

SpectraPlex Type for Single-Tube Color Cameras

- Integral Dichroic Filter Stripes Optically Encode Color Information
- Signal Can Be NTSC (or PAL) Encoded
- Requires Only Moderate Studio Lighting—100 lumens/foot² (fc)
- Produces Fully Compatible Video for Black-and-White Monitors
- Familiar Vidicon Structure — Magnetic Focus and Deflection

General Data

Electrical:

Heater Voltage	6.3 ± 5% V
Heater Current at 6.3 Volts, ac or dc	0.6 nominal A
Focusing Method	Magnetic
Deflection Method	Magnetic
Direct Interelectrode Capacitance: ^a	
Target to all other electrodes	4.6 pF

Optical:

Outer faceplate glass is Corning code 7056 having a thickness of 0.094" ± 0.012".

Inner faceplate	Dark-Clad Fiber Optics
Photoconductor	Antimony Trisulfide

Orientation of quality rectangle Proper orientation is obtained when the horizontal scan is essentially parallel to the plane passing through the tube axis and short index pin.

Maximum Useful Diagonal of Image	0.625 in (16 mm)
--	------------------

Mechanical:

Maximum Length	6.475 in (164.5 mm)
Maximum Diameter	1.135 in (28.83 mm)
Bulb	T8
Base	Small-Button Ditetra 8-Pin (JEDEC No.E8-11)
Socket	Cinch ^b No.8VT (133-98-11-015), or equivalent
Deflecting Yoke — Focusing Coil —	
Alignment Coil — Assembly	Cleveland Electronics ^{c,d} No.VDA-945, or equivalent
Operating Position	Any
Weight (Approx.)	2 oz

**Maximum and Minimum Ratings,
Absolute-Maximum Values:^e**

For scanned area of 1/2" x 3/8" (12.7 mm x 9.5 mm)

	Min.	Max.	
Grid-No.4 Voltage ^f	—	1000	V
Grid-No.4 and Grid-No.3 Voltage Difference	—	600	V
Grid-No.3 Voltage ^f	—	1000	V
Grid-No.2 Voltage	—	350	V
Grid-No.2 Power Dissipation	—	1	W
Grid-No.1 Voltage	-150	0	V
Heater-Cathode Voltage	-125	10	V
Heater-Voltage Tolerance	—	5	%
Target Voltage	—	70	V
Dark Current	—	0.25	μA
Peak Target Current ^g	—	0.75	μA
Faceplate:			
Illumination ^h	—	$\left\{ \begin{array}{l} 1000 \\ 10,000 \end{array} \right.$	lm/ft ² lux
Temperature:			
Operating and storage	—	71	°C

Typical Operation and Performance Data:

For scanned area of 1/2" x 3/8" —

Faceplate temperature of 30° ± 3° C and standard TV scanning Rate

Grid-No.4 (Decelerator) Voltage ^f	900	V
Grid-No.3 (Beam-Focus Electrode) Voltage ^f	540	V
Grid-No.2 (Accelerator) Voltage	300	V
Grid-No.1 Voltage for Picture Cutoff ⁱ	-65 to -100	V
Average "Gamma" of Transfer Characteristic for Signal-Output Current Between 30 nA and 300 nA	0.65	
Lag—Per Cent of Initial Value of Signal-Output Current 1/20 Second After Illumination is Removed ^k	25	%
Peak-to-Peak Blanking Voltage:		
When applied to grid No.1	75	V
When applied to cathode	20	V

Field Strength at Center of Focusing Coil ^m	60 ± 5	G
Field Strength of Adjustable Alignment Coil ⁿ	0 to 4	G
Peak Deflecting-Coil Current:		
Horizontal	250	mA
Vertical	45	mA

