

Seventeen-inch direct-view monochrome television CRT with tri-potential electrostatic focus, magnetic deflection, and an aluminized P4 white screen. Its high-voltage system and broad deflection geometry provide a bright receiver picture and require X-ray precautions.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
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	36000 V
MAXIMUM SCREEN VOLTAGE	550 V
CRT-specific ratings, operating conditions, capacitances, focus/deflection, cutoff, optical, and screen data are retained in section parameters.	

17DXP4 — Tri-Potential Electrostatic Focus Television Picture Tube

Overview

The **17DXP4** is a 17-inch direct-viewed, rectangular glass television picture tube. It features a short neck, a spherical gray filterglass faceplate, and an aluminized screen utilizing P4-Sulfide phosphor. The tube employs a tri-potential low-voltage electrostatic focusing method and 110-degree magnetic deflection. Its electron gun is designed to operate without requiring an external ion-trap magnet. Additionally, the tube

incorporates an external conductive coating and a controlled warm-up time heater for unipotential cathode operation.

Mechanical Specifications and Physical Dimensions

The 17DXP4 is housed in a J132-1/2 A/B bulb and has a spherical faceplate with approximately 77% light transmission. The minimum useful screen dimensions provide a projected area of 155 square inches, with a minimum height of 11-11/16", a minimum width of 14-3/4", and a minimum diagonal of 15-3/4".

Parameter	Value
Overall Length	10-11/16" $\pm$ 1/4"
Greatest Width	15-5/8" $\pm$ 1/8"
Greatest Height	12-3/4" $\pm$ 1/8"
Diagonal	16-9/16" $\pm$ 1/8"
Neck Length	3-9/16" $\pm$ 1/8"
Weight	Approx. 10 lbs
Operating Position	Any

The tube uses a Small-Button Neoeightar 7-Pin base (JEDEC No. B7-208) and a Recessed Small Cavity Cap (JEDEC No. J1-21) for the anode connection. The socket should be a non-rigid mounting type with flexible leads, such as Ucinite Part No. 115446 or its equivalent.

Heater and Interelectrode Capacitances

The unipotential cathode is heated by a 6.3 V heater with a controlled warm-up time.

Heater Parameter	Value
Heater Voltage (AC or DC)	6.3 V
Heater Current	0.45 A $\pm$ 5% (450 mA)
Average Warm-up Time	11 seconds

The heater warm-up time is defined as the time required to reach 80% of the rated heater voltage when tested in series with a resistance equal to three times the rated heater voltage divided by the rated heater current, applying four times the rated heater voltage.

Direct interelectrode capacitances are approximately:

- **Grid No. 1 to all other electrodes:** 6 μ F
- **Cathode to all other electrodes:** 5 μ F
- **External conductive coating to anode (ultor):** 1000 pF (min) to 1500 pF (max)

Basing and Pinout

The 17DXP4 utilizes the **8JR** basing arrangement. Base Pin No. 4 aligns with the horizontal centerline within 30 degrees and is located on the same side as the anode contact.

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 3 (Focusing Electrode)
Pin 6	Internal Connection (Do Not Use)
Pin 7	Cathode
Pin 8	Heater
Cap	Anode / Ultor (Grid No. 4, Collector)
External Coating	Must be grounded

Operating Ratings

The maximum and minimum ratings for the 17DXP4 are published under both Design-Center and Design-Maximum rating systems for Grid-Drive service.

Parameter	Design-Center Rating	Design-Maximum Rating
Anode (Ultor) Voltage	12,000 V min / 16,000 V max	17,600 V max (11,000 V absolute min)
Grid No. 3 (Focusing) Voltage	650 V max	700 V max
Grid No. 2 Voltage	300 V min / 550 V max	600 V max
Grid No. 1 Negative-Peak Voltage	200 V max	220 V max
Grid No. 1 Negative-Bias Voltage	140 V max	154 V max
Grid No. 1 Positive-Bias Voltage	0 V max	0 V max
Grid No. 1 Positive-Peak Voltage	2 V max	2 V max

Parameter	Design-Center Rating	Design-Maximum Rating
Peak Heater-Cathode Voltage (Heater negative to cathode, warm-up $\leq$ 15s)	410 V max	450 V max
Peak Heater-Cathode Voltage (Heater negative to cathode, after warm-up)	180 V max	200 V max
Peak Heater-Cathode Voltage (Heater positive to cathode)	180 V max	200 V max

For Cathode-Drive service, the ratings are specified relative to Grid No. 1:

- **Ultor-to-Grid-No. 1 Voltage:** 12,000 V min to 16,000 V max (Design-Center)
- **Grid-No. 3-to-Grid-No. 1 Voltage:** 650 V max (Design-Center)
- **Grid-No. 2-to-Grid-No. 1 Voltage:** 690 V max (Design-Center)
- **Grid-No. 2-to-Cathode Voltage:** 300 V min to 550 V max (Design-Center)
- **Cathode-to-Grid-No. 1 Voltage:**
 - Positive-peak: 200 V max
 - Positive-bias: 140 V max
 - Negative-bias: 0 V max
 - Negative-peak: 2 V max

Typical Operating Conditions and Service Examples

The 17DXP4 can be operated in either Grid-Drive or Cathode-Drive configurations.

Grid-Drive Service Examples

- **Anode Voltage:** 14,000 V (Typical) or 16,000 V (Example)
- **Grid-No. 3 Voltage for Focus:** 0 to 400 V
- **Grid-No. 2 Voltage:** 400 V to 500 V (A minimum of 400 V is recommended for improved brightness and resolution)
- **Grid-No. 1 Voltage for Visual Extinction:**
 - At Grid-No. 2 = 400 V: -34 V to -63 V
 - At Grid-No. 2 = 500 V: -43 V to -78 V
 - *Note:* Extinction of a stationary focused spot requires approximately 5 V more negative bias.
- **Grid-No. 1 Video Drive (White-level, peak positive):**
 - At Grid-No. 2 = 400 V: 34 V to 63 V
 - At Grid-No. 2 = 500 V: 43 V to 78 V
- **Maximum Grid-No. 1 Circuit Resistance:** 1.5 Megohms

Cathode-Drive Service Examples (at 16,000 V Ultor-to-Grid-No. 1)

- **Grid-No. 2-to-Grid-No. 1 Voltage:** 400 V or 500 V
- **Grid-No. 3-to-Grid-No. 1 Voltage for Focus:** 0 to 400 V
- **Cathode-to-Grid-No. 1 Voltage for Visual Extinction:**
 - At Grid-No. 2-to-Grid-No. 1 = 400 V: 34 V to 56 V
 - At Grid-No. 2-to-Grid-No. 1 = 500 V: 41 V to 69 V
- **Cathode-to-Grid-No. 1 Video Drive (White-level, peak negative):**
 - At Grid-No. 2-to-Grid-No. 1 = 400 V: -34 V to -56 V
 - At Grid-No. 2-to-Grid-No. 1 = 500 V: -41 V to -69 V
- **Maximum Grid-No. 1 Circuit Resistance:** 1.5 Megohms

Focusing and Operating Considerations

The tri-potential electrostatic focusing system is highly sensitive. The optimum focus voltage varies dynamically based on operating parameters:

- It increases directly with anode voltage at a rate of approximately **46 V per 1000 V** change.
- It decreases inversely with Grid-No. 2 voltage at a rate of approximately **60 V per 100 V** change.
- It decreases inversely with anode current at a rate of approximately **60 V per 100 μ A** change.

Because of this narrow depth of focus, a potentiometer or a 4-tap switch is required in the focusing circuit. The equipment design range for Grid-No. 3 current is -25 to +25 μ A, and for Grid-No. 2 current is -15 to +15 μ A. If a centering magnet is used, its field strength should be adjustable from 0 to 12 gauss.

Safety and Shielding

The external conductive coating of the 17DXP4 must be reliably grounded. For safety, a shatter-proof glass cover should be installed over the tube face to protect against potential implosion and to provide X-ray shielding. X-ray radiation shielding may be necessary if the tube is operated above 16,000 V or the maximum rated anode voltage, to protect against prolonged exposure at close range.



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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	17600 V	—
Anode Voltage	14000 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	Aluminized



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

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Tri-potential electrostatic	—
Deflection method	Magnetic	—
Horizontal deflection angle	81 deg	—
Diagonal deflection angle	92 deg	—
Vertical deflection angle	67 deg	—
Fluorescence	White	—
Persistence	Short to medium	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	450 mA	—

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	Aluminized P4	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum anode voltage	17600 V	—
Typical anode voltage	14000 V	—
Typical grid2 voltage	500 V	—
Cutoff voltage range	-43 to -78 V	—
Grid1 circuit resistance maximum	1.5 Mohm	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid1-to-all capacitance	6 pF	—
External conductive coating to anode capacitance maximum	1500 pF	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Monochrome television picture display	—



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.

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Voltage (AC or DC)	6.3 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Current at 6.3 volts – published value 1	6.3 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Current at 6.3 volts – published value 2	0.45 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
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)	77	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.
Grid-No.3 Current – published value 1	-25	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.3 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.
With ultor voltage of	36000 V	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.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
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.
of focused raster – published value 1	34 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
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.
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.
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.
With any ultor-to-grid-No.3 voltage (Ec4g 1 1 between – published value 1	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
With any ultor-to-grid-No.3 voltage (Ec4g 1 1 between – published value 2	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
32000 and 36000 volts and grid-No.z-to-grid – published value 1	32000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
32000 and 36000 volts and grid-No.z-to-grid – published value 2	36000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
No.3 voltage (E~ZgI) between qoa and 6qo volts	6 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
No.1 voltage of – published value 1	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
No.1 voltage of – published value 2	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
for focus – published value 1	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
for focus – published value 2	400 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
for focus – published value 3	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
for 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	34 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 2	56 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 3	41 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 4	69 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
a{nifus into r– or into r–to –gritl–No.1 voltage is 11,000 volts, below – published value 1	11 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
a{nifus into r– or into r–to –gritl–No.1 voltage is 11,000 volts, below – published value 2	0 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
into r– or into r–to–grid–x0.1 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.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
into r- or into r-to-grid- x0.1 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.
u6 volts for each 1000-volt change in ultor voltage; inversely with	1000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
grid-No.2 voltage at the rate of about 60 volts }or each 100-volt – published value 1	60 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
grid-No.2 voltage at the rate of about 60 volts }or each 100-volt – published value 2	100 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
rate of about 60 volts for each 100-microampere change in ultor current – published value 1	60 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
rate of about 60 volts for each 100-microampere change in ultor current – published value 2	100 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
o Dtaind If the focusing voltage is ithin 75 olts of the value	75 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
to within 75 volts OP the optimum val ue turing line- voltage fluctuations	75 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
unde Plected' focu sed 'spot well 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.
unde Plected' focu sed 'spot well 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 7016000 – 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 7016000 – published value 2	7016000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
GRID-N'2 VOLTS	2 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-Ns1 VOLTS=12000 TO 16000 – 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-Ns1 VOLTS=12000 TO 16000 – published value 2	16000 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.3 (FOCUSING) VOLTAGE	650 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-No.2 VOLTAGE	550 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.
VOLTAGE	650 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-No.2-T0-GRID-No.1 VOLTAGE	690 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-No.2-TD-CATHODE VOLTAGE	550 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.

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