

Color Picture Tube

ULTRA-RECTANGULAR

HI-LITE SCREEN

4 X 3 Aspect Ratio

Blue-Gun-Down Operation

Electrical

Electron Guns, Three with Axes

Tilted Toward Tube Axis Red, Blue, Green

Heater, of Each Gun Series Connected within

Tube with Each of the Other Two Heaters:

Current at 6.3 V 900 mA

Focusing Method Electrostatic

Focus Lens Unipotential

Convergence Method Magnetic

Deflection Method Magnetic

Deflection Angles (Approx.):

Diagonal 90 deg

Horizontal 78 deg

Vertical 60 deg

Direct Interelectrode Capacitance (Approx.):

Grid No.1 of any gun to all other electrodes 7.5 pF

Grid No.4 to all other electrodes 6 pF

All cathodes to all other electrodes 15 pF

Capacitance Between Anode and External

Conductive Coating { 2300 max. pF
1800 min. pF

Resistance Between Metal Hardware and

External Conductive Coating 50 M Ω

Optical

Faceplate Filterglass

Light transmission at center (Approx.) 53%

Surface Polished

Screen Aluminized

Phosphor, rare-earth (red) sulfide (blue & green) P22

Persistence Medium-Short

Array 382,000 Dot trios

Spacing between centers of adjacent

dot trios (Approx.) 0.024 in (0.61 mm)

Mechanical

Minimum Screen Area (Projected) 185 sq in (1194 sq cm)

Bulb Funnel Designation JEDEC No.J160-3/4 B1/C1

Bulb Panel Designation JEDEC No.FP161-3/4 V1

Base Designation^a Small-Button Diheptar 12-Pin
(JEDEC No.B12-244)

Basing Designation JEDEC No.14BH

Pin Position Alignment Pin No.5 Aligns Approx. with
Anode Bulb Contact

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Operating Position, preferred Anode Bulb Contact on Top
Gun Configuration Delta
Weight (Approx.) 25 lb (11.4 kg)

Implosion Protection

Type Banded

Maximum and Minimum Ratings, Design-Maximum Values

Unless otherwise specified, values are for each gun and voltage values are positive with respect to cathode.

Anode Voltage	{ 22.5 max. kV 17 min. kV
Anode Current, Long-Term Average ^b	

	1000 max. μ A
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Grid-No.4 (Focusing Electrode) Voltage:

Positive value	1100 max. V
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Negative value	550 max. V
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Peak-Grid-No.2 Voltage,

Including Video Signal Voltage	1000 max. V
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Grid-No.1 Voltage:

Negative bias value	400 max. V
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Negative operating cutoff value	140 max. V
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Positive bias value	0 max. V
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Positive peak value	2 max. V
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Heater Voltage (ac or dc):^c

Under operating conditions	{ 6.9 max. V 5.7 min. V
Under standby conditions ^d	

	5.5 max. V
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Heater-Cathode Voltage:

Heater negative with respect to cathode:

During equipment warm-up period not exceeding 15 seconds	450 max. V
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After equipment warm-up period:

DC component value	200 max. V
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Peak value	200 max. V
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Heater positive with respect to cathode:

DC component value	0 max. V
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Peak value	200 max. V
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Equipment Design Ranges

Unless otherwise specified, values are for each gun and voltage values are positive with respect to cathode.

For anode voltages between 17 and 22.5 kV

Grid-No.4 (Focusing Electrode) Voltage	-75 to 400 V
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Grid-No.2 Voltage for Visual Extinction

of Undelected Focused Spot . . . See CUTOFF DESIGN CHART
in Figure 3

At Grid No.1 voltage of -75 V	90 to 270 V
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At Grid No.1 voltage of -125 V 210 to 505 V

At Grid No.1 voltage of -140 V 245 to 580 V

Maximum Ratio of Grid-No.2 Voltages, Highest Gun to

Lowest Gun in Any Tube (At grid-No.1 spot cutoff

voltage of -100 V) 1.86

Heater Voltage:^c

Under operating conditions:

When standby operation is not utilized 6.3 V

When 5.0-V standby operation is utilized^d 6.0 VUnder standby conditions^d 5.0 VGrid-No.4 Current (Total) $\pm 60 \mu\text{A}$ Grid-No.2 Current $\pm 5 \mu\text{A}$ Grid-No.1 Current $\pm 5 \mu\text{A}$

	Illum. D	Color
To Produce White Light of	6550 ^o K + 7 M.P.C.D.	9300 ^o K + 27 M.P.C.D.

