



EMI ELECTRONICS LTD

Serving Science and Industry

VALVE DIVISION

EMI HIGH RESOLUTION VIDICON JEDEC TYPE 8566

The EMI High Resolution Vidicon JEDEC type 8566 has been designed for use in studio broadcast television cameras and in high quality industrial television cameras. The 8566 has the latest separate mesh electrode structure and a very uniform target layer. This has resulted in a vidicon with excellent signal uniformity over a wide range of target voltages and an exceptionally high resolution capability.

An important feature of the 8566 vidicon is its ability to operate at high beam currents and low target voltages without loss of picture quality.

The low heater wattage (0.6W) of the 8566 makes it very suitable for use in transistorised cameras and in cameras where heat dissipation must be kept to a minimum.

CHARACTERISTICS

General

Scanned area	12.8 mm x 9.6 mm ($\frac{1}{2}$ in x $\frac{3}{8}$ in)
Length	158.75 $\pm$ 3.30 mm (6.25 $\pm$ 0.130 in)
Max. diameter	28.58 $\pm$ 0.20 mm (1.125 $\pm$ 0.008 in)
Bulb diameter	25.91 $\pm$ 0.64 mm (1.020 $\pm$ 0.030 in)
Focusing method	Magnetic
Deflection method	Magnetic
Alignment method	Magnetic
Orientation of image	The horizontal scan should be parallel to a plane passing through the tube axis and the short index pin.
Signal electrode capacitance to all other electrodes	4.5 pF
Spectral response	See fig. 2.
Operating position	Any (see note 5)
Socket	Small-Button Ditetrar 8 pin (Jedec type 8ME)

Cathode

The heater supply should be designed to give nominal 6.3 V and should be kept within the limits 5.7 V to 6.9 V. Under no circumstances should the heater voltage be allowed to exceed 9.5 V. If this figure is likely to be exceeded on switching on a surge limiting device must be incorporated.

Maximum Ratings (All potentials are relative to the cathode)

Modulator G1 negative bias	-150 V	
positive bias	0 V	
Limiter G2	750 V	(These maximum ratings are
Wall anode G3	750 V	limiting values above which
Mesh G4	1000 V	the life of the tube may be
Signal electrode voltage	100 V	impaired).
Dark current	0.6 μ A	
Target illumination	10000 lx	
Target temperature	70°C	
Adjustable transverse alignment field	$\pm$ 4 gauss	

TYPICAL OPERATING CONDITIONS

Modulator G1	-35 to -75 V
Cut-off voltage	-60 to -100 V
Limiter G2	300 V
Wall anode G3	280 to 300 V
Mesh G4	420 to 450 V
Minimum blackout pulses when applied to G1	-75 V
Minimum blackout pulses when applied to cathode	+10 V
Axial magnetic field	40 gauss

STUDIO OPERATION

Target illumination (High lights)	6 foot candles
Signal electrode voltage	25 to 40 V
Dark current	0.01 μ A
Signal current	0.25 μ A to 0.3 μ A

INDUSTRIAL OPERATION

Target illumination (Highlights)	2 foot candles
Signal electrode voltage	30 to 60 V
Dark current	0.01 μ A
Signal current	0.2 μ A peak

FILM PICK-UP OPERATION

Average highlight for one frame	50 to 100 foot candles
Signal electrode voltage	10 to 20 V
Dark current	< 0.005 μ A
Signal current	0.25 to 0.30 μ A

LEAKAGE SPECIFICATION

between pin No.	and pin No.	Test potential	Leakage current
2, 3, 5, 6, 7,	1 and 8 (negative)	100 V	100 μ A max.
1, 3, 5, 6, 7, 8,	2 (negative)	150 V	15 μ A max.
1, 2, 3, 6, 7, 8,	5 (positive)	500 V	50 μ A max.
1, 2, 3, 5, 7, 8,	6 (positive)	500 V	5 μ A max.
1, 2, 5, 6, 7, 8, and signal plate	3 (positive)	500 V	5 μ A max.

OPERATING NOTES

1. Resolution

For optimum resolution and beam landing at a given wall anode voltage the mesh should be kept at approximately 1.5 times the wall anode voltage. Under these conditions the percentage modulation at 5 Mc/s on a 625 line system is double that of a normal vidicon and the scanning current has only to be increased by approximately 20%. From fig. 3 it can be seen that an appreciable increase in depth of modulation can be obtained when the mesh is only a few volts positive to the wall anode and under these conditions negligible increase in scanning current is required.

