

OUTPUT PENTODE

EL38

Output pentode primarily intended for use as line time base output valve in A.C. television receivers.

HEATER

V_h	6.3	V
I_h	1.4	A

CAPACITANCES

C_{in}	18	μF
C_{out}	8.0	μF
C_{a-g1}	< 1.2	μF

CHARACTERISTICS

V_a	275	V
V_{g2}	275	V
I_a	91	mA
I_{g2}	11	mA
V_{g1}	-9	V
g_m	14	mA/V
μ_{g1-g2}	16.5	
r_a	20	k Ω

OPERATION AS LINE OUTPUT PENTODE

Circuit Design

To allow for valve spread and for deterioration during life the line output stage should be designed around the following values :—

V_a	90	V
V_{g2}	275	V
I_a	150	mA

For the average new valve the following figures will apply:—

V_a	90	V
V_{g2}	275	V
V_{g1}	-1	V
I_a	225	mA

Typical Circuit (See circuit on page 3)

	V_b	300	V
For EL38	I_a	64	mA
	I_{g2}	18	mA
	R_k	120	Ω
For EBC33	I_a	0.8	mA

N.B.—Above figures measured under synchronised conditions.

LIMITING VALUES

$V_{a(b)} \text{ max.}$	1.2	kV
$V_a \text{ max.}$	800	V
$V_{bk(p_k)} \text{ max.}$	8	kV
$V_{g2(b)} \text{ max.}$	800	V
$V_{g2} \text{ max.}$	400	V
$p_a \text{ max.}$	25	W
$p_{g2} \text{ max.}$	8	W
$I_k \text{ max.}$	200	mA
$V_{g1} \text{ max. (} I_{g1} = +0.3 \mu A \text{)}$	-1.3	V
$R_{g1-k} \text{ max. (} p_a < 25W \text{)}$	500	k Ω
$R_{g1-k} \text{ max. (} p_a < 9W \text{)}$	800	k Ω
$V_{h-k} \text{ max.}$	100	V
$R_{h-k} \text{ max.}$	20	k Ω

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CIRCUIT VALUES (see circuit on page 3)

Resistors		Value	Wattage	Tolerance
R ₁	47	k Ω	$\frac{1}{4}$ W	20%
R ₂	330	k Ω	$\frac{1}{4}$ W	10%
R ₃	50	k Ω	1 W	Potentiometer
R ₄	680	Ω	$\frac{1}{4}$ W	10%
R ₅	820	k Ω	$\frac{1}{4}$ W	20%
R ₆	120	Ω	1 W	20%
R ₇	500	Ω	4 W	Potentiometer
R ₈	2.2	k Ω	$\frac{1}{4}$ W	20%
R ₉	2.5	k Ω	4 W	Potentiometer
R ₁₀	2.7	k Ω	4 W	20%
R ₁₁	100	Ω	$\frac{1}{4}$ W	20%

Capacitors		Value	Tolerance	Wkg. Voltage
C ₁	0.1	μ F	20%	350 V
C ₂	0.0022	μ F	20%	350 V
C ₃	0.01	μ F	10%	350 V
C ₄	0.001	μ F	10%	350 V
C ₅	0.004-0.006	μ F	—	500 V

Transformers

- T1 Ratio 1 : 3 (step-up into grid circuit)
 T2 Ratio 4 : 1 primary inductance ≤ 1 H

Deflector Coils

Resistance	3 Ω
Inductance	6.5 mH

To provide full scan for 9" picture tube ($V_{a2}=7$ kV) with peak to peak current swing of 500 mA.

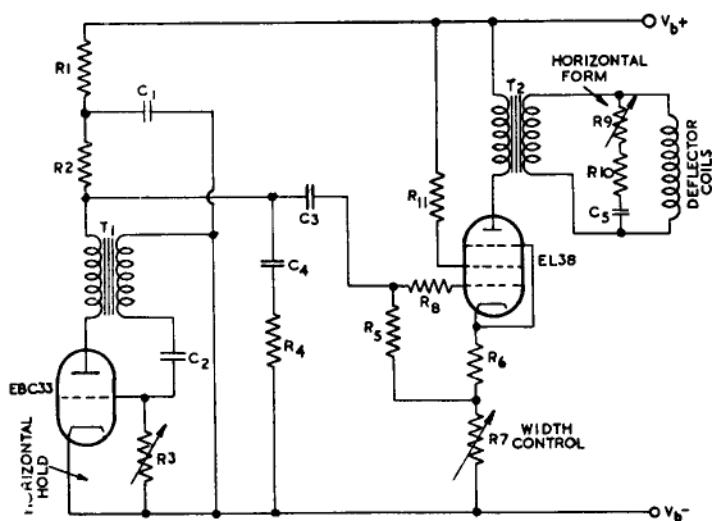
Notes

- Synchronising pulses may be applied negatively to the anode or positively to the grid of the EBC33.
- The decoupling components (R_1 C_1) in the anode circuit of the EBC33 are necessary only if there is ripple on the H.T. line.
- All potentiometers should be linear components to provide smooth control.

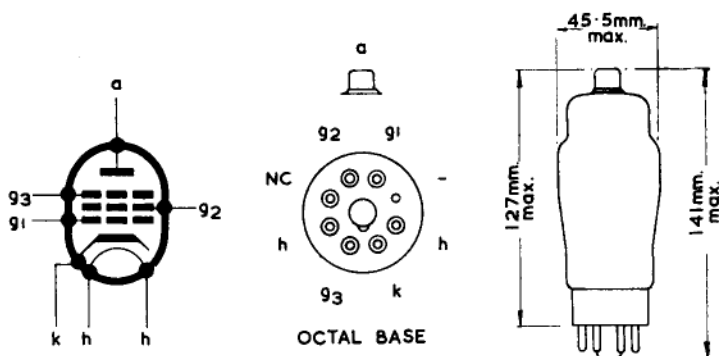
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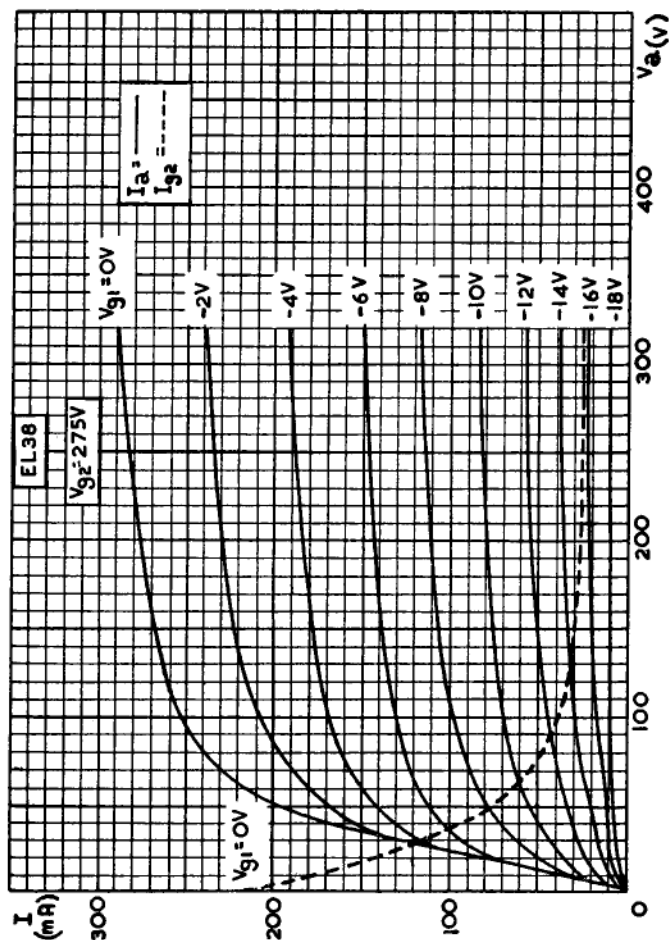


LINE TIME BASE CIRCUIT



732

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