



# COLOR PICTURE TUBE

## A56-160X

TENTATIVE DATA

The Hitachi A56-160X is a 560 mm (22 inch), 110° ultra-rectangular color picture tube. The wider deflection angle results in a tube 84 mm shorter than 90° type. The smaller neck diameter minimizes the increase in power required for the wider deflection angle. Useful minimum screen height is 336.7 mm (13.26 inch), and useful minimum screen width is 445.4 mm (17.54 inch).

### FEATURES

- Wide angle deflection — 110°
- Shorter overall length — 388.7 mm (15.30 inch)
- Narrow neck diameter — 29.1 mm (1.146 inch)
- Internal magnetic shield
- Ultra-rectangular — 4 x 3 aspect ratio
- For PST (Precision Static Toroid) deflection yoke
- Banded type implosion protection for "Push through" cabinet design

### ELECTRICAL DATA

Electron guns, three with axes  
 Tilted toward tube axis ..... Red, blue, green  
 Heater current at 6.3 volts ..... 750 mA  
 Focusing method ..... Electrostatic  
 Focus lens ..... Bi-potential  
 Deflection method ..... Magnetic  
 Deflection angles (approx.):  
 Diagonal ..... 110 deg.  
 Direct interelectrode capacitances (approx.)  
 Grid-No. 1 of any gun to all other electrodes ..... 5 pF  
 All cathodes to all other electrodes ..... 15 pF  
 Grid-No. 3 to all other electrodes ..... 4 pF  
 External conductive coating to anode ..... 2200 pF max.  
 (Including implosion protection hardware) 1000 pF min.

### OPTICAL DATA

Light transmission at center (approx.) ..... 52.0 %  
 Screen, on inner surface of faceplate ..... Aluminized,  
 Tricolor, phosphor-dot  
 Phosphor (three separate phosphors,  
 collectively) ..... P22-new rare-earth (red),  
 sulfide (blue & green) type  
 Dot arrangement ..... Triangular group consisting of  
 red dot, blue dot and green dot  
 Spacing between centers of adjacent  
 dot trios (approx.) ..... 0.69 mm (0.027 in.)

### MECHANICAL DATA

Minimum useful screen area ..... 1459 cm<sup>2</sup> (226 sq. in.)

Funnel ..... EIAJ No. J560C1  
 Panel ..... EIAJ No. J560H1  
 Gun Position Alignment ..... Blue gun aligns approx.  
 with anode contact  
 Implosion protection ..... "Push through" banded type  
 Weight (approx.) ..... 15.0 kg (33.1 lbs.)

### MAGNETIC SHIELDING, DEGAUSSING

The tube is provided with an internal magnetic shield. The internal magnetic shield and the shadow-mask with its suspension system may be provided with an automatic degaussing system, consisting of two coils covering top and bottom cone parts. For proper degaussing an initial m.m.f. of 450 ampere-turns is required in each of the coils. This m.m.f. has to be gradually decreased by appropriate circuitry. To prevent beam landing disturbances by line-frequency currents induced in the degaussing coils, these coils should be shunted by a capacitor of sufficiently high value. In the steady state no significant m.m.f. should remain in the coils (<0.5 A.t.). To ease the mounting of the coils, the rimband is provided with rectangular holes.

### MAXIMUM AND MINIMUM RATINGS

(Design-maximum values)

Unless otherwise specified, voltage values are for each gun and values are positive with respect to cathode.  
 Anode voltage ..... 27,500 volts max.  
 20,000 volts min.  
 Total anode current, long-term average ..... 1,000  $\mu$ A max.  
 Grid No. 3 (focusing electrode) voltage ..... 6,000 volts max.  
 Peak grid-No. 2 voltage,  
 including video signal voltage ..... 1,000 volts max.  
 Grid-No. 1 voltage:  
 Negative bias value ..... 400 volts max.  
 Negative operating cutoff value ..... 200 volts max.  
 Positive bias value ..... 0 volts max.  
 Positive peak value ..... 2 volts max.  
 Heater voltage (AC or DC) ..... 6.9 volts max.  
 5.7 volts min.  
 Under standby conditions ..... 5.5 volts max.  
 Peak heater-cathode voltage:  
 Heater negative with respect to cathode:  
 During equipment warm-up period  
 not exceeding 15 seconds ..... 450 volts max.  
 After equipment warm-up period ..... 200 volts max.  
 Heater positive with respect to cathode:  
 AC component ..... 200 volts max.  
 DC component ..... 0 volt max.

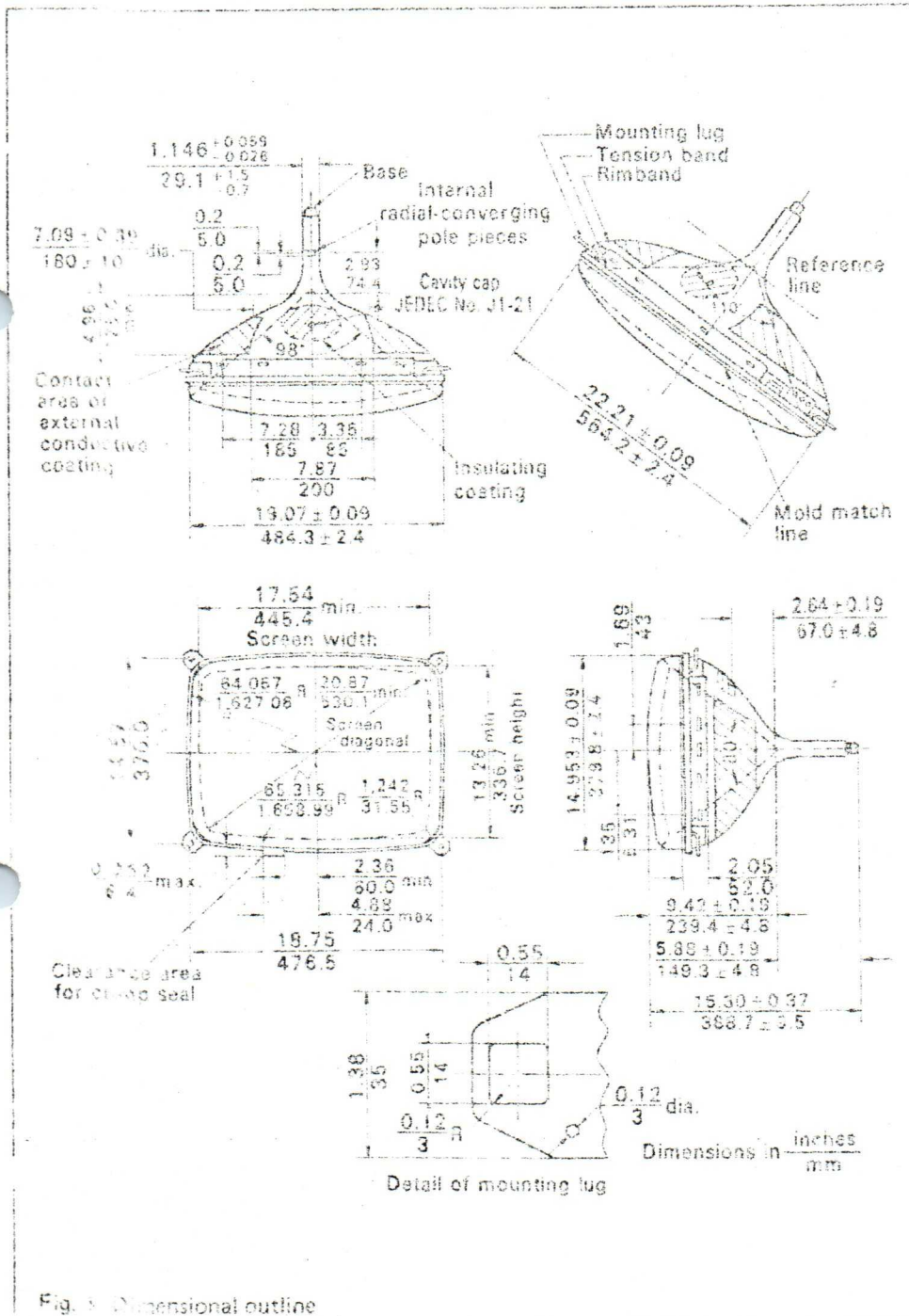
## EXAMPLES OF USE OF DESIGN RANGES

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

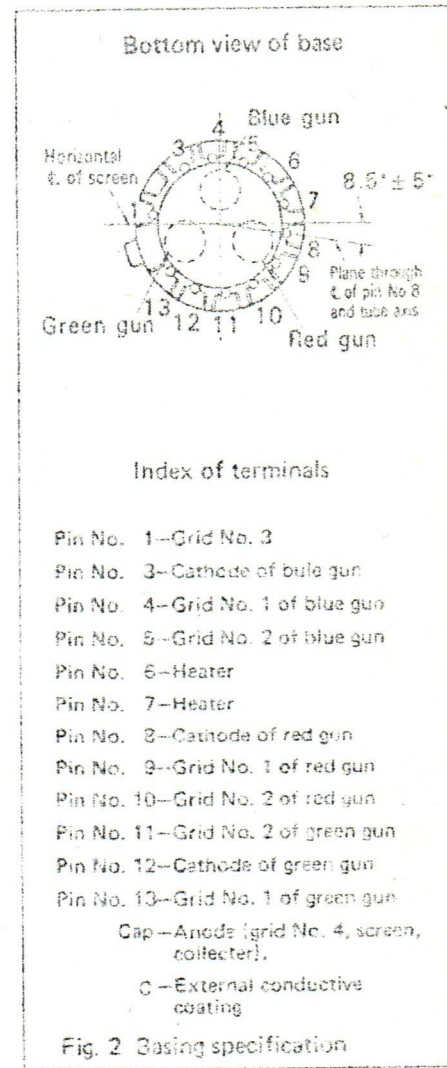
- Anode voltage ..... 25,000 volts
- Grid-No. 1 (focusing electrode) voltage . . . 4,200 to 5,000 volts
- Grid-No. 2 voltage when circuit design utilizes grid-No. 1 voltage of -150 volts

- for visual extinction of focused spot . . . . . 285 to 685 volts
- Grid-No. 1 voltage for visual extinction of focused spot when circuit design utilizes grid-No. 2 voltage of 400 volts . . -95 to -190 volts
- Heater voltage:
  - Under operating condition . . . . . 6.3 volts
  - Under standby condition . . . . . 5.0 volts

## DIMENSIONAL OUTLINE



## BASING SPECIFICATION



ANNEX  
ML-TE  
CRT74/11-12  
CRT75/01

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GENERAL DATA

ANNEX  
ML-TE  
CRT74/11-12  
CRT75/01  
- 9 -

1. Electrical:

Electron Guns, Three with Axes  
Tilted Toward Tube Axis ..... Red, Blue, Green  
Heater Current at 6.3 volts ..... 750 mA  
Focusing Method ..... Electrostatic  
Focus Lens ..... Bi-potential  
Convergence Method ..... Magnetic  
Deflection Method ..... Magnetic  
Deflection Angles (Approx.):  
Diagonal ..... 110 deg.  
Direct Interelectrode Capacitances (Approx.)  
Grid-No. 1 of any gun  
to all other electrodes ..... 5 pF  
All cathodes to all other electrodes ..... 15 pF  
Grid-No. 3 to all other electrodes ..... 4 pF  
External conductive coating to anode ..... 2200 max. pF  
(including Implosion Protection Hardware) ..... 1600 min. pF

2. Optical:

Light transmission at center (Approx.) ..... 52.0 %  
Screen, on Inner Surface of Faceplate ..... Aluminized,  
Tricolor, Phosphor-Dot  
Phosphor (three separate phosphors,  
collectively) ..... P22-New Rare-Earth(Red),  
Sulfide (Blue & Green) Type  
Dot Arrangement ..... Triangular group consisting of  
red dot, blue dot and green dot  
Spacing between centers of adjacent  
dot trios (Approx.) ..... 0.69 mm (0.027 in.)

3. Mechanical:

Overall Length ..... 388.7 ± 9.5 mm (15.30 ± 0.38 in.)  
Minimum Useful Screen Dimensions (Projected):  
Diagonal ..... 530.1 mm (20.87 in.)  
Horizontal Axis ..... 445.4 mm (17.54 in.)  
Vertical axis ..... 336.7 mm (13.26 in.)  
Area ..... 1459 cm<sup>2</sup> (226 sq. in.)  
Bulb:  
Funnel ..... EIAJ No. J560C1  
Panel ..... EIAJ No. J560H1  
Gun Position Alignment ..... Blue gun aligns approx. with anode contact  
Implosion Protection ..... "Push Through" Banded type  
Weight (Approx.) ..... 15.0 Kg (33.1 lbs)

4. Magnetic shielding, degaussing:

The tube is provided with an internal magnetic shield. The internal magnetic shield and the shadow-mask with its suspension system may be provided with an automatic degaussing system, consisting of two coils covering top and bottom cone parts. For proper degaussing an initial m.m.f. of 450 ampere-turns is required in each of the coils. This m.m.f. has to be gradually decreased by appropriate circuitry. To prevent beam landing disturbances by line-frequency currents induced in the degaussing coils, these coils should be shunted by a capacitor of sufficiently high value. In the steady state no significant m.m.f. should remain in the coils (≤ 0.5 A.t). To ease the mounting of the coils, the rimband is provided with rectangular holes.

H.achi.Ltd. Electron Tube Div.	DATE Feb. 6, 1975	SH No. 284PS 0507 - A56-160X - 11	1/1
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GENERAL DATA

ANNEX  
ML-TE  
CRT74/11-12  
CRT75/01  
- 9 -

1. Electrical:

Electron Guns, Three with Axes  
Tilted Toward Tube Axis ..... Red, Blue, Green  
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Grid-No. 3 to all other electrodes ..... 4 pF  
External conductive coating to anode ..... 2200 max. pF  
(including Implosion Protection Hardware) ..... 1600 min. pF

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Tricolor, Phosphor-Dot  
Phosphor (three separate phosphors,  
collectively) ..... P22-New Rare-Earth (Red),  
Sulfide (Blue & Green) Type  
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Hitachi Ltd.  
Electron Tube Div.

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RATINGS AND ELECTRICAL DATA FOR BPF TYPE GUN

1. Maximum and Minimum Ratings, (Design-Maximum Values):

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

Anode Voltage .....	27,500 max. volts
	20,000 min. volts
Total Anode Current,	
Long-Term Average .....	1,000 max. $\mu$ A
Grid-No. 3 (Focusing Electrode) Voltage .....	6,000 max. volts
Peak Grid-No. 2 Voltage,	
Including Video Signal Voltage .....	1,000 max. volts
Grid-No. 1 Voltage:	
Negative bias value .....	400 max. volts
Negative operating cutoff value .....	200 max. volts
Positive bias value .....	0 max. volts
Positive peak value .....	2 max. volts
Heater Voltage (ac or dc) .....	6.9 max. volts
	5.7 min. volts
	5.5 max. volts
Under standby conditions .....	
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 .....	200 max. volts
Heater positive with respect to cathode:	
AC component .....	200 max. volts
DC component .....	0 max. volts

2. Equipment Design Ranges:

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

for anode voltages between 20,000 and 27,500 volts

Grid-No. 3 (Focusing Electrode) Voltage .....	16.8 % to 20 %		
		of Anode voltage	
Grid-No. 2 and Grid-No. 1 Voltage for Visual			
Extinction of Focused Spot .....	See CUTOFF DESIGN CHART		
		in 284PS 0509-901-1	
Maximum Ratio of Grid-No. 2			
Highest Gun to Lowest Gun in Any Tube (At Grid-No.1			
Spot Cutoff Voltage of -100 volts) .....	1.86		
Grid-No. 3 Current (Total) .....	-15 to +15 $\mu$ A		
Grid-No. 2 Current .....	-5 to +5 $\mu$ A		
To Produce White of 9300° K + 27 M.P.C.D.			
(CIE Coordinates x = 0.281, y = 0.311):			
Percentage of total anode current supplied	Red	Blue	Green
by each gun (average) .....	36.8	26.4	36.8%
Ratio of cathode currents	Min.	Typ.	Max.
Red to Green .....	0.5	1.0	1.6
Red to Blue .....	0.8	1.4	2.0

Hitachi, Ltd.  
Electron Tube Div.

DATE Sept. 3, 1973

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Displacements, Measured at Center of Screen:

Raster centering displacements:

Horizontal .....	±11.4 mm (±0.45 in)
Vertical .....	±11.4 mm (±0.45 in)
Lateral convergence displacement of blue beam with respect to converged red and green beams .....	± 5.3 mm (±0.21 in)
Radial convergence displacement excluding effects of dynamic convergence (each beam) .....	± 6.6 mm (±0.26 in)
Maximum Required Correction for Register (Including Effect of Earth's Magnetic Field when Using Recommended Components) as Measured at the center of the screen in any Direction .....	0.13 mm (0.005 in)

3. Examples of Use of Design Ranges:

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

Anode Voltage .....	25,000	volts
Grid-No. 3 (Focusing Electrode) Voltage .....	4,200 to 5,000	volts
Grid-No. 2 Voltage when circuit design utilizes grid-No. 1 voltage of -150 volts for visual extinction of focused spot .....	285 to 685	volts
Grid-No. 1 Voltage for visual extinction of focused spot when circuit design utilizes grid-No. 2 voltage of 400 volts .....	-95 to -190	volts
Heater Voltage (Note 1.):		
Under operating condition .....	6.3	volts
Under standby condition .....	5.0	volts

4. Limiting Circuit Values:

High-voltage Circuits:

In order to minimize the possibility of damage to the tube caused by a momentary internal arc, it is recommended that the high-voltage power supply and the grid-No.3 power supply be of the limited-energy type.

Grid-No. 3 circuit resistance ..... 7.5 Max. megohms

Low-Voltage Circuits:

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

The low voltage circuits should be analyzed by assuming the color picture tube heater is connected directly to the receiver chassis ground. Under these conditions the grid-No. 2-to-heater circuit, the grid-No. 1-to-heater circuit, and the cathode-to-heater circuits of all other tubes operating from the same heater winding as the color picture tube 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 milliamperes total. Such current limitation will prevent heater burnout in case of a momentary internal arc within the color picture tube.

Note 1. For maximum cathode life, it is recommended that the heater supply be regulated.

Hitachi, Ltd. Electron Tube Div.	DATE Apr. 19, '73	SHEET No. 284PS 0507 - 1 - 2	2
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X-Radiation Limit for 21V Color Picture Tube

Maximum Anode Voltage at which the X-radiation emitted will not exceed 0.5 mR/h  
 at an anode current of 300  $\mu$ A ..... 33 KV

The X-radiation emitted from this picture tube, as measured in accordance with the procedure of JEDEC Publication No.64C, will not exceed 0.5 mR/h throughout the useful life of the tube when operated within the Design-Maximum ratings.

The tube should not be operated beyond its Design-Maximum ratings stated above, but its X-radiation will not exceed 0.5 mR/h for anode voltage and current combinations given by the isoexposure-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 of the U.S. for Television Receivers, Section 1020.10 of Part 1020 of Title 21, Code of Federal Regulation (PL90-602) as published in Federal Register Volume 38, No, 198, Monday, October 15, 1973.

Maximum X-radiation as a function of anode voltage at 300  $\mu$ A anode current is shown by the curve in Figure 2. X-radiation at a constant anode voltage varies linearly with anode current.

Hitachi Ltd. Electron Tube Div.	DATE June 5, 1974	SH No 284PS 0508 - 21V - 1	1/2
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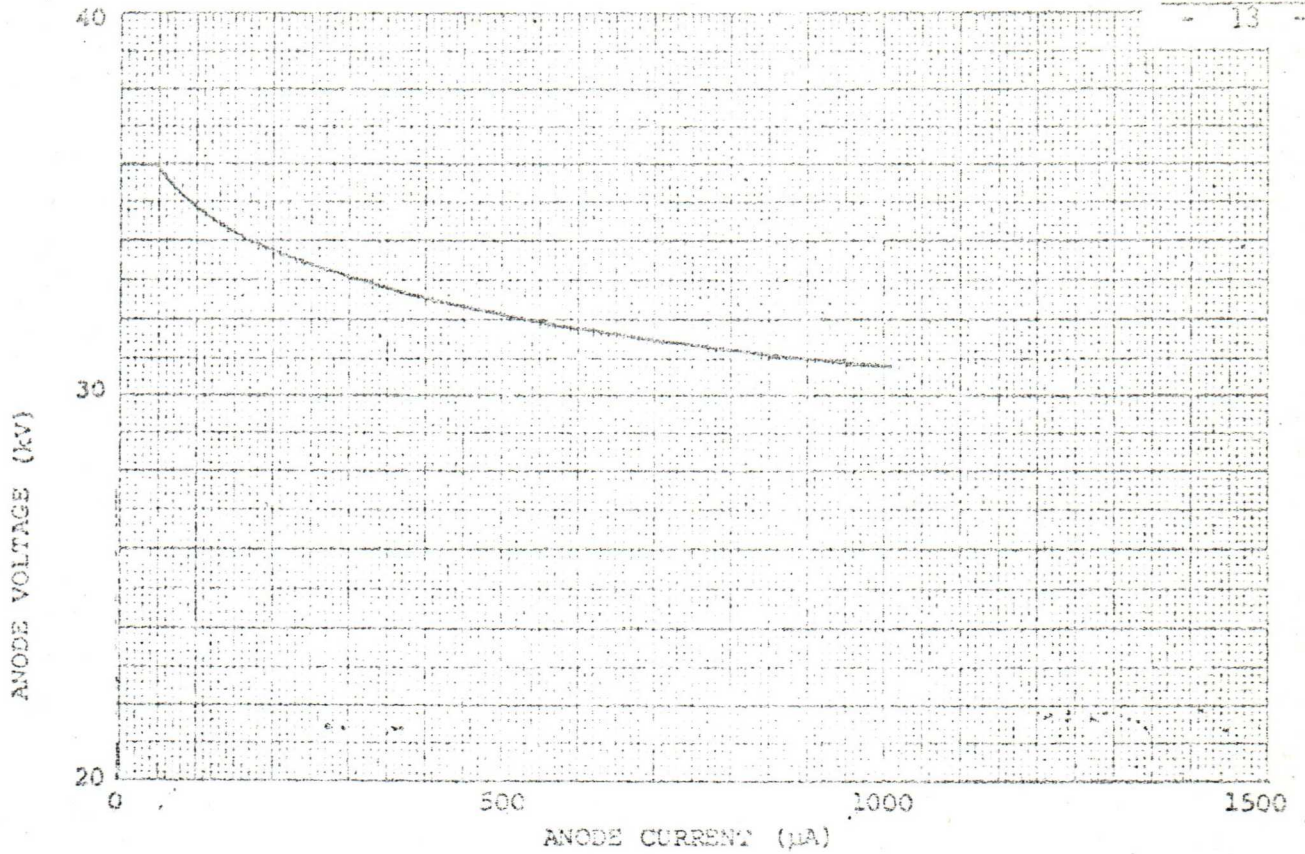


Fig. 1 0.5 mR/h Isoexposure - Rate Limit Curve

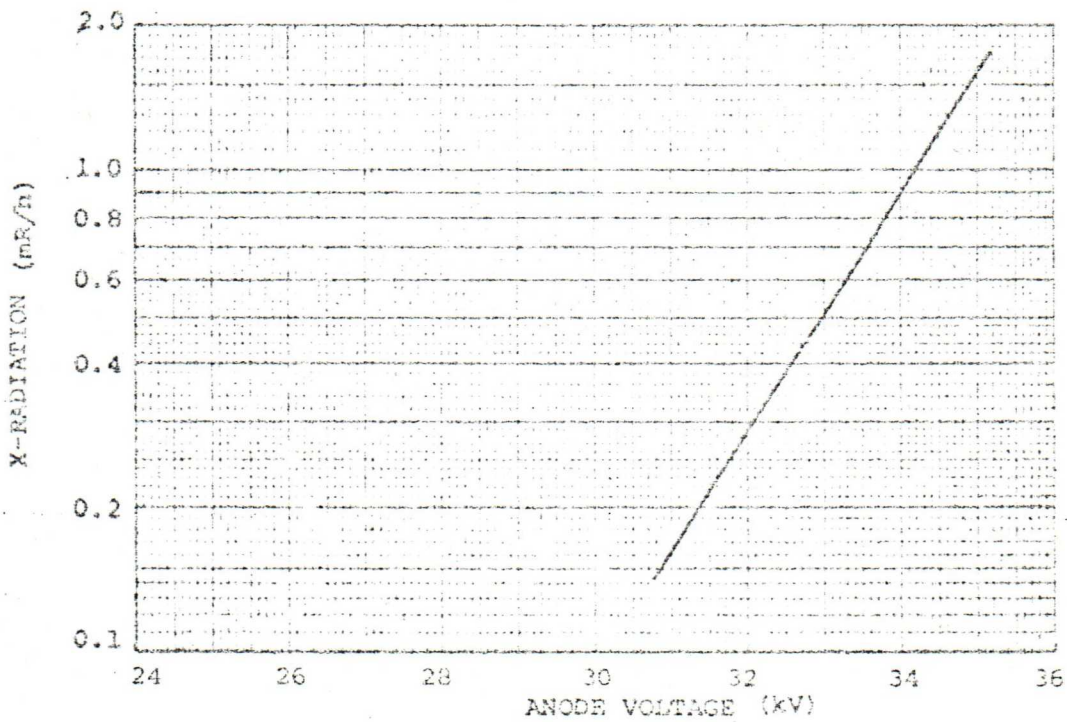


Fig. 2 X-radiation Limit Curve at a Constant Anode Current of 300μA

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WARNING

**X-Radiation:**

Operation of this color picture tube at abnormal conditions which exceed the 0.5 mR/h isodose-rate curve shown in 284PS0508 may produce soft X-rays which may constitute a health hazard on prolonged exposure at close range unless adequate external shielding is provided. Therefore, precautions must be exercised during servicing of TV receivers employing this tube to assure that the anode voltage and other tube voltages are adjusted to the recommended values so that the Design-Maximum Ratings will not be exceeded.

**Tube Replacement:**

This picture tube employs integral X-radiation and implosion protection and must be replaced with a tube of the same type number or a Hitachi recommended replacement to assure continued safety.

**Shock Hazard:**

The high voltage at which the tube is operated may be very dangerous. Design of the TV receiver should include safeguards to prevent the user from coming in contact with the high voltage. Extreme care should be taken in the servicing or adjustment of any high-voltage circuit.

Caution must be exercised during the replacement or servicing of the picture tube since a residual electrical charge may be contained on the high-voltage capacitor formed by the external and internal conductive coatings of the picture tube funnel. To remove any undesirable residual high-voltage charges from the picture tube, "bleed off" the charge by shorting the anode contact button, located in the funnel of the picture tube, to the external conductive coating before handling the tube. Discharging the high voltage to isolated metal parts such as cabinets and control brackets may produce a shock hazard.

**Tube Handling:**

Picture tubes should be kept in the shipping box or similar protective container until just prior to installation. Wear heavy protective clothing, including gloves and safety goggles with side shields, in areas containing unpacked and unprotected tubes to prevent possible injury from flying glass in the event a tube breaks. Handle the picture tube with extreme care. Do not strike, scratch or subject the tube to more than moderate pressure. Particular care should be taken to prevent damage to the seal area.

The receiver mounting system should incorporate sufficient cushioning so that under normal conditions of shipment or handling an impact force of more than 35 G is never applied to the tube.

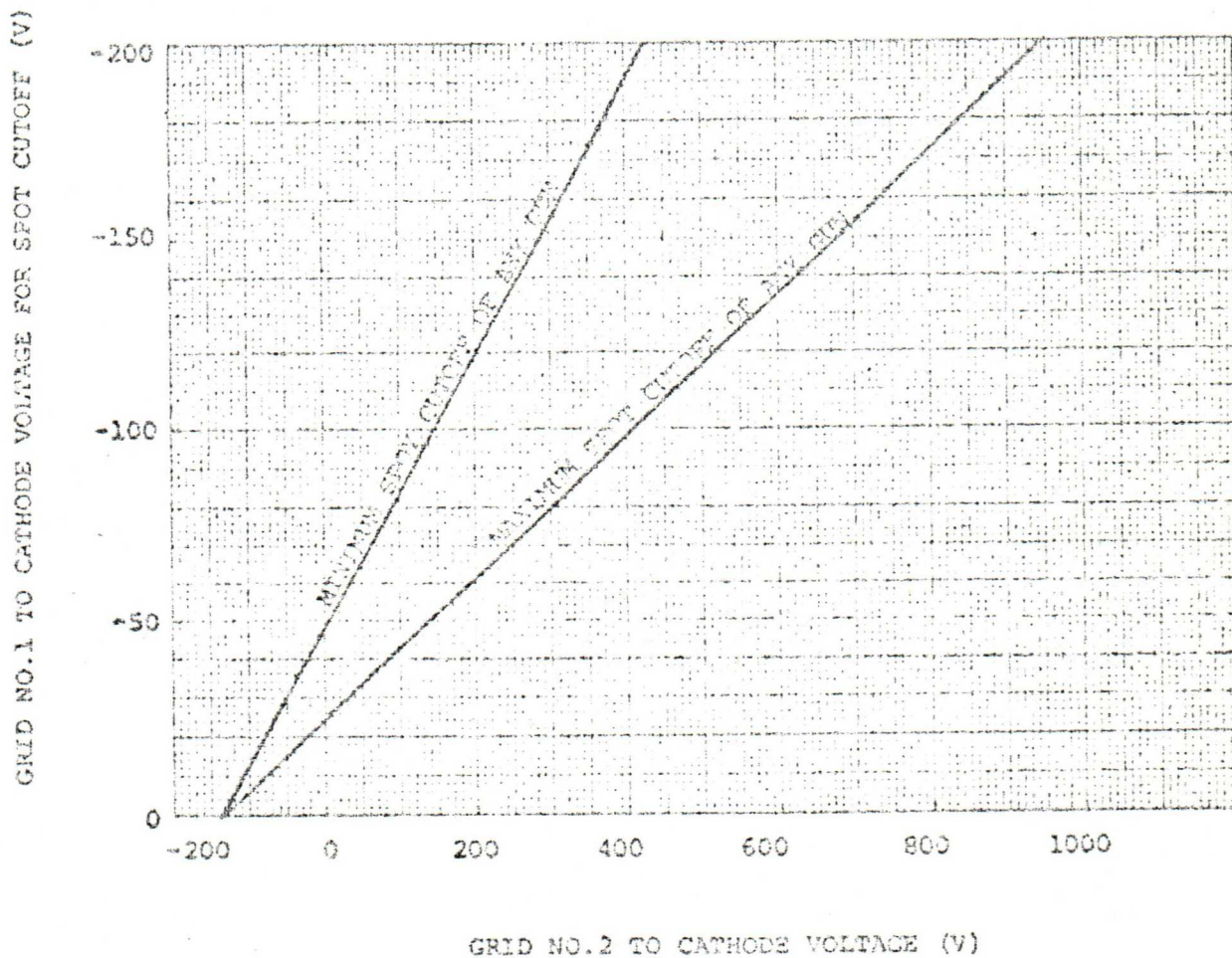
### ARCING PRECAUTIONS

Hitachi Color Picture Tube employs a very strong arc-resistant heater cathode construction. But following precautions are recommended to prevent the possible damage of picture tube and other receiver component caused by internal arcing in picture tube.

- (1) The picture tube heater should be operated from a transformer. And DC bias should be applied to this heater through a divider which consists of resistors having 1/2 W rating and being at least 150 K $\Omega$  each. A 0.1  $\mu$ F, 600 V capacitor should be connected between the divider tie point and the ground.
- (2) Spark gaps are recommended to be placed from Grid No. 1, Grid No. 2 and Grid No. 3 socket leads of picture tube to ground. Recommended breakdown voltage of this spark gap is 2 to 4 KV for Grid No. 1 and Grid No. 2, and 8 to 12 KV for Grid No. 3. Spark gaps should not be connected to picture tube heater of shunt regulator tube cathode or heater.
- (3) When the shunt regulator heater is operated in parallel connection with picture tube heater, a 1 K $\Omega$ , 1/2 W resistor should be used to connect the cathode of this regulator tube to DC voltage source.
- (4) 1 K $\Omega$ , 1/2 W resistors should be connected in series with the Grid No. 2 socket leads. Same methods are also recommended to all other socket leads except heater leads.
- (5) Non-insulated wires and components of picture tube heater connection should be spaced at least 6 mm (0.24 in.) from all other circuit connections including ground. The heater circuit should be sufficiently insulated from any high-energy sources.

CUTOFF DESIGN CHART

HEATER VOLTAGE = 6.3 VOLTS  
ANODE-TO-CATHODE VOLTAGE = 25,000 VOLTS  
GRID-NO.3-TO-CATHODE VOLTAGE ADJUSTED FOR FOCUS.



Philips, Ltd.  
Electron Tube Div.

DATE

Dec. 1, '72

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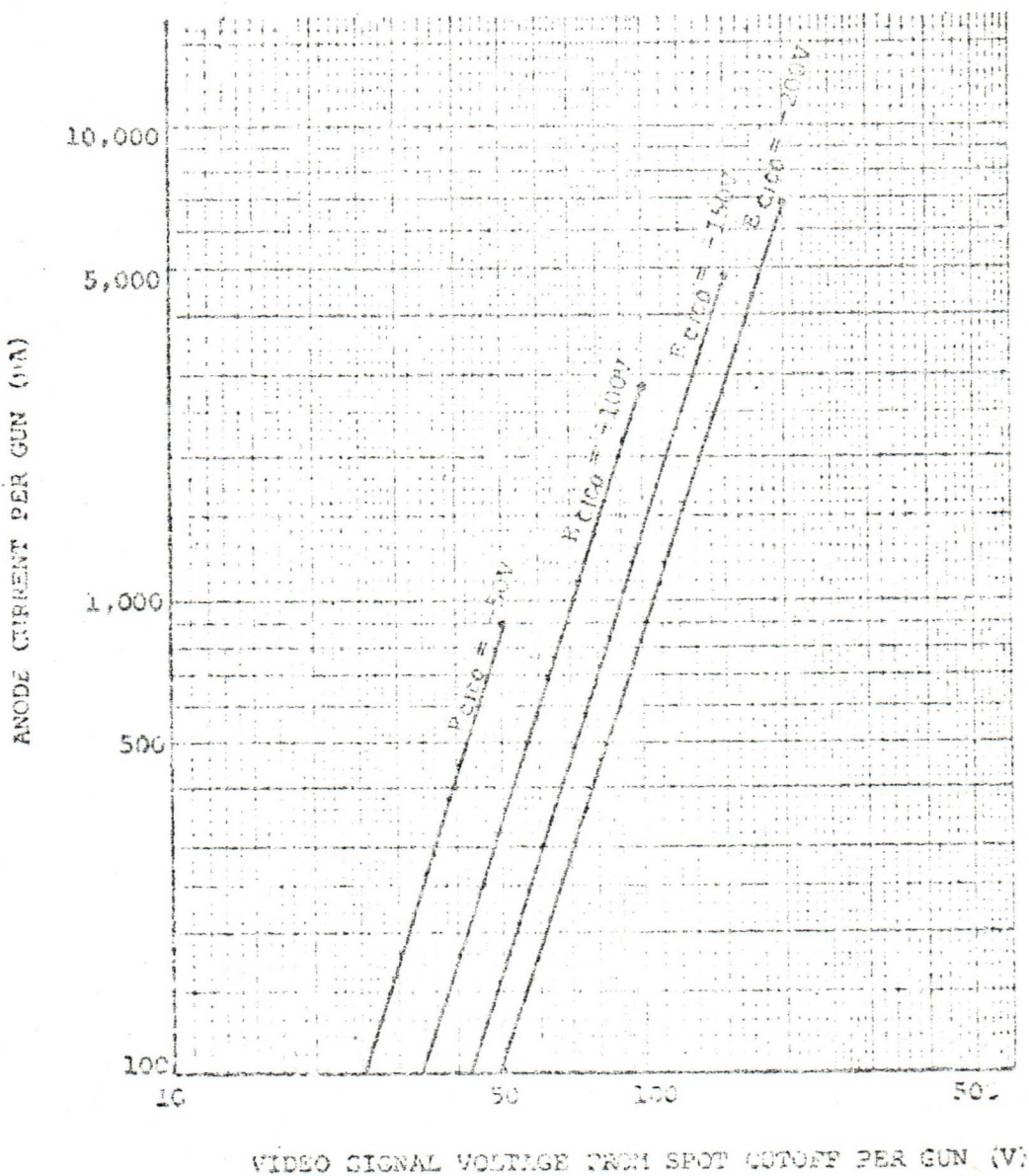
284PS 0509-901-1

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TYPICAL DRIVE CHARACTERISTICS  
 (GRID-DRIVE SERVICE)

