

Brimar thermionic products [®] EL84

HEATER

V_h	6.3	V
I_h	760	mA

CAPACITANCES

C_{in}	10.8	pF
C_{out}	6.5	pF
C_{a-g1}	< 500	mpF
C_{g1-h}	< 250	mpF

CHARACTERISTICS

Pentode connection

V_{i1}	250	V
V_{R2}	250	V
I_a	48	mA
I_{R2}	5.5	mA
V_{R1}	-7.3	V
g_m	11.3	mA/V
r_a	38	k Ω
μ_{g1-g2}	19	

Triode connection (g_2 connected to a)

V_a	250	V
I_a	34	mA
V_{g1}	-9.0	V
g_m	10	mA/V
r_a	2.0	k Ω
μ	19.5	

OPERATING CONDITIONS AS SINGLE VALVE AMPLIFIER

Pentode connection

V_a	250	250	V
V_{g2}	250	250	V
R_a	5.2	4.5	k Ω
V_{g1}	-7.3	-7.3	V
I_a	48	48	mA
I_{g2}	5.5	5.5	mA
$V_{in(r.m.s.)}$ ($P_{out} = 50mW$)	300	300	mV
$V_{in(r.m.s.)}$ ($D_{tot} = 10\%$)	4.3	4.4	V
P_{out} ($D_{tot} = 10\%$)	5.7	5.7	W
D_3	9.5	8.0	%
D_2	2.0	5.0	%

Triode connection (g_2 connected to a)

V_a	250	V
R_a	3.5	k Ω
V_{g1}	-9.0	V
$I_{a(0)}$	34	mA
$V_{in(r.m.s.)}$ ($P_{out} = 50mW$)	1.0	V
$V_{in(r.m.s.)}$	6.0	V
P_{out}	1.5	W
D_{tot}	6.0	%
$I_{a(max.sig.)}$	39	mA

OPERATING CONDITIONS FOR TWO VALVES IN PUSH-PULL

Pentode connection

V_a	250	300	V
V_{g2}	250	300	V
R_k (per valve)	270	270	Ω
R_{a-a}	8.0	8.0	k Ω
$I_{a(0)}$	2×31	2×36	mA
$I_{g2(0)}$	2×3.5	2×4.0	mA
$V_{in(g1-g1)}$ r.m.s.	16	20	V
P_{out}	11	17	W
D_{tot}	3.0	4.0	%
$I_{a(max.sig.)}$	2×37.5	2×46	mA
$I_{g2(max.sig.)}$	2×7.5	2×11	mA

Distributed load conditions for maximum output (screen-grid tapping at 20% of primary turns)

V_a	300	300	V
V_{g2}	300	300	V
R_k (per valve)	$390 + 47$	270	Ω
R_{a-a}	6.0	8.0	k Ω
$I_{k(0)}$	2×28	2×40	mA
$V_{in(g1-g1)}$ r.m.s.	17	18.3	V
P_{out}	14.4	15.4	W
D_{tot}	0.85	1.17	%
$I_{k(max.sig.)}$	2×55	2×48.5	mA

Distributed load conditions for minimum distortion (screen-grid tapping at 43% of primary turns)

V_a	300	300	V
V_{g2}	300	300	V
R_k (per valve)	$390 + 47$	270	Ω
R_{a-a}	6.0	8.0	k Ω
$I_{k(0)}$	2×28	2×40	mA
$V_{in(g1-g1)}$ r.m.s.	16.8	16	V
P_{out}	10.1	11	W
D_{tot}	0.72	0.7	%
$I_{k(max.sig.)}$	2×47	2×45	mA

Triode connection (g_2 connected to a)

V_a	250	300	V
R_k (per valve)	560	560	Ω
R_{a-a}	10	10	k Ω
$I_{a(0)}$	2×20	2×24	mA
$V_{in(g1-g1)}$ r.m.s.	16.5	20	V
P_{out}	3.4	5.2	W
D_{tot}	2.5	2.5	%
$I_{a(max.sig.)}$	2×21.5	2×26	mA

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OPERATING CONDITIONS WITH CONTINUOUS SINE WAVE DRIVE

Single valve

V _a	250	250	V
V _{g2(b)}	250	250	V
*R _{g2}	4.7(±10%)	3.9(±10%)	kΩ
R _k	130	130	Ω
R _a	5.25	4.5	kΩ
I _{a(o)}	44	44	mA
I _{g2(o)}	5.1	5.2	mA
V _{in(r.m.s.)}	4.4	4.65	V
P _{out}	5.4	5.6	W
D _{tot}	12.5	13.9	%
I _{a(max.sig.)}	40	42	mA
I _{g2(max.sig.)}	8.6	8.4	mA
P _{g2}	1.8	1.8	W

*Decoupled by 8μF capacitor.

