ELECTRONIC TUBE REFERENCE

1A5G

Power - Pentode (NOT beam) electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
PENTODE

> Directly heated battery power pentode for very-low-consumption receiver audio output, producing roughly 0.1 W.

General characteristics

BASE DESIGNATION	–	**BASE PINS**	8
NOMINAL HEATER	1.4 V / 50 mA	**PARALLEL HEATER**	– / –
HEATING	Direct	**SERIES OPERATION**	Not specified
CATHODE ARRANGEMENT	Separate cathodes	**SECTION CONSTRUCTION**	Similar

Section ratings

SECTION1 Pentode

PLATE RESISTANCE	300000 Ω
TRANSCONDUCTANCE	0.00085 S
AMPLIFICATION FACTOR	255
MAXIMUM PLATE VOLTAGE	90 V
MAXIMUM SCREEN VOLTAGE	90 V

Published values promoted where clearly attributable to this section.

1A5G — Low-Drain Battery Power Pentode

The **1A5G** (also designated as **1A5G/GT**) is a low-drain, low-consumption battery-operated power output pentode. It is designed for highly economical operation in battery-operated receivers. Due to its special filament construction, it can operate directly from a 1.5 V dry cell without requiring a ballast resistor. The tube was registered by the Philco Radio & Television Corporation under RMA release number 140 on June 10, 1938. The tube is housed in a glass envelope with an octal base and can be mounted in any position.

Mechanical Construction, Filament, and Pinout

The 1A5G features a filament designed for low-current battery operation. It has the following filament ratings:

- **Filament Voltage**: 1.4 V (nominal, capable of direct operation on a 1.5 V dry cell)
- **Filament Current**: 0.05 A (50 mA)

The tube is housed in a T-9, T9-B, or glass tubular (GT outline) envelope. The physical dimensions are:

- **Maximum Diameter**: 1-5/16 inches
- **Maximum Overall Length**: 4 inches (or 3-5/16 inches depending on the specific envelope outline)
- **Seated Height**: 2-5/8 inches

The mounting position is unrestricted (any position). The tube uses a small shell octal 7-pin base (designation 6-X). The pin connections are as follows:

Pin	Connection
Pin 1	No connection (NC)
Pin 2	Positive Filament (F+)
Pin 3	Plate / Anode (P)
Pin 4	Screen Grid (G_2)
Pin 5	Control Grid (G_1)
Pin 6	Omitted
Pin 7	Negative Filament / Suppressor Grid ($F-$, G_3)
Pin 8	No connection (NC)

Electrical Characteristics and Operating Points

The 1A5G can be operated under two typical operating conditions depending on the plate and screen voltages (85 V or 90 V maximum):

Parameter	85 V Operation	90 V Operation (Maximum)
Plate (Anode) Voltage	85 V	90 V
Screen Grid (G_2) Voltage	85 V	90 V
Control Grid (G_1) Voltage	-4.5 V	-4.5 V
Plate Current	3.5 mA	3.5 mA to 4.0 mA
Screen Grid Current	0.7 mA	0.8 mA

Parameter	85 V Operation	90 V Operation (Maximum)
Plate Resistance (Anode Impedance)	0.3 MΩ	0.3 MΩ
Transconductance (Mutual Conductance)	800 µmhos	850 µmhos (0.85 mA/V)
Amplification Factor	240	255
Load Impedance (Optimum Load)	25,000 Ω	25,000 Ω
Power Output	100 mW	115 mW to 117 mW
Total Harmonic Distortion	10%	7%

Circuit-Specific Applications and Bias Configurations

The 1A5G is optimized for low-consumption battery-operated receivers. Several circuit configurations are documented for its application:

Bias Configurations

- **Automatic Bias**: This is the preferred biasing method because the grid bias voltage will scale down proportionally as the 'B' battery voltage drops over time, maintaining balanced operation.
- **C-Battery**: A separate C-battery is not required for receivers using the 1.4 V series. The grid returns for RF and second detector stages should be connected directly to the negative filament.

Parallel Operation

For applications requiring higher power output, two 1A5G tubes can be operated in parallel:

- **Load Impedance**: 12,500 Ω (half of the single-tube optimum load)
- **Power Output**: Approximately doubled, yielding around 200 mW to 230 mW.
- **Distortion**: Remains approximately the same as that of a single tube (7% to 10%).

Technical Summary

The **1A5G** is an octal-based, low-drain power pentode designed for highly economical battery-operated receivers. Operating with a filament supply of **1.4 V at 50 mA**, it can run directly off a 1.5 V dry cell. It delivers a power output of **100 mW to 117 mW** under typical single-tube Class A conditions with plate and screen voltages of 85 V to 90 V. Its design supports automatic bias and parallel operation, making it a versatile and efficient output stage for portable battery-powered equipment.

SOURCE OPERATING CONDITIONS

1948 Brimar Radio Valve Manual

SOURCE PDF

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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Power output	**0.117 W**	—

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

1950 Sylvania

SOURCE PDF

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

1950 SYLVANIA

Section 1 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical plate current	**3.5 mA**	—

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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 · Pentode

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Plate Voltage	**90 V**	—
Plate Current	**4 mA**	—
Screen Voltage	**90 V**	—
Screen Current	**0.8 mA**	—
Control Grid Voltage	**-4.5 V**	—
Optimum Load	**25000 ohm**	—
Power Output	**0.115 W**	—

CHARACTERISTIC		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Plate Resistance	**300000 ohm**	—
Transconductance	**850 µS**	—
Amplification Factor	**255**	—

Tube Tinker

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