RAYTHEON

TECHNICAL INFORMATION SERVICE

Technical Information

6HJ5 21HJ5 30HJ5

BEAM PENTODES

The types 6HJ5, 21HJ5, and 30HJ5 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 perveance are necessary characteristics. A separate connection to grid no. 3 provides for applying positive voltage to minimize "snivets" which may occur with "below knee" operation.

Structural features of this type include a single–ended T–12 envelope and a compactron 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. Types 21HJ5 and 30HJ5 are identical to type 6HJ5 except for heater characteristics.

ELECTRICAL DATA

HEATER CHARACTERISTICS:

	6HJ5	21HJ5	30HJ5	
Heater voltage	6.3 ± 10%	21.5●●	30.0	volts●●
Heater current	2.25●	0.6 ± 6%□	0.45 ± 6%	amps.□
Heater warm–up time		11	11	sec.

Maximum heater cathode voltages:

Heater negative with respect to cathode

Total DC and peak . . . . . 200 volts

Heater positive with respect to cathode

DC component . . . . . 100 volts

Total DC and peak . . . . . 200 volts

DESIGN MAXIMUM RATINGS(See EIA standard RS–239)–HORIZONTAL DEFLECTION AMPLIFIER:**

Plate 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 gird #1 voltage	330	volts
Grid #1 circuit resistance	1.0	meg.
Bulb temperature (at hottest point on bulb surface)	240	°C
DC grid #3 voltage Δ	70	volts

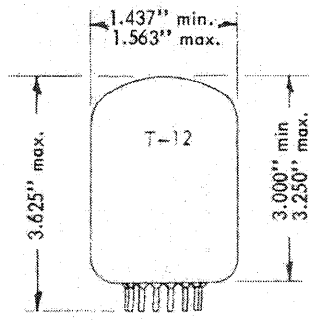
AVERAGE CHARACTERISTICS:

Plate voltage	20	40	60	135	volts
Grid #2 voltage	110	110	135	135	volts
Grid #1 voltage	0	0	0	–22	volts
Grid #3 voltage				0	volts
Plate current	240++	400++	540++	80	ma
Grid #2 current	160++	42++	48++	5.5	ma
Triode amplification factor				4.2	

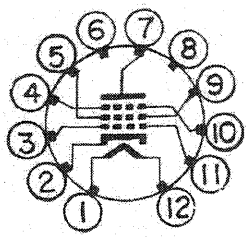
MECHANICAL DATA

ENVELOPE . . . . . T12 glass
BASE . . . 12–pin button, E12–74
MOUNTING POSITION . . . . any
CATHODE . . . . coated unipotential

PHYSICAL DIMENSIONS



BASING 12 ES



BOTTOM VIEW

TERMINAL CONNECTIONS

Pin 1 Heater
Pin 2 Cathode
Pin 3 Grid #1
Pin 4 Grid #3
Pin 5 Grid #2
Pin 6 No connection*
Pin 7 Plate
Pin 8 No connection*
Pin 9 Grid #2
Pin 10 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.

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ELECTRICAL DATA (cont'd.)

AVERAGE CHARACTERISTICS: (cont'd.)

Transconductance	10,000 μmhos
Plate resistance	5000 ohms
Grid #1 voltage (approx.) for Ib = 1 ma (Ep = 4.5 KV)	–70 volts

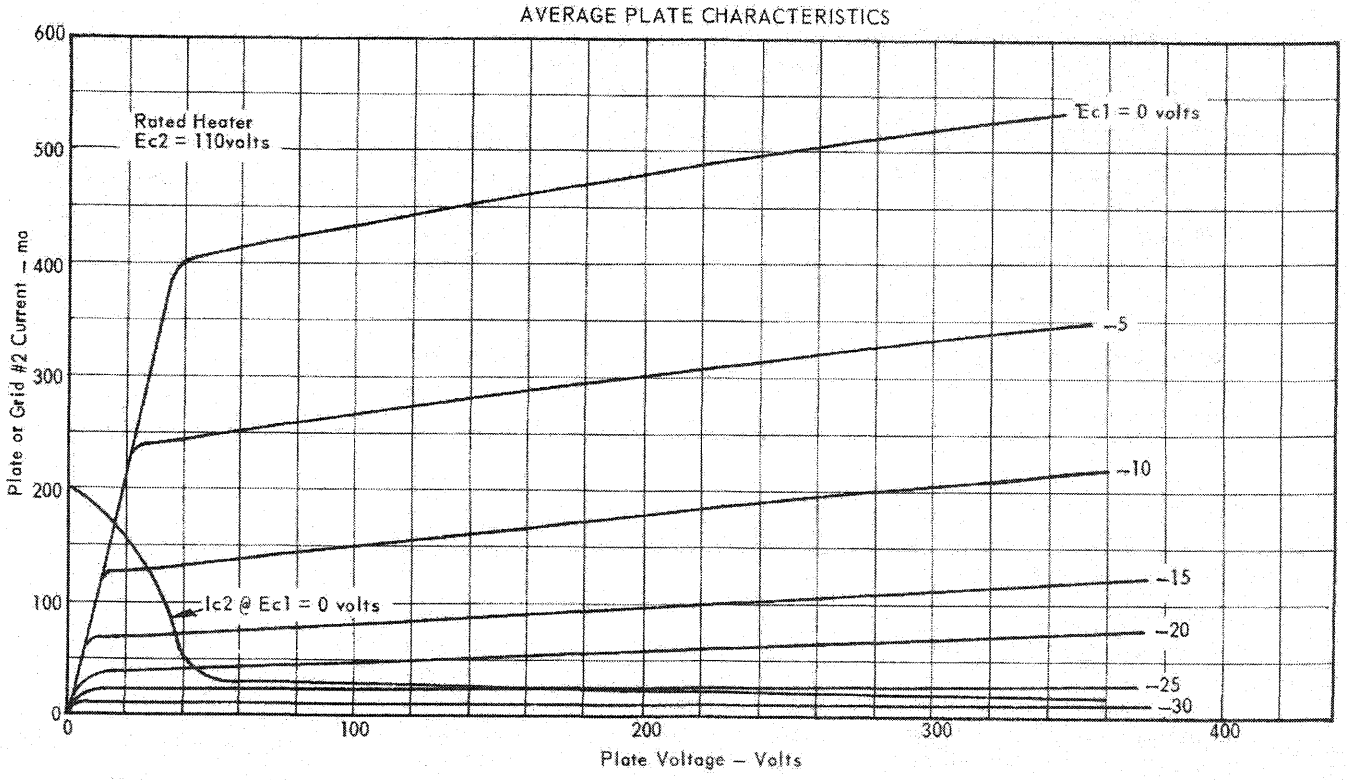
** For operation in a 525 line, 30–frame system as described in "Standards of Good Engineering Practice for Television Broadcasting stations; Federal Communications Commission". The duty cycle of the voltage pulse not to exceed 15% of a scanning cycle and its duration is limited to 10 micro seconds.

+ 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 6HJ5 and the heater current for the 21HJ5 and 30HJ5 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