

OUTPUT PENTODE

EL90

Output pentode with a maximum anode dissipation of 12 W suitable for use as an audio output valve.

HEATER

V_h	6.3	V
I_h	0.45	A

MOUNTING POSITION

Any

CAPACITANCES (measured without an external shield)

C_{in}	8.3	$\mu\mu\text{F}$
C_{out}	8.2	$\mu\mu\text{F}$
C_{a-g1}	0.35	$\mu\mu\text{F}$

CHARACTERISTICS

V_a	180	250	V
V_{g2}	180	250	V
I_a	29	45	mA
I_{g2}	3.0	4.5	mA
V_{g1}	-8.5	-12.5	V
g_m	3.7	4.1	mA/V
r_a	58	52	k Ω
μ_{g1-g2}	10	10	

OPERATING CONDITIONS AS SINGLE VALVE CLASS "A" AMPLIFIER

V_a	180	250	V
V_{g2}	180	250	V
R_k	270	250	Ω
$I_{a(0)}$	29	45	mA
I_a (max. sig.)	30	47	mA
$I_{g2(0)}$	3.0	4.5	mA
I_{g2} (max. sig.)	4.0	7.0	mA
R_a	5.5	5.0	k Ω
V_{in} (r. m. s.) ($P_{out}=50$ mW)	1.0	0.94	V
P_{out}	2.0	4.5	W
V_{in} (r. m. s.)	6.0	8.8	V
D_{tot}	8.0	8.0	%

Bulb temperature at 20°C ambient, in free air and without external screening can

165	230	°C
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OPERATING CONDITIONS FOR TWO VALVES AS CLASS "AB" PUSH-PULL AUDIO AMPLIFIER (Self bias)

V_a	250	V
V_{R2}	250	V
$I_{a(0)}$	2×35	mA
I_a (max. sig.)	2×38.5	mA
$I_{g2(0)}$	2×2.5	mA
I_{g2} (max. sig.)	2×6.5	mA
R_k	200	Ω
R_{a-b}	10	k Ω
P_{out}	10	W
V_{in} (r. r. m. s.)	21.2	V
D_{tot}	5.0	%

LIMITING VALUES (design centre)

$V_{a(b)}$ max.	550	V
V_a max.	250	V
p_a max.	12	W
$V_{g2(b)}$ max.	550	V
V_{g2} max.	250	V
p_{g2} max.	2.0	W
I_k max.	55	mA
R_{g1-k} max. (fixed bias)	100	k Ω
R_{g1-k} (cathode bias)	500	k Ω
V_{h-k} max.	90	V
Max. bulb temperature	235	$^{\circ}C$
Max. ambient temperature at $p_a + p_{g2} = 13W$ and without external screening can and at normal altitudes	20	$^{\circ}C$
*Max. temperature opposite the anode at any point 15 mm from the bulb, with $p_a + p_{g2} = 13W$ and without external screening can and at normal altitudes	30	$^{\circ}C$
Max. ambient temperature at $p_a + p_{g2} = 14W$ and without external screening can and at normal altitudes	15	$^{\circ}C$
*Max. temperature opposite the anode at any point 15 mm from the bulb, with $p_a + p_{g2} = 14W$ and without external screening can and at normal altitudes	25	$^{\circ}C$

*Measured by placing a Mercury thermometer at the specified distance from the valve.

Adequate Ventilation

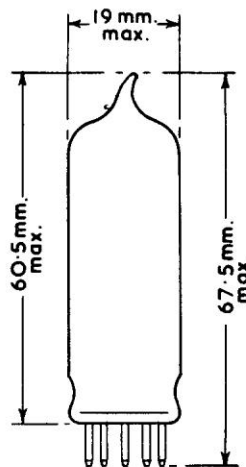
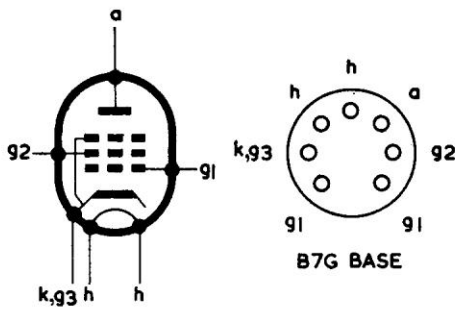
At maximum ratings and normal ambient temperature ($20^{\circ}C$) this valve is operating near its maximum bulb temperature, therefore the designer should take special care with the layout and design of an equipment. For this reason figures for the maximum ambient and surrounding temperature are given as well as the maximum bulb temperature.

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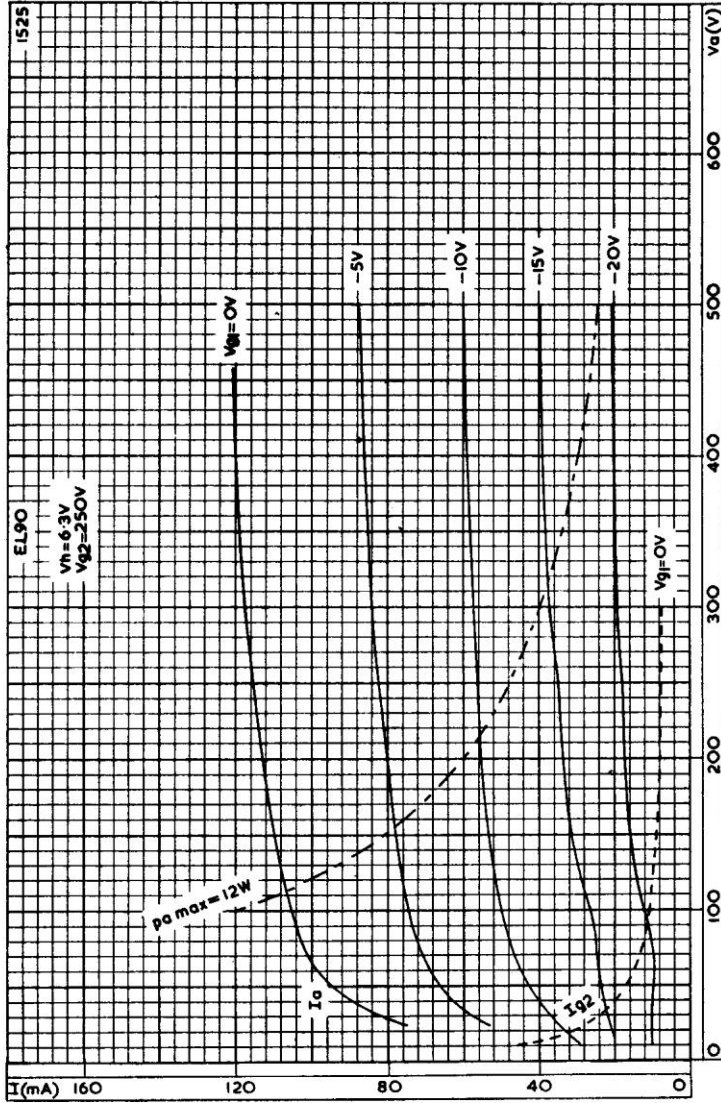
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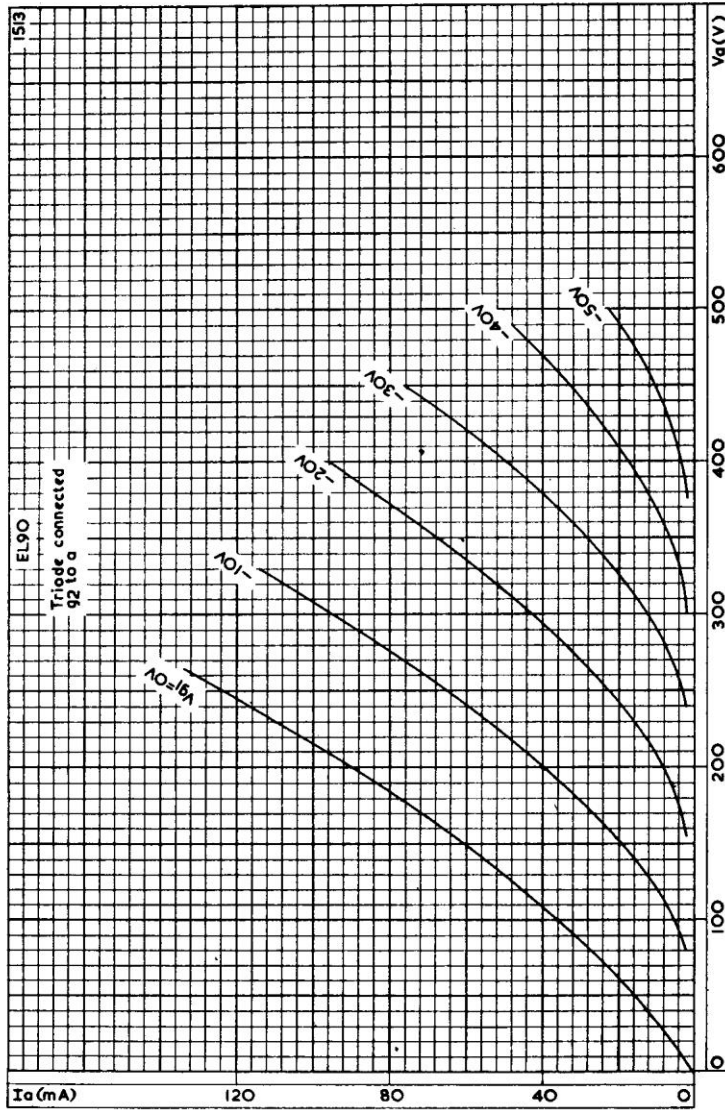


ANODE AND SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER

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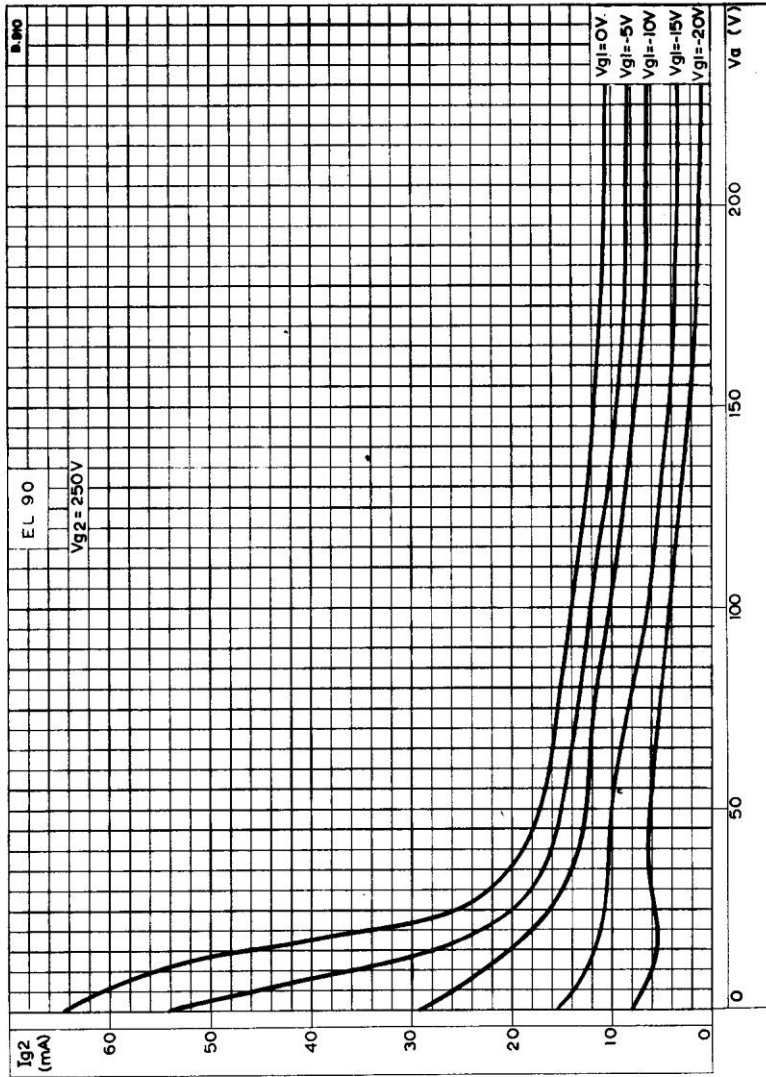


ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER WHEN CONNECTED AS TRIODE

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SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 250V$