GL-8092

IMAGE ORTHICON

EXCEPTIONAL SENSITIVITY
3 IN. DIAMETER, MAXIMUM LONG LIFE

The GL-8092 is a television camera tube primarily intended for live color-pickup service where normal lighting conditions are not available. This includes the range of applications from most remotes to black-and-white illuminated studios.

The tube features a high-gain, thin-film semiconductor target, which results in extremely high sensitivity and ability to handle wide ranges of scene illumination. The tube will produce color pictures of good quality at a scene illumination of approximately 40 foot-candies, and black-and-white pictures at light levels of approximately 1 foot-candle.

Particularly important for color service is the addition of a field mesh in the scanning section which provides an excellent landing, shading, and dynamic match in color cameras utilizing three image orthicons for the simultaneous method of pickup.

Other significant advantages of the thin-film semiconductor target include excellent resolution and high amplitude response, elimination of stickiness throughout life, greatly reduced susceptibility to permanent burn-in damage, stable operation during life and elimination of target raster burns.

A photocathode with a spectral response close to that of the eye provides accurate color rendition of scenes by assuring gray-scale reproduction of colors in nearly their true tonal gradation.

The GL-8092 is interchangeable with the GL-7692, 7295, 5820 and 7513.

Electrical

Cathode—Unipotential
Heater Voltage, AC or DC . 6.3 ±10% Volts
Heater Current . 0.6 Amperes
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 µfd

Mechanical

Over-all Length . 15.20 ±0.25 Inches
Greatest Diameter of Bulb . 3.00 ±0.06 Inches
Minimum Deflection Coil Inside Diameter . 23/4 Inches
Deflecting Coil Length . 5 Inches
Focusing Coil Length . 10 Inches
Alignment-Coil Length . 1/2 Inch
Photocathode Distance Inside End of Focusing Coil . 3/4 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 . 55 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 Volts
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 . 350 Volts
Target Voltage
Above Target Cutoff, positive direction . 6 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
## TYPICAL OPERATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<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 Voltage, approx.</td>
<td>-75 percent of Photocathode Voltage, approximate</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>
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<tr>
<td>Characteristic Curve, page 3</td>
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† Ratio of dynode voltages is shown under Typical Operation.

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

§ The target supply voltage should be adjustable from -3 to +5 volts with blanking voltage off. Recommended target voltage is +2 volts above cutoff. At marginally low light levels, a slight increase in target voltage may help sensitivity. Slight readjustment, usually only a small fraction of a volt, may be necessary to minimize microphonics.

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

### SPECTRAL-SENSITIVITY CHARACTERISTIC—S-10 RESPONSE

For Equal Values of Radiant Flux at All Wavelengths

![Spectral Sensitivity Characteristic Graph](image_url)
LIGHT TRANSFER CHARACTERISTIC

RESOLUTION SENSITIVITY

PHOTOCATHODE ILLUMINATION IN FOOT-CANDLES

K-69087-72A008 HIGHLIGHT ILLUMINATION ON PHOTOCATHODE IN FOOT-CANDLES 11-30-59

K-69087-72A009 PHOTOCATHODE ILLUMINATION IN FOOT-CANDLES 11-30-59
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 DIAM. OF 0.150±0.001" ALL HOLES HAVE DEPTH OF 0.250±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'DO ON CIRCLE
DIAMETER OF 2.500±0.001".

b. SEVEN HOLES HAVING HEIGHT OF 0.187±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±0.001".

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

SMALL-SHELL DIHEPTAL 14-PIN BASE

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 AND
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 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 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

GENERAL ELECTRIC
CATHODE RAY TUBE DEPARTMENT
Syracuse, N. Y.