

Image Orthicon

MAGNETIC FOCUS

MAGNETIC DEFLECTION

ANTI-GHOST IMAGE SECTION

For Studio Black-and-White TV Cameras. The 8093A
is Unilaterally Interchangeable with the 8093.

DATA

General:

Heater, for Unipotential Cathode:

Voltage (AC or DC) $6.3 \pm 10\%$ volts
Current at heater volts = 6.3 0.600 amp

Direct Interelectrode Capacitance (Approx.):

Anode to all other electrodes 12 μmf

Target-to-Mesh Spacing (Average) 0.001"

Spectral Response S-10

Wavelength of Maximum Response 4500 ± 300 angstroms

Photocathode, Semitransparent:

Rectangular image (4 x 3 aspect ratio):

Useful size of 1.8" max. diagonal

Note: The size of the optical image focused on the photocathode should be adjusted so that its maximum diagonal does not exceed the specified value. The corresponding electron image on the target should have a size such that the corners of the rectangle just touch the target ring; a condition that may be achieved in some camera designs with a 1.6" diagonal image on the photocathode.

Orientation of. . . Proper orientation is obtained when the vertical scan is essentially parallel to the plane passing through center of faceplate and pin 7 of the shoulder base. The horizontal and vertical scan should preferably start at the corner of the raster nearest pin 6 of the shoulder base.

Focusing Method Magnetic

Deflection Method Magnetic

Overall Length $15.20" \pm 0.25"$ Greatest Diameter of Bulb $3.00" \pm 0.06"$

Minimum Deflection-Coil Inside Diameter 2-3/8"

Deflecting-Coil Length 5"

Focusing-Coil Length 10"

Alignment-Coil:

Length 15/16"

Position on neck Centerline of coil located
8.5" from flat area of the
jumbo annular base.

Photocathode Distance Inside End of Focusing Coil 1/2"

Operating Position. . . The tube should never be operated in a vertical position with the Diheptal-base end up nor in any other position where the axis of the tube with the base up makes an angle of less than 20° with the vertical.

Weight (Approx.) 1 lb 2 oz



8093A

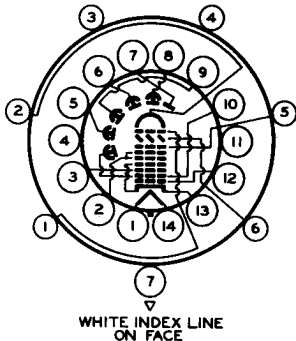
Shoulder Base Keyed Jumbo Annular 7-Pin
BOTTOM VIEW

- | | |
|----------------------|--------------------|
| Pin 1 - Grid No.6 | Pin 5 - Grid No.5 |
| Pin 2 - Photocathode | Pin 6 - Target |
| Pin 3 - Do Not Use | Pin 7 - Do Not Use |
| Pin 4 - Do Not Use | |

End Base. Small-Shell Diheptal 14-Pin
(JEDEC Group 5, No.B14-45)
BOTTOM VIEW

- Pin 1 - Heater
Pin 2 - Grid No.4,
Field Mesh
Pin 3 - Grid No.3
Pin 4 - Do Not Use
Pin 5 - Dynode No.2
Pin 6 - Dynode No.4
Pin 7 - Anode
Pin 8 - Dynode No.5
Pin 9 - Dynode No.3
Pin 10 - Dynode No.1,
Grid No.2
Pin 11 - Do Not Use
Pin 12 - Grid No.1
Pin 13 - Cathode,
Suppressor Grid
Pin 14 - Heater

DIRECTION OF LIGHT:
PERPENDICULAR TO
LARGE END OF TUBE



NOTE: In the tube symbol, the suppressor grid connected to the cathode, and the field-mesh grid connected to grid No.4, are intentionally without numbers to avoid upsetting industry practice of associating functional camera control knobs with specified grid numbers. For example, beam-focus control is generally associated with knob identified as G_4 (Grid No.4).

Maximum and Minimum Ratings, Absolute-Maximum Values:

PHOTOCATHODE:

Voltage -550 max. volts
Illumination 50 max. fc

OPERATING TEMPERATURE:

Any part of bulb 50 max. °C
Of bulb at large end of tube
(Target section). 35 min. °C

TEMPERATURE DIFFERENCE:

Between target section and any part
of bulb hotter than target section. 5 max. °C

GRID-No.6 VOLTAGE -550 max. volts

TARGET VOLTAGE:

Positive value. 10 max. volts
Negative value. 10 max. volts

GRID-No.5 VOLTAGE 150 max. volts

GRID-No.4 VOLTAGE 300 max. volts

GRID-No.3 VOLTAGE 400 max. volts

GRID-No.2 & DYNODE-No.1 VOLTAGE 350 max. volts



GRID-No.1 VOLTAGE:		
Negative-bias value	125 max.	volts
Positive-bias value	0 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	125 max.	volts
Heater positive with respect to cathode.	10 max.	volts
ANODE SUPPLY VOLTAGE ^a	1350 max.	volts
VOLTAGE PER MULTIPLIER STAGE.	350 max.	volts

Typical Operating Values:^b

Photocathode Voltage (Image Focus) ^c . . .	-325 to -475	volts
Grid-No.6 Voltage (Accelerator)—		
Approx. 75% of photocathode voltage ^d . .	-210 to -360	volts
Target-Cutoff Voltage ^e	-3 to +1	volts
Grid-No.5 Voltage (Decelerator)	0 to 40	volts
Grid-No.4 Voltage (Beam Focus) ^c	140 to 180	volts
Grid-No.3 Voltage ^f	260 to 300	volts
Grid-No.2 & Dynode-No.1 Voltage	300	volts
Grid-No.1 Voltage for Picture Cutoff. . . .	-45 to -115	volts
Dynode-No.2 Voltage	600	volts
Dynode-No.3 Voltage	800	volts
Dynode-No.4 Voltage	1000	volts
Dynode-No.5 Voltage	1200	volts
Anode Voltage	1250	volts
Target-Temperature Range.	35 to 45	°C
Minimum Peak-to-Peak Blanking Voltage . .	5	volts
Field Strength at Center		
of Focusing Coil ^g	75	gausses
Field Strength of Alignment Coil.	0 to 3	gausses

Performance Data:

With conditions shown under Typical Operating Values and with camera lens set to bring the picture highlights one stop above the "knee" of the light-transfer characteristic

	Min.	Average	Max.	
Cathode Radiant Sensitivity				
at 4500 angstroms	-	0.028	-	μa/μW
Luminous Sensitivity				
(2870° K)	30	60	-	μa/lm
Anode Current (DC)	-	30	50	μa
Signal-Output Current				
(Peak to peak)	5	-	30	μa
Ratio of Peak-to-Peak				
Highlight Video-Signal				
Current to RMS Noise				
Current for bandwidth of				
4.5 Mc.	40	50	-	←
Photocathode Illumination at				
2870° K required to bring				
picture highlights one stop				
above the "knee" of light-				
transfer characteristic	-	0.040	0.060	fc

← Indicates a change.



8093A

Amplitude Response at 400 TV lines per picture height

(Per cent of large-area black to large-area white)^h.

→ 40 60 - %

Limiting Horizontal

Resolution. 500 675 - TV lines

Uniformity:

Ratio of shading (Background) signal to highlight signal.

- 0.12 0.15

Variation of highlight signal (Per cent of maximum highlight signal)^j.

