

ELECTRONIC TUBE REFERENCE

1A4E

Voltage - Pentode Remote Cutoff (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
PENTODE

Directly heated variable-mu battery pentode for gain-controlled RF amplification with economical 2 V, 60 mA filament operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	2 V / 60 mA	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Pentode	
PLATE RESISTANCE	800000 Ω
TRANSCONDUCTANCE	0.00065 S
MAXIMUM PLATE VOLTAGE	135 V
MAXIMUM SCREEN VOLTAGE	67.5 V
Published source values promoted where applicable; additional values retained as parameters.	

1A4E — Vari-Mu Battery R.F. Pentode

Overview

The **1A4E** is a vari-mu (variable-mu) radio frequency (R.F.) pentode designed primarily for R.F. amplification in battery-operated equipment. It features a glass bulb construction with a top cap and is designed for low-power filament operation, making it suitable for portable or battery-powered receiver designs. The tube is classified as an obsolete type and is maintained for reference purposes.

Physical Construction and Base Configuration

The 1A4E is constructed with a glass envelope that incorporates a top cap for the control grid (G1) connection. This physical separation of the control grid from the other electrodes helps minimize input-to-output capacitance, which is beneficial in high-frequency amplification stages.

The physical dimensions of the tube are:

- **Maximum Diameter:** 1-9/16 inches
- **Maximum Height:** 3-7/8 inches

The tube utilizes a standard 4-pin **U.X. Base**. The pinout configuration, viewed from the bottom of the base, is as follows:

Pin / Terminal	Connection
Pin 1	Filament Positive (F+)
Pin 2	Anode (A)
Pin 3	Screen Grid (G2)
Pin 4	Filament Negative (F-), Suppressor Grid (G3)
Top Cap	Control Grid (G1)

The suppressor grid (G3) is internally tied to the negative side of the filament (Pin 4), simplifying external circuit wiring.

Filament Ratings

The filament is designed for direct heating from a low-voltage battery source. The electrical requirements for the filament are:

- **Filament Voltage:** 2.0 V
- **Filament Current:** 0.06 A (60 mA)
- **Calculated Filament Power:** 0.12 W

The extremely low current draw of 60 mA is optimized to conserve battery life in portable receivers.

Electrical Characteristics and Typical Operating Points

The 1A4E operates as a variable-mu pentode, allowing for automatic volume control (AVC) or manual gain control by varying the control grid bias. Under typical operating conditions, the electrical characteristics of the tube are defined as follows:

Parameter	Value
Anode Voltage	135 V

Parameter	Value
Screen Grid (<u>G2</u>) Voltage	67.5 V
Control Grid (G1) Voltage	-3.0 V
Anode Current	2.2 mA
Screen Grid Current	0.9 mA
Anode Impedance	1.0 MΩ (megohm)
Mutual Conductance (Transconductance)	0.65 mA/V (650 μmhos)

At this operating point, the total current drawn by the plate and screen grid combined is 3.1 mA, which, when added to the filament power, represents a highly efficient design for battery-operated R.F. amplifier stages.

Technical Summary

The **1A4E** is a specialized vari-mu battery R.F. pentode housed in a glass bulb with a 4-pin U.X. base and a top cap. Operating with a highly efficient 2.0 V, 0.06 A filament, it is optimized for radio frequency amplification in battery-powered equipment. With a typical anode voltage of 135 V and screen voltage of 67.5 V, it provides a mutual conductance of 0.65 mA/V and an anode impedance of 1.0 megohm. The tube is now designated as an obsolete type for reference only.



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 1 · Pentode

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cutoff characteristic	Variable- μ	—

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