GL-8093

IMAGE ORTHICON

FIELD MESH

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-3820, -7293 and 7513.

Electrical

Cathode—Unipotential
Heater Voltage, AC or DC ............... 6.3 ±10% Volts
Heater Current ......... 0.6 Ampere
Photocathode—Semi-transparent
Response — 8-10
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 µf

Mechanical

Over-all Length .......... 15.20 ±0.25 Inches
Greatest Diameter of Bulb .......... 3.00 ±0.06 Inches
Minimum Deflecting-Coil Inside
Diameter .................. 2 ½ Inches
Deflecting-Coil Length ............... 5 Inches
Focusing-Coil Length ............... 10 Inches
Alignment-Coil Length ............... ¾ Inch
Photocathode Distance Inside End Of
Focusing Coil ............... ½ 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
 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 Voltage ............... 10 Volts
Negative Voltage ............... 10 Volts
Peak Heater-Cathode Voltage
Heater Negative with Respect to
Cathode ............... 125 Volts
Heater Positive with Respect to
Cathode ............... 10 Volts

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GENERAL ELECTRIC
### TYPICAL OPERATION

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

* 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.
SPECTRAL-SENSITIVITY CHARACTERISTIC—S-10 RESPONSE

For Equal Values of Radiant Flux at All Wavelengths

TYPICAL SIGNAL OUTPUT

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

RANGE OF MAXIMUM VALUE

"X" POINTS REPRESENT 10 PERCENT OF MAXIMUM RESPONSE.
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 ±0.001" AND ONE HOLE HAVING DIAMETR OF 0.150 ±0.001" ALL HOLES HAVE DEPTH OF 0.285 ±0.001".

b. SIX 0.065" HOLES ARE ENLARGED BY 45° TAPER TO DEPTH OF 0.047" ALL HOLES ARE SPACED AT ANGLES OF 51° 25' 24" ON CIRCLE DIAMETER OF 2.500 ±0.001".

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

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

SMALL-SHELL DIHEPTAL 14-PIN BASE

PIN 1: HEATER PIN 9: DYNOKE NO.3
PIN 2: GRID NO.4 & PIN 10: DYNOKE NO.1, FIELD MESH 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: DYNOKE NO.2 PIN 13: CATHODE AND SUPPRESSOR GRID
PIN 6: DYNOKE NO.4 PIN 14: HEATER
PIN 7: ANODE PIN 8: DYNOKE 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 G4 (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.