- 20 25 %

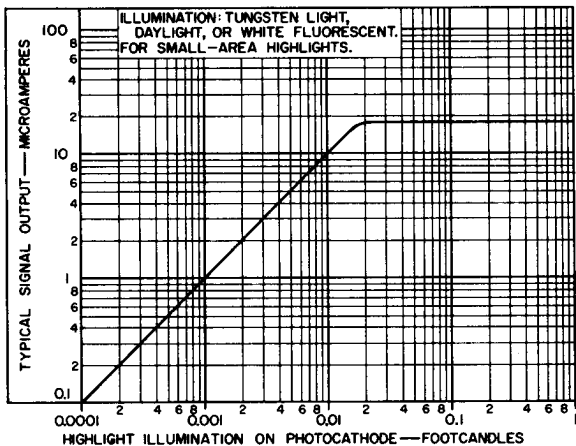
- ^a Dynode-voltage values are shown under *Typical Operating Values*.
- ^b With 8093A operated in RCA-TK-11 or -TK-31 camera. Other cameras may require slightly different voltage ranges.
- ^c Adjust for best focus.
- ^d For minimum highlight flare or "ghost" the grid-No.6 voltage should be 73 per cent of the photocathode voltage.
- ^e Normal setting of target voltage is +2 volts from target cutoff. The target supply voltage should be adjustable from -3 to +5 volts.
- ^f Adjust to give the most uniformly shaded picture near maximum signal.
- ^g Direction of current 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.
- ^h Measured with amplifier having flat frequency response.
- ^j Variation of response over scanned area.

**SPECTRAL-SENSITIVITY CHARACTERISTIC
OF PHOTOSENSITIVE DEVICE HAVING S-10 RESPONSE
is shown at front of this section**

→ Indicates a change.



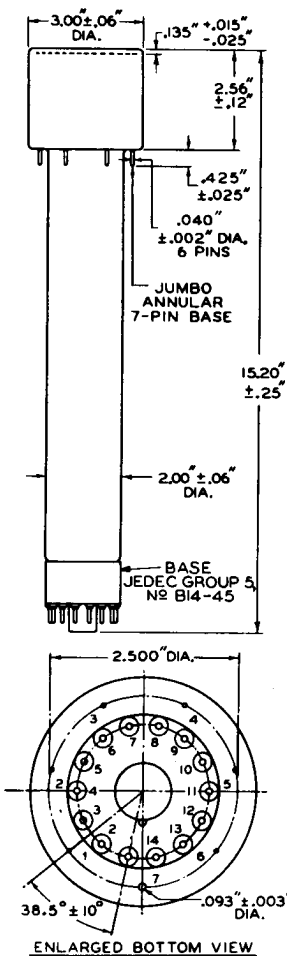
BASIC LIGHT-TRANSFER CHARACTERISTIC



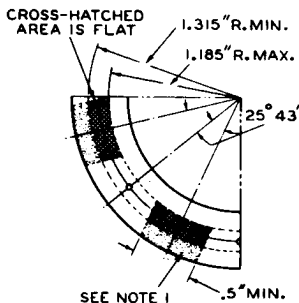
92CS-11620



8093A



DETAIL OF BOTTOM VIEW OF JUMBO ANNULAR BASE



NOTE 1: DOTTED AREA IS FLAT OR EXTENDS TOWARD DIHEPTAL-BASE END OF TUBE BY 0.060" MAX.

ANNULAR-BASE GAUGE

ANGULAR VARIATIONS BETWEEN PINS AS WELL AS ECCENTRICITY OF NECK CYLINDER WITH RESPECT TO PHOTO-CATHODE CYLINDER ARE HELD TO TOLERANCES SUCH THAT PINS AND NECK CYLINDER WILL FIT FLAT-PLATE GAUGE WITH:

- SIX HOLES HAVING DIAMETER OF 0.065 ± 0.001 " AND ONE HOLE HAVING DIAMETER OF 0.150 ± 0.001 ". ALL HOLES HAVE DEPTH OF 0.265 ± 0.001 ". THE SIX 0.065 " HOLES ARE ENLARGED BY 45° TAPER TO DEPTH OF 0.047 ". ALL HOLES ARE SPACED AT ANGLES OF $51^\circ 26' \pm 5'$ ON CIRCLE DIAMETER OF 2.500 ± 0.001 ".
- SEVEN STOPS HAVING HEIGHT OF 0.187 ± 0.001 ", CENTERED BETWEEN PIN HOLES TO BEAR AGAINST FLAT AREAS OF BASE.
- RIM EXTENDING OUT A MINIMUM OF 0.125 " FROM 2.812 " DIAMETER AND HAVING HEIGHT OF 0.126 ± 0.001 ".
- NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF 2.200 ± 0.001 ".

92CM-8293R3