

Color Picture Tube

Ultra-Rectangular
4 x 3 Aspect Ratio

Hi-Lite Matrix Screen
Light-Neutral Screen Appearance

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 Bipotential

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.3 to all other electrodes 6.5 pF

All cathodes to all other electrodes 15 pF

Capacitance Between Anode and External

Conductive Coating $\left\{ \begin{array}{l} 2500 \text{ max. pF} \\ 2000 \text{ min. pF} \end{array} \right.$

Optical:

Faceplate and Safety Panel Filterglass

Light transmission at center (Approx.) 66%

Surface of Safety Panel Treated to minimize
specular reflection

Screen Aluminized

Matrix Black opaque material

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

Persistence Medium-Short

Array 566,000 Dot trios

Spacing between centers of adjacent
dot trios (approx.) 0.026 in (0.66 mm)

Mechanical:

Minimum Screen Area (Projected) 315 sq. in (2032 sq. cm)

Bulb Funnel Designation JEDEC No.J208-3/4 B1/D1

Bulb Panel Designation JEDEC No.FP209-3/4 W2

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

Basing Designation JEDEC No.14BE

Pin Position Alignment Pin No.12 Aligns Approx. with
Anode Bulb Contact

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Operating Position, preferred Anode Bulb Contact on Top
Gun Configuration Delta
Weight (Approx.) 49 lb (22.3 kg)

Implosion Protection:

Integral Safety Panel JEDEC No.SP209-1/4A1

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	{ 27.5 max. 20 min.	kV kV
Anode Current, Long-Term Average ^b . . .	1000 max.	μA
Grid-No.3 (Focusing Electrode) Voltage	6000 max.	V
Peak-Grid-No.2 Voltage, Including Video Signal Voltage	1000 max.	V
Grid-No.1 Voltage:		
Negative bias value	400 max.	V
Negative operating cutoff value	200 max.	V
Positive bias value	0 max.	V
Positive peak value	2 max.	V
Heater Voltage (ac or dc): ^c		
Under operating conditions	{ 6.9 max. 5.7 min.	V V
Under standby conditions ^d	5.5 max.	V
Heater-Cathode Voltage:		
Heater negative with respect to cathode:		
During equipment warm-up period not exceeding 15 seconds	450 max.	V
After equipment warm-up period:		
DC component value	200 max.	V
Peak value	200 max.	V
Heater positive with respect to cathode:		
DC component value	0 max.	V
Peak value	200 max.	V

Equipment Design Ranges:

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

For anode voltages between 20 and 27.5 kV

Grid-No.3 (Focusing Electrode) Voltage 16.8% to 20% of
Anode voltage

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	95 to 295 V
At Grid No.1 voltage of -125 V	205 to 535 V
At Grid No.1 voltage of -175 V	315 to 780 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.3 Current (Total) $\pm 15 \mu\text{A}$ Grid-No.2 Current $\pm 5 \mu\text{A}$ Grid-No.1 Current $\pm 5 \mu\text{A}$

To Produce White Light of	Illum.D 6550°K + 7 M.P.C.D.	Color 9300°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)

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Radial convergence displacement excluding
effects of dynamic convergence
(each beam) ± 0.37 in (± 9.4 mm)

Maximum Required Correction for Register^e
(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	25 kV
Grid No.3 Voltage	Adjusted for focus
Color Temperature	9300° K + 27 M.P.C.D.
Raster Size	20.776 x 15.582 in (527.71 x 395.78 mm)

Typical White-Light Output Measured within 5 in (127 mm) diameter area centered on tube face:

At anode current of 1000 μ A } 54 fL
185 Nit

Limiting Circuit Values:

High-Voltage Circuits:

Grid-No.3 circuit resistance 7.5 max. MΩ

Low-Voltage Circuits:

