

ELECTRONIC TUBE REFERENCE

19DBP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch rectangular television picture tube using low-voltage cathode drive, electrostatic focus, and wide-angle magnetic deflection. Its approximately 114-degree deflection system is intended for a shallow large-screen monochrome receiver cabinet.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	6
NOMINAL HEATER	6.3 V / 450 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	19800 V
CRT accelerator/final-anode maximum mapped to MaxPlateVoltage.	

19DBP4 — Rectangular Cathode Ray Tube

The **19DBP4** is a 19-inch direct-view rectangular picture tube designed for television display applications. It features a spherical faceplate made of gray filter glass, an aluminized screen, and a bonded protective implosion panel. The tube utilizes electrostatic focusing and a 114° magnetic deflection angle. It is specifically designed for cathode-drive service, operating with a low Grid #2 voltage of 40 V, and does not require an external ion trap.

Physical and Optical Characteristics

The 19DBP4 is constructed using a **J149C1** glass bulb and an **FP149B2** bonded implosion panel. The faceplate is made of gray filter glass with an approximate light transmittance of 48% at the center, which

enhances picture contrast under bright ambient lighting conditions. The screen is coated with a **P4 aluminized** phosphor, providing high brightness and efficient light output.

Mechanical Dimensions

- **Overall Length:** 11 13/16 ± 5/16 inches
- **Neck Length:** 4 3/8 ± 1/8 inches
- **Greatest Diagonal:** 18 5/8 ± 1/8 inches
- **Greatest Width:** 16 13/32 ± 1/8 inches
- **Greatest 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 Useful Area:** 172 square inches

Deflection Angles

The magnetic deflection system operates with the following approximate angles:

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

Electrical Connections and Pinout

The tube utilizes a **B6-214** base with a **7FA** basing arrangement. The high-voltage anode connection is made via a recessed small cavity contact (**J1-21**). The anode contact is aligned with the pin position #7 within a tolerance of ±30°.

The pin assignments for the 7FA base, viewed from the bottom, are:

Pin Number	Connection
Pin 1	Heater (H)
Pin 2	Cathode (K)
Pin 4	Heater (H)
Pin 5	Grid #1 (<i>G</i> ₁)
Pin 6	Grid #4 (<i>G</i> ₄ , Focusing Electrode)
Pin 7	Grid #2 (<i>G</i> ₂)

Pin Number	Connection
Recessed Contact	Anode (A)

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** 5 $\mu\mu\text{f}$ (approximate)
- **Grid #1 to all other electrodes:** 6 $\mu\mu\text{f}$ (approximate)
- **External conductive coating to Anode:**
 - Maximum: 1900 $\mu\mu\text{f}$
 - Minimum: 1400 $\mu\mu\text{f}$

The external conductive coating, when connected to a system ground, forms a high-voltage filter capacitor with the internal anode coating.

Heater and Filament Ratings

The heater is designed for a nominal voltage of 6.3 V. The electrical specifications for the filament are:

- **Nominal Heater Voltage:** 6.3 V
- **Heater Current:** 450 $\pm$ 10% mA (at 6.3 V)
- **Heater Warm-up Time:** 11 seconds

Maximum Ratings (Design Maximum System)

All voltages are positive and measured with respect to Grid #1 unless otherwise specified. Under the Design Maximum System, the operating limits are:

- **Anode Voltage:** 19,800 V maximum, 12,000 V minimum
- **Grid #4 (Focusing Electrode) Voltage:** +1100 V maximum, -500 V minimum
- **Grid #2 Voltage:** 60 V maximum, 25 V minimum
- **Cathode Voltage:** 100 V maximum
- **Heater Voltage:** 7.0 V maximum, 5.8 V minimum
- **Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during warm-up ($\leq$ 15 seconds): -410 V maximum
 - Heater negative with respect to cathode after warm-up: -180 V maximum
 - Heater positive with respect to cathode: 180 V maximum
- **Grid #1 Circuit Resistance:** 1.5 Megohms maximum

Typical Operating Conditions (Cathode Drive Service)

In typical cathode-drive applications, the electrodes are operated under the following conditions (with voltages measured with respect to Grid #1):

- **Anode Voltage:** 16,000 V
- **Grid #2 Voltage:** 40 V
- **Grid #4 (Focusing Electrode) Voltage:** 250 V
 - *Note:* Satisfactory focus is typically obtained on individual tubes at some value between 0 and 500 V when the combined Grid #1 bias and video-signal are adjusted for a 150 μA anode current on a $15\frac{1}{8} \times 12$ inch pattern.
- **Cathode Voltage:** 35 to 50 V (for visual extinction of the focused raster)

Special Characteristics

The tube has a maximum anode penetration current of 150 μA . This is measured under specific test conditions: 19,800 V applied to the anode, 0 V applied to the cathode, Grid #1, and Grid #2, with all other elements set to their nominal voltages.

Technical Summary

The **19DBP4** is a highly integrated 19-inch rectangular cathode ray tube featuring a 114° magnetic deflection angle and electrostatic focus. Its design is optimized for cathode-drive television receivers, utilizing a low Grid #2 voltage of 40 V and eliminating the need for an ion trap. With its built-in FP149B2 bonded implosion panel, gray filter glass faceplate, and aluminized P4 phosphor screen, the 19DBP4 provides a robust, high-contrast display solution. Its standard 7FA basing and 6.3 V heater make it compatible with contemporary television chassis designs of its era.

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	450 mA	—
Typical anode/accelerator voltage	19800 V	—
Typical grid 2 voltage	60 V	—
Maximum heater-cathode voltage	180 V	Heater positive to cathode

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