

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

1631

1 SECTION
CONSTRUCTION
BEAMPOWER

Power - Beam (NOT sweep) electronic tube

6L6-related beam-power output tube with a 12.6-volt heater, documented for push-pull Class-AB1 audio service with roughly 18 to 26.5 watts output.

GENERAL CHARACTERISTICS

BASE DESIGNATION	7AC	BASE PINS	7
NOMINAL HEATER	12.6 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

7AC - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – Pin 1	–	–	NC · verified
PIN2 – Pin 2	–	H – Heater	CONNECTED · verified
PIN3 – Pin 3	A	P – Plate (Anode)	CONNECTED · verified
PIN4 – Pin 4	A	G2 – Screen Grid	CONNECTED · verified
PIN5 – Pin 5	A	G1 – Control Grid	CONNECTED · verified
PIN7 – Pin 7	–	H – Heater	CONNECTED · verified
PIN8 – Pin 8	A	BP – Beam-Forming Plate	CONNECTED · verified
PIN8 – Pin 8	A	K – Cathode	CONNECTED · verified

SECTION1 Beam Power	
MAXIMUM PLATE VOLTAGE	360 V
MAXIMUM SCREEN VOLTAGE	270 V
MAXIMUM PLATE DISSIPATION	16 W
MAXIMUM SCREEN DISSIPATION	2.5 W
<i>Promoted from printed maximum-rating/characteristic columns; additional published values retained in TUBE_SECTION_PARAMETER.</i>	

1631 — Beam Power Amplifier Vacuum Tube

Overview

The **1631** is a metal-envelope beam power amplifier vacuum tube designed for applications requiring high performance and strict uniformity of characteristics. It is electrically similar to the classic **6L6** beam power tube but features a **12.6 V** heater and modified dissipation ratings. The 1631 is particularly suited for push-pull Class **AB1** audio frequency power amplification where matched performance and reliability are critical.

Construction, Heater, and Base Pinout

The 1631 is constructed with a rugged metal envelope, which provides self-shielding and mechanical durability. It utilizes an indirectly heated, coated unipotential cathode.

Heater Characteristics

The heater is designed for operation from a 12.6 V supply, making it suitable for mobile, aircraft, or industrial equipment utilizing 12 V electrical systems.

- **Heater Voltage:** 12.6 V (AC or DC)
- **Heater Current:** 0.45 A
- **Calculated Heater Power:** 5.67 W

Physical Dimensions

- **Maximum Overall Length:** 4-5/16 inches
- **Maximum Diameter:** 1-5/8 inches
- **Envelope Type:** Metal

Base and Wiring Connections

The tube uses a standard octal base with a **7AC** pinout configuration. The pin connections, viewed from the bottom of the base, are as follows:

- **Pin 1:** Metal Shell (S) / Shield
- **Pin 2:** Heater (H)
- **Pin 3:** Plate (P)
- **Pin 4:** Grid No. 2 (Screen Grid, G2)
- **Pin 5:** Grid No. 1 (Control Grid, G1)
- **Pin 7:** Heater (H)
- **Pin 8:** Cathode (K)
- *Note: Pin 6 is omitted from the active base pins.*

Maximum Ratings

To ensure reliable operation and prevent premature tube failure, the 1631 must be operated within its maximum design limits. These absolute maximum ratings are:

- **Maximum Plate Voltage:** 360 V
- **Maximum Grid-No. 2 (Screen) Voltage:** 270 V
- **Maximum Plate Dissipation:** 16 W
- **Maximum Grid-No. 2 Input:** 2.5 W

Push-Pull Class AB1 Operating Conditions

The primary application of the 1631 is in push-pull Class AB1 amplifier circuits. The published operating data are specified for a pair of tubes operating together.