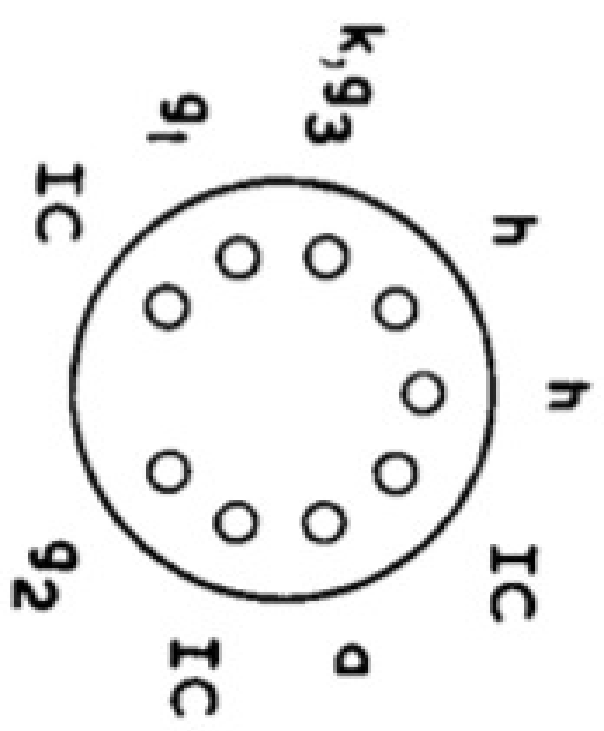
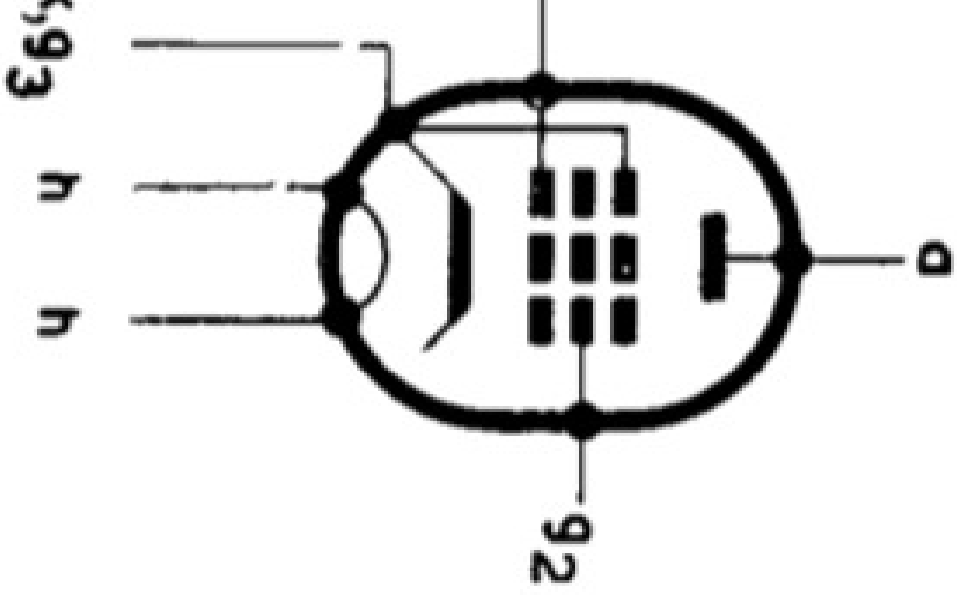
Two valves in push-pull

V _a		300	V
V _{g2(b)}		300	V
*R _{g2}		1.8(±10%)	kΩ
R _k (per valve)		270	Ω
R _{a-a}		8.0	kΩ
I _{a(o)}		2 × 35	mA
I _{g2(o)}		2 × 4.0	mA
V _{in(g1-g1)r.m.s.}		17.4	V
P _{out}		15	W
D _{tot}		3.4	%
I _{a(max.sig.)}		2 × 42	mA
I _{g2(max.sig.)}		2 × 7.0	mA
P _{g2}		1.93	W

*Screen-grid resistor common to both valves.

LIMITING VALUES

V _{a(b)} max.		550	V
V _a max.		300	V
p _a max.		12	W
V _{g2(b)} max.		550	V
V _{g2} max.		300	V
p _{g2} max.		2.0	W
I _k max.		65	mA
-V _g max.		100	V
R _{g1-k} max.		300	kΩ
V _{h-k} max.		100	V
R _{h-k} max.		20	kΩ



B9A Base

