

TRIODE HEXODE

ECH35

Triode hexode for use as frequency changer in a.c. mains-operated receivers. The hexode section is designed for a.g.c.

HEATER

V_h	6.3	V
I_h	225	mA

CAPACITANCES

C_{gt-g1}	<300	mpF
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Hexode section

C_{g1-k}	5.0	pF
C_{a-k}	10	pF
C_{a-g1}	<3.0	mpF

Triode section

C_{g-k}	9.0	pF
C_{a-k}	3.0	pF
C_{a-g1}	1.6	pF

OPERATING CONDITIONS

Hexode section

(a) With fixed screen-grid voltage

V_a	250	250	250	V
V_{g2+g4}	100	100	100	V
R_k	215	215	215	Ω
R_{g3+gt}	50	50	50	k Ω
I_{g3+gt}	200	200	200	μA
V_{g1}	-2.0	-17	-23	V
I_{ah}	3.0	—	—	mA
I_{g2+g4}	3.0	—	—	mA
g_c	650	6.5	1.5	$\mu A/V$
r_a	1.3	>5.0	>6.0	M Ω

(b) With screen grid fed by a potentiometer (See Fig. 1)

$V_a = V_b$	250	250	250	V
R_i	24	24	24	k Ω
R_2	33	33	33	k Ω
R_k	215	215	215	Ω
R_{g3+gt}	50	50	50	k Ω
I_{g3+gt}	200	200	200	μA
V_{g1}	-2.0	-23.5	-31	V
V_{g2+g4}	100	—	145	V
I_{ah}	3.0	—	—	mA
I_{g2+g4}	3.0	—	—	mA
g_c	650	6.5	1.5	$\mu A/V$
r_a	1.3	>3.0	>4.0	M Ω

V_{g1} max. ($I_{g1} = +0.3\mu A$)

-1.3 V

V_{g3} max. ($I_{g3} = +0.3\mu A$)

-1.3 V

OPERATING CONDITIONS

Triode section

V_b	100	250	V
R_a	—	45	k Ω
I_a ($R_{gt} = 50k\Omega$, $I_{gt} = 200\mu A$)	3.3	3.3	mA
I_a ($V_{gt} = 0V$, $V_{osc} = 0V$)	10	4.5	mA
g_m ($V_{gt} = 0V$, $V_{osc} = 0V$)	2.8	2.2	mA/V
μ ($V_{gt} = 0V$, $V_{osc} = 0V$)	24	24	
V_{gt} max. ($I_{g1} = +0.3\mu A$)		-1.3	V

LIMITING VALUES

Hexode section

$V_{a(b)}$ max.	550	V
V_a max.	300	V
p_a max.	1.2	W
$V_{g2+g4(b)}$ max.	550	V
V_{g2+g4} max. ($I_a = 4.5mA$)	125	V
V_{g2+g4} max. ($I_a < 0.5mA$)	200	V
p_{g2+g4} max.	600	mW
I_k max.	15	mA
R_{g1-k} max.	3.0	M Ω
R_{g3-k} max.	100	k Ω
V_{h-k} max.	100	V
R_{h-k} max.	20	k Ω

Triode section

$V_{a(b)}$ max.	550	V
V_a max.	100	V
p_a max.	1.5	W
R_{gt} max.	100	k Ω

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HEATER

V_h	6.3	V
I_h	0.225	A ←

CAPACITANCES

C_{gt-gl}	<0.3	$\mu\mu F$
Hexode Section		
C_{g1-k}	5.0	$\mu\mu F$
C_{a-k}	10.0	$\mu\mu F$
C_{a-gl}	<0.003	$\mu\mu F$
Triode Section		
C_{g-k}	9.0	$\mu\mu F$
C_{a-k}	3.0	$\mu\mu F$
C_{a-gl}	1.6	$\mu\mu F$