Common Operating Parameters (Two Tubes)

- **Plate Supply Voltage:** 360 V
- **Grid-No. 2 Supply Voltage:** 270 V
- **Grid-No. 1 Bias Voltage:** -22.5 V
- **Total Zero-Signal Plate Current:** 88 mA (44 mA per tube)
- **Total Zero-Signal Grid-No. 2 Current:** 5.0 mA (2.5 mA per tube)

Operating Configurations and Output Power

Depending on the plate-to-plate load impedance selected, the push-pull stage can be optimized for maximum power output or alternative performance characteristics:

Parameter	Configuration A (High Output)	Configuration B (Alternative Load)
Plate-to-Plate Load Resistance	6,600 _Ω	3,800 _Ω
Rated Power Output	26.5 W	18.0 W

Quiescent Dissipation Calculations

Using the common operating parameters, the quiescent (zero-signal) power dissipation for each tube can be calculated:

- **Quiescent Plate Dissipation per Tube:** $360\text{ V} \times 0.044\text{ A} = 15.84\text{ W}$. This quiescent dissipation represents approximately 99% of the maximum rated plate dissipation (16 W), indicating that the Class [AB1](#) bias point is configured near the thermal limit of the plate structure for maximum efficiency and linearity.
- **Quiescent Grid-No. 2 Dissipation per Tube:** $270\text{ V} \times 0.0025\text{ A} = 0.675\text{ W}$. This is well within the maximum grid-no. 2 input rating of 2.5 W.

Comparison with Related Designations

The 1631 belongs to a family of specialized industrial and military-grade beam power tubes.

- **Comparison with [6L6](#):** The 1631 is described as similar to the [6L6](#) but differs in its heater voltage (12.6 V / 0.45 A versus the [6L6](#)'s 6.3 V / 0.9 A) and its maximum plate dissipation rating (16 W). Additionally, the 1631 is manufactured to tighter tolerances for applications critical as to the uniformity of characteristics.
- **Comparison with [1632](#):** While both are beam power tubes with 12.6 V heaters, the **1632** is similar to the [25L6](#) (except for its 12.6 V heater and dissipation ratings). The 1632 operates at much lower voltages (maximum plate and screen voltage of 117 V) and is rated for a lower power output of 2.1 W in Class A service, compared to the high-power capabilities of the 1631.

Technical Summary

The **1631** is a rugged, metal-envelope beam power amplifier featuring a 12.6 V, 0.45 A heater and a 7-pin octal base (7AC). Designed for applications requiring high uniformity of characteristics, it is similar to the [6L6](#) but optimized with a 16 W plate dissipation rating and a 12.6 V heater. In push-pull Class [AB1](#) service, a pair of 1631 tubes can deliver up to 26.5 W of power into a 6,600_Ω plate-to-plate load, or 18 W into a 3,800_Ω load, under a 360 V plate supply and 270 V screen supply.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X General Electric Essential Characteristics

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

195X GENERAL ELECTRIC ESSENTIAL CHARACTERISTICS

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	360 V	ClassAB PushPull TwoTubes
Screen voltage	270 V	ClassAB PushPull TwoTubes
Control-grid voltage	-22.5 V	ClassAB PushPull TwoTubes
Plate current	88 mA	ClassAB PushPull TwoTubes
Screen current	5 mA	ClassAB PushPull TwoTubes
Load resistance plate-to-plate	6600 Ω	ClassAB PushPull TwoTubes
Power output	26.5 W	ClassAB PushPull TwoTubes

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1960 RCA Industrial and Communications Types

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

1960 RCA INDUSTRIAL AND COMMUNICATIONS TYPES

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	360 V	PushPull;ClassAB1
Screen supply	270 V	PushPull;ClassAB1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid bias	-22.5 V	PushPull;ClassAB1
Screen current	5 mA	PushPull;ClassAB1
Plate current	88 mA	PushPull;ClassAB1
Load resistance	6600 Ohm	PushPull;PlateToPlate
Power output	26.5 W	PushPull;ClassAB1
Alternate load resistance	3800 Ohm	PushPull;PlateToPlate
Alternate power output	18 W	PushPull;ClassAB1

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