

TRIODE PENTODE

ECL83

Combined triode and output pentode with separate cathodes intended for use in audio frequency applications.

HEATER Suitable for parallel operation a.c. or d.c.

V_h	6.3	V
I_h	600	mA

MOUNTING POSITION

Any

CAPACITANCES (measured without an external shield)

C_{at-gp}	<0.1	pF
C_{at-ap}	<1.6	pF
C_{gt-gp}	<0.03	pF
C_{gt-ap}	<0.05	pF

Pentode section

C_{a-g1}	<0.2	pF
C_{in}	5.7	pF
C_{out}	4.7	pF
C_{g1-h}	0.4	pF

Triode section

C_{a-g}	1.6	pF
C_{in}	2.3	pF
C_{out}	0.32	pF

CHARACTERISTICS

Pentode section

V_a	170	200	V
V_{g2}	170	200	V
I_a	30	27	mA
I_{g2}	5.0	4.4	mA
V_{g1}	-9.5	-13	V
g_m	5.5	5.0	mA/V
r_a	53	65	k Ω
μ_{g1-g2}	10	10	

Triode section

V_a	170	200	V
I_a	1.6	2.4	mA
V_g	-1.5	-1.5	V
g_m	2.1	2.5	mA/V
r_a	40	34	k Ω
μ	82	85	



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PENTODE SECTION AS AUDIO OUTPUT VALVE

Single valve class 'A'

V_a	170	200	V
V_{g2}	170	200	V
V_{g1}	-9.5	-13	V
$I_{a(o)}$	30	27	mA
$I_{g2(o)}$	5.0	4.4	mA
R_k	270	410	Ω
R_a	5.5	7.5	k Ω
$V_{in(r.m.s.)}$	5.0	5.2	V
P_{out}	2.2	2.5	W
D_{tot}	10	10.5	%

Two valves in class 'AB' push-pull

V_a	170	200	V
V_{g2}	170	200	V
* R_k	180	220	Ω
$I_{a(o)}$	2 × 24	2 × 25	mA
I_a (max. sig.)	2 × 27.5	2 × 29	mA
$I_{g2(o)}$	2 × 3.8	2 × 3.9	mA
I_{g2} (max. sig.)	2 × 6.25	2 × 8.5	mA
R_{a-a}	6.5	7.5	k Ω
$V_{in(g1-g1)r.m.s.}$	17	23.5	V
P_{out}	5.0	7.2	W
D_{tot}	3.6	4.2	%

*Common cathode bias resistor

TRIODE SECTION AS A.F. VOLTAGE AMPLIFIER

V_b (V)	R_a (k Ω)	I_b (μ A)	R_k (k Ω)	$\frac{V_{out}}{V_{in}}$	V_{out} (V _{r.m.s.})	R_{g1} * (k Ω)
170	100	650	1.8	49	15.3	330
200	100	720	2.2	47	17.7	330

$\frac{V_{out}}{V_{in}}$ measured with an input of 100mV

V_{out} measured for a total harmonic distortion of 5%

*Grid resistor of following valve.

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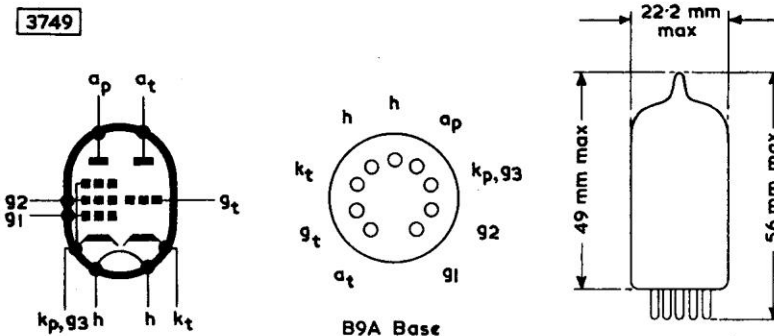
LIMITING VALUES

Pentode section

$V_{a(b)}$ max.	550	V
V_a max.	250	V
p_a max.	5.4	W
$V_{g2(b)}$ max.	550	V
V_{g2} max.	250	V
p_{g2} max.	1.2	W
p_{g2} max. (speech and music)	2.4	W
I_k max.	45	mA
R_{g1-k} max. (self-bias)	500	$k\Omega$
R_{g1-k} max. (fixed bias)	250	$k\Omega$
V_{h-k} max. (d.c. cathode positive or a.c.r.m.s.)	250	V
V_{h-k} max. (d.c. cathode negative)	100	V

