Hitachi, Ltd.
Tokyo Japan

# HITACHI COLOR PICTURE TUBE 14BCP22

The Hitachi 14BCP22 is a directly viewed, 14″-rectangular glass picture tube for use in color television receivers. It is capable of producing either a full-color or a black-and-white picture measuring 9-1/8″ × 11-27/32″ rectangular area.

The 14BCP22 utilizes three gun shadow mask system and offers two major features-simplified color-field set up, and very bright screen with a new sulfide group of color phosphors. This outstanding new phosphor group is more efficient, producing color pictures up to 300% brighter than that of 17″ and 21″ color tubes; has medium short persistance to provide sharper pictures on rapid-action scenes; and produces white light with nearly equal current from each of the three electron guns.

The 14BCP22 also utilizes the graded-hole shadow mask which has holes that increase gradually in diameter from the outer edge of the mask inward to the center. As a result of this gradation, the mask permits increased light output from the screen.

## ELECTRICAL DATA

| | | |
|---|---|---|
| Electron Guns, Three with Axes Tilted Toward Tube Axis | | |
| | Blue, Green, Red | |
| Focusing Method | Electrostatic | |
| Convergence Method | Magnetic | |
| Deflection Method | Magnetic | |
| Deflection Angles, (approx.) | | |
| Horizontal | 65 | Degrees |
| Vertical | 50 | Degrees |
| Diagonal | 70 | Degrees |
| Direct Interelectrode Capacitances | | |
| Cathode of Blue Gun+Cathode of Green Gun +Cathode of Red Gun to all other Electrodes | 16 | $\mu\mu$f |
| Grid No. 1 of any Gun to all other Electrodes | 7 | $\mu\mu$f |
| External Conductive Coating to Ultor | Min. 500 | $\mu\mu$f |
| | Max. 1,500 | $\mu\mu$f |
| Heater Characteristics | | |
| Heater Voltage | 6.3 | Volts |
| Heater Current | 1.8 | Amperes |
| Heater Warm up Time | 11 | Seconds |

from JEDEC release #3919, Oct. 8, 1962

## OPTICAL DATA

Phosphor Number .....P22-A11-Sulfide Type, Aluminized
Fluorescence and phosphorescence of separate phosphors, respectively Blue, Green, Red.
Dot Arrangement....Triangular group of Blue Dot, Green Dot, and Red Dot.

## MECHANICAL DATA

| | | |
|---|---|---|
| Overall Length | 19-9/32 ±3/8 | Inches |
| Greatest Dimension of Tube | | |
| Diagonal | 14 ±1/8 | Inches |
| Width | 13-1/16 ±1/8 | Inches |
| Height | 10-9/16 ±1/8 | Inches |
| Minimum Useful Screen Dimensions | | |
| Diagonal | 12-19/32 | Inches |
| Horizontal | 11-27/32 | Inches |
| Vertical | 9-1/8 | Inches |
| Area | 100 Sq. | Inches |
| Neck Length | 9-9/16 ±1/4 | Inches |
| Bulb Contact | J1-21 | |
| Base | B12-131 | |
| Basing | 14AU | |

## MAXIMUM RATINGS (Design Maximum System)

Unless otherwise specified, voltage values are positive and measured with respect to cathode.

| | | |
|---|---|---|
| Maximum Anode Voltage | 22,000 | Volts |
| Minimum Anode Voltage | 12,000 | Volts |
| Maximum Grid No. 3 Voltage | 5,300 | Volts |
| Maximum Grid No. 2 Voltage | 650 | Volts |
| Grid No. 1 Voltage | | |
| Maximum Negative Value | 400 | Volts DC |
| Maximum Positive Value | 0 | Volts DC |
| Maximum Positive Peak Value | 2 | Volts |
| Maximum Heater Voltage | 6.9 | Volts |
| Minimum Heater Voltage | 5.7 | Volts |
| Maximum Heater-Cathode Voltage | | |
| Heater Negative with Respect to Cathode | | |
| During warm-up period not to exceed 15 seconds | 450 | Volts |
| After equipments warm-up period | 200 | Volts |
| Heater Positive with Respect to Cathode | 200 | Volts |

## EQUIPMENT DESIGN RANGES

Percentage of Total Ultor Current Supplied by Each Gun (average) to Produce White of 9,300°K+27 M.P.C.D. (CIE Coordinates x=0.281, y=0.311)

| | | |
|---|---|---|
| Red Gun | 42 | Percent |
| Blue Gun | 28 | Percent |
| Green Gun | 30 | Percent |

Ratio of Cathode Current to produce White of 9,300°K+27 M.P.C.D.

| | Min. | Av. | Max. |
|---|---|---|---|
| Red to Green | 0.85 | 1.4 | 1.95 |
| Red to Blue | 0.8 | 1.5 | 2.2 |

## TYPICAL OPERATING CONDITIONS

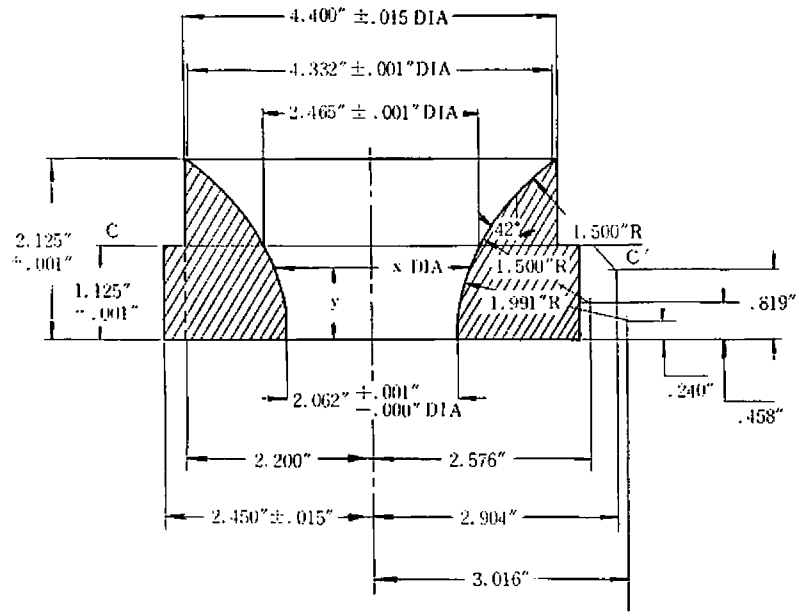
| | | |
|---|---|---|
| Anode Voltage | 16,000 | Volts |
| Grid No. 3 Voltage (Focusing Electrode) | 2,400 to 3,400 | Volts |
| Grid No. 2 Voltage | 200 | Volts |
| Grid No. 1 Voltage (Note 1) | −45 to −100 | Volts |

Note 1. Visual extinction of focused raster.

## MAXIMUM CIRCUIT VALUES

| | | |
|---|---|---|
| Maximum Grid No. 3 Circuit Resistance | 7.5 | Megohms |
| Maximum Grid No. 1 Circuit Resistance | 0.75 | Megohms |

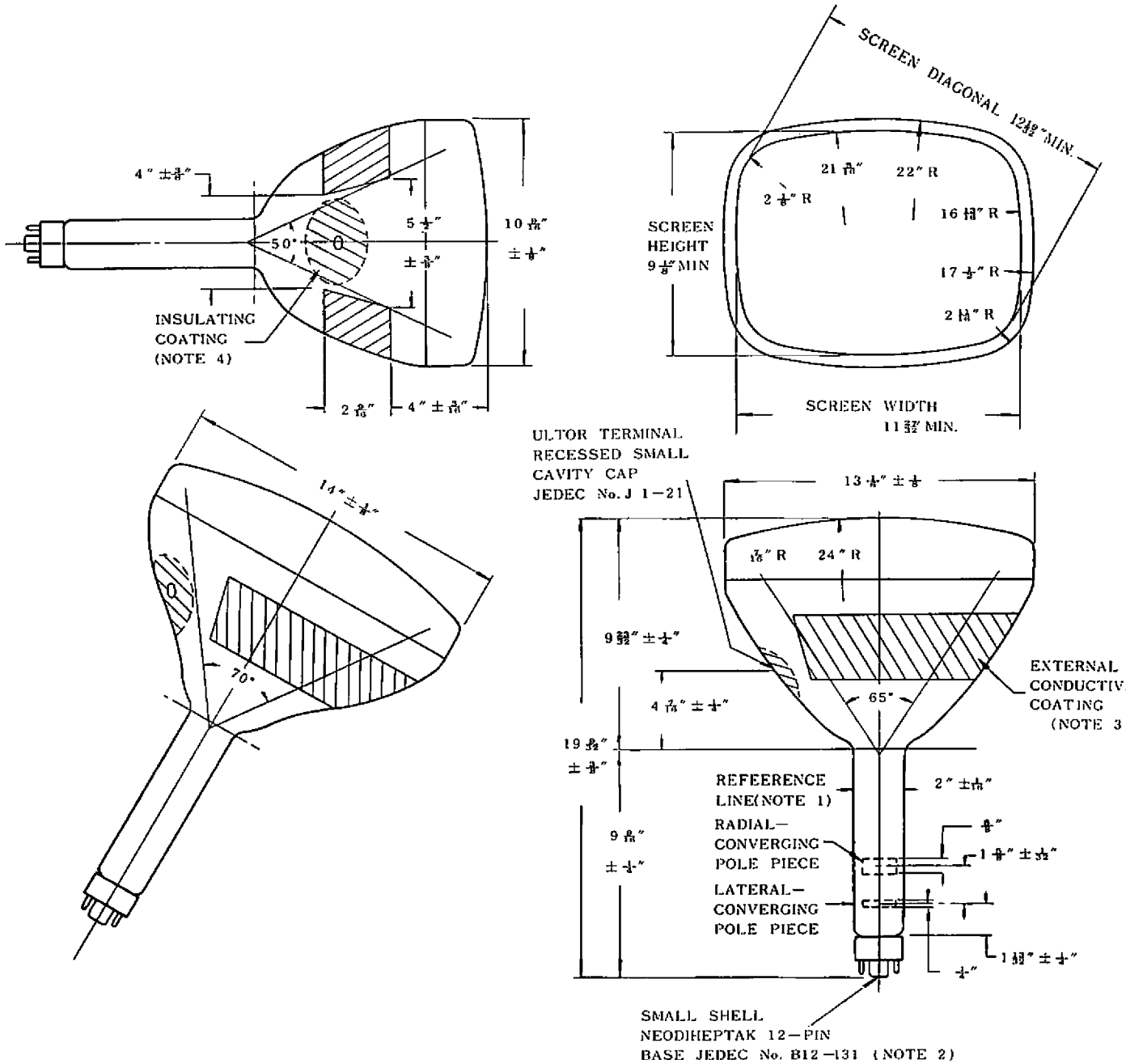
## REFERENCE-LINE AND NECK-FUNNEL-CONTOUR GAUGE

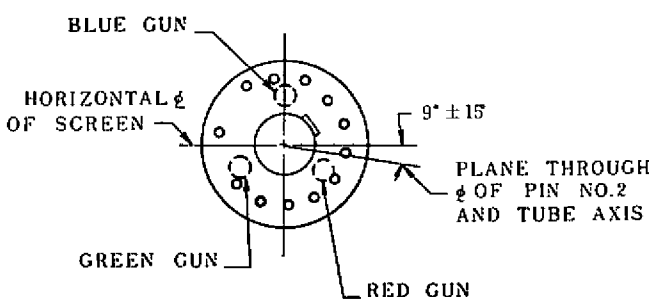



Reference Line is Determined by Plane C–C' When Gauge is Seated Against Funnel.

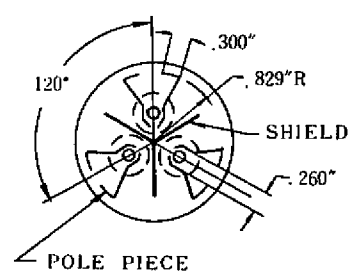
| y | x |
|---|---|
| 0.000" | 2.062" +0.001" −0.000" |
| 0.125" | 2.062" +0.001" −0.000" |
| 0.250" | 2.062" +0.001" −0.000" |
| 0.375" | 2.062" +0.001" −0.000" |
| 0.385" | 2.062" +0.001" −0.000" |
| 0.500" | 2.084" ±0.001" |
| 0.625" | 2.122" ±0.001" |
| 0.750" | 2.182" ±0.001" |
| 0.875" | 2.258" ±0.001" |

| y | x |
|---|---|
| 1.000" | 2.352" ±0.001" |
| 1.125" | 2.465" ±0.001" |
| 1.250" | 2.604" ±0.001" |
| 1.375" | 2.778" ±0.001" |
| 1.500" | 2.990" ±0.001" |
| 1.625" | 3.216" ±0.001" |
| 1.750" | 3.400" ±0.001" |
| 1.875" | 3.678" ±0.001" |
| 2.000" | 3.958" ±0.001" |
| 2.125" | 4.332" ±0.001" |

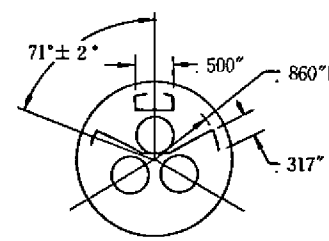



Base Bottom View



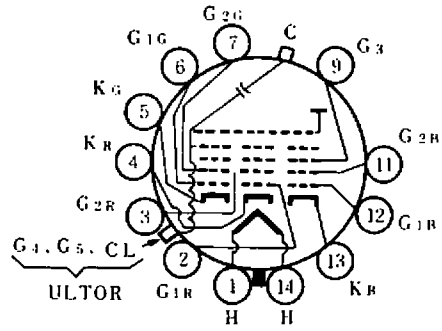

Radial Converging Pole Pieces




Lateral Converging Pole Pieces

# BASING DIAGRAM

**Bottom View**




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

**NOTE 1:** With tube neck inserted through flared end of reference-line and neck-funnel contour gauge (shown on preceding page) 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 shell will fall within a circle concentric with bulb axis and having a diameter of 3″.

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

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

Hitachi, Ltd.
Tokyo Japan

Head Office : 4, 1-chome, Marunouchi, Chiyoda-ku, Tokyo
Tel. Tokyo (212) 1111 (80 lines)
Cable Address : "HITACHY" TOKYO
Codes : All Codes Used

Printed in Japan RF-Y(HK)