Sensitivity**Conditions**

Faceplate illumination (highlight)	6	lm/ft ² (fc)
Dark current ^p	30	nA

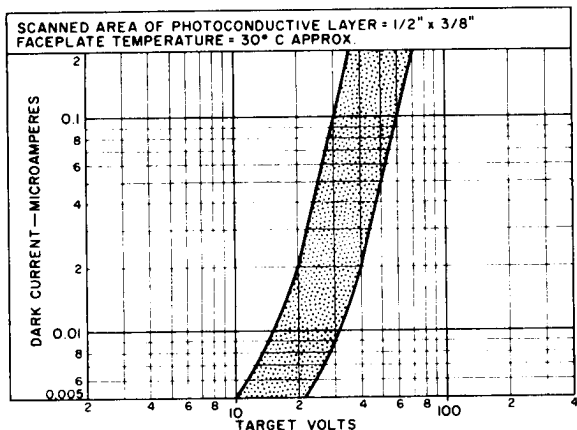
Performance

Target voltage ^{q,r}	22 to 45	V
Signal-Output Current ^s	300	nA

- a** This capacitance, which effectively is the output impedance of the tube, is increased when the tube is mounted in the deflecting yoke and focusing-coil assembly. The resistive component of the output impedance is in the order of 100 megohms.
- b** Made by Cinch Manufacturing Corporation, 1501 Morse Ave., Elk Grove Village, ILL 60007.
- c** Made by Cleveland Electronics Inc., 17877 St. Clair Avenue, Cleveland, OH 44110.
- d** These components are chosen to maximize resolution uniformity over the useful picture area of the camera tube. Resolution uniformity is necessary for good color uniformity.
- e** A description of the Absolute Maximum Rating is given in the General Section titled Rating System for Electron Tubes.
- f** Grid-No.4 voltage must always be greater than grid-No.3 voltage. The maximum voltage difference between these electrodes, however, should not exceed 600 volts. The recommended ratio of grid-No.3 to grid-No.4 voltage is 6/10.
- g** Video amplifiers must be designed properly to handle target currents of this magnitude to avoid amplifier overload or picture distortion.
- h** For conditions where "white light" is uniformly diffused over entire tube face.
- i** With no blanking voltage on grid No.1.
- k** For initial signal-output current of 300 nanoamperes and a dark current of 30 nanoamperes.

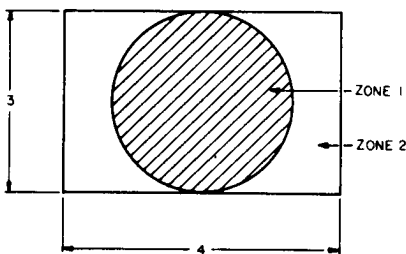
- m The polarity of the focusing coil should be such that a north-seeking pole is attracted to the image end of the focusing coil, with the indicator located outside of and at the image end of the focusing coil.
- n The alignment coil should be located on the tube so that its center is at a distance of 3-3/4 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.
- p 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.
- q The target voltage for each tube must be adjusted to that value which gives the desired operating dark current.
- r Indicated range serves only to illustrate the operating target-voltage range normally encountered.
- s Defined as the component of the highlight target current after dark-current component has been subtracted.

Typical Range of Dark Current



92CS-12235

Spurious Signal Test



92L3-1064

Figure 1
Spurious Signal
Test Zones

This test is performed using a uniformly illuminated test pattern containing two "zones" as shown in Figure 1. Illumination is for a peak signal current of 300 nanoamperes. Under these conditions, a blemish will be counted if its signal amplitude is greater than 45 nanoamperes under either illuminated or capped conditions. Some spots and fiber-optic distortion errors are more easily observed when viewing a red or a blue field. Therefore, Wratten filters numbers 25 or 47B (or equivalents) will be inserted into the light path to provide the red or blue fields. Table I shows the number of countable spots allowed. No two spots may be closer together than the distance equivalent to twenty TV lines.

