

Seventeen-inch monochrome television picture tube with electrostatic focus, magnetic deflection, and an aluminized P4 white screen. Its high-voltage direct-view design and published X-ray warning suit conventional television receiver display service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
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	18000 V
MAXIMUM SCREEN VOLTAGE	500 V
CRT-specific ratings, operating conditions, capacitances, focus/deflection, cutoff, optical, and screen data are retained in section parameters.	

17DSP4 Television Picture Tube

The **17DSP4** is a 17-inch direct-viewed, rectangular glass television picture tube. It features a lightweight design, a spherical faceplate, and a low-voltage electrostatic focusing system. The tube utilizes 110-degree magnetic deflection and a straight electron gun that does not require an external ion-trap magnet. An external conductive coating is applied to the envelope to form a supplementary filter capacitor when grounded.

Physical and Mechanical Characteristics

The 17DSP4 is constructed with a rectangular glass bulb (designated as J132 1/2 A, J132 1/2 B, or J132 1/2 A1/B1) and a spherical faceplate made of neutral gray filter glass. This filter glass provides approximately 78% light transmission. The screen is aluminized and coated with P4-Sulfide Type phosphor, which exhibits white fluorescence and phosphorescence with a short to medium-short persistence.

Key Dimensions and Weight

- **Overall Length:** 11-1/4 inches $\pm$ 3/16 inch (with a maximum of 11-7/16 inches)
- **Neck Length:** 4-1/8 inches $\pm$ 1/8 inch
- **Neck Diameter:** 1.168 inches maximum at the splice (or 1-1/8 inches nominal)
- **Faceplate External Radius of Curvature:** 20-3/4 inches
- **Minimum Useful Screen Dimensions:** 14-3/4 inches width, 11-11/16 inches height, 15-3/4 inches diagonal
- **Minimum Useful Screen Area:** 155 square inches
- **Bulb Dimensions:** 15-5/8 inches $\pm$ 1/8 inch width, 12-3/4 inches $\pm$ 1/8 inch height, 16-9/16 inches $\pm$ 1/8 inch diagonal
- **Net Weight:** Approximately 10 lbs

The tube can be mounted in any operating position. The anode terminal is a recessed small cavity cap (JEDEC No. J1-21). The base is a small-button Neoeightar 7-pin configuration (JEDEC No. B7-208) with an 8HR basing arrangement. The tube socket (such as Ucinite Part No. 115446 or equivalent) must not be rigidly mounted and must use flexible leads to prevent mechanical stress on the neck.

Heater and Electrical Connections

The 17DSP4 is equipped with a coated unipotential cathode. The heater is designed for controlled warm-up service, reaching its operating state in approximately 11 seconds.

Heater Parameter	Value
Heater Voltage (AC or DC)	6.3 V
Heater Current	0.6 A
Warm-Up Time	11 seconds

Basing and Pinout Variations

The 8HR basing arrangement is documented with minor variations in pin assignments. All configurations share the same heater, cathode, and Grid No. 2 connections, but differ in the placement of Grid No. 1 and Grid No. 4 (Focusing Electrode).

- **Common Connections:**

- Pin 1: Heater
- Pin 3: Grid No. 2
- Pin 7: Cathode
- Pin 8: Heater
- Anode Cap: Ultor (Grid No. 3, Grid No. 5, Collector)
- **Pinout Configuration A:**
 - Pin 2: Grid No. 1
 - Pin 4: Grid No. 4 (Focus)
 - Pin 6: Grid No. 1
- **Pinout Configuration B:**
 - Pin 2: Grid No. 1
 - Pin 4: No Connection (aligns with anode contact within 30°)
 - Pin 6: Grid No. 4 (Focus)
- **Pinout Configuration C:**
 - Pin 2: Grid No. 4 (Focus)
 - Pin 4: No Connection (aligns with anode contact within 30°)
 - Pin 6: Grid No. 1

Interelectrode Capacitances

- **Grid No. 1 to all other electrodes:** 6 μF
- **Cathode to all other electrodes:** 5 μF
- **External conductive coating to anode:** 1000 μF minimum, 1500 μF maximum

The external conductive coating forms a supplementary filter capacitor and must be grounded. Additionally, a transparent insulating coating of approximately 6 inches in diameter is applied to the bulb.

Maximum Ratings

The 17DSP4 has been rated under both the Design-Center and Design-Maximum systems. These ratings represent different design limits and must not be combined.

