



COMPACTRON BEAM PENTODE

FOR TV HORIZONTAL-DEFLECTION AMPLIFIER APPLICATIONS

DESCRIPTION AND RATING

The 21HB5-A is a compactron beam-power pentode designed for use as the horizontal-deflection amplifier in television receivers. It is unilaterally interchangeable with the 21HB5.

GENERAL

ELECTRICAL

Cathode - Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC* 21 Volts

Heater Current† 0.45±0.03 Amperes

Heater Warm-up Time, Average§ 11 Seconds

Direct Interelectrode Capacitances, approximate¶

Grid-Number 1 to Plate: (g1 to p) 0.4 pf

Input: g1 to (h + k + g2 + b.p.) 24 pf

Output: p to (h + k + g2 + b.p.) 9.5 pf

MECHANICAL

Operating Position - Any

Envelope - T-12, Glass

Base - E12-74, Button 12-Pin

Outline Drawing - EIA 12-58

Maximum Diameter 1.563 Inches

Maximum Over-all Length 3.375 Inches

Maximum Seated Height 3.000 Inches

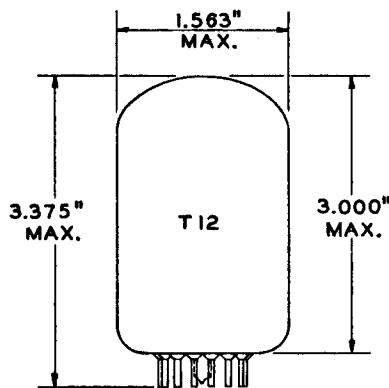
MAXIMUM RATINGS

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all other electron devices in the equipment.

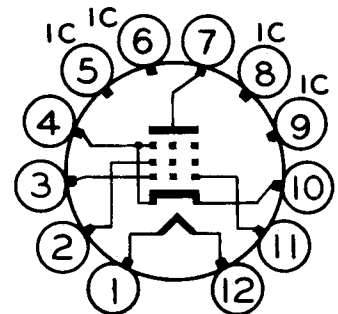
PHYSICAL DIMENSIONS



TERMINAL CONNECTIONS

- Pin 1 - Heater
- Pin 2 - Grid Number 2 (Screen)
- Pin 3 - Grid Number 1
- Pin 4 - Cathode and Beam Plates
- Pin 5 - Internal Connection - Do Not Use
- Pin 6 - Internal Connection - Do Not Use
- Pin 7 - Plate
- Pin 8 - Internal Connection - Do Not Use
- Pin 9 - Internal Connection - Do Not Use
- Pin 10 - Cathode and Beam Plates
- Pin 11 - Grid Number 1
- Pin 12 - Heater

BASING DIAGRAM



EIA 12BJ

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or elements. In the absence of an

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MAXIMUM RATINGS (Cont'd)

HORIZONTAL-DEFLECTION AMPLIFIER SERVICE^Δ—DESIGN-MAXIMUM VALUES

DC Plate-Supply Voltage (Boost + DC Power Supply)	. . . . .	770	Volts
Peak Positive Pulse Plate Voltage	. . . . .	6000	Volts
Peak Negative Pulse Plate Voltage	. . . . .	1500	Volts
Screen Voltage	. . . . .	220	Volts
Negative DC Grid-Number 1 Voltage	. . . . .	55	Volts
Peak Negative Grid-Number 1 Voltage	. . . . .	330	Volts
Plate Dissipation^{§§}	. . . . .	18	Watts
Screen Dissipation	. . . . .	3.5	Watts
DC Cathode Current	. . . . .	230	Milliamperes
Peak Cathode Current	. . . . .	800	Milliamperes
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component	. . . . .	100	Volts
Total DC and Peak	. . . . .	200	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak	. . . . .	200	Volts
Grid-Number 1 Circuit Resistance	. . . . .	1.0	Megohms
Bulb Temperature at Hottest Point	. . . . .	220	C