OPERATING CONDITIONS

Hexode Section

(a) With fixed screen grid voltage

V_a	250	250	250	V
V_{g2+g4}	100	100	100	V
R_k	215	215	215	Ω
R_{g3+gt}	50	50	50	k Ω
I_{g3+gt}	200	200	200	μA
V_{gl}	-2	-17	-23	V
I_{ah}	3	—	—	mA
I_{g2+g4}	3	—	—	mA
g_c	650	6.5	1.5	$\mu A/V$
r_a	1.3	>5.0	>6.0	M Ω

(b) With screen grid fed by a potentiometer (See Fig. 1)

$V_a = V_b$	250	250	250	V
R_1	24	24	24	k Ω
R_2	33	33	33	k Ω
R_k	215	215	215	Ω
R_{g3+gt}	50	50	50	k Ω
I_{g3+gt}	200	200	200	μA
V_{gl}	-2	-23.5	-31	V
V_{g2+g4}	100	—	145	V
I_{ah}	3	—	—	mA
I_{g2+g4}	3	—	—	mA
g_c	650	6.5	1.5	$\mu A/V$
r_a	1.3	>3.0	>4.0	M Ω

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OPERATING CONDITIONS

Triode Section

V_b	100	250	V
R_a	—	45	k Ω
I_a ($R_{gt}=50$ k Ω , $I_{gt}=200$ μ A)	3.3	3.3	mA
I_a ($V_{gt}=0$ V, $V_{osc}=0$ V)	10	4.5	mA
g_m ($V_{gt}=0$ V, $V_{osc}=0$ V)	2.8	2.2	mA/V
μ ($V_{gt}=0$ V, $V_{osc}=0$ V)	24	24	

LIMITING VALUES

Hexode Section

V_a (b) max.	550	V
V_a max.	300	V
p_a max.	1.2	W
V_{g2+g4} (b) max.	550	V
V_{g2+g4} max. ($I_a=4.5$ mA)	125	V
V_{g2+g4} max. ($I_a \leq 0.5$ mA)	200	V
p_{g2+g4} max.	0.6	W
V_{g1} max. ($I_{g1}=+0.3$ μ A)	-1.3	V
V_{g3} max. ($I_{g3}=+0.3$ μ A)	-1.3	V
I_k max.	15	mA
R_{g1-k} max.	3.0	M Ω
R_{h-k} max.	20	k Ω
V_{h-k} max.	100	V
R_{g3-k} max.	100	k Ω

Triode Section

V_a (b) max.	550	V
V_a max.	100	V
p_a max.	1.5	W
V_{gt} max. ($I_{g1}=+0.3$ μ A)	-1.3	V
R_{gt} max.	100	k Ω

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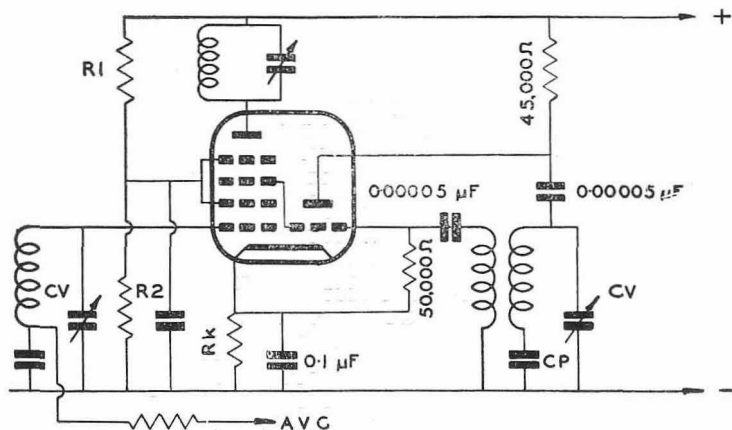
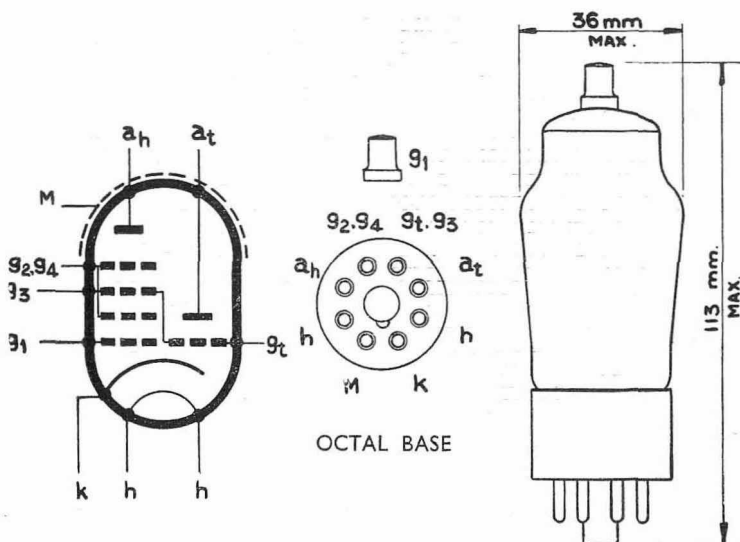


