

January 20, 1955

Medium-Mu Twin Triode Type 12BH7-A

The 12BH7-A is a medium-mu twin triode designed for the vertical deflection circuits of television receivers. In this application, one triode unit can be used as a vertical deflection amplifier while the other unit serves as a vertical oscillator. The 12BH7-A is particularly suitable for this type of operation as the cutoff rating is controlled. Except for the controlled cutoff rating and controlled heater warm-up characteristics, the 12BH7 is identical with the 12BH7-A.

The 12BH7-A has been designed for used in receivers which employ series-connected heaters, especially in television receivers where the picture-tube heater is in series with other heaters. When it is employed in this type of circuit with other tubes having a heater current rating of 600 ma., heater voltage surges across individual tubes are minimized inasmuch as the heater warm-up characteristic is controlled.

GENERAL DATA

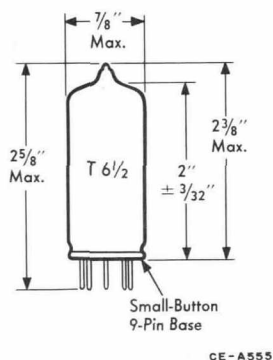
Electrical:

Cathodes	Two, Coated Unipotential			
Heater:	Series	Parallel		
Voltage	12.6	6.3	ac or dc	Volts
Current	0.3	0.6	Ampere	
Warm-up Time (Approx.)*	10.5		Seconds	
Direct Interelectrode Capacitances (Unshielded):				
	Unit 1	Unit 2		
Grid to Plate	2.4	2.4	$\mu\mu\text{f}$	
Grid 1 to Cathode and Heater	3.3	3.3	$\mu\mu\text{f}$	
Plate to Cathode and Heater	0.5	0.4	$\mu\mu\text{f}$	

Mechanical:

Bulb	T-6 $\frac{1}{2}$
Base	Small Button 9-pin (JETEC E9-1)
Basing	9A
Mounting Position	Any

*See Page 3



AMPLIFIER — CLASS A₁

Values for each unit

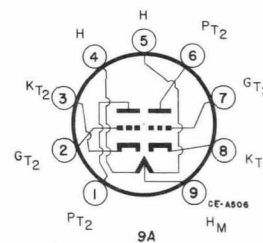
Maximum Ratings

Design Center Values

Plate Voltage	300 max. Volts
Grid Voltage:	
Negative Bias Value	50 max. Volts
Positive Bias Value	0 max. Volts
Plate Dissipation	3.5 max. Watts
Cathode Current	20 max. Ma.
Heater-Cathode Voltage:	
Heater Negative with Respect to Cathode	
Total DC + Peak	200 max. Volts
Heater Positive with Respect to Cathode	
DC Component	100 max. Volts
Total DC + Peak	200 max. Volts

Characteristics

Plate Voltage	250	Volts
Grid Voltage	-10.5	Volts
Amplification Factor	17	
Plate Resistance (Approx.)	5500	Ohms
Transconductance	3100	μmhos
Plate Current	11.5	Ma.
Grid Voltage (Approx.) for		
Plate Current of 10 $\mu\text{amp.}$	-25	Volts



Bottom View

Receiving Tube Section

VERTICAL DEFLECTION AMPLIFIER

Values for each unit

Maximum Ratings

Design Center Values

For Operation in 525-line, 30-frame system**

DC Plate Voltage	500 max. Volts
Peak Positive Pulse Plate Voltage†	1350 max. Volts
DC Grid Voltage	-50 max. Volts
Peak Negative-Pulse Grid Voltage†	200 max. Volts
Plate Dissipation†	3.5 max. Watts
DC Cathode Current	20 max. Ma.

