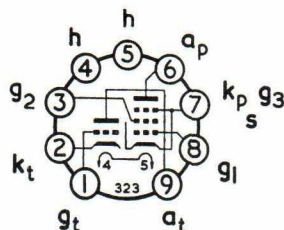


TRIODE PENTODE



B9A Base

GENERAL

This high- μ triode and output pentode combination is for use in audio amplifier circuits.

Heater Voltage
Heater Current

V_h 6.3 V
 I_h 0.66 A

RATINGS

	Triode	Pentode	
Maximum Anode Dissipation	0.5	9.0	W
Maximum Screen Grid Dissipation	—	1.8	W
For speech and music	—	3.0	W
Maximum Anode Supply Voltage ($I_a = 0$)	550	550	V
Maximum Anode Voltage	300	300	V
Maximum Screen Grid Supply Voltage ($I_{g2} = 0$)	—	550	V
Maximum Screen Grid Voltage	—	300	V
Maximum Heater to Cathode Voltage	100	100	V
Maximum Cathode Current	4.0	55	mA
Maximum Grid 1 to Cathode Resistance			
Fixed Bias	1.0	1.0	M Ω
Self Bias	2.0	—	M Ω
Grid Current Bias	22	—	M Ω
Maximum Heater to Cathode Resistance	$R_{h-k(max)}$	20*	20 k Ω

* When used as a phase inverter immediately preceding the output stage $R_{h-k(max)}$ may be 120k Ω .

INTER-ELECTRODE CAPACITANCES†

Pentode input	$C_{in(p)}$	10	pF
Grid 1 to Anode Pentode	C_{g1-ap}	<0.4	pF
Grid 1 to Heater	C_{g1-h}	<0.24	pF
Triode Input	$C_{in(t)}$	2.3	pF
Triode Output	$C_{out(t)}$	2.5	pF
Grid Triode to Anode Triode	C_{gt-at}	1.4	pF
Grid Triode to Heater	C_{gt-h}	<0.006	pF
Grid Triode to Grid 1	C_{gt-g1}	<0.02	pF
Grid Triode to Anode Pentode	C_{gt-ap}	<0.006	pF
Anode Triode to Anode Pentode	C_{at-ap}	<0.15	pF
Anode Triode to Grid 1	C_{at-g1}	<0.2	pF

† In fully shielded socket without can (I.E.C. Publication 100).

CHARACTERISTICS

	Triode	Pentode	
Anode Voltage	V_a 250	250	V
Screen Grid Voltage	V_{g2} —	250	V
Control Grid Voltage	V_{g1} -1.9	-7.0	V
Anode Current	I_a 1.2	36	mA
Screen Grid Current	I_{g2} —	6.0	mA
Mutual Conductance	g_m 1.6	10	mA/V
Valve Anode Resistance ($\delta v_a / \delta i_a$)	r_a 62	48	k Ω
Amplification Factor	μ 100	—	
Inner Amplification Factor	μ_{g1-g2} —	21	

TYPICAL OPERATION

Pentode as Class A Audio Output Stage

Anode Voltage	V_a	250	250	V
Screen Grid Voltage	V_{g2}	250	250	V
Cathode Resistor	R_k	270	170	Ω
Anode Resistor	R_a	10	7.0	$k\Omega$
Anode Current	I_a	27	37	mA
Screen Grid Current	I_{g2}	8.2	10	mA
Power Output	P_{out}	2.8	4.0	W
Total Distortion	D_{tot}	10	10	%
Input Voltage (R.M.S.)	$V_{in(r.m.s.)}$	2.7	3.2	V
Input Voltage (R.M.S.) for 50mW output		280	300	mV

Pentodes—Two Valves in Push-Pull (Cathode Bias)

Anode Supply Voltage	$V_{a(b)}$	250	300	V
Screen Supply Voltage	$V_{g2(b)}$	250	300	V
Cathode Resistor (per valve)	R_k	180	260	Ω
Anode to Anode Load Resistor	R_{a-a}	8.2	9.1	$k\Omega$
Anode Current (Quiescent)	$I_{a(o)}$	2×32.5	2×31	mA
Anode Current (max. sig.)	$I_{a(max. sig.)}$	2×35.5	2×37	mA
Screen Grid Current (Quiescent)	$I_{g2(o)}$	2×5.6	2×5.5	mA
Screen Grid Current (max. sig.)	$I_{g2(max. sig.)}$	2×8.9	2×10.6	mA
Power Output	P_{out}	10	13.6	W
Total Distortion	D_{tot}	5.0	4.0	%
Input Voltage (R.M.S.) Grid to Grid	$V_{in(g1-g1)r.m.s.}$	11	16.8	V
Input Voltage (R.M.S.) for 50mW output		480	520	mV

