#128

Cunningham Radiotron

RCA-6K8

TRIODE-HEXODE CONVERTER

The 6K8 is a multi-unit type of all-metal vacuum tube intended primarily for use as a converter in superheterodyne receivers, especially those of the all-wave type. In such receivers, performance of the 6K8 is characterized by improved frequency stability in the high-frequency band.

The design of the 6K8 incorporates a triode unit and a hexode unit in one metal shell.

The action of the 6K8 in converting a radio frequency to an intermediate frequency depends on (1) the generation of a local frequency by the triode unit, (2) the transferring of this frequency to the hexode grid No. 1, and (3) the mixing in the hexode unit of this frequency with that of the r-f signal frequency applied to the hexode grid No. 3.

Because of its design, the 6K8 offers distinctive features of practical interest to the set engineer as follows: (1) In a-c/d-c receivers, the same voltage can be used for the screen and plate of the hexode unit. Such operation is made possible because shield plates serve as a suppressor to raise the plate resistance of the hexode unit at low plate voltages. (2) The triode plate voltage can be the same as the hexode screen voltage and provide adequate oscillation, because the latter is substantially independent of the hexode screen voltage. (3) For adequate conversion transconductance and high plate resistance (hexode unit), only a low triode grid current is required. (4) There is small variation in transconductance of the triode unit with changes in bias on hexode control-grid No.3. As a result, the oscillator frequency is not appreciably influenced by avc voltage.

from RMA registration #128, Jan. 31, 1938

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RCA-6K8

TRIODE-HEXODE CONVERTER

(TENTATIVE DATA)

HEATER VOLTAGE (A.C. or D.C.)	6.3	Volts
HEATER CURRENT	0.3	Ampere
DIRECT INTERELECTRODE CAPACITANCES (Approx.): *		
Hexode Grid No.3 to Hexode Plate	0.03	μμf
Hexode Grid No.3 to Triode Plate	0.01	μμf
Hexode Grid No.3 to Triode Grid	0.1	μμf
Triode Grid to Triode Plate	1.1	μμf
Triode Grid and Hexode Grid No.1 to Hexode Plate	0.05	μμf
Hexode Grid No.3 to All Other Electrodes = R-F Input	6.6	μμf
Triode Plate to All Other Electrodes (except Triode Grid and Hexode Grid No.1) = Osc. Output	3.2	μμf
Triode Grid and Hexode Grid No.1 to All Other Electrodes (except Triode Plate) = Osc. Input	6.0	μμf
Hexode Plate to All Other Electrodes = Mixer Output	3.5	μμf
MAXIMUM OVERALL LENGTH	3-1/8"	
MAXIMUM DIAMETER	1-5/16"	
CAP	Skirted Miniature - Style B	
BASE	Small Wafer Octal 8-Pin	

Converter Service

HEXODE PLATE VOLTAGE		250 max.	Volts
HEXODE SCREEN (Grids No.2 & 4) VOLTAGE		100 max.	Volts
HEXODE CONTROL-GRID (Grid No.3) VOLTAGE		-3 min.	Volts
TRIODE PLATE VOLTAGE		200 max.	Volts
TOTAL CATHODE CURRENT		16 max.	Milliamperes
TYPICAL OPERATION:			
Heater Voltage **	6.3	6.3	Volts
Hexode Plate Voltage	100	250	Volts
Hexode Screen Voltage	100	100	Volts
Hexode Control-Grid Voltage	-3	-3	Volts
Triode Plate Voltage	100	100	Volts
Triode Grid Resistor	50000	50000	Ohms
Hexode Plate Resistance (Approx.)	0.3	0.6	Megohms
Conversion Transconductance	360	400	Micromhos
Hexode Control-Grid Bias (Approx.) for Conversion Transconductance = 2 micromhos	-30	-30	Volts
Hexode Plate Current	2.3	2.7	Milliamperes
Hexode Screen Current	6.9	6.5	Milliamperes
Triode Plate Current	3.5	3.5	Milliamperes
Triode Grid Current	0.15	0.15	Milliamperes

The transconductance of the oscillator portion (not oscillating) of the 6K8 is approximately 2400 micromhos when the Triode Plate Voltage is 100 volts, and the Triode Grid Voltage is 0 volts.

* With shell connected to cathode.

