



ELECTRONIC TUBE REFERENCE

19CQP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch rectangular direct-view television CRT with electrostatic focus and wide-angle magnetic deflection. Its approximately 103-degree deflection and nearly 20 kV maximum anode rating support a large monochrome picture in a relatively shallow receiver cabinet.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	0
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	19800 V
<i>CRT accelerator/final-anode maximum mapped to MaxPlateVoltage.</i>	

19CQP4 — Television Picture Tube

The **19CQP4** is a 19-inch direct-view rectangular glass cathode-ray tube (CRT) designed for television display applications. It features a spherical faceplate made of gray filter glass, a 114-degree magnetic deflection system, and electrostatic focusing. The tube utilizes an aluminized screen with a P4 phosphor and is designed specifically for cathode-drive applications. Notable design features include a low Grid No. 2 operating voltage, an external conductive coating, and the absence of an ion trap.

Mechanical Specifications and Optical Characteristics

The 19CQP4 is housed in a J 149 A1 (or equivalent) glass bulb with a B6-214 base and uses the 7FA basing configuration. The mechanical dimensions and screen specifications are as follows:

- **Overall Length:** 11 5/8 ± 1/4 inches
- **Neck Length:** 4 3/8 ± 1/8 inches
- **Greatest Dimensions:**
 - Diagonal: 18 5/8 ± 1/8 inches
 - Width: 16 13/32 ± 1/8 inches
 - Height: 13 11/32 ± 1/8 inches
- **Minimum Useful Screen Dimensions (Projected):**
 - Diagonal: 17 9/16 inches
 - Horizontal Axis: 15 1/8 inches
 - Vertical Axis: 12 inches
 - Total Area: 172 square inches

The screen is aluminized and utilizes a P4 phosphor. The gray filter glass faceplate provides a light transmittance of approximately 78% at the center. Electrical connection to the high-voltage anode is made via a J1-21 bulb contact (cap), which aligns with pin position #7 ± 30°.

Electrical Data and Basing

The 19CQP4 operates with a nominal 6.3 V heater that draws 600 ± 10% mA, featuring a controlled heater warm-up time of 11 seconds.

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** approximately 5 pF
- **Grid No. 1 to all other electrodes:** approximately 6 pF
- **External conductive coating to anode:** 1400 pF minimum, 1900 pF maximum

Deflection Angles (Approximate)

- **Diagonal:** 114°
- **Horizontal:** 103°
- **Vertical:** 86°

Pinout and Basing (7FA)

The tube uses a B6-214 base with the 7FA basing arrangement. The pin connections, viewed from the bottom of the base, are:

Pin	Connection
Pin 2	Cathode (K)
Pin 3	Heater (H)
Pin 4	Heater (H)

Pin	Connection
Pin 6	Grid No. 1 (G1)
Pin 7	Grid No. 2 (G2)
Pin 8	Grid No. 4 (Focusing Electrode, G4)
Cap	Anode (A)

Absolute Maximum Ratings

The following ratings are established under the Design Maximum System. Voltages are positive and measured with respect to Grid No. 1 unless otherwise specified.

Parameter	Minimum	Maximum
Anode Voltage	12,000 V	19,800 V
Grid No. 4 (Focusing Electrode) Voltage	-500 V	+1100 V
Grid No. 2 Voltage	25 V	60 V
Cathode Voltage	—	100 V
Heater Voltage	5.8 V	7.0 V
Grid No. 1 Circuit Resistance	—	1.5 MΩ

Heater-Cathode Voltage Limits

- **Heater negative with respect to cathode:**
 - During warm-up period (not to exceed 15 seconds): -410 V maximum
 - After equipment warm-up period: -180 V maximum
- **Heater positive with respect to cathode:** 180 V maximum

Typical Operating Conditions (Cathode Drive Service)

In typical cathode-drive service, voltages are positive and measured with respect to Grid No. 1. Under these conditions, the focusing electrode (Grid No. 4) voltage is adjusted to obtain satisfactory focus, which typically falls between 0 and 500 V.

- **Anode Voltage:** 16,000 V
- **Grid No. 4 Voltage:** 250 V (nominal focus point)
- **Grid No. 2 Voltage:** 35 V
- **Cathode Voltage (for visual extinction of focused raster):** 25 to 50 V

The typical focus condition is specified with the combined Grid No. 1 bias and video-signal voltage adjusted to produce an anode current of 150 μA on a 15 1/8 by 12 inch pattern (such as that generated by a [2F21](#) Monoscope or equivalent).

Technical Summary

The **19CQP4** is a 19-inch rectangular glass television picture tube featuring a 114° magnetic deflection angle, electrostatic focusing, and a P4 aluminized screen. Designed for cathode-drive operation, it operates with a low Grid No. 2 voltage (typically 35 V) and a 6.3 V, 600 mA heater with an 11-second warm-up time. Its physical design incorporates a gray filter glass faceplate with 78% center light transmittance, an external conductive coating providing up to 1900 pF of capacitance to the anode, and a 7FA basing configuration.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Rauland

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 RAULAND

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—
Typical anode/accelerator voltage	19800 V	—
Typical grid 2 voltage	60 V	—
Maximum heater-cathode voltage	180 V	Heater positive to cathode
Maximum grid 1 circuit resistance	1.5 Mohm	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Electrostatic	—
Deflection angle	103 deg	—

TUBE TINKER

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