Triode as Resistance Coupled A.F. Amplifier

Cathode Self Bias*

Supply Voltage	V_b	200	250	250	300	V
Anode Load Resistance	R_a	220	220	220	220	$k\Omega$
Cathode Self Bias Resistance	R_k	2.6	1.75	1.75	1.2	$k\Omega$
Grid Resistance of Following Valve		0.68	0.68	10	10	$M\Omega$
Anode Current	I_a	0.42	0.6	0.6	0.8	mA
Voltage Amplification		66	70	75	80	
R.M.S. Output Voltage		3.2	3.2	5.0	9.0	V
Total Harmonic Distortion	D_{tot}	0.6	0.4	0.4	0.4	%

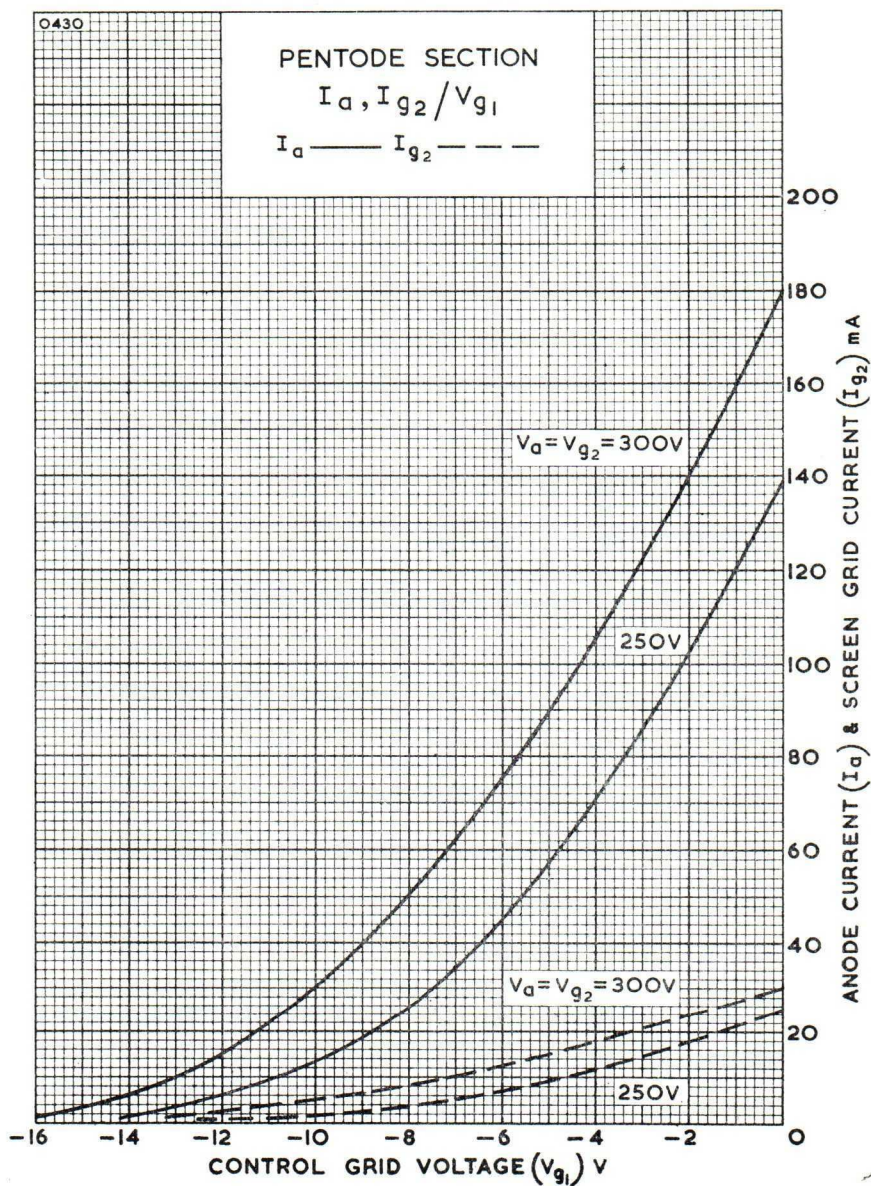
* At lower values of supply voltage grid current bias should be used.

