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6342-A

MULTIPLIER PHOTOTUBE

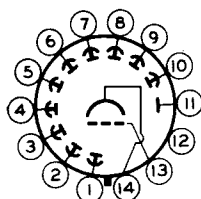
10-STAGE, HEAD-ON, FLAT-FACEPLATE TYPE WITH 1.68"-DIAMETER,
CURVED, SEMITRANSSPARENT PHOTOCATHODE AND S-11 RESPONSE
HIGH-CURRENT DYNODES
Supersedes Type 6342

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 $\mu\mu\text{f}$
Anode to all other electrodes.	7 $\mu\mu\text{f}$
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 - Photo-
cathode

Maximum Ratings, Absolute Values:

SUPPLY VOLTAGE BETWEEN ANODE AND CATHODE (DC or Peak AC).	1500 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).	400 max. volts
FOCUSING-ELECTRODE SUPPLY VOLTAGE (DC or Peak AC).	400 max. volts
AVERAGE ANODE CURRENT [■]	2 max. ma
AMBIENT TEMPERATURE.	75 max. °C

■: See next page.



6342-A

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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 = 1250 volts (except as noted) and focusing-electrode* voltage adjusted to give maximum anode current

	Min.	Median	Max.	
Sensitivity:				
Radiant, at				
4400 angstroms. .	-	11000	-	$\mu\text{a}/\mu\text{w}$
Cathode radiant, at				
4400 angstroms. .	-	0.064	-	$\mu\text{a}/\mu\text{w}$
Luminous:†				
At 0 cps.	4	14	120	amp/lumen
With dynode No.10				
as output elec-				
trode‡.	-	10	-	amp/lumen
Cathode luminous:				
With tungsten				
light source▲. .	50	80	-	$\mu\text{a}/\text{lumen}$
With blue light				
sourceⓈ.	0.05	-	-	μa
Current Amplifi-				
cation.	-	175000	-	
Equivalent Anode-				
Dark-Current				
Input*	-	5×10^{-10}	2×10^{-9}	lumen
Equivalent Noise				
Input**	-	7×10^{-12}	1.7×10^{-11}	lumen
Anode-Pulse Rise				
Time□	-	3	-	milli μsec
Greatest Delay Be-				
tween Anode Pulses:				
Due to position				
from which elec-				
trons are simul-				
taneously released				
within a circle				
centered on tube				
face and having a				
diameter of—				
1.12".	-	1.3 [‡]	-	milli μsec
1.56".	-	4 [‡]	-	milli μsec

■ 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.

†, ‡, ▲, Ⓢ, ◆, ●, **, □, Ⓢ: See next page.



6342-A

6342-A

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- 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 may be reduced by the use of a refrigerant.
- For maximum signal-to-noise ratio, operation with a supply voltage (E) below 1250 volts is recommended.
- ** Under the following conditions: Supply voltage (E) is 1250 volts, 25°-C tube temperature, external-shield potential -1250 volts with respect to anode, ac-amplifier bandwidth of 1 cycle per second, tungsten light source of 2870° K interrupted at 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 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

Operation at an *average anode current* well below the maximum rated value of 2 milliamperes is recommended when stability is important.

Electrostatic and/or *magnetic shielding* of the 6342-A may be necessary. When a shield is used, it should be connected to a potential near that of the photocathode.

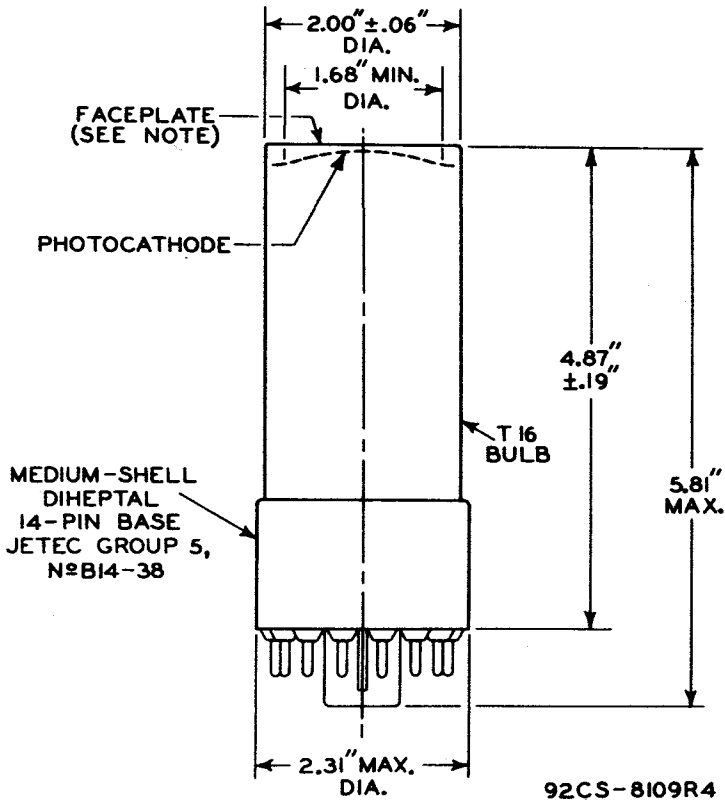
SPECTRAL-SENSITIVITY CHARACTERISTIC
of Phototube having S-II Response
is shown at the front of this Section

6342-A



6342-A

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

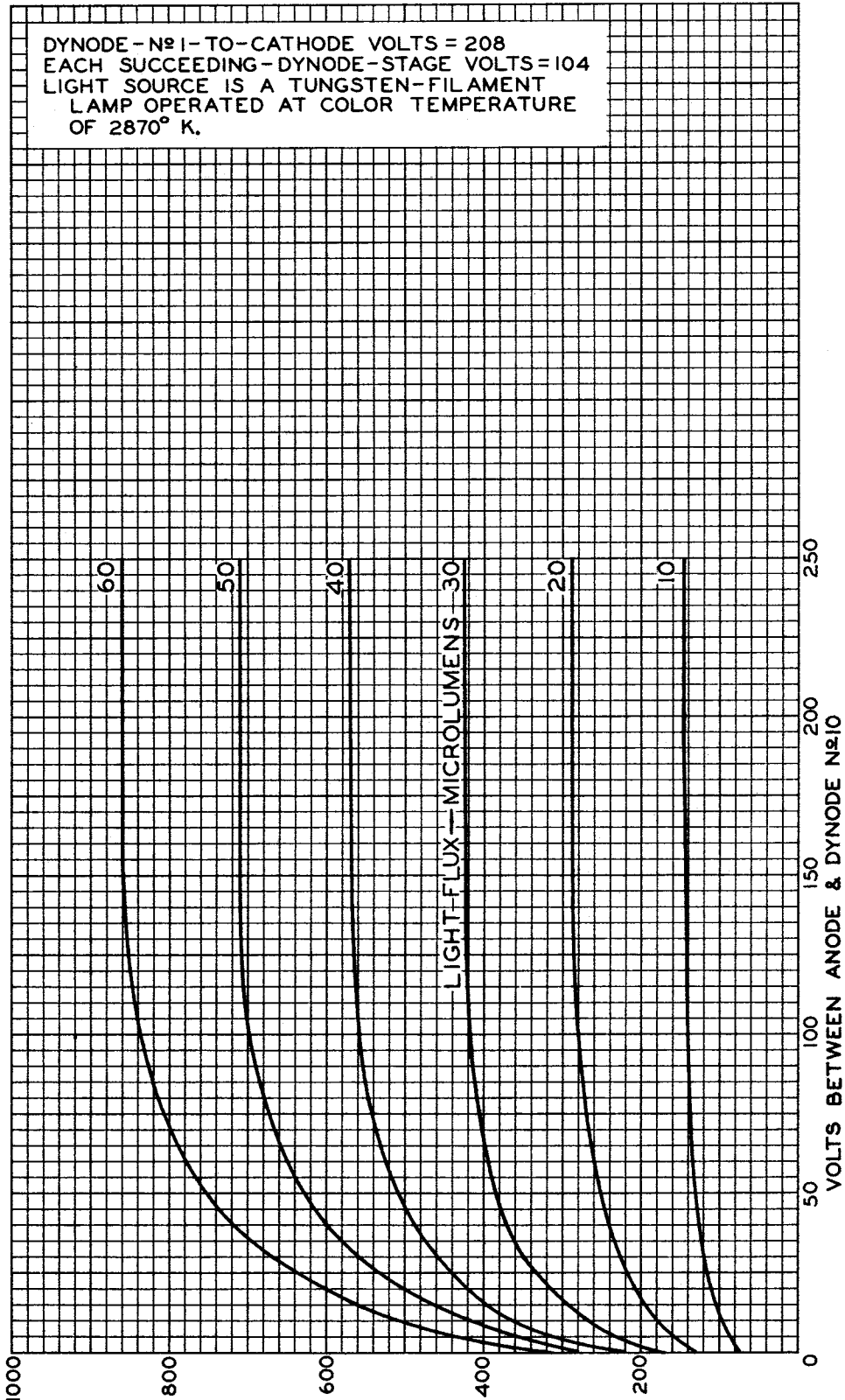
NOTE: WITHIN 1.68" DIAMETER, DEVIATION FROM FLATNESS OF EXTERNAL SURFACE OF FACEPLATE WILL NOT EXCEED 0.010" FROM PEAK TO VALLEY.



6342-A

6342-A

AVERAGE ANODE CHARACTERISTICS



ANODE MICROAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8125R2

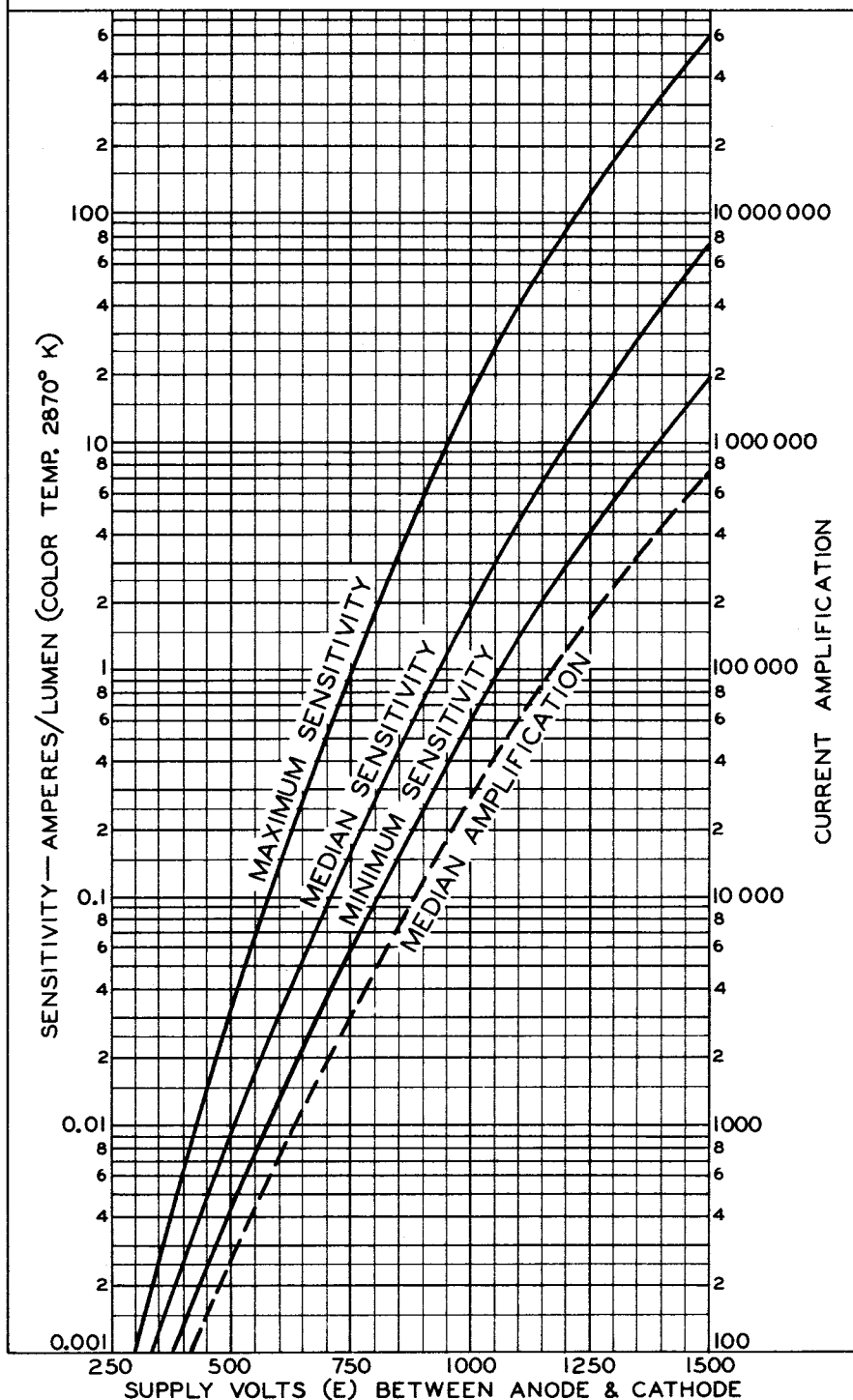
6342-A



6342-A

CHARACTERISTICS