CIE Coordinates:

X 0.313 0.281

Y 0.329 0.311

Percentage of total anode current

supplied by each gun (average):

Red 41 30 %

Blue 24 31 %

Green 35 39 %

Ratio of cathode currents:

Red/blue:

Minimum 1.35 0.75

Typical 1.70 0.95

Maximum 2.20 1.25

Red/green:

Minimum 0.95 0.60

Typical 1.15 0.75

Maximum 1.70 1.10

Blue/green:

Minimum 0.50 0.60

Typical 0.70 0.80

Maximum 0.95 1.10

Displacements, Measured at Center of Screen:

Raster centering displacement:

Horizontal ± 0.45 in (± 11.4 mm)Vertical ± 0.45 in (± 11.4 mm)

Lateral distance between the blue beam and

the converged red and green beams . . . ± 0.25 in (± 6.4 mm)

Radial convergence displacement excluding

effects of dynamic convergence

(each beam) ± 0.37 in (± 9.4 mm)

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Maximum Required Correction for Register^a

(Including Effect of Earth's Magnetic Field
when Using Recommended Components) as

Measured at the Center of the Screen in

any Direction 0.005 in (0.13 mm) max.

Typical Operation

Heater Voltage 6.3 V

Anode Voltage 20 kV

Grid-No.4 Voltage Adjusted for focus

Color Temperature 9300° K + 27 M.P.C.D.

Raster Size 15.922 x 11.941 in
(404.42 x 303.30 mm)

Typical White-Light Output Measured within 4 in

(102 mm) diameter area centered on tube face:

At anode current of 1000 μ A $\left\{ \begin{array}{l} 44 \text{ fL} \\ 151 \text{ Nit} \end{array} \right.$

Limiting Circuit Values

Low-Voltage Circuits:

Effective grid-No.1-to-cathode-

circuit resistance (each gun) 0.75 max. M Ω

X-Radiation Characteristic :

Maximum Anode Voltage at which the X-radiation emitted
will not exceed 0.5 mR/h at an anode current of

300 μ A 33 kV

The X-radiation emitted from this picture tube, as measured in accordance with the procedure of JEDEC Publication No.64A will not exceed 0.5 mR/h throughout the useful life of the tube when operated within the Design-Maximum ratings: 27.5 kV anode voltage and 1000 μ A anode current. The tube should not be operated beyond its Design-Maximum ratings stated above (such operation may shorten tube life or have other permanent adverse affects on its performance), but its X-radiation will not exceed 0.5 mR/h for anode voltage and current combinations given by the isodose-rate limit characteristics as shown in Figure 1. Operation above the values shown by the curve may result in failure of the television receiver to comply with the Federal Performance Standard for Television Receivers, Sub-Part C of Part 78 of Title 42, Code of Federal Regulations (PL90-602) as published in the Federal Register Vol.34, No. 247, Thursday, December 25, 1969. Maximum X-radiation as a function of anode voltage at 300 μ A anode current is shown by the curve in Figure 2. X-radiation at a constant anode voltage varies linearly with anode current.

- ^a The mating socket, including its associated, physically-attached hardware and circuitry, must not weigh more than one pound (one-half kilogram).
- ^b The short-term average anode current should be limited by circuitry to 1500 microamperes.
- ^c For maximum cathode life, it is recommended that the heater supply be regulated. The series impedance to any chassis con-

nection in the dc biasing circuit for the heater should be between 100 kilohms and 1 megohm. The surge voltage across the heater must be limited to 9.5 volts rms.

- d The use of a 5-volt standby condition in conjunction with 6-volt operating conditions is recommended to improve the reliability of the color picture tube by extending the emission wear-out life and reducing other gun-related defects. A maximum heater voltage of 5.5 volts (Design-Maximum value) may be maintained on the color picture tube when the receiver is in the "off" (standby) position. All other voltages normally applied to the tube must be removed during standby operation.
- e Register is defined as the relative position of the beam trios with respect to the associated phosphor-dot trios.

IMPORTANT: Refer to sheet *Safety Precautions For Color Picture Tubes* at front of this section.

Notes For Dimensional Outline

Note 1 — With tube neck inserted through flared end of reference-line and neck-funnel-contour gauge (JEDEC No.G162) and with tube seated in gauge, the reference line is determined by the intersection of the plane C-C' of the gauge with the glass funnel.

Note 2 — Socket for this base should not be rigidly mounted; it should have flexible leads and be allowed to move freely. Bottom circumference of base will fall within a 2-inch (51-mm) circle concentric with bulb axis.

Note 3 — The drawing shows the size and location of the contact area of the external conductive coating. The actual area of this coating will be greater than that of the contact area so as to provide the required capacitance. External conductive coating must be grounded with multiple contacts.

