

**GL-8093**

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ET-T1666

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## IMAGE ORTHICON

FIELD MESH

3 IN. DIAMETER, MAXIMUM

### MAGNETIC FOCUS AND DEFLECTION

The GL-8093 is a television camera tube for studio pickup service where high quality of performance is required and lighting can be controlled.

The construction of the target-mesh assembly assures a high signal-to-noise ratio, particularly desirable for videotaping requirements. The GL-8093 also features a field mesh in the scanning section which enhances picture quality by providing sharp transition from black to white without spurious effect (white edges) and by improving flatness of field and corner resolution.

A suppressor grid maintains high signal-to-noise ratio by preventing field-mesh secondary electrons from entering the electron multiplier.

A photocathode with a spectral response close to that of the eye permits portrayal of scenes in nearly their true tonal gradation.

In operation alignment is performed with the lens open on a chart or scene since dynode apertures are not visible with the lens capped.

The tube is interchangeable with the GL-5820, -7293 and 7513.

### Electrical

|                                                                                                                                                                                        |                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Cathode—Unipotential                                                                                                                                                                   |                     |
| Heater Voltage, AC or DC                                                                                                                                                               | 6.3 $\pm$ 10% Volts |
| Heater Current                                                                                                                                                                         | 0.6 Ampere          |
| Photocathode—Semi-transparent                                                                                                                                                          |                     |
| Response—S-10                                                                                                                                                                          |                     |
| Rectangular Image, 4 by 3 aspect ratio                                                                                                                                                 |                     |
| Useful Size, maximum diagonal                                                                                                                                                          | 1.8 Inches          |
| Orientation—Proper orientation is obtained when the vertical scan is essentially parallel to the plane passing through the center of the faceplate and pin No. 7 of the shoulder base. |                     |
| Focusing Method—Magnetic                                                                                                                                                               |                     |
| Deflecting Method—Magnetic                                                                                                                                                             |                     |
| Direct Interelectrode Capacitance                                                                                                                                                      |                     |
| Anode to All Other Electrodes                                                                                                                                                          | 12 $\mu$ f          |

### Mechanical

|                                                                                                                           |                  |        |
|---------------------------------------------------------------------------------------------------------------------------|------------------|--------|
| Over-all Length                                                                                                           | 15.20 $\pm$ 0.25 | Inches |
| Greatest Diameter of Bulb                                                                                                 | 3.00 $\pm$ 0.06  | Inches |
| Minimum Deflecting-Coil Inside                                                                                            |                  |        |
| Diameter                                                                                                                  | 2 $\frac{3}{8}$  | Inches |
| Deflecting-Coil Length                                                                                                    | 5                | Inches |
| Focusing-Coil Length                                                                                                      | 10               | Inches |
| Alignment-Coil Length                                                                                                     | 1 $\frac{1}{2}$  | Inch   |
| Photocathode Distance Inside End of                                                                                       |                  |        |
| Focusing Coil                                                                                                             | 1 $\frac{1}{2}$  | Inch   |
| Weight, approximate                                                                                                       | 1.4              | Pounds |
| Operating Position—Any, except with diheptal base up and the tube axis at an angle of less than 20 degrees from vertical. |                  |        |

### Thermal

|                                                                                               |    |   |
|-----------------------------------------------------------------------------------------------|----|---|
| Operating Temperature of Any Part of Bulb                                                     | 50 | C |
| Operating Temperature of Bulb at Large End of Tube, Target Section, Minimum                   | 35 | C |
| Temperature Difference Between Target Section and Any Part of Bulb hotter than Target Section | 5  | C |

### MAXIMUM RATINGS—ABSOLUTE VALUES

|                                         |      |              |
|-----------------------------------------|------|--------------|
| Photocathode Voltage                    | —550 | Volts        |
| Photocathode Illumination               | 50   | Foot-Candles |
| Anode Supply Voltage*                   | 1350 | Volts        |
| Grid-No. 1 Voltage                      |      |              |
| Negative-Bias Value                     | 125  | Volts        |
| Positive-Bias Value                     | 0    | Volt         |
| Grid-No. 2 and Dynode-No. 1 Voltage     | 350  | Volts        |
| Grid-No. 3 Voltage                      | 400  | Volts        |
| Grid-No. 4 Voltage                      | 300  | Volts        |
| Grid-No. 5 Voltage                      | 150  | Volts        |
| Grid-No. 6 Voltage                      | —550 | Volts        |
| Voltage per Multiplier Stage            |      | Its          |
| Target Voltage                          |      |              |
| Positive Value                          | 10   | Volts        |
| Negative Value                          | 10   | Volts        |
| Peak Heater-Cathode Voltage             |      |              |
| Heater Negative with Respect to Cathode | 125  | Volts        |
| Heater Positive with Respect to Cathode | 10   | Volts        |

