6342

MULTIPLIER PHOTOTUBE

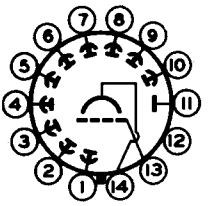
10-STAGE, HEAD-ON TYPE WITH
1-1/2" SEMITRANSPARENT CATHODE AND S-4 RESPONSE

DATA

General:

Spectral Response	S-4
Wavelength of Maximum Response	4000 ± 500 angstroms
Cathode, Semitransparent:	
Shape	Circular
Window:	
Area	1.8 sq. in.
Minimum Diameter	1.5 in.
Index of Refraction	1.51
Direct Interelectrode Capacitances (Approx.):	
Anode to Dynode No.10	4.4 μμf
Anode to All Other Electrodes	7.0 μμf
Overall Length	5-5/8" ± 3-16"
Seated Length	4-7/8" ± 3/16"
Maximum Diameter	2-1/4"
Bulb	T-16
Mounting Position	Any
Base	Medium-Shell Diheptal 14-Pin, Non-hygroscopic (JETEC No.B14-38)

BOTTOM VIEW



DIRECTION OF LIGHT: INTO END OF BULB

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

Maximum Ratings, *Absolute Values:*

ANODE-SUPPLY VOLTAGE (DC or Peak AC)	1500 max.	volts
SUPPLY VOLTAGE BETWEEN DYNODE No.10 AND ANODE (DC or Peak AC)	150 max.	volts
SUPPLY VOLTAGE BETWEEN CATHODE AND DYNODE No.1 (DC or Peak AC)	400 max.	volts
FOCUSING-ELECTRODE VOLTAGE (DC or Peak AC)	400 max.	volts
AVERAGE ANODE CURRENT●	2 max.	ma
AMBIENT TEMPERATURE	75 max.	°C

Characteristics Range Values for Equipment Design:

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

(continued on next page)

● Averaged over any interval of 30 seconds maximum.

6342

6342

MULTIPLIER PHOTOTUBE

With E = 1250 volts (except as noted) and Focusing Electrode connected to Dynode No. 1 at socket*

	Min.	Av.	Max.	
Sensitivity:				
Radiant, at 4000 angstroms	–	7000	–	μamp/μwatt
Cathode Radiant, at 4000 angstroms	–	0.056	–	μamp/μwatt
Luminous:♦				
At 0 cps	3	7.5	–	amp/lumen
Cathode Luminous:				
With tungsten light source▲	40	60	–	μamp/lumen
With blue light source●♦	0.04	–	–	μamp
Current Amplification .	–	125000	–	
Equivalent Anode-Dark-Current Input✱■	–	2×10^{-10}	2×10^{-9}	lumen
Equivalent Noise Input★		7×10^{-12}	–	lumen

With E = 1500 volts (except as noted) and Focusing Electrode connected to Dynode No. 1 at socket*

	Min.	Av.	Max.	
Sensitivity:				
Radiant, at 4000 angstroms	–	33600	–	μamp/μwatt
Cathode Radiant, at 4000 angstroms	–	0.056	–	μamp/μwatt
Luminous:♦				
At 0 cps	–	35	–	amp/lumen
Cathode Luminous:				
With tungsten light source▲	40	60	–	μamp/lumen
With blue light source●♦	0.04	–	–	μamp
Current Amplification .	–	600000	–	

* In general, the focusing electrode is connected to dynode No. 1 at the socket and operated at the same fixed potential as dynode No. 1. However, in applications critical as to magnitude, uniformity, or speed of the response, the focusing electrode may 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 a 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.

▲ For conditions the same as shown under (♦) except that the value of light flux is 0.01 lumen 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.

●,✱,■,★: See next page.

6342

MULTIPLIER PHOTOTUBE

⊕ 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.

✱ 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 1250 volts is recommended.

★ Under the following conditions: Supply voltage (E) is 1250 volts, 25°C tube temperature, ac-amplifier bandwidth of 1 cycle per second, tungsten light source 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.

OPERATING CONSIDERATIONS

The *operating stability* of the 6342 is dependent on the magnitude of the anode current and its duration. When the 6342 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 6342 usually recovers a substantial percentage of such loss in sensitivity.

The use of an average anode current well below the maximum rated value of 2 milliamperes is recommended when stability of operation is important. When maximum stability is required, the anode current should not exceed 250 microamperes.

Electrostatic and/or *magnetic shielding* of the 6342 may be necessary.

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

6342

6342

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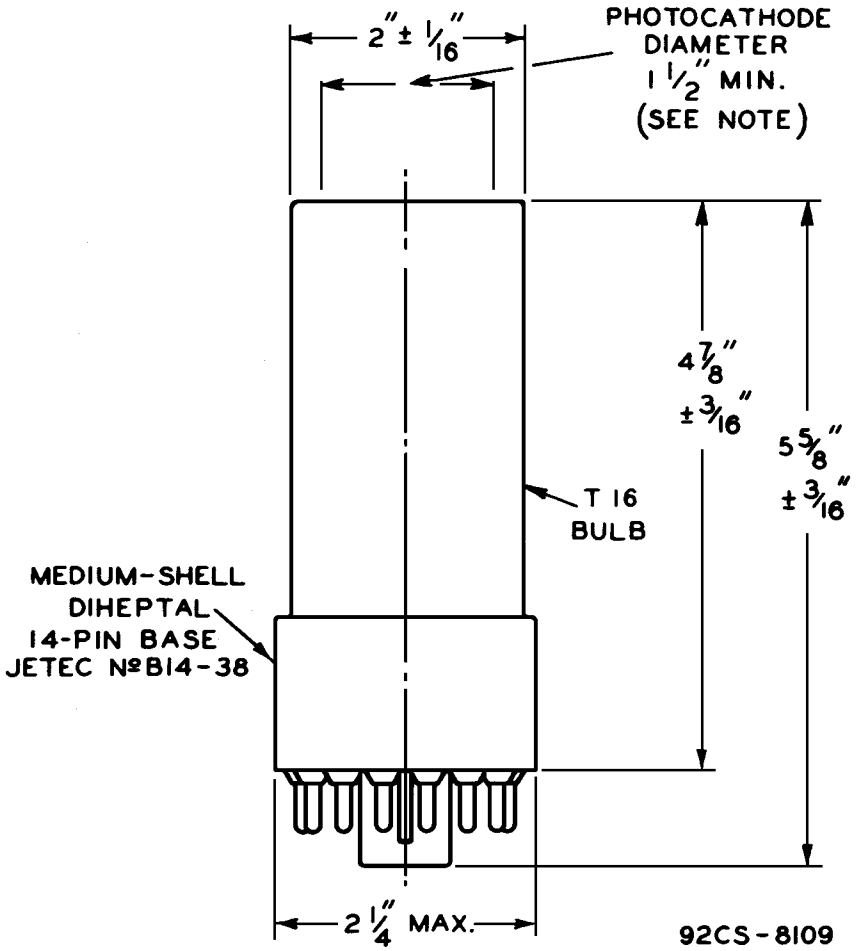

℄ OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM THE PERPENDICULAR ERECTED AT THE CENTER OF BOTTOM OF THE BASE.

NOTE: WITHIN MINIMUM DIAMETER, DEVIATION FROM FLATNESS WILL NOT EXCEED 0.010" FROM PEAK TO VALLEY.

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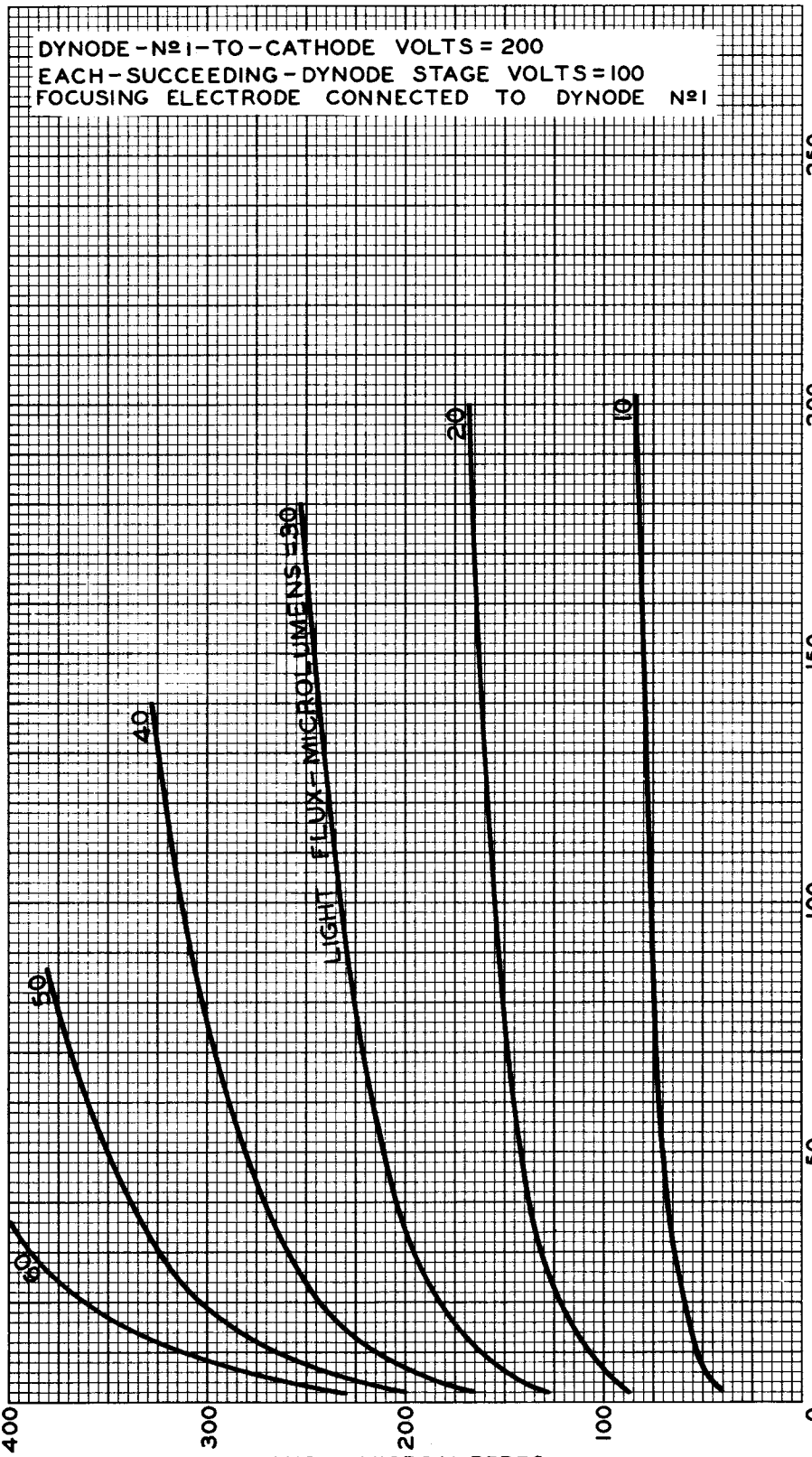
6342

