

Color Picture Tube

Perma-Chrome
 90° Rectangular
 Blue-Gun-Down Operation
 New Rare-Earth (Red) Phosphor

Banded-Type Implosion Protection
 Einzel-Lens Focus
 HI-LITE Screen
 Unity Current Ratios

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 volts^a 900 mA

Focusing Method. Electrostatic

Focus Lens Unipotential

Convergence Method Magnetic

Deflection Method Magnetic

Deflection Angles (Approx.):

Diagonal 90 deg.

Horizontal 79 deg.

Vertical 63 deg.

Direct Interelectrode Capacitances (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

External conductive coating
 to anode (Approx.) { 1050 max. pF
 550 min. pF

OPTICAL

Faceplate Filterglass

Light transmission at center
 (Approx.) 52 %

Surface of Faceplate Polished

Screen, on Inner Surface of Faceplate:

Type Aluminized, Tricolor, Phosphor-Dot

Phosphor (three separate phosphors,
 collectively) b P22—New Rare-Earth (Red),
 Sulfide (Blue & Green) Type

Fluorescence and phosphorescence
 of separate phosphors,
 respectively Red, Blue, Green

Persistence of group
 phosphorescence Medium Short

15NP22

Dot Arrangement Triangular group consisting of
red dot, blue dot, and green dot

Spacing between centers of
adjacent dot trios (Approx.) 0.025 in (0.64 mm)

MECHANICAL

Tube Dimensions:

Overall length 15.000 $\pm$.375 in (381.0 $\pm$ 9.5 mm)
Neck length 6.693 $\pm$.188 in (170.0 $\pm$ 4.8 mm)
Diagonal 14.810 $\pm$.093 in (376.2 $\pm$ 2.4 mm)
Greatest width 12.969 $\pm$.093 in (329.4 $\pm$ 2.4 mm)
Greatest height (including tension-
band clip) 10.653 $\pm$.100 in (270.6 $\pm$ 2.5 mm)

Minimum Screen Dimensions (Projected):

Diagonal 13.557 in (344.3 mm)
Greatest width 11.689 in (296.9 mm)
Greatest height 9.139 in (232.1 mm)
Area 102 sq in (658 sq cm)

Bulb Funnel Designation JEDEC No.J117-3/4A1

Bulb Panel Designation JEDEC No.FP118

Base Designation Small-Button Diheptar 12-pin
(JEDEC No.B12-244)

Basing Designation JEDEC No.14BH

Bulb Contact Designation Recessed Small Cavity Cap
(JEDEC No.J1-21)

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

Operating Position Anode Bulb Contact on Top

Weight (Approx.) 11.3 lb (5.1 kg)

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 $\left\{ \begin{array}{l} 22,500 \text{ max. volts} \\ 17,000 \text{ min. volts} \end{array} \right.$

Total Anode Current,
Long-Term Average 750 max. μ A

Grid-No.4 (Focusing Electrode) Voltage

Positive value 1100 max. volts
Negative value 550 max. volts

Peak Grid-No.2 Voltage,
Including Video Signal Voltage 1000 max. volts



Grid-No.1 Voltage:

Negative bias value	400 max. volts
Negative operating cutoff value . .	140 max. volts
Positive bias value	0 max. volts
Positive peak value	2 max. volts

Heater Voltage (ac or dc):

Under operating conditions ^a	} 6.9 max. volts 5.7 min. volts
Under standby conditions ^c	
	5.5 max. volts

Peak Heater-Cathode Voltage:**Heater negative with respect to cathode:**

During equipment warm-up period not exceeding 15 seconds . .	450 max. volts
---	----------------

After equipment warm-up period:

Combined AC and DC value	200 max. volts
DC component value	200 max. volts

Heater positive with respect to cathode:

AC component value	200 max. volts
DC component value	0 max. volt

EQUIPMENT DESIGN RANGES

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

For anode voltage between 17,000 and 22,500 volts

Grid-No.4 (Focusing Electrode)

Voltage	-75 to 400 volts
-------------------	------------------

Grid-No.2 and Grid-No.1 Voltages

for Visual Extinction of

Focused Spot . . . See *Cutoff Design Chart*

Maximum Ratio of Grid-No.2 Voltages,

Highest Gun to Lowest Gun in

Any Tube (At grid-No.1 spot

cutoff voltage of -100 volts) 1.86

Heater Voltage:

Under operating conditions ^a	6.3 volts
Under standby conditions	5.0 volts

Grid-No.4 Current (Total) -60 to +60 μ A

Grid-No.2 Current -5 to +5 μ A

To Produce White 9300°K + 27 M.P.C.D.

(CIE Coordinates $x = 0.281$, $y = 0.311$):

Percentage of total anode

current supplied by

each gun (average)

Red	Blue	Green	%
34	32	34	

15NP22

	<i>Red</i>	<i>Blue</i>	<i>Green</i>
Ratio of cathode currents:	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>
Red/blue	0.75	1.10	1.50
Red/green	0.65	1.00	1.50
Blue/green	0.60	0.91	1.30

Displacements, Measured at Center of Screen:

Raster centering displacement:

Horizontal ± 0.47 in (± 11.9 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)

Maximum Required Correction for Register^d (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.

EXAMPLE OF USE OF DESIGN RANGES

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

Anode Voltage 20,000 volts

Grid-No.4 (Focusing

Electrode) Voltage -75 to 400 volts

Grid-No.2 Voltage when circuit design utilizes grid-No.1 voltage of -100 volts for visual extinction of focused spot

150 to 390 volts

Grid-No.1 Voltage for visual extinction of focused spot when circuit design utilizes grid-No.2 voltage of 200 volts

-57 to -125 volts

Heater Voltage:

Under operating conditions^a 6.3 volts

Under standby conditions 5.0 volts

LIMITING CIRCUIT VALUES

Effective grid-No.1-to-cathode-circuit resistance (each gun) 0.75 max. megohm

The low-voltage circuits, including all heater circuits, should be analyzed by assuming the color picture tube heater is connected directly to the receiver chassis ground. Under these conditions the circuits to the elements of all tubes, including the color picture tube, operating from the same



heater winding and all connections of any other circuits to the heater winding should each have an impedance such that their respective power sources in combination will not supply a continuous short circuit current of more than 750 mA total in the assumed picture tube heater ground connection. The leads from all other circuits must be separated from the picture tube leads by a minimum distance of 0.25 inch (6.4 mm) to prevent energy transfer to the picture tube circuits. Such current limitation will help prevent picture tube damage in case of momentary cascade arcing.

^aFor maximum cathode life, it is recommended that the heater supply be regulated at 6.3 volts. The series impedance to any chassis connection in the DC biasing circuit for the heater should be between 100,000 ohms and 1 megohm.

^bFor curve, see *Group Phosphor-P22-New Rare-Earth (Red), Sulfide (Blue & Green)* at front of this section.

^cFor "instant on" applications, 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.

^dRegister is defined as the relative position of the beam trios with respect to the associated phosphor-dot trios.

X-RADIATION WARNING

Because the 15NP22 is designed to be operated at anode voltages as high as 22.5 kilovolts (design-maximum value), shielding of the 15NP22 for X-radiation may be needed to correct against possible injury from prolonged exposure at close range.