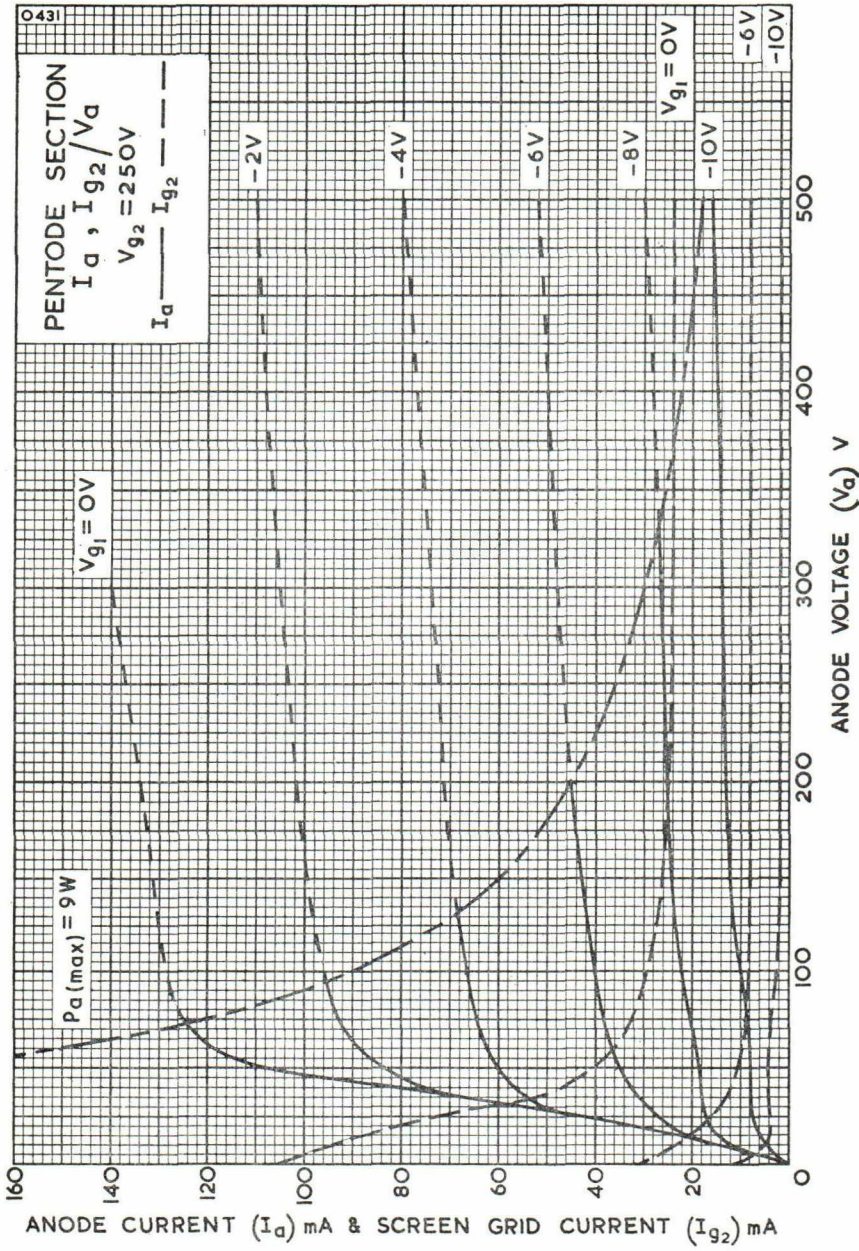
Grid Current Bias ($R_g = 10 M\Omega$)

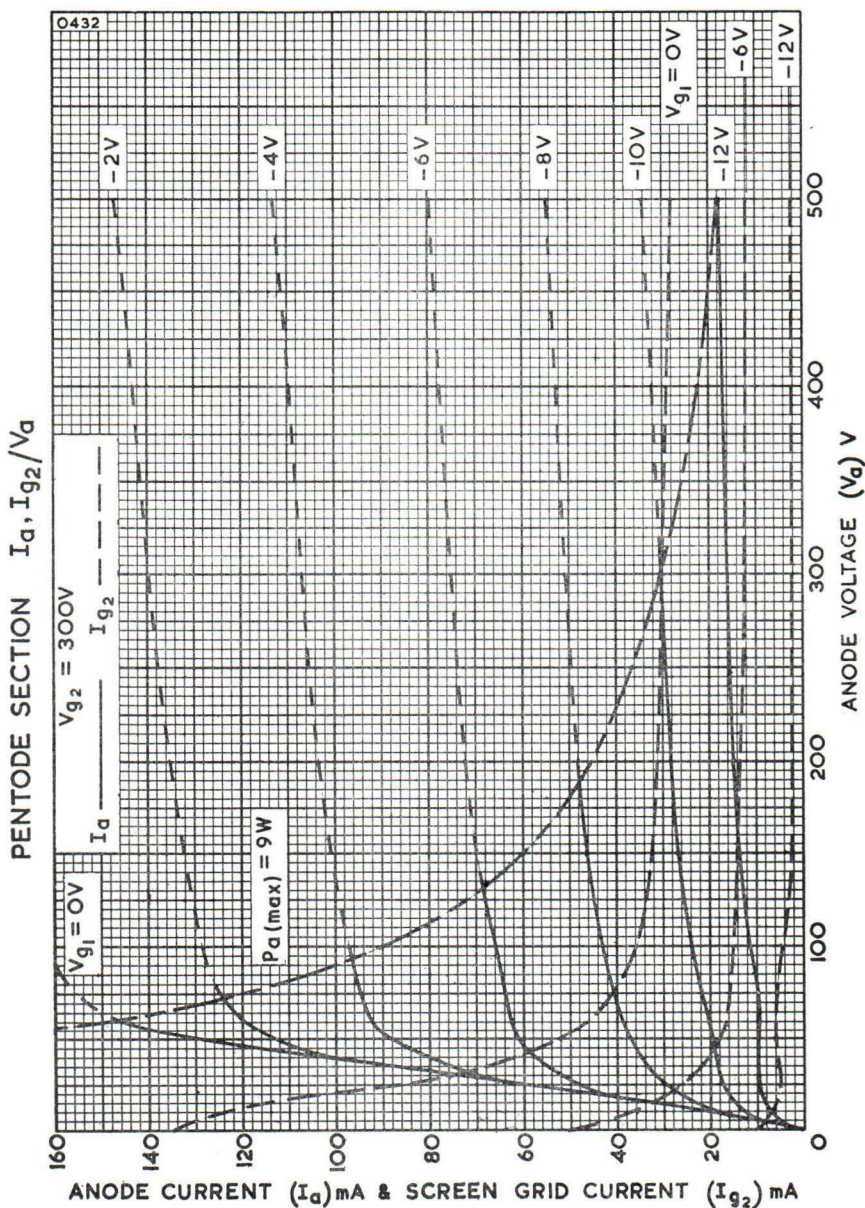
Supply Voltage	V_b	200	250	250	300	V
Anode Load Resistance	R_a	220	220	220	220	$k\Omega$
Grid Resistance of Following Valve		0.68	0.68	10	10	$M\Omega$
Anode Current	I_a	0.42	0.6	0.6	0.8	mA
Signal source impedance	Z_s	47	47	47	47	$k\Omega$
Voltage amplification		66	70	75	80	
R.M.S. Output Voltage		3.2	3.2	5.0	9.0	V
Total Harmonic Distortion	D_{tot}	0.6	0.4	0.4	0.4	%

