



ELECTRONIC TUBE REFERENCE

1AD2

Rectifier - TV Line Scan Boost electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
RECTIFIER

Filamentary high-voltage television flyback rectifier for generating CRT accelerating voltage from horizontal-output transformer pulses, using a low-power filament suitable for operation at elevated potential.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	1.25 V / 200 mA	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Rectifier	
MAXIMUM CATHODE CURRENT	0.5 mA
PEAK INVERSE VOLTAGE	26000 V
NOMINAL OUTPUT CURRENT	0.5 mA
PEAK FORWARD CURRENT	50 mA
FORWARD VOLTAGE DROP	225 V
<i>Pulsed high-voltage rectifier.</i>	

1AD2 — Half-Wave Vacuum Rectifier

The **1AD2** is a compactron-style, duodecar half-wave vacuum rectifier designed specifically for high-voltage pulse rectifier service in color and black-and-white television receivers. As a filamentary diode, it features a coated filament and is engineered to withstand the extreme peak inverse voltages encountered in television horizontal deflection and flyback transformer circuits.

Construction and Physical Characteristics

The 1AD2 is constructed with a T-9 glass envelope (JEDEC T9) and a 12-pin button base (JEDEC No. E12-70), requiring a standard duodecar 12-contact socket. The physical dimensions of the tube are as follows:

- **Maximum Overall Length:** 3.125 inches
- **Seated Length:** 2.500 to 2.750 inches
- **Maximum Diameter:** 1.062 to 1.188 inches
- **Dimensional Outline:** JEDEC No. 9-98 (or Outline 9A)

The tube is designed to operate in **any mounting position**. Depending on the specific manufacturer and basing configuration, the plate connection is made either via a top cap or through a base pin. When a top cap is utilized, it is either a standard small cap (JEDEC No. C1-1) or a small cap with a tubular support (JEDEC No. C1-34).

Filament and Electrical Ratings

The 1AD2 utilizes a coated filament designed for low-power operation. Due to the high-voltage environment of the rectifier circuit, measuring the filament voltage requires extreme caution.

Parameter	Value
Filament Voltage (AC or DC, Bogey)	1.25 V
Filament Voltage Range (Design-Maximum)	1.05 V to 1.45 V
Filament Current (Bogey)	0.2 A (200 mA)
Direct Interelectrode Capacitance (Plate to Filament, approx. without shield)	1.6 pF

Basing and Socket Connections

The 1AD2 is documented with two distinct basing configurations: **12GV** and **12DQ**. Both configurations utilize the 12-pin duodecar base but differ in how the plate is connected.

12GV Basing Configuration (Top Cap Plate)

In the 12GV configuration, the plate is connected to the top cap of the envelope, isolating the high-voltage anode from the base pins.

- **Pin 1:** Filament, Internal Shield (F, IS)
- **Pin 2:** Internal Connection (IC) — Do not use
- **Pin 3:** Internal Connection (IC) — Do not use
- **Pin 4:** No Connection (NC) — May be used as a tie point for components at or near filament potential
- **Pin 5:** Internal Connection (IC) — Do not use
- **Pin 6:** Filament, Internal Shield (F, IS) / Internal Shield (IS)

- **Pin 7:** Internal Connection (IC) — Do not use
- **Pin 8:** Internal Connection (IC) — Do not use
- **Pin 9:** Internal Connection (IC) — Do not use
- **Pin 10:** No Connection (NC) — May be used as a tie point for components at or near filament potential
- **Pin 11:** Internal Connection (IC) — Do not use
- **Pin 12:** Filament (F)
- **Top Cap:** Plate (P)

12DQ Basing Configuration (Base Pin Plate)

In the 12DQ configuration, the plate is connected directly to Pin 7 of the duodecar base.

- **Pin 1:** Filament, Internal Shield (F, IS)
- **Pin 2:** Internal Connection (IC)
- **Pin 3:** Internal Connection (IC)
- **Pin 4:** Loop Connection (LC) — Usable as a tie point for components at or near filament potential
- **Pin 5:** Internal Connection (IC)
- **Pin 6:** Internal Connection (IC)
- **Pin 7:** Plate (P)
- **Pin 8:** Internal Connection (IC)
- **Pin 9:** Internal Connection (IC)
- **Pin 10:** Loop Connection (LC) — Usable as a tie point for components at or near filament potential
- **Pin 11:** Internal Connection (IC)
- **Pin 12:** Filament (F)

Socket Wiring Constraints

To prevent internal voltage breakdown, corona discharge, or circuit instability, strict rules must be followed when wiring the socket:

- **Internal Connections:** Pins designated as "Internal Connection" (IC) or "Do Not Use" (Pins 2, 3, 5, 7 [in 12GV], 8, 9, and 11) must never be used as tie points for any external components.
- **Tie Points:** Pins 4 and 10 (designated as No Connection or Loop Connection) are electrically isolated from the active tube elements and may be used as convenient tie points, but only for components operating at or near filament (cathode) potential.

Pulsed-Rectifier Service and Operating Points

The 1AD2 is primarily rated for pulsed-rectifier service in television receivers operating under a standard 525-line, 30-frame system. The Design-Maximum ratings define the safe operating envelope for these high-stress conditions.

Design-Maximum Ratings

- **Peak Inverse Plate Voltage (Total DC and Peak):** 26,000 V

- *Duty Cycle Restriction:* This maximum rating is applicable only when the pulse duration does not exceed 15% of one horizontal scanning cycle (which corresponds to a maximum of 10 microseconds in a 525-line, 30-frame system).

- **DC Inverse Plate Voltage:** 22,000 V
- **Peak Plate Current:** 50 mA
- **Average Plate Current:** 0.5 mA

Electrical Characteristics

The internal resistance and efficiency of the diode are indicated by its instantaneous voltage drop during conduction:

- **Tube Voltage Drop:** 225 V at an instantaneous plate current (I_b) of 7.0 mA.

Safety and Environmental Hazards

Due to the extreme electrical potentials associated with television flyback circuits, the operation of the 1AD2 presents significant safety hazards that must be addressed in equipment design and servicing.

High-Voltage Shock Hazard

The operating voltages of the 1AD2 (up to 26,000 V) are lethal. High-potential components, including the top cap and associated wiring, must be fully enclosed and insulated to prevent accidental contact. Technicians must exercise extreme care, particularly when measuring the filament voltage, which floats at the high DC potential of the cathode circuit.

X-Radiation Hazard

The high voltages used to accelerate electrons within the tube can produce X-radiation. Prolonged exposure to unshielded X-radiation at close range constitutes a serious health hazard. Equipment designers must incorporate adequate shielding around the tube enclosure. During servicing, all shielding components, metal cages, and covers must be completely and correctly reinstalled. For detailed high-voltage and X-ray safety guidelines, reference should be made to the established safety protocols for the 1G3GT and 1B3GT rectifier types.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 RCA HB3 Binder 4 of 7

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

1971 RCA HB3 BINDER 4 OF 7

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater/filament voltage	1.25 V	—
Heater/filament current	200 mA	—
Peak inverse plate voltage total DC plus peak	26000 V	PulsedRectifier
Maximum DC component of inverse plate voltage	22000 V	PulsedRectifier
Peak plate current	50 mA	PulsedRectifier
Average plate current	0.5 mA	PulsedRectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Tube voltage drop	225 V	PlateCurrent=7mA

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	High-voltage half-wave pulsed rectifier	TelevisionFlyback

TUBE TINKER

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

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker