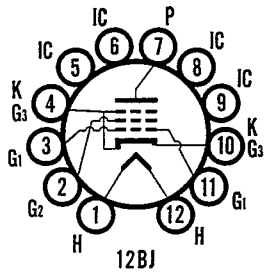
6HB5 SYLV

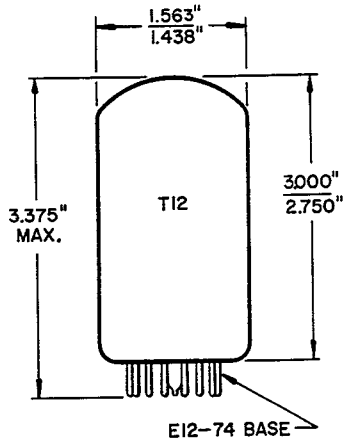
RECEIVING TUBES

SYLVANIA

Horizontal Deflection Amplifier
6HB5, 21HB5, 21HB5A

- **BEAM POWER PENTODE**
- **COMPACTRON CONSTRUCTION**
- **T-12 ENVELOPE**
- **12 PIN BASE**





DESCRIPTION

Sylvania Types 6HB5, 21HB5, 21HB5A are beam pentodes featuring compactron construction. They are designed for use as a horizontal deflection amplifier in television receivers. The 21HB5A is unilaterally interchangeable with the 21HB5.

MECHANICAL DATA

Envelope	T-12
Base	E12-74
Outline	12-58
Maximum Diameter	1.563 Inches
Maximum Seated Height	3.000 Inches
Maximum Overall Length	3.375 Inches
Cathode	Coated Unipotential
Operating Position	Any
Basing	12BJ

Terminal Connections

Pin No. 1—Heater
Pin No. 2—Grid No. 2 (Screen)
Pin No. 3—Grid No. 1
Pin No. 4—Cathode and Grid No. 3 (Beam Plates)
Pin No. 5—Internal Connection(8)
Pin No. 6—Internal Connection(8)
Pin No. 7 —Plate
Pin No. 8 —Internal Connection(8)
Pin No. 9 —Internal Connection(8)
Pin No. 10—Cathode and Grid No. 3 (Beam Plates)
Pin No. 11—Grid No. 1
Pin No. 12—Heater

ELECTRICAL DATA

HEATER CHARACTERISTICS AND RATINGS (Design Maximum Rating System)(1)

Type	6HB5	21HB5	21HB5A
Heater Circuit	Parallel	Series	Series
Heater Voltage	6.3 ± 0.6(3)	21(2)	21(2) Volts
Heater Current	1.5(9)	0.45 ± 0.03(3)	0.45 ± 0.03(3) Amperes
Heater Warm-up Time (Average)(11)	—	11	11 Seconds
Maximum Heater Cathode Voltage			
Heater Negative with Respect to Cathode			
Total DC and Peak	200	200	200 Volts
Heater Positive with Respect to Cathode			
DC	100	100	100 Volts
Total DC and Peak	200	200	200 Volts

DIRECT INTERELECTRODE CAPACITANCES (Unshielded)

Grid to Plate: g1 to p	0.40	0.40	0.54 pf
Input: g1 to (h + k + g2 + g3)	22	22	22 pf
Output: p to (h + k + g2 + g3)	9.0	9.0	9.5 pf

RATINGS (Design Maximum Rating System)[1]

Horizontal Deflection Amplifier[7]

DC Plate Supply Voltage (Boost + DC Power Supply)	770 Volts	Max.
Peak Positive Plate Pulse Voltage (Absolute Maximum)	6000 Volts	Max.
Peak Negative Plate Pulse Voltage	1500 Volts	Max.
Grid No. 2 D.C. (Screen) Voltage	220 Volts	Max.
Negative Grid No. 1 Voltage (DC)	55 Volts	Max.
Peak Negative Grid No. 1 Voltage	330 Volts	Max.
Plate Dissipation[4]	18 Watts	Max.
Grid No. 2 Dissipation	3.5 Watts	Max.
Average Cathode Current	230 Ma	Max.
Peak Cathode Current	800 Ma	Max.
Grid No. 1 Circuit Resistance	1.0 Megohms	Max.
Bulb Temperature (At Hottest Point)	220 °C	Max.

