



ELECTRONIC TUBE REFERENCE

17DAP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Seventeen-inch cathode-ray picture tube documented by Philco. The available approved source identifies the device but provides insufficient extracted detail to support more specific construction or performance claims beyond direct-view television display.

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.*

17DAP4 Television Picture Tube

The **17DAP4** (also designated **17DAP4/SF17**) is a direct-view television picture tube featuring electrostatic focusing and magnetic deflection. Designed with an extremely short overall length and low heater power requirements, the tube incorporates a metal-backed screen, a straight electron gun that eliminates the need for an ion trap magnet, and an external conductive coating. Its physical interface consists of a short integral glass-button base with straight-through leads and an indexing lug.

Heater, Base, and Pinout

The 17DAP4 is designed for low-power heater operation. The nominal heater electrical characteristics and physical connections are detailed below:

Parameter	Value
Nominal Heater Voltage	2.68 V $\pm$ 5%
Nominal Heater Current	0.45 A (at 2.68 V)
Heater Warm-up Time	11 Seconds

The heater warm-up time of 11 seconds is specifically defined as the time required to reach 80% of the rated heater voltage when applying four times the rated heater voltage to a circuit consisting of the tube heater in series with an external resistance. This series resistance is calculated as three times the rated heater voltage divided by the rated heater current:

$$\text{Series Resistance} = 3 \times \frac{2.68 \text{ V}}{0.45 \text{ A}} = 17.87 \Omega$$

Using the nominal heater voltage of 2.68 V and nominal heater current of 0.45 A, the calculated nominal heater power consumption is:

$$\text{Heater Power} = 2.68 \text{ V} \times 0.45 \text{ A} = 1.206 \text{ W}$$

Base and Pin Connections

The tube utilizes a **B7-208** base with an **8JK** basing configuration. The electrical connections are assigned as follows:

- **Pin 1:** Heater (H)
- **Pin 2:** Grid No. 1 (G1)
- **Pin 3:** Grid No. 4 (G4)
- **Pin 7:** Grid No. 2 (G2)
- **Pin 8:** Heater (H)
- **Cap:** Anode, Grid No. 3, Grid No. 5 (connected internally)

The high-voltage anode contact is a **J1-21** cap, which is aligned with the center line between Pin #6 and Pin #7 within an angular tolerance of $\pm 30^\circ$.

Mechanical and Optical Specifications

The physical envelope of the 17DAP4 is optimized for compact television receiver designs, featuring wide deflection angles and a rectangular screen.

Mechanical Dimensions

- **Overall Length:** 10-11/16 $\pm$ 3/16 Inches
- **Neck Length:** 3-9/16 $\pm$ 1/16 Inches
- **Greatest Bulb Dimensions:**
 - Diagonal: 16-5/8 $\pm$ 1/8 Inches
 - Width: 15-5/8 $\pm$ 1/8 Inches

- Height: 12-3/4 ± 1/8 Inches
- **Minimum Useful Screen Dimensions:**
 - Diagonal: 15-3/4 Inches
 - Width: 14-3/8 Inches
 - Height: 11-11/16 Inches

Optical Characteristics and Deflection Angles

The tube is equipped with a **P4** phosphor screen, which produces a white fluorescent color with medium persistence. The faceplate exhibits a light transmission of approximately 77% at its center.

The magnetic deflection system operates over the following approximate angles:

- **Horizontal Deflection:** 105°
- **Vertical Deflection:** 87°
- **Diagonal Deflection:** 110°

Electrical Characteristics and Operating Services

The 17DAP4 can be operated in either Grid Drive Service or Cathode Drive Service. The electrical capacitances of the electrodes, measured as approximate values, are:

- **Cathode to All Other Electrodes:** 3.65 µpf
- **Grid No. 1 to All Other Electrodes:** 4.15 µpf
- **External Coating Capacitance:** 900 pF (minimum) to 1400 pF (maximum) (expressed as µpf in original specifications)

Grid Drive Service

In Grid Drive Service, operating voltages are referenced positive with respect to the cathode unless otherwise specified.

Parameter	Absolute Maximum Rating	Typical Operating Condition
Anode Voltage	17,600 V DC	14,000 V DC
Grid No. 4 Voltage (Focusing)	-700 to +950 V DC	100 to 500 V DC
Grid No. 2 Voltage	550 V DC	300 V DC
Grid No. 1 Negative-Bias Voltage	155 V DC	—
Grid No. 1 Negative-Peak Voltage	220 V	—
Grid No. 1 Positive-Bias Voltage	0 V DC	—

Parameter	Absolute Maximum Rating	Typical Operating Condition
Grid No. 1 Positive-Peak Voltage	2 V	—
Grid No. 1 Voltage for Visual Extinction	—	-35 to -72 V DC

Note on Cutoff: Under typical grid-drive operating conditions, the voltage required for visual extinction of the focused raster ranges from -35 to -72 V DC. The cutoff of an undeflected focus spot increases the absolute bias value by approximately 5 V (making the range -40 to -77 V DC).

Maximum Circuit Values: The maximum Grid No. 1 circuit resistance must not exceed 1.5 Megohms.

Cathode Drive Service

In Cathode Drive Service, operating voltages are referenced positive with respect to Grid No. 1 unless otherwise specified.

Parameter	Absolute Maximum Rating	Typical Operating Condition
Anode Voltage	17,600 V DC	14,000 V DC
Grid No. 4 Voltage (Focusing)	-550 to +1100 V DC	150 to 550 V DC
Grid No. 2 Voltage	700 V DC	300 V DC
Cathode Positive-Bias Voltage	155 V DC	—
Cathode Positive-Peak Voltage	220 V	—
Cathode Negative-Bias Voltage	0 V DC	—
Cathode Negative-Peak Voltage	2 V	—
Grid No. 1 Voltage	—	0 V DC
Cathode Voltage for Visual Extinction	—	+34 to +60 V DC

Note on Cutoff: Under typical cathode-drive operating conditions, the cathode voltage required for visual extinction of the focused raster ranges from +34 to +60 V DC. The cutoff of an undeflected focus spot increases the absolute bias value by approximately 5 V (making the range +39 to +65 V DC).

Maximum Circuit Values: The maximum Grid No. 1 circuit resistance must not exceed 1.5 Megohms.

Peak Heater-Cathode Voltage Ratings

The peak heater-to-cathode voltage limits are identical for both Grid Drive and Cathode Drive services:

- **Heater Negative to Cathode (during warm-up $\leq$ 15 seconds):** 450 Max. Volts
- **Heater Negative to Cathode (after warm-up):** 200 Max. Volts

- **Heater Positive to Cathode:** 200 Max. Volts

Safety and X-ray Radiation

When operating the 17DAP4, safety precautions regarding X-ray radiation must be observed. If the tube is operated at anode voltages exceeding 16,000 Volts, shielding may be necessary to protect equipment operators and users against personal injury from prolonged exposure at close range.

Technical Summary

The **17DAP4** (17DAP4/SF17) is a compact, short-neck, direct-view television picture tube utilizing electrostatic focusing and 110-degree diagonal magnetic deflection. It features a low-power 2.68 V, 0.45 A heater with an 11-second warm-up characteristic, a P4 white phosphor screen, and a straight electron gun design. The tube supports both Grid Drive and Cathode Drive configurations, operating typically at an anode potential of 14,000 V DC (with an absolute maximum rating of 17,600 V DC). Its physical design is characterized by a B7-208 glass-button base, an 8JK pinout, and a J1-21 high-voltage anode cap.