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The resolution can be further increased by increasing the wall anode voltage and the corresponding mesh voltage, but this will require additional focus current and scan power (see fig.4). To operate the 8566 in a standard camera the mesh should be connected to the limiter by joining pin 3 (mesh) to pin 5 (limiter) provided the limiter is positive with respect to the wall anode.

On no account should the mesh be operated at a lower voltage than the wall anode since, under these conditions, an ion spot may be observed.

The increased vertical resolution obtained with a 8566 vidicon will give an obvious increase in picture sharpness compared with a standard tube since the relatively poor vertical resolution of a standard tube cannot be corrected by aperture correction.

The increased horizontal resolution of the 8566 compared with the standard tube (see fig.4) enables aperture correction in the head amplifier to be reduced, with corresponding increase in signal to noise ratio. If the 8566 is being fitted into a standard camera and the aperture correction is not reduced, high frequency "ringing" may occur.

2. Beam

The setting of the beam current in the 8566 is less critical than with a standard vidicon provided the mesh is positive with respect to the wall anode. The 8566 can be over-beamed without loss of resolution, thus the beam can be preset to discharge the peak highlights, no further adjustment being required.

Beam landing is considerably improved as the mesh voltage is increased to the optimum of 1.5 times the wall anode voltage. Under these conditions the "porthole effect" which occurs at low target voltages is eliminated.

Rotation of the picture, when the wall anode is varied, about electrical focus is considerably reduced when the mesh is 20 volts or more positive with respect to the wall anode.

3. Sensitivity

The uniform target layer of the 8566 ensures that when the target voltage is increased the dark current and sensitivity increase uniformly over the target area.

The dark current should not, however, be allowed to exceed $0.6 \mu\text{A}$ or a burnt-in picture may result.

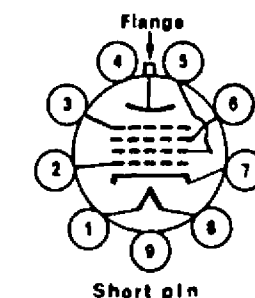
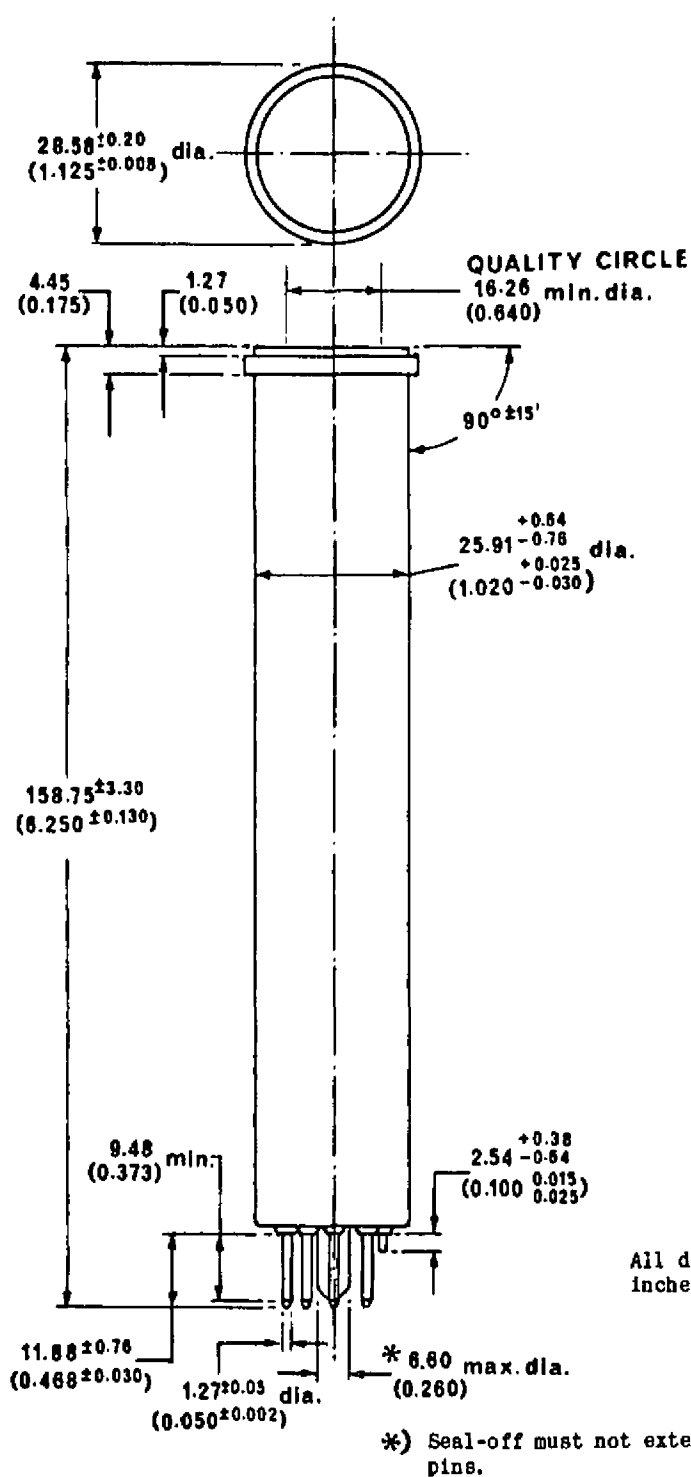
4. Scanned area

