

Seventeen-inch P4 picture tube with approximately 90-degree magnetic deflection, electrostatic focusing, and an external conductive coating. Its direct-view construction is intended for monochrome television receiver display.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12L	BASE PINS	6
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	26000 V
MAXIMUM SCREEN VOLTAGE	500 V
CRT-specific ratings, operating conditions, capacitances, focus/deflection, cutoff, optical, and screen data are retained in section parameters.	

17CFP4 Television Picture Tube

The **17CFP4** is a rectangular glass television picture tube designed for direct-view applications. It features a lightweight construction, a short neck, low-voltage electrostatic focusing, and 90-degree magnetic deflection. The electron gun design does not require an ion-trap magnet, simplifying installation and adjustment.

Physical and Mechanical Characteristics

The 17CFP4 is built with a rectangular glass envelope (bulb designation J132 1/2 C or equivalent) and is designed to be mounted in any operating position.

Faceplate and Screen

The faceplate features spherical inner and outer surfaces made of gray neutral filter glass, which provides a light transmission of approximately 77% to 79% (nominally $77 \pm 3\%$). This filter glass improves picture contrast under ambient room lighting.

The screen utilizes an aluminized P4-sulfide type phosphor that produces white fluorescence and white phosphorescence with a short to medium-short persistence. The minimum useful screen dimensions and area are:

- **Minimum Useful Height:** 11-11/16 inches
- **Minimum Useful Width:** 14-3/4 inches
- **Minimum Useful Diagonal:** 15-3/4 inches
- **Minimum Useful Area:** 155 square inches
- **Raster Size:** 11-11/16 inches by 14-3/4 inches

Physical Dimensions and Weight

- **Overall Length:** $15 \pm 3/8$ inches
- **Greatest Width:** $15-5/8 \pm 1/8$ inches
- **Greatest Height:** $12-3/4 \pm 1/8$ inches
- **Diagonal Dimension:** $16-9/16 \pm 1/8$ inches
- **Neck Length:** $5-1/2 \pm 3/16$ inches
- **Net Weight:** Approximately 10 to 10-1/2 pounds

Base, Terminals, and Grounding

The tube uses a Small Shell Duodecal 6-pin base (JETEC B6-63 or B6-203) with a 12L basing arrangement. The high-voltage anode terminal is a Recessed Small Cavity Cap (JETEC J1-21), which aligns with pin position number 6 within a tolerance of ± 30 degrees.

An external conductive coating is applied to the envelope and must be grounded. The contact area for this coating must be at least 2 inches by 2 inches, located $2 \pm 1/4$ inches from the reference line and positioned 90 degrees counterclockwise from the anode button when viewed from the base end.

Heater and Electrical Connections

The 17CFP4 contains a coated unipotential cathode. The heater is designed for either AC or DC operation.

Heater Specifications

- **Heater Voltage:** 6.3 V

- **Heater Current:** 0.6 A (with a tolerance of $\pm 5\%$ or $\pm 10\%$ depending on the specification standard)
- **Heater Warm-up Time:** 11 seconds (defined as the time required to reach 5.0 V across the heater terminals in a standard test circuit with an applied voltage of 25 V and a series resistance of 31.5 ohms)

Pinout Configuration (Basing 12L)

The electrical connections viewed from the bottom of the base are as follows:

Pin Number	Electrode Connection
Pin 1	Heater
Pin 2	Grid No. 1 (Control Grid)
Pin 6	Grid No. 4 (Focusing Electrode)
Pin 10	Grid No. 2 (Screen Grid)
Pin 11	Cathode
Pin 12	Heater
Cap	Anode (Grid No. 3, Grid No. 5, Screen / Ultor / Collector)
C	External Conductive Coating

Interelectrode Capacitances

- **Grid No. 1 to all other electrodes:** 6 μf
- **Cathode to all other electrodes:** 5 μf
- **External conductive coating to anode (ultor):** 1200 μf (minimum) to 1500 μf (maximum)

Operating Modes and Typical Characteristics

The 17CFP4 can be operated in either Grid-Drive service or Cathode-Drive service. Average drive characteristics indicate that Cathode-Drive operation achieves slightly higher highlight brightness and anode current than Grid-Drive for the same video signal drive voltage.