AVERAGE ANODE CHARACTERISTICS



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6342

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6342

TYPICAL ANODE-DARK-CURRENT CHARACTERISTIC

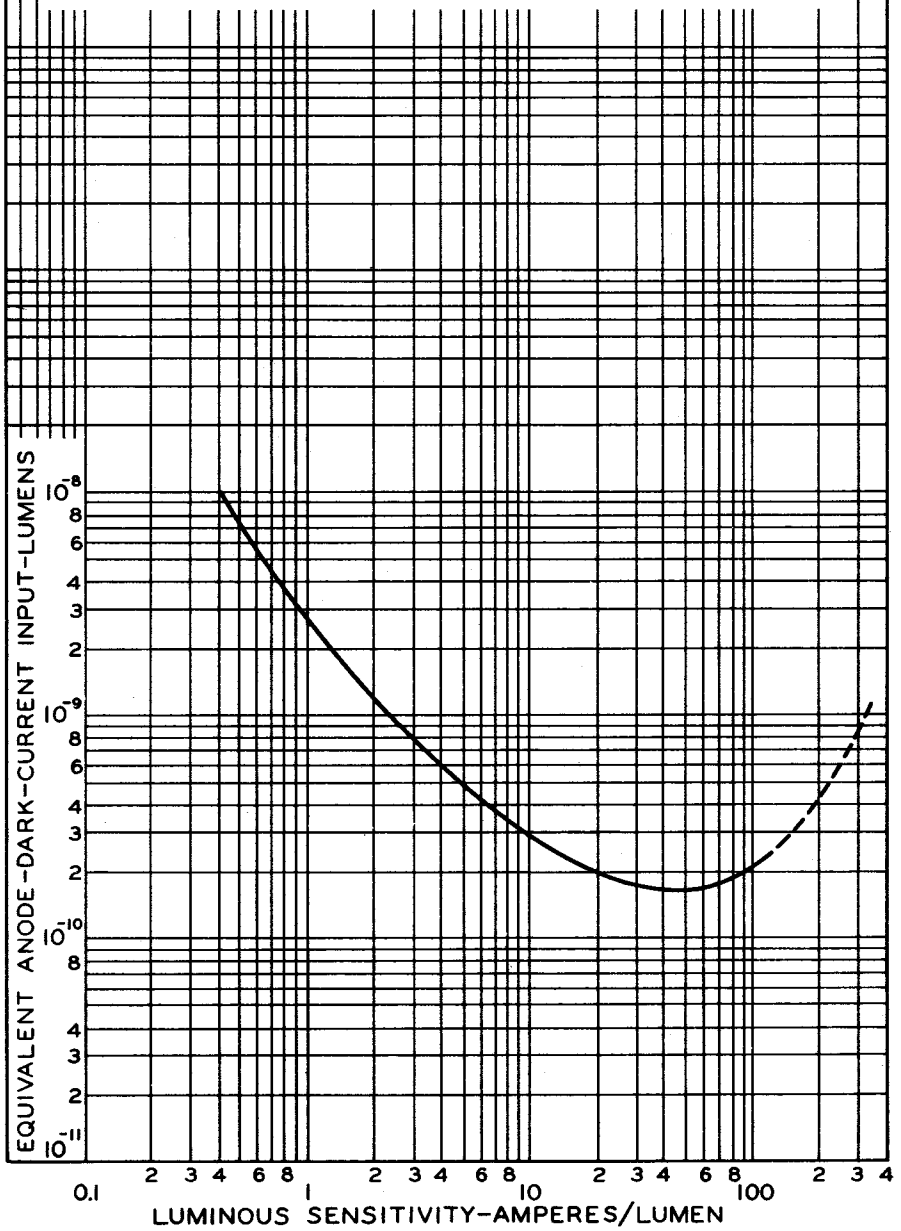
ANODE LUMINOUS SENSITIVITY IS VARIED BY ADJUSTING THE SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER WHICH PROVIDES 1/6 OF E BETWEEN CATHODE AND DYNODE Nº1; 1/12 OF E FOR EACH SUCCEEDING STAGE; AND 1/12 OF E BETWEEN DYNODE Nº10 AND ANODE.

FOCUSING ELECTRODE IS CONNECTED TO DYNODE Nº1

DASHED PORTION INDICATES INSTABILITY

LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP OPERATED AT A COLOR TEMPERATURE OF 2870°K.

TUBE TEMPERATURE=25°C



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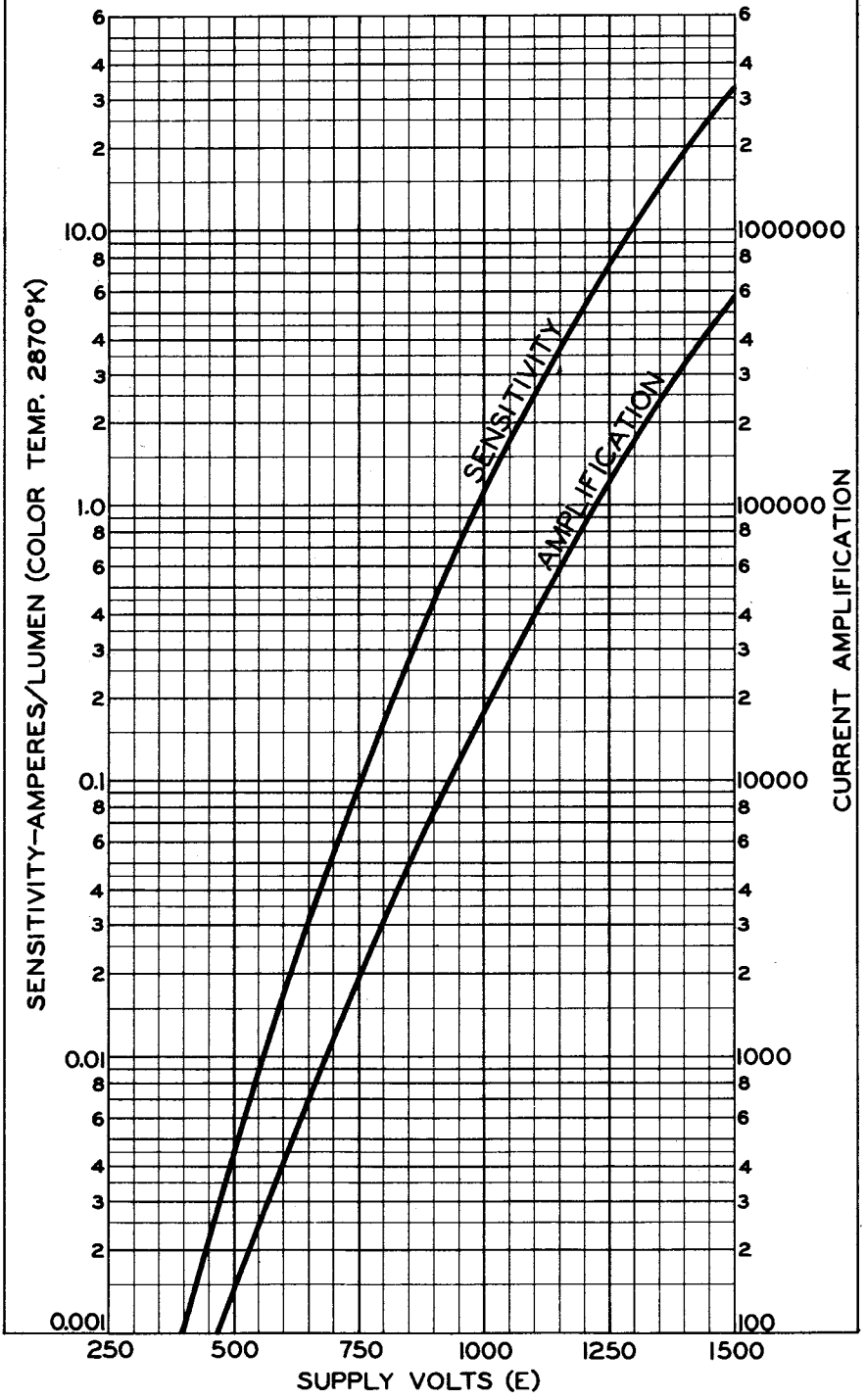
6342

AVERAGE CHARACTERISTICS

SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING 1/6 OF E BETWEEN CATHODE AND DYNODE №1; 1/12 OF E FOR EACH SUCCEEDING DYNODE STAGE; AND 1/12 OF E BETWEEN DYNODE №10 AND ANODE
FOCUSING ELECTRODE IS CONNECTED TO DYNODE №1



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