

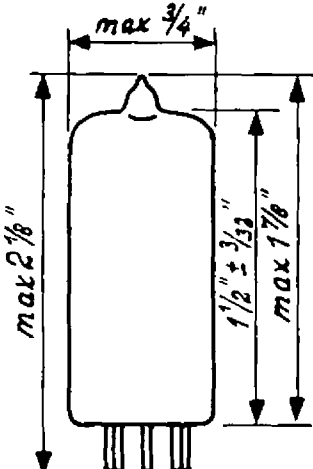
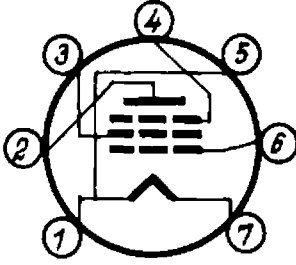
Rogers Electronic Tubes & Components

1 AN 5

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

<u>TUBE OUTLINE</u>	<u>BOTTOM VIEW</u> <u>OF BASE</u>	<u>BASE PIN</u> <u>No.</u>	<u>ELEMENT</u>
		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 μ F
Input capacitance	3.7 μ F
Grid No.3 to all other elements	5.2 μ F
Plate to grid No.1	max. 0.01 μ F
Grid No.1 to grid No.3	max. 0.1 μ F
Grid No.1 to grid No.2	2.5 μ F

Direct interelectrode capacitances (continued)In triode connection (grids No.2 and 3 connected to plate)

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

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 g3⁰) 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	- μ amps
Grid No. 2 current	795	- μ amps
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 μ amps
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

^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.

⁰) 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.