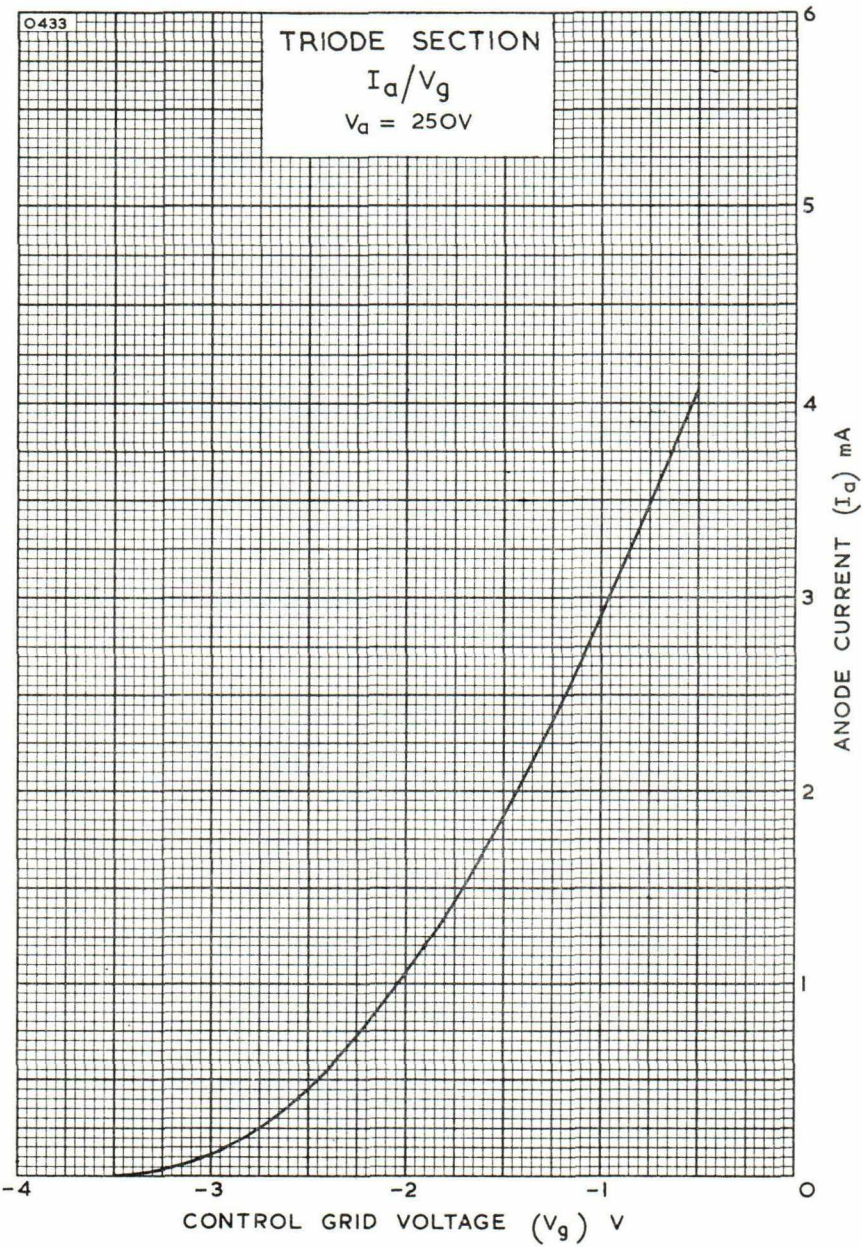
Note: Microphony. This valve may be used without special precautions against microphony in equipment where the input voltage is not less than 4 mV for an output of 50 mW.