AVERAGE CHARACTERISTICS (for 6HB5, 21HB5)

Plate Voltage	5000	130	60 Volts
Grid No. 2 Voltage	130	130	130 Volts
Grid No. 1 Voltage	—	−20	0 Volts
Grid No. 3 Voltage		Note 6	Volts
Plate Current	—	50	410 Ma [5]
Grid No. 2 Current	—	1.75	24 Ma [5]
Transconductance	—	9100	— μmhos
Triode Amplification Factor (Grid No. 2 Connected to Plate) Eb = Ec2 = 130 Volts; Ec1 = −20 Volts	—	4.7	—
Plate Resistance (Approx.)	—	11,000	— Ohms
Grid No. 1 Voltage for Ib = 1 Ma (Approx.)	−66	−33	— Volts

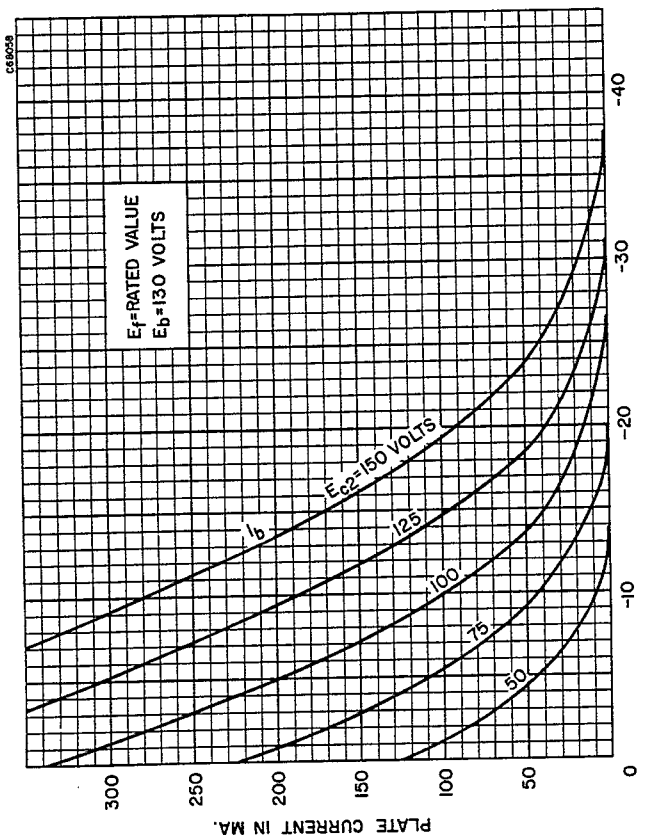
AVERAGE CHARACTERISTICS (for 21HB5A)

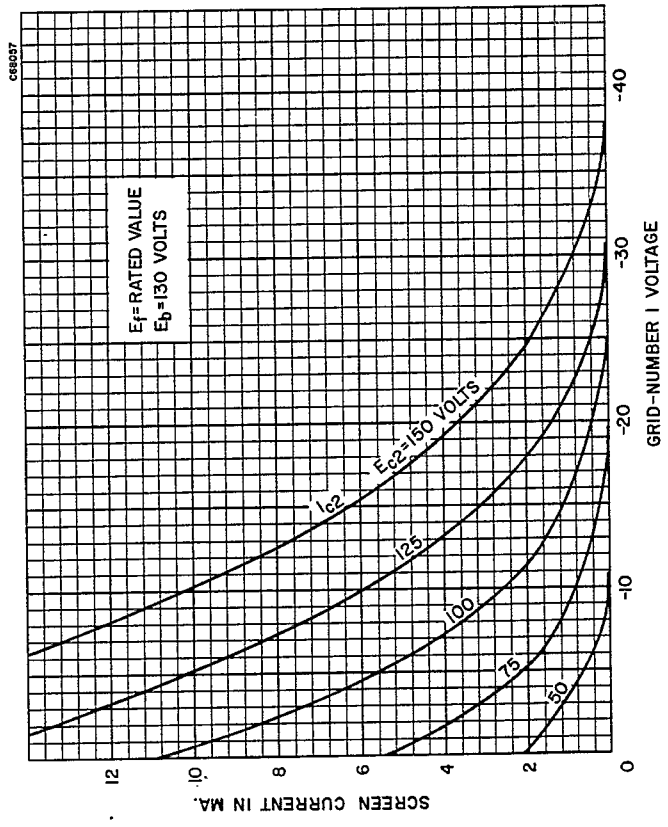
Plate Voltage	130	50 Volts
Grid No. 2 (Screen) Voltage	130	130 Volts
Grid No. 1 Voltage	−20	0 Volts
Grid No. 3 Voltage	Note 6	Volts
Plate Current	46	450 Ma[5]
Grid No. 2 (Screen) Current	1.8	29 Ma[5]
Transconductance	10,500	— μmhos
Triode Amplification Factor (Grid No. 2 Connection to Plate) Eb = Ec2 = 125 Volts; Ec1 = −25 Volts	4.8	—
Plate Resistance (Approx.)	9900	— Ohms
Grid No. 1 Voltage for Ib = 1 Ma (Approx.)	−32	— Volts