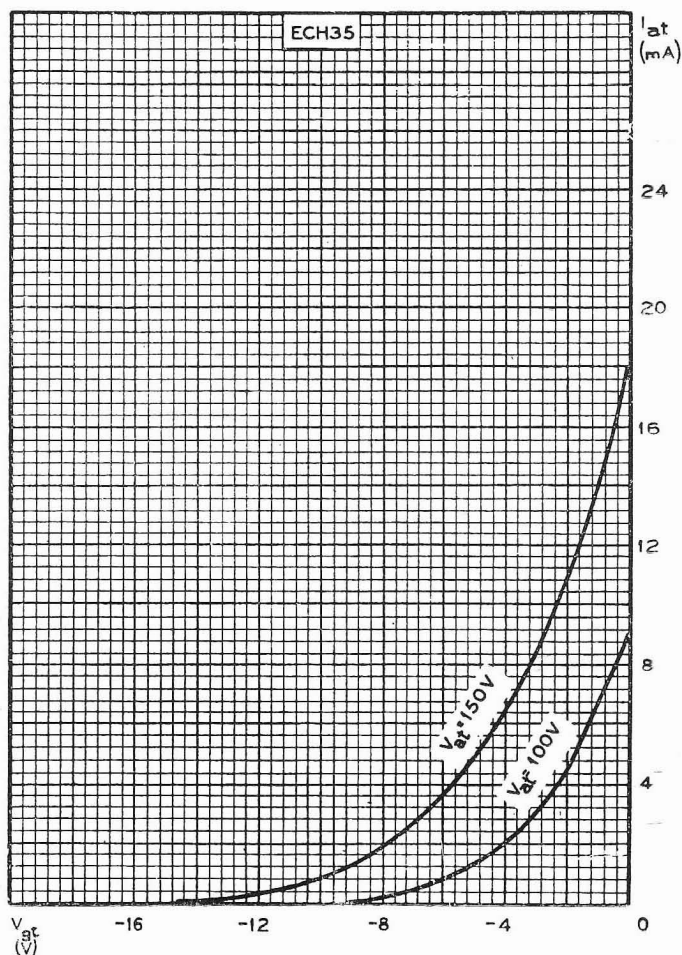
Fig. 1.—ECH35 as frequency changer with screen grid fed by a potentiometer



