

Vidicon

Magnetic Focus Magnetic Deflection
High-Resolution Type Having High Sensitivity and Low Lag
For Live Scene and Film Pickup in Black-and-White
and Color TV Cameras

GENERAL

Current at 6.3 volts	0.6	A
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Spectral Response See *Typical Spectral Sensitivity Characteristic*

Maximum useful diagonal of
rectangular image (4 x 3
aspect ratio) 0.62 in

Orientation of quality rectangle—Proper orientation is obtained when the horizontal scan is essentially parallel to the straight sides of the masked portions of the faceplate. The straight sides are parallel to the plane passing through the tube axis and short index pin. The masking is for orientation only and does not define the proper scanned area of the photoconductive layer.

(JEDEC No.E8-11)

Deflecting Yoke-Focusing Coil-

Alignment Coil Assembly Cleveland Electronics^{c,d}
No.VYFA-355-2, or equivalent

Weight (Approx.) 2 oz

ABSOLUTE-MAXIMUM RATINGS

For scanned area of $1/2'' \times 3/8''$

Grid-No.1 Voltage:

Negative bias value 100 max. V
Positive bias value 0 max. V

Peak Heater-Cathode Voltage:

Heater negative with respect to cathode	125 max.	V
Heater positive with respect to cathode	10 max.	V
Target Voltage	100 max.	V
Dark Current	0.25 max.	μA
Peak Target Current ⁹	0.75 max.	μA
Faceplate:		
Illumination ^h	5000 max.	fc
Temperature	71 max.	°C

TYPICAL OPERATION AND PERFORMANCE DATA

*For scanned area of 1/2" x 3/8" –
Faceplate temperature of 30° to 35° C
and Standard TV Scanning Rate*

	Low- Voltage Mode	High- Voltage Mode	
Grid-No.4 (Decelerator) Voltage ^f	500	900	V
Grid-No.3 (Beam-Focus Electrode) Voltage ^f . . .	300	540	V
Grid-No.2 (Accelerator) Voltage	300	300	V
Grid-No.1 Voltage for Picture Cutoff ⁱ	–65 to –100	–65 to –100	V
Average “Gamma” of Transfer Characteristic for signal-output current between 0.02 μA and 0.2 μA			
	0.65	0.65	
Visual Equivalent Signal- to-Noise Ratio (Approx.) ^k	300:1	300:1	
Lag – Per Cent of Initial Value of Signal-Output Current 1/20 Second After Illumination is Removed ^m	20	20	%
Minimum Peak-to-Peak Blanking Voltage: When applied to grid No.1	75	75	V
When applied to cathode	20	20	V

Limiting Resolution:

At center of picture . . .	1000	1100	TV lines
At corner of picture . . .	600	700	TV lines

Amplitude Response to
a 400 TV Line Square —

Wave Test Pattern at

Center of Picture ⁿ . . .	50	60	%
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Field Strength at Center

of Focusing Coil ^p . . .	40 ± 4	58 ± 4	G
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Peak Deflecting-Coil

Current:

Horizontal	180	250	mA
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Vertical	33	45	mA
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Field Strength of

Adjustable Alignment

Coil ^q	0 to 4	0 to 4	G
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*High-Sensitivity Operation —
0.1 Footcandle on Faceplate*

Faceplate Illumination

(Highlight)	0.1	fc
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Target Voltage ^{r,s}	30 to 60	V
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Dark Current ^t	0.10	μA
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Signal-Output Current:^u

Typical	0.1	μA
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*Average-Sensitivity Operation —
1.0 Footcandle on Faceplate*

Faceplate Illumination

(Highlight)	1.0	fc
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Target Voltage ^{r,s}	20 to 40	V
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Dark Current ^t	0.02	μA
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Signal-Output Current:^u

Typical	0.2	μA
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*High-Light Level Operation —
10 Footcandles on Faceplate*

