.



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Characteristics Range Values for Equipment Design:

Under conditions with dc supply voltage (E) across a voltage divider providing 1/6 of E between dynode No. 1 and cathode; 1/12 of E for each succeeding dynode stage; and 1/12 of E between anode and dynode No. 10

With E = 1000 volts (except as noted) and focusing-electrode* voltage adjusted to give maximum anode current

	Min.	Median	Max.	
Sensitivity:				
Radiant, at 4400 angstroms	-	40000	-	$\mu\text{a}/\mu\text{w}$
Cathode radiant, at 4400 angstroms	-	0.044	-	$\mu\text{a}/\mu\text{w}$
Luminous:▲				
At 0 cps.	10	50	300	amp/lumen
With dynode No. 10 as output electrode†.	-	36	-	amp/lumen
Cathode luminous: With tungsten light source▲.	40	55	-	$\mu\text{a}/\text{lumen}$
With blue light source◆.	0.04	-	-	μa
Current Amplification.	-	900000	-	
Equivalent Anode-Dark-Current Input#	-	8.5×10^{-10}	2×10^{-9}	lumen
Equivalent Noise Input**	-	7×10^{-12}	2.7×10^{-11}	lumen
Anode-Pulse Rise Time□	-	3	-	milliμsec
Greatest Delay Between Anode Pulses:				
Due to position from which electrons are simultaneously released within a circle centered on tube face and having a diameter of—				
1.12"	-	1.5#	-	milliμsec
1.56"	-	4.5#	-	milliμsec

■, *, ▲, †, ●, ◆, #, ●, **, □, #: See next page.



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- Averaged over any interval of 30 seconds maximum.
- * The focusing electrode should be connected to the adjustable arm of a potentiometer between cathode and dynode No.1 in the voltage divider, and operated at an optimum potential within the range of 10 to 60 per cent of the dynode-No.1 potential.
- For conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2870° K. A light input of 10 microlumens is used. The load resistor has a value of 0.01 megohm.
- † An output current of opposite polarity to that obtained at the anode may be provided by using dynode No.10 as the output electrode. With this arrangement, the load is connected in the dynode-No.10 circuit and the anode serves only as collector.
- ▲ For conditions the same as shown under (•) except that the value of light flux is 0.01 lumen and 200 volts are applied between the cathode and all other electrodes connected together as anode.
- ⊙ 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 0.01 lumen. The load resistor has a value of 0.01 megohm, and 200 volts are applied between cathode and all other electrodes connected together as anode.
- ◆ 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.
- # 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.
- 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, 25° -C tube temperature, external shield potential of -1000 volts with respect to anode, ac-amplifier bandwidth of 1 cycle per second, tungsten light source at 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.
- Measured between 10 per cent and 90 per cent of maximum anode-pulse height. This anode-pulse rise time is determined by transit-time variations in the multiplier stages only and with an incident light spot approximately 1 millimeter in diameter centered on the photocathode.
- ⊕ These values also represent the difference in time of transit between the photocathode and dynode No.1 for electrons simultaneously released from the center and from the periphery of the specified areas.

OPERATING CONSIDERATIONS

The use of an *average anode current* well below the maximum rated value of 0.75 milliamperes is recommended when stability of operation is important.

Electrostatic and/or *magnetic shielding* of the 6655-A may be necessary. When a shield is used it should be connected to a potential near that of the cathode.