Grid-Drive Service

In Grid-Drive service, operating voltages are referenced to the cathode.

- **Anode (Ultor) Voltage:** 14,000 V DC (typically operated at this level; voltages below 12,000 V result in decreased brilliance and definition)
- **Grid No. 4 (Focusing) Voltage:** -50 to +350 V DC
- **Grid No. 2 Voltage:** 300 V DC

- **Grid No. 1 Voltage for Raster Cutoff:** -35 to -72 V DC (or -28 to -72 V DC depending on the specific operating point) for visual extinction of a focused raster. Extinction of a stationary focused spot requires approximately 5 V more negative bias.
- **Grid No. 1 Video Drive (White-level):** 28 to 72 V
- **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

Cathode-Drive Service

In Cathode-Drive service, operating voltages are referenced to Grid No. 1.

- **Anode-to-Grid-No. 1 Voltage:** 16,000 V DC
- **Grid-No. 2-to-Grid-No. 1 Voltage:** 300 V DC
- **Grid-No. 4-to-Grid-No. 1 Focus Voltage:** 0 to 400 V DC
- **Cathode-to-Grid-No. 1 Voltage for Raster Cutoff:** 28 to 60 V DC
- **Cathode-to-Grid-No. 1 Video Drive (White-level):** -28 to -60 V
- **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

Cutoff Characteristics

Raster-cutoff characteristics show that the Grid-No. 1 cutoff voltage ranges from -20 V to -120 V depending on the Grid-No. 2 voltage (across a 200 V to 500 V range) for Grid-Drive operation. For Cathode-Drive operation, the Cathode-to-Grid-No. 1 cutoff voltage ranges from 20 V to 96 V over the same Grid-No. 2 voltage range.

Maximum Ratings and Circuit Limits

The maximum ratings for the 17CFP4 are specified under both Design-Center and Absolute Maximum rating systems. Operating the tube beyond these limits can cause damage or degrade performance.

Voltage Ratings

Parameter	Design-Center Maximum	Absolute Maximum
Anode (Ultor) Voltage	16,000 V	17,600 V
Anode (Ultor) Voltage (Minimum)	12,000 V	10,800 V
Grid No. 4 (Focusing) Voltage	-500 to +1000 V	-550 to +1100 V
Grid No. 2 Voltage	500 V	550 V

Parameter	Design-Center Maximum	Absolute Maximum
Grid No. 2 to Grid No. 1 Voltage (Cathode-Drive)	640 V	—
Grid No. 2 to Cathode Voltage (Cathode-Drive)	500 V	—
Grid No. 1 Negative Bias	140 V	155 V
Grid No. 1 Negative Peak	200 V	220 V
Grid No. 1 Positive Bias	0 V	0 V
Grid No. 1 Positive Peak	2 V	2 V

Peak Heater-Cathode Voltage Ratings

- **Heater negative with respect to cathode (during warm-up, ≤ 15 seconds):** 410 V (Design-Center), 450 V (Absolute Maximum)
- **Heater negative with respect to cathode (after warm-up):** 180 V (Design-Center), 200 V (Absolute Maximum)
- **Heater positive with respect to cathode:** 180 V (Design-Center), 200 V (Absolute Maximum)

Limiting Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 M Ω maximum
- **Grid No. 2 Circuit Resistance:** A protective resistance of 10,000 Ω is advised.
- **Grid No. 4 Circuit Resistance:** A protective resistance of 10,000 Ω is advised.

Installation and Safety Guidelines

Socket Mounting

The tube socket should not be mounted rigidly. It must be allowed to move freely, supported by flexible leads, to prevent mechanical stress on the tube neck and base pins.