Design-Center Ratings

Under the Design-Center system, the maximum ratings are defined as follows:

- **Anode (Ultor) Voltage:** 18,000 max Volts (Operation below 12,000 Volts is not recommended; equivalent absolute minimum is 11,000 Volts)
- **Grid No. 4 (Focusing) Voltage:** Positive 1,000 max Volts, Negative 500 max Volts
- **Grid No. 2 Voltage:** 500 max Volts
- **Grid No. 1 Voltage:** Negative peak 200 max Volts, Negative bias 140 max Volts, Positive bias 0 max Volts, Positive peak 2 max Volts
- **Peak Heater-Cathode Voltage:**

- Heater negative with respect to cathode (during warm-up ≤ 15 seconds): 410 max Volts
- Heater negative with respect to cathode (after warm-up): 180 max Volts
- Heater positive with respect to cathode: 180 max Volts

For **Cathode-Drive Service** (voltages positive with respect to Grid No. 1), the Design-Center ratings are:

- **Ultor-to-Grid-No. 1 Voltage:** 18,000 max Volts, 12,000 min Volts (Equivalent absolute minimum: 11,000 Volts)
- **Grid-No. 4-to-Grid-No. 1 Voltage:** Positive 1,000 max Volts, Negative 500 max Volts
- **Grid-No. 2-to-Grid-No. 1 Voltage:** 640 max Volts
- **Grid-No. 2-to-Cathode Voltage:** 500 max Volts
- **Cathode-to-Grid-No. 1 Voltage:** Positive peak 200 max Volts, Positive bias 140 max Volts, Negative bias 0 max Volts, Negative peak 2 max Volts

Design-Maximum Ratings

Under the Design-Maximum system, the maximum ratings are defined as follows:

- **Anode Voltage:** 18,000 V dc
- **Grid No. 4 Voltage (Focusing Electrode):** -550 to +1100 V dc
- **Grid No. 2 Voltage:** 550 V dc
- **Grid No. 1 Voltage:** Negative bias 154 V dc, Negative peak 220 V, Positive bias 0 V dc, Positive peak 2 V
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up ≤ 15 seconds): 450 V
 - Heater negative with respect to cathode (after warm-up): 200 V
 - Heater positive with respect to cathode: 200 V

Typical Operating Conditions and Drive Services

The 17DSP4 can be operated using 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).

Grid-Drive Service

In Grid-Drive Service, voltages are specified positive with respect to the cathode:

- **Anode Voltage:** 14,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to 400 V dc
- **Grid No. 2 Voltage:** 400 V dc
- **Grid No. 1 Cutoff Voltage:** -45 to -90 V dc (for visual extinction of a focused raster; this must be increased by approximately 5 V for stationary focused spot extinction)

Examples of Grid-Drive Design Ranges (at Anode = 16,000 V):

- **Example 1 (Grid No. 2 = 300 V):** Focus Voltage = 0 to 400 V, Grid No. 1 Cutoff = -38 to -72 V, White-level Video Drive = 38 to 72 V
- **Example 2 (Grid No. 2 = 400 V):** Focus Voltage = 0 to 400 V, Grid No. 1 Cutoff = -45 to -90 V, White-level Video Drive = 45 to 90 V

Cathode-Drive Service

In Cathode-Drive Service, voltages are specified positive with respect to Grid No. 1:

- **Anode Voltage (or Anode-to-Grid-1):** 14,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to 400 V dc
- **Grid No. 2 Voltage:** 450 V dc
- **Cathode Cutoff Voltage:** +46 to +85 V dc (for visual extinction of a focused raster; this must be increased by approximately 5 V for stationary focused spot extinction)

Examples of Cathode-Drive Design Ranges (at Anode-to-Grid-1 = 16,000 V):

- **Example 1 (Grid-No. 2-to-Grid-No. 1 = 300 V):** Focus Voltage = 0 to 400 V, Cathode-to-Grid-No. 1 Cutoff = 35 to 63 V, White-level Video Drive = -35 to -63 V
- **Example 2 (Grid-No. 2-to-Grid-No. 1 = 400 V):** Focus Voltage = 0 to 400 V, Cathode-to-Grid-No. 1 Cutoff = 43 to 78 V, White-level Video Drive = -43 to -78 V

Circuit and Equipment Design Limits

To ensure reliable operation, the following circuit values and equipment design ranges must be maintained:

- **Grid No. 1 Circuit Resistance:** 1.5 max Megohms
- **Grid No. 2 Circuit Resistance:** 10,000 min Ohms (protective resistance is advised)
- **Grid No. 4 Circuit Resistance:** 10,000 min Ohms (protective resistance is advised)
- **Grid No. 4 Current:** -25 to +25 μ A
- **Grid No. 2 Current:** -15 to +15 μ A
- **Centering Magnet Field Strength:** 0 to 8 gauss

Performance and Drive Characteristics

The raster-cutoff range scales linearly with the Grid No. 2 (or Grid-No. 2-to-Grid-No. 1) voltage. When comparing drive characteristics, Cathode-Drive Service yields higher highlight brightness (up to approximately 850 fL at 70 V drive) and higher ultor current (up to approximately 2.3 mA at 70 V drive) compared to Grid-Drive Service at equivalent video signal voltages.