from JEDEC release #3417, Sept. 11, 1961

GENERAL  ELECTRIC

## TYPICAL OPERATION

|                                                                                      |              |              |                                                                                                            |          |             |
|--------------------------------------------------------------------------------------|--------------|--------------|------------------------------------------------------------------------------------------------------------|----------|-------------|
| Photocathode Voltage, image focus.....                                               | -400 to -540 | Volts        | Target Voltage†                                                                                            |          |             |
| Grid-No. 1 Voltage for Picture Cutoff, beam.....                                     | -45 to -115  | Volts        | Target Cutoff Voltage†.....                                                                                | -3 to +1 | Volts       |
| Grid-No. 2 and Dynode-No. 1 Voltage.....                                             | 300          | Volts        | Target Temperature Range....                                                                               | 35 to 45 | C           |
| Grid-No. 3 Voltage‡, multiplier focus.....                                           | 225 to 330   | Volts        | Ratio of Peak-to-Peak High-light Video Signal Current to RMS Noise Current:                                |          |             |
| Grid-No. 4 Voltage, beam focus.....                                                  | 140 to 180   | Volts        | Minimum.....                                                                                               | 38       |             |
| Grid-No. 5 Voltage, decelerator.....                                                 | 0 to 125     | Volts        | Average.....                                                                                               | 50       |             |
| Grid-No. 6 Voltage, accelerator—75 percent of Photocathode Voltage, approximate..... | -300 to -405 | Volts        | Photocathode Illumination at 2870°K Required to Reach Knee of Light Transfer Characteristic, approximate.. | 0.018    | Foot-Candle |
| Dynode-No. 2 Voltage.....                                                            | 600          | Volts        | Minimum Peak-to-Peak Blanking Voltage.....                                                                 | 5        | Volts       |
| Dynode-No. 3 Voltage..                                                               | 800          | Volts        | Field Strength at Center of Focusing Coils§.....                                                           | 75       | Gausses     |
| Dynode-No. 4 Voltage.....                                                            | 1000         | Volts        | Field Strength of Alignment Coil** approximate.....                                                        | 0 to 3   | Gausses     |
| Dynode-No. 5 Voltage.....                                                            | 1200         | Volts        |                                                                                                            |          |             |
| Anode Voltage.....                                                                   | 1250         | Volts        |                                                                                                            |          |             |
| DC Anode Current, average....                                                        | 30           | Microamperes |                                                                                                            |          |             |
| Signal Output Current, peak-to-peak.....                                             | 5 to 30      | Microamperes |                                                                                                            |          |             |

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

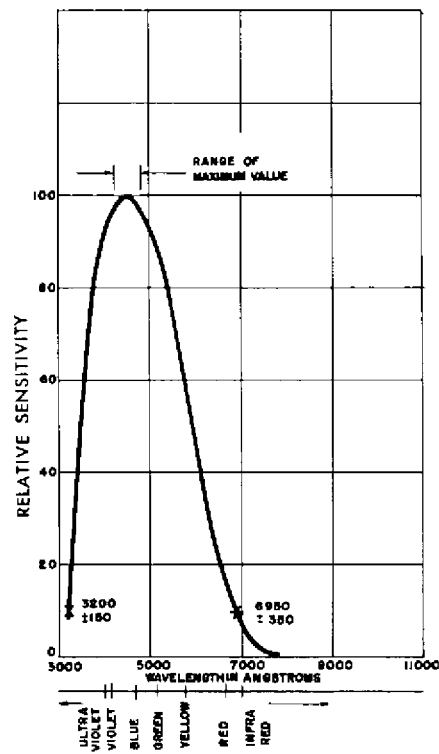
† Adjust to give maximum signal.

‡ Adjustable from -3 to +5 volts with blanking voltage off. Normal setting of target voltage is +2 volts from target cutoff.

§ 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.

