27M2

NINE STAGE PHOTO-ELECTRIC MULTIPLIER

GENERAL

The 27.M.2 is a high vacuum photo-cell with high response in the visible region. The photo electric current produced at the Cathode is multiplied many times by secondary emission occuring at successive cathodes within the valve.

It is capeble of multiplying very small currents produced under weak illumination by an average value of 250,000 times, when operated at 80 volts per stage.

The resultant output current is a linear function of the exciting illumination, under normal operating conditions. Since secondary emission occurs simultaneously, the frequency response is flat up to the frequencies at which transit time becomes a limiting factor.

Because of its sensitivity, low noise level, low dark current and freedom from distortion the 27.M.2 may be used for light operated relays and in experiments involving low light levels and in many applications where its small size is an advantage.

It should be appreciated that with photo-electric multipliers large variations in overall sensitivity may be present between individual valves

RATING

Maximum Anode Supply Voltage (volts)	• 900
Maximum Potential Anode/Secondary cathode k10 (volts)	100
Maximum Anode Current (mA)	1.0
Cathode k1 sensitivity (µA lumen)	$ 10

• With respect to cathode.

$ The sensitivity is on the basis of a lamp colour temperature of 2700° K and a light area of 4mm x 20mm. Vk1 = 0, all secondary cathodes joined at 100 Volts.

NOTES

(1) It is recommended that the bleeder current in the potentiometer providing the secondary cathode voltages should be of the order of 10 times the maximum working current output of the tube.

(2) The 27.M.2 is similar to the 27.M.1 except for the wider tolerance on the anode dark current which necessitates a lower anode supply voltage.

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TYPICAL OPERATION

Voltage between anode and secondary cathode k10 (volts)	50
Voltage Difference per stage (volts)	80
Anode dark current (max) (µA)	* 0.25
Luminous sensitivity (amps/lumen)	‡ 2
Current amplification	† ‡ 250×10^3

* With 80 volts between anode and secondary cathode K10.

† Ratio of anode sensitivity/cathode sensitivity.

‡ The sensitivity is on the basis of a lamp colour temperature of 2700°K and a light area of 4.0mm x 20mm.

NOTE

By joining together Pins 8, 9 and 10 the cell may be used as a 7 stage multiplier. Volts per stage not to exceed 80 volts

By joining together pins 6, 7, 8, 9 and 10 the cell may be used as a 5 stage multiplier. Volts per stage not to exceed 80 volts.

INTER-ELECTRODE CAPACITANCES

Anode to all other electrodes (µµF)	6.7
Anode to cathode k10 (µµF)	4.1

DIMENSIONS

Maximum Overall length (mm)	94.0
Maximum Seated Height (mm)	80.0
Maximum Bulb Diameter (mm)	28.5
Maximum Base Diameter (mm)	33.4
Light centre from seat (mm)	49.2±2.4
Cathode Length (mm)	24
Cathode Width (mm)	8

BASING Special 11 pin Sub Magnal

Pin 1	Cathode	2
Pin 2	Cathode	3
Pin 3	Cathode	4
Pin 4	Cathode	5
Pin 5	Cathode	6
Pin 6	Cathode	7
Pin 7	Cathode	8
Pin 8	Cathode	9
Pin 9	Cathode	10
Pin 10	Anode	
Pin 11	Cathode	1

Viewed from free end of pins.

NOTE: Pin 1 is taken as the first pin to the left of the keyway. Similarly pin 11 which is connected to the photo emitting cathode k1 is taken as the first pin to the right of the keyway.

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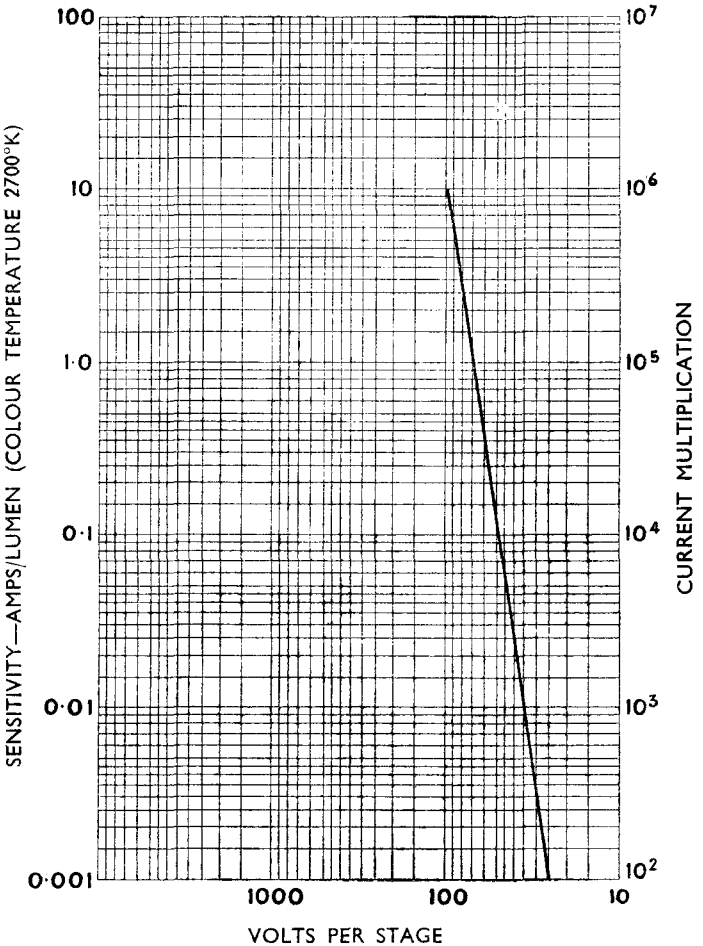
TENTATIVE CHARACTERISTIC CURVES

