

RAYTHEON

TECHNICAL
INFORMATION
SERVICE

Technical Information

**6HD5
21HD5
28HD5**

BEAM PENTODES

MECHANICAL DATA

ENVELOPE T-12 Glass
BASE 12-Pin Button E12-74
MOUNTING POSITION Any

The types 6HD5, 21HD5, and 28HD5 are heater-cathode type beam pentodes for use as horizontal deflection amplifiers in television receivers. They have been designed to meet the circuit requirements of low B supply receivers and color applications where high peak plate currents and high permeance are necessary.

Structural features of this type include a single-ended T-12 envelope and an integral all-glass twelve-pin base. The large diameter internal leads to the base of this tube assure firm support for the mount structure. The design permits cool operation of both grids and additional cooling of grids #1 & #2 can be obtained by employing connections to the dual base pins.

ELECTRICAL DATA

HEATER CHARACTERISTICS:

	<u>6HD5</u>	<u>21HD5</u>	<u>28HD5</u>
Heater Voltage	6.3 ± 10%	21.5 ●●	28.0 volts ●●
Heater Current	2.25 ●	0.6 ± 6% □	0.45 ± 6% amps. □
Heater Warm-Up Time		11	11 sec.
<u>Maximum Heater Cathode Voltages:</u>			
Heater Negative with Respect to Cathode			
Total DC and Peak	200 volts		
Heater Positive with Respect to Cathode			
DC	100 volts		
Total DC and Peak	200 volts		

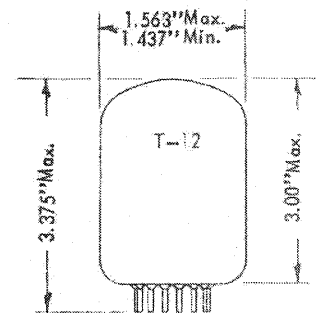
DESIGN MAXIMUM RATINGS - HORIZONTAL DEFLECTION AMPLIFIER: **

Plate Supply Voltage (boost + DC power supply)	770 volts
Grid #2 Voltage	220 volts
Plate Dissipation	24 watts
Grid #2 Dissipation	6.0 watts
Grid #2 Dissipation (Warm up Surge) +	12 watts
Average Cathode Current	280 ma
Peak Cathode Current	1000 ma
Peak Positive Plate Voltage	7000 volts
Peak Negative Plate Voltage	1500 volts
Peak Negative Grid #1 Voltage	330 volts
Grid #1 Circuit Resistance	1.0 meg.
Bulb Temperature (at hottest point on bulb surface)	240 °C

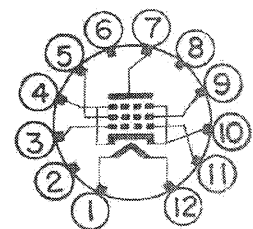
AVERAGE CHARACTERISTICS:

Plate Voltage	60	60	135 volts
Grid #2 Voltage	110	135	135 volts
Grid #1 Voltage	0	0	-22 volts
Plate Current	410 ++	540 ++	65 ma
Grid #2 Current	28 ++	48 ++	4 ma
Triode Amplification Factor	4.2		
Transconductance	10000 μmhos		
Plate Resistance	5000 ohms		
Grid #1 Voltage (approx.) for Ib=1 ma (Ep=3 KV)	-60 volts		

PHYSICAL DIMENSIONS



BASING 12 ES



BOTTOM VIEW

TERMINAL CONNECTIONS

- Pin 1 Heater
- Pin 2 No Connection
- Pin 3 Grid #1
- Pin 4 Cathode & Grid #3
- Pin 5 Grid #2
- Pin 6 Internal Conn. *
- Pin 7 Plate
- Pin 8 Internal Conn. *
- Pin 9 Grid #2
- Pin 10 Cathode & Grid #3
- Pin 11 Grid #1
- Pin 12 Heater

* Do not use - It is suggested that socket clips for these pins be omitted to improve insulation factor of socket.

Printed in
U.S.A.

BEAM PENTODES

ELECTRICAL DATA (cont'd.)

** For operation in a 525 line, 30-frame system as described in "Standards of Good Engineering Practice for Television Broadcasting Stations; Federal Communications Commission". The duty cycle of the voltage pulse not to exceed 15% of a scanning cycle and its duration is limited to 10 micro seconds.

Design—Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey 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 servicability of the tube, taking responsibility for the effects of changes in operating conditions due to variations in tube characteristics.

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 variations, equipment component variation, equipment control adjustment, load variation, signal variation, and environmental conditions.

+ Surge not to exceed 15 seconds duration.

++ Instantaneous values.

● Heater current at bogie heater voltage.

●● Heater voltage at bogie heater current.

□ The equipment designer shall design equipment so that the heater voltage for the 6HD5 and the heater current for the 21HD5 and 28HD5 are centered at the specified bogey value with heater supply variations restricted to maintain heater voltage (or current) within the specified tolerance.

AVERAGE PLATE CHARACTERISTICS

$E_f = \text{rated}, E_{c2} = 135 \text{ Volts}$