Faceplate Illumination

(Highlight)	10	fc
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Target Voltage ^{r,s}	10 to 22	V
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Dark Current ^t	0.005	μA
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Signal-Output Current:^u

Typical	0.3	μA
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8507A

- ^a This capacitance, which effectively is the output impedance of the 8507A, is increased when the tube is mounted in the deflecting-yoke and focusing-coil assembly. The resistive component of the output impedance is in the order of 100 megohms.
- ^b Made by Cinch Manufacturing Corporation, 1026 S. Homan Avenue, Chicago 24, Illinois.
- ^c Made by Cleveland Electronics Inc., 2000 Highland Road, Twinsburg, Ohio 44087
- ^d These components are chosen to provide tube operation with minimum beam-landing error when mounted in the recommended position along the tube axis.
- ^f Grid-No.4 voltage must always be greater than grid-No.3 voltage. The maximum voltage difference between these electrodes, however, should not exceed 600 volts. The recommended ratio of grid-No.3 to grid-No.4 voltage is 6/10 to 5/10; best geometry being provided when the ratio is 6/10, and most uniform signal output when the ratio is 5/10. The operator should select the ratio within this range which provides the desired performance.
- ^g Video amplifiers must be designed properly to handle target currents of this magnitude to avoid amplifier overload or picture distortion.
- ^h For conditions where "white light" is uniformly diffused over entire tube face.
- ⁱ With no blanking voltage on grid No.1.
- ^k Measured with high-gain, low-noise, cascode-input-type amplifier having bandwidth of 5 MHz and a peak signal-output current of 0.35 microampere. Because the noise in such a system is predominately of the high-frequency type, the visual equivalent signal-to-noise ratio is taken as the ratio of the highlight video-signal current to rms noise current, multiplied by a factor of 3.
- ^m For initial signal-output current of 0.3 microampere and a dark current of 0.02 microampere.
- ⁿ Amplitude response is the signal amplitude from a given TV line number (fine picture detail) expressed as a percent of the signal amplitude from a very-low-frequency (large-

area) picture element. In practice, the large-detail reference is usually 15 TV lines with signal amplitude set equal to 100 per cent. The TV line numbers are determined by the number of equal-width black and white lines that will fit into the physical height of the image focused on the camera-tube faceplate.

- P The polarity of the focusing coil should be such that a north-seeking pole is attracted to the image end of the focusing coil, with the indicator located outside of and at the image end of the focusing coil.
- Q The alignment coil should be located on the tube so that its center is at a distance of 3-11/16 inches from the face of the tube, and be positioned so that its axis is coincident with the axis of the tube, the deflecting yoke, and the focusing coil.
- R The target voltage for each 8507A must be adjusted to that value which gives the desired operating dark current.
- S Indicated range for each type of service serves only to illustrate the operating target-voltage range normally encountered.
- T The deflecting circuits must provide extremely linear scanning for good black-level reproduction. Dark-current signal is proportional to the scanning velocity. Any change in scanning velocity produces a black-level error in direct proportion to the change in scanning velocity.
- U Defined as the component of the highlight target current after the dark-current component has been subtracted.

BASING DIAGRAM (Bottom View) 8ME

Pin 1: Heater

Pin 2: Grid No.1

Pin 3: Grid No.4

Pin 4: Internal Connection —

Do Not Use

Pin 5: Grid No.2

Pin 6: Grid No.3

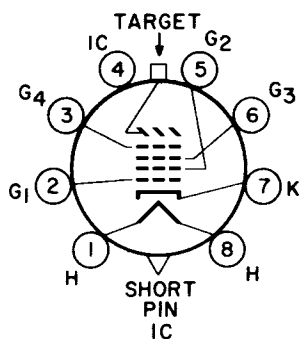
Pin 7: Cathode

Pin 8: Heater

Flange: Target

Short Index Pin — Internal Connection —

Make No Connection



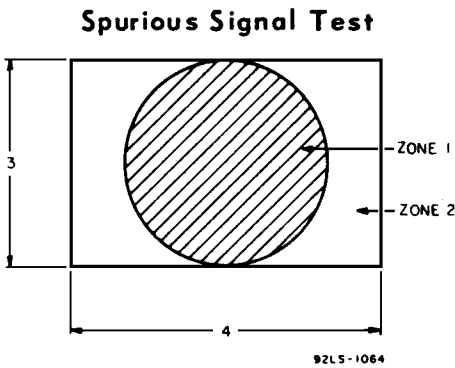


Fig.1

This test is performed using a uniformly diffused white test pattern that is separated into two zones as shown in *Fig.1*. The 8507A is operated under the conditions specified under *Typical Operation and Performance Data* with the lens adjusted to provide a target current of 0.3 microampere. The tubes are adjusted to provide maximum picture resolution. Spurious signals are evaluated by size which is represented by equivalent numbers of raster lines in a 525 TV line system. Allowable spot size for each zone is shown in Table 1. To be classified as a spot, a contrast ratio of 1.5:1 must exist for white spots and 2:1 for black spots. Smudges, streaks, or mottled and grainy background must have a contrast ratio of 1.5:1 to constitute a reject item.

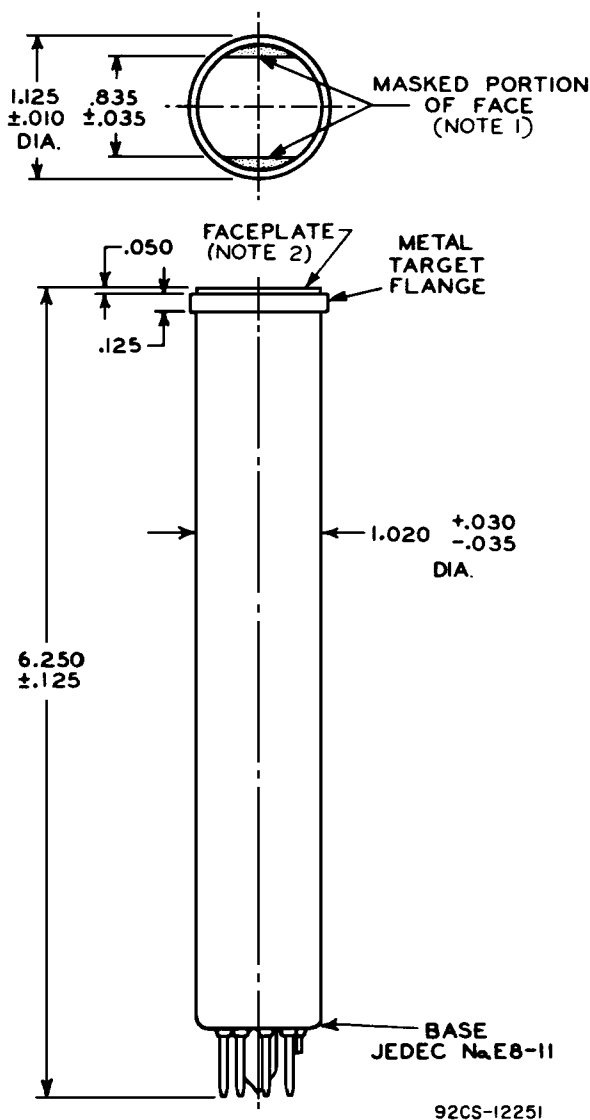
Table 1
For scanned area of 1/2" x 3/8"

Equivalent Number of Raster Lines	Zone 1 Allowed Spots	Zone 2 Allowed Spots
over 4	0	0
4 but not including 3	0	1
3 but not including 1	2	3
1 or less	■	■

Minimum separation between any 2 spots greater than 1 raster line is limited to 16 raster lines.

■Spots of this size are allowed unless concentration causes a smudged appearance.

DIMENSIONAL OUTLINE



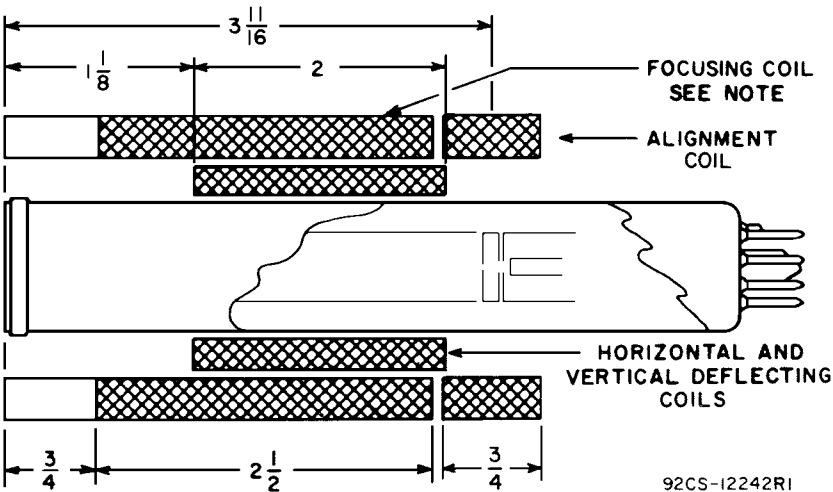
DIMENSIONS IN INCHES

Note 1: Straight sides of masked portions are parallel to the plane passing through tube axis and short index pin.

Note 2: Faceplate glass is Corning No. 7056 having a thickness of $0.094'' \pm 0.012''$.

RECOMMENDED LOCATION AND LENGTH OF DEFLECTING, FOCUSING, AND ALIGNMENT COMPONENTS

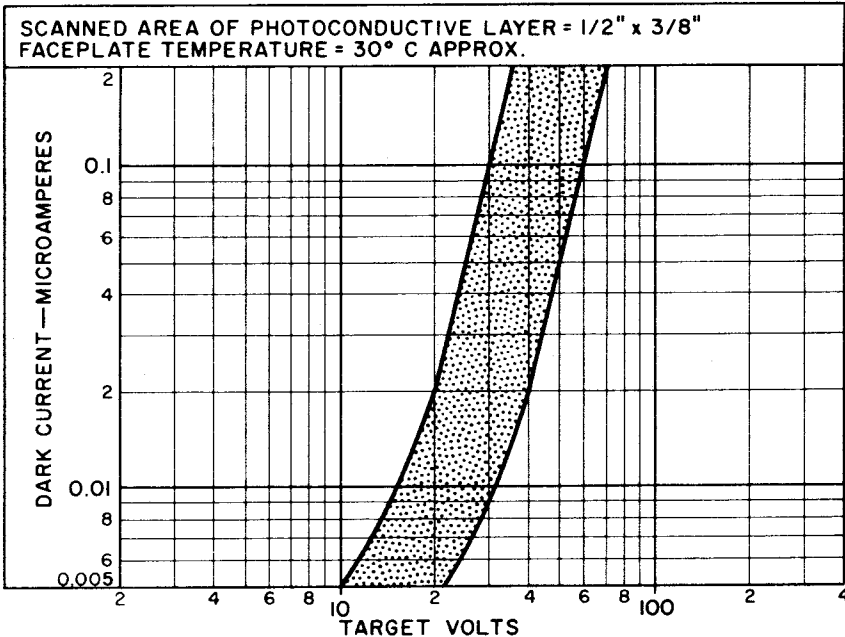
To obtain minimum beam-landing error



92CS-12242R1

Note: Cross-hatching indicates wound portion of focusing coil.

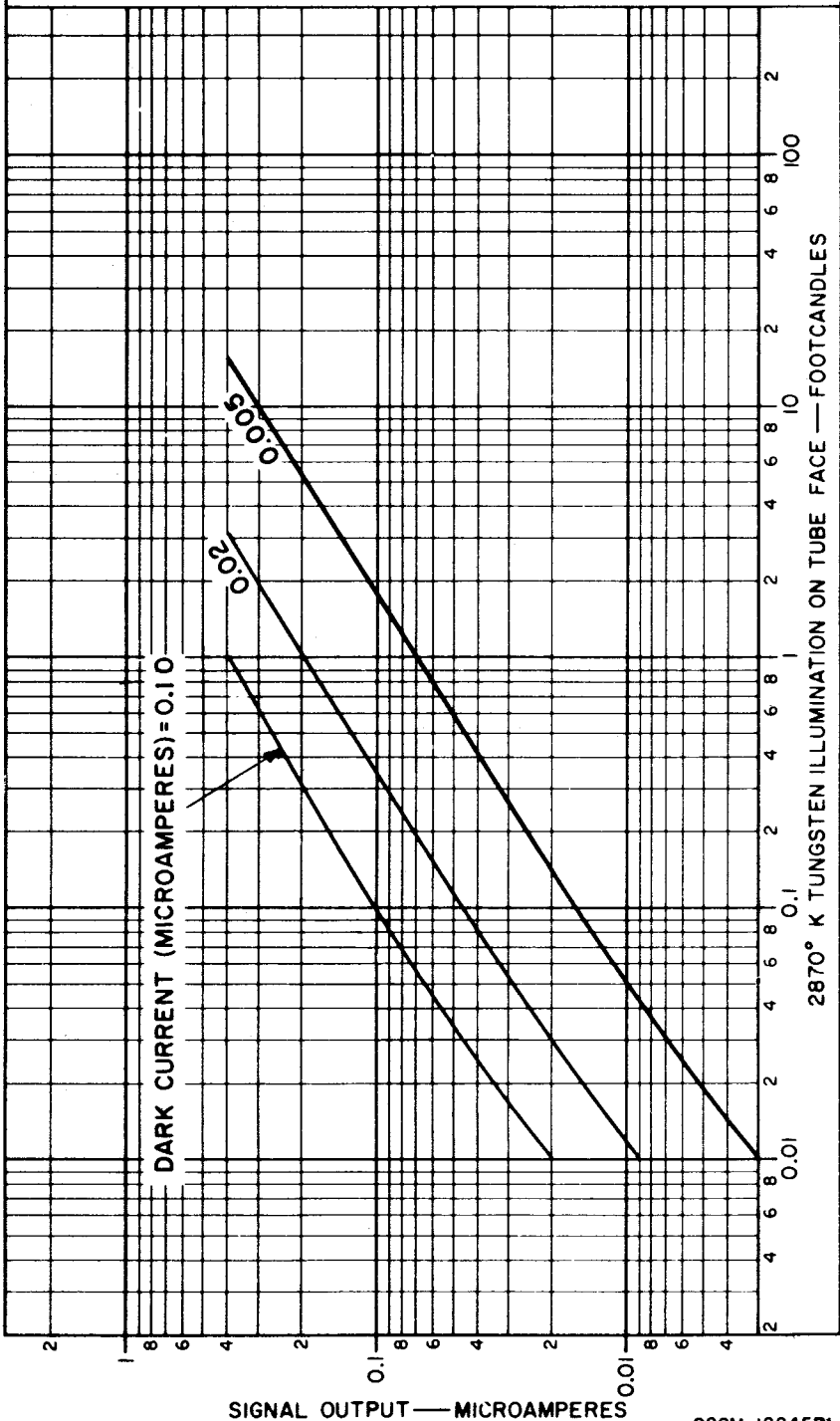
RANGE OF DARK CURRENT



92CS-12235

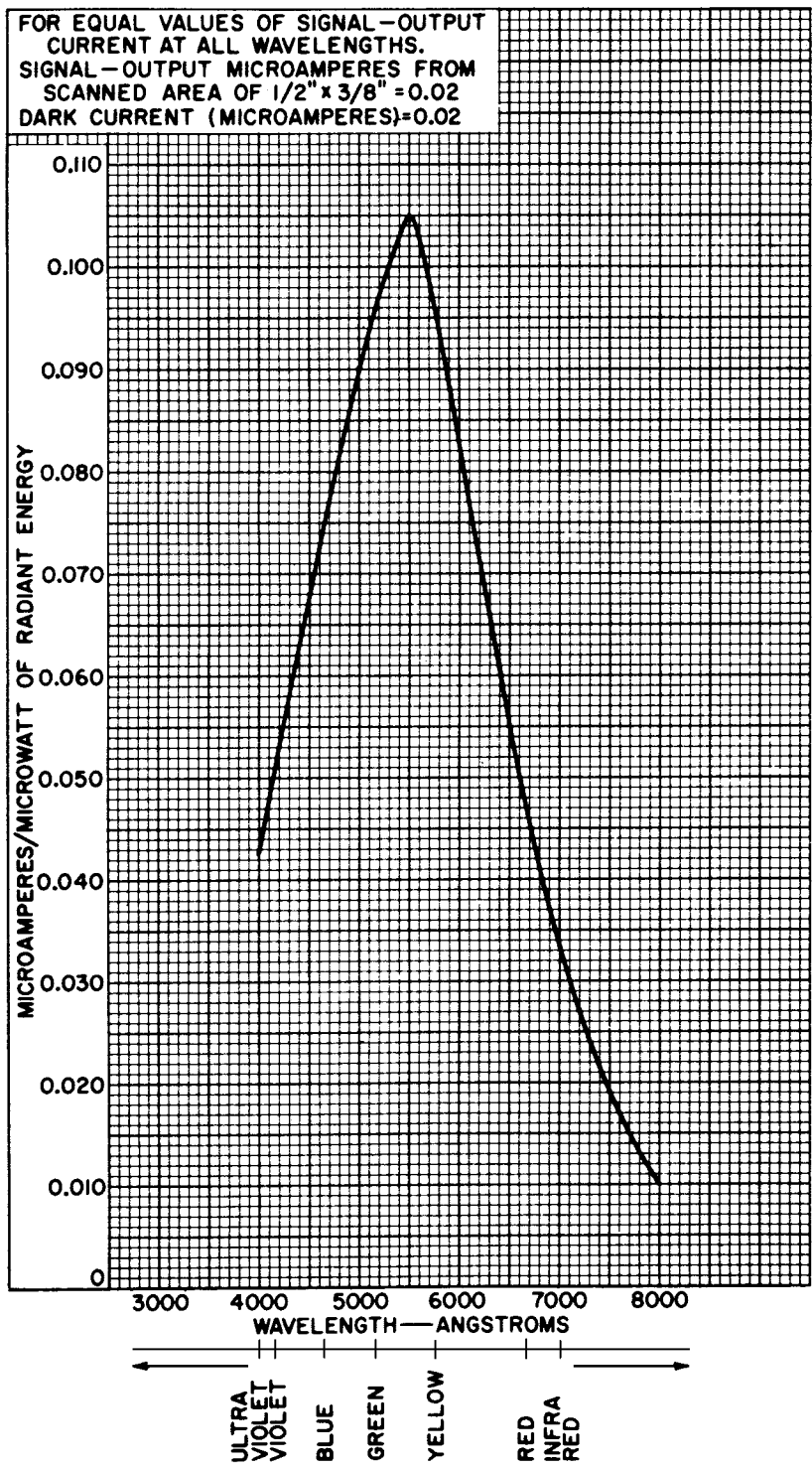
LIGHT TRANSFER CHARACTERISTICS

ILLUMINATION: UNIFORM OVER PHOTOCONDUCTIVE LAYER.
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = $1/2" \times 3/8"$
FACEPLATE TEMPERATURE = 30°C APPROX.



92CM-12245R1

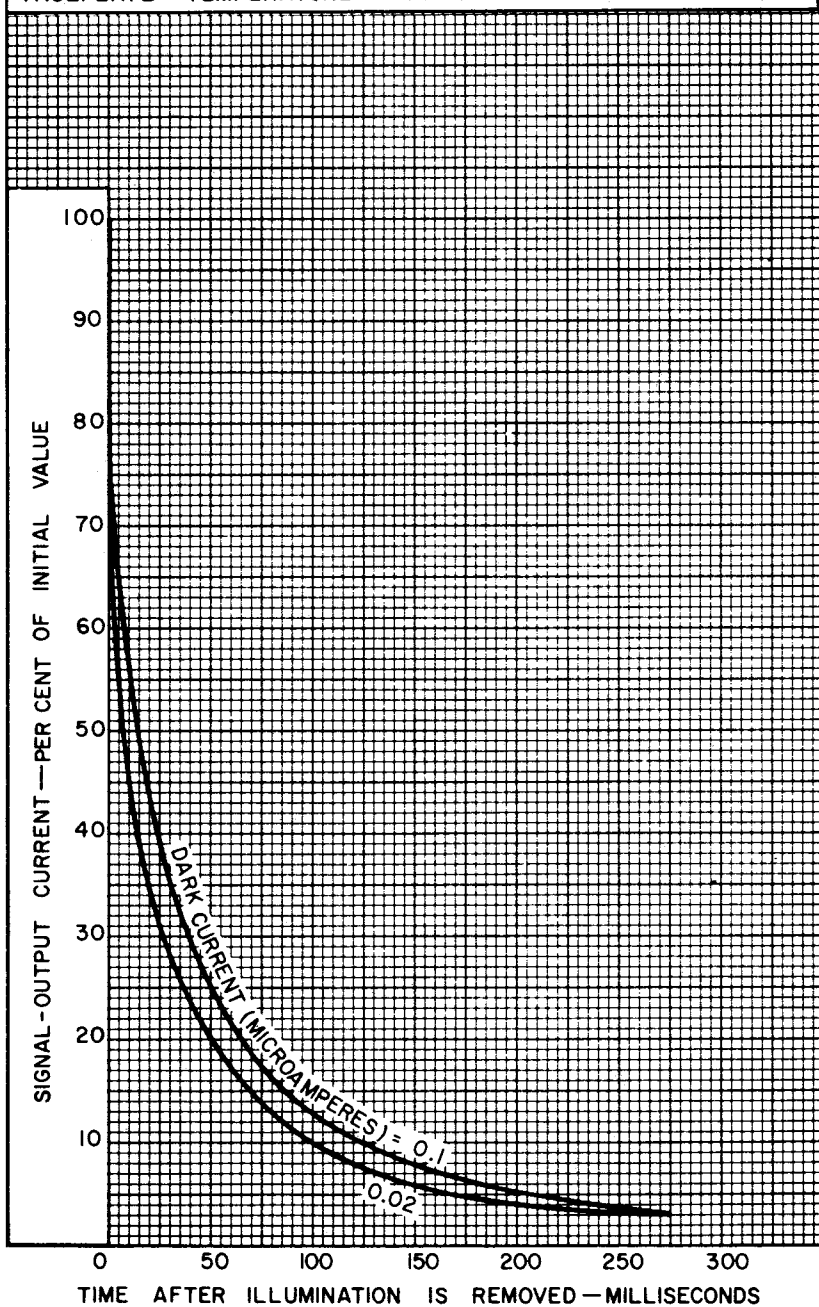
TYPICAL SPECTRAL SENSITIVITY CHARACTERISTIC



92CM-11619

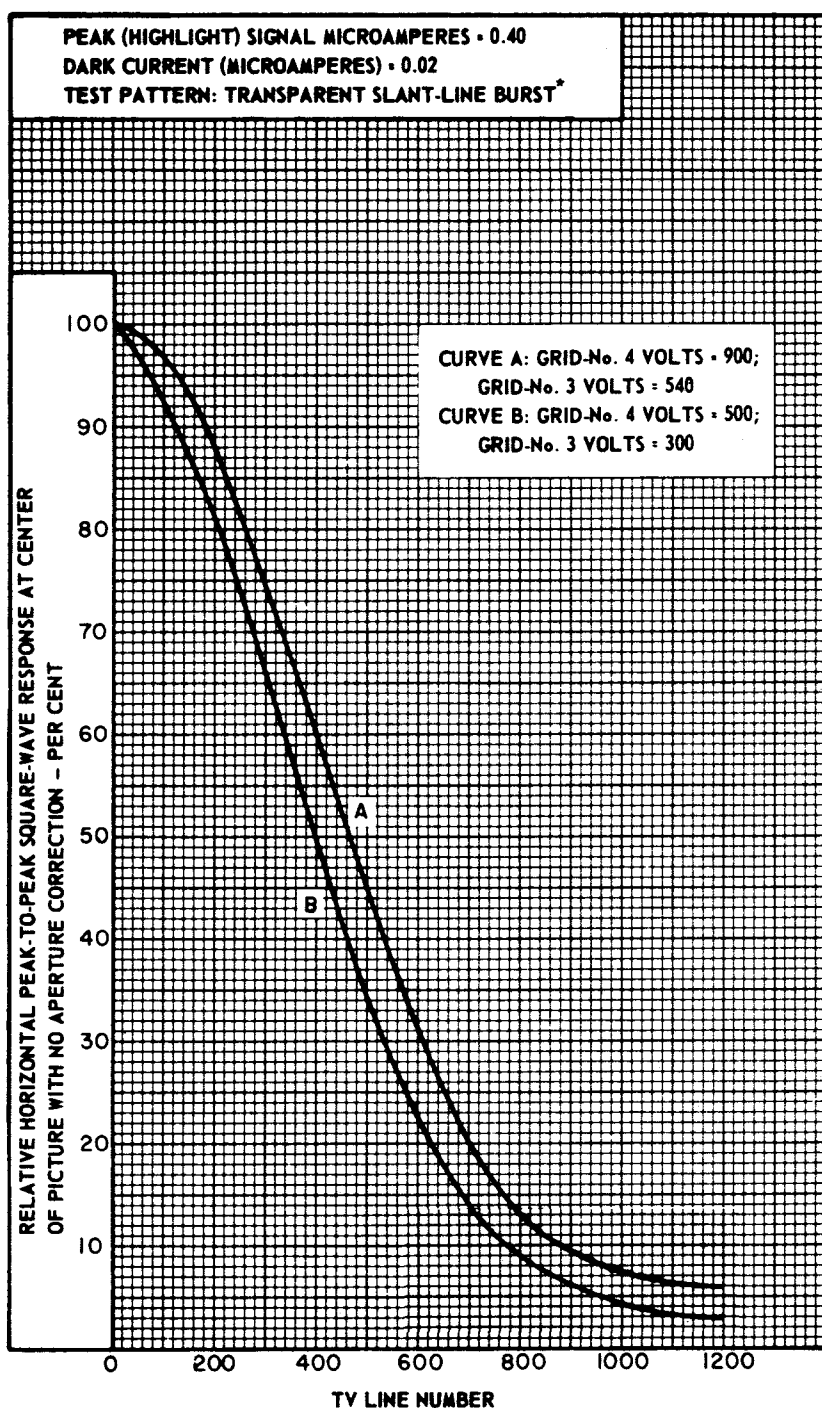
TYPICAL PERSISTENCE CHARACTERISTICS

INITIAL HIGHLIGHT SIGNAL - OUTPUT MICROAMPERES = 0.3
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = $1/2" \times 3/8"$
FACEPLATE TEMPERATURE = 30°C APPROX.



92LM-2171

HORIZONTAL SQUARE-WAVE RESPONSE



92LM-2195

*Amplitude response measured using the RCA P200 slant-line burst pattern with horizontal center response balanced on the 400 line chevrons.