HEATER VOLTAGE = 6.3 VOLTS  
 ANODE-TO-CATHODE VOLTAGE = 20,000 TO 27,500 VOLTS  
 GRID-NO. 3-TO-CATHODE VOLTAGE ADJUSTED FOR FOCUS.  
 GRID-NO. 2-TO-CATHODE VOLTAGE (EACH GUN) ADJUSTED TO PROVIDE SPOT CUTOFF  
 FOR DESIRED, FIXED GRID-NO. 1-TO-CATHODE (EACH GUN) VOLTAGE ( $E_{c1co}$ )

\* = ZERO-BIAS POINT

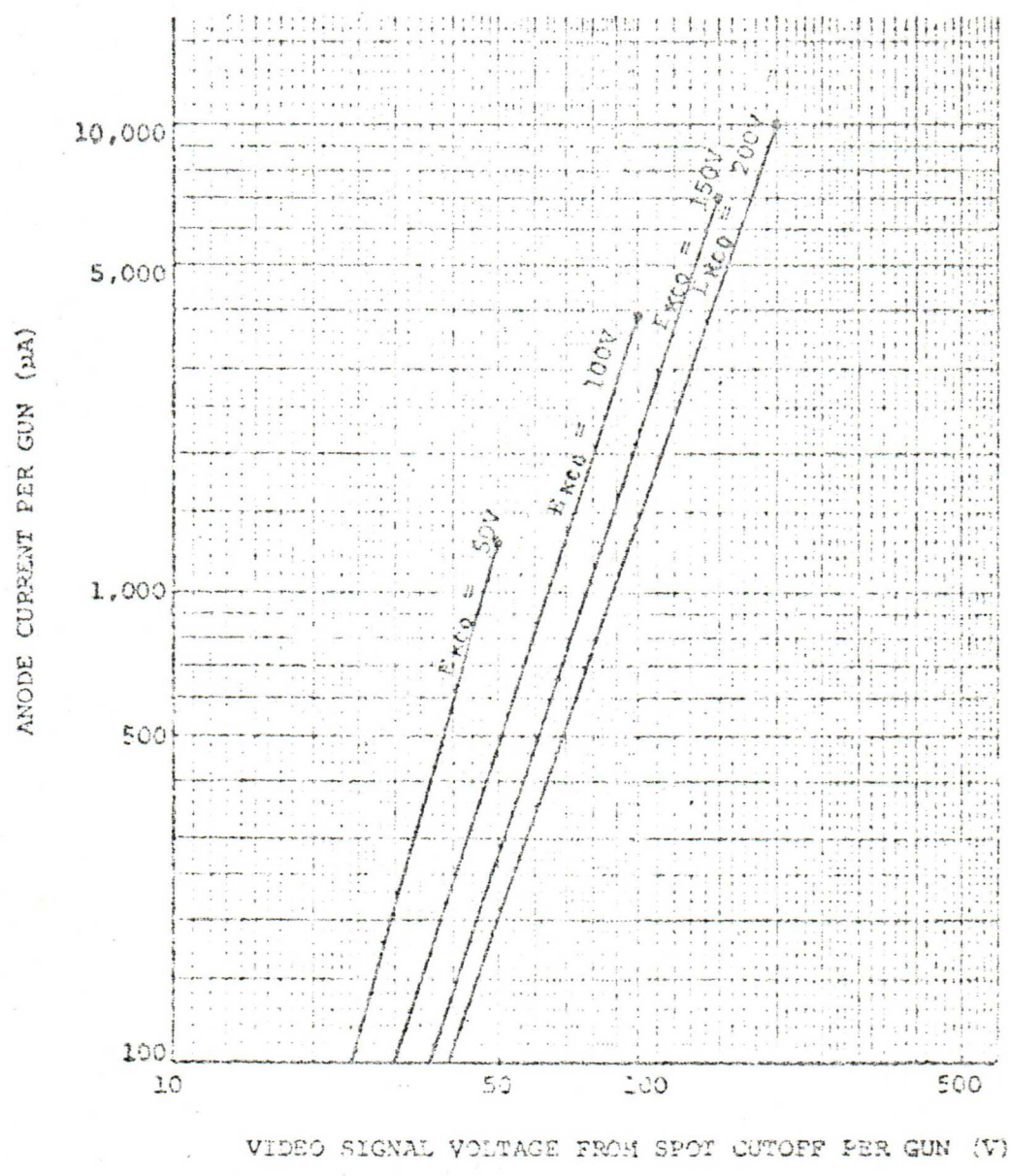


Hitachi, Ltd. Electron Tube Div.	DATE Nov. 20, '72	SH. No. 284PS0509-902-1	1/2
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TYPICAL DRIVE CHARACTERISTICS  
(CATHODE-DRIVE SERVICE)

HEATER VOLTAGE = 6.3 VOLTS  
 ANODE-TO-GRID-NO.1 VOLTAGE = 20,000 to 27,500 VOLTS  
 GRID-NO.3-TO-GRID-NO.1 VOLTAGE ADJUSTED FOR FOCUS.  
 GRID-NO.2-TO-GRID NO.1 VOLTAGE (EACH GUN) ADJUSTED TO PROVIDE SPOT CUTOFF  
 FOR DESIRED, FIXED CATHODE-TO-GRID-NO.1 (EACH GUN) VOLTAGE (E<sub>kco</sub>)

\* = ZERO-BIAS POINT



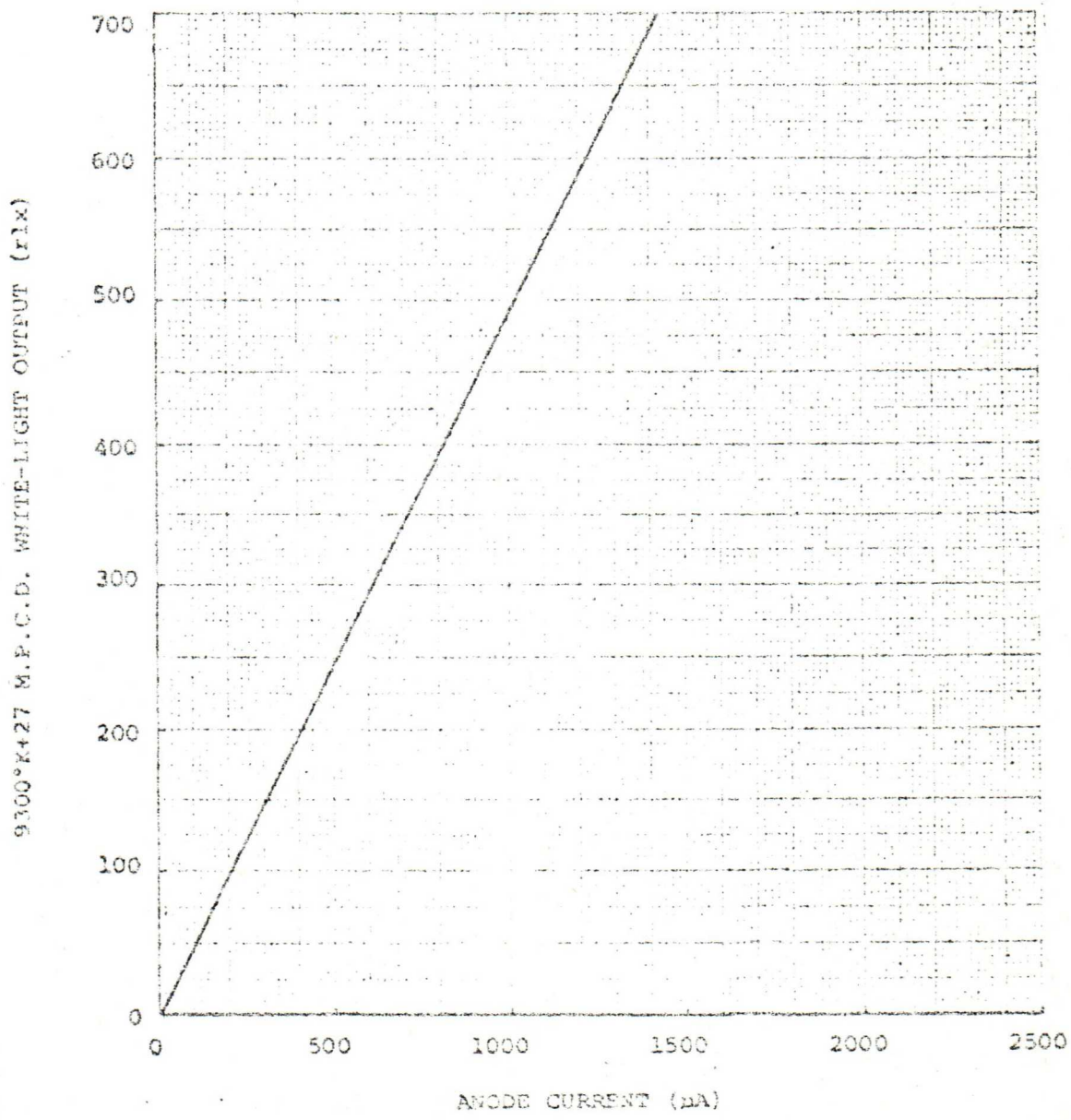
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TYPICAL LIGHT OUTPUT CHARACTERISTICS

HEATER VOLTS = 6.3VOLTS  
 ANODE-TO-CATHODE VOLTAGE = 25,000VOLTS  
 GRID-NO.3-TO-CATHODE VOLTAGE ADJUSTED FOR FOCUS  
 DRIVE OF EACH GUN IS ADJUSTED TO GIVE COMPOSITE ANODE CURRENT  
 TO PRODUCE 9300°K+27 M.P.C.D. WHITE-LIGHT OUTPUT.  
 PERCENTAGE OF TOTAL ANODE CURRENT SUPPLIED BY EACH GUN TO PRODUCE  
 9300°K+27 M.P.C.D. WHITE:

RED	36.8	%
BLUE	26.4	%
GREEN	36.8	%

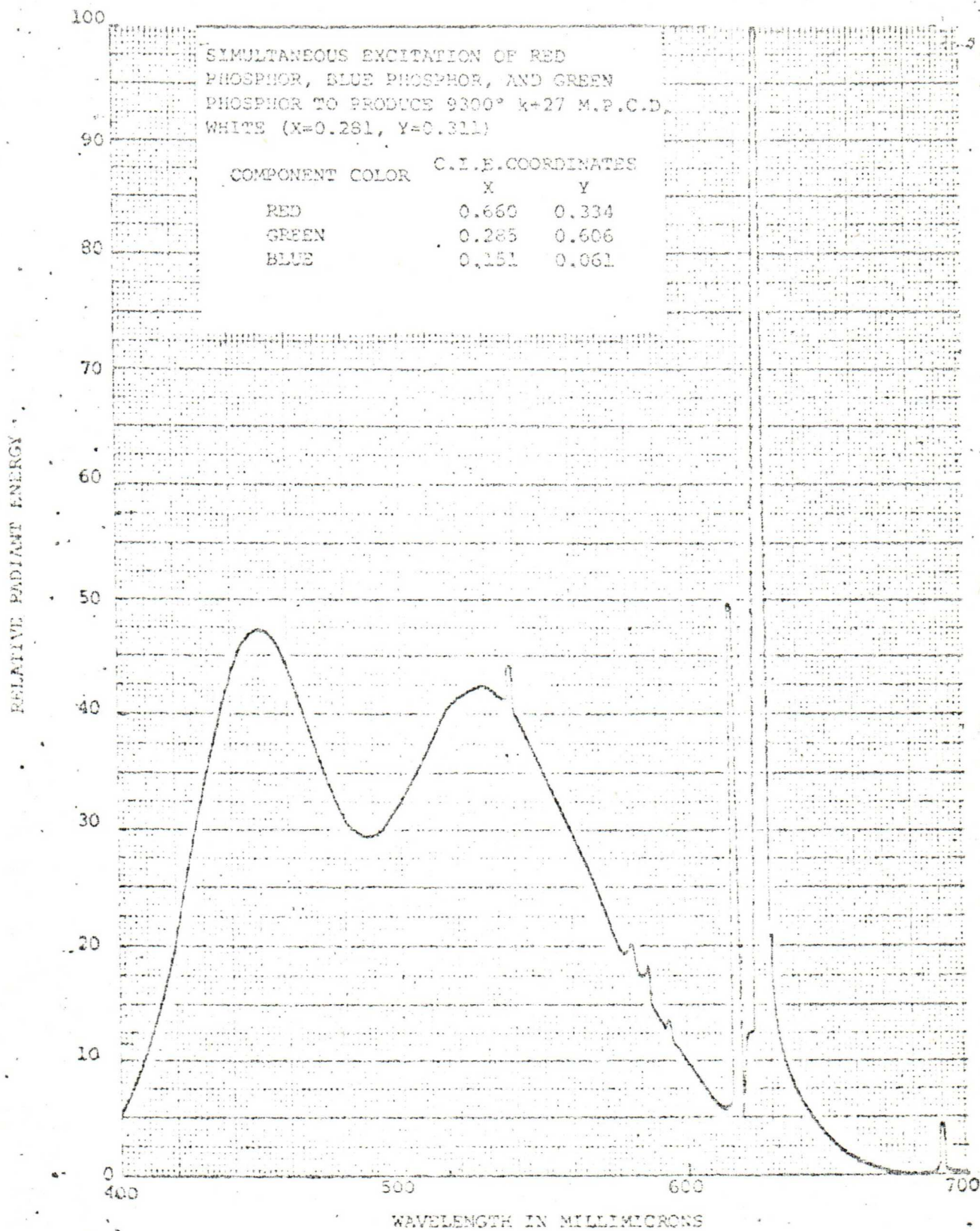
RASTER SIZE 445.4 X 336.7mm<sup>2</sup> (17.54 X 13.26 sq. in.)  
 MEASURED WITHIN 8CM-DIAMETER AREA  
 CENTERED ON TUBE FACE



Mitsubishi, Ltd. Electron Tube Div.	DATE Nov. 5, '73	SH No. 284PS0509 - 2lv - 2	1/1
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SPECTRAL-ENERGY EMISSION CHARACTERISTIC OF GROUP PHOSPHOR P22-NEW  
RARE-EARTH (RED), SULPHIDE (BLUE & GREEN) TYPE

The relative intensities of the narrow-emission bands of the red phosphor are dependent of the resolution of the measuring device.



Hitachi, Ltd.  
Electron Tube Div.

DATE Nov. 29, 1973 SH No 284PS 0509-951-3

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COMPONENT CONSIDERATION

The Deflecting Yoke should not be used for supporting the picture tubes. The Yoke and tube axes must coincide and the yoke must be free to move along the neck for adjustment purposes. The Yoke mount should also provide for a small amount of rotational adjustment. Centering of the raster on the screen may be accomplished by passing direct current of the required value through each pair of deflecting coils.

The Purifying Magnet is used to compensate for the effects of uniform extraneous magnetic fields and other causes which may affect register. It should be positioned on the neck as shown in 284PS 0504-904-. The devices should provide a magnetic field perpendicular to the tube axis. The field should be adjustable in magnetude and direction to cause a change of register. The purifying magnet must be capable of supplying correction for register from zero to the maximum value specified.

The Radial-Converging Assembly and associated circuits provide the magnetic fields necessary to converge dynamically the three electron beams as they traverse the screen of the picture tube, and together with the lateral-converging device the radial-converging assembly provides the magnetic fields necessary for static convergence. The assembly is mounted on the neck of the picture tube with the three electromagnets centered over the three pairs of internal converging pole pieces as shown in 284PS 0504-904-13. The necessary horizontal and vertical current waveforms are passed through the windings for maintaining dynamic convergence of the deflected beams. Static magnetic fields for converging the three beams at the center of the screen are produced by passing direct current through the windings or by permanent magnets variably coupled through the cores of the electromagnets to the converging pole pieces in the tube. The magnetic field strength should be adjustable to provide movements, as shown in 284PS 0504-904-2, ranging from zero to the specified maximum distance in either direction.

The Lateral-Converging Device supplements the correction supplied by the radial-converging assembly for statically converging the three electron beams at the center of the picture. It should be positioned on the neck as shown in 284PS 0504-904-13. The magnetic field should cause a lateral (horizontal) movement of the blue beam opposite to the movement of the converged red and green beams, as shown in 284PS 0504-904-2. The magnetic field strength should be adjustable to provide movement of the blue beam relative to the converged red and green beams ranging from zero to the specified maximum distance in either direction.

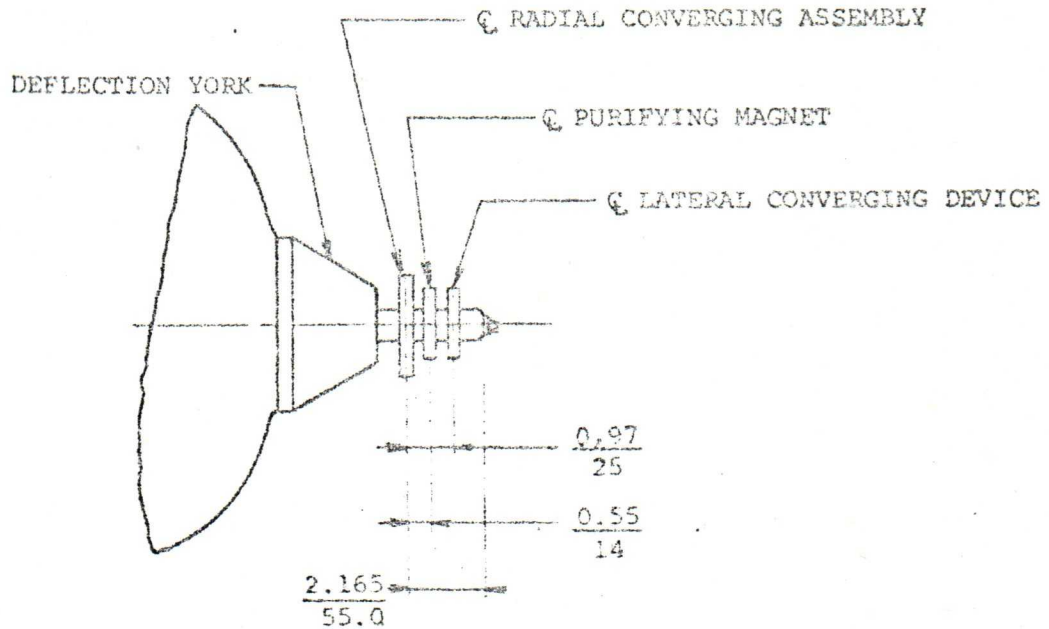
Radco Ltd.  
Electron Tube Div.

DATE Sept. 26, 1974 SH No. 284PS 0507 - 0 - 116

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RELATIVE PLACEMENT OF TYPICAL COMPONENTS  
(For 110° Deflection 29.1 mm dia.)

