



# 12BH7-A

## TWIN TRIODE

### DESCRIPTION AND RATING

The 12BH7-A is a miniature, medium-mu twin triode designed primarily for use as a vertical-deflection amplifier in television receivers. In this application, the two sections may be employed in parallel, or they may be employed as a combined vertical-deflection amplifier and vertical oscillator. The tube is also suitable for use as the horizontal oscillator in television receivers as well as in a wide variety of general-purpose applications. Each section of the 12BH7-A features a relatively high plate current at low plate voltages and is capable of withstanding the high pulse voltages normally encountered in vertical-amplifier applications.

The 12BH7-A differs from the 12BH7 primarily by incorporating a controlled heater warm-up characteristic which makes the tube particularly suited for use in television receivers which employ 600-milliamperre series-connected heaters.

### GENERAL

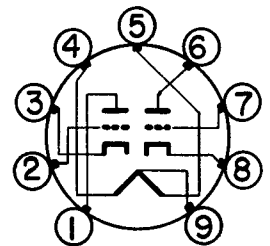
#### ELECTRICAL

Cathode—Coated Unipotential	<b>Series</b>	<b>Parallel</b>	
Heater Voltage, AC or DC . . . . .	12.6	6.3	Volts
Heater Current . . . . .	0.3	0.6	Amperes
Heater Warm-up Time* . . . . .		11	Seconds
Direct Interelectrode Capacitances, approximate†			
Grid to Plate, Each Section . . . . .	2.6		μμf
Input, Each Section . . . . .	3.2		μμf
Output, Section 1 . . . . .	0.5		μμf
Output, Section 2 . . . . .	0.4		μμf
Plate to Plate . . . . .	0.8		μμf

#### MECHANICAL

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

### BASING DIAGRAM

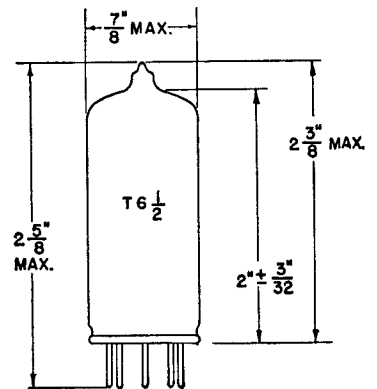


RETMA 9A

### TERMINAL CONNECTIONS

- Pin 1—Plate (Section 2)
- Pin 2—Grid (Section 2)
- Pin 3—Cathode (Section 2)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Cathode (Section 1)
- Pin 9—Heater Center-Tap

### PHYSICAL DIMENSIONS



RETMA 6-3

**MAXIMUM RATINGS**

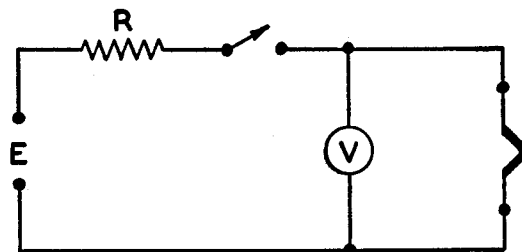
<b>DESIGN-CENTER VALUES UNLESS OTHERWISE INDICATED, EACH SECTION</b>	<b>Class A<sub>1</sub> Amplifier</b>	<b>Vertical- Deflection Amplifier‡</b>
DC Plate Voltage . . . . .	300	450 Volts
Peak Positive Pulse Plate Voltage . . . . .	. . .	1500§ Volts
Positive DC Grid Voltage . . . . .	0	. . . Volts
Negative DC Grid Voltage . . . . .	50	. . . Volts
Peak Negative Grid Voltage . . . . .	. . .	250 Volts
Plate Dissipation . . . . .	3.5	3.5π Watts
DC Cathode Current . . . . .	20	20 Milliamperes
Peak Cathode Current . . . . .	. . .	70 Milliamperes
<b>Heater-Cathode Voltage</b>		
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
<b>Grid Circuit Resistance</b>		
With Fixed Bias . . . . .	0.25	. . . Megohms
With Cathode Bias . . . . .	1.0	2.2 Megohms
	<b>Vertical- Oscillator Service‡</b>	<b>Horizontal- Oscillator Service‡</b>
DC Plate Voltage . . . . .	450	450 Volts
Peak Negative Grid Voltage . . . . .	400	600 Volts
Plate Dissipation . . . . .	3.5	3.5 Watts
DC Cathode Current . . . . .	20	20 Milliamperes
Peak Cathode Current . . . . .	70	300 Milliamperes
<b>Heater-Cathode Voltage</b>		
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
<b>Grid Circuit Resistance</b>		
With Fixed Bias . . . . .	2.2	2.2 Megohms
With Cathode Bias . . . . .	2.2	2.2 Megohms

**CHARACTERISTICS AND TYPICAL OPERATION**

**CLASS A<sub>1</sub> AMPLIFIER, EACH SECTION**

Plate Voltage . . . . .	250	250 Volts
Grid Voltage . . . . .	-14	-10.5 Volts
Amplification Factor . . . . .	. . .	16.5
Plate Resistance, approximate . . . . .	. . .	5300 Ohms
Transconductance . . . . .	. . .	3100 Micromhos
Plate Current . . . . .	4.0	11.5 Milliamperes
<b>Grid Voltage, approximate</b>		
I <sub>b</sub> = 50 Microamperes . . . . .	. . .	-23 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 (V) to increase from zero to the heater test voltage ( $V_1$ ). For this type,  $E=25.0$  volts (RMS or DC),  $V_1=5.0$  volts (RMS or DC) and  $R=31.5$  ohms.



Heater of Tube under Test

† Without external shield.

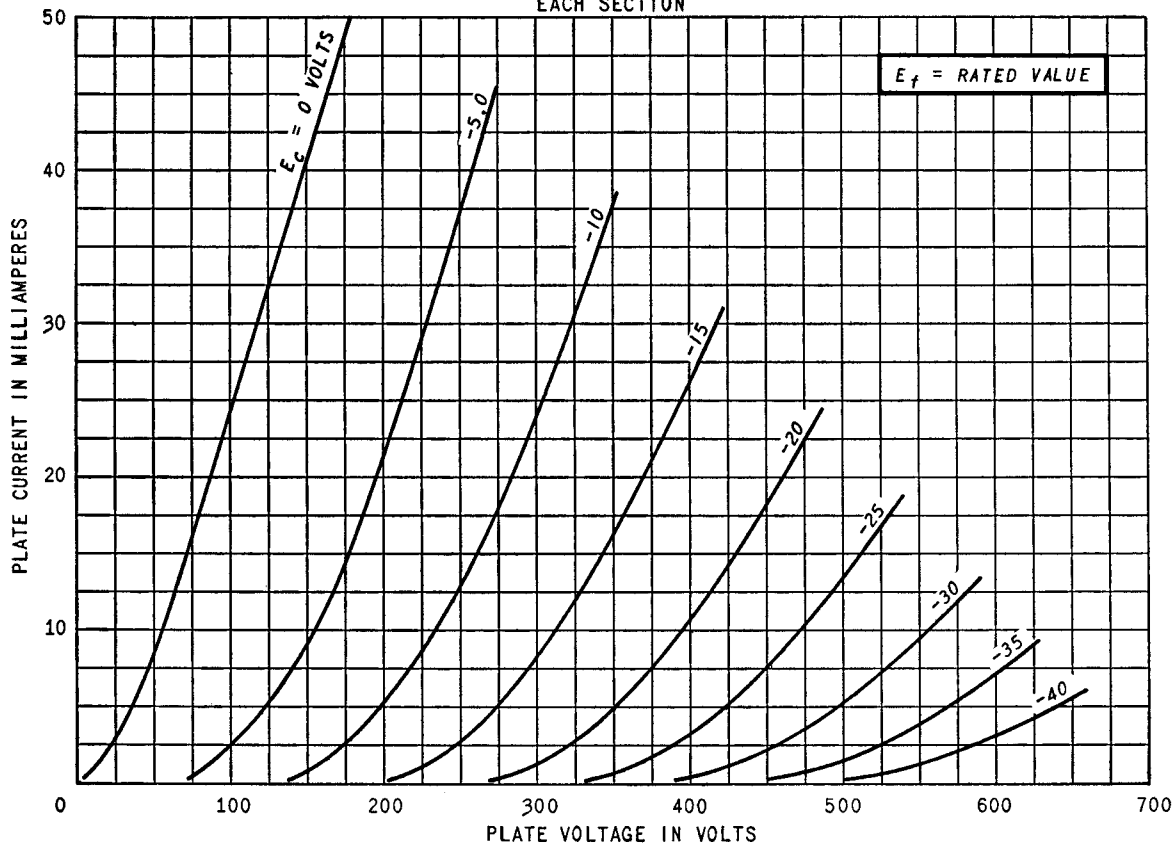
‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

§ 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.

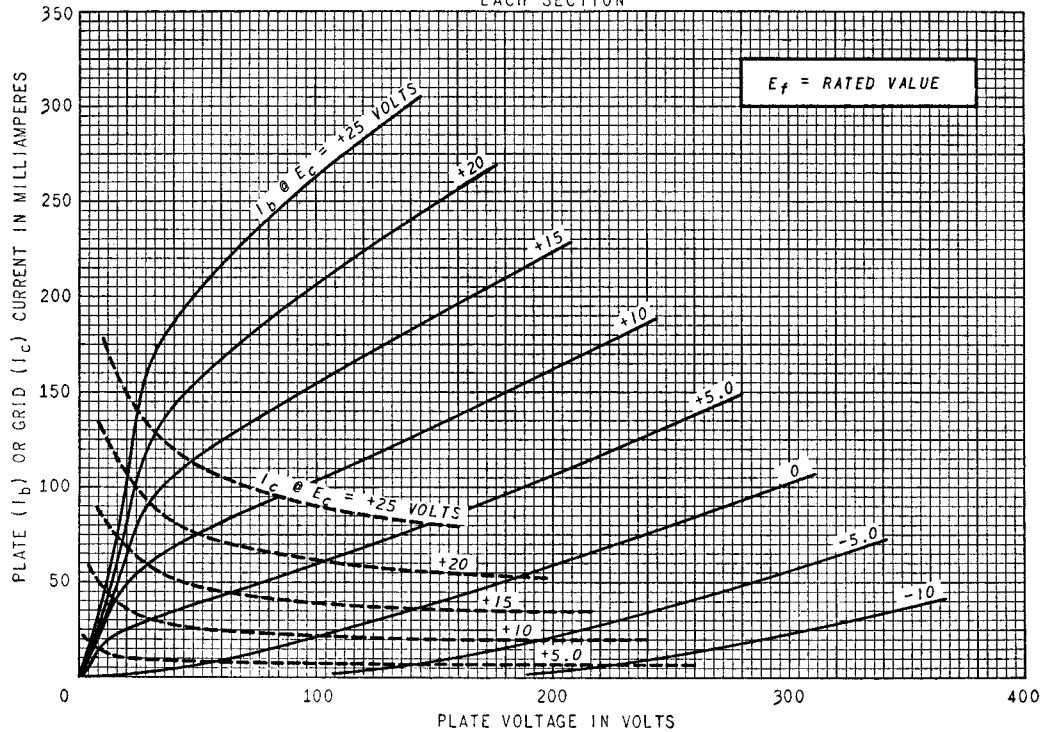
### AVERAGE PLATE CHARACTERISTICS

EACH SECTION



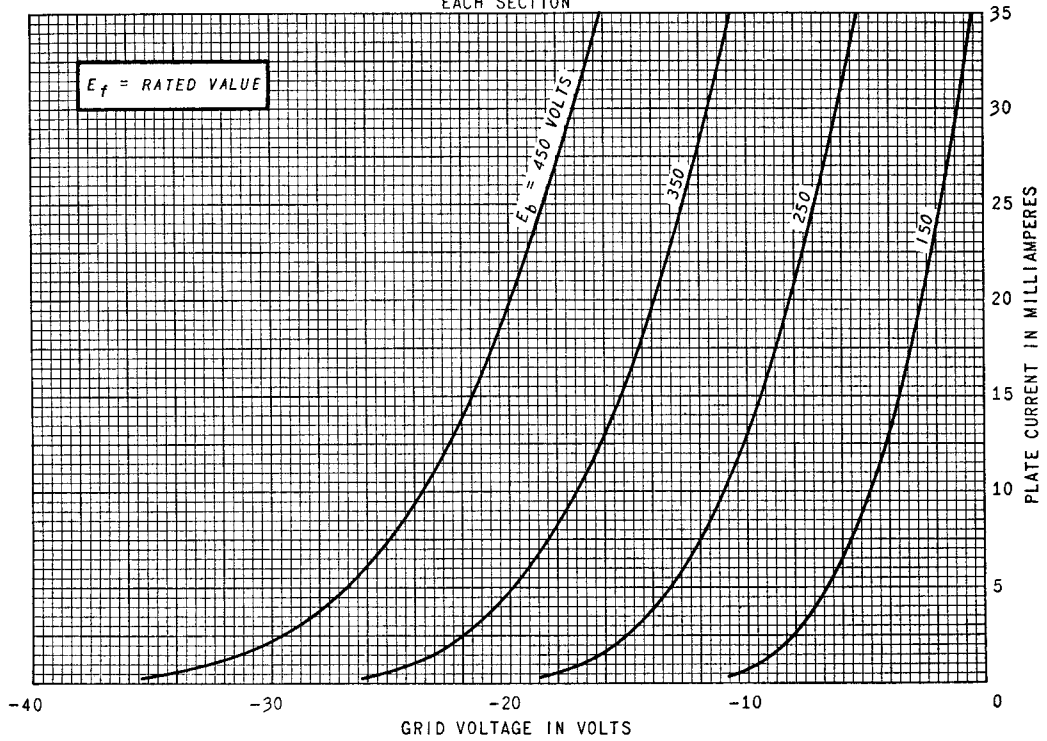
**AVERAGE PLATE CHARACTERISTICS**

EACH SECTION



**AVERAGE TRANSFER CHARACTERISTICS**

EACH SECTION



TUBE DEPARTMENT

**GENERAL ELECTRIC**

Schenectady 5, N. Y.