

## Image Orthicon

## MAGNETIC FOCUS

## MAGNETIC DEFLECTION

For Low-Light-Level Color Pickup. The 4401 is Unilaterally Interchangeable with Types 5820, 6474, and 7513.

## DATA

## General:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . . 6.3  $\pm$  10% volts  
Current at 6.3 volts . . . . . 0.6 amp

Direct Interelectrode Capacitance:

Anode to all other electrodes . . . . . 12  $\mu$ f

Spectral Response . . . . . S-10

Wavelength of Maximum Response . . . . . 4500  $\pm$  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.

Orientation of . . . Proper orientation is obtained when the vertical scan is essentially parallel to the plane passing through center of face-plate and pin 7 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 Deflecting-Coil Inside Diameter . . . . . 2-3/8"

Deflecting-Coil Length . . . . . 5"

Focusing-Coil Length . . . . . 10"

Alignment-Coil Length . . . . . 15/16"

Photocathode Distance Inside End of Focusing Coil . . . . . 1/2"

Operating Position . . . . . See *Operating Considerations*

Weight (Approx.) . . . . . 1 lb 6 oz

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

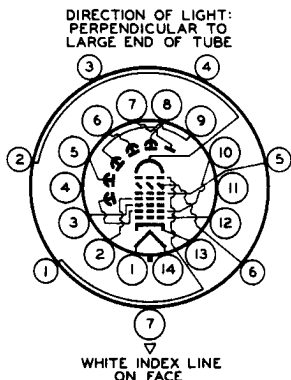
▲ See basing diagram on next page.



End Base. . . . . Small-Shell Diheptal 14-Pin  
(JEDEC Group 5, No.814-45)

## BOTTOM VIEW

- Pin 1 - Heater
- Pin 2 - Grid No.4
- 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
- Pin 14 - Heater



### Maximum and Minimum Ratings, Absolute-Maximum Values:

#### PHOTOCATHODE:

Voltage . . . . .	-550 max.	volts
Illumination . . . . .	50 max.	fc

#### OPERATING TEMPERATURE:

Of 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
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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\* . . . . . 1500 max. volts

VOLTAGE PER MULTIPLIER STAGE. . . . . 500 max. volts



**Typical Operation and Characteristics:**

Photocathode Voltage (Image Focus) . . .	-400 to -540	volts
Grid-No.6 Voltage (Accelerator)—		
Approx. 75% of photocathode voltage . . .	-300 to -405	volts
Target-Cutoff Voltage* . . . . .	-3 to +1	volts
Grid-No.5 Voltage (Decelerator) . . . . .	0 to 125	volts
Grid-No.4 Voltage (Beam Focus) . . . . .	140 to 180	volts
Grid-No.3 Voltage . . . . .	225 to 330	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
Minimum Peak-to-Peak Blanking Voltage . . . . .	5	volts
Field Strength at Center		
of Focusing Coil . . . . .	75	gausses
Field Strength of Alignment Coil . . . . .	0 to 3	gausses

**Performance Data:**

*With conditions shown under Typical Operation and with picture highlights at the "knee" of the accompanying Basic-Light-Transfer-Characteristic Curve*

	Min.	Average	Max.	
Cathode Radiant Sensitivity				
at 4500 angstroms . . . . .	-	0.03	-	$\mu\text{a}/\mu\text{w}$
Anode Current (DC) . . . . .	-	40	-	$\mu\text{a}$
Signal-Output Current				
(Peak-to-peak) . . . . .	10.	25	50	$\mu\text{a}$
Ratio of Peak-to-Peak High-				
light 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 . . . . .	-	0.007	0.01	fc
Peak-to-Peak Response to				
Square-Wave Test Pattern				
at 400 TV Lines per Picture				
Height (Per cent of large-				
area black to large-area				
white) . . . . .	28	35	-	%

• Ratio of dynode voltages is shown under *Typical Operation*.

\* Normal setting of target voltage is +2 volts from target cutoff. The target supply voltage should be adjustable from -3 to +5 volts.

◆ Adjust to give the most uniformly shaded picture near maximum signal.

• 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.

◆ Measured with amplifier having flat frequency response.

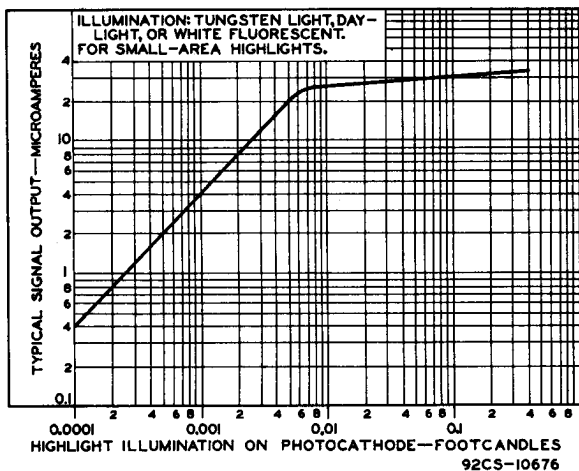


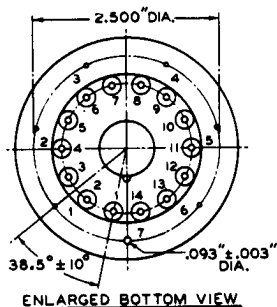
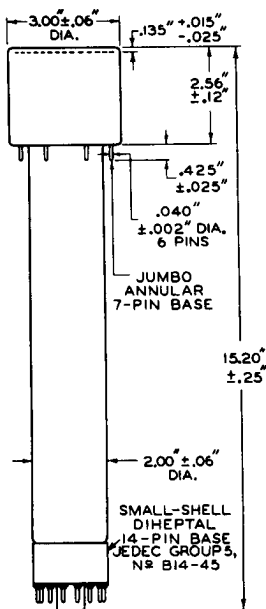
## OPERATING CONSIDERATIONS

The *operating position* of the 4401 should preferably be such that any loose particles in the neck of the tube will not fall down and strike or become lodged on the target. Therefore, it is recommended that the tube 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 base up makes an angle of less than  $20^{\circ}$  with the vertical.

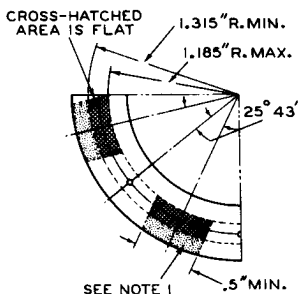
**SPECTRAL-SENSITIVITY CHARACTERISTIC**  
of Photosensitive Device having S-10 Response  
is shown at the front of this Section

## BASIC LIGHT-TRANSFER CHARACTERISTIC





### 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:

- SIX HOLES HAVING DIAMETER OF 0.065"  $\pm$  0.001" AND ONE HOLE HAVING DIAMETER OF 0.150"  $\pm$  0.001". ALL HOLES HAVE DEPTH OF 0.265"  $\pm$  0.001". THE SIX 0.065" HOLES ARE ENLARGED BY 45 $^{\circ}$  TAPER TO DEPTH OF 0.047". ALL HOLES ARE SPACED AT ANGLES OF 51 $^{\circ}$  26'  $\pm$  5' ON CIRCLE DIAMETER OF 2.500"  $\pm$  0.001".
- SEVEN STOPS HAVING HEIGHT OF 0.187"  $\pm$  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"  $\pm$  0.001".
- NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF 2.200"  $\pm$  0.001".

92CM-8293R3



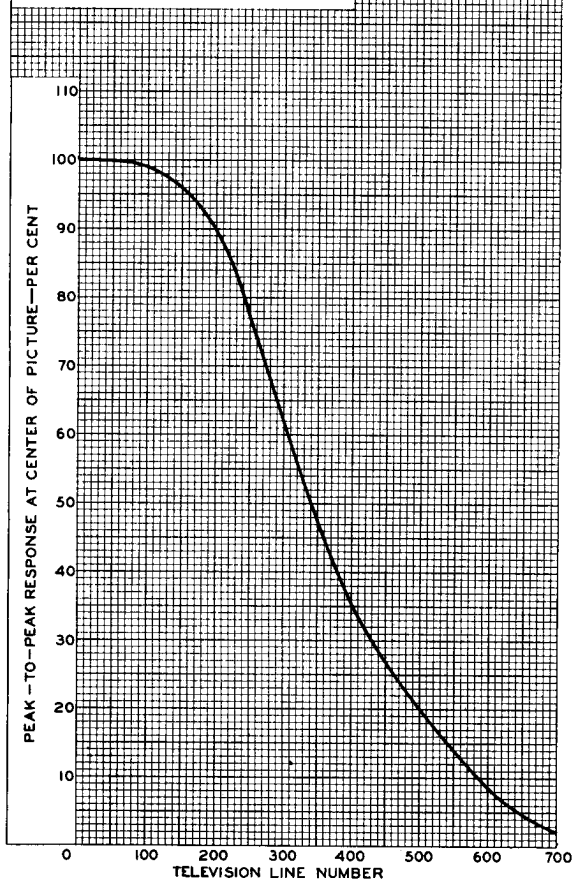
RADIO CORPORATION OF AMERICA  
Electron Tube Division

Harrison, N. J.

DATA 3  
10-60

## SQUARE-WAVE-RESPONSE CHARACTERISTIC

TEST PATTERN: SQUARE WAVE.  
OPERATING TEMPERATURE OF BULB  
ADJACENT TO TARGET: 35° C.  
RESPONSE MEASURED IN SYSTEM  
HAVING 10-Mc BANDWIDTH,  
WITH HIGHLIGHTS AT KNEE OF  
LIGHT TRANSFER CHARACTERISTIC.



92CM-10675