Triode section

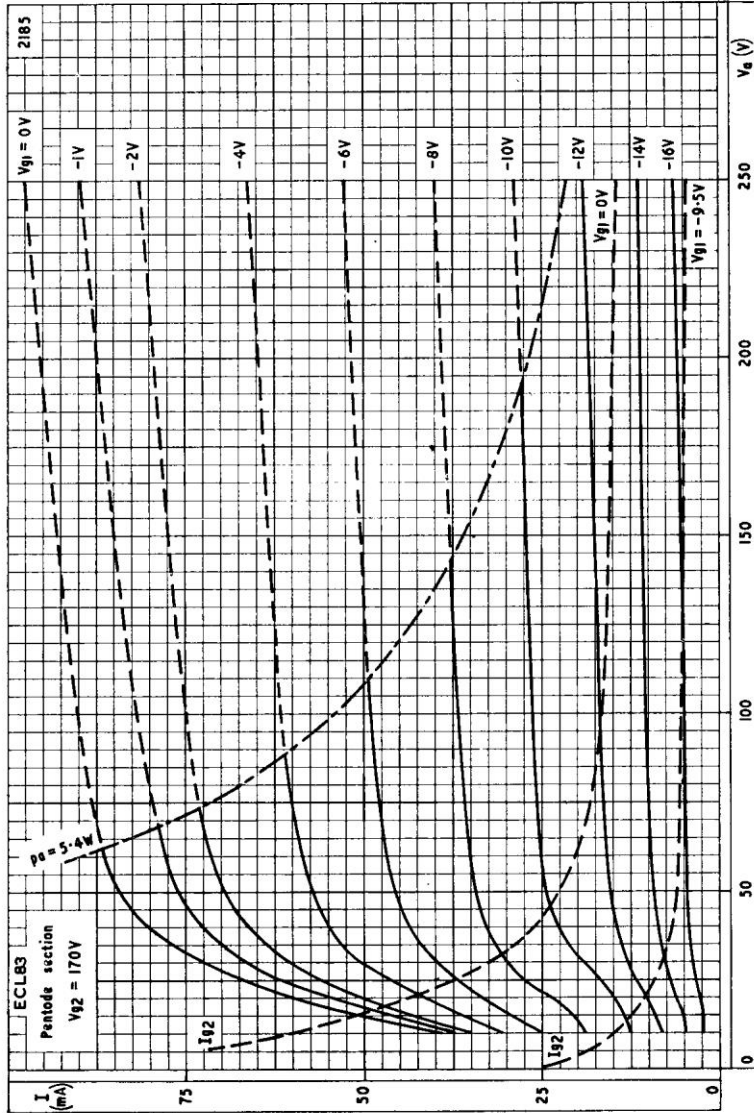
$V_{a(b)}$ max.	550	V
V_a max.	250	V
p_a max.	3.5	W
I_k max.	15	mA
R_{g1-k} max. (fixed bias)	1.0	$M\Omega$
R_{g1-k} max. (grid current biasing)	22	$M\Omega$
V_{h-k} max. (d.c. cathode positive or a.c.r.m.s.)	250	V
V_{h-k} max. (d.c. cathode negative)	100	V



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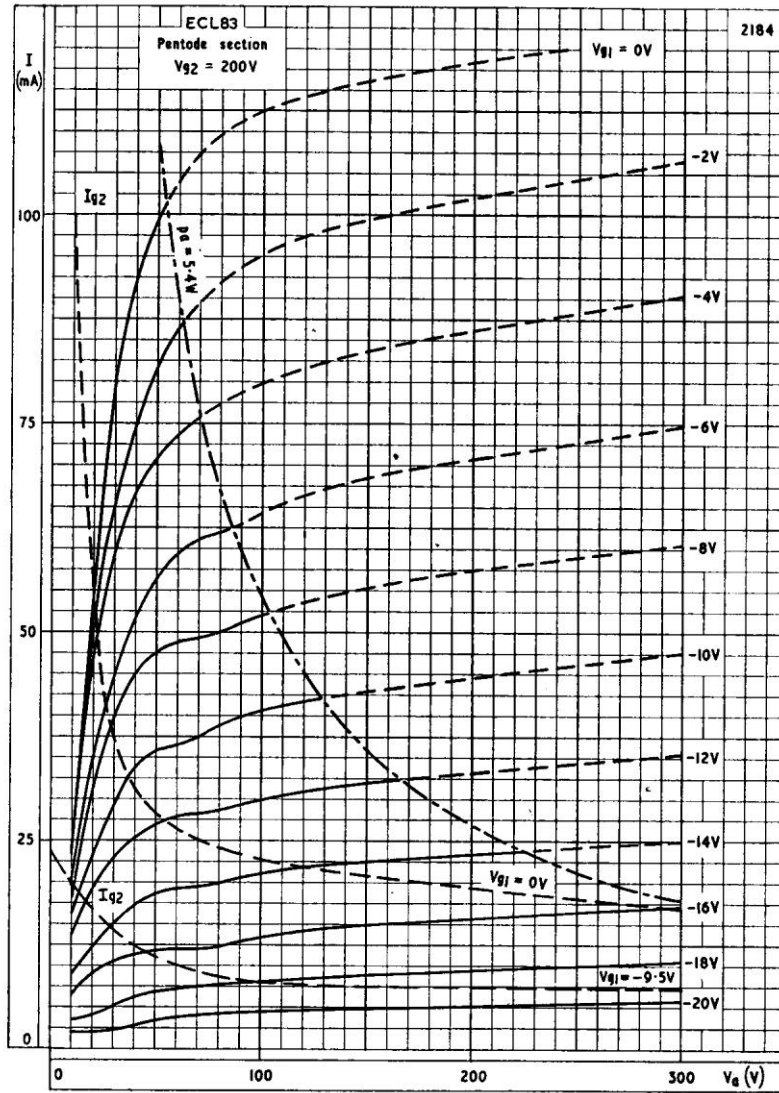


ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 170V$.

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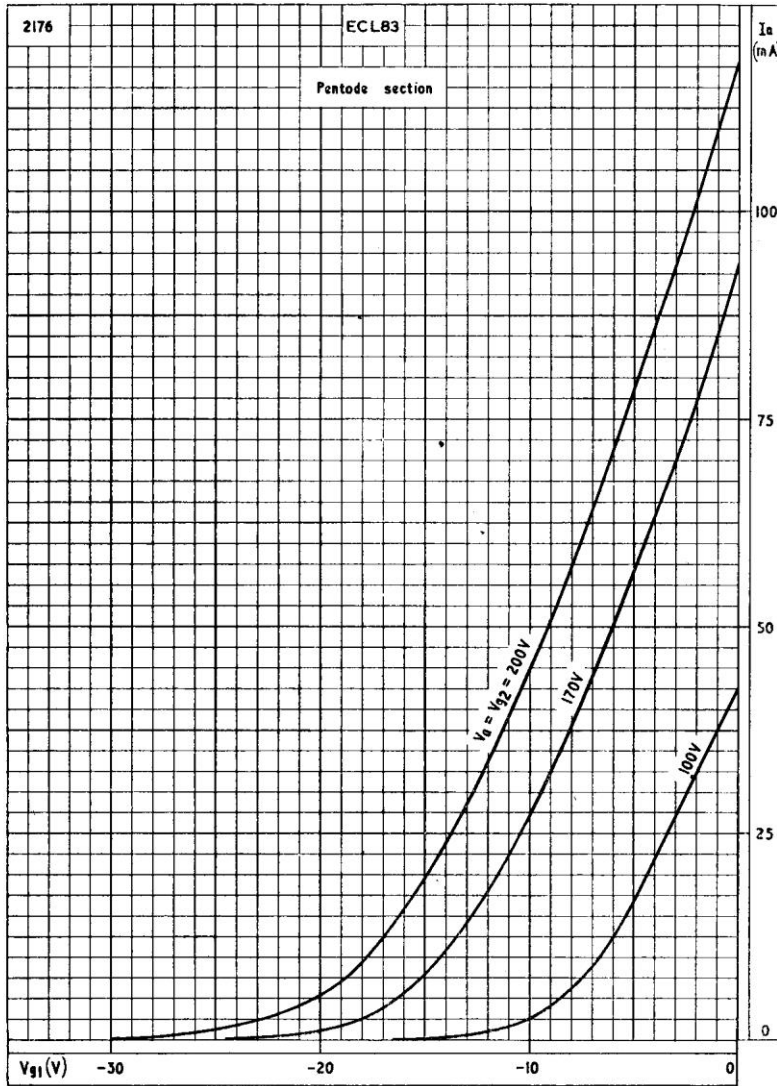
ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 200$ V