CHARACTERISTICS AND TYPICAL OPERATION

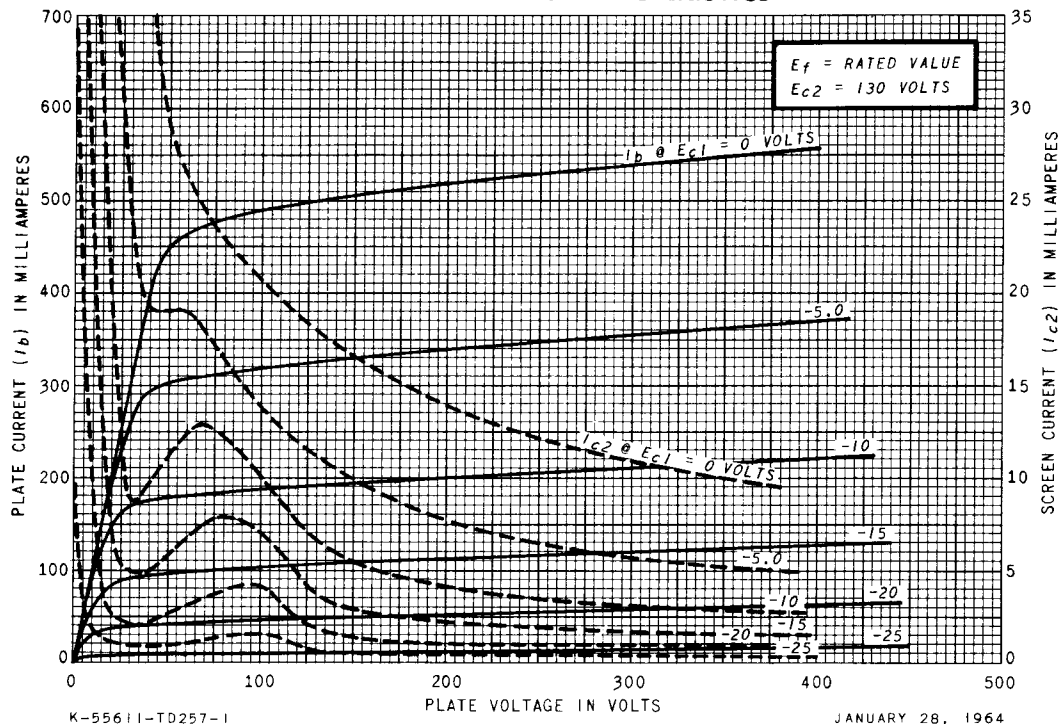
AVERAGE CHARACTERISTICS

Plate Voltage	. . . . .	5000	50	130	Volts
Screen Voltage	. . . . .	130	130	130	Volts
Grid-Number 1 Voltage	. . . . .	---	0**	-20	Volts
Plate Resistance, approximate	. . . . .	---	---	9900	Ohms
Transconductance	. . . . .	---	---	9000	Micromhos
Plate Current	. . . . .	---	450	46	Milliamperes
Screen Current	. . . . .	---	29	1.8	Milliamperes
Grid-Number 1 Voltage, approximate					
I _b = 1.0 Milliamperes	. . . . .	-64	---	-32	Volts
Triode Amplification Factor^{##}	. . . . .	---	---	4.8	

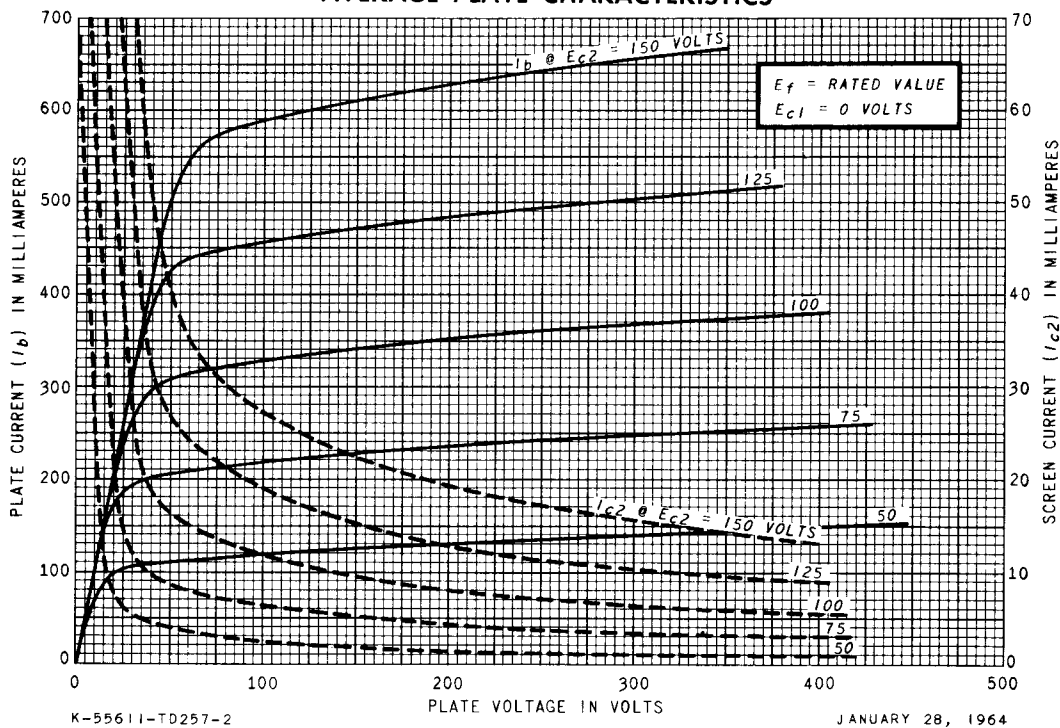
NOTES

- * Heater voltage for a bogey tube at I_f = 0.45 amperes.
- ‡ The equipment designers should design the equipment so that heater current is centered at the specified bogey value, with heater supply variations restricted to maintain heater current within the specified tolerance.
- § The time required for the voltage across the heater to reach 80 percent of the bogey value after applying 4 times the bogey heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the bogey heater voltage divided by the bogey heater current.
- ¶ Without external shield.
- Δ 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.
- §§ 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.
- ** Applied for short interval (two seconds maximum) so as not to damage tube.
- ## Triode connection (screen tied to plate) with E_b = E_{c2} = 130 volts and E_{c1} = -20 volts.

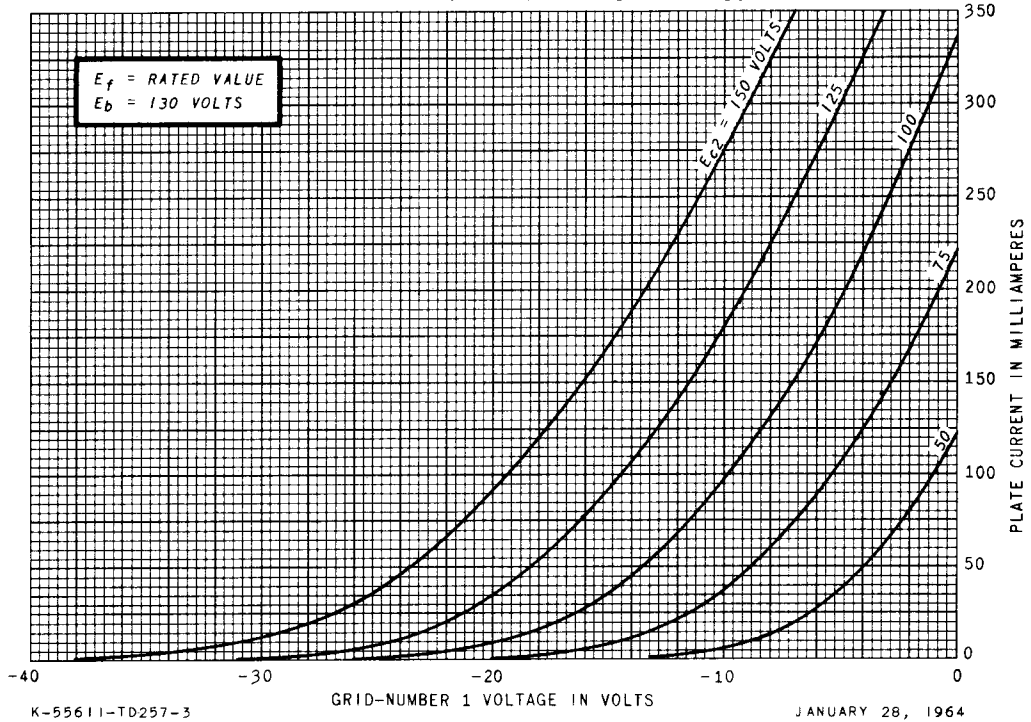
AVERAGE PLATE CHARACTERISTICS



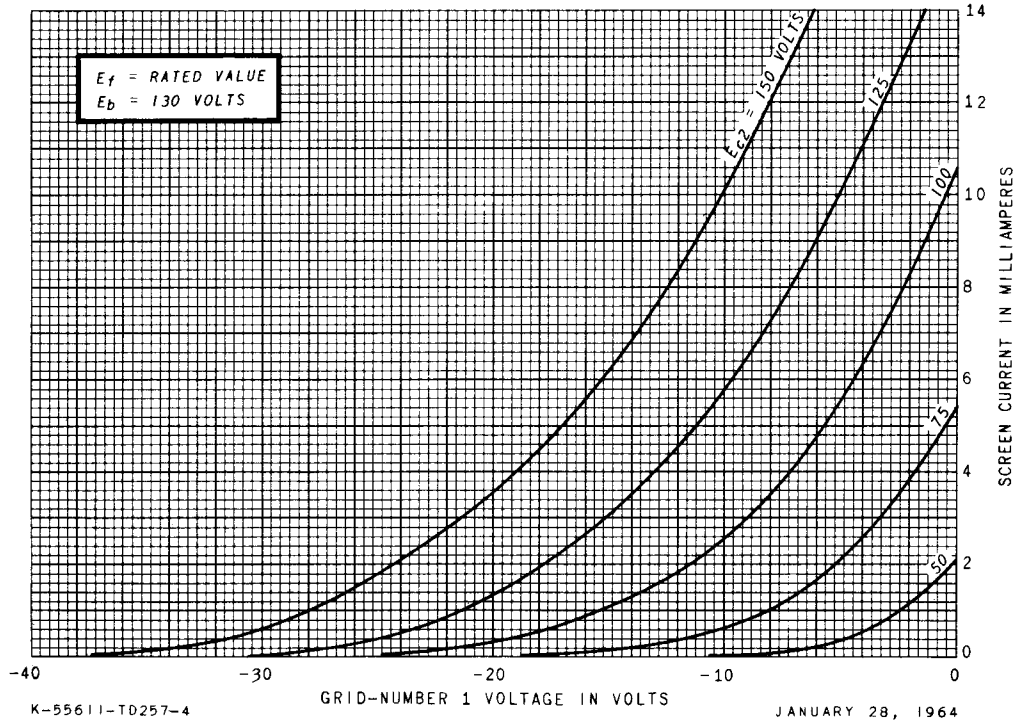
AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS



TUBE DEPARTMENT



Owensboro, Kentucky