Effective grid-No.1-to-cathode-circuit resistance (each gun) 0.75 max. $M\Omega$

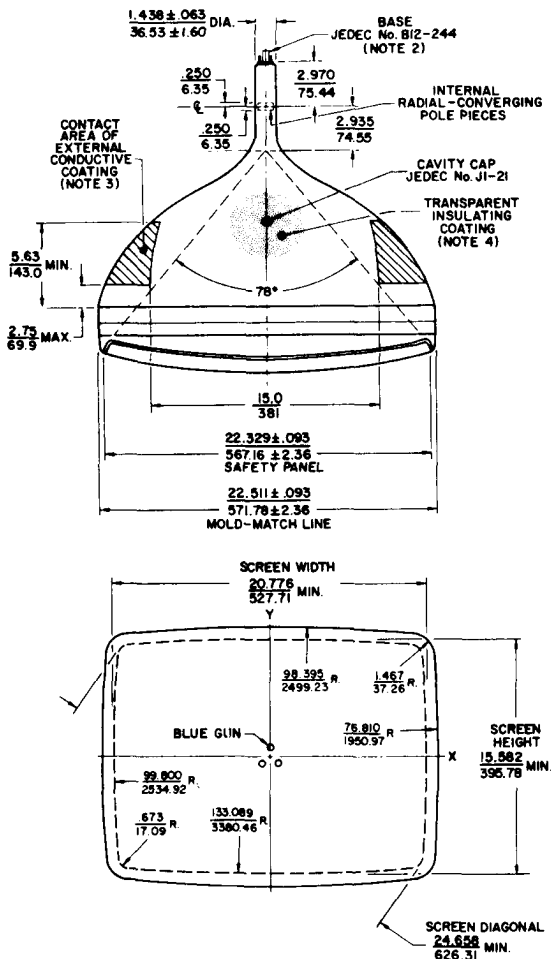
X-Radiation Characteristic:

Maximum Anode Voltage at which the X-radiation emitted
will not exceed 0.5 mR/h at an anode current
of 300 μ A 35 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.

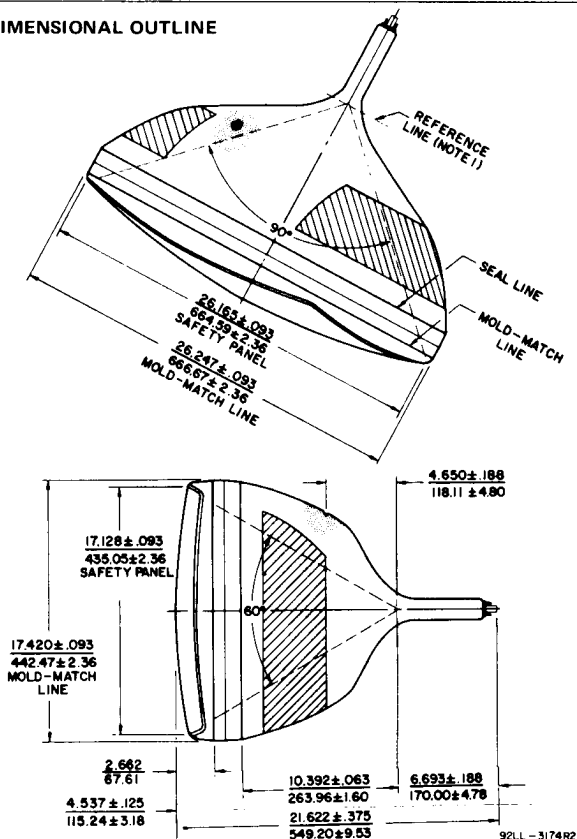
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DIMENSIONAL OUTLINE



Dimensions in inches/mm unless otherwise noted

DIMENSIONAL OUTLINE



Sagittal Heights with Reference to Centerface at Points (3.18 mm) Beyond Edge of Minimum Screen.

Station No.	Coordinates		Sagittal Height
	X	Y	
	in (mm)	in (mm)	in (mm)
1 (Minor)	0 (0)	7.916 (201.07)	.680 (17.27)
2	1.000 (25.40)	7.912 (200.96)	.692 (17.58)
3	2.000 (50.80)	7.901 (200.69)	.730 (18.54)
4	3.000 (76.20)	7.882 (200.20)	.791 (20.09)
5	4.000 (101.60)	7.856 (199.54)	.877 (22.28)
6	5.000 (127.00)	7.822 (198.68)	.987 (25.07)

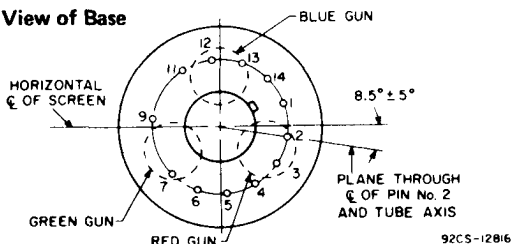
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Sagittal Heights (Cont'd)