NOTES FOR DIMENSIONAL OUTLINE

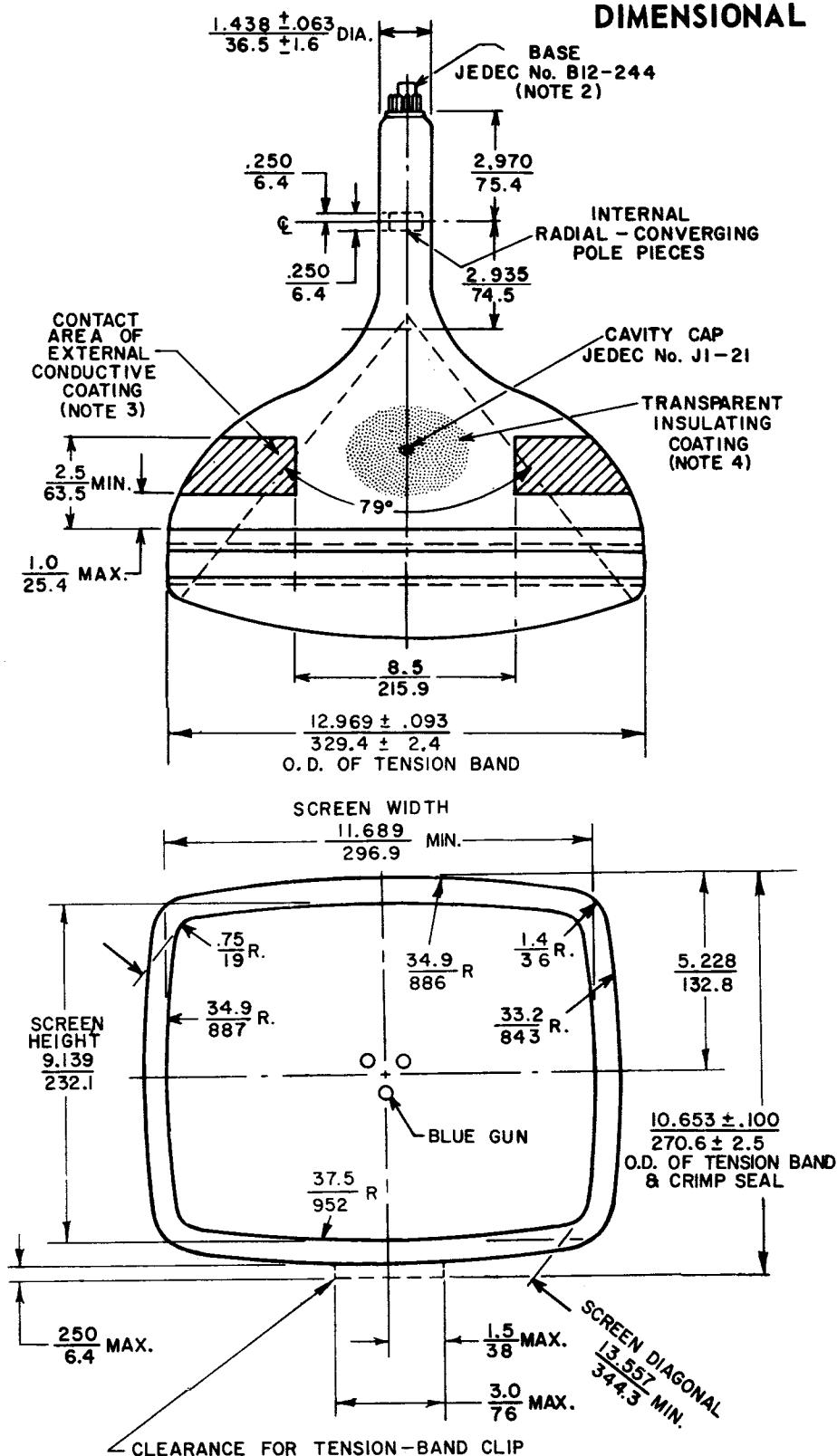
NOTE 1: With tube neck inserted through flared end of reference-line and neck-funnel-contour gauge and with tube seated in gauge, the reference line is determined by the intersection of the plane CC' of the gauge with the glass funnel.

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.