The tube should be operated with the target area $12.8 \text{ mm} \times 9.6 \text{ mm}$ ($\frac{1}{2} \text{ in} \times \frac{3}{8} \text{ in}$) completely scanned to obtain the best signal to noise ratio and resolution. Small changes in sensitivity and dark current occur in the scanned area over a long period of time so that it is important to use the same scanned area throughout the life of the tube.

5. Operating position

When the 8566 is operated vertically with its face downwards care should be taken to avoid undue mechanical shock.

EMI VIDICON CAMERA TUBE JEDEC TYPE 8566 (continued)



BASE 8ME
SMALL BUTTON DITETRAR

Pin No.	Connections
1	Heater
2	Modulator G_1
3	Mesh G_4
4	Do not use
5	Limiter G_2
6	Wall anode G_3
7	Cathode
8	Heater
Flange	Signal electrode
Short pin	Do not use

FIGURE 1

EMI VIDICON CAMERA TUBE JEDEC TYPE 8566 (continued)

RELATIVE SPECTRAL RESPONSE

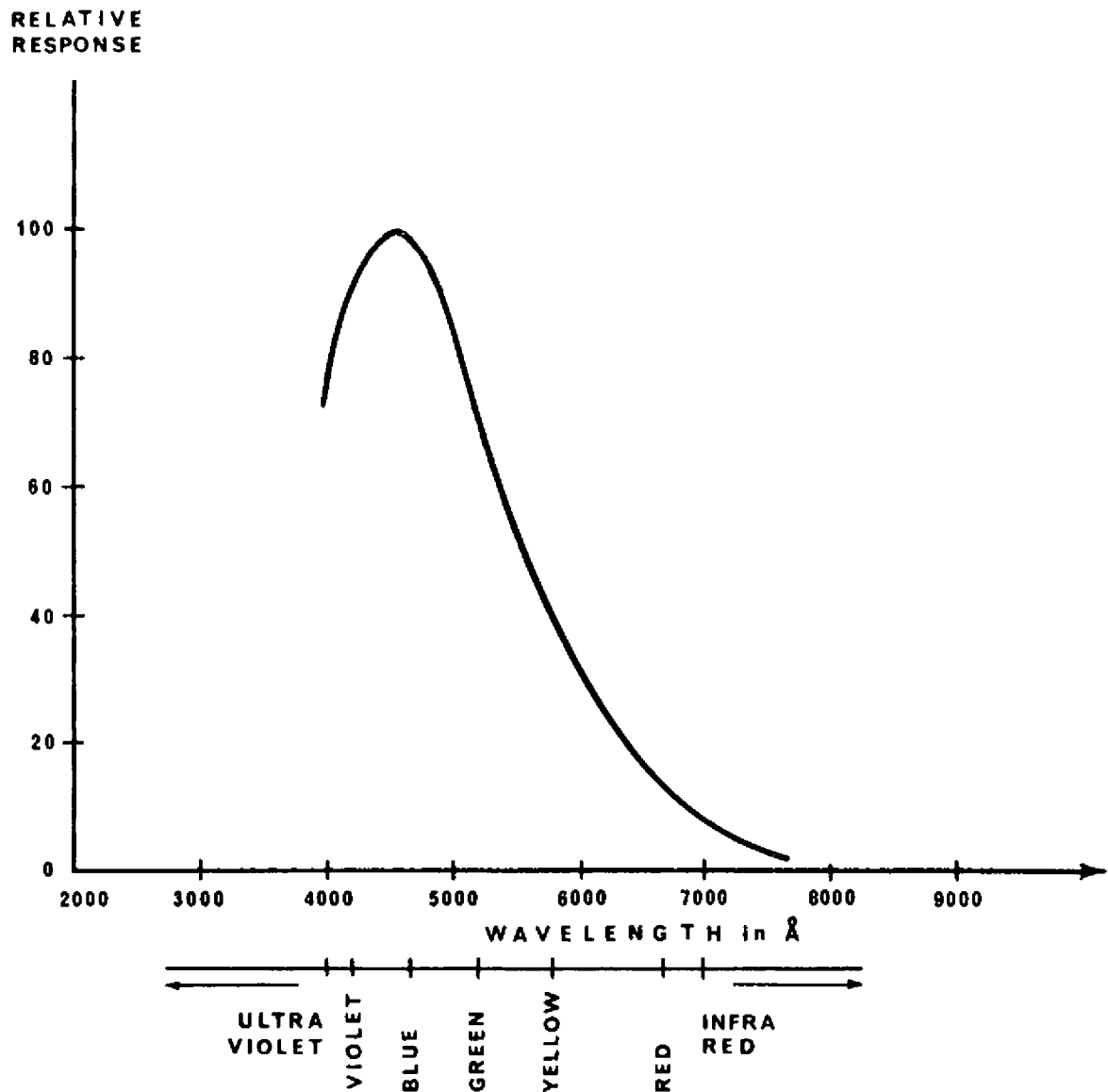


FIGURE 2

EMI VIDICON CAMERA TUBE JEDEC TYPE 8566 (continued)

