7293A

Image Orthicon

MAGNETIC FOCUS **MAGNETIC DEFLECTION**

ANTI-GHOST IMAGE SECTION

For Outdoor and Studio Pickup with Black-and-White TV Cameras

DATA

General:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.6	amp
Direct Interelectrode Capacitance (Approx.):		
Anode to all other electrodes	12	μμf
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" ± 0.25"
Greatest Diameter of Bulb	3.00" ± 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

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Shoulder Base. . . . . .Keyed Jumbo Annular 7-Pin

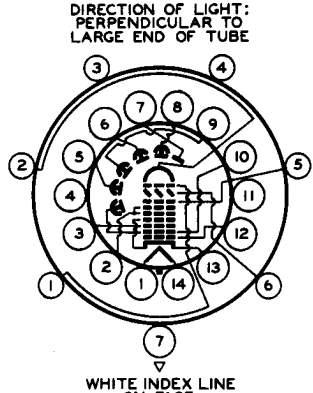
BOTTOM VIEW

Pin 1 - Grid No.6
Pin 2 - Photocathode
Pin 3 - Internal Connection—Do Not Use
Pin 4 - Internal Connection—Do Not Use
Pin 5 - Grid No.5
Pin 6 - Target
Pin 7 - Internal Connection—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 - Internal Connection—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 - Internal Connection—Do Not Use
Pin 12 - Grid No.1
Pin 13 - Cathode, Suppressor Grid
Pin 14 - Heater



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.	-700 max.	volts
Illumination	50 max.	fc
OPERATING TEMPERATURE:		
Any part of bulb	65 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.	-700 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	350 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]	-400 to -540	volts
Grid-No.6 Voltage (Accelerator)—		
Approx. 75% of photocathode voltage[d]	-300 to -405	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	gauss
Field Strength of Alignment Coil	0 to 3	gauss

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.	35:1	45:1	-	←
Photocathode Illumination at 2870° K required to reach "knee" of light-transfer characteristic	-	0.01	0.028	fc

← Indicates a change.

Amplitude Response at 400 TV lines per picture height (Per cent of large-area black to large-area white)[h].	30	40	-	%
Limiting Horizontal Resolution. .	500	-	-	TV lines

[a] Dynode-voltage values are shown under *Typical Operating Values.*

[b] With 7293A 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.

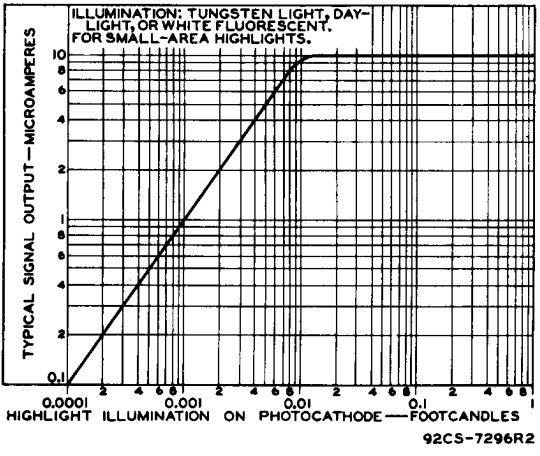
[f] Adjust to give the most uniformly shaded picture near maximum signal.

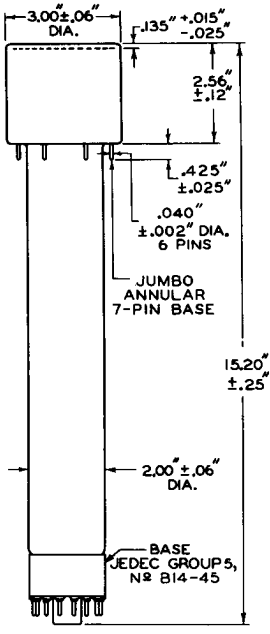
[g] Direction of current should be such that a north-seeking pole is attracted to the image end of the focusing coil, with the indicator located outside of and at the image end of the focusing coil.

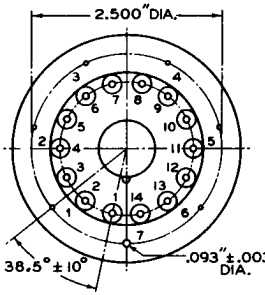
[h] Measured with amplifier having flat frequency response.

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

BASIC LIGHT-TRANSFER CHARACTERISTIC

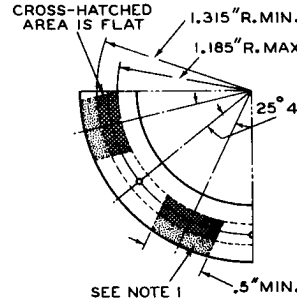






ENLARGED BOTTOM VIEW

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 PHOTOCATHODE CYLINDER ARE HELD TO TOLERANCES SUCH THAT PINS AND NECK CYLINDER WILL FIT FLAT-PLATE GAUGE WITH:

a. 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°26' ± 5' ON CIRCLE DIAMETER OF 2.500" ± 0.001".

b. SEVEN STOPS HAVING HEIGHT OF 0.187" ± 0.001", CENTERED BETWEEN PIN HOLES TO BEAR AGAINST FLAT AREAS OF BASE.

c. RIM EXTENDING OUT A MINIMUM OF 0.125" FROM 2.812" DIAMETER AND HAVING HEIGHT OF 0.126" ± 0.001".

d. NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF 2.200" ± 0.001".

92CM-8293R3