



ELECTRONIC TUBE REFERENCE

11D5

Voltage - Triode (with diode, heptode or hexode) electronic tube

CONSOLIDATED TECHNICAL
DATA

3 SECTIONS

CONSTRUCTION

DIODE-DIODE-TRIODE

Double-diode triode combining radio detection with subsequent voltage amplification. Two diode sections serve detector and control functions while the medium-mu triode amplifies the recovered audio signal.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	13 V / 150 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

SECTION RATINGS

SECTION1 Diode

No fixed ratings recorded.

Published ratings and characteristics promoted from the supplied Brimar source.

SECTION2 Diode

No fixed ratings recorded.

Published ratings and characteristics promoted from the supplied Brimar source.

SECTION3 Triode	
PLATE RESISTANCE	26700 Ω
TRANSCONDUCTANCE	0.0015 S
AMPLIFICATION FACTOR	40
Published ratings and characteristics promoted from the supplied Brimar source.	

11D5 — Double Diode Triode Vacuum Tube

An indirectly heated double diode triode vacuum tube designed for signal detection, automatic volume control (AVC) rectification, and voltage amplification in radio receiving equipment.

Overview

The **11D5** is a multi-unit thermionic valve containing two diode systems and a single triode system within a single glass envelope. The diode and triode sections share a common indirectly heated cathode. Designed as a replacement type, the 11D5 features a classic 7-pin English base and an external top cap connection for the triode control grid. It is characterized by a medium-mu triode section, making it suitable for general-purpose audio-frequency amplification and detection circuits.

Physical Characteristics and Base Configuration

The 11D5 is constructed with a dome-top glass bulb and a standard 7-pin **English Base**. The physical dimensions of the device are as follows:

- **Maximum Bulb Diameter:** 1 9/16 inches (approximately 39.7 mm)
- **Maximum Overall Height:** 3 1/8 inches (approximately 79.4 mm)

The electrical connections are distributed between the 7-pin base and a top cap terminal. The pinout configuration, viewed from the bottom of the tube base, is defined as follows:

Pin / Terminal	Electrode Connection	Description
Top Cap (TC)	g	Triode Control Grid
Pin 1	a"d	Diode Anode 2
Pin 2	—	No Connection
Pin 3	a'd	Diode Anode 1
Pin 4	h	Heater
Pin 5	h	Heater
Pin 6	k	Cathode

Pin / Terminal	Electrode Connection	Description
Pin 7	a	Triode Anode

This configuration isolates the sensitive control grid at the top of the envelope, reducing parasitic interelectrode capacitances and enhancing stability in high-gain stages. The two diode anodes (a'd and a''d) are brought out to separate pins, allowing for independent diode operation, such as full-wave detection or combined detection and automatic volume control (AVC) rectification.

Heater and Electrical Characteristics

The 11D5 features an indirectly heated, coated unipotential cathode. The heater is designed for operation under the following nominal ratings:

- **Heater Voltage:** 13.0 V
- **Heater Current:** 0.15 A

Triode Section Class A Operating Point

The triode section of the 11D5 is designed for Class A voltage amplification. Under typical operating conditions, the triode section exhibits the following characteristics:

- **Anode Voltage:** 250 V
- **Grid Voltage:** -3 V
- **Anode Current:** 3.8 mA
- **Cathode Bias Resistor:** 750 Ω
- **Anode Impedance (Plate Resistance):** 26,700 Ω
- **Mutual Conductance (Transconductance):** 1.5 mA/V (1,500 μ mhos)
- **Amplification Factor (μ):** 40

The fundamental relationship between the tube's mutual conductance ($g_m = 1.5 \text{ mA/V}$) and anode impedance ($r_p = 26,700 \Omega$) mathematically determines the amplification factor:

$$\mu = g_m \times r_p = 0.0015 \text{ S} \times 26,700 \Omega \approx 40$$

This calculated value matches the specified amplification factor of 40, demonstrating the consistency of the published operating parameters.

Comparison with Related Types

The 11D5 is closely related to the [11D3](#), another double diode triode sharing the same physical dimensions, English 7-pin base, and 13.0 V heater voltage. However, the two types are optimized for different circuit requirements and are not direct electrical substitutes:

- **Heater Current:** The 11D5 has a lower heater current requirement of **0.15 A**, compared to the **0.2 A** drawn by the [11D3](#).

- **Amplification Factor:** The 11D5 is a medium-mu triode with an amplification factor of **40**, whereas the 11D3 is a high-mu triode with an amplification factor of **100** (with triode characteristics equivalent to the type 75 tube).
- **Anode Impedance and Current:** At an anode voltage of 250 V, the 11D5 operates at a significantly higher anode current (**3.8 mA** vs. **0.4 mA** for the 11D3) and a much lower anode impedance (**26,700 Ω** vs. **90,000 Ω** for the 11D3).
- **Cathode Bias:** The typical operating point of the 11D5 utilizes a **750 Ω** cathode bias resistor at a grid voltage of -3 V, while the 11D3 requires a **5,000 Ω** resistor at a grid voltage of -2 V.

These differences indicate that the 11D5 is better suited for applications requiring lower output impedance and higher signal-handling capability, whereas the 11D3 is optimized for maximum voltage gain.

Technical Summary

The **11D5** is a **double diode triode** vacuum tube featuring a **13.0 V, 0.15 A heater**, an **English 7-pin base**, and a **top-cap control grid**. Its triode section provides a medium amplification factor of **40**, a transconductance of **1.5 mA/V**, and an anode impedance of **26,700 Ω** at a typical operating anode voltage of **250 V**. The combination of two independent diode anodes and a medium-impedance triode stage sharing a common cathode makes the 11D5 a versatile component for detection, rectification, and audio preamplification in vintage receiving systems.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1948 Brimar Radio Valve Manual

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

1948 BRIMAR RADIO VALVE MANUAL

Section 3 · Triode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode Voltage	250 V	—
Anode Current	3.8 mA	—
Grid Voltage	-3 V	—
Cathode Bias Resistor	750 ohm	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1958 Brimar Radio Valve No 7

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

1958 BRIMAR RADIO VALVE NO 7

Section 1 · Diode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	13 V	—
Heater Current	150 mA	—

1958 BRIMAR RADIO VALVE NO 7

Section 3 · Triode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	250 V	—
Plate Current	3.8 mA	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Resistance	26700 ohm	—
Transconductance	1500 uS	—
Amplification Factor	40	—

TUBE TINKER

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