

TRIODE-HEPTODE

Triode-heptode intended for use as mixer in car radio sets and as sync separator in TV receivers.

QUICK REFERENCE DATA

Triode

Anode voltage	V_a	25	12.6	6.3	V
Anode current	I_a	2	0.75	0.3	mA
Transconductance	S	2.2	1.4	0.8	mA/V
Amplification factor	μ	20	18.3	14.6	-

Heptode as mixer

Anode voltage	V_a	25	12.6	6.3	V
Grids No.2 and 4 voltage	V_{g2+4}	25	12.6	6.3	V
Conversion conductance	S_c	450	220	90	μ A/V

Heptode as R.F. or I.F. amplifier

Anode voltage	V_a	25	12.6	6.3	V
Grids No.2 and 4 voltage	V_{g2+4}	25	12.6	6.3	V
Transconductance	S	1.5	0.75	0.35	mA/V

HEATING: Indirect by A.C. or D.C.; parallel or series supply

Heater voltage

V_f 6.3 V

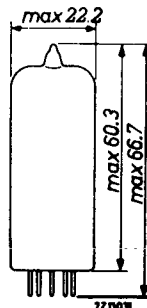
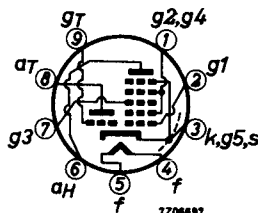
Heater current

I_f 300 mA

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



CAPACITANCES

Triode section

Anode to all except grid	$C_{a(g)}$	2.1 pF
Grid to all except anode	$C_{g(a)}$	2.6 pF
Anode to grid	C_{ag}	1.0 pF

Heptode section

Anode to all	C_a	7.9 pF
Grid No.1 to all	C_{g_1}	4.8 pF
Anode to grid No.1	C_{ag_1}	max. 0.012 pF
Grid No.3 to all	C_{g_3}	6.0 pF
Grid No.1 to grid No.3	$C_{g_1g_3}$	max. 0.3 pF

Between heptode and triode sections

Anode heptode to anode triode	C_{aHaT}	0.20 pF
Anode heptode to grid triode	C_{aHgT}	max. 0.09 pF
Grid No.1 heptode to anode triode	C_{g_1HaT}	max. 0.06 pF
Grid No.1 heptode to grid triode	C_{g_1HgT}	max. 0.17 pF
Grid No.1 heptode to grid triode and grid No.3	C_{g_1H/gTg_3}	max. 0.45 pF
Anode heptode to grid triode and grid No.3	C_{aH/gTg_3}	max. 0.35 pF

TYPICAL CHARACTERISTICS

Triode section

Anode voltage	V_a	25	12.6	6.3	V
Grid voltage	V_g	1)	1)	1)	-
Anode current	I_a	2	0.75	0.3	mA
Transconductance	S	2.2	1.4	0.8	mA/V
Amplification factor	μ	20	18.3	14.6	-

1) Obtained by grid current biasing: $R_g = 47 \text{ k}\Omega$.

OPERATING CHARACTERISTICS

Heptode as mixer, circuit fig.1.

Anode voltage	V_a	25	12.6	6.3	V
Grids No.2 and 4 voltage	$V_{g_{2+4}}$	25	12.6	6.3	V
Grid No.1 voltage	V_{g_1}	1)	1)	1)	
Oscillator voltage	V_{osc}	3.5	1.7	1.1	V_{RMS}
Grid No.3 resistor	R_{g_3}	47	47	47	$k\Omega$
Grid No.3 current	I_{g_3}	40	18	7	μA
Anode current	I_a	550	170	50	μA
Grids No.2 and 4 current	$I_{g_{2+4}}$	1000	300	80	μA
Conversion conductance	S_c	450	220	90	$\mu A/V$
Internal resistance	R_i	0.5	1.5	1.3	$M\Omega$

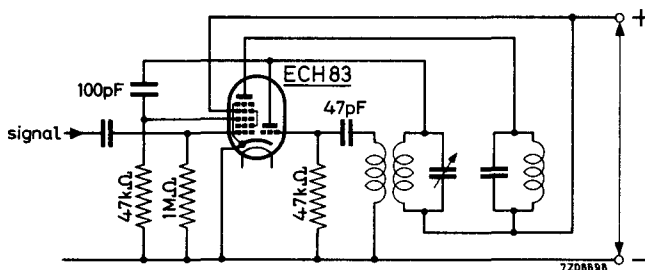


fig. 1

Heptode as R.F. or I.F. amplifier

Anode voltage	V_a	25	12.6	6.3	V
Grids No.2, No.3 and No.4 voltage	$V_{g_{2+3+4}}$	25	12.6	6.3	V
Grid No.1 voltage	V_{g_1}	1)	1)	1)	
Anode current	I_a	1.25	0.4	0.11	mA
Grids No.2, No.3 and 4 current	$I_{g_{2+3+4}}$	0.85	0.25	0.08	mA
Transconductance	S	1.5	0.75	0.35	mA/V
Internal resistance	R_i	0.2	0.85	0.6	$M\Omega$
Equivalent noise resistance	R_{eq}	5	6.5	8.5	$k\Omega$

1) Obtained by grid current biasing: $R_{g_1} = 1 M\Omega$.

LIMITING VALUES (Design centre rating system)

Triode section

Anode voltage	V_{a_o}	max. 550 V
	V_a	max. 250 V
Anode dissipation	W_a	max. 0.8 W
Cathode current	I_k	max. 6.5 mA
Grid resistor	R_g	max. 3 $M\Omega$
Cathode to heater voltage	V_{kf}	max. 150 V
D.C. component		max. 100 V

Heptode section

Anode voltage	V_{a_o}	max. 550 V
	V_a	max. 50 V
Grids No.2 and 4 voltage	$V_{g_{2+4}}$	max. 50 V
Cathode current	I_k	max. 5 mA
Grid No.1 resistor	R_{g_1}	max. 3 $M\Omega$
Grid No.3 resistor	R_{g_3}	max. 50 $k\Omega$
Cathode to heater voltage	V_{kf}	max. 150 V
D.C. component		max. 100 V

PHILIPS

Data handbook



**Electronic
components
and materials**

ECH83

page	sheet	date
1	1	1969.12
2	2	1969.12
3	3	1969.01
4	4	1969.12
5	FP	1999.08.15