Heater-Cathode Voltage:

Heater Negative with Respect to Cathode

Total DC + Peak 200 max. Volts

Heater Positive with Respect to Cathode

DC Component 100 max. Volts

Total DC + Peak 200 max. Volts

Maximum Circuit Values

Grid Circuit Resistance:

For Cathode-bias operation 2.5 max. Megohms

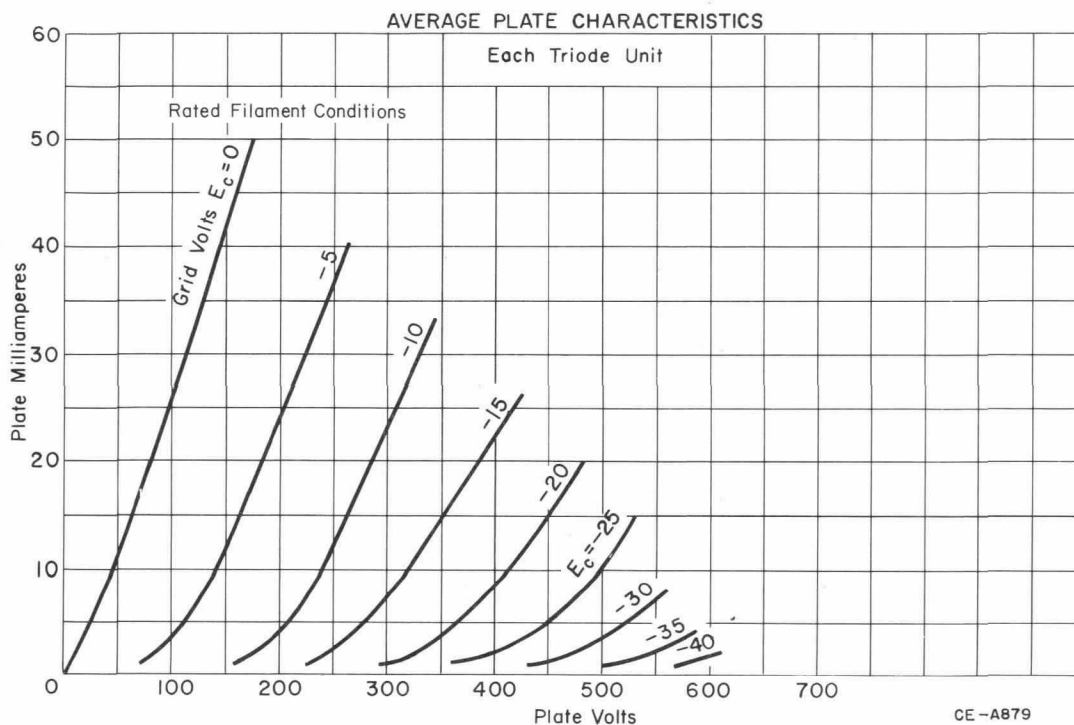
For Fixed-bias operation 1 max. Megohm

Cathode-Bias Resistance—Sufficient cathode-bias resistance should be used to protect the tube in case of failure of excitation and consequent loss of bias.

** As described in "Standards of Good Engineering Practice for Television Broadcast Stations," Federal Communication Commission.

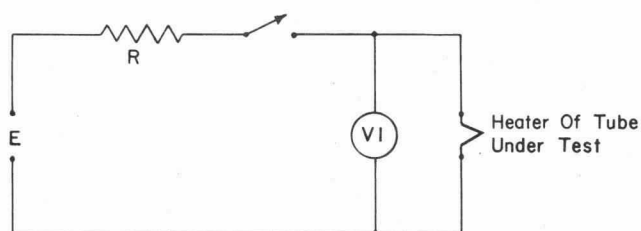
Duration of the voltage pulse must not exceed 15 per cent of one scanning cycle, or 2.5 milliseconds in a 525-line, 30-frame system.

† From the viewpoint of tube life, these values should not be exceeded by more than 10 per cent under any condition of high line voltage or misadjustment of any controls.



HEATER WARM-UP TIME MEASUREMENTS

Heater warm-up time is defined as the time required for the voltage across the heater terminals to increase from zero to the heater test voltage (V_1) in the circuit shown below. The conditions used in conjunction with the test circuit depend upon the rated heater voltage and current of the tube under test.



CE-A933

E —Applied Voltage, RMS or DC	25	Volts
R —Total Series Resistance	31.5	Ohms
V_1 —Heater Voltage, RMS or DC	5.0	Volts
E_r —Rated Heater Voltage	6.3	Volts
I_r —Rated Heater Current	0.6	Amperes

