



ELECTRONIC TUBE REFERENCE

11

Voltage - Triode (single) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

TRIODE

Directly heated triode for detector and amplifier service in dry-cell radio receivers, with a very low-voltage filament suited to battery operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	4
NOMINAL HEATER	1.1 V / 250 mA	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.00044 S
AMPLIFICATION FACTOR	6.6
MAXIMUM PLATE VOLTAGE	135 V
<i>Published ratings and characteristics promoted from the approved RCA source.</i>	

11 — Detector and Amplifier Triode

Overview

The **11** (also referred to as **RCA-11**) is a classic three-electrode vacuum tube designed for use as a detector and amplifier in dry-cell operated radio receivers. It is characterized by its low-voltage filament, which is optimized for battery-operated equipment. The electrical characteristics of the 11 are identical to those of the **RCA-12** (or **12**), but the two types differ significantly in their physical dimensions, bulb

shapes, and base configurations. Both types are primarily intended for renewal purposes in older receivers designed specifically around their parameters.

Filament and Electrical Characteristics

The 11 is designed for direct-current (DC) filament operation, drawing a low current suitable for dry-cell batteries. Its electrical characteristics are shared exactly with the RCA-12.

- **Filament Voltage (D.C.):** 1.1 V
- **Filament Current:** 0.25 A

Typical Operating Points and Characteristics

The tube operates as a Class A amplifier or detector. The typical operating parameters at two different plate voltages are detailed below:

Parameter	Operating Point A	Operating Point B (Maximum)
Plate Voltage	90 V	135 V
Grid Voltage	-4.5 V	-10.5 V
Plate Current	2.5 mA	3.0 mA
Plate Resistance	15,500 _Ω	15,000 _Ω
Amplification Factor	6.6	6.6
Transconductance	425 _μ mhos	440 _μ mhos

At its maximum rated plate voltage of 135 V, the tube requires a grid bias of -10.5 V, which yields a plate current of 3.0 mA. Under these conditions, the plate resistance decreases slightly to 15,000_Ω, and the transconductance rises to 440 _μmhos. The amplification factor remains constant at 6.6 across both operating points.

Interelectrode Capacitances

The direct interelectrode capacitances of the 11 are relatively low, reflecting its design for audio-frequency and detector applications:

- **Grid-to-Plate Capacitance (C_{gp}):** 3.3 pF
- **Grid-to-Filament Capacitance (C_{gf}):** 2.5 pF
- **Plate-to-Filament Capacitance (C_{pf}):** 2.5 pF

Mechanical Construction, Bases, and Pinouts

While the RCA-11 and RCA-12 share identical electrical ratings, they are housed in different glass envelopes and utilize distinct bases, meaning they cannot be directly plugged into the same sockets without adapters.

RCA-11 Physical Specifications

- **Bulb Type:** T-8
- **Base Type:** WD 4-Pin
- **Maximum Overall Length:** 4 1/8 inches
- **Maximum Seated Height:** 3 1/2 inches
- **Maximum Bulb Diameter:** 1 3/16 inches

Looking at the bottom of the WD 4-pin base, the pin connections are assigned as follows:

- **Pin 1:** Filament Positive (F+)
- **Pin 2:** Plate (P)
- **Pin 3:** Filament Negative (F-)
- **Pin 4:** Grid (G)

RCA-12 Physical Specifications

- **Bulb Type:** T-10
- **Base Type:** Medium 4-Pin Bayonet
- **Maximum Overall Length:** 4 11/16 inches
- **Maximum Seated Height:** 4 1/16 inches
- **Maximum Bulb Diameter:** 1 9/16 inches

Looking at the bottom of the medium 4-pin bayonet base, the pin connections are assigned as follows:

- **Pin 1:** Filament (F)
- **Pin 2:** Plate (P)
- **Pin 3:** Grid (G)
- **Pin 4:** Filament (F)

Technical Summary

The **11** is an early dry-cell triode designed for detector and amplifier service in battery-powered radio receivers. Operating with a 1.1 V, 0.25 A DC filament, it provides a modest amplification factor of 6.6 and a transconductance of 425 to 440 9mhos depending on whether the plate is operated at 90 V or its maximum limit of 135 V. The RCA-11 is distinguished from its electrical twin, the RCA-12, by its smaller T-8 envelope and WD 4-pin base, compared to the RCA-12's larger T-10 envelope and medium 4-pin bayonet base. Both types remain important primarily as renewal components for vintage equipment built around their specific characteristics.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1940 RCA

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

1940 RCA

Section 1 · Triode

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Detector_Amplifier text	—

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