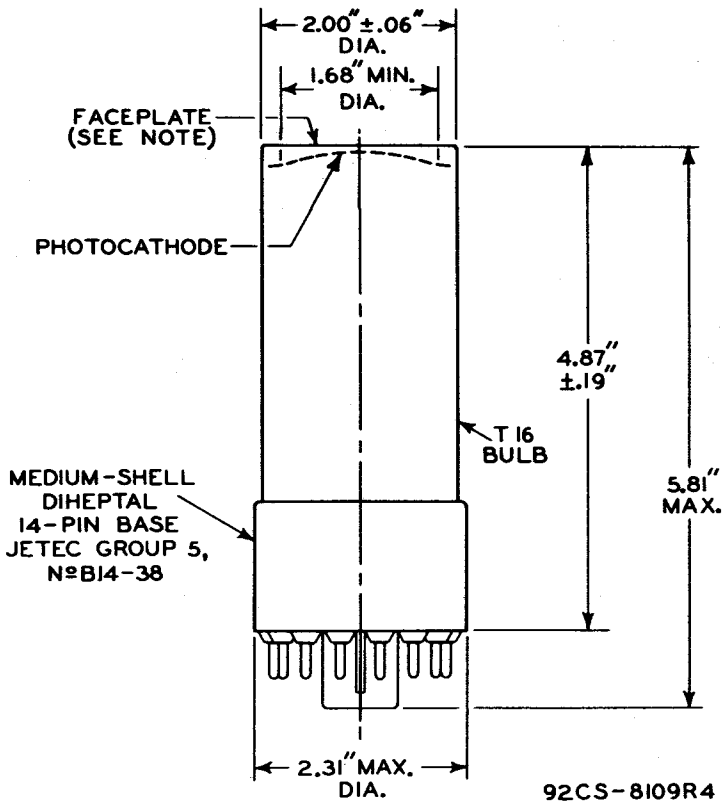
SPECTRAL-SENSITIVITY CHARACTERISTIC
of Phototube having S-II Response
is shown at the front of this Section

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

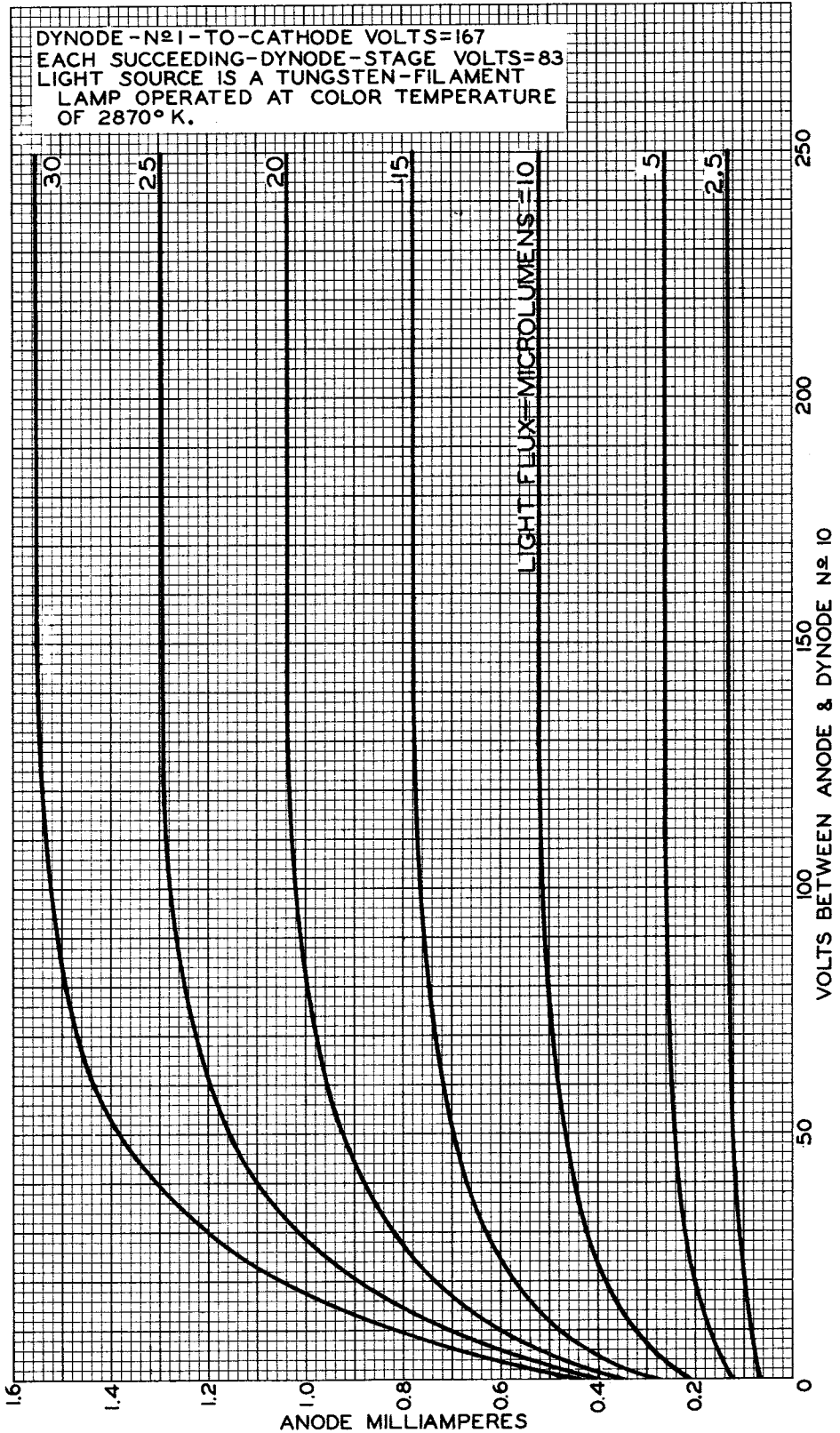
NOTE: WITHIN 1.68" DIAMETER, DEVIATION FROM FLATNESS OF EXTERNAL SURFACE OF FACEPLATE WILL NOT EXCEED 0.010" FROM PEAK TO VALLEY.