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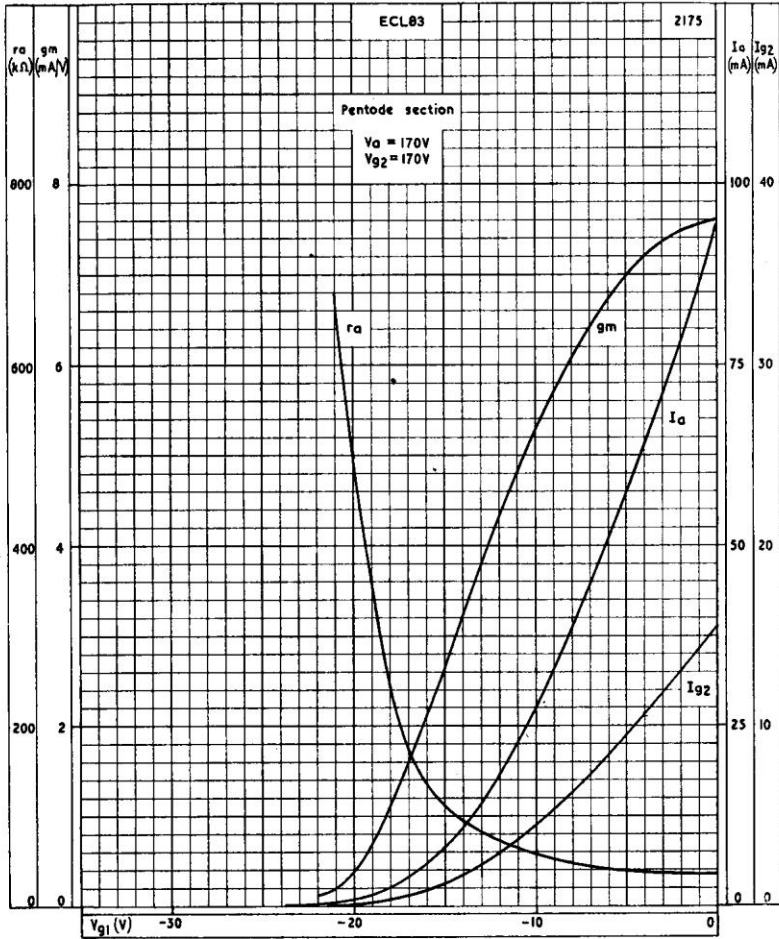
ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE FOR VARIOUS ANODE AND SCREEN-GRID VOLTAGES



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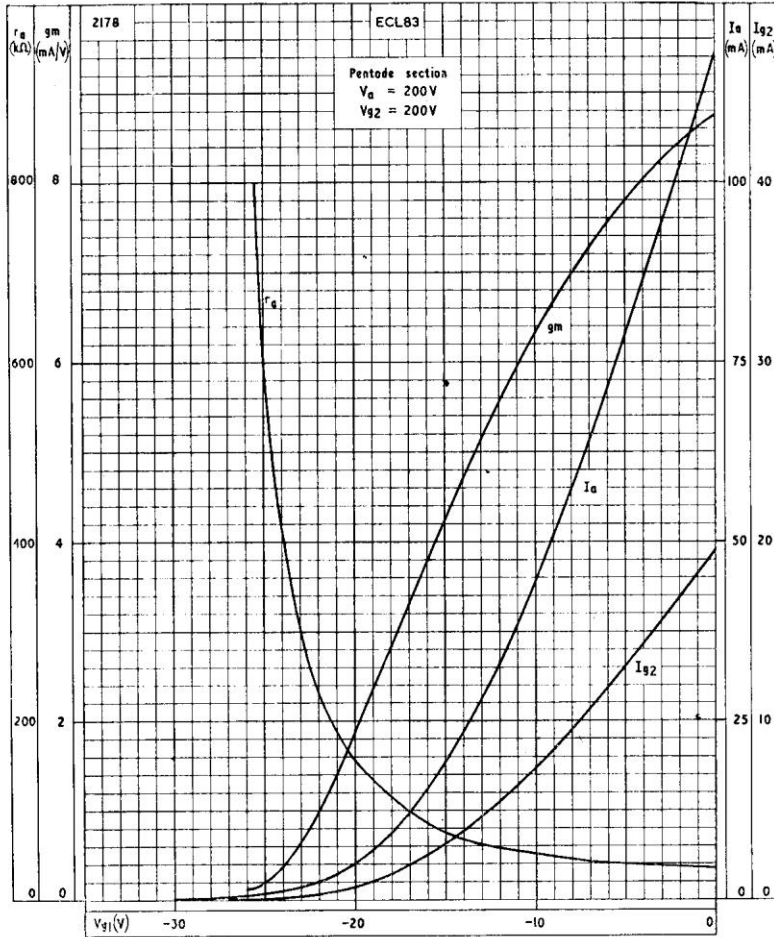
ANODE CURRENT, SCREEN-GRID CURRENT, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE.
 $V_a = V_{g2} = 170V$