7	6.000 (152.40)	7.781 (197.64)	1.121 (28.47)
8	7.000 (177.80)	7.732 (196.39)	1.279 (32.49)
9	8.000 (203.20)	7.676 (194.97)	1.461 (37.11)
10	9.000 (228.60)	7.612 (193.34)	1.668 (42.37)
11	9.540 (242.32)	7.574 (192.38)	1.790 (45.47)
12 (Diagonal)	10.132 (257.35)	7.242 (183.95)	1.878 (47.70)
13	10.279 (261.09)	6.832 (173.53)	1.841 (46.76)
14	10.333 (262.46)	6.000 (152.40)	1.720 (43.69)
15	10.388 (263.86)	5.000 (127.00)	1.595 (40.51)
16	10.433 (265.00)	4.000 (101.60)	1.492 (37.90)
17	10.468 (265.89)	3.000 (76.20)	1.412 (35.86)
18	10.493 (266.52)	2.000 (50.80)	1.355 (34.42)
19	10.508 (266.90)	1.000 (25.40)	1.320 (33.53)
20 (Major)	10.513 (267.03)	0 (0)	1.308 (33.22)

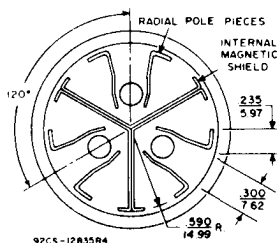
Bottom View of Base