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AVERAGE ANODE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-8603RI

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

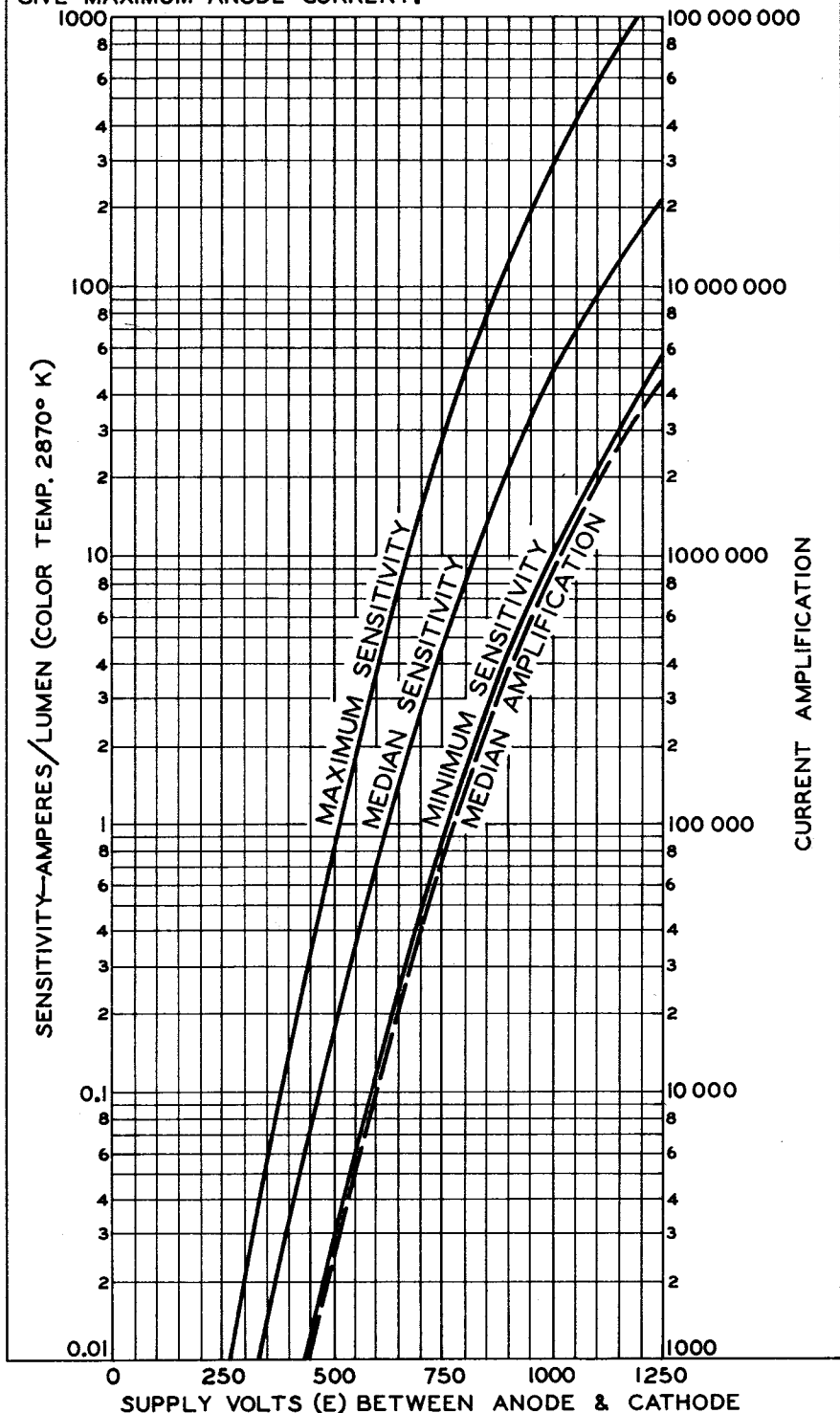
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CHARACTERISTICS

SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING $\frac{1}{6}$ OF E BETWEEN CATHODE AND DYNODE №1; $\frac{1}{12}$ OF E FOR EACH SUCCEEDING DYNODE STAGE; AND $\frac{1}{12}$ OF E BETWEEN DYNODE №10 AND ANODE. FOCUSING-ELECTRODE VOLTAGE ADJUSTED TO GIVE MAXIMUM ANODE CURRENT.



ELECTRON TUBE DIVISION

92CM-8638R1

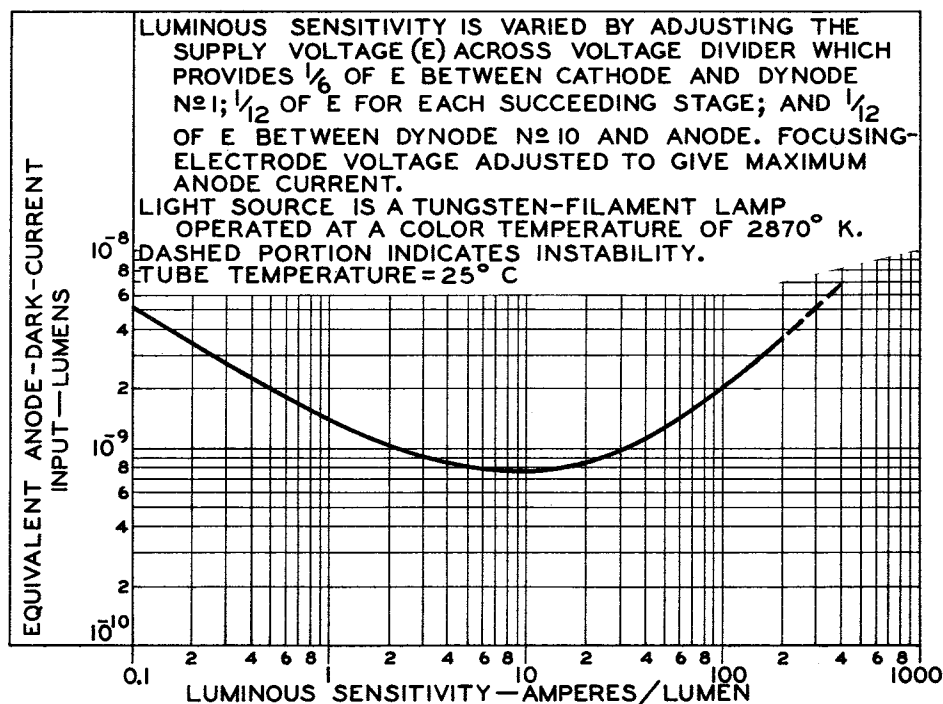
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TYPICAL ANODE-DARK-CURRENT CHARACTERISTIC



92CS-8636RI

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