



# 8507A

## 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 <sup>g</sup> . . . . .	0.75 max.	μA
Faceplate:		
Illumination <sup>h</sup> . . . . .	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 <sup>f</sup> . . . . .	500	900	V
Grid-No.3 (Beam-Focus Electrode) Voltage <sup>f</sup> . . . . .	300	540	V
Grid-No.2 (Accelerator) Voltage . . . . .	300	300	V
Grid-No.1 Voltage for Picture Cutoff <sup>i</sup> . . . . .	-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.) <sup>k</sup> . . . . .	300:1	300:1	
Lag – Per Cent of Initial Value of Signal-Output Current 1/20 Second After Illumination is Removed <sup>m</sup> . . . . .	20	20	%
Minimum Peak-to-Peak Blanking Voltage:			
When applied to No.1 . . . . .	75	75	V
When applied to cathode . . . . .	20	20	V

<b>Limiting Resolution:</b>			
At center of picture . . .	1000	1100	TV lines
At corner of picture . . .	600	700	TV lines
<b>Amplitude Response to a 400 TV Line Square — Wave Test Pattern at Center of Picture<sup>n</sup> . . .</b>			
	50	60	%
<b>Field Strength at Center of Focusing Coil<sup>P</sup> . . .</b>			
	40 ± 4	58 ± 4	G
<b>Peak Deflecting-Coil Current:</b>			
Horizontal . . . . .	180	250	mA
Vertical . . . . .	33	45	mA
<b>Field Strength of Adjustable Alignment Coil<sup>q</sup> . . . . .</b>			
	0 to 4	0 to 4	G

*High-Sensitivity Operation —  
0.1 Footcandle on Faceplate*

<b>Faceplate Illumination</b>			
(Highlight) . . . . .	0.1		fc
Target Voltage <sup>r, s</sup> . . . . .	30 to 60		V
Dark Current <sup>†</sup> . . . . .	0.10		μA
<b>Signal-Output Current:<sup>u</sup></b>			
Typical . . . . .	0.1		μA

*Average-Sensitivity Operation —  
1.0 Footcandle on Faceplate*

<b>Faceplate Illumination</b>			
(Highlight) . . . . .	1.0		fc
Target Voltage <sup>r, s</sup> . . . . .	20 to 40		V
Dark Current <sup>†</sup> . . . . .	0.02		μA
<b>Signal-Output Current:<sup>u</sup></b>			
Typical . . . . .	0.2		μA

*High-Light Level Operation —  
10 Footcandles on Faceplate*

<b>Faceplate Illumination</b>			
(Highlight) . . . . .	10		fc
Target Voltage <sup>r, s</sup> . . . . .	10 to 22		V
Dark Current <sup>†</sup> . . . . .	0.005		μA
<b>Signal-Output Current:<sup>u</sup></b>			
Typical . . . . .	0.3		μA

# 8507A

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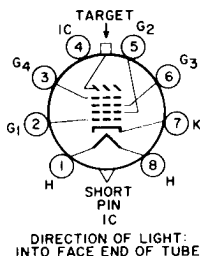
- a This capacitance, which effectively is the output impedance of the 8507A, is increased when the tube is mounted in the deflecting-yoke and focusing-coil assembly. The resistive component of the output impedance is in the order of 100 megohms.
- b Made by Cinch Manufacturing Corporation, 1026 S. Homan 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



## Spurious Signal Test

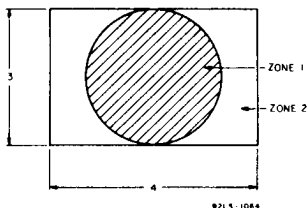


Fig.1

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.

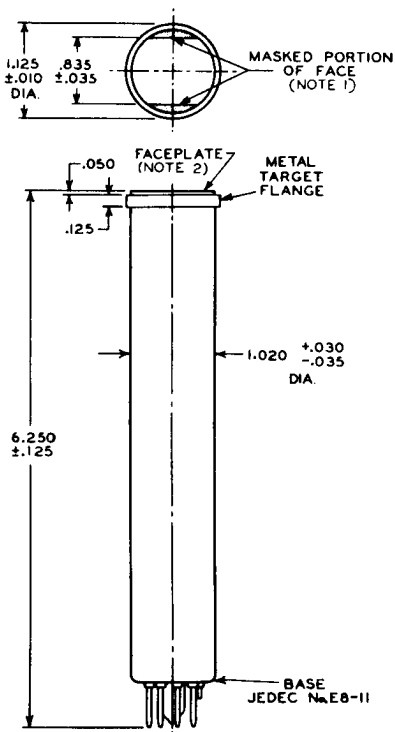
**Table 1**  
For scanned area of  $1/2'' \times 3/8''$

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



92CS-12251

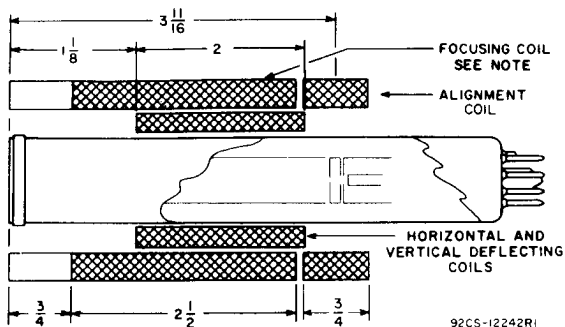
## DIMENSIONS IN INCHES

**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

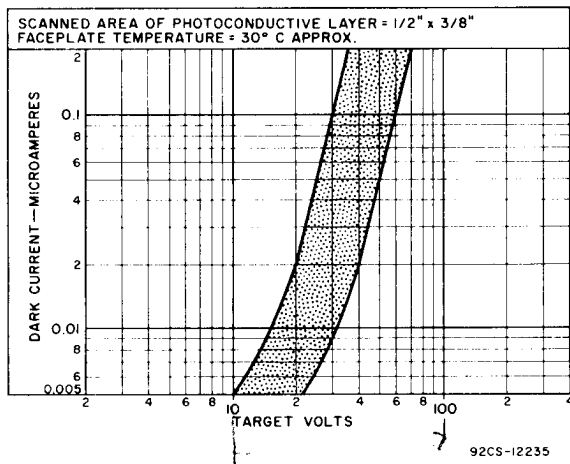
To obtain minimum beam-landing error



Dimensions in Inches

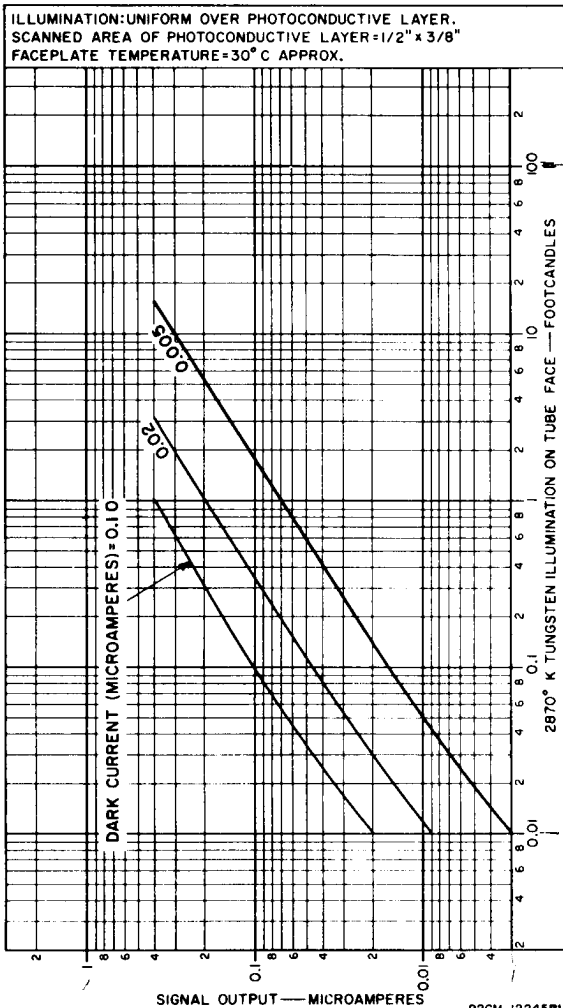
Note: Cross-hatching indicates wound portion of focusing coil.

## RANGE OF DARK CURRENT

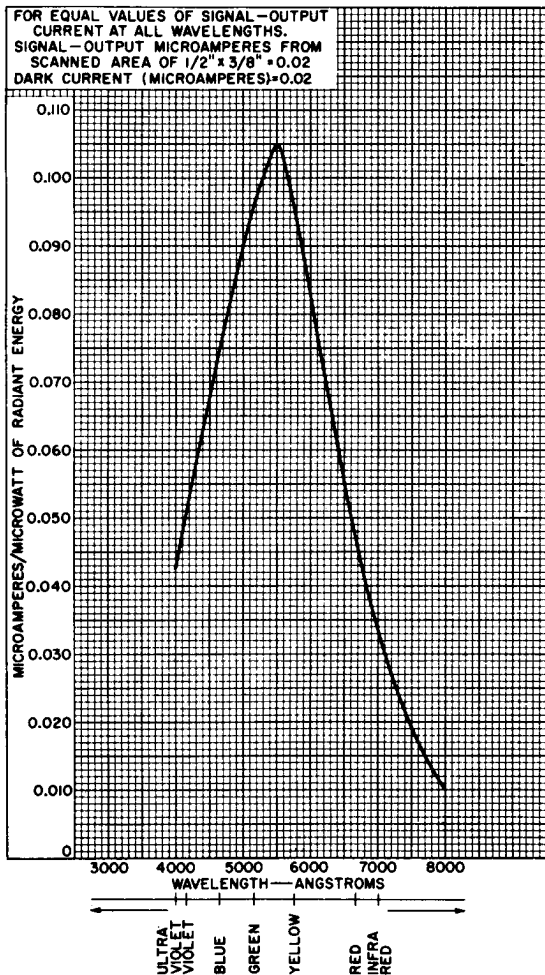




## LIGHT TRANSFER CHARACTERISTICS



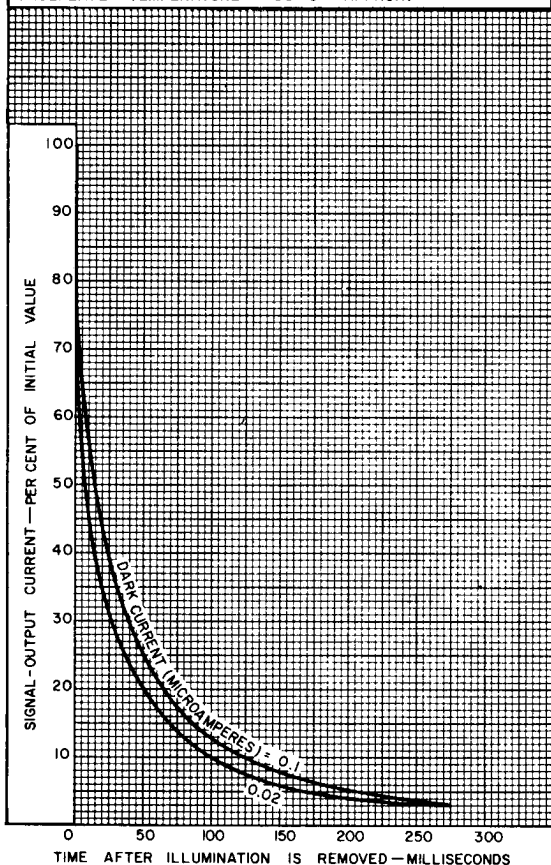
## TYPICAL SPECTRAL SENSITIVITY CHARACTERISTIC



92CM-11619

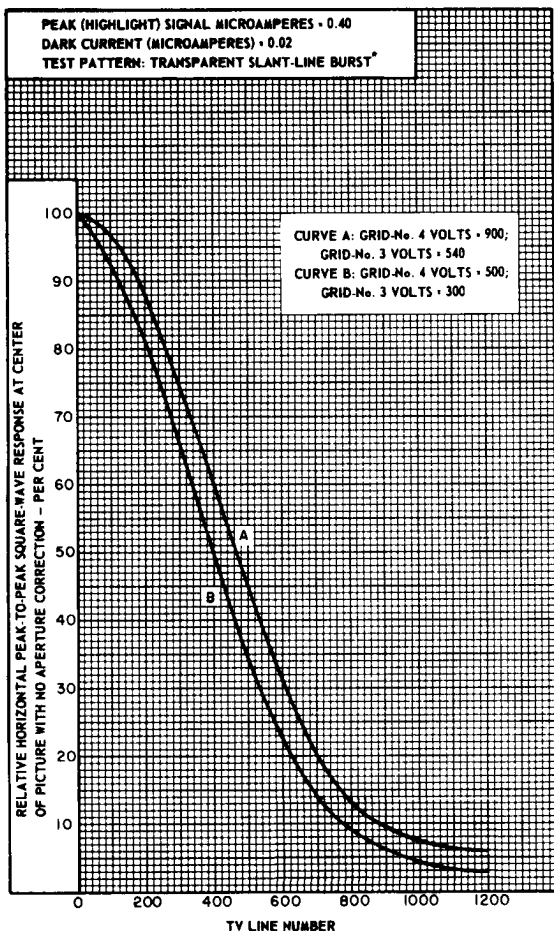
## TYPICAL PERSISTENCE CHARACTERISTICS

INITIAL HIGHLIGHT SIGNAL-OUTPUT MICROAMPERES = 0.3  
 SCANNED AREA OF PHOTOCONDUCTIVE LAYER =  $1/2" \times 3/8"$   
 FACEPLATE TEMPERATURE =  $30^{\circ}\text{C}$  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.