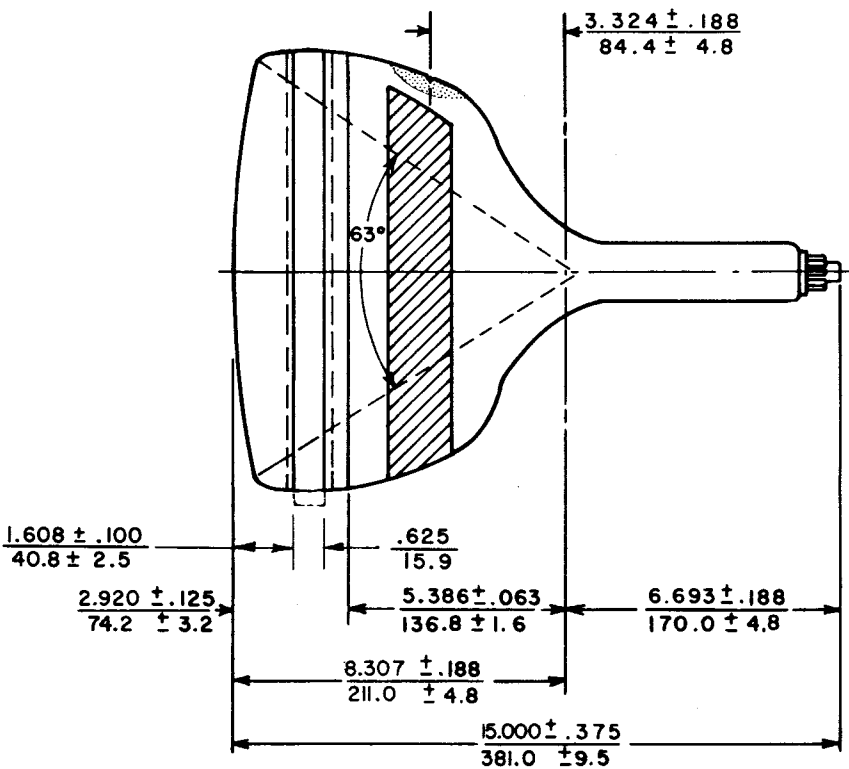
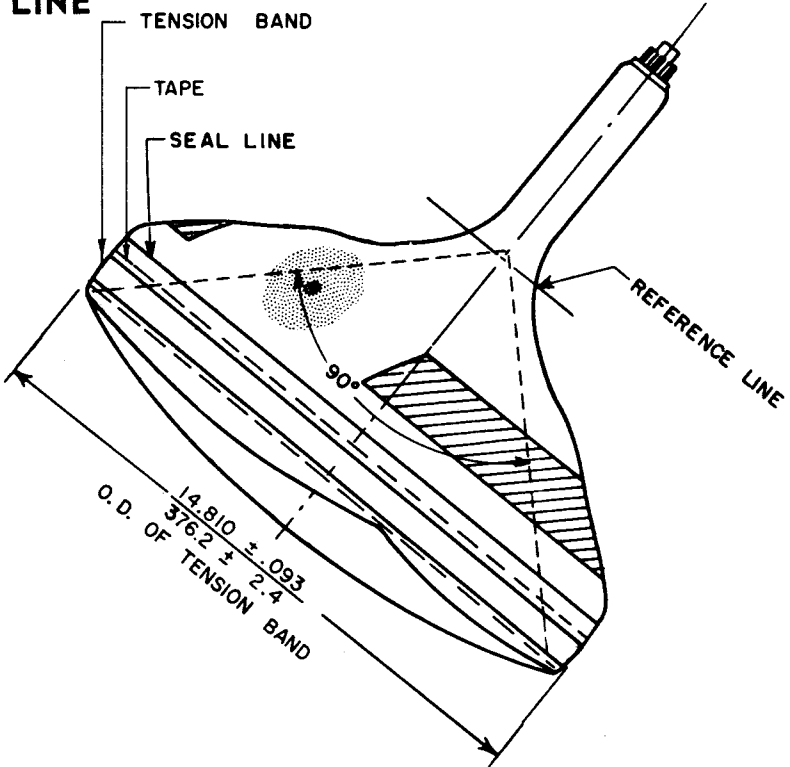
NOTE 3: The drawing shows the size and location of the contact area of the external conductive coating. The actual area of this coating will be greater than that of the contact area so as to provide the required capacitance. External conductive coating must be grounded with multiple contacts.

NOTE 4: To clean this area, wipe only with soft, dry, lintless cloth.

