MAGNETIC FOCUS 1-1/2" Diameter  MAGNETIC DEFLECTION
For Black-and-White Pickup in Industrial Closed-Circuit TV Systems Requiring Limiting Resolutions of more than 1200 TV Lines

General:
Heater, for Unipotential Cathode:
Voltage (AC or DC)........... 6,3 ± 10% volts
Current at heater volts = 6.3........ 0.6 amp
Direct Interelectrode Capacitance:
Target to all other electrodes........ 8.0 pf
Spectral Response............. See Accompanying Curve
Photoconductive Layer:
Maximum useful diagonal of rectangular image (4 x 3 aspect ratio)........ 1"
Focusing Method.............. Magnetic
Deflection Method............. Magnetic
Overall Length................ 7.75" ± 0.25"
Greatest Diameter............. 1.59" ± 0.01"
Bulb Diameter................. 1.50" ± 0.01"
Operating Position............ Any
Weight (Approx.).............. 5.25 oz
Bulb............. T12
Focusing-Alignment Assembly........ Cleveland Electronics No. 15-VFA-259, or equivalent
Deflecting Yoke.............. Cleveland Electronics No. 15-VY-258, or equivalent
Socket.................. Alden No. 208-SBSDC, or equivalent Base........ Small-Button Super-Ditettral 8-Pin (JEDEC No.E8-78)
Basing Designation for BOTTOM VIEW.... 8LB

Pin 1-Heater
Pin 2-Grid No.1
Pin 3-Do Not Use
Pin 4-Grid No.4
Pin 5-Grid No.2
Pin 6-Grid No.3
Pin 7-Cathode
Pin 8-Heater
Flange-Target
Short Index Pin-Do Not Use

Maximum Ratings, Absolute-Maximum Values:
For scanned area of 0.6" x 0.8"
Grid-No.4 Voltage........... 1500 max. volts
Grid-No.3 Voltage........... 1500 max. volts
Grid-No.2 Voltage........... 550 max. volts

RADIO CORPORATION OF AMERICA
Electronic Components and Devices  Harrison, N. J.
DATA 1 6-64
Grid-No.1 Voltage:
- Negative-bias value: 300 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

Target Voltage: 100 max. volts

Dark Current: 0.25 max. μA
Peak Target Current: 0.60 max. μA

Faceplate:
- Illumination: 1000 max. fc
- Temperature: 71 max. °C

Typical Operation:

For scanned area of 0.6" x 0.8" and faceplate temperature of 280° to 340° C

Grid-No.4 (Decelarator) Voltage: 1400 volts
Grid-No.3 (Beam-Focus Electrode): 800 to 1000 volts
Grid-No.2 (Accelerator) Voltage: 300 volts
Grid-No.1 Voltage for picture cutoff: -45 to -100 volts

Average "Gamma" of Transfer Characteristic for signal-output current between 0.02 μA and 0.6 μA: 0.65

Minimum Peak-to-Peak Blanking Voltage:
- When applied to grid No.1: 75 volts
- When applied to cathode: 20 volts

Lag—Per Cent of Initial Value of Signal-Output Current 1/20 Second after Illumination is Removed:
- Maximum value: 45 %
- Typical value: 30 %

Limiting Resolution:
- At center of picture:
  - Typical value: 1500 TV lines
  - Minimum value: 1200 TV lines
- At corners of picture:
  - Typical value: 900 TV lines

Amplitude Response to a 400 TV Line Square-Wave Test Pattern
at Center of Picture:
- Minimum value: 60 %

Field Strength at Center of Focusing Coil (Approx.): 46 gauss
Field Strength of Adjustable Alignment Coil: 0 to 4 gauss

Peak Deflecting-Coil Current for Specified Deflecting Yoke:
- Horizontal: 240 ma
- Vertical: 50 ma

Maximum—Sensitivity Operation—0.1 Footcandle on Faceplate

Faceplate Illumination (Highlight): 0.1 tc
8521

Target Voltage \( n_p \) ........................................ 30 to 60 volts
Dark Current \( q \) ........................................... 0.1 \( \mu A \)
Signal-Output Current: \( r \)
Typical .................................................... 0.2 \( \mu A \)

Average-Sensitivity Operation—
1.0 Footcandle on Faceplate

Faceplate Illumination

(Highlight) ................................................... 1.0 fc
Target Voltage \( n_p \) ........................................ 17 to 35 volts
Dark Current \( q \) ........................................... 0.02 \( \mu A \)
Signal-Output Current: \( r \)
Typical .................................................... 0.20 \( \mu A \)
Minimum .................................................. 0.15 \( \mu A \)