** In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

Pin Connections

Pin 1 - Shell
Pin 2 - Heater
Pin 3 - Hexode Plate
Pin 4 - Hexode Grids No.2 & 4
Pin 5 - Hexode Grid No.1 & Triode Grid
Pin 6 - Triode Plate
Pin 7 - Heater
Pin 8 - Cathode
Cap - Hexode Grid No.3

(Pin numbers are according to RMA system)

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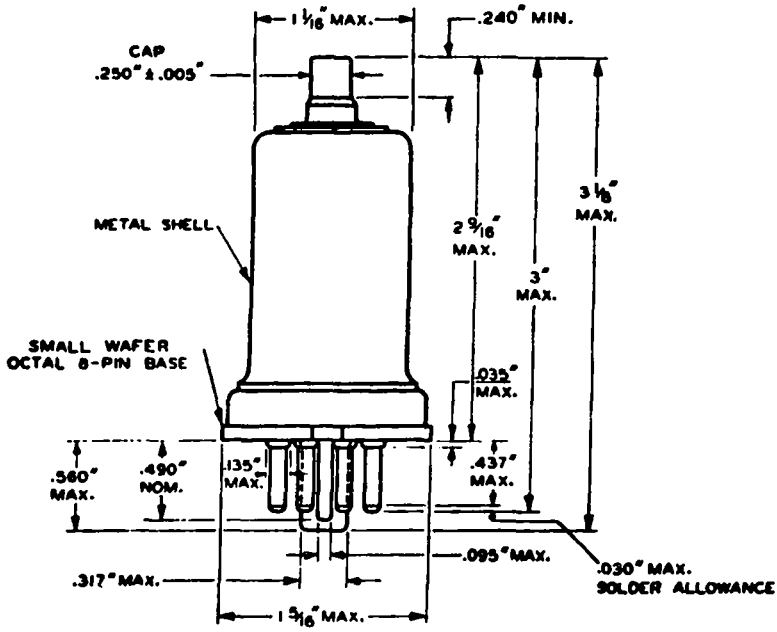
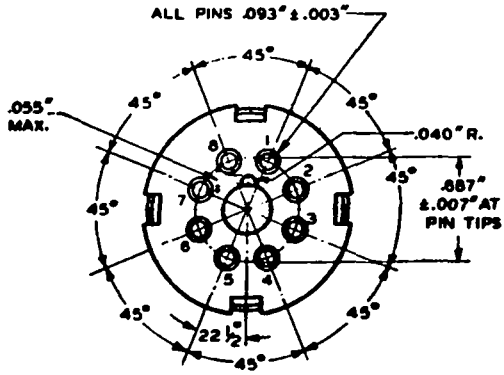
RCA-6K8

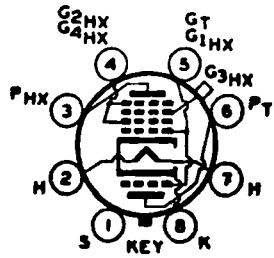
Outline Drawing





BOTTOM VIEW OF BASE

Tube Symbol & Bottom View of Socket Connections



8K

January 31, 1938

JETEC DATA
JOINT ELECTRON TUBE ENGINEERING COUNCIL
COMMITTEE ON RECEIVING TUBES

JETEC TYPE 6K8

TRIODE HEXODE

MECHANICAL DATA

Coated unipotential cathode
Outline drawing. . . . . 8-2 Bulb MT-8
Base . . . . . B8-21, small wafer octal 8-pin
Top cap. . . . . C1-4, miniature
Maximum diameter . . . . . 1-5/16"
Maximum overall length . . . . . 3-1/8 "
Maximum seated height. . . . . 2-9/16"
Pin connections. . . . . Basing 8K

Pin 1 - Shell
Pin 2 - Heater
Pin 3 - Plate
Pin 4 - Hexode grids #2 and #4
Pin 5 - Hexode grid #1, triode grid
Pin 6 - Triode plate
Pin 7 - Heater
Pin 8 - Cathode
Top cap-Hexode grid #3

Mounting position. . . . . Any

ELECTRICAL DATA

Direct interelectrode capacitances*

Signal grid to mixer plate: (g3h to ph) max.	0.03	μμf
Signal grid to oscillator plate: (g3h to pt) max..	0.02	μμf
Signal grid to oscillator grid: (g3h to gt&glh) max.	0.2	μμf
Oscillator grid to oscillator plate: (gt&glh to pt).	1.1	μμf
Oscillator grid to mixer plate: (gt&glh to ph) max.	0.1	μμf
Signal input: g3h to (h+k+gt&glh+g4h&g2h+pt+ph)	6.6	μμf
Oscillator input: gt&glh to (h+k+g3h+g4h&g2h-ph)	6.0	μμf
Oscillator output: pt to (h+k+g3h+g4h&g2h+ph).	3.2	μμf
Mixer output: ph to (h+k+gt&glh+g3h+g4h&g2h+pt).	3.5	μμf

*Pin #1 connected to pin #8.

Ratings

Heater voltage	6.3	volts
Maximum hexode plate voltage	300	volts
Maximum hexode grids #2 and #4 supply voltage.	300	volts
Maximum hexode grids #2 and #4 voltage	150	volts
Maximum hexode plate dissipation	.75	watts
Maximum hexode grids #2 and #4 dissipation	.70	watts
Maximum oscillator anode voltage	125	volts
Maximum oscillator anode dissipation	.75	watts
Maximum total cathode current.	16	ma
Minimum external signal grid bias voltage.	0	volts
Maximum heater-cathode voltage	90	volts

Note: page 2 of release #128A
missing from RMA database.

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