Safety and Handling

Because the 17DSP4 operates at high voltages, appropriate safety precautions are required:

- **Shatter-Proof Cover:** It is recommended to use a protective glass cover over the tube face to protect against potential implosion and to provide X-ray shielding.
- **X-ray Shielding:** X-ray radiation shielding may be necessary if the tube is operated above 16,000 V or its maximum rated anode voltage.

Technical Summary

The **17DSP4** is a lightweight, 17-inch rectangular glass television picture tube featuring 110-degree magnetic deflection and low-voltage electrostatic focusing. Operating with a 6.3 V, 0.6 A heater with an 11-second controlled warm-up, it is designed for direct-view television applications. It supports both Grid-Drive and Cathode-Drive configurations, with typical anode operating voltages around 14,000 V to 16,000 V (up to an absolute maximum of 18,000 V). The tube's aluminized P4 screen provides white fluorescence with short to medium persistence, and its external conductive coating provides supplementary filtering when grounded.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	600 mA	—
Cathode To All Other Electrodes Capacitance	5 pF	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	18000 V	—
Maximum Grid2 Voltage	550 V	—
Typical Anode Voltage	14000 V	—



SOURCE OPERATING CONDITIONS

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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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—
Maximum anode voltage	16000 V	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum grid 2 voltage	500 V	—
Maximum positive cathode voltage	154 V	—
Maximum positive peak cathode voltage	220 V	—
Minimum recommended anode voltage	12000 V	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	—
Grid 1 to all other electrodes capacitance	6 pF	—



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1971 RCA HB3 Binder 1 of 7

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

1971 RCA HB3 BINDER 1 OF 7

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to all other electrodes	6	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Light transmission (Approx)	78	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus§ – published value 1	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus§ – published value 2	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.4 Current – published value 1	-25	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Current – published value 2	25	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Current – published value 1	-15	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Current – published value 2	15	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus – published value 1	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus – published value 2	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus – published value 3	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus – published value 4	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 1	-38 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 2	-72 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 3	-45 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 4	-90 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Voltage for focus§ – published value 1	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Voltage for focus§ – published value 2	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Voltage for focus – published value 1	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Voltage for focus – published value 2	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Voltage for focus – published value 3	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Voltage for focus – published value 4	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
tion of focused raster – published value 1	35 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
tion of focused raster – published value 2	63 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
tion of focused raster – published value 3	43 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
tion of focused raster – published value 4	78 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
winisuw ul for (or alto r-to –ggrid–No.i) voltage is 11.000 volts, Delow	11 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ul for (or alto r-to–grid–No.1) voltage is never less than 11,000 volts – published value 1	11 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ul for (or alto r-to–grid–No.1) voltage is never less than 11,000 volts – published value 2	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus of any individual tube will have a value Det ween 0 and u00 volts	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
u ndePlected focused spot will fall within a circle having a 5/16–inch – published value 1	5	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
undePlected focused spot will fall within a circle having a 5/16-inch – published value 2	16	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR VOLTS=12000 7018000 – published value 1	12000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR VOLTS=12000 7018000 – published value 2	7018000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-N'4 VOLTS ADJUSTED FOR FOCUS	4 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-N~1 VOLTS=12000 7018000 – published value 1	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-N~1 VOLTS=12000 7018000 – published value 2	12000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-N~1 VOLTS=12000 7018000 – published value 3	7018000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-N' 2-T0-GRID-N3I VOLTS	2 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-NQI VOLTS=16000 – published value 1	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-NQI VOLTS=16000 – published value 2	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-N'I – published value 1	12000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-N'I – published value 2	18000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
VOLTS=12000 TO IB000	12000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
GRID-No.2 VOLTAGE	500 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater positive with respect to cathode	180 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.1-Circuit Resistance – published value 1	1 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.1-Circuit Resistance – published value 2	5 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-No.2-T0-GR10-No.1 VOLTAGE	640 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-No.2-T0-CATHODE VOLTAGE	500 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.1-Circuit Resistance	1.5 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.