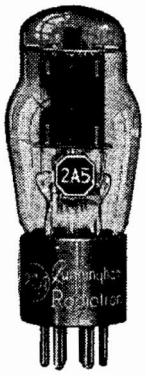
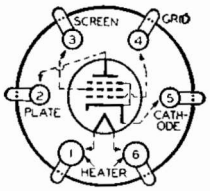


RCA Cunningham Radiotron RADIO TUBES

Type 2A5

POWER AMPLIFIER PENTODE



The 2A5 is a heater-cathode type of power-amplifier pentode for use in the audio-output stage of a-c receivers. It is capable of giving large power output with a relatively small input-signal voltage. Because of the heater-cathode construction, a uniformly low hum-level is attainable in power-amplifier design.

CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.)	2.5	Volts
HEATER CURRENT	1.75	Amperes
BULB (For dimensions, see Page 151, Fig. 11)		ST-14
BASE		Medium 6-Pin

As Single-Tube Class A Amplifier

	Pentode Connection	*Triode Connection* Screen tied to plate	
PLATE VOLTAGE	250 *max.*	250 *max.*	Volts
SCREEN VOLTAGE	250 *max.*	—	Volts
GRID VOLTAGE	−16.5	−20	Volts
PLATE CURRENT	34	31	Milliamperes
SCREEN CURRENT	6.5	—	Milliamperes
PLATE RESISTANCE	100000 *approx.*	2700	Ohms
AMPLIFICATION FACTOR	220 *approx.*	6.2	
MUTUAL CONDUCTANCE	2200	2300	Micromhos
LOAD RESISTANCE	7000	3000	Ohms
TOTAL HARMONIC DISTORTION	7	5	Per cent
POWER OUTPUT	3	0.65	Watts

As Push-Pull Class AB Amplifier (Triode Connection)

Screen tied to plate

	Fixed-Bias	*Self-Bias*	
PLATE VOLTAGE	350 *max.*	350 *max.*	Volts
GRID VOLTAGE	−38	—	Volts
SELF-BIAS RESISTOR	—	730	Ohms
ZERO-SIGNAL PLATE CURRENT (Per tube)	21	21	Milliamperes
LOAD RESISTANCE (Plate-to-plate)	8000	8000	Ohms
TOTAL HARMONIC DISTORTION	5	5	Per cent
POWER OUTPUT (2 tubes)	18*	15†	Watts

* With one 2A5 driver (connected as triode) at plate voltage of 250 volts, grid voltage, − 20 volts, and plate load, approximately 24600 ohms. Input transformer ratio, primary to one-half secondary is 1.6.

† With one 2A5 driver (connected as triode) at plate voltage of 250 volts, grid voltage, − 20 volts, and plate load, approximately 25200 ohms. Input transformer ratio, primary to one-half secondary, is 1.14.

INSTALLATION

The **base** pins of the 2A5 fit the standard six-contact socket which may be installed to hold the tube in any position.

The **bulb** of this tube will become very hot under certain conditions of operation. Sufficient ventilation should be provided to prevent overheating.

The **heater** is designed to operate at 2.5 volts. The transformer winding supplying the heater circuit should be designed to operate the heater at this recommended value for full-load operating conditions at average line voltage.

The **cathode** should preferably be connected directly to a mid-tap on the heater winding or to a center-tapped resistor across the heater winding. If this practice is not followed, the potential difference between heater and cathode should be kept as low as possible.

APPLICATION

As a **Class A power-amplifier pentode,** the 2A5 may be used either singly or in push-pull. Recommended operating conditions are given under CHARACTERISTICS. If a single 2A5 is operated at a plate voltage of 250 volts, the self-bias resistor should have a value of approximately 410 ohms. For two tubes in the same stage, the value of the self-bias resistor should be approximately one-half that for a single tube.

As a **Class A power-amplifier triode,** the 2A5 may be used either singly or in push-pull. For this service the screen is connected to the plate. Recommended operating conditions are given under CHARACTERISTICS. If a single 2A5 is operated as a Class A triode at a plate voltage of 250 volts, the self-bias resistor should have a value of approximately 650 ohms. For two tubes in the same stage, the value of the self-bias resistor should be approximately one-half that for a single stage.

As a **Class AB power-amplifier triode,** the 2A5 should be operated as shown under CHARACTERISTICS. The values shown cover operation with fixed-bias and with self-bias, and have been determined on the basis of some grid current flow during the most positive swing of the input signal and of cancellation of second-harmonic distortion by virtue of the push-pull circuit.

Self-bias resistors should be shunted by a filter network to avoid degeneration at the low audio-frequencies. The filter network may be omitted for push-pull Class A pentode and Class A triode service.

The type of **input coupling** used should not introduce too much resistance in the grid circuit. Transformer or impedance coupling devices are recommended. If, however, resistance coupling is employed, the grid resistor should not exceed one megohm with self-bias provided the heater voltage does not rise more than 10 per cent above the rated value under any conditions of operation; without self-bias, the value should be limited to 0.1 megohm.

Additional curve information is given under type 42.