Note 4 — To clean this area, wipe only with soft, dry, lintless cloth.

SAGITTAL HEIGHTS AT POINTS $\frac{.125}{3.18}$ BEYOND EDGE OF MIN. SCREEN

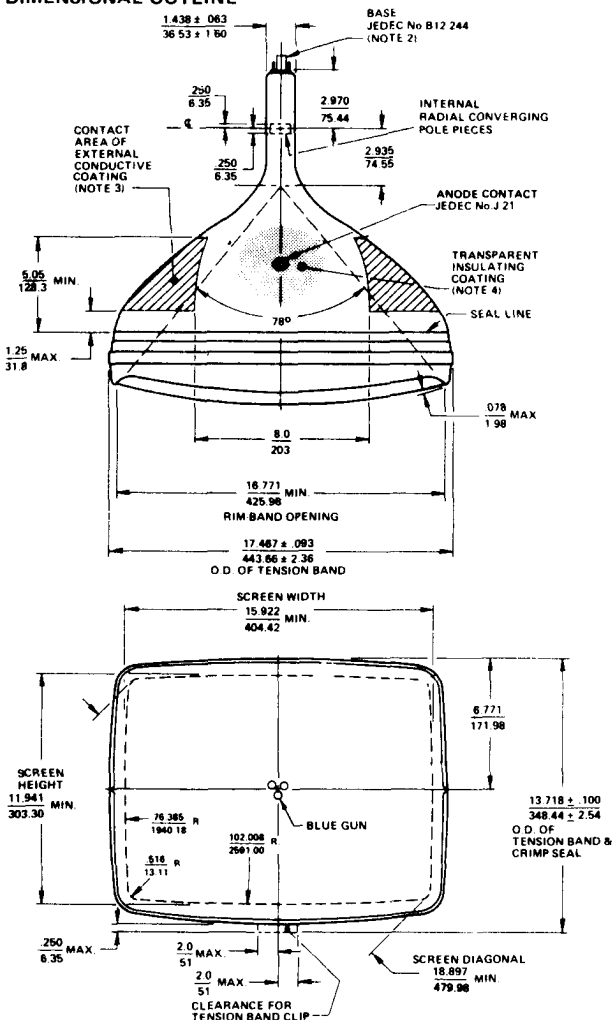
DIAGONAL $\frac{1.485}{37.72}$

WIDTH $\frac{1.044}{26.52}$

HEIGHT $\frac{.582}{14.78}$

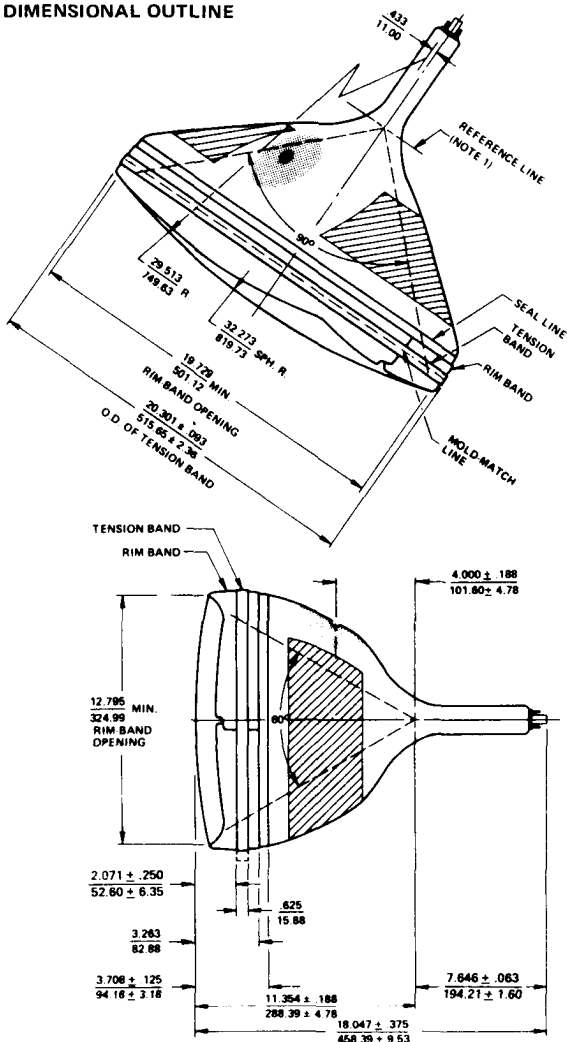
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DIMENSIONAL OUTLINE