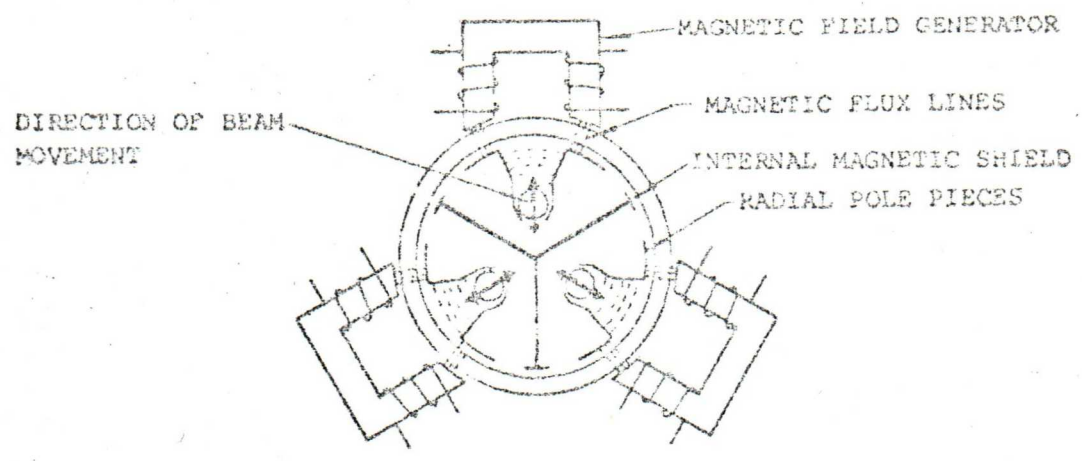


Dimensions in  $\frac{\text{inches}}{\text{mm}}$

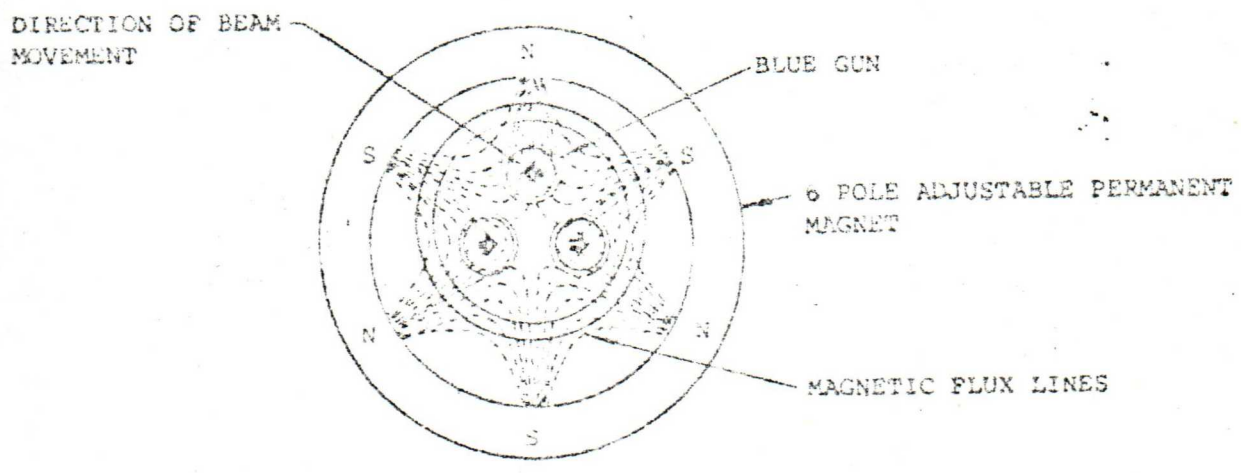
Center line of Radial Converging Assembly Core directly over  
center line of internal pole pieces.

CONVERGING SYSTEM

RADIAL-CONVERGING SYSTEM



LATERAL-CONVERGING SYSTEM

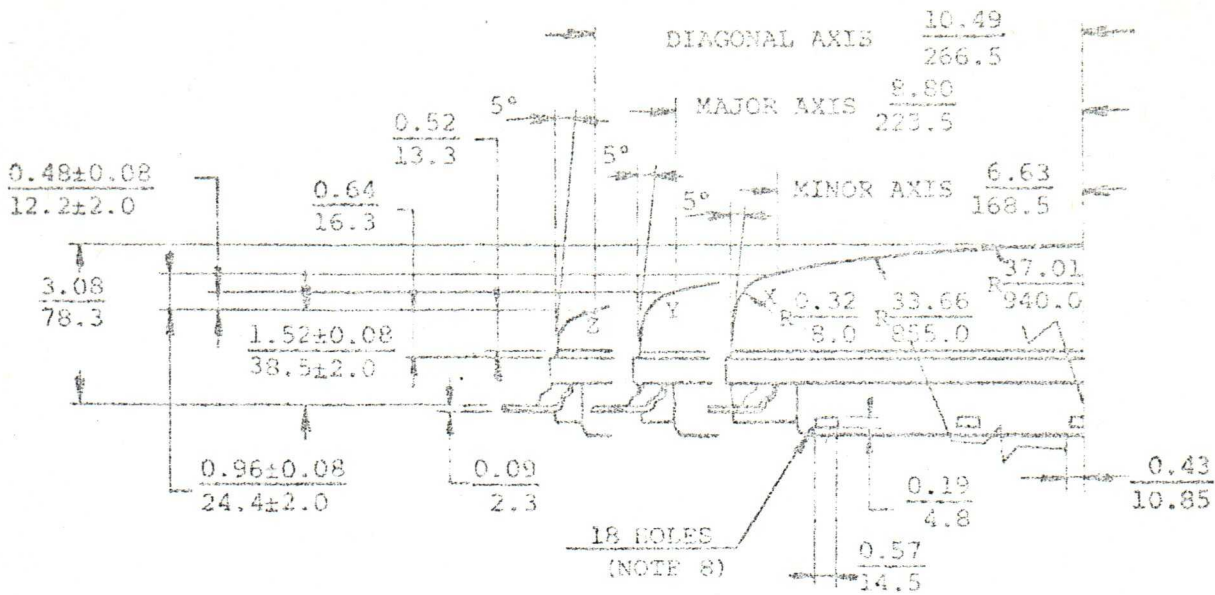


Hitachi, Ltd.  
Electron Tube Div.

DATE Nov. 20, '72 SH No. 284PS 0504 - 994 - 2

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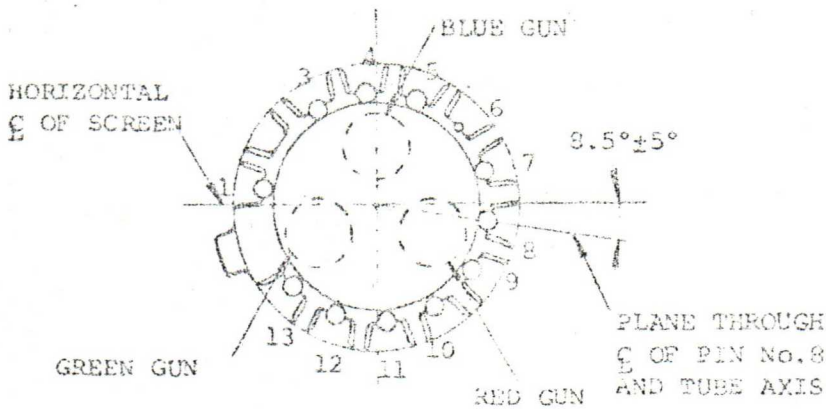
SAGITTAL HEIGHTS AND MOUNTING LUG HEIGHT

ONE OF THE FOUR MOUNTING LUGS MAY  
DIVERGE (2.0 mm) FROM THE PLANE OF  
THE OTHER THREE.  
THIS DEVIATION IS INCORPORATED  
IN THE  $\frac{\pm 0.08}{\pm 2.0}$  TOLERANCE.

- NOTE 1: With tube neck inserted through flared end of reference-line and neck-funnel-contour gauge (EIAJ G-R1100J1) and with tube seated in gauge, 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 circle concentric with bulb axis and have a diameter of 50 mm (2 inches).
- 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.
- NOTE 5: The tolerance of the mounting lug holes will accommodate mounting screws up to 3.5 mm (0.335 inches) in diameter when positioned on the true center of the hole.
- NOTE 6: The "X", "Y", and "Z" reference points are located on the outside surface of the face-plate.
- NOTE 7: These radii and dimensions are to the outside of the glass at the mold-match line and are intended to define the shape of the required cutout for "Push-Through" cabinet designs.
- NOTE 8: Mounting holes for degaussing coils.