TYPICAL DISCONTINUITY IN MODULATION CURVE

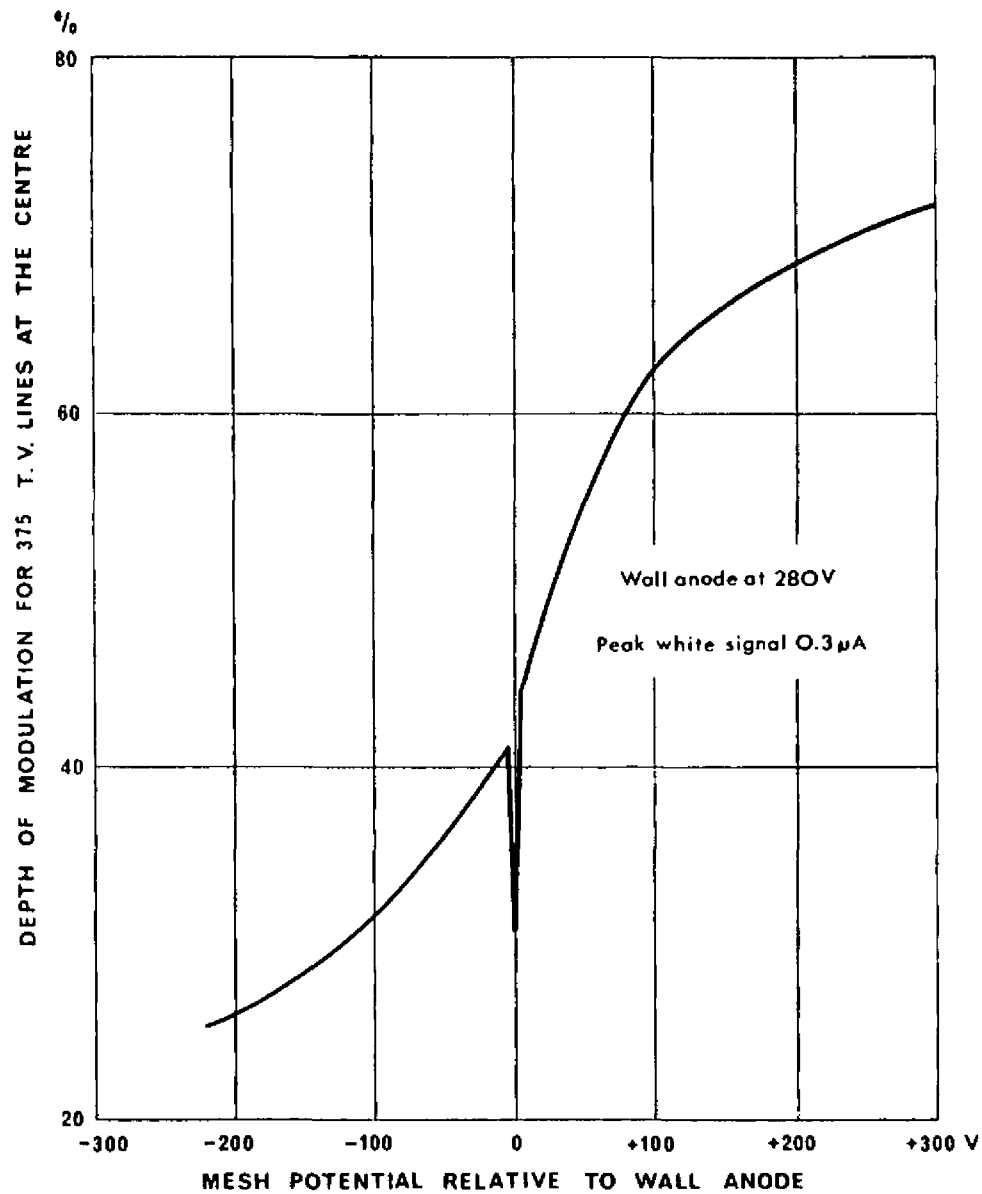


FIGURE 3

TYPICAL RESOLUTION CHARACTERISTICS