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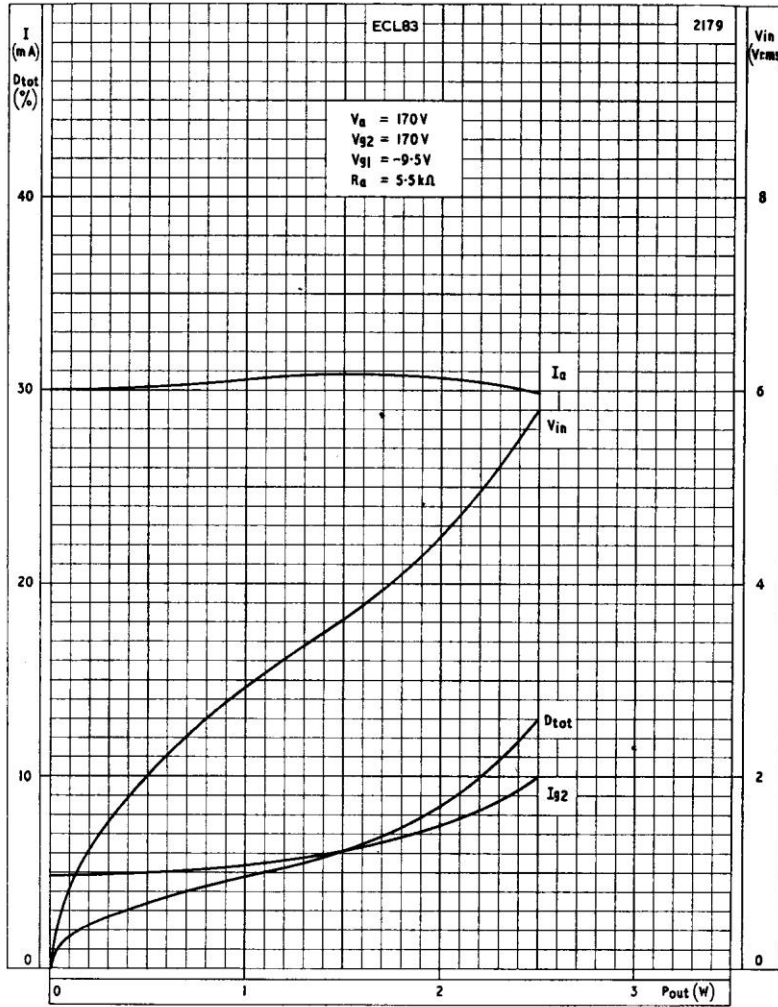


ANODE CURRENT, SCREEN-GRID CURRENT, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE.
 $V_a = V_{g2} = 200V$

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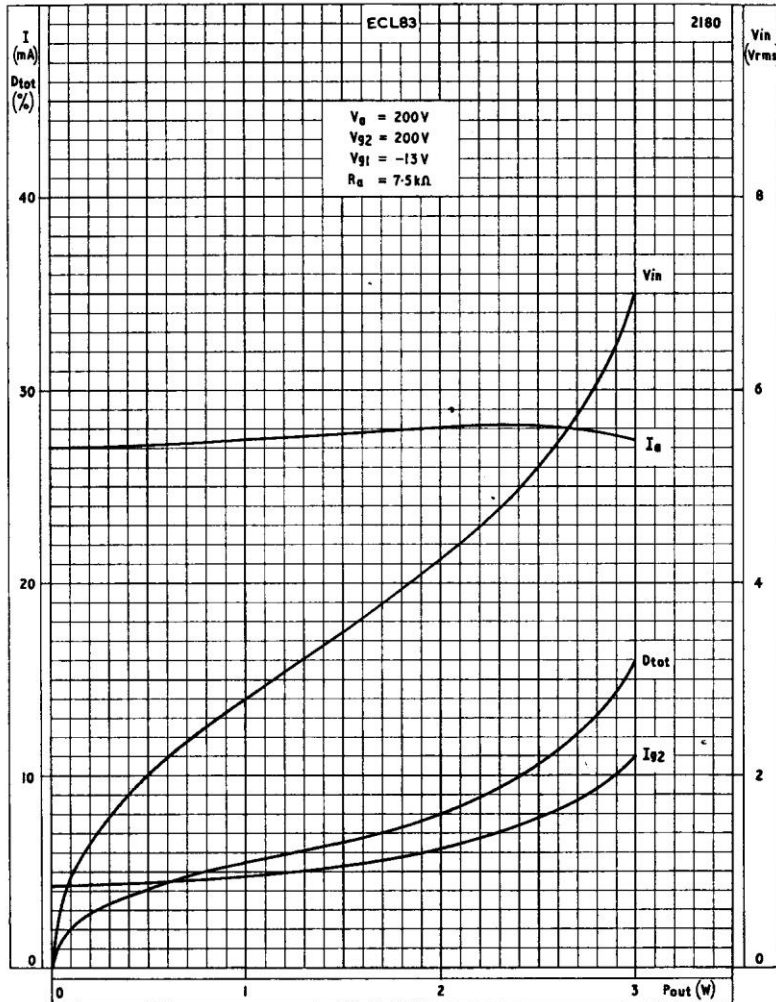
PERFORMANCE OF PENTODE SECTION AS CLASS 'A' AMPLIFIER WITH FIXED BIAS. $V_a = 170\text{V}$