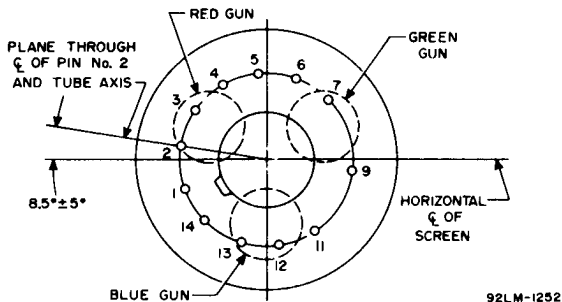
Dimensions in $\frac{\text{Inches}}{\text{mm}}$ unless otherwise noted

DIMENSIONAL OUTLINE



92LL 3949H1

BOTTOM VIEW OF BASE

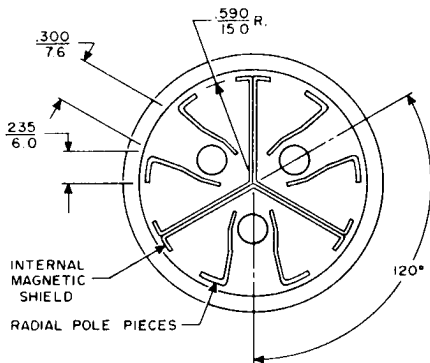


92LM-1252

Base Specification — JEDEC No.14BH

Pin 1:	Heater	Cap:	Anode (Grid No.3, Grid No.5, Screen, Collector)
Pin 2:	Cathode of Red Gun	C:	External Conductive Coating
Pin 3:	Grid No.1 of Red Gun		
Pin 4:	Grid No.2 of Red Gun		
Pin 5:	Grid No.2 of Green Gun		
Pin 6:	Cathode of Green Gun		
Pin 7:	Grid No.1 of Green Gun		
Pin 9:	Grid No.4		
Pin 11:	Cathode of Blue Gun		
Pin 12:	Grid No.1 of Blue Gun		
Pin 13:	Grid No.2 of Blue Gun		
Pin 14:	Heater		

LOCATION OF RADIAL-COVERING POLE PIECES VIEWED FROM SCREEN END OF GUNS



92LM-1251R1

0.5 mR/h ISODOSE – RATE LIMIT CURVE

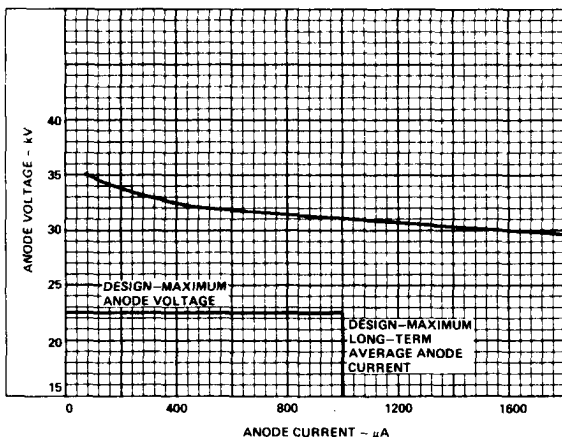


Figure 1

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X-RADIATION LIMIT CURVE AT A CONSTANT ANODE CURRENT OF 300 μ A (X-RADIATION AT A CONSTANT ANODE VOLTAGE VARIES LINEARLY WITH ANODE CURRENT)

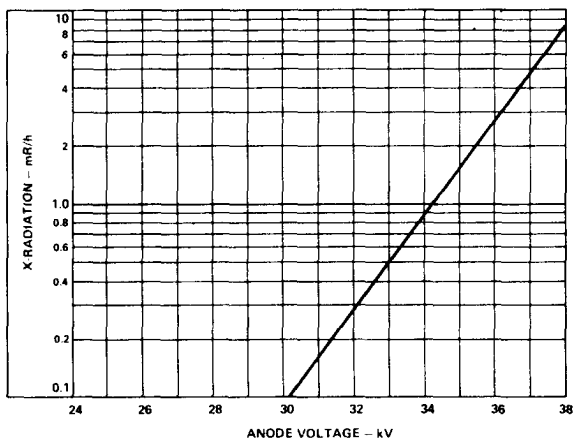
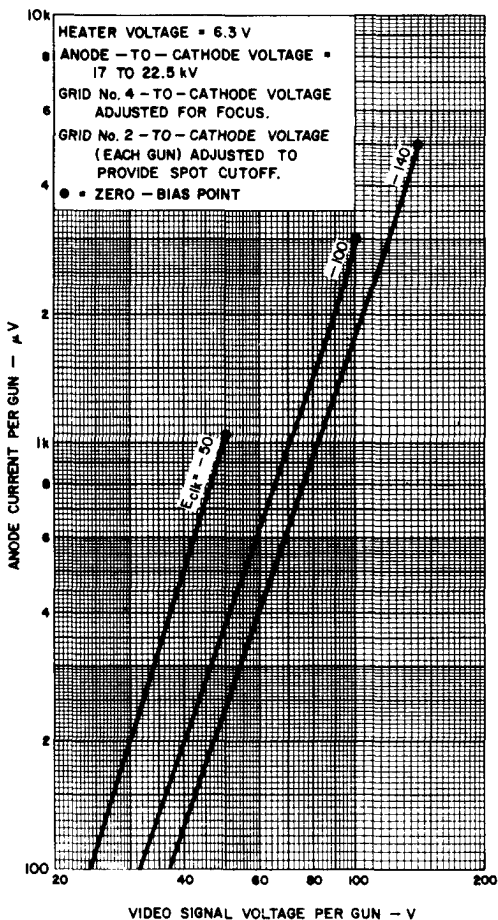


Figure 2

92LS-3296R1

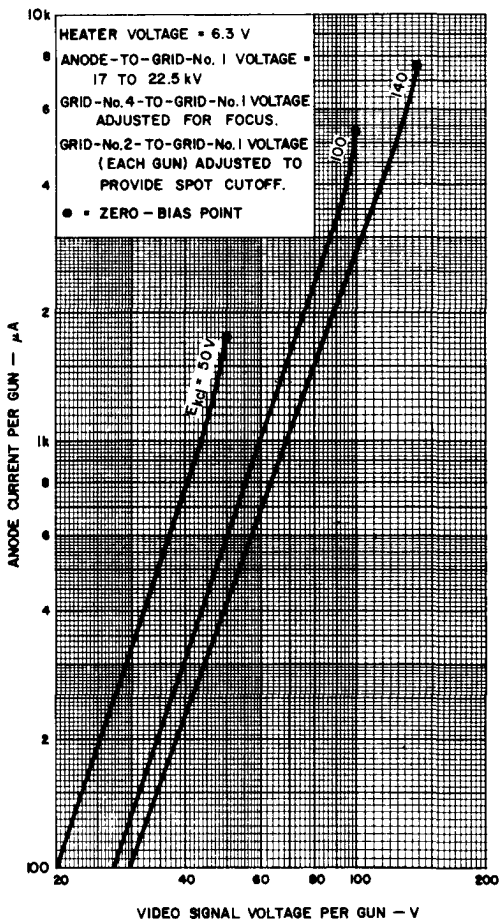
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TYPICAL DRIVE CHARACTERISTICS, GRID-DRIVE SERVICE



92LM-3541

TYPICAL DRIVE CHARACTERISTICS, CATHODE-DRIVE SERVICE



92LM-3542

CUTOFF DESIGN CHART

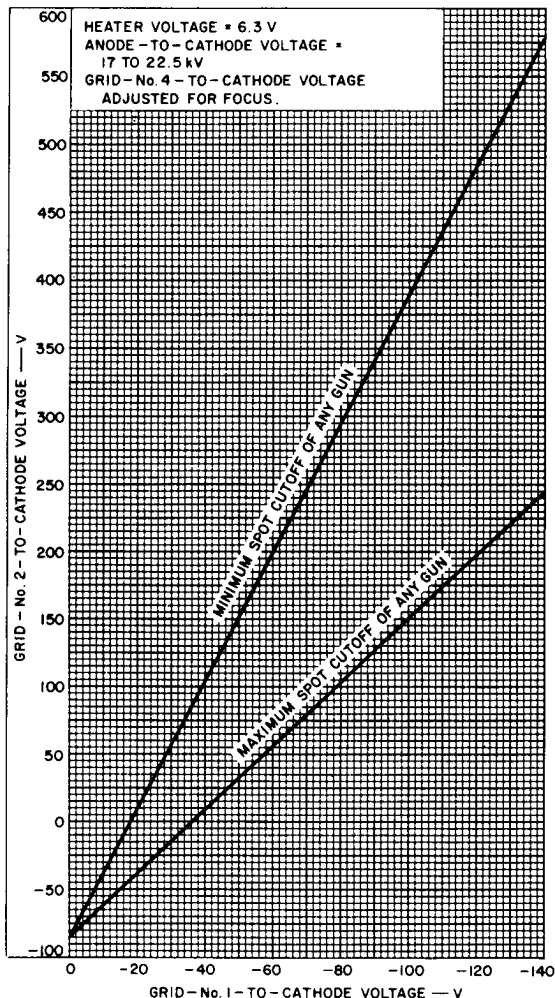


Figure 3