



ELECTRONIC TUBE REFERENCE

19CJP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch cathode-ray picture tube documented by Philco for direct-view television service. The approved source is sparse in the extracted record, so additional construction or performance properties are not asserted.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	0
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray*No fixed ratings recorded.**Published values promoted where clearly attributable to this section.*

19CJP4 — Rectangular Glass Picture Tube

Overview

The **19CJP4** is a directly viewed, rectangular glass picture tube featuring an aluminized screen and a relatively flat envelope. It incorporates a compound radius faceplate and special internal contouring in the deflection yoke region, allowing it to achieve a 114° diagonal deflection angle using standard 110° components. The tube is designed with a short, improved electron gun that requires no ion trap magnet and is engineered to enhance edge focus quality. It utilizes electrostatic focusing and magnetic deflection.

Mechanical and Physical Characteristics

The 19CJP4 is built using a J149A2 bulb and a B7-208 short integral glass button base, which features straight-through leads and an indexing lug. The tube's physical dimensions are:

- **Overall Length:** 11-5/16 +1/4 -3/16 inches
- **Neck Length:** 4-1/8 +1/16 -1/8 inches
- **Greatest Bulb Dimensions:**
 - Diagonal: 18-5/8 $\pm$ 1/8 inches
 - Width: 16-13/32 $\pm$ 1/8 inches
 - Height: 13-11/32 $\pm$ 1/8 inches
- **Minimum Useful Screen Dimensions:**
 - Diagonal: 17-9/16 inches
 - Width: 15-1/8 inches
 - Height: 12 inches
 - Area: 172 square inches

The faceplate has a light transmission of approximately 78% at the center. The screen is coated with an aluminized P4 phosphor, which produces a white fluorescent color with medium-short persistence. The tube also features an external conductive coating.

Electrical and Deflection Specifications

The 19CJP4 has the following electrical and deflection characteristics:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 600 $\pm$ 30 mA
- **Heater Warm-up Time:** 11 seconds (defined as the time required to reach 80% of the rated voltage under a series resistance test condition with four times the rated voltage applied)
- **Deflection Angles (approximate):**
 - Diagonal: 114 degrees
 - Horizontal: 102 degrees
 - Vertical: 85 degrees
- **Direct Interelectrode Capacitances (approximate):**
 - Cathode to all other electrodes: 4 pF
 - Grid #1 to all other electrodes: 5 pF
 - External coating capacitance: 1300 pF minimum to 1700 pF maximum

Base Connections and Pinout

The tube utilizes the 8HR basing diagram. Electrical connections are made through the B7-208 base pins and a recessed small cavity cap (J1-21) for the anode (ultor), which contains Grid #3 and Grid #5. The anode contact aligns with Pin #4 within $\pm$ 30 degrees.

The pinout configuration is:

- **Pin 1:** Grid #1 (G1)
- **Pin 2:** Cathode (K)
- **Pin 3:** Heater (H)
- **Pin 4:** Grid #4 (G4)
- **Pin 6:** Grid #1 (G1)
- **Pin 7:** Grid #2 (G2)
- **Pin 8:** Heater (H)
- **Cap:** Anode (Ultor)

Operating Services and Ratings

The 19CJP4 can be operated under either Grid Drive Service or Cathode Drive Service. The maximum ratings and typical operating conditions for each service are detailed below.

Grid Drive Service

Under Grid Drive Service, the maximum ratings are specified as Design-Maximum values:

- **Anode Voltage:** 20,000 max. Volts DC
- **Grid #4 Voltage:** -550 min. to +1100 max. Volts DC
- **Grid #2 Voltage:** 200 min. to 550 max. Volts DC
- **Grid #1 Voltage:**
 - Negative-Bias Value: 154 max. Volts DC
 - Negative-Peak Value: 220 max. Volts
 - Positive-Bias Value: 0 max. Volts DC
 - Positive-Peak Value: 2 max. Volts
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up ≤ 15 seconds): 450 max. Volts
 - Heater negative with respect to cathode (after warm-up): 200 max. Volts
 - Heater positive with respect to cathode: 200 max. Volts
- **Grid #1 Circuit Resistance:** 1.5 max. Megohms

Typical operating conditions for Grid Drive Service are:

- **Anode Voltage:** 16,000 Volts DC
- **Grid #4 Voltage for Focus:** 0 to 400 Volts DC
- **Grid #2 Voltage:** 400 Volts DC
- **Grid #1 Voltage (for visual extinction of focused raster):** -65 to -105 Volts DC (the cutoff of an undeflected focus spot increases the absolute bias by approximately 5 Volts)

Cathode Drive Service

Under Cathode Drive Service, the maximum ratings are specified as Absolute-Maximum values:

- **Anode Voltage:** 20,000 max. Volts DC
- **Grid #4 Voltage:** -400 min. to +1250 max. Volts DC
- **Grid #2 Voltage:** 350 min. to 700 max. Volts DC
- **Cathode Voltage:**
 - Positive-Bias Value: 154 max. Volts DC
 - Positive-Peak Value: 220 max. Volts
 - Negative-Bias Value: 0 max. Volts DC
 - Negative-Peak Value: 2 max. Volts
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up ≤ 15 seconds): 450 max. Volts
 - Heater negative with respect to cathode (after warm-up): 200 max. Volts
 - Heater positive with respect to cathode: 200 max. Volts
- **Grid #1 Circuit Resistance:** 1.5 max. Megohms

Typical operating conditions for Cathode Drive Service are:

- **Anode Voltage:** 16,000 Volts DC
- **Grid #4 Voltage for Focus:** 0 to 400 Volts DC
- **Grid #2 Voltage:** 400 Volts DC
- **Grid #1 Voltage:** 0 Volts DC
- **Cathode Voltage (for visual extinction of focused raster):** +56 to +84 Volts DC (the cutoff of an undeflected focus spot increases the absolute bias by approximately 5 Volts)

Safety Considerations

When operating the 19CJP4, safety precautions regarding X-ray radiation must be observed. If the tube is operated at anode voltages higher than 16,000 Volts, shielding may be necessary to protect against the potential danger of personal injury from prolonged exposure at close range.

Technical Summary

The **19CJP4** is a 114-degree rectangular glass picture tube featuring electrostatic focusing, magnetic deflection, and an aluminized P4 white phosphor screen. It utilizes a short, improved electron gun that eliminates the need for an ion trap magnet while enhancing edge focus. The tube is characterized by its 6.3 V, 600 mA heater with an 11-second warm-up time, and is designed to operate under either Grid Drive or Cathode Drive configurations. With a maximum anode voltage rating of 20,000 V, it provides a reliable display solution when operated within its specified design-maximum and absolute-maximum limits, provided appropriate safety shielding is implemented for anode voltages exceeding 16,000 V.

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