



ELECTRONIC TUBE REFERENCE

17EBP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Seventeen-inch television picture tube with electrostatic focus, magnetic deflection, and an aluminized P4 screen. Its high-voltage direct-view construction and wide deflection geometry support bright monochrome receiver images, with published X-ray precautions.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 450 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	20000 V
<i>Source-derived physical section; applicable promoted ratings are populated from the printed sheet.</i>	

17EBP4 — Low-Voltage Electrostatic Focus Television Picture Tube

The **17EBP4** is a 110-degree television picture tube featuring a spherical neutral gray glass faceplate, a short neck design, and an aluminized screen. It utilizes low-voltage electrostatic focusing combined with magnetic deflection. The tube incorporates a "No-Ion-Trap" electron gun, which eliminates the need for an external ion-trap magnet. Additionally, the 17EBP4 features an external conductive coating configured for grounding via the tube's mounting system, which functions as a supplementary filter capacitor in the high-voltage power supply.

Mechanical Specifications and Physical Dimensions

The 17EBP4 is designed with a compact physical envelope to minimize cabinet depth. Its dimensions and physical characteristics include:

- **Bulb Designation:** J132-1/2 A1 or equivalent.
- **Faceplate:** Spherical, neutral gray glass with approximately 78% light transmission.
- **Screen Dimensions (Minimum):** Width of 14-3/4 inches, height of 11-11/16 inches, and a diagonal of 15-3/4 inches, providing a minimum screen area of 155 square inches.
- **Bulb Dimensions:** Width of 15-5/8" $\pm$ 1/8", height of 12-3/4" $\pm$ 1/8", and a diagonal of 16-9/16" $\pm$ 1/8".
- **Neck Length:** 4-1/8" $\pm$ 1/8".
- **Neck Diameter:** Maximum of 1.168 inches at the splice.
- **Overall Length:** 11-1/4" $\pm$ 3/16".
- **Net Weight:** Approximately 10 lbs.
- **Mounting Position:** Any.

The tube features a transparent insulating coating approximately 6 inches in diameter. To maintain its insulating properties, this coating should only be wiped with a soft, dry, lintless cloth.

Electrical Connections and Basing

The 17EBP4 uses a **Small Button 7-Pin** base (JEDEC No. B7-208, Style 8 or Style B) with an **8HR** basing configuration. The high-voltage anode connection is made via a recessed small cavity cap (JEDEC No. J1-21) located on the side of the bulb.

The pinout connections are as follows:

Pin	Connection
Pin 1	Heater (H)
Pin 2	Grid No. 1 (g1)
Pin 3	Grid No. 2 (g2)
Pin 4	Grid No. 4 (g4) [Focusing Electrode]
Pin 6	Grid No. 1 (g1)
Pin 7	Cathode (K)
Pin 8	Heater (H)
Cap	Anode (A)

The anode terminal is aligned on the same side of the tube as pin 4 with an angular tolerance of $\pm 30^\circ$.

Heater Ratings

The heater is designed for operation on either AC or DC:

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.45 A
- **Heater Warm-Up Time:** Approximately 11 seconds. This warm-up time is defined as the time required to reach 80% of the rated heater voltage when 4 times the rated voltage is applied in series with an external resistance. As a calculation, the series resistance used in this warm-up measurement is 3 times the rated voltage (6.3 V) divided by the rated current (0.45 A), which equals **42 Ω** .
- **Heater Power:** The nominal heater power is calculated as 6.3 V multiplied by 0.45 A, which equals **2.835 W**.

Interelectrode Capacitances

- **Grid 1 to all other electrodes:** 6 μF
- **Cathode to all other electrodes:** 5 μF
- **External conductive coating to anode:** 1100 μF (minimum) to 1700 μF (maximum)

Maximum Ratings (Design Maximum Values)

The following limits represent the maximum safe operating parameters for the 17EBP4:

- **Anode Voltage:** 20,000 V maximum. (Operation below 12,000 V is not recommended, as it causes a decrease in picture brilliance and definition).
- **Grid 4 (Focusing Electrode) Voltage:** Positive 1100 V maximum; Negative 550 V maximum.
- **Grid 2 Voltage:** 700 V maximum.
- **Grid 1 Voltage:**
 - Negative bias value: 154 V maximum
 - Negative peak value: 220 V maximum
 - Positive bias value: 0 V maximum
 - Positive peak value: 2 V maximum
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode: 200 V maximum. During equipment warm-up, a peak value of 450 V design center maximum may be applied for a duration not exceeding 15 seconds.
 - Heater positive with respect to cathode: 200 V maximum.

Typical Operating Conditions

The 17EBP4 can be operated in either grid-drive or cathode-drive configurations depending on where the video signal is applied.

Grid Drive Operation (Video Signal Applied to Grid 1)

In this mode, the video signal modulates Grid 1 while the cathode is held at a reference potential:

- **Anode Voltage:** 14,000 V
- **Grid 2 Voltage:** 500 V
- **Grid 4 Voltage for Focus:** 0 to +400 V
- **Grid 1 Cutoff Voltage:** -43 to -72 V (for visual extinction of the focused raster)

Cathode Drive Operation (Video Signal Applied to Cathode)

In this mode, the video signal modulates the cathode relative to Grid 1:

- **Anode to Grid 1 Voltage:** 14,000 V
- **Grid 2 to Grid 1 Voltage:** 500 V
- **Grid 4 to Grid 1 Voltage for Focus:** 0 to +400 V
- **Cathode to Grid 1 Cutoff Voltage:** 40 to 63 V (for visual extinction of the focused raster)

Limiting Circuit Values and Installation Guidelines

To ensure reliable operation and protect the tube from internal damage, specific circuit resistance limits and installation practices must be observed:

- **Grid 1 Circuit Resistance:** 1.5 M Ω maximum.
- **Grid 2 Circuit Resistance:** 10,000 Ω minimum. A protective series resistance in the Grid 2 circuit is advisable to prevent damage.
- **Grid 4 Circuit Resistance:** 10,000 Ω minimum. A protective series resistance in the Grid 4 circuit is also advisable.
- **Socket Mounting:** The tube socket must not be mounted rigidly. It must be free to move with flexible leads to prevent lateral strain on the base pins.
- **Centering Magnet:** If a permanent magnet (PM) centering magnet is used, it should provide a field of 0 to 8 gauss and must extend no more than 2-1/8 inches from the yoke reference line.
- **X-Ray Radiation Shielding:** The tube is permitted to operate at absolute maximum voltages up to 22.0 kV. However, if the operating voltage exceeds 16 kV, appropriate shielding may be required to protect users from X-ray exposure.

Technical Summary

The **17EBP4** is a 110-degree, low-voltage electrostatic-focus television picture tube featuring magnetic deflection, a "No-Ion-Trap" gun, and an aluminized screen. Operating with a 6.3 V, 0.45 A heater, it provides a compact display solution with its short neck design and 11-1/4 inch overall length. It supports both grid-drive and cathode-drive video configurations, typically operating at an anode voltage of 14,000 V. By utilizing an external conductive coating as a filter capacitor and requiring no external ion-trap magnet, the 17EBP4 simplifies receiver design while maintaining high picture definition and brilliance within its recommended 12,000 V to 20,000 V operating range.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1947 Westinghouse

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

1947 WESTINGHOUSE

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater: Anode Voltage i i i	20000 V	Heater: Anode Voltage. i i i 20000 max. Volts
Voltage (acorde) o i i i i i	4 V	Voltage (acorde) o i i i 6.3 Volts Grid 4 Voltage:
[T	1100 A	[T 2. T Y 0.45 Ampere Positive Value 1100 max. VVolts
Warm-Up Time {Approx.jé	550 s	Warm-Up Time {Approx.jé 11 Seconds Negative Value . . v v v - v v v v i t v 550 max. VVolts
Direct Interelectrode Copdcitances: Grid	700 V	Direct Interelectrode Copdcitances: Grid 2 Voltage. oo ool 700 max. Volts
Grid	1 pF	Grid 1 to all other Elactrodes [ppf Grid 1 Voltage:
Cathode to all other Electrodes	154 V	Cathode to all other Electrodes 5 puf Negative Bios Value. . . .o oo it v s 154 max. Volts
MaXimUM & e st it i i e	0 V	MaXimUM & e st it i i e 1700 s Positive Bias Value 0 max, Volts
Minimum. « o0 ot e s e e e	2 V	Minimum. « o0 ot e s e e e 1100 Huf Positive Peak Value 2 max. Volts
Fluoresconce « o v v v v anivanovorantiboenenss White Heater Negative with Respect to Cothode§	200 V	Fluoresconce « o v v v v anivanovorantiboenenss White Heater Negative with Respect to Cothode§ 200 max. Volts
Defloction Method » « v o v v oo e e e Magnetic Grid	1.8 Mohm	Defloction Method » « v o v v oo e e e Magnetic Grid 1 Circuit Restsmnca 1.8 m?x. Megohms
Mounting Position o0 C e e e e Any Anode Voltage. . . .o covvvvnnenehns	14000 V	Mounting Position o0 C e e e e Any Anode Voltage. . .o covvvvnnenehns 14000 Volrs

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Seroen Dimensions (min. at greatest part): Grid	500 V	Seroen Dimensions (min. at greatest part): Grid 2 Voltage. . . . v v ittt 500 volts
R Grid	400 V	R Grid 4 Voltage for Focus. . . « v oot v i v s 0 to +400 Volts
M3/ g1 Cutoff Voltaged v v o v vevenenon –	72 V	M3/ g1 Cutoff Voltaged v v o v vevenenon — 4310 =72 Velts
Transmission {(Approx.j. [	14000 V	Transmission {(Approx.j. [78% Ancde to Grid 1 Voltage e v v i v v v e ot 14000 Volts
Bulb Dimensions (ot greatest part): Grid	500 V	Bulb Dimensions (ot greatest part): Grid 2to Grid 1 Voltage . . v .o vv v i v e e sy - 500 Volts
Width, o« v i vt i et i e et e e e e	4 V	Width, o« v i vt i et i e et e e e e 15-5/8" + 1/8" Grid 4 to Grid Voltage for Focus . . .
.. . . 0 lo 400 Volts	400 V	 0 lo 400 Volts
Height. . oo v vin i viiiien i i	63 V	Height. . oo v vin i viiiien i i 12-3/4" + 1/8" Cathode to Grid Cutoff Voltagea 40 to 63 Velts
e 16-9/16 +]{8. § Brilliance ond definition decrease with decreasing	8 V	e 16-9/16 +]{8. § Brilliance ond definition decrease with decreasing anade voltage.
Overall Longth « .+ e	16 mm	Overall Longth « .+ e 1143740 + 3/16° commended.
voltages as high as	22 V	voltages as high as 22.0 kilovolts {absolute value), shielding of
voltage across the heater to reach	80 V	voltage across the heater to reach 80% of its rated volue after
applying	4 V	applying 4 times rated heater voltage to a circuit consisting of
conditions involve voltages in excess of	14 V	conditions involve voltages in excess of 14 kilovolts.
heater valtage divided by rated heater current. § A peak value of	450 V	heater valtage divided by rated heater current. § A peak value of 450 volts design center maximum may be applied
for not more than	15 s	for not more than 15 seconds during squipment warm-up periods.
NOTE é: Neck dicmeter may be	1.168 cm	NOTE é: Neck dicmeter may be 0 maximum of 1.168° at the splice.

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
A Grid	10000 ohm	A Grid 2 Circuit Resistance® 10000 min. Ohms
Deflection Angle: Grid	10000 ohm	Deflection Angle: Grid 4 Circuit Resistance® 10000 min, Ohms
N T T	155 Inches	N T T 155 Sq. Inches Video Si I Applied to Cathods)



SOURCE OPERATING CONDITIONS

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	450 mA	—
Maximum anode voltage	20000 V	—
Maximum grid 2 voltage	700 V	—
Maximum positive cathode voltage	154 V	—
Maximum positive peak cathode voltage	220 V	—
Minimum recommended anode voltage	12000 V	—
Maximum focusing electrode voltage	1100 V	Positive limit

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

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes,
and their source documents.

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