



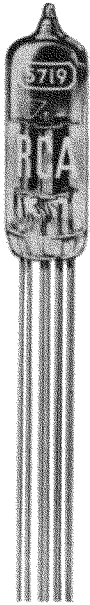
# 5719

## HIGH-MU TRIODE

"Premium" Subminiature Type

TENTATIVE DATA

RCA-5719 is a high- $\mu$  subminiature triode of the heater-cathode type designed primarily for use as an audio amplifier in mobile and aircraft receivers where dependable performance under shock and vibration is a prime consideration. In audio service as a resistance-coupled amplifier, it is capable of providing high voltage gain.



Actual Size

The 5719 features a pure-tungsten heater to give long life under conditions of frequent on-off switching, and a compact design in which special attention has been given to structural details which provide increased mount strength against shock and vibration and reduced microphonic output. In addition, each tube is manufactured under rigid controls and undergoes rigorous tests to insure long and dependable performance.

The 5719 supersedes the 5898.

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC) . . . . .	6.3 $\pm$ 5%	volts	
Current . . . . .	0.150	ampere	
Direct Interelectrode Capacitances:			
	<i>With External Shield</i> <sup>o</sup>	<i>Without External Shield</i>	
Grid to Plate . . . . .	0.8	0.8	$\mu\mu\text{f}$
Input . . . . .	1.9	1.7	$\mu\mu\text{f}$
Output . . . . .	2.2	0.6	$\mu\mu\text{f}$

<sup>o</sup> Having inside diameter of 0.405" and connected to cathode.

#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage	100	150	volts
Cathode Resistor . . . . .	1500	680	ohms
Amplification Factor	70	70	
Plate Resistance . . . . .	41000	30500	ohms
Transconductance . . . . .	1700	2300	$\mu\text{mhos}$
Plate Current . . . . .	0.73	1.85	ma
Grid volts (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-2.5	-3.8	volts

#### Mechanical:

Operating Position . . . . .	Any
Maximum Bulb Length . . . . .	1-3/8"
Length from Button Seal to Bulb Top (Excluding tip) . . . . .	1.075" $\pm$ 0.060"
Diameter . . . . .	0.383" $\pm$ 0.017"
Bulb . . . . .	T-3
Leads, Flexible . . . . .	8
Length . . . . .	1-1/2" to 1-3/4"
Orientation and Diameter . . . . .	See Dimensional Outline

### AMPLIFIER - Class A<sub>1</sub>

#### Maximum Ratings, Absolute Values:

PLATE VOLTAGE . . . . .	165 max.	volts
GRID VOLTAGE . . . . .	-55 max.	volts
PLATE CURRENT . . . . .	3.3 max.	ma
PLATE DISSIPATION . . . . .	0.55 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	250 max.	$^{\circ}\text{C}$

#### Typical Operation as Resistance-Coupled Amplifier:

See Chart on Page 2

#### Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation . . . . .	1.2 max.	megohms
For fixed-bias operation . . . . .	Not recommended	

### CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN\*

	Note	Min.	Max.	
Heater Current . . . . .	1	0.138	0.162	amp
Grid-to-Plate Capacitance . . . . .	2	0.6	1.0	$\mu\mu\text{f}$
Input Capacitance . . . . .	2	1.2	2.2	$\mu\mu\text{f}$
Output Capacitance . . . . .	2	0.4	0.8	$\mu\mu\text{f}$
Amplification Factor . . . . .	1,3	60	80	
Plate Current . . . . .	1,3	0.5	0.9	ma
Plate Current . . . . .	1,4	-	50	$\mu\text{amp}$
Transconductance . . . . .	1,3	1400	2000	$\mu\text{mhos}$
Transconductance . . . . .	5,3	1300	-	$\mu\text{mhos}$
Grid Current . . . . .	1,6	-	$\pm$ 0.3	$\mu\text{amp}$
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode . . . . .	1,7	-	7.0	$\mu\text{amp}$
Heater positive with respect to cathode . . . . .	1,7	-	7.0	$\mu\text{amp}$
Leakage Resistance:				
Between Grid and All Other Electrodes Tied Together . . . . .	1,8	100	-	megohms
Between Plate and All Other Electrodes Tied Together . . . . .	1,9	100	-	megohms

\* Each tube is stabilized before characteristics testing by continuous operation for at least 45 hours at room temperature and with dissipation values equivalent to life test conditions.

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Without external shield.

Note 3: With plate supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode bypass capacitor of 1000 microfarads.



Note 4: With dc plate voltage of 100 volts, and dc grid voltage of -2.5 volts.

Note 5: With 5.7 volts ac or dc on heater.

Note 6: With plate supply voltage of 100 volts, cathode resistor of 1500 ohms, cathode bypass capacitor of 1000 microfarads and grid resistor of 0.1 megohm.

Note 7: With 100 volts dc between heater and cathode.

Note 8: With grid 100 volts negative with respect to all other electrodes tied together.

Note 9: With plate 300 volts negative with respect to all other electrodes tied together.

**Low-Frequency Vibration Performance:**

RMS Output Voltage . . . . . 25 max. mv  
 Under the following conditions: A 150-volt plate voltage supply having an impedance not exceeding that of a 40  $\mu$ f capacitor, plate load resistance of 10000 ohms, grid resistor of 0.1 megohm, cathode resistor of 1500 ohms, cathode bypass capacitor of 1000  $\mu$ f, and vibrational acceleration of 15 g at 40 cps.

**Heater-Cycling Life Performance:**

Cycles of Intermittent Operation . . 2500 min. cycles  
 Under the following conditions: With heater voltage of 7.0 volts cycled 1 minute on and 4 minutes off, heater-cathode voltage of 140 volts (rms), and plate and grid voltage = 0 volts.

**SPECIAL RATINGS & PERFORMANCE DATA**

**Shock Rating:**

Impact Acceleration . . . . . 450 max. g  
 Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.

**Fatigue Rating:**

Vibrational Acceleration . . . . . 2.5 max. g  
 Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

**Uniform Acceleration Rating:** . . . . . 1000 max. g

Tubes are subjected in each of three positions to a gradually applied uniform acceleration up to 1000 g.

**Average Life Performance:**

The average life performance based on a 500-hour test at 175°C ambient temperature is not less than 450 hours. This life test is made on sample lot of tubes with heater voltage of 6.3 volts; plate supply voltage of 100 volts; dc heater-cathode voltage (heater positive with respect to cathode) of 200 volts; cathode resistor of 1500 ohms; and grid resistor of 1 megohm.

The 500-hour end-point limits for the 5719 with heater voltage of 6.3 volts, plate supply voltage of 100 volts, cathode resistor of 680 ohms bypassed by capacitor having a maximum reactance of 3 ohms, and dc heater-cathode voltage of 100 volts with heater either positive or negative with respect to cathode are: transconductance, 1000 micromhos minimum; heater-cathode leakage current, 20 microamperes maximum; and grid current, +0.9 microampere maximum or -0.9 microampere maximum.

**OPERATING CONDITIONS AS RESISTANCE-COUPLED AMPLIFIER**

**Cathode-Bias Operation**

	100						200						
Plate Supply Voltage													volts
Plate Load Resistor	0.1	0.1	0.27	0.27	0.47	0.47	0.1	0.1	0.27	0.27	0.47	0.47	megohm
Grid Resistor (of following stage)	0.27	0.47	0.47	1.0	0.47	1.0	0.27	0.47	0.47	1.0	0.47	1.0	megohm
Cathode Resistor	2700	2700	5600	6800	10000	10000	1500	1800	3300	3900	5600	6800	ohms
Signal Input Volts (rms)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	volt
Output Volts (rms)	3.7	3.9	4.1	4.2	3.95	4.3	4.4	4.6	4.9	5.0	4.8	5.0	volts
Gain <sup>▲</sup>	37	39	41	42	39.5	43	44	46	49	50	48	50	
Distortion	2.4	2.1	2.1	1.8	2.4	1.7	0.7	0.7	0.9	0.7	0.9	0.7	per cent
Signal Input volts (rms)*	0.20	0.20	0.20	0.26	0.20	0.25	0.51	0.61	0.50	0.59	0.49	0.64	volt
Output Volts (rms)	7.3	7.7	8.1	10.7	7.8	10.7	22	27	24.2	29	23.2	31.6	volts
Gain <sup>▲</sup>	36.5	38.5	40.5	41.2	39	42.8	43.1	44.3	48.4	49.2	47.3	49.4	
Distortion	5.0	4.5	4.3	4.9	5.0	4.5	3.9	5.0	4.5	4.5	5.0	5.0	per cent

