



# 12B4-A

## TRIODE

FOR TV VERTICAL DEFLECTION APPLICATIONS

### DESCRIPTION AND RATING

The 12B4-A is a miniature low-mu triode designed primarily for service as a vertical-deflection amplifier in television receivers. The tube features high plate current at relatively low plate voltages and is capable of withstanding the high pulse voltages normally encountered in this application.

In addition, the 12B4-A exhibits a controlled heater warm-up characteristic which makes the tube particularly suited for use in television receivers which employ series-connected heaters. When the 12B4-A is used in conjunction with other 600-milliamper types which exhibit essentially the same heater warm-up characteristic, heater voltage surges across the individual tubes are minimized during the warm-up period.

Except for the controlled heater warm-up time characteristic, the 12B4-A is identical to the 12B4.

### GENERAL

#### ELECTRICAL

Cathode—Coated Unipotential		
Heater Voltage, AC or DC	Series 12.6	Parallel 6.3 Volts
Heater Current	0.3	0.6 Amperes
Heater Warm-up Time*	—	11 Seconds
Direct Interelectrode Capacitances, approximate†		
Grid to Plate	4.8	μμf
Input	5.0	μμf
Output	1.5	μμf

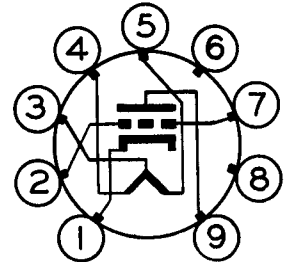
#### MECHANICAL

Mounting Position—Any  
Envelope—T-6½, Glass  
Base—E9-1, Small Button 9-Pin

### MAXIMUM RATINGS

	Class A <sub>1</sub> Amplifier	Vertical- Deflection Amplifier‡
DC Plate Voltage	550	550 Volts
Peak Positive Pulse Plate Voltage	—	1000§ Volts
Peak Negative Grid Voltage	—	250 Volts
Plate Dissipation	5.5	5.5 π Watts
DC Cathode Current	—	30 Milliamperes
Peak Cathode Current	—	105 Milliamperes
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode		
DC Component	100	100 Volts
Total DC and Peak	200	200 Volts
Heater Negative with Respect to Cathode		
Total DC and Peak	200	200 Volts
Grid Circuit Resistance		
With Fixed Bias	0.47	— Megohms
With Cathode Bias	2.2	2.2 Megohms

### BASING DIAGRAM

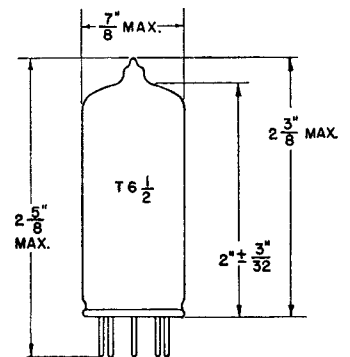


RETMA 9AG

### TERMINAL CONNECTIONS

- Pin 1—Cathode
- Pin 2—Grid
- Pin 3—Heater Center-Tap
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—No Connection
- Pin 7—Grid
- Pin 8—No Connection
- Pin 9—Plate

### PHYSICAL DIMENSIONS



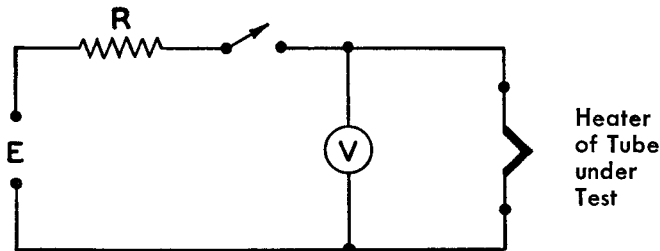
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**CHARACTERISTICS AND TYPICAL OPERATION**

**CLASS A<sub>1</sub> AMPLIFIER**

Plate Voltage .....	150	150 Volts
Grid Voltage .....	-23	-17.5 Volts
Amplification Factor .....	—	6.5
Plate Resistance, approximate .....	—	1030 Ohms
Transconductance .....	—	6300 Micromhos
Plate Current .....	9.6	34 Milliampères
Grid Voltage, approximate $I_b = 200$ Microampères .....	—	-32 Volts

\* Heater warm-up time is defined as the time required in the circuit shown at the right for the voltage across the heater terminals to increase from zero to the heater test voltage ( $V_1$ ). For this type,  $E = 25$  volts (RMS or DC),  $V_b = 5.0$  volts (RMS or DC), and  $R = 31.5$  ohms.



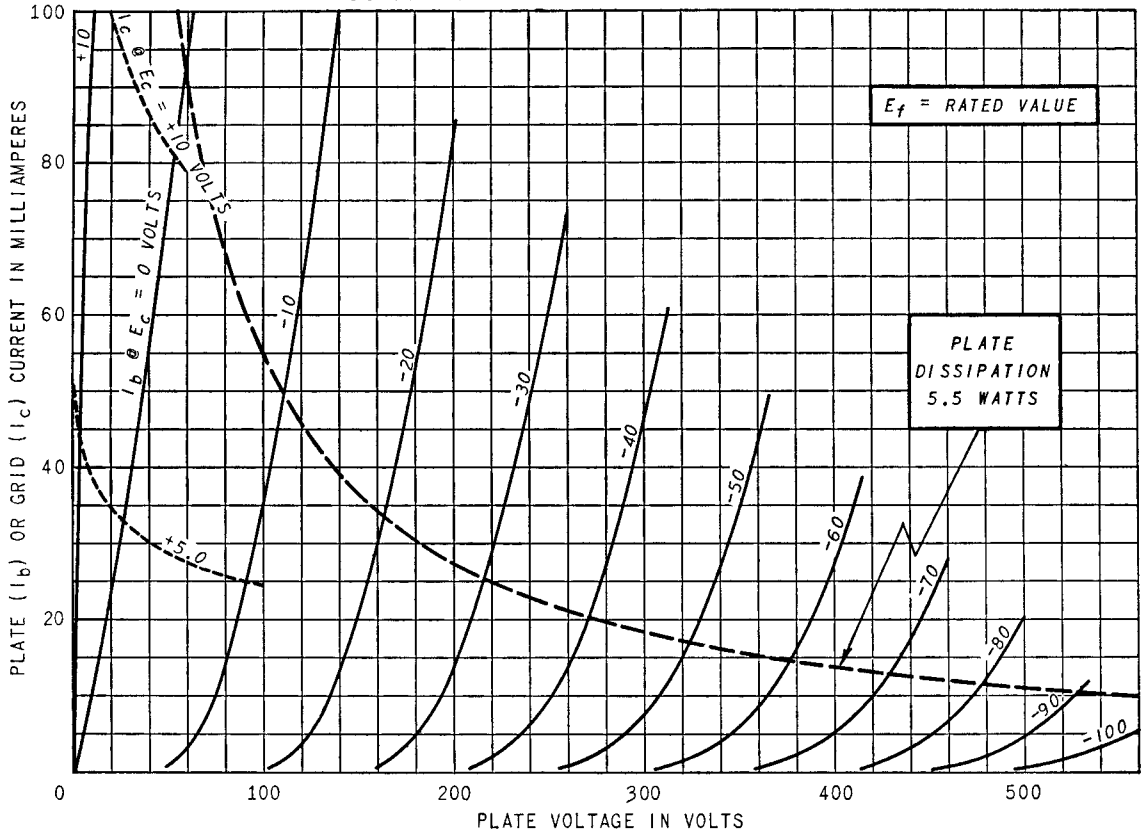
† Without external shield.

‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

§ Value given is to be considered as an Absolute Maximum Rating. In this case, the combined effect of supply voltage variation, manufacturing variation including components in the equipment, and adjustment of equipment controls should not cause the rated value to be exceeded.

π In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.

**AVERAGE PLATE CHARACTERISTICS**



**AVERAGE TRANSFER CHARACTERISTICS**

