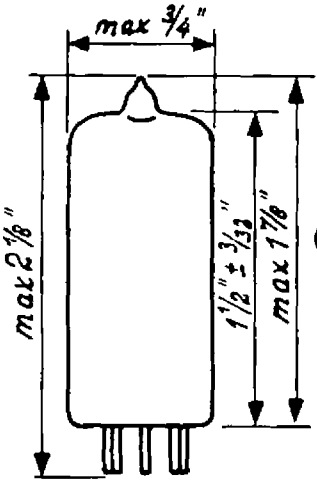
Rogers Electronic Tubes & Components

Description: Variable-mu pentode for use as I.F. amplifier and multiplicative or additive mixer in FM/AM battery-receivers

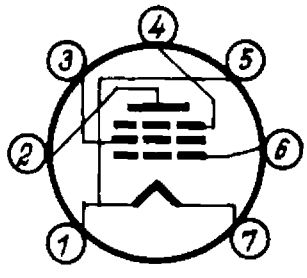
Mechanical data

Cathode	coated, filament
Base	E7-1
Bulb	T 5 1/2
Outline	5-2
Basing	7 ES
Mounting position	any

TUBE OUTLINE



BOTTOM VIEW OF BASE



BASE PIN No.	ELEMENT
1	(-) filament, internal shield
2	Plate
3	Grid No.2
4	Grid No.3
5	(-) filament, internal shield
6	Grid No.1
7	(+) filament

General Electrical data

Filament voltage (parallel supply of the filaments)	1.4 volts
Filament current	25 mamps
Filament current (series supply of the filaments)	25 mamps
Filament voltage	1.3 volts

Direct interelectrode capacitances

Output capacitance	7.5 μμF
Input capacitance	3.7 μμF
Grid No.3 to all other elements	5.2 μμF
Plate to grid No.1	max. 0.01 μμF
Grid No.1 to grid No.3	max. 0.1 μμF
Grid No.1 to grid No.2	2.5 μμF

from JEDEC release #2382, Feb. 9, 1959

Direct interelectrode capacitances (continued)

In triode connection (grids No.2 and 3 connected to plate)

Output capacitance	8.1 μμF
Input capacitance	1.1 μμF
Plate to grid	2.6 μμF

Maximum ratings (design center values)

Supply voltage	120 volts +)
Plate voltage	120 volts
Plate dissipation	0.25 watts
Grid No.2 voltage	90 volts
Grid No.2 dissipation	0.15 watt
Cathode current	2.5 mamps
Grid No.1 circuit resistance	3 megohms
Grid No.3 circuit resistance	1.5 megohms

Operating characteristics as I.F. amplifier

Plate and supply voltage	85 x)		85 x)		
Grid No.3 voltage	0		0		
Grid No.2 series resistor	33,000		47,000		
Grid No.1 bias	0	-5	0	-5	volts
Grid No.2 voltage	62	-	57	-	volts
Plate current	1.7	-	1.5	-	mamps
Grid No.2 current	700	-	595	-	μamps
Transconductance	940	10	900	10	micromhos
Plate resistance	0.45	>10	0.525	>10	megohms
Amplification factor of grid No. 2 with respect to grid No. 1	20	-	20	-	

x) Based on a battery voltage of 90 volts, minus the bias of the output tube
Voltage with respect to (-) filament.

+) Absolute maximum 150 volts

Operating characteristics as I.F. amplifier (continued)

Plate and supply voltage	64 x)		64 x)		volts
Grid No.3 voltage	0		0		volt
Grid No.2 series resistor	1500		4700		ohms
Grid No.1 bias	0	-3.8	0	-3.8	volts
Grid No.2 voltage	63	-	61	-	volts
Plate current	1.7	-	1.6	-	mamps
Grid No.2 current	780	-	725	-	µamps
Transconductance	880	10	870	10	micromhos
Plate resistance	0.25	>10	0.27	>10	megohm
Amplification factor of grid No. 2 with respect to grid No. 1	20	-	20	-	
Plate and supply voltage			45		volts
Grid No.3 voltage			0		volt
Grid No.2 series resistor			0		ohm
Grid No.1 bias			0	-2.7	volts
Grid No.2 voltage			45	-	volts
Plate current			0.9	-	mamps
Grid No.2 current			445	-	µamps
Transconductance			700	10	micromhos
Plate resistance			0.28	>10	megohm
Amplification factor of grid No.2 with respect to grid No.1			20	-	

Operating characteristics as multiplicative mixer with oscillator voltage on g3 o).

Plate and supply voltage	85 x)		64 x)		volts
Grid No.2 series resistor	47,000		4700		ohms
Oscillator voltage	12		12		volts(rms)
Grid No.3 resistor	0.3		0.3		megohm
Grid No.1 bias	0	-4.6	0	-3.5	volts
Grid No.2 voltage	47	-	58	-	volts
Plate current	540	-	670	-	µamps
Grid No.2 current	800	-	1250	-	µamps
Conversion conductance	265	10	280	10	micromhos
Plate resistance	0.50	>5	0.30	>5	megohms

x),+),o) See page 4

Operating characteristics as multiplicative mixer with oscillator voltage on g3 °) continued.

Plate and supply voltage	45		volts
Grid No.2 series resistor	0		ohm
Oscillator voltage	12		volts(rms)
Grid No.3 resistor	0.3		megohm
Grid No.1 bias	0	-2.4	volts
Grid No.2 voltage	45	-	volts
Plate current	420	-	µamps
Grid No. 2 current	795	-	µamps
Conversion conductance	250	10	micromhos
Plate resistance	0.49	>5	megohms

Operating characteristics as additive mixer (triode connection grid No.2 and 3 connected to plate)

Supply voltage	85[X]	85[X]	64[+]	64[+]	45	45	volts
Plate series resistor ⫽	0	4700	0	3300	0	1500	ohms
Grid resistor	1	1	1	1	1	1	megohm
Grid current	4.4	3.8	3.1	2.5	2.0	2.0	µamps
Plate current	1.9	1.7	1.3	1.2	0.73	0.7	mamp
Oscillator voltage	4.0	3.5	3.0	2.5	2.0	2.0	volts (rms)
Conversion conductance	500	490	465	460	405	400	micro-mhos
Plate resistance	26,000	26,500	29,000	28,500	34,000	35,000	ohms

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[X]) Based on a battery voltage of 90 volts, minus the bias of the output tube. Voltage with respect to (-)filament

[+]) Based on a battery voltage of 67.5 volts, minus the bias of the output tube. Voltage with respect to (-)filament

⫽) By-passed.

°) If in the short wave range A.G.C. is applied to the mixer, the current flowing to g1 due to transit time effect should be taken into account.