

Nineteen-inch direct-view monochrome television CRT with electrostatic focus, magnetic deflection, and an aluminized P4 white screen. Wide-angle magnetic deflection and high-voltage operation support a bright receiver picture, with published X-ray precautions.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	BASE PINS	—
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	23000 V
Cathode-ray picture-tube section; anode rating and published direct capacitances captured from supplied family sheet.	

19DAP4 — Television Picture Tube

An indirectly heated, rectangular glass television picture tube featuring a 114-degree magnetic deflection angle, electrostatic focusing, and a bonded shield with an anti-reflection treated safety plate.

Overview

The **19DAP4** is a 19-inch, direct-viewed, rectangular glass television picture tube. It features a bonded shield, electrostatic focusing, a 114-degree magnetic deflection system, and an external conductive coating. The tube does not require an ion trap. Electrically and mechanically, the 19DAP4 is identical to

the **19CZP4** but is distinguished by an anti-reflection treatment applied to the external surface of its safety plate to reduce specular reflection.

Mechanical and Optical Design

The 19DAP4 is constructed using a J149C glass bulb and incorporates a bonded shield design. This shield consists of a gray filter glass safety plate laminated directly to the face of the tube, providing a light transmittance of approximately 60%. The external surface of this safety plate is treated to minimize specular reflection, improving image contrast and viewability under ambient lighting.

Screen Dimensions

The screen provides a minimum useful display area of 172 square inches with the following dimensions:

- **Height:** 12 3/4 inches
- **Width:** 15 1/4 inches
- **Diagonal:** 17 9/16 inches

Physical and Deflection Characteristics

The tube has a short-neck design to facilitate compact cabinet styling. Its physical and deflection specifications include:

- **Overall Length:** 11 9/16 ± 5/16 inches
- **Neck Length:** 4 1/8 ± 1/8 inches
- **Weight:** Approximately 15 1/2 lbs
- **Deflection Angles (Approximate):**
 - Diagonal: 114°
 - Horizontal: 101°
 - Vertical: 86°

The bulb contact is a recessed small cavity cap (J1-21), and the base is a B7-208 configuration.

Phosphor

The tube utilizes an aluminized P4 phosphor, which exhibits white fluorescence and medium-short persistence. The aluminized backing increases light output and prevents screen burning without requiring an external ion trap magnet.

Electrical Characteristics and Pinout

The 19DAP4 features an indirectly heated cathode with a controlled warm-up time. The heater is designed for series or parallel operation.

Heater and Capacitance Ratings

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.45 A $\pm$ 5%
- **Heater Warm-up Time:** 11 seconds
- **Direct Interelectrode Capacitances (Approximate):**
 - Cathode to all other electrodes: 5 pF
 - Grid No. 1 to all other electrodes: 6 pF
 - External conductive coating to anode: 1000 pF minimum, 1500 pF maximum

The external conductive coating acts as a capacitor in conjunction with the internal anode coating, which helps in filtering the high-voltage anode supply. This external coating must be grounded.

Pinout and Basing (8HR)

The 19DAP4 uses the 8HR basing arrangement, which provides the following pin connections viewed from the bottom of the base:

Pin Number	Connection
Pin 1	Heater (H)
Pin 2	Grid No. 1 (G1)
Pin 3	Grid No. 4 (Focusing Electrode)
Pin 4	No Connection (aligns with horizontal centerline within 30°)
Pin 6	Grid No. 2 (G2)
Pin 7	Cathode (K)
Pin 8	Heater (H)
Recessed Cap	Anode Contact (J1-21)

Operating Conditions and Drive Services

The 19DAP4 can be operated in either Grid Drive Service (where the video signal is applied to Grid No. 1) or Cathode Drive Service (where the video signal is applied to the cathode). The typical operating conditions for each service are outlined below.

Typical Operating Conditions (at 20,000 V Anode)

Parameter	Grid Drive Service	Cathode Drive Service
Anode Voltage	20,000 V dc	20,000 V dc

Parameter	Grid Drive Service	Cathode Drive Service
Grid No. 4 (Focusing) Voltage	0 to 400 V dc	0 to 400 V dc
Grid No. 2 Voltage	400 V dc	400 V dc
Cutoff Voltage	-46 to -94 V dc (Grid No. 1)	42 to 78 V dc (Cathode)

In both modes, electrostatic focusing is achieved via Grid No. 4, which typically operates between 0 and 400 V dc to maintain sharp focus across the screen area.

Design-Maximum Ratings

The ratings below are established under the Design-Maximum Rating System. Operating the tube beyond these limits can impair performance and shorten tube life.

Voltage Limits by Service Type

Parameter	Grid Drive Service	Cathode Drive Service
Maximum Anode Voltage	23,000 V dc	23,000 V dc
Minimum Anode Voltage	15,000 V dc	15,000 V dc
Grid No. 4 (Focusing) Voltage	-550 to +1100 V dc	-400 to +1250 V dc
Maximum Grid No. 2 Voltage	550 V dc	700 V dc
Minimum Grid No. 2 Voltage	200 V dc	350 V dc
Grid No. 1 Voltage (Negative Bias)	155 V dc	—
Grid No. 1 Voltage (Negative Peak)	220 V	—
Grid No. 1 Voltage (Positive Bias)	0 V dc	—
Grid No. 1 Voltage (Positive Peak)	2 V	—
Cathode Voltage (Positive Bias)	—	155 V dc
Cathode Voltage (Positive Peak)	—	220 V

Parameter	Grid Drive Service	Cathode Drive Service
Cathode Voltage (Negative Bias)	—	0 V dc
Cathode Voltage (Negative Peak)	—	2 V

Heater-Cathode Voltage Ratings

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

- **Heater negative with respect to cathode (during warm-up, ≤ 15 seconds):** 450 V maximum
- **Heater negative with respect to cathode (after warm-up):** 200 V maximum
- **Heater positive with respect to cathode:** 200 V maximum

Circuit Values

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms

The external conductive coating must be reliably connected to the chassis ground to ensure proper operation and safety.

Technical Summary

The **19DAP4** is a 19-inch rectangular glass television picture tube featuring a 114-degree magnetic deflection angle, electrostatic focusing, and an aluminized P4 phosphor screen. It is characterized by its bonded shield construction with an anti-reflection treated safety plate that reduces specular reflection. Designed for either grid-drive or cathode-drive operation, the tube operates at a typical anode voltage of 20,000 V and utilizes a 6.3 V, 0.45 A heater with a controlled 11-second warm-up time. Its electrical and mechanical parameters are identical to the [19CZP4](#), with the exception of the anti-reflection surface treatment on the safety plate.



SOURCE OPERATING CONDITIONS

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	—
Focusing method	Electrostatic	—
Deflection method	Magnetic	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	600 mA	—
FocusingMethod	Electrostatic	—
DeflectionMethod	Magnetic	—
Phosphor	Aluminized P4 white	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngles	110-class magnetic	—
Cathode To All Capacitance	5 pF	—
Grid1 To All Capacitance	6 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMaximum	1500 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMinimum	1000 pF	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
AnodeVoltageMaximum	23000 V	—
AnodeVoltageMinimum	15000 V	—
FocusingElectrodeVoltageRangeMaximum	-400 to +1250 V	—
Grid2VoltageMaximum	700 V	—
Grid2VoltageMinimum	350 V	—
Grid1NegativeBiasMagnitudeMaximum	155 V	—
Grid1PositivePeakVoltageMaximum	2 V	—
HeaterCathodeVoltageMaximum	450 V	Warmup<=15s;HeaterNegative
HeaterCathodeVoltageMaximum	200 V	AfterWarmup
HeaterCathodeVoltageMaximum	200 V	HeaterPositive
Anode Voltage	20000 V	—
FocusingElectrodeVoltage	0 to +400 V	—
Grid1VoltageForCutoff	-42 to -78 V	—
Grid1CircuitResistanceMaximum	1.5 Mohm	—