Base Specification — JEDEC No.14BE

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

Location of Radial-Converging Pole Pieces Viewed from Screen End of Guns



0.5 mR/h ISODOSE - RATE LIMIT CURVE

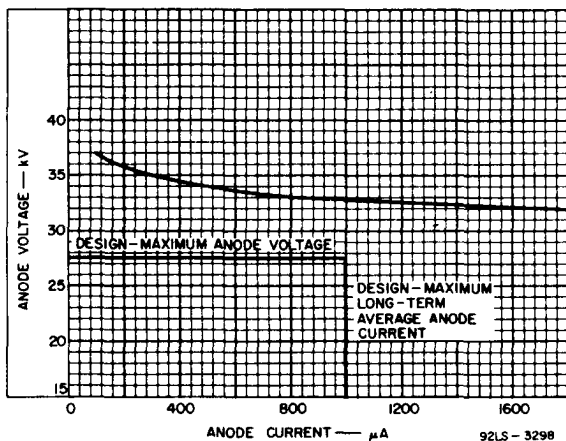


Figure 1

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

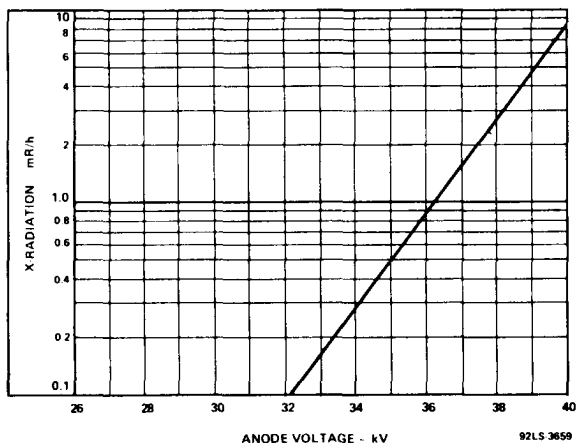
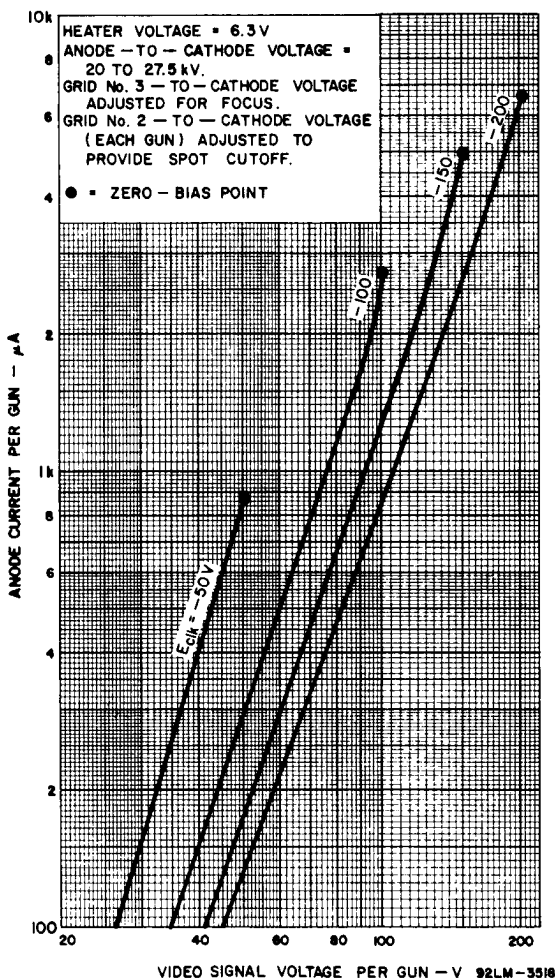
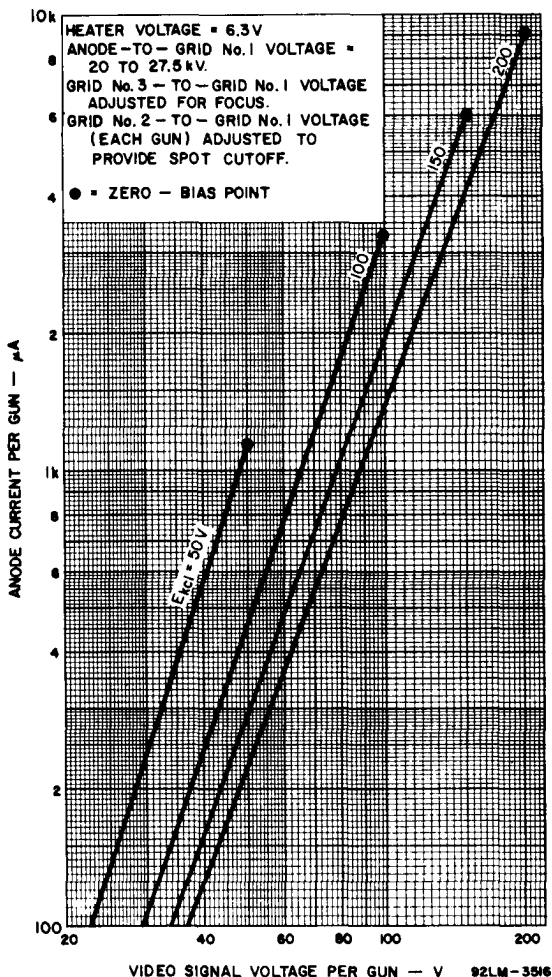


Figure 2

TYPICAL DRIVE CHARACTERISTICS, GRID-DRIVE SERVICE

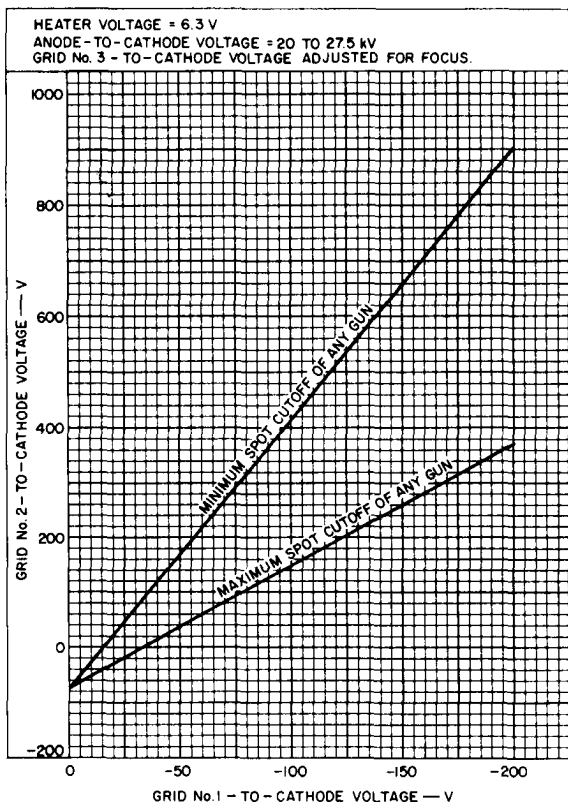


TYPICAL DRIVE CHARACTERISTICS,
CATHODE-DRIVE SERVICE



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CUTOFF DESIGN CHART



92LM-316IRI

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

Figure 3