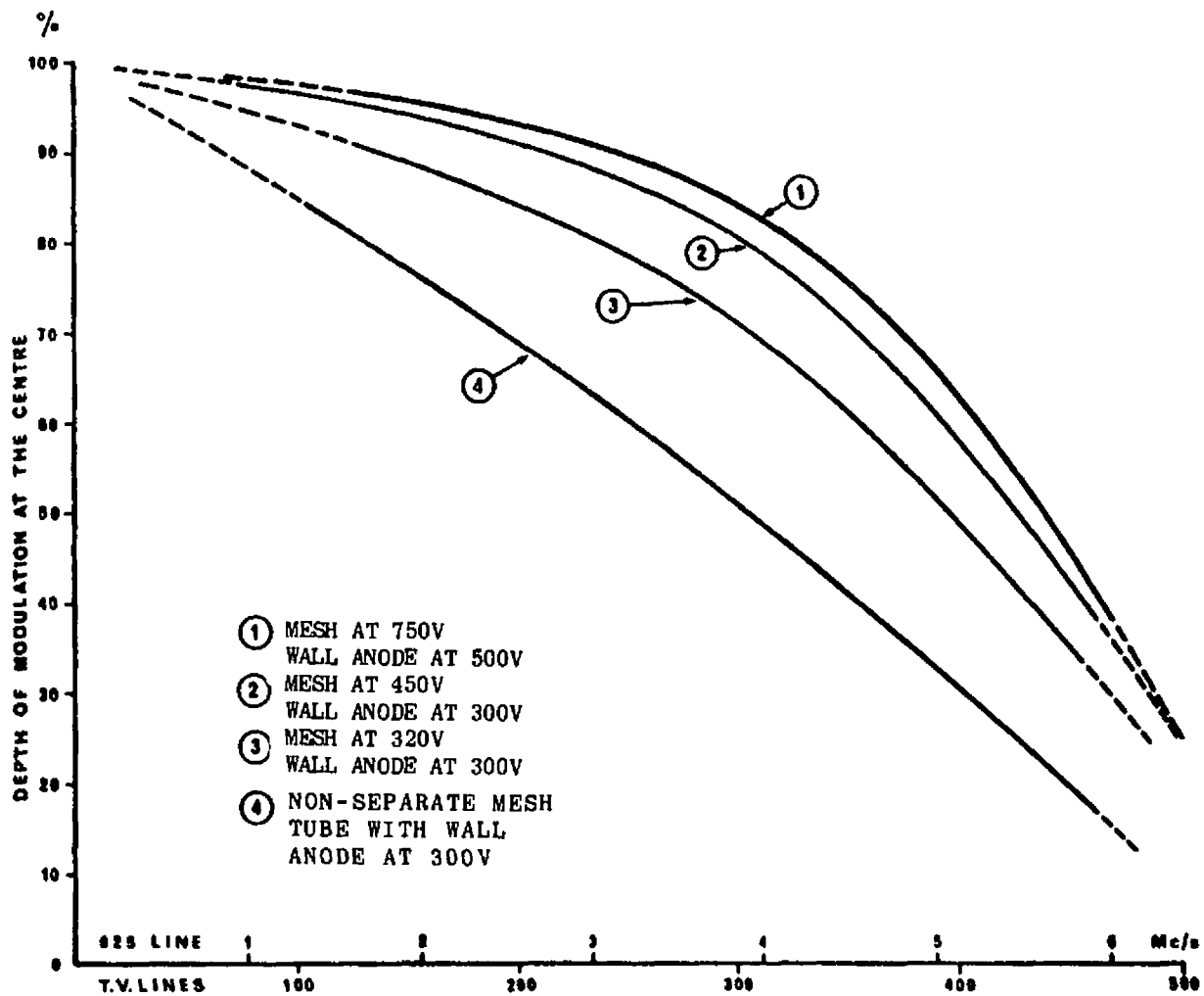


FIGURE 4

EMI VIDICON CAMERA TUBE JEDEC TYPE 8566 (continued)