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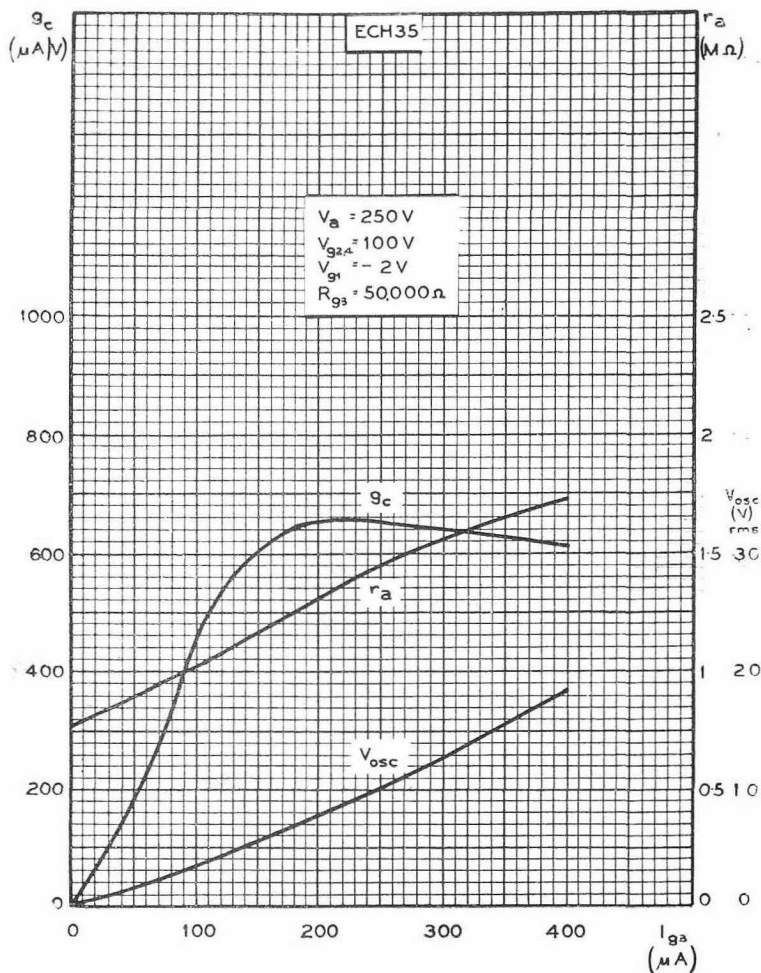


TRIODE-ANODE CURRENT PLOTTED AGAINST TRIODE-GRID VOLTAGE

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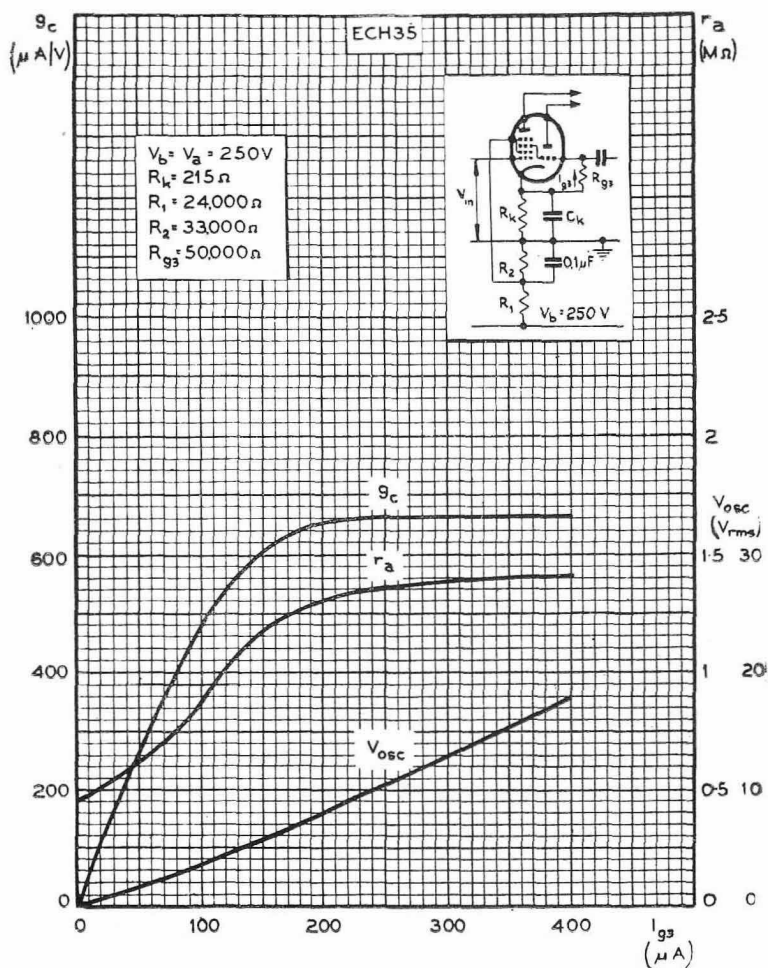


CONVERSION CONDUCTANCE, INTERNAL RESISTANCE AND OSCILLATOR VOLTAGE PLOTTED AGAINST OSCILLATOR-GRID CURRENT WITH $V_{g2+g1} = 100\text{ V}$

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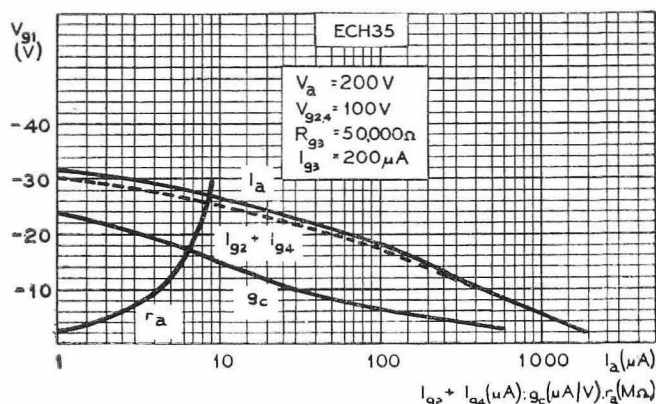
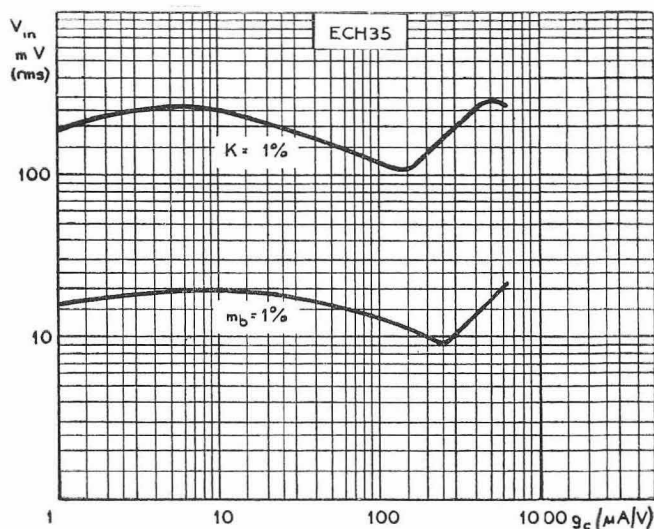


CONVERSION CONDUCTANCE, INTERNAL RESISTANCE AND OSCILLATOR VOLTAGE PLOTTED AGAINST OSCILLATOR-GRID VOLTAGE WITH SCREEN-GRID FED VIA A POTENTIOMETER

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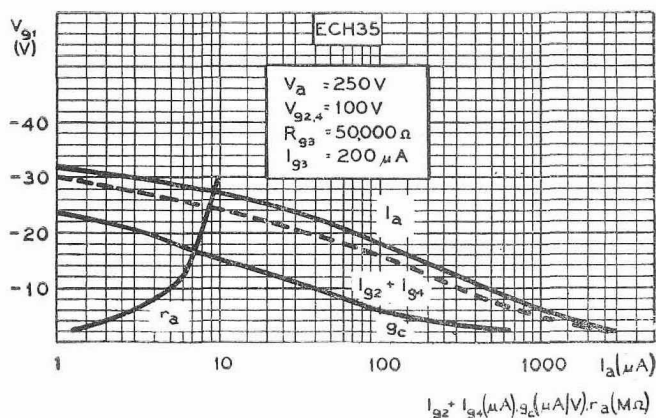
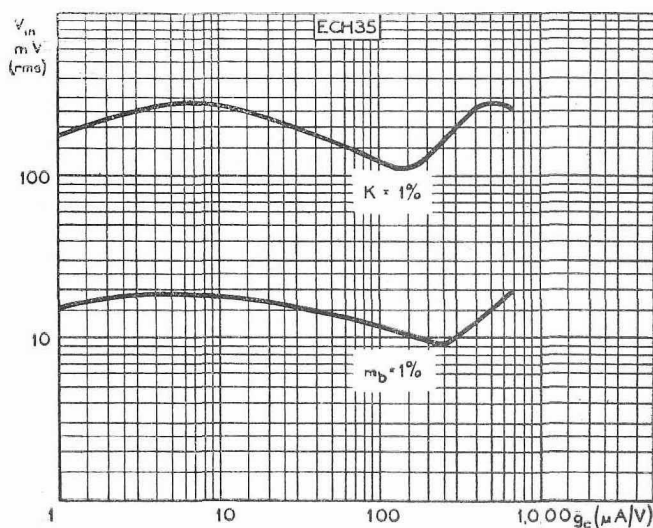


CROSS MODULATION CURVES AND CONTROL CHARACTERISTIC FOR
 $V_a = 200V$, $V_{g2+g4} = 100V$

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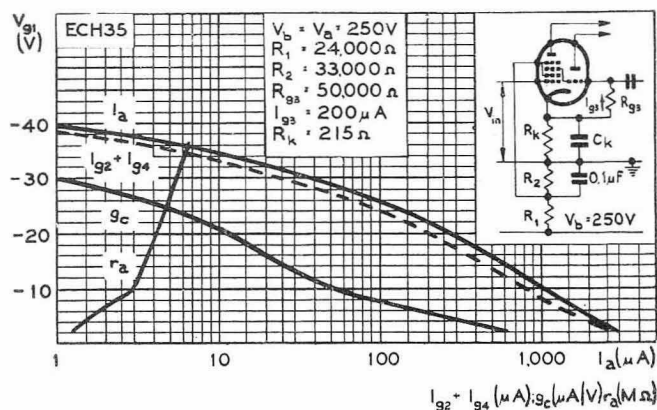
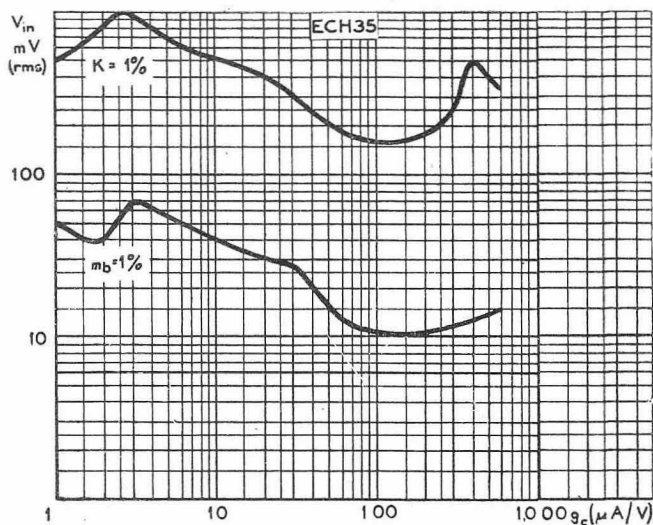


CROSS MODULATION CURVES AND CONTROL CHARACTERISTIC FOR
 $V_a = 250 V, V_{g2+g4} = 100 V$

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CROSS MODULATION CURVES AND CONTROL CHARACTERISTIC FOR $V_b = 250V$ AND SCREEN-GRID FED VIA A POTENTIOMETER