X-ray Radiation Shielding

When the 17CFP4 is operated at anode voltages exceeding 16,000 V, X-ray radiation shielding may be necessary. Appropriate shielding protects users from prolonged exposure at close range when the tube is operated up to its absolute maximum anode voltage of 17,600 V.

Technical Summary

The **17CFP4** is a 17-inch rectangular glass television picture tube utilizing low-voltage electrostatic focusing and 90-degree magnetic deflection. It features an aluminized P4 screen with a spherical gray

filter glass faceplate that provides 77% to 79% light transmission. Operating with a 6.3 V, 0.6 A heater, the tube is highly versatile, supporting both Grid-Drive and Cathode-Drive configurations. With an absolute maximum anode voltage rating of 17,600 V and a design-center maximum of 16,000 V, it delivers reliable brightness and resolution when operated within its recommended limits. Proper installation requires grounding the external conductive coating, using a flexible socket mount, and implementing X-ray shielding if operated above 16,000 V.



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	17600 V	—
Maximum Grid2 Voltage	550 V	—
Typical Anode Voltage	14000 V	—



SOURCE OPERATING CONDITIONS

1965 Sylvania Electronic Tubes Vol3

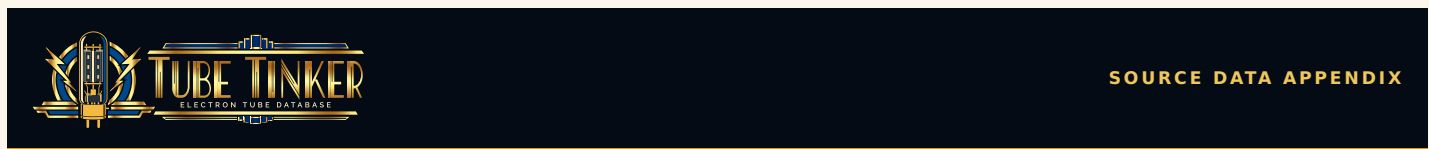
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1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	1 code	LowVoltageElectrostatic
Deflection method	1 code	Magnetic
Deflection angle	90 deg	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode voltage maximum	16000 V	—
Anode voltage	14000 V	—
Grid No. 2 voltage maximum	500 V	—
Grid No. 4 focusing voltage minimum	0 V	—
Grid No. 4 focusing voltage maximum	400 V	—



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
Voltage (AC or DC)	63 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Current – published value 1	0	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Current – published value 2	6	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Current – published value 3	10	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.)	79	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
With any ultor voltage (Ec gkl between i2000l and 26000 volts	26000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus§ – published value 1	-50 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focus§ – published value 2	350 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
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.
With ultor voltage of	26000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltage for focus – published value 1	-50 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltage for focus – published value 2	350 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 1	-28 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.
No.T voltage (fic y gil he tween aao 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.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
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.
Na.1 voltage of	16 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
No.: voltage of – published value 1	3 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
No.: voltage of – published value 2	0 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.
ulto r- or ultor-to-grid-No.i voltage is never less than 10,800 volts – published value 1	10 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ulto r- or ultor-to-grid-No.i voltage is never less than 10,800 volts – published value 2	800 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
u ndeTl ec led focused spot will tall It hin 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.
u ndeTl ec led focused spot will tall It hin 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 YOLTS=12000 TO 16000 – published value 1	12000	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR YOLTS=12000 TO 16000 – published value 2	16000	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-TO-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.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
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.
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.
I.G:I. GORDINATES OF SCREEN: X=0.270 – published value 1	0.27	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
I.G:I. GORDINATES OF SCREEN: X=0.270 – published value 2	0.3	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ULTOR-T0-GRID-N>z1 – 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>z1 – published value 2	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
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.
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.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	1.5 mA	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	640 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.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 – 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.

TUBE TINKER

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