ILLUMINATION vs TARGET VOLTS TO GIVE 0.25 μ A SIGNAL CURRENT

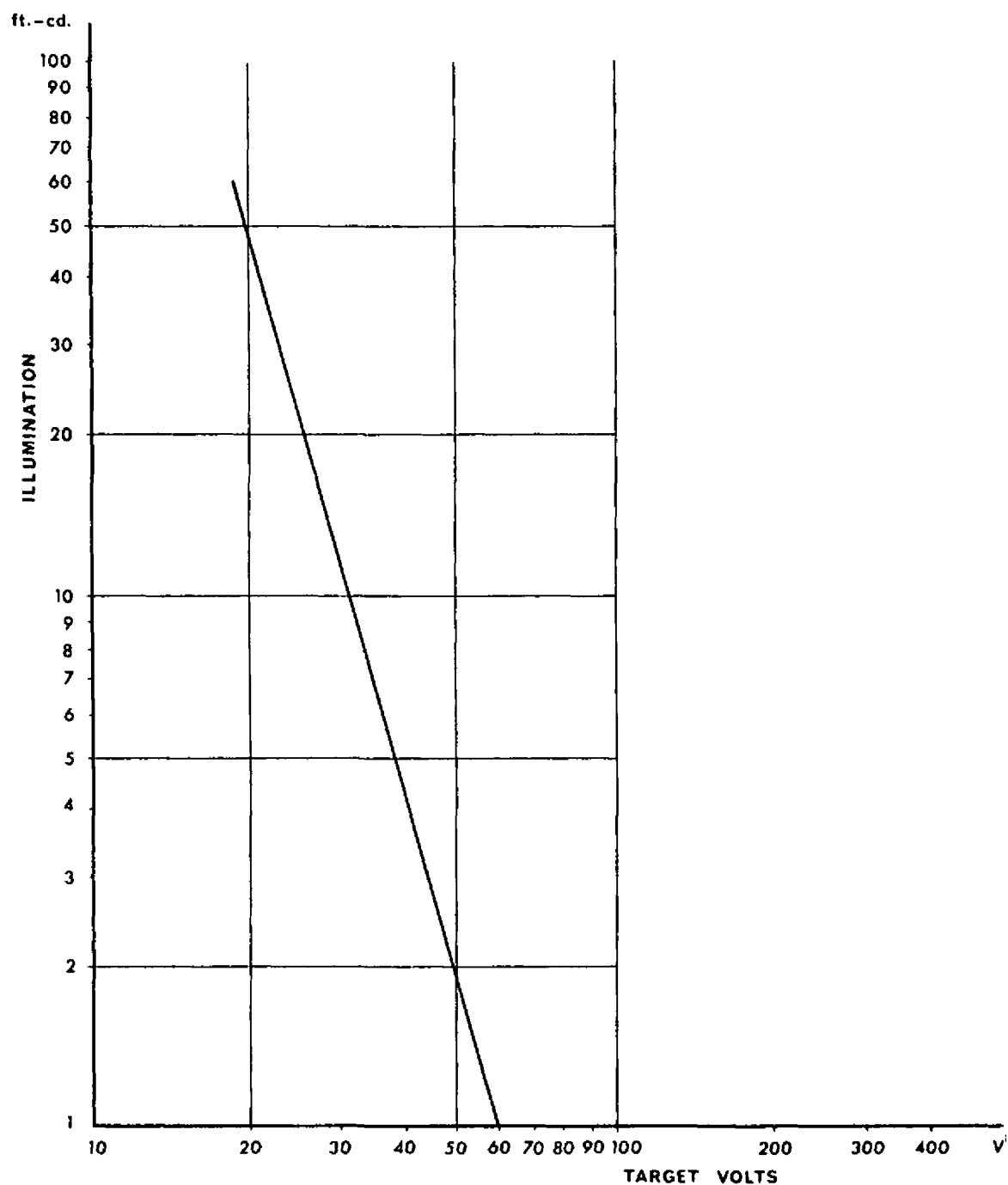


FIGURE 5

