

Cunningham RADIO TUBES

C-347

POWER AMPLIFIER PENTODE

The '47 is a 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. In comparison with three-electrode power amplifiers of the same plate dissipation, the '47 is capable of greater power output with the additional feature of higher amplification. This power-handling ability of the '47 is made possible by the addition of both a suppressor and a screen between the grid and plate. (See page 5 for further information on pentodes.)

CHARACTERISTICS

FILAMENT VOLTAGE (A. C. or D. C.)	2.5	Volts
FILAMENT CURRENT	1.75	Amperes
PLATE VOLTAGE	250 max.	Volts
SCREEN VOLTAGE	250 max.	Volts
GRID VOLTAGE*	-16.5	Volts
PLATE CURRENT	31	Milliamperes
SCREEN CURRENT	6.0	Milliamperes
PLATE RESISTANCE	60000	Ohms
AMPLIFICATION FACTOR	150	
MUTUAL CONDUCTANCE	2500	Micromhos
LOAD RESISTANCE	7000	Ohms
POWER OUTPUT	2500	Milliwatts
EFFECTIVE GRID-PLATE CAPACITANCE	1.25	μ f.
INPUT CAPACITANCE	8.7	μ f.
OUTPUT CAPACITANCE	13.2	μ f.
MAXIMUM OVERALL LENGTH		5 ⁵ / ₈ "
MAXIMUM DIAMETER		2 ³ / ₁₆ "
BULB (See page 42, Fig. 10)		S-17
BASE		Medium 5-Pin

* If filament is operated on d.c., grid bias should be -15.3 volts.

INSTALLATION

The base pins of the '47 fit the standard five-contact socket which should be mounted preferably to hold the tube in a vertical position. For socket connections, see page 39, Fig. 6. If it is necessary to place the tube in a horizontal position, the socket should be mounted with its filament pin openings one vertically above the other. Provision should be made for free circulation of air around the tube since the bulb becomes quite hot during operation.

The coated filament of the '47 is intended for operation from a 2.5-volt winding of the power transformer. The voltage applied to the filament terminals should be the rated value of 2.5 volts under operating conditions and average line voltage.

APPLICATION

For the power amplifier stage of radio receivers, the '47 is recommended either singly or in push-pull combination. More than one audio stage preceding the '47 is undesirable because of the possibility of microphonic disturbances resulting from the high level of amplification.

If a single '47 is operated self-biased, the self-biasing resistor should be approximately 450 ohms. This resistor should be shunted by a condenser of 4 to 20 μ f.