NOTES:

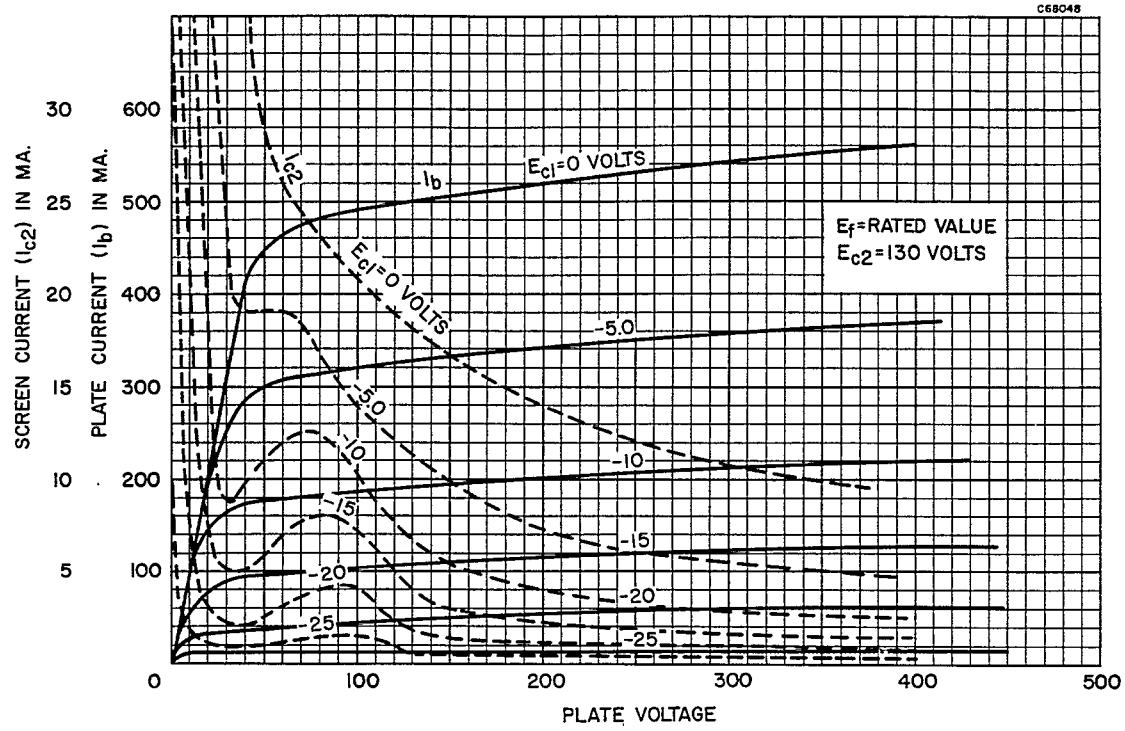
(1) Design Maximum Ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.
The tube manufacturer chooses these values to provide acceptable 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 variation in the characteristics of all other electron devices in the equipment.
(2) Heater voltage of a bogey tube at If = 450 Ma.
(3) The equipment designer 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.
(4) In stages operating with a grid leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.
(5) Values measured by a method involving a recurrent waveform such that the plate and screen dissipations will be kept within ratings in order to prevent damage to the tube.
(6) Grid No. 3 (Beam Plate) returned to cathode at socket.
(7) For operation in a 525 line, 30 frame system as described in "Standards of Good Engineering Practice for Television Stations; Federal Communications Commission." The duty cycle of the voltage pulse must not exceed 15% of one horizontal scanning cycle.
(8) Pins designated Internal Connection (IC) may or may not have connections to internal elements depending on the manufacturer. To maintain interchangeability do not use these pins for external connection.
(9) Heater current of a bogey tube at Ef = 6.3 volts.
(10) Applied at short intervals (two seconds maximum) so as not to damage tube.
(11) Heater warm-up time is the time required for the voltage across the heater to reach 80% of the rated heater voltage after applying four times the rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three times the rated heater current.

AVERAGE TRANSFER CHARACTERISTICS





AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS