

# PHILCO CORPORATION

A SUBSIDIARY OF *Ford Motor Company*.

4XP11  
4XP16

LANSDALE DIVISION

Ultra-High Resolution

Cathode Ray Tube

## CATHODE RAY TUBE

### DATA SHEET

#### Description

The Philco type 4XP\_ is an ultra-high resolution cathode ray tube of the magnetic focus and magnetic deflection type. It features an ultra-high resolution spot which is essentially constant over a radius of 0.75 inch. The tube is capable of resolving 2600 lines per inch.

The tube also features a small neck diameter which reduces power requirements for deflection and focusing. This makes the tube particularly attractive for airborne applications where minimum weight is desirable.

The optical quality, non-browning, flat faceplate, combined with an essentially blemish-free, metal backed screen, makes it suitable for photo-oscillographic applications. The high quality settled screen results in considerably more light output than other types of high resolution screens.

#### Electrical Data

|                                              |            |
|----------------------------------------------|------------|
| Focusing Method . . . . .                    | Magnetic   |
| Deflection Method . . . . .                  | Magnetic   |
| Deflection Angle, approximate . . . . .      | 56°        |
| Direct Interelectrode Capacitances           |            |
| Cathode to all other electrodes . . . . .    | 6.0 uuf    |
| Grid No. 1 to all other electrodes . . . . . | 6.0 uuf    |
| Heater Current at 6.3 Volts . . . . .        | 600±10% ma |

#### Optical Data

| Phosphor Number             | P11          | P16           |
|-----------------------------|--------------|---------------|
| Fluorescent Color . . . . . | Blue         | Bluish Purple |
| Phosphorescence . . . . .   | Blue         | Bluish Purple |
| Persistence . . . . .       | Medium Short | Very Short    |

Faceplate  
Optical Quality, Flat, Gray, Non-browning

### Mechanical Data

|                                                      |                         |
|------------------------------------------------------|-------------------------|
| Overall Length . . . . .                             | 12 $\pm$ 1/4 Inches     |
| Greatest Diameter of Tube . . . . .                  | 3 3/4 $\pm$ 3/32 Inches |
| Minimum Useful Screen Diameter (Projected) . . . . . | 2.8 Inches              |
| Implosion Protection . . . . .                       | None                    |
| Bulb . . . . .                                       | Modified C30 Exp. 4     |
| Bulb Contact . . . . .                               | J1-21                   |
| Base . . . . .                                       | B6-185                  |
| Basing . . . . .                                     | 7GP                     |
| Bulb Contact Alignment                               |                         |
| Anode Contact Aligns with Base Lug $\pm$ 10°         |                         |

### Ratings (Design Maximum System)

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

|                                                        |                 |
|--------------------------------------------------------|-----------------|
| Maximum Anode Voltage (Note 1) . . . . .               | 22,000 Volts DC |
| Minimum Anode Voltage (Note 2) . . . . .               | 8,000 Volts DC  |
| Grid No. 1 Voltage                                     |                 |
| Maximum Negative Value . . . . .                       | 100 Volts DC    |
| Maximum Positive Value . . . . .                       | 0 Volts DC      |
| Maximum Positive Peak Value . . . . .                  | 0 Volts DC      |
| Maximum Heater Voltage . . . . .                       | 7.0 Volts       |
| Minimum Heater Voltage . . . . .                       | 5.0 Volts       |
| Maximum Heater-Cathode Voltage (Note 3)                |                 |
| Heater Negative with Respect to Cathode                |                 |
| During Warm-up Period not to exceed 15 seconds . . . . | 410 Volts       |
| After Equipment Warm-up Period . . . . .               | 180 Volts       |
| Heater Positive with Respect to Cathode . . . . .      | 180 Volts       |

### Typical Operating Conditions (Grid Drive Service)

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

|                                       |                     |
|---------------------------------------|---------------------|
| Anode Voltage . . . . .               | 10,000 Volts DC     |
| Grid No. 1 Voltage (Note 4) . . . . . | -20 to -40 Volts DC |
| Focus Coil Current (Note 5) . . . . . | 50 ma DC            |
| Resolution:                           |                     |
| Line Width "A" (Note 6) . . . . .     | 0.0004 Inch         |
| Spot Size (Note 7) . . . . .          | 0.0007 Inch         |

### Maximum Circuit Values

|                                                 |             |
|-------------------------------------------------|-------------|
| Maximum Grid No. 1 Circuit Resistance . . . . . | 1.0 Megohms |
|-------------------------------------------------|-------------|

Notes

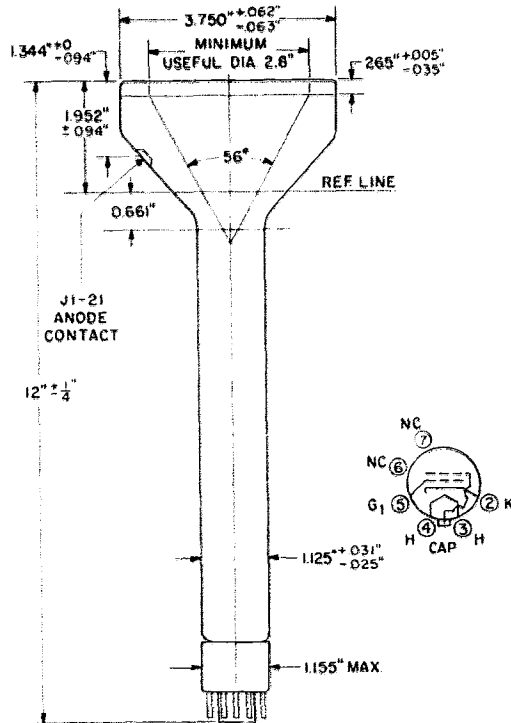
1. Anode and Grid No. 2 are connected together within the tube and are referred to herein as anode.
2. Due to the triode construction, tube performance is greatly affected by a reduction of anode voltage.
3. Cathode should be returned to one side or to the mid-tap of the heater transformer winding.
4. Visual extinction of the undeflected focused spot.
5. For Celco Focus Coil No. B1781, or equivalent, with the combined Grid No. 1 bias voltage and video-signal voltage adjusted to produce cathode current of 1.0 microampere. Distance from reference line to center of air gap on focus coil shall be 4 1/8 inches.
6. Measured with a 525 line pattern adjusted to 90% of minimum useful screen diameter at  $I_k = 10\mu a$ . The line width is the merged raster height divided by the number of lines (measured in the center of the tube face).
7. Measured to the half-brightness point at center of face with  $I_k = 1.0\mu a$ .

PHILCO CORPORATION - LANSDALE DIVISION

Outline Drawing

4XP

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MECHANICAL NOTES

1. The reference line is determined by a  $1.937^{+0.002}$ " diameter ring gauge 2" long.
2. Anode contact aligns with base lug  $\pm 10^\circ$ .
3. A centering magnet should be used to center the beam in the aperture.

WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at anode voltages higher than 16,000 volts.

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