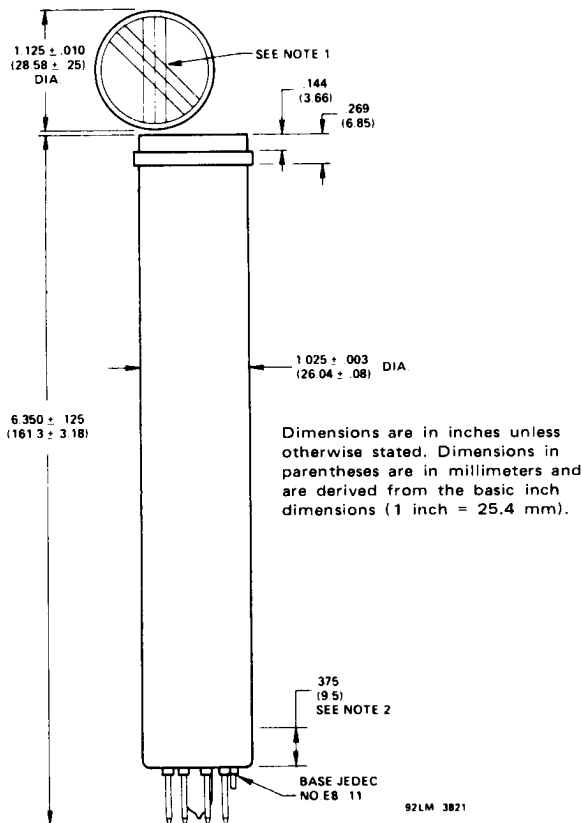
Table I

For scanned area of 1/2" x 3/8" (12.7 mm x 9.5 mm)

Blemish Size (equivalent number of raster lines)	Zone 1	Zone 2
over 4	0	0
over 3	2	3
over 1	6	10
1 or less	*	*

*Spots of this size are allowed unless concentration causes a smudged appearance.

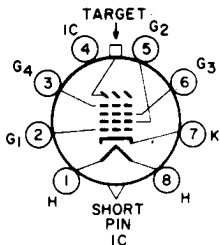
Dimensional Outline



Note 1 — Color encoding stripes, 530 line pairs/inch. The yellow (minus blue) stripes are shown vertically on the centerline, the cyan (minus red) stripes are 45° counterclockwise from the yellow stripes. The yellow stripes are perpendicular to the plane passing through tube axis and short index pin. This plane also defines the direction of horizontal scan.

Note 2 — Within this distance, diameter of bulb is 1.025" + 0.003" - 0.030".

Basing Diagram

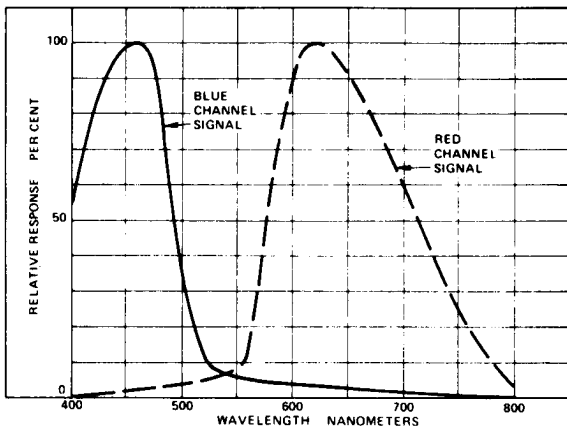


DIRECTION OF LIGHT:
INTO FACE END OF TUBE

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

Typical System Response

(These data are obtained by "sweeping" the input of a camera system, employing a SpectraPlex vidicon type 4445 with the output of a Bausch & Lomb Monochromator Model 33-86-02.



92LS-3819

Typical Light Transfer Characteristic

ILLUMINATION UNIFORM OVER PHOTOCONDUCTIVE LAYER.
 SCANNED AREA OF PHOTOCONDUCTIVE LAYER - 1/2" x 3/8"
 FACEPLATE TEMPERATURE - 30° C APPROX.
 ONE (1) LUMEN/FT² IS APPROXIMATELY EQUAL TO TEN (10) LUX.