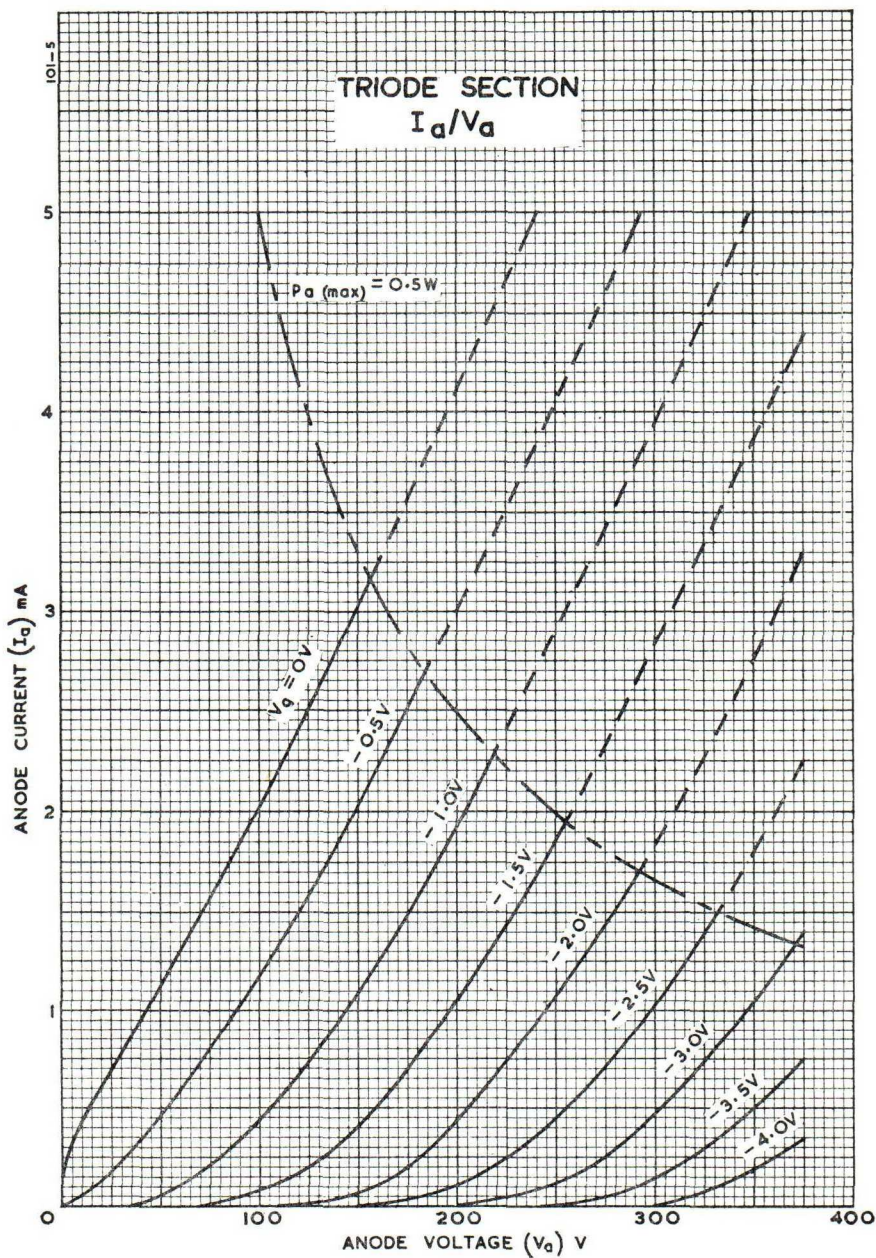
MOUNTING POSITION—Unrestricted

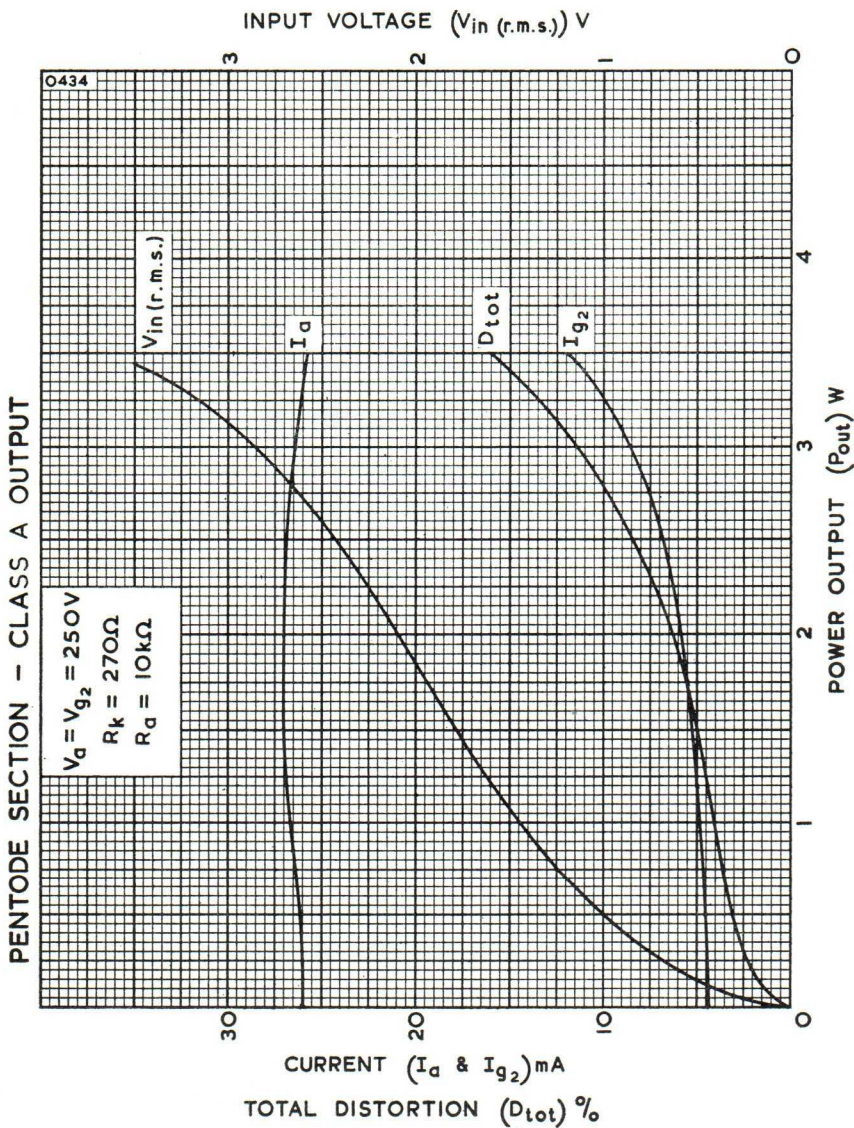