\*\*Adjusted to produce flattest field with maximum response. Alignment is correct when the center of the picture merely goes through focus and does not rotate when beam focus (Grid-No. 4) is varied.

For Equal Values of Radiant Flux at All Wavelengths

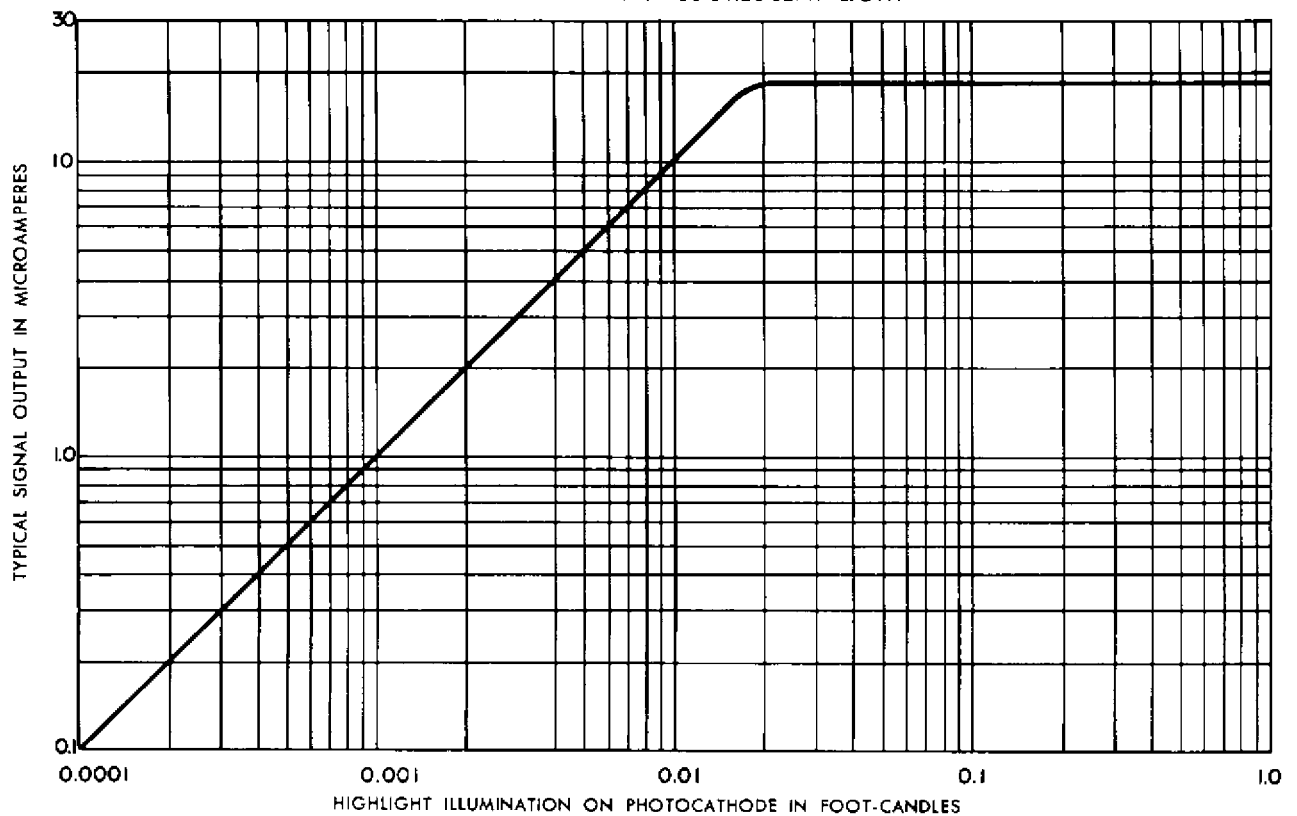


K-69087-72A923

"x" POINTS REPRESENT 10 PERCENT OF MAXIMUM RESPONSE.

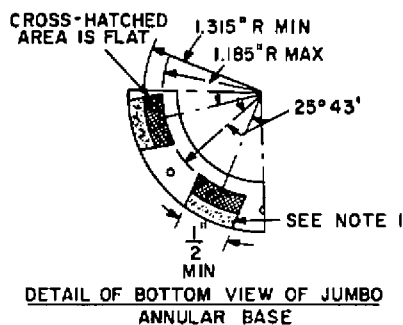
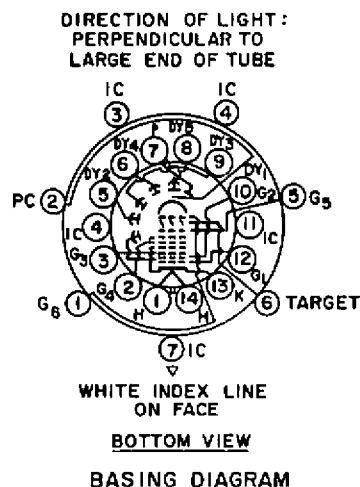
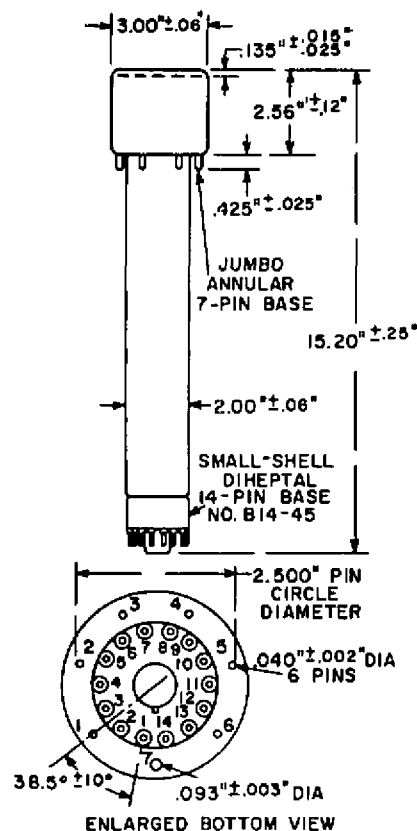
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## TYPICAL SIGNAL OUTPUT

SCENE: BLACK AND WHITE BALANCED TUNGSTEN,  
DAYLIGHT OR WHITE FLUORESCENT LIGHT

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

#### ANNULAR BASE GAGE

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 GAGE WITH:

a. SIX HOLES HAVING DIAMETER OF  $0.065 \pm 0.001$ " AND ONE HOLE HAVING DIA 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  $51^\circ 26' \pm 6'$  ON CIRCLE DIAMETER OF  $2.500 \pm 0.001$ ".

b. SEVEN STOPS HAVING HEIGHT OF  $0.167 \pm 0.001$ ", CENTERED BETWEEN PIN HOLES, TO BEAR AGAINST FLAT AREAS OF BASE.

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

d. NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF  $2.200 \pm 0.001$ ".

#### SMALL-SHELL DIHEPTAL 14-PIN BASE

|                                       |                                        |
|---------------------------------------|----------------------------------------|
| PIN 1: HEATER                         | PIN 9: DYNODE NO.3                     |
| PIN 2: GRID NO.4 & FIELD MESH         | PIN 10: DYNODE NO.1, GRID NO.2         |
| PIN 3: GRID NO.3                      | PIN 11: INTERNAL CONNECTION-DO NOT USE |
| PIN 4: INTERNAL CONNECTION-DO NOT USE | PIN 12: GRID NO.1                      |
| PIN 5: DYNODE NO.2                    | PIN 13: CATHODE AND SUPPRESSOR GRID    |
| PIN 6: DYNODE NO.4                    | PIN 14: HEATER                         |
| PIN 7: ANODE                          |                                        |
| PIN 8: DYNODE NO.5                    |                                        |

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 SPECIFIC GRID NUMBERS. FOR EXAMPLE, BEAM-FOCUS CONTROL IS GENERALLY ASSOCIATED WITH KNOB IDENTIFIED AS  $G_4$  (GRID NO.4).

#### KEYED JUMBO ANNULAR 7-PIN BASE

|                                       |                                       |
|---------------------------------------|---------------------------------------|
| PIN 1: GRID NO.6                      | PIN 5: GRID NO.5                      |
| PIN 2: PHOTOCATHODE                   | PIN 6: TARGET                         |
| PIN 3: INTERNAL CONNECTION-DO NOT USE | PIN 7: INTERNAL CONNECTION-DO NOT USE |
| PIN 4: INTERNAL CONNECTION-DO NOT USE |                                       |

GENERAL  ELECTRIC

CATHODE RAY TUBE DEPARTMENT

Syracuse, N. Y.