AVERAGE LAG CURVES

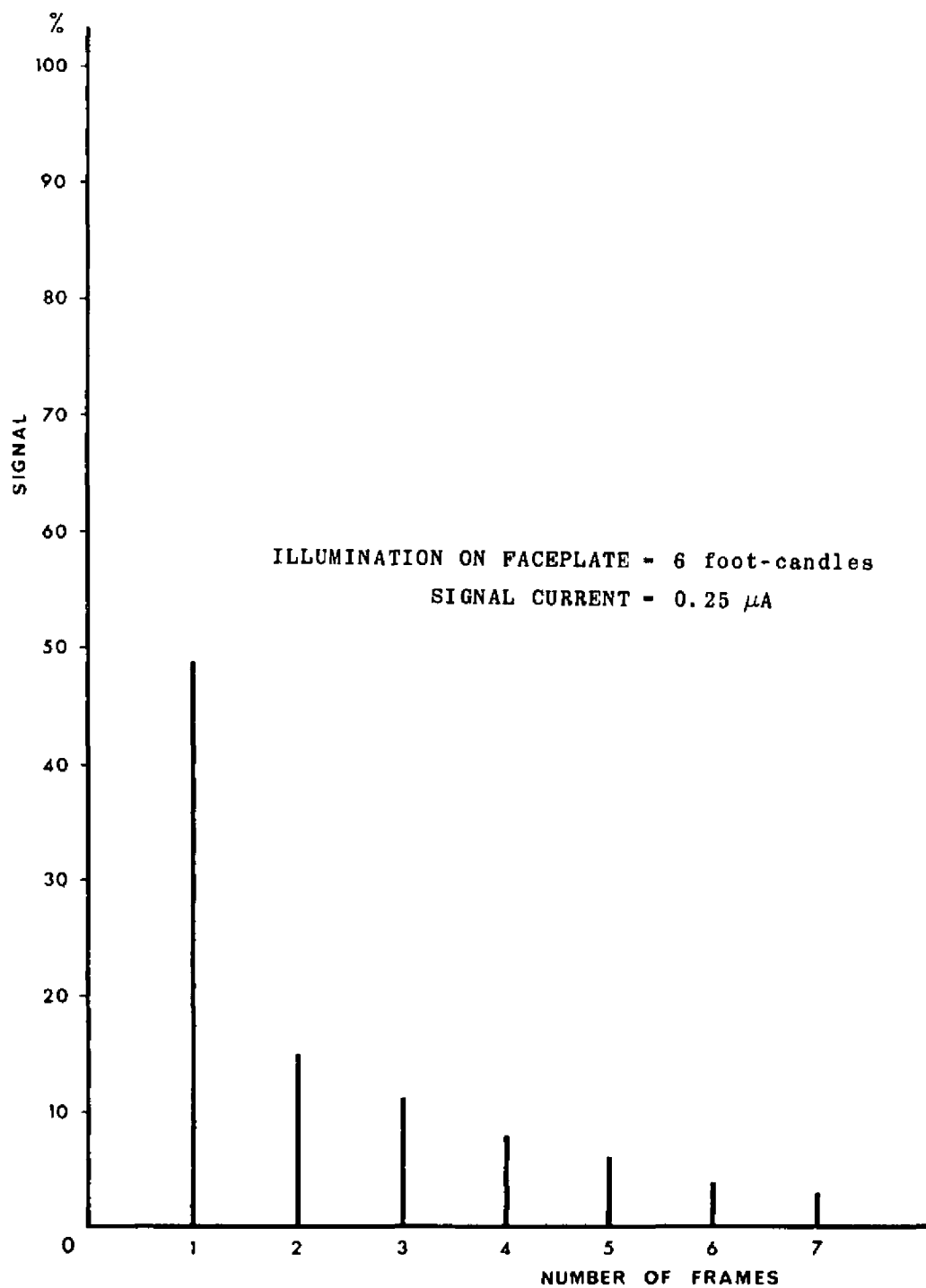


FIGURE 6

EMI VIDICON CAMERA TUBE JEDEC TYPE 8566 (continued)

SIGNAL CURRENT vs TARGET VOLTS

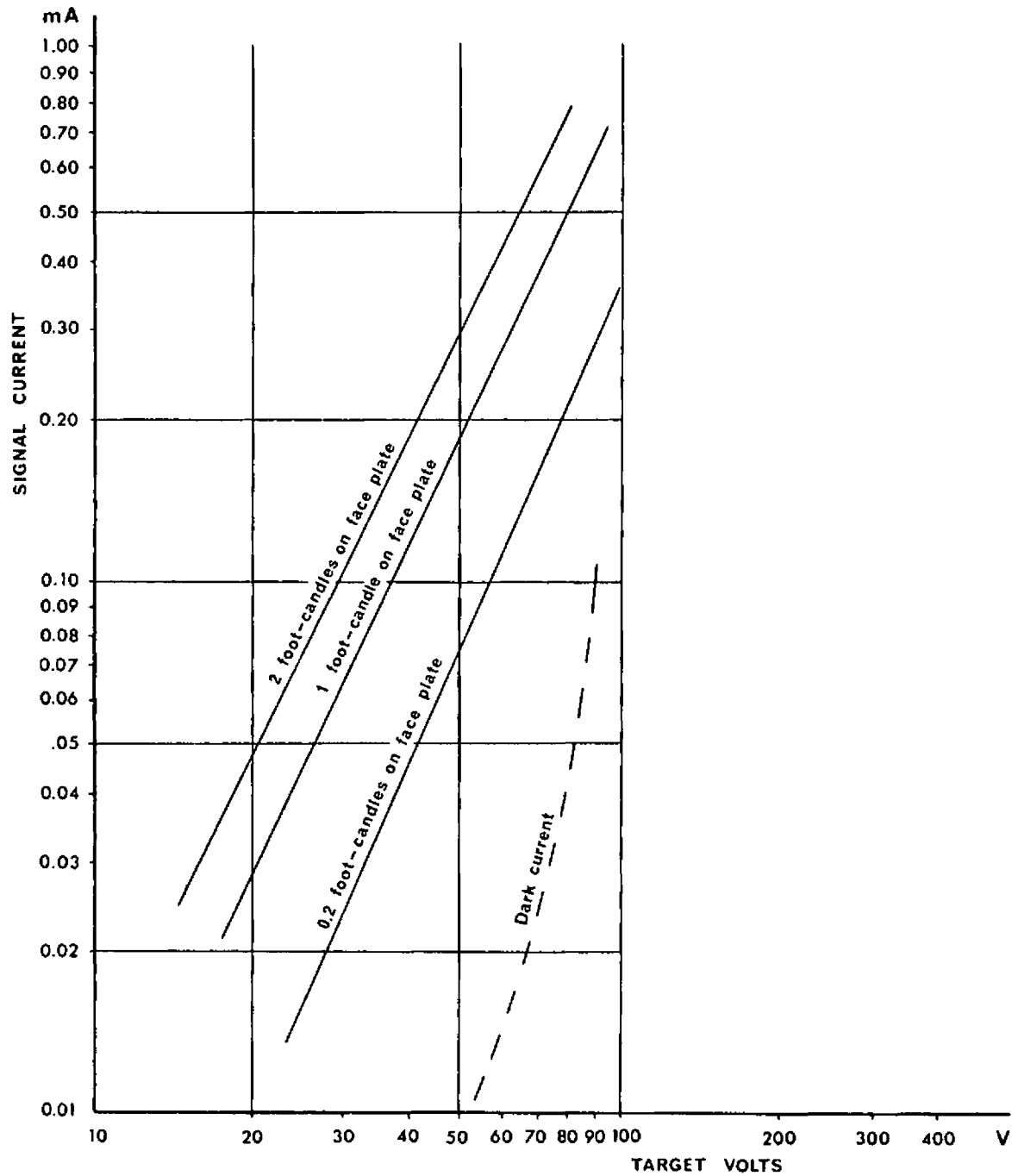


FIGURE 7