D.C. OPERATION



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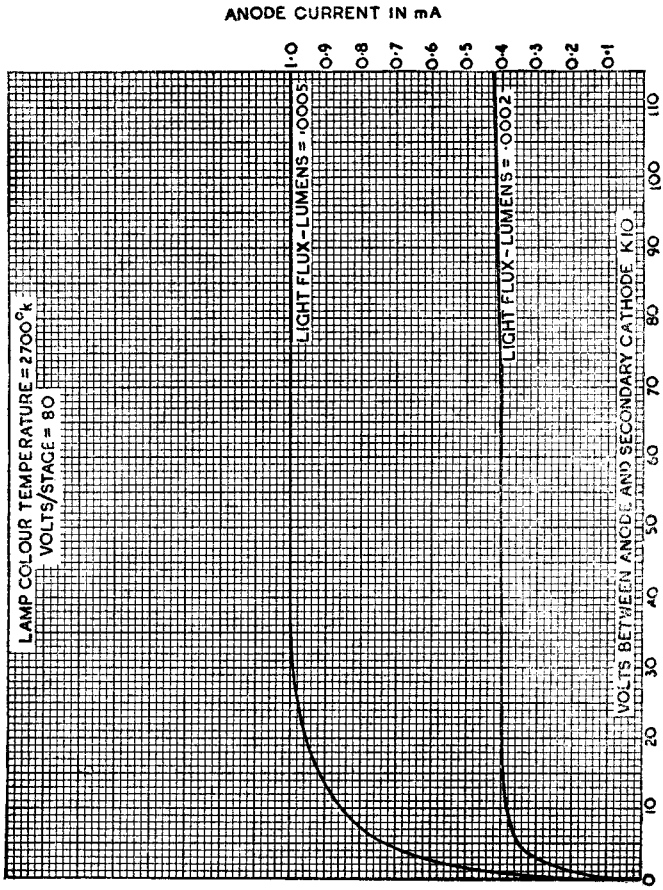

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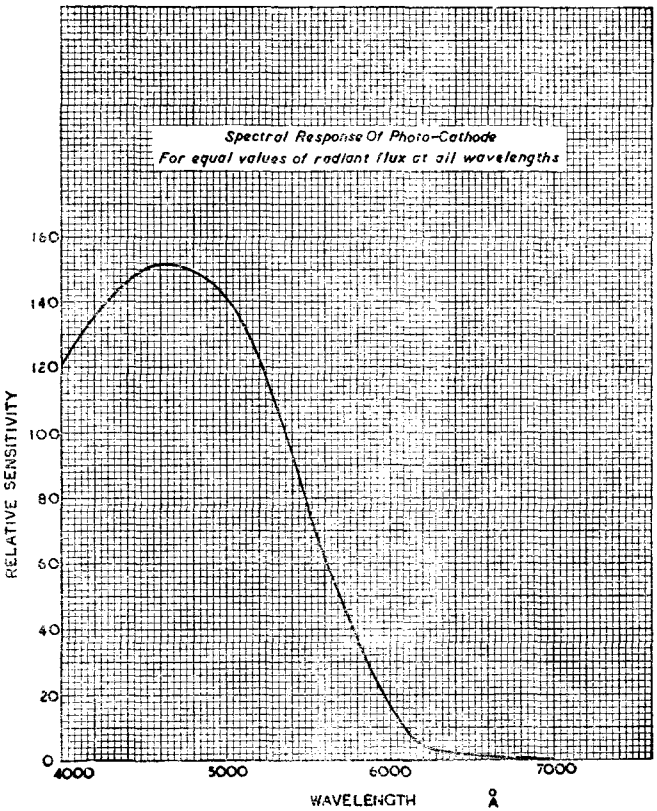

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