ELECTRONIC TUBE REFERENCE

17BKP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
CATHODERAY

P4 cathode-ray display tube documented for high-voltage direct-view operation, using magnetic deflection and manufacturer-specified beam focusing and control arrangements appropriate to type 17BKP4A.

General characteristics

BASE DESIGNATION	B6-63	**BASE PINS**	6
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	17600 V

CRT-specific anode, focus, deflection and optical data retained as parameters rather than forced into ordinary plate/screen fields.

17BKP4A — Cathode Ray Tube

The **17BKP4A** is a direct-view, rectangular glass picture tube designed for television receiver applications. It features electrostatic focusing and magnetic deflection, utilizing a gray filter faceplate and an aluminized screen. The tube is identical to the **17BKP4** except for the addition of this aluminized screen, which improves brightness and contrast.

Construction and Mechanical Specifications

The 17BKP4A is constructed with a rectangular glass bulb, a gray filter faceplate, an external conductive coating, and requires an external single-field ion trap. The physical dimensions of the tube are as follows:

- **Overall Length:** 15 5/8 ± 3/8 inches

- **Greatest Diagonal Dimension:** 16 5/8 ± 1/8 inches
- **Greatest Width:** 15 3/8 ± 1/8 inches
- **Greatest Height:** 12 9/32 ± 1/8 inches
- **Minimum Useful Screen Dimensions:** 14 5/16 inches wide by 11 1/8 inches high, producing a nominal raster size of 14 5/16 by 11 1/8 inches.

The tube uses a **Small Shell Duodecal 6-Pin base (B6-63)** with a **12L** basing configuration. The high-voltage anode connection is made via a **Recessed Small Cavity Cap (J1-21)**, which is aligned with pin position #6 within a tolerance of ± 30 degrees.

Heater and Electrical Characteristics

The 17BKP4A contains an indirectly heated cathode with a heater designed for series or parallel operation:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.450 ± 5% Ampere
- **Heater Warm-up Time:** Approximately 11.0 seconds. This is defined as the time required for the voltage across the heater terminals to rise to 5.0 V in a standard test circuit with an applied voltage of 25 V and a series resistance of 42 ohms.

Direct Interelectrode Capacitances

The approximate direct interelectrode capacitances of the tube are:

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

Optical and Deflection Characteristics

The faceplate of the tube is made of gray filter glass with an approximate light transmission of 74% at the center.

- **Phosphor:** P-4 (Sulfide type), which produces a white fluorescence and white phosphorescence with medium persistence.
- **Deflection Method:** Magnetic deflection, with approximate deflection angles of:
  - **Horizontal:** 85°
  - **Diagonal:** 90°
- **Focusing Method:** Electrostatic focusing, controlled via Grid No. 4.

Design Center System Ratings

The following maximum ratings are established under the Design Center System:

- **Maximum DC Anode Voltage:** 17,600 Volts

- **Maximum DC Grid No. 4 Voltage:** -550 to +1100 Volts
- **Maximum DC Grid No. 2 Voltage:** 550 Volts
- **Maximum Grid No. 1 Voltage:**
  - **DC negative-bias value:** 155 Volts
  - **DC positive-bias value:** 0 Volts
  - **Positive-peak value:** 2 Volts
- **Maximum DC Peak Heater-Cathode Voltage:**
  - **Heater negative with respect to cathode during warm-up (≤ 15 seconds):** 450 Volts
  - **Heater negative with respect to cathode after warm-up:** 200 Volts
  - **Heater positive with respect to cathode:** 200 Volts
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms

Typical Operating Conditions

Under typical operating conditions, the 17BKP4A is configured with the following parameters:

- **DC Anode Voltage:** 14,000 Volts
- **DC Grid No. 4 Voltage:** -56 to +310 Volts (adjusted for visual extinction of the focused raster)
- **DC Grid No. 2 Voltage:** 300 Volts
- **DC Grid No. 1 Voltage:** -28 to -72 Volts (adjusted for visual extinction of the focused raster)
- **DC Ion Trap Magnet:** Requires an external single-field ion trap. When using a Standard Coil #117, the typical current is approximately 28 mA, corresponding to a rated magnetic field strength of 31 Gausses.

Pin Connections and Basing (12L)

The bottom view of the Small Shell Duodecal 6-Pin base (B6-63) provides the following pinout connections:

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 6	Grid No. 4
Pin 10	Grid No. 2
Pin 11	Cathode
Pin 12	Heater
Anode Cap	Grid No. 3, Grid No. 5, Anode

Technical Summary

The **17BKP4A** is a specialized television picture tube featuring a rectangular glass envelope, electrostatic focusing, and magnetic deflection. It is distinguished from the **17BKP4** by its aluminized screen, which provides enhanced brightness on its P-4 phosphor faceplate. Operating at a typical anode voltage of 14,000 Volts, the tube utilizes a 6.3 V, 0.450 A heater with a controlled 11-second warm-up time, making it suitable for standard television receiver designs.

SOURCE OPERATING CONDITIONS

1961 Tung Sol

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

1961 TUNG SOL

Section 1 · Cathode Ray

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Maximum Anode Voltage	**17600 V**	—
Typical Anode Voltage	**14000 V**	—
Maximum Grid2 Voltage	**550 V**	—
Typical Grid2 Voltage	**200 V**	—

CHARACTERISTIC		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
FocusingMethod	**Electrostatic**	—
DeflectingMethod	**Magnetic**	—
DiagonalDeflectionAngleApproximate	**90 degree**	—
PhosphorNumber	**4**	—
FluorescentColor	**White**	—
Persistence	**Medium**	—

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

SOURCE PDF

1966 Tung Sol Electronic Tubes 4 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 4 OF 4

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Maximum DC grid 2 voltage	**550 V**	—
Maximum DC grid 4 voltage	**-550–1100 V**	—
Maximum grid 1 negative-bias voltage	**155 V**	NegativeBias
Maximum grid 1 positive-bias voltage	**0 V**	PositiveBias
Maximum grid 1 positive-peak voltage	**2 V**	PositivePeak
Peak heater-cathode voltage	**450 V**	HeaterNegativeWarmup
Peak heater-cathode voltage	**200 V**	HeaterNegativeAfterWarmup
Peak heater-cathode voltage	**200 V**	HeaterPositive
DC anode voltage	**14000 V**	TypicalOperation
DC grid 4 voltage	**-50–310 V**	TypicalOperation
DC grid 2 voltage	**300 V**	TypicalOperation
DC grid 1 voltage	**-28–-72 V**	TypicalOperation
Ion trap current	**28 mA**	Approximate
Ion trap magnet rated strength	**31 gauss**	—

CHARACTERISTIC		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Horizontal deflection angle	**85 degrees**	Approximate
Vertical deflection angle	**68 degrees**	Approximate
Diagonal deflection angle	**90 degrees**	Approximate

CAPACITANCE		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Cathode to all other electrodes capacitance	**5 pF**	Approximate
Grid 1 to all other electrodes capacitance	**6 pF**	Approximate
External conductive coating to anode capacitance	**1500 pF**	Maximum

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
External conductive coating to anode capacitance	**1200 pF**	Minimum

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