DIMENSIONAL



OUTLINE



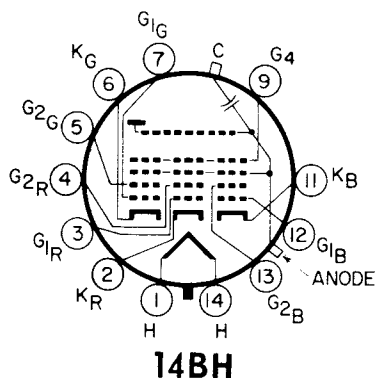
92LL-2071R2

Dimensions In Inches unless otherwise noted
mm

15NP22

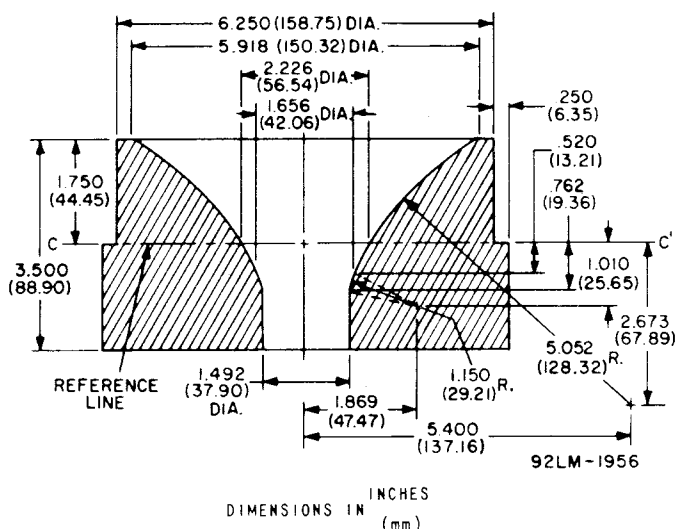
TERMINAL DIAGRAM (Bottom View)

- Pin 1: Heater
- Pin 2: Cathode of Red Gun
- 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



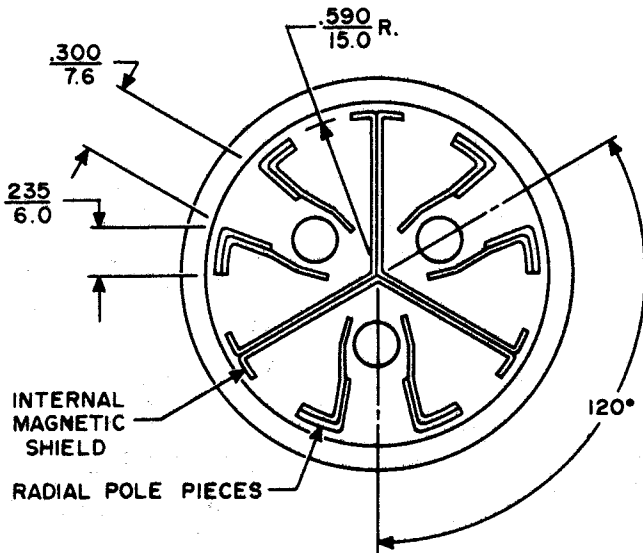
- Cap: Anode (Grid No.3, Grid No.5,
Screen, Collector)
- C: External Conductive Coating

REFERENCE-LINE AND NECK-FUNNEL-CONTOUR GAUGE JEDEC No.G162



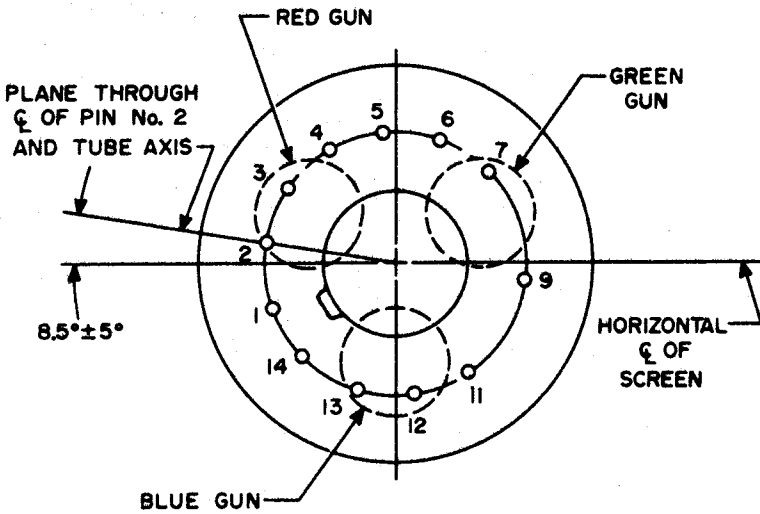
Reference Line is determined by plane CC' when gauge is seated.

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



92LM-1251R1

BOTTOM VIEW OF BASE



92LM-1252

15NP22

CUTOFF DESIGN CHART