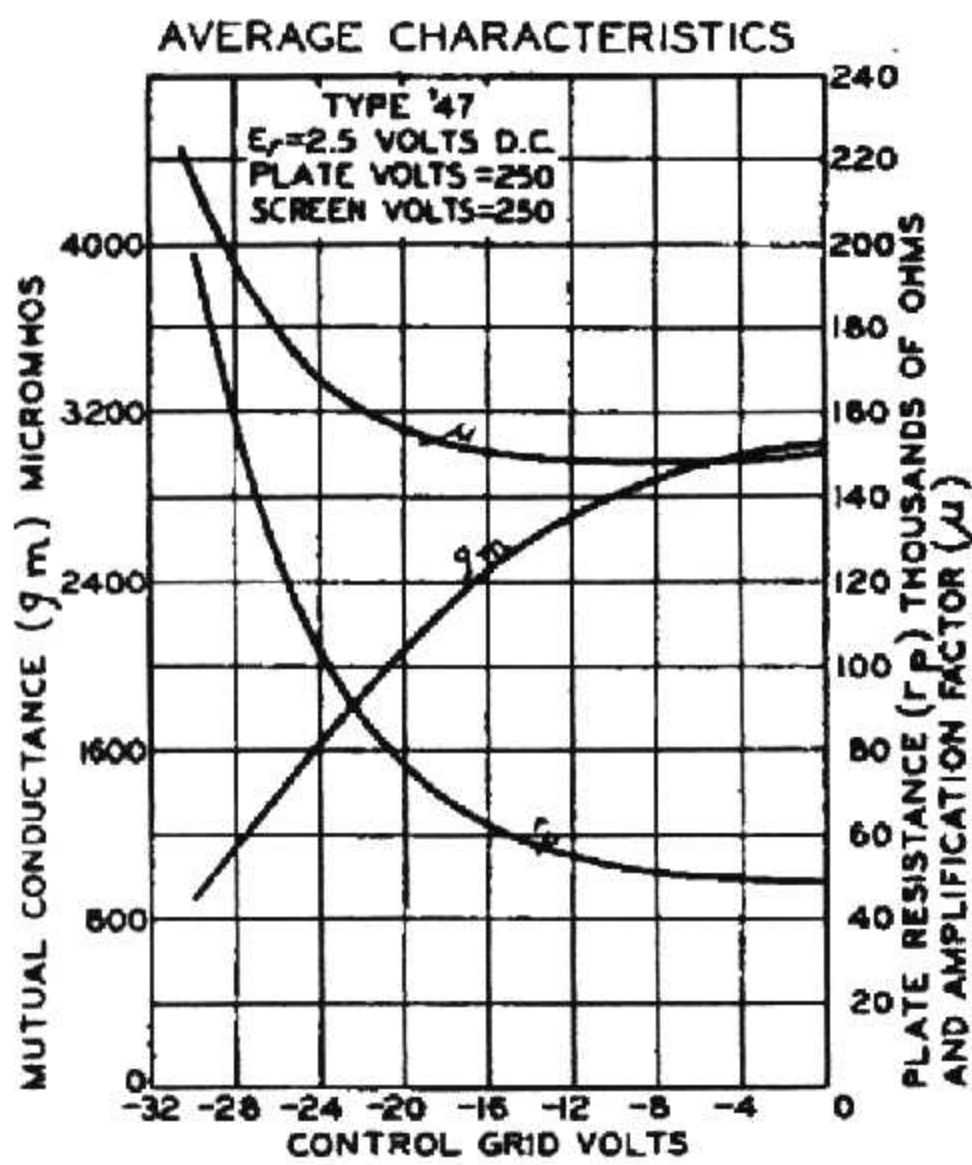
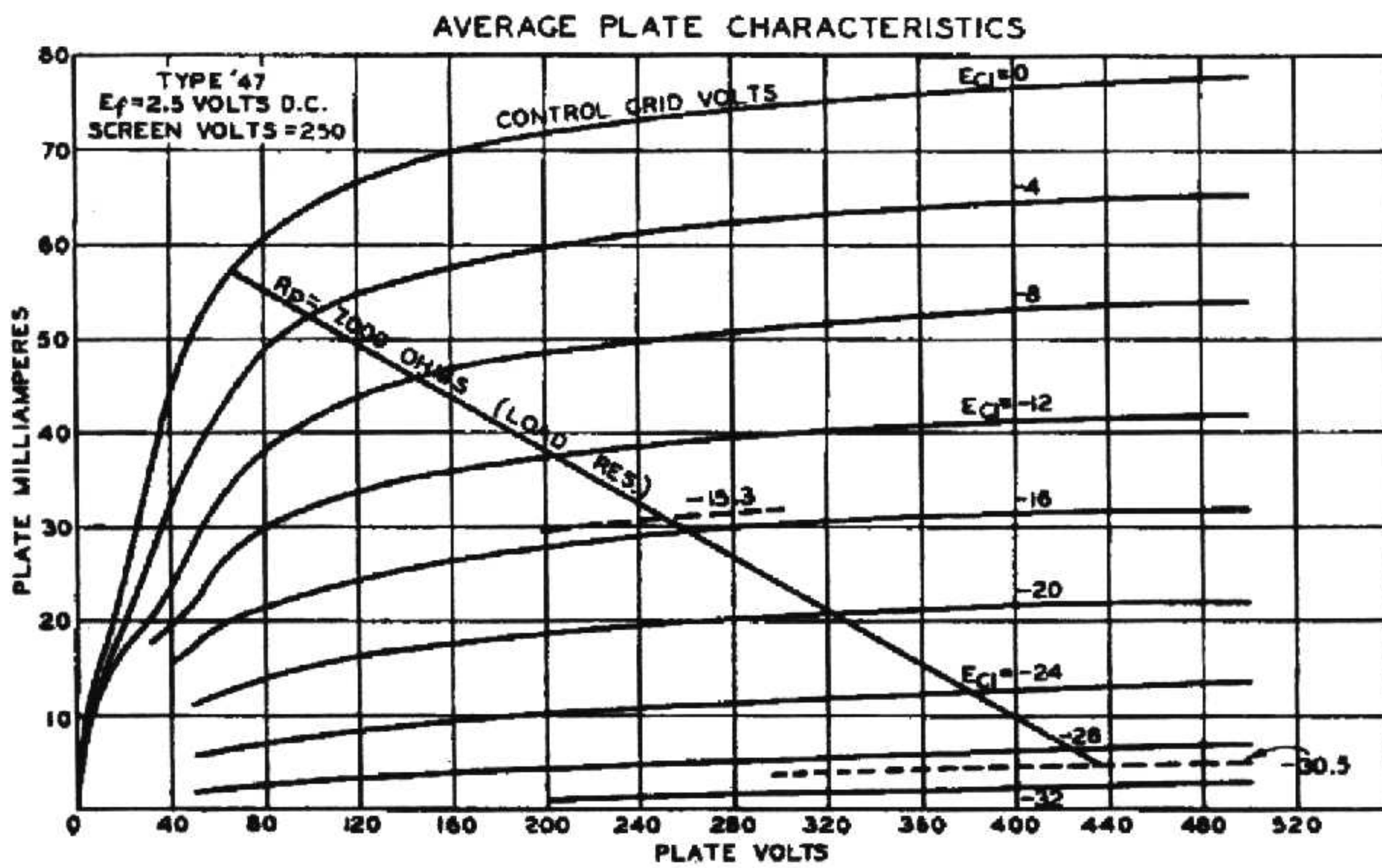
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to avoid degeneration effects at low audio frequencies. The use of two '47's in push-pull eliminates the necessity of bypassing the resistor and is, in addition, effective in reducing hum from filter circuits. The self-biasing resistor required for the push-pull stage is approximately 225 ohms.

Any conventional type of **input coupling** may be used, provided that the resistance added to the grid circuit by this device is not too high. Transformer or impedance coupling devices are preferable. If input-resistance coupling is used, a grid resistance not to exceed 0.5 megohm may be employed under self-bias conditions. Without self-bias, the grid leak resistance should not exceed 50000 ohms.

An **output transformer** should be used in order to supply power to the winding of the reproducing unit. The optimum value of load resistance for the output device is 7000 ohms. For best results, the impedance in the plate circuit of the '47 over the entire audio-frequency range should be as uniform as possible.

The blue glow which frequently appears on the inner surface of the '47 bulb is due to fluorescence caused by stray electrons from the filament which strike the interior of the getter-coated bulb. This fluorescence is a natural effect and is in no manner an indication of the performance of the tube.



AVERAGE OUTPUT CHARACTERISTICS