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

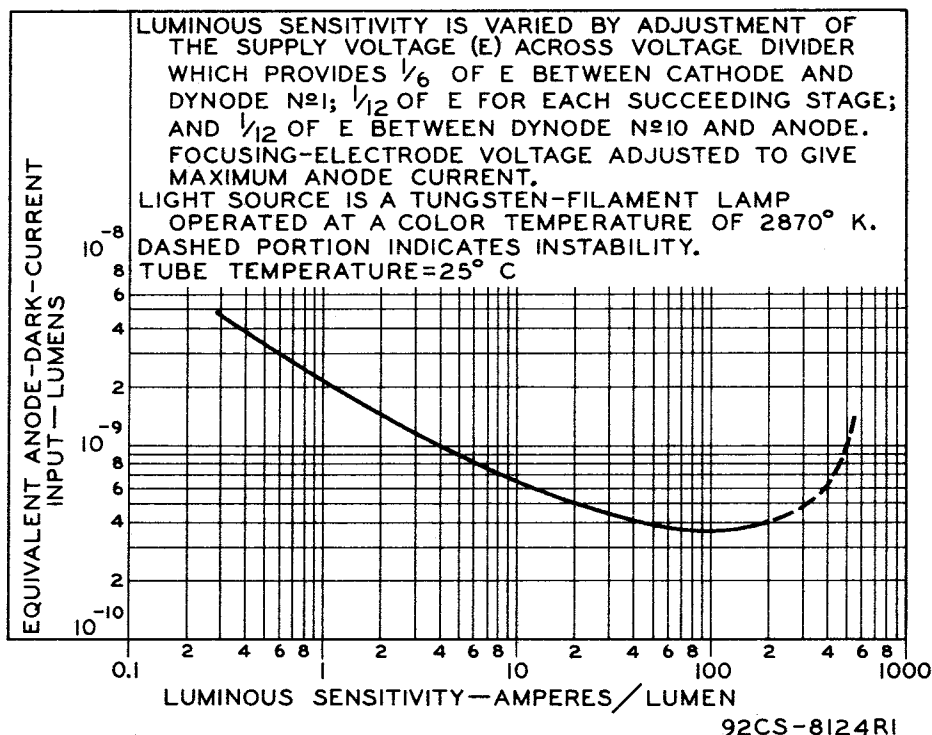




6342-A

6342-A

TYPICAL ANODE-DARK-CURRENT CHARACTERISTIC



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY