

Vidicon

Magnetic Focus 1"-Diameter Magnetic Deflection

For Live-Scene Pickup with Color or Black-and-White TV Cameras in Broadcast, Industrial, and Closed-Circuit Systems. The 7735B is Unilaterally Interchangeable with Types 7735 & 7735A.

GENERAL

Heater, for Unipotential Cathode:

Voltage (AC or DC) 6.3 ± 10% volts

Current at 6.3 volts 0.6 A

Direct Interelectrode Capacitance:^a

Target to all other electrodes 4.6 pF

Spectral Response . . See Type II Spectral Response at front of this section

Photoconductive Layer:

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

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.

Focusing Method Magnetic

Deflection Method Magnetic

Overall Length 6.25" ± 0.25"

Greatest Diameter 1.125" ± 0.010"

Bulb T8

Base Small-Button Ditetra 8-Pin, (JEDEC No. E8-11)

Socket Cinch^b No. 54A18088, or equivalent

Cleveland Electronics^{cd}

Focusing Coil No. VF-115-5, or equivalent

Deflecting Yoke No. VY-111-3, or equivalent

Alignment Coil No. VA-118, or equivalent

Operating Position Any

Weight (Approx.) 2 oz

ABSOLUTE-MAXIMUM RATINGS

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

Grid—No. 3 & Grid—No. 4 Voltage . . . 1000 max. volts

Grid—No. 2 Voltage 1000 max. volts

Grid—No. 1 Voltage:

Negative bias value 300 max. volts

Positive bias value 0 max. volts

Peak Heater-Cathode Voltage:

Heater negative with respect to cathode 125 max. volts

7735B

Heater positive with respect to cathode	10 max.	volts
Target Voltage	100 max.	volts
Dark Current	0.25 max.	μ A
Peak Target Current ^f	0.55 max.	μ A
Faceplate:		
Illumination	1000 max.	fc
Temperature	71 max.	$^{\circ}$ C

TYPICAL OPERATION AND PERFORMANCE

<i>For scanned area of 1/2" x 3/8" - Faceplate temperature of 30^o to 35^oC</i>	<i>Low-Voltage Operation</i>	<i>High-Voltage Operation</i>	
Grid-No.4 (Decelerator) & Grid-No.3 (Beam-Focus Electrode) Voltage . . .	250 ^g to 300	750	volts
Grid-No.2 (Accelerator) Voltage	300	300	volts
Grid-No.1 Voltage for Picture Cutoff ^h	-45 to -100	-45 to -100	volts
Average "Gamma" of Transfer Characteristic for signal-output current between 0.02 μ a and 0.2 μ a	0.65	0.65	
Visual Equivalent Signal-to-Noise Ratio (Approx.) ⁱ	300:1	300:1	
Lag ^k			
Maximum value	28	28	%
Typical value	23	23	%
Minimum Peak-to-Peak Blanking Voltage:			
When applied to grid No.1	75	75	volts
When applied to cathode.	20	20	volts
Limiting Resolution:			
At center of picture—			
Typical value	750	900	TV lines
Minimum value	700	—	TV lines
Amplitude Response to a 400 TV Line Square-Wave Test			
→ Pattern at Center of Picture	30	45	%
Field Strength at Center of Focusing Coil ^m	40	60	gauss
Peak Deflecting-Coil Current:			
Horizontal	185	375	mA
Vertical	25	43	mA
Field Strength of Adjustable Alignment Coil	0 to 4	0 to 4	gauss

→ Indicates a change.

High-sensitivity operation—0.5 footcandle on faceplate

	Low-Voltage Operation	High-Voltage Operation	
Faceplate Illumination (Highlight)	0.5	-	fc
Target Voltage ^{n,p}	30 to 60	-	V
Dark Current ^q	0.10	-	μ A
Signal-Output Current ^r			
Typical	0.27	-	μ A

Average-sensitivity operation—1.0 footcandle on faceplate

	Low-Voltage Operation	High-Voltage Operation	
Faceplate Illumination (Highlight)	1.0	-	fc
Target Voltage ^{n,p}	20 to 40	-	V
Dark Current ^q	0.025	-	μ A
Signal-Output Current ^r			
Typical	0.275	-	μ A
Minimum	0.265	-	μ A

High-Light Level Operation—10 footcandles on faceplate

	Low-Voltage Operation	High-Voltage Operation	
Faceplate Illumination (Highlight)	10	-	fc
Target Voltage ^{n,p}	10 to 22	-	V
Dark Current ^q	0.005	-	μ A
Signal-Output Current ^r			
Typical	0.3	-	μ A

- a This capacitance, which effectively is the output impedance of the 7735B, 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 Orientation of quality rectangle 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 pin. The masking is for orientation only and does not define the proper scanned area of the photoconductive layer.
- c Made by Cleveland Electronics Inc., 1974 East 61st St., Cleveland, Ohio.
- d These components are chosen to provide tube operation with minimum beam-landing error.
- e Made by Cinch Manufacturing Corporation, 1026 S. Homan Ave., Chicago 24, Illinois.
- f Video amplifiers must be designed properly to handle target currents of this magnitude to avoid amplifier overload or picture distortion.
- g Definition, focus uniformity, and picture quality decrease with decreasing grid-No. 4 and grid-No. 3 voltage. In general, grid-No. 4 and grid-No. 3 should be operated above 250 volts.
- h With no blanking voltage on grid No. 1.
- j Measured with high-gain, low-noise, cascode-input-type amplifier having bandwidth of 5 Mc/s 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.
- k Defined as the per cent of initial value of signal-output current 1/20 second after illumination is removed. Values shown are for initial signal-output current of 0.3 microampere and a dark current of 0.025 microampere.
- m 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.
- n The target voltage for each 7735B must be adjusted to the value which gives the desired operating signal current.
- p Indicated range for each type of service serves only to illustrate the operating target-voltage range normally encountered.



^q 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.

^r Defined as the component of the highlight target current after the dark-current component has been subtracted.

OPERATING CONSIDERATIONS

Target connection is made by a suitable spring contact bearing against the edge of the metal ring at the face end of the tube.

Faceplate-temperature should not exceed 71°C (160°F), either during operation or storage of the 7735B. Operation with a faceplate temperature in the range from about 25° to 35°C (77° to 95°F) is recommended.

Provisions should also be made in the camera installation to hold the faceplate temperature of the 7735B at a *steady value* within the recommended range. Dark current increases with increasing temperature. It is highly desirable to operate the 7735B at a steady temperature to maintain dark current at a preselected value. This mode of operation ensures both optimum and stable day-to-day performance. If such provisions cannot be made, changes in target voltage may be required from time to time to maintain the desired picture quality.

As shown under *Uncompensated Horizontal Square-Wave Response*, a substantial increase in both limiting resolution and amplitude response of the 7735B may be obtained by increasing the operating voltages on grid No.4 and grid No.3. The focusing-coil field strength must be increased and more deflecting power is required at higher electrode voltages as indicated under *Typical Operation and Performance Data*.

Operation at higher electrode voltages may introduce additional beam-landing errors that may be partially compensated for by repositioning the deflecting components. Full compensation may require the application of a modulating voltage of suitable waveform, at both horizontal and vertical scan rates, to the cathode, grid No.1, and grid No.2 of the 7735B.

Dos and Don'ts on Use of RCA-7735B

Dos

1. Adjust camera scanning to utilize maximum useful area of photoconductive layer.
2. Orient the vidicon so that horizontal scan is essentially parallel to the plane passing through tube axis and short pin.
3. Align electron beam.
4. With lens capped, adjust target voltage for each individual vidicon to the highest value that will still give uniform background.
5. Match any visible raster pattern of photoconductive layer with new scan by reorienting the vidicon as required.
6. Use only sufficient beam current to bring out picture highlights.

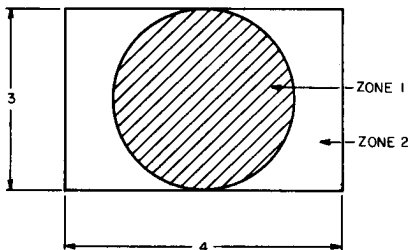


7. Open lens iris or increase the scene illumination to obtain the "snappiest" picture without noticeable smear from moving objects. Target voltage should be reduced if light on the tube and/or resultant signal is excessive.
8. Always cap lens when transporting camera (see "Don'ts" 5).

Don'ts

1. Don't underscan the photoconductive layer.
2. Don't change camera size and centering controls once the scanned area of photoconductive layer has been properly positioned.
3. Don't rotate vidicon from its original operating position in deflecting yoke.
4. Don't turn beam of vidicon on without normal scanning or remove scanning before beam of vidicon is turned off.
5. DON'T ALLOW IMAGE OF THE SUN OR OTHER VERY INTENSE SOURCE OF ILLUMINATION TO BE FOCUSED ON PHOTOCONDUCTIVE LAYER AT ANY TIME.

SPURIOUS SIGNAL TEST



92LS-1084

This test is performed using a uniformly diffused white test pattern that is separated into two zones as shown above. The 7735B 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 7735B is 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.



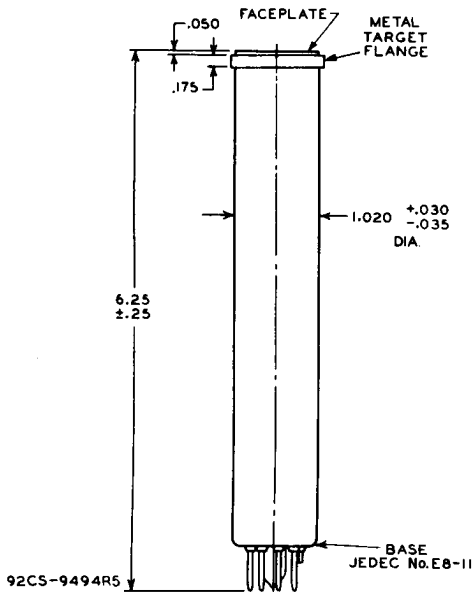
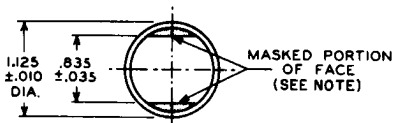
TABLE I (For scanned area of 1/2" x 3/8")

Equivalent Number of Raster Lines	ZONE 1 Allowed Spots	ZONE 2 Allowed Spots
Over 3	0	0
3 but not including 1	1	2
1 or less	footnote §	footnote §

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

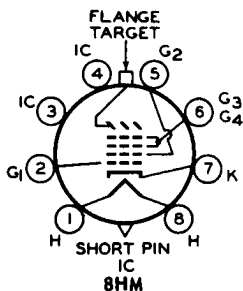
Note: Straight sides of masked portions are parallel to the plane passing through tube axis and short pin.

ADDITIONAL DIMENSIONAL OUTLINE NOTE:

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

TERMINAL DIAGRAM (Bottom View)

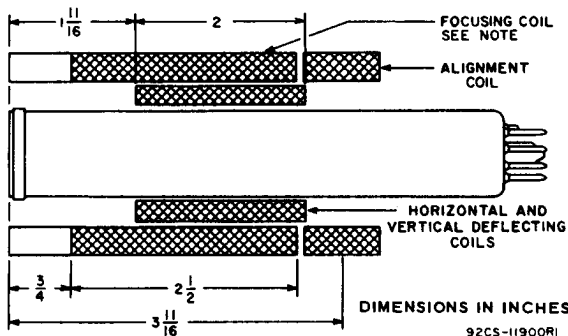
- Pin 1: Heater
- Pin 2: Grid No.1
- Pin 3: Internal Connection — Do Not Use
- Pin 4: Internal Connection — Do Not Use
- Pin 5: Grid No. 2
- Pin 6: Grids No.2 and No.4
- Pin 7: Cathode
- Pin 8: Heater
- Flange: Target
- Short Index Pin: Internal Connection — Make No Connection



DIRECTION OF LIGHT:
INTO FACE END OF TUBE

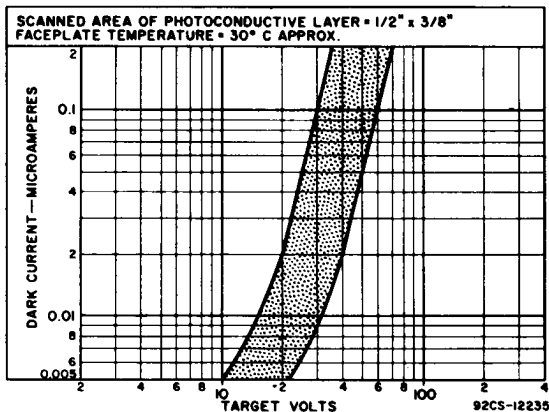
RECOMMENDED LOCATION AND LENGTH OF DEFLECTING, FOCUSING, AND ALIGNMENT COMPONENTS

To obtain minimum beam-landing error

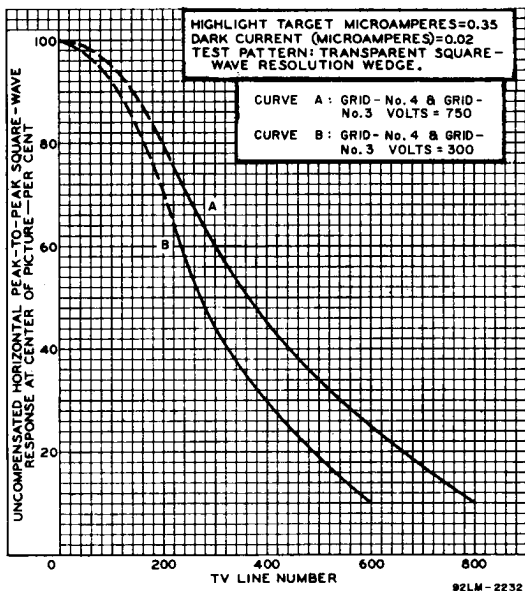


Note: Cross-hatching indicates wound position of focusing coil.

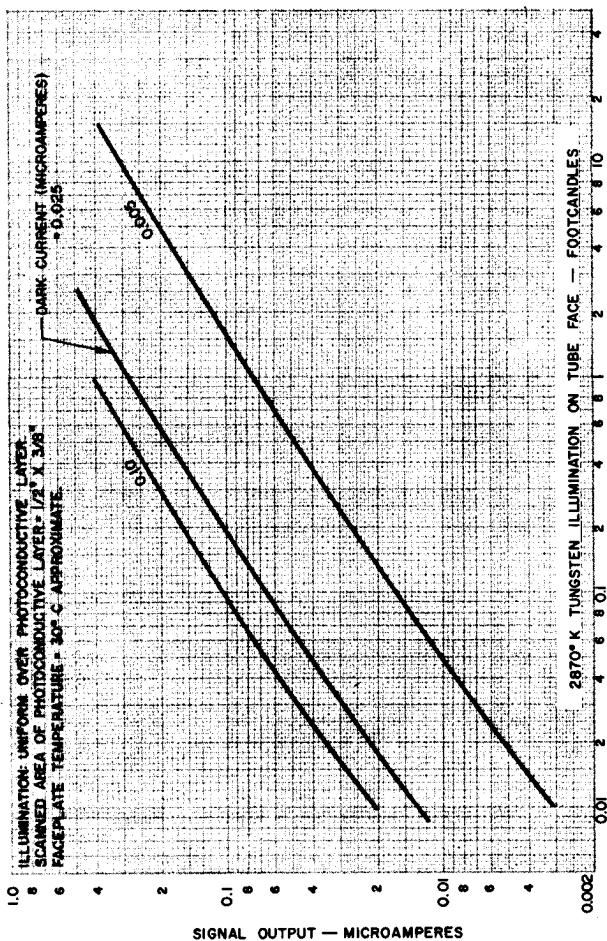
RANGE OF DARK CURRENT



UNCOMPENSATED HORIZONTAL SQUARE-WAVE RESPONSE



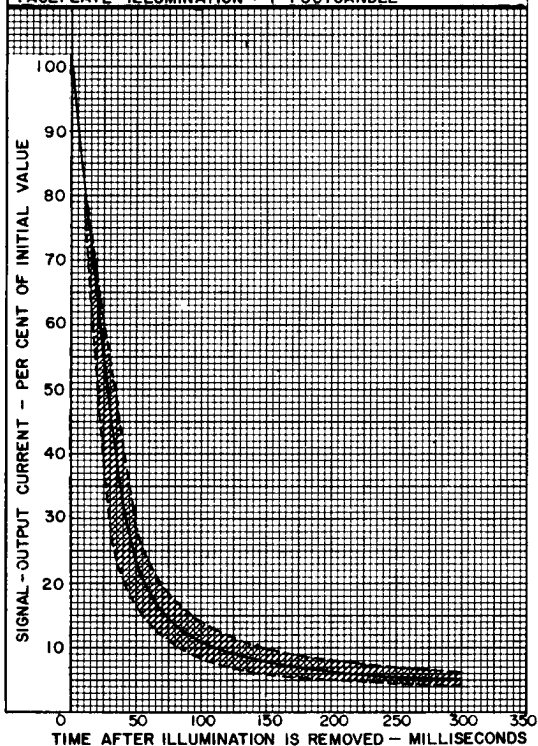
LIGHT TRANSFER CHARACTERISTICS



92LM-1056R1

TYPICAL PERSISTENCE CHARACTERISTIC

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



92LM-1068R1