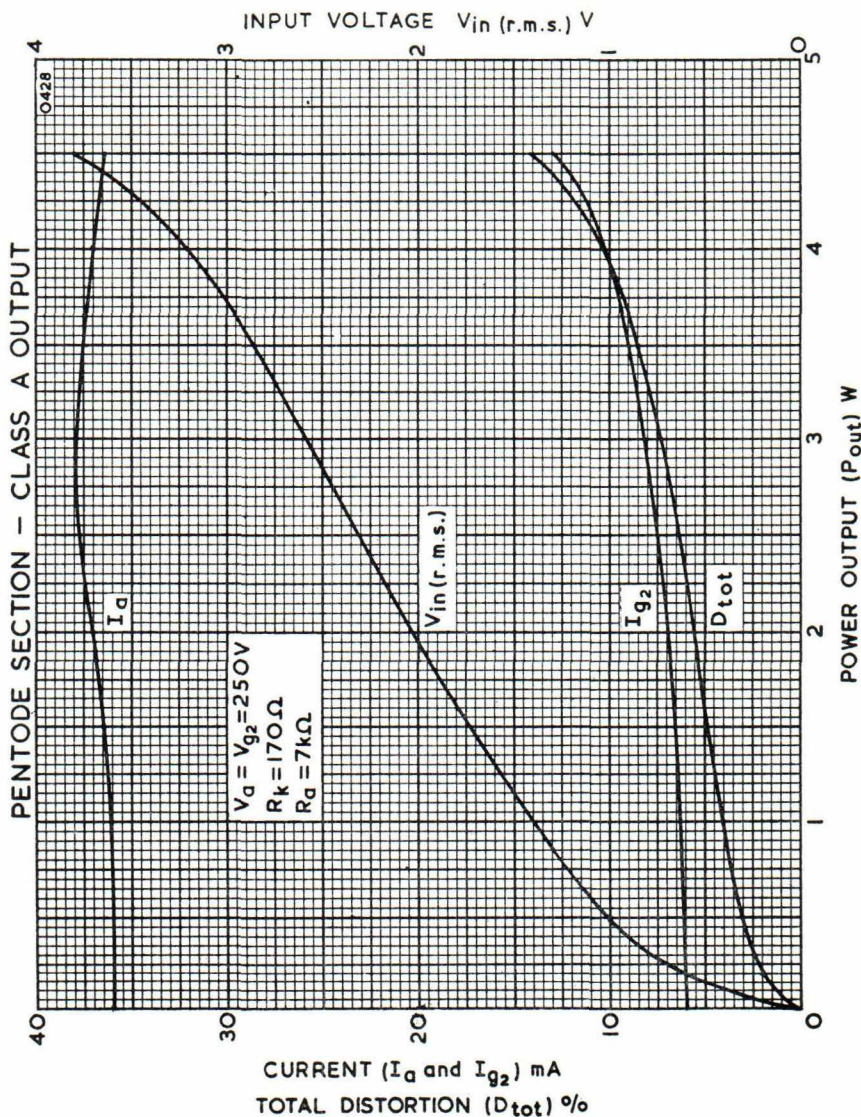












PENTODE SECTIONS PUSH - PULL OUTPUT