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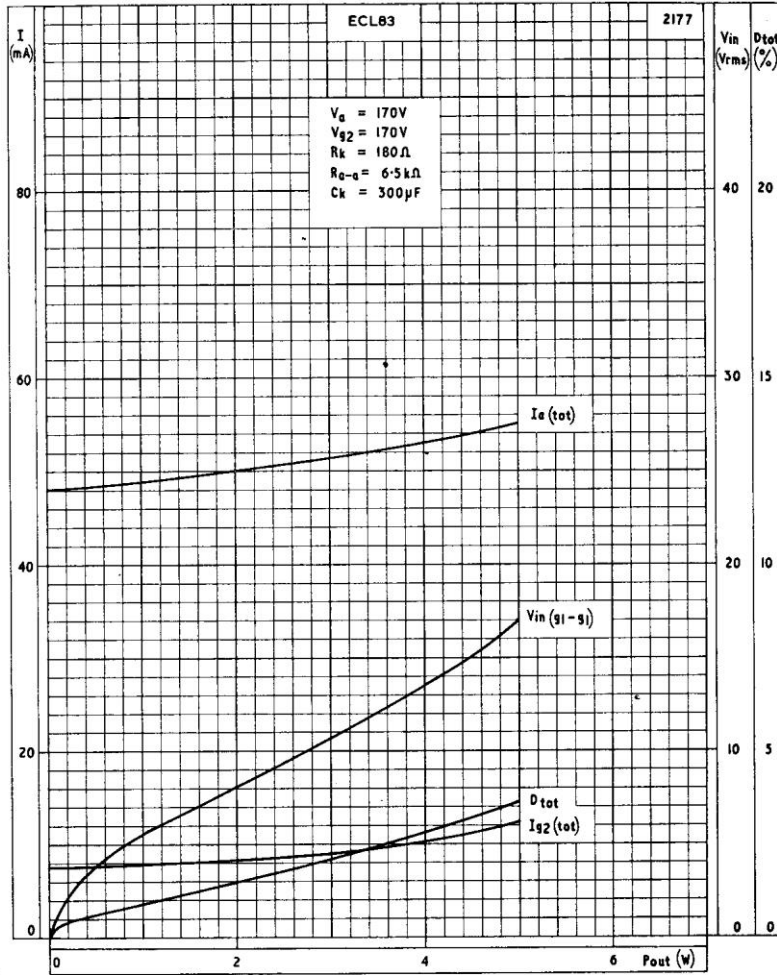


PERFORMANCE OF PENTODE SECTION AS CLASS 'A' AMPLIFIER WITH FIXED BIAS. $V_a = 200V$

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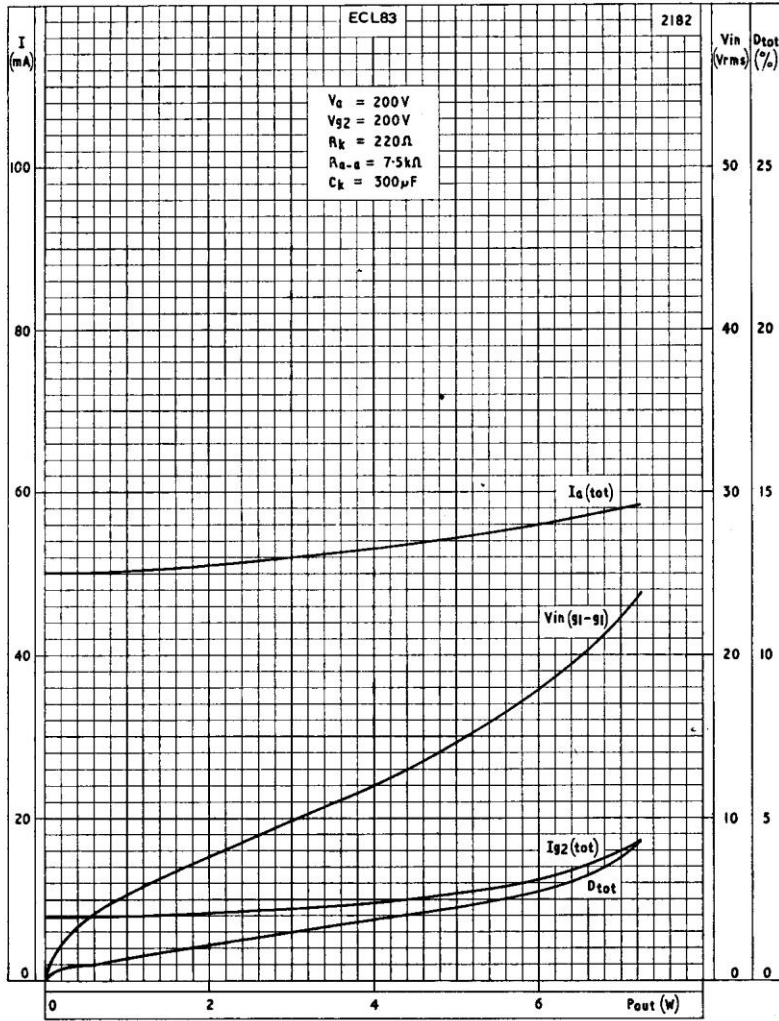
PERFORMANCE OF ECL83 IN PUSH-PULL. $V_a=170V$



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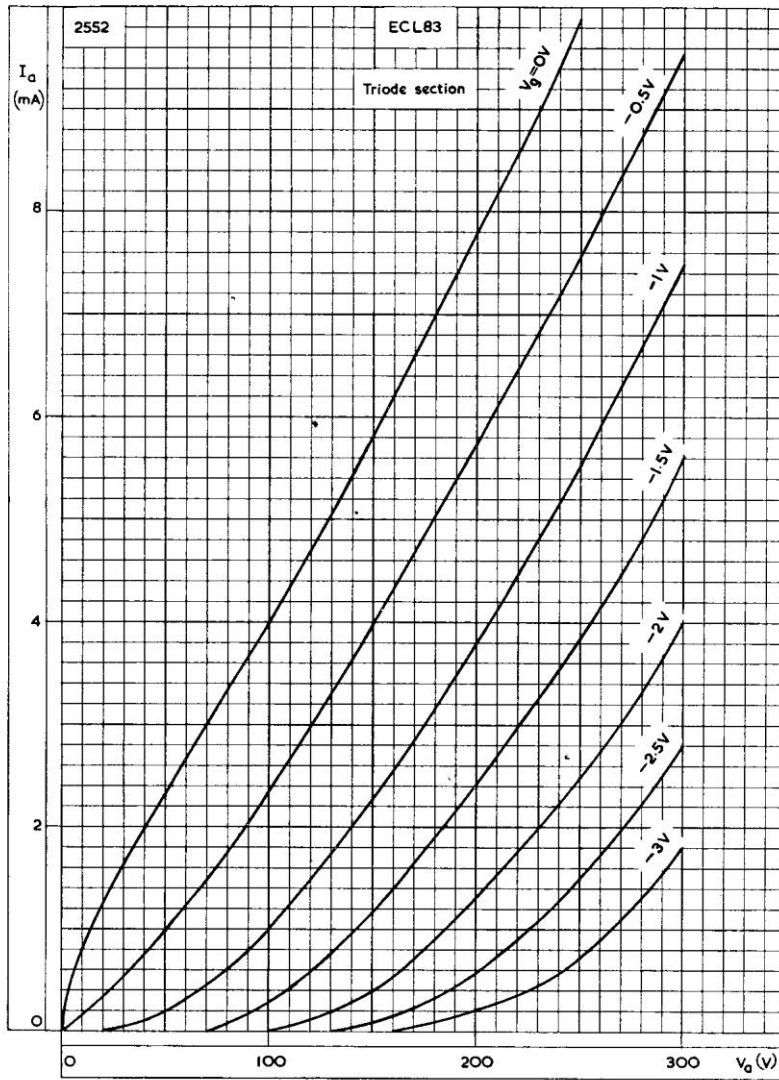
PERFORMANCE OF ECL83 IN PUSH-PULL. $V_a=200V$



