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50HC6

For AF Power Amplifier Applications

The 50HC6 is a miniature power pentode primarily designed for use in the audio-frequency power output stage of radio receivers. Features of the tube include high power sensitivity at low plate and screen voltages and a heater tap to permit operation of a panel lamp.

GENERAL

Electrical

Cathode - Coated Unipotential
Heater Characteristics and Ratings (Design-Maximum Rating System)

Heater Voltage, AC or DC*	50	Volts
Heater Current+	0.15±0.009	Amperes
Heater Tap Voltage‡	7.0	Volts
Direct Interelectrode Capacitances, approximate§		
Grid-Number 1 to Plate: (g1 to p)	0.5	pf
Input: g1 to (h + k + g2 + g3)	17	pf
Output: p to (h + k + g2 + g3)	9.0	pf

Mechanical

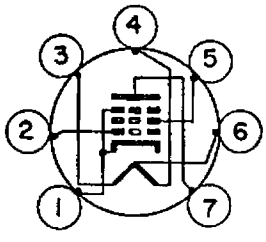
Mounting Position - Any
Envelope - T-5 1/2, Glass
Base - E7-1, Miniature Button, 7-Pin
Outline Drawing - EIA 5-3

Maximum Diameter	3/4	Inches
Maximum Over-all Length	2 5/8	Inches
Maximum Seated Height	2 3/8	Inches

TERMINAL CONNECTIONS

Pin 1 - Cathode and Grid Number 3 (Suppressor)
Pin 2 - Grid Number 1
Pin 3 - Heater
Pin 4 - Heater
Pin 5 - Grid Number 2 (Screen)
Pin 6 - Heater Tap
Pin 7 - Plate

BASING DIAGRAM



EIA 7FZ

MAXIMUM RATINGS

Design-Maximum Values

Heater-Tap Voltage When Panel Lamp Fails, RMS	14	Volts
Plate Voltage	150	Volts
Screen Voltage	130	Volts
Plate Dissipation	5.5	Watts
Screen Dissipation	2.0	Watts
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

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 serviceability of the tube, taking responsibility for the effects of changes in operating conditions due to variations in 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, variation in characteristics of all other tubes in the equipment, equipment control adjustment, load variation, signal variation, and environmental conditions.

CHARACTERISTICS AND TYPICAL OPERATION

Class A_1 Amplifier

Plate Voltage	110	Volts
Screen Voltage	115	Volts
Cathode-Bias Resistor	62	Ohms
Peak AF Grid-Number 1 Voltage	3.0	Volts
Plate Resistance, approximate	11000	Ohms
Transconductance	14600	Micromhos
Zero-Signal Plate Current	42	Milliamperes
Maximum-Signal Plate Current	42	Milliamperes
Zero-Signal Screen Current	11.5	Milliamperes
Maximum-Signal Screen Current	14.5	Milliamperes
Load Resistance	3000	Ohms
Total Harmonic Distortion, approximate	7	Percent
Maximum-Signal Power Output	1.4	Watts

* Heater voltage at bogey heater current.

\+ For series heater operation, the equipment designer shall 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.

‡ Without panel lamp.

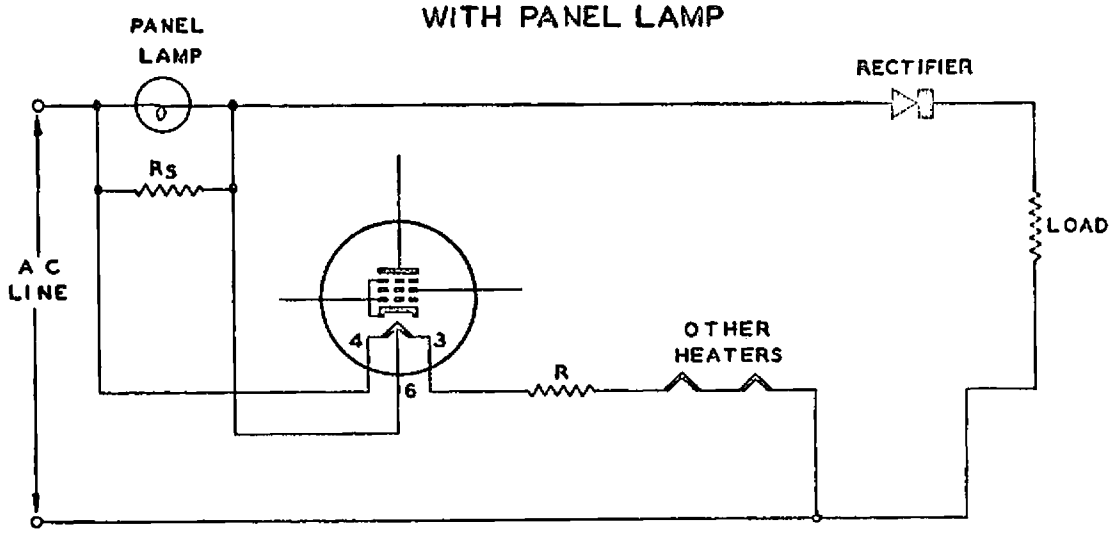
§ Without external shield.

The 50HC6 has a heater tap, which may be used for operating a 6.3-volt, 150-milliampere panel lamp in equipment employing semiconductor rectifiers. The table below gives the required values of panel-lamp shunting resistor for various rectifier load currents.

SHUNTING RESISTOR REQUIRED WITH PANEL LAMP NUMBER 40 OR NUMBER 47 (See Typical Circuit)

Heater Voltage (Pin 3 to Pin 4)	45	45	45	45	45	45	45	Volts
Heater-Tap Voltage (Pin 4 to Pin 6)	5.0	5.4	5.5	5.5	5.5	5.5	5.5	Volts
Heater Current (Between Pins 3 and 6)	150	150	150	150	150	150	150	Milliamperes
Panel-Lamp Shunting Resistor	---	---	370	175	120	88	73	Ohms
Rectifier Load Current¶	60	70	80	90	100	110	120	Milliamperes

TYPICAL CIRCUIT FOR OPERATION WITH PANEL LAMP



Rs = PANEL-LAMP SHUNTING RESISTOR

DROP ACROSS R AT 0.15 AMPERE SHOULD EQUAL DIFFERENCE BETWEEN LINE VOLTAGE AND TOTAL OF ALL RATED HEATER VOLTAGES

¶ Higher load currents will require smaller values of panel-lamp shunting resistor. For maximum panel-lamp life, the shunting resistor should be selected to allow a panel-lamp voltage of 5.5 volts with full rectifier load current.