**Zero-Bias Operation**

	100						200						
Plate-Supply Voltage													volts
Plate Load Resistor	0.1	0.1	0.27	0.27	0.47	0.47	0.1	0.1	0.27	0.27	0.47	0.47	megohm
Grid Resistor (of following stage)	0.27	0.47	0.47	1.0	0.47	1.0	0.27	0.47	0.47	1.0	0.47	1.0	megohm
Signal Input Volts (rms)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	volt
Output Volts (rms)	3.8	4.0	4.3	4.55	4.2	4.55	4.7	4.9	5.35	5.4	5.2	5.4	volts
Gain <sup>▲</sup>	38	40	43	45.5	42	45.5	47	49	53.5	54	52	54	
Distortion	2.2	2.0	1.9	1.6	2.1	1.6	0.4	0.4	0.8	0.7	0.9	0.7	per cent
Signal Input volts (rms)*	0.2	0.21	0.22	0.26	0.2	0.27	0.59	0.63	0.54	0.65	0.5	0.63	volt
Output Volts (rms)	7.25	7.9	8.95	11	7.9	11.3	25	27.7	25.8	31.5	23.5	30.5	volts
Gain <sup>▲</sup>	36.2	37.6	40.6	42.4	39.5	41.8	42.4	43.9	47.7	48.5	47	48.4	
Distortion	5.0	4.8	4.9	4.8	4.8	5.0	4.9	5.0	4.9	5.0	5.0	4.8	per cent

Note 1: Coupling capacitors should be selected to give desired frequency response. Cathode resistor should be adequately bypassed.

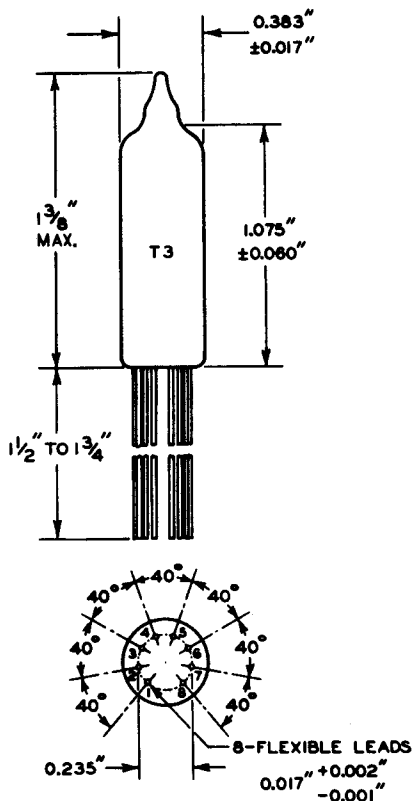
\* Maximum value to swing the grid of resistance-coupled amplifier tube to the point where its grid starts to draw current.

▲ Ratio of signal output to signal input.

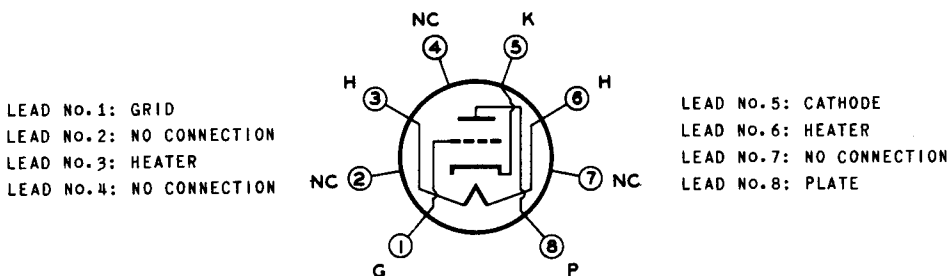




**DIMENSIONAL OUTLINE**



**FLEXIBLE LEAD CONNECTIONS**



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