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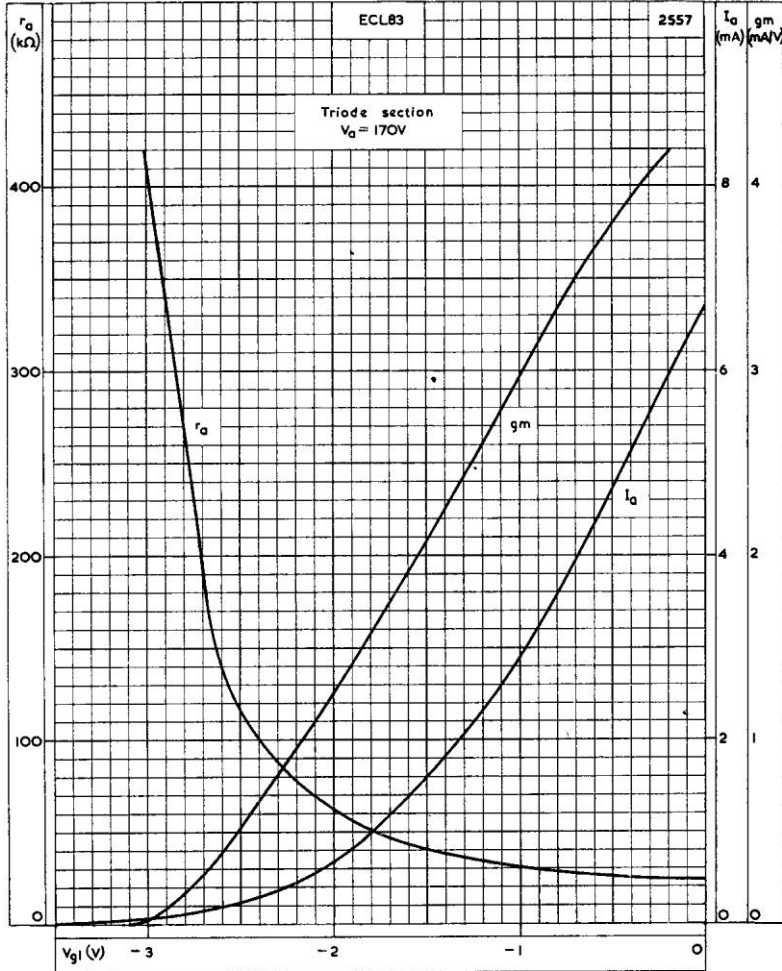


ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER

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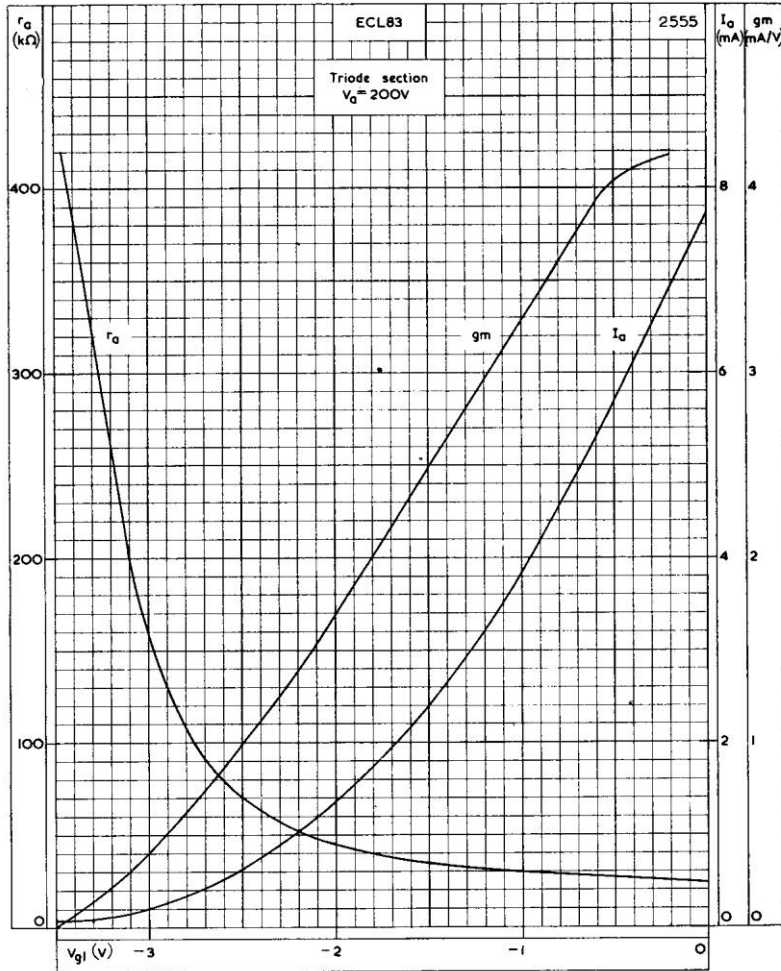


ANODE CURRENT, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST GRID VOLTAGE. $V_a = 170V$

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ANODE CURRENT, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST GRID VOLTAGE. $V_a = 200V$