High-Light Level Operation—
10 Footcandles on Faceplate

Faceplate Illumination

(Highlight) ................................................... 10 fc
Target Voltage \( n_p \) ........................................ 10 to 20 volts
Dark Current \( q \) ........................................... 0.005 \( \mu A \)
Signal-Output Current: \( r \)
Typical .................................................... 0.3 \( \mu A \)

a This capacitance, which effectively is the output impedance of the 8521, is increased when the tube is mounted in the deflecting-yoke and focusing-alignment assembly. The resistive component of the output impedance is in the order of 100 megohms.

b Proper orientation of quality rectangle is obtained when the horizontal scan is essentially parallel to the plane passing through the axis and short index pin. The masking is for orientation only and does not define the proper scanned area of photoconductive layer. Final orientation should be such that the image also fits inside of any internal mask of the mesh assembly.

c Cleveland Electronics Inc., 1974 East 61st St., Cleveland, Ohio.

d For minimum geometric distortion, the deflecting yoke should be located in its proper axial position 3/4-inch from the face of the tube.

e Alden Products Co., 9140 North Main Street, Brockton 64, Mass.

f Video amplifiers must be designed properly to handle target currents of this magnitude to avoid amplifier overload or picture distortion.

g Grid-No.4 voltage must always be greater than grid-No.3 voltage. For minimum "porthole" effect, grid-No.4 voltage should be adjusted to approximately 1.6 times the grid-No.3 voltage value, and the focusing-alignment assembly and deflecting yoke positioned as shown in accompanying diagram.

h Beam focus is obtained by the combined effect of grid-No.3 voltage, which should be adjustable over indicated range, and a focusing coil having an average field strength of 46 gauss.

i With no blanking voltage on grid No.1.

j For initial signal-output current of 0.2 \( \mu A \) and a dark current of 0.02 \( \mu A \).

k The alignment coil should be located on the tube so that its center is at a distance of 6 inches from the face of the tube, and be positioned so that its axis is coincident with the axis of the tube, the deflecting yoke, and the focusing coil.

l Indicated range for each type of service serves only to illustrate the operating target-voltage range normally encountered.

m The target voltage for each 8521 must be adjusted to that value which gives the desired operating dark current.

n The deflecting circuits must provide extremely linear scanning for good black-level reproduction. Dark-current signal is proportional to the scanning velocity. Any change in scanning velocity produces a black-level error in direct proportion to the change in scanning velocity.

o Defined as the component of the highlight target current after the dark-current component has been subtracted.
DIMENSIONS IN INCHES

Note 1: Straight sides of masked portions are parallel to the plane passing through tube axis and short index pin.

Note 2: Within this area the minimum bulb diameter dimension does not apply.

Note 3: Faceplate thickness is 0.135" ± 0.005".
LIGHT TRANSFER CHARACTERISTICS

ILLUMINATION: UNIFORM OVER PHOTOCONDUCTIVE LAYER.
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 0.6" X 0.8"
FACEPLATE TEMPERATURE = 30° C APPROX.

DARK CURRENT (MICROAMPERES) = 0.1

2870° K TUNGSTEN ILLUMINATION ON TUBE FACE—FOOTCANDLES

SIGNAL OUTPUT—MICROAMPERES

92CM-12413
TYPICAL SPECTRAL SENSITIVITY CHARACTERISTIC

For equal values of signal—output current at all wavelengths, signal—output microamperes from scanned area of 1/2" x 3/8" = 0.02 dark current (microamperes) = 0.02
TYPICAL PERSISTENCE CHARACTERISTICS

INITIAL HIGHLIGHT SIGNAL-OUTPUT MICROAMPERES = 0.2
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 0.6" x 0.8"
FACEPLATE TEMPERATURE = 30° C APPROX.
UNCOMPENSATED HORIZONTAL RESPONSE TO A SQUARE-WAVE TEST PATTERN

HIGHLIGHT TARGET MICROAMPERES = 0.3
DARK CURRENT (MICROAMPERES) = 0.02
TEST PATTERN: TRANSPARENT SQUARE-WAVE RESOLUTION WEDGE.
GRID-No. 4 VOLTS = 1400
GRID-No. 3 VOLTS = 850
GRID-No. 2 VOLTS = 300