BASING SPECIFICATION

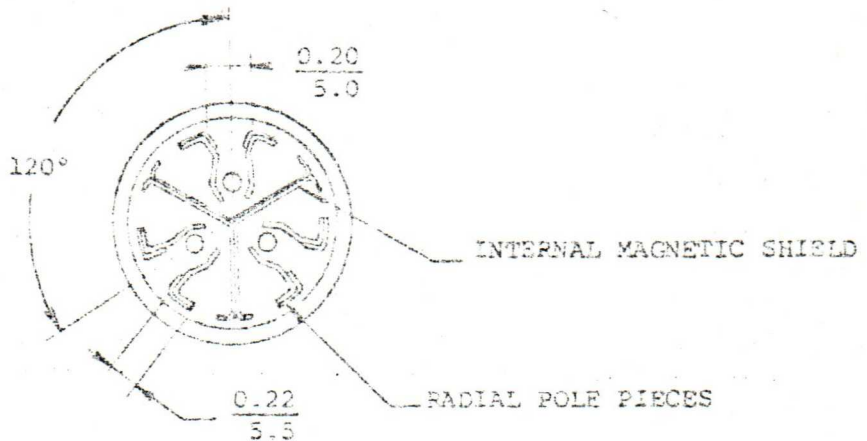
BOTTOM VIEW OF BASE



INDEX OF TERMINALS

- PIN 1 - GRID No.3
- PIN 3 - CATHODE OF BLUE GUN
- PIN 4 - GRID No.1 OF BLUE GUN
- PIN 5 - GRID No.2 OF BLUE GUN
- PIN 6 - HEATER
- PIN 7 - HEATER
- PIN 8 - CATHODE OF RED GUN
- PIN 9 - GRID No.1 OF RED GUN
- PIN 10 - GRID No.2 OF RED GUN
- PIN 11 - GRID No.2 OF GREEN GUN
- PIN 12 - CATHODE OF GREEN GUN
- PIN 13 - GRID No.1 OF GREEN GUN
- CAP - ANODE (Grid No.4, Screen, Collector).
- C - EXTERNAL CONDUCTIVE COATING

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



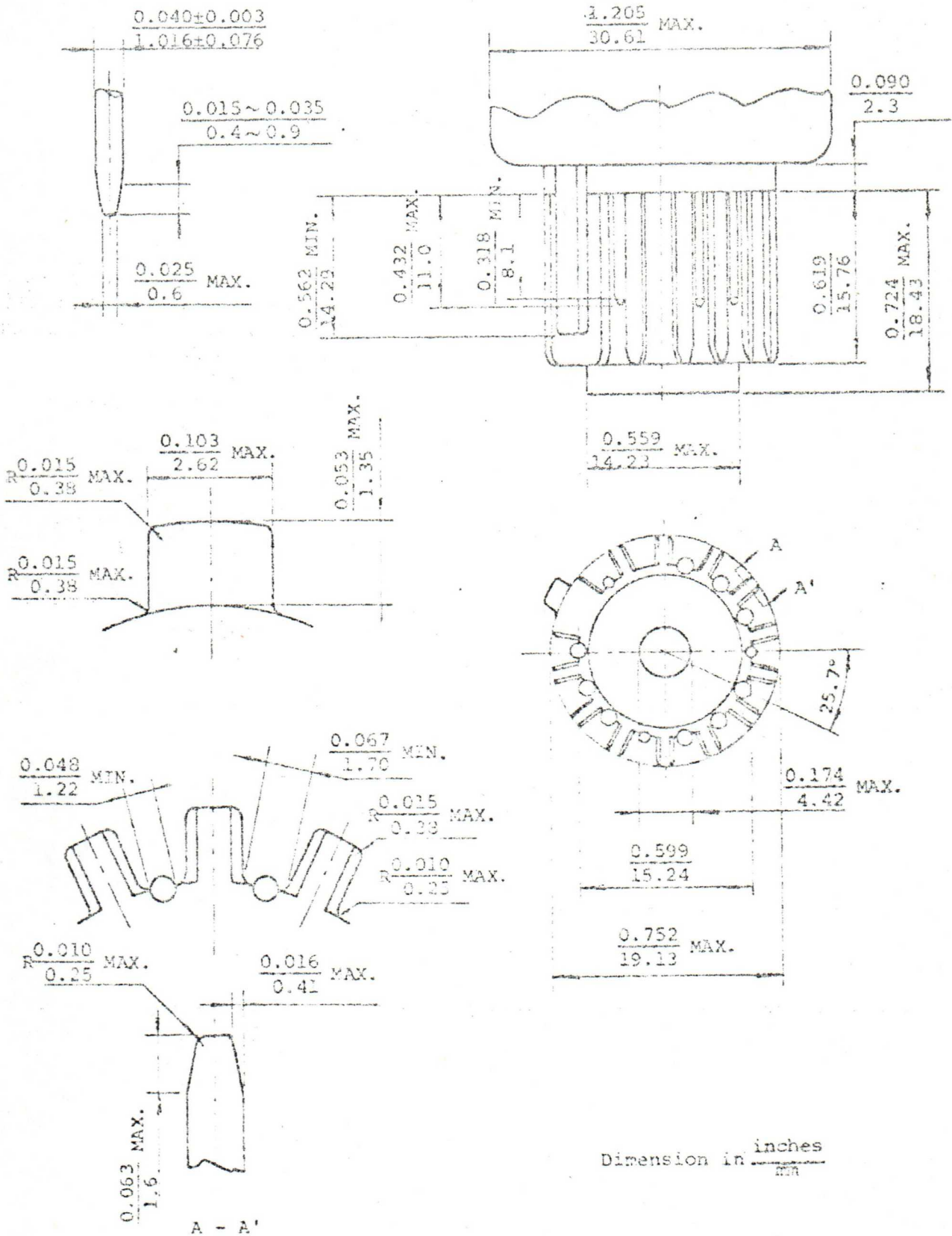
Dimensions in  $\frac{\text{inches}}{\text{mm}}$

Hitachi, Ltd.  
 Electron Tube Div.

DATE Sept. 26, 1974 SHN 284PS 0504 - 902 - 13

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NO. BASE



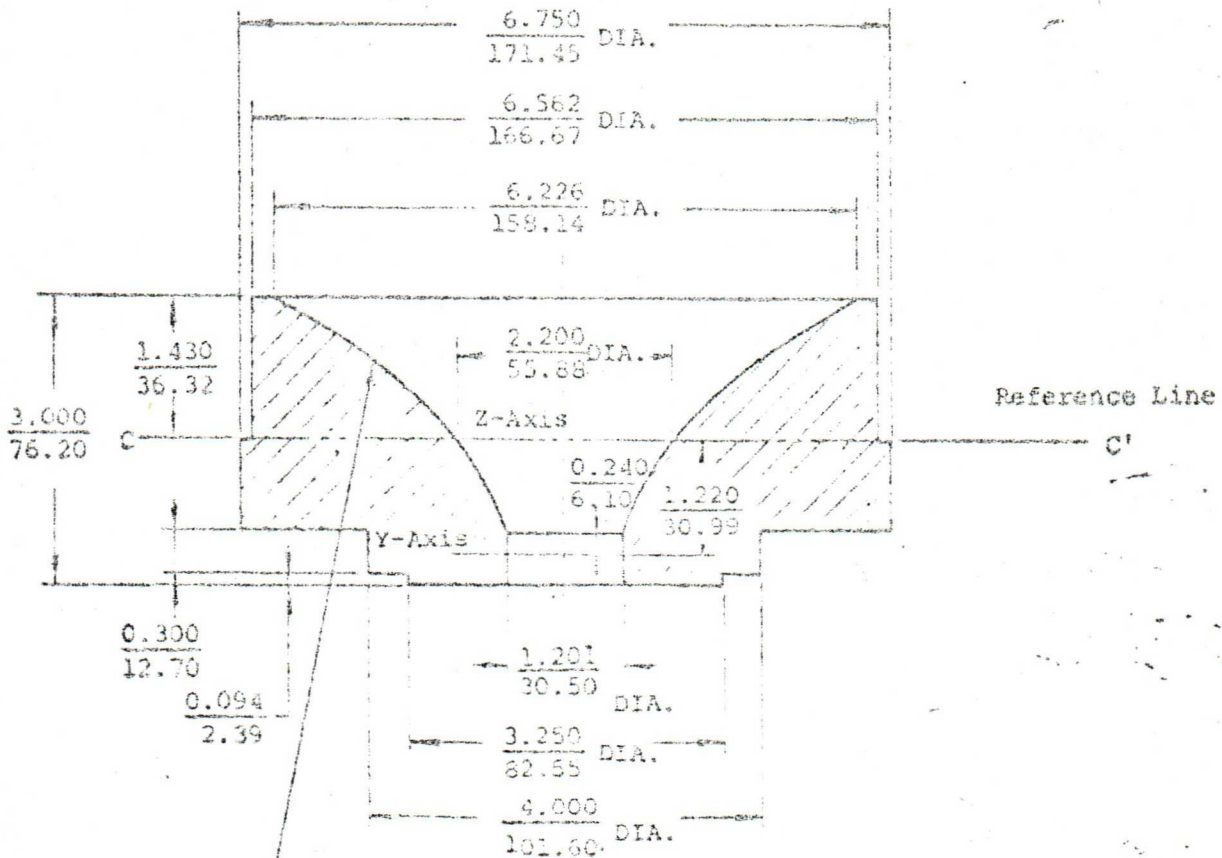
Dimension in  $\frac{\text{inches}}{\text{mm}}$

Mitsubishi Ltd.  
Electron Tube Div.

DATE July 23, 1974 SH No. 284PS0504 - 901 - 3

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REFERENCE-LINE AND NECK-FUNNEL-CONTOUR GAUGE



$$Y = 0.5980 - 0.0375Z + 0.3758Z^2 - 0.0008Z^3$$

$$Y = 14.94 - 0.0375Z + 0.01479Z^2 - 0.00000124Z^3$$

Reference Line is determined by C-C' when gauge is seated.

Dimensions in  $\frac{\text{inches}}{\text{mm}}$

Hitachi, Ltd.  
 Electron Tube Div.

DATE

Feb. 8, '73

SH No.

284PS 0504 - 905 - GR110CJ1

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