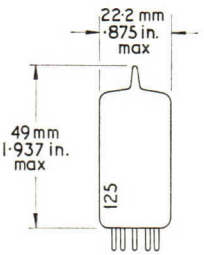
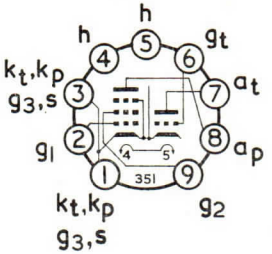


V.H.F. TRIODE PENTODE



B9A Base

GENERAL

This triode pentode is designed for use as a V.H.F. frequency changer. It has high conversion conductance and input impedance at 200 Mc/s.

Heater Current	I_h	0·3 A
Heater Voltage	V_h	8·0 V

RATINGS

		Pentode	Triode	
Maximum Anode Dissipation	$p_{a(max)}$	2·0	1·5	W
Maximum Screen Grid Dissipation	$p_{g_2(max)}$	0·5	—	W
Maximum Anode Voltage	$V_{a(max)}$	250	125	V
Maximum Screen Grid Voltage	$V_{g_2(max)}$	150	—	V
Maximum Heater to Cathode Voltage	$V_{h\text{-}k(max)}$	—	100*	V
Maximum Cathode Current	$I_{k(max)}$	18	15	mA
Maximum Grid to Cathode Resistance	$R_{g_1\text{-}k(max)}$	250	500	kΩ

* To fulfil hum requirements on A.M. sound, it will be necessary for $V_{h\text{-}k}$ to be less than 50 V r.m.s. For intercarrier receivers $V_{h\text{-}k}$ should not exceed 75 V r.m.s.

INTER-ELECTRODE CAPACITANCES†

Input Pentode	$c_{in(p)}$	5·8	pF
Output Pentode	$c_{out(p)}$	3·5	pF
Grid 1 to Anode Pentode	$c_{g_1\text{-}ap}$	0·012	pF
Grid 1 to Grid 2	$c_{g_1\text{-}g_2}$	1·7	pF
Grid Triode to Anode Triode	$c_{gt\text{-}at}$	2·0	pF
Grid Triode to Cathode and Heater	$c_{gt\text{-}k,h}$	2·4	pF
Anode Triode to Cathode and Heater	$c_{at\text{-}k,h}$	1·1	pF
Anode Pentode to Anode Triode	$c_{ap\text{-}at}$	0·125	pF
Anode Pentode to Grid Triode	$c_{ap\text{-}gt}$	0·014	pF
Grid 1 to Anode Triode	$c_{g_1\text{-}at}$	<0·01	pF
Grid 1 to Grid Triode	$c_{g_1\text{-}gt}$	<0·01	pF

† Measured without an external shield.

CHARACTERISTICS

		Pentode	Triode	
Anode Voltage	V_a	170	100	V
Screen Grid Voltage	V_{g_2}	150	—	V
Control Grid Voltage	V_{g_1}	−1·2	−3·0	V
Anode Current	I_a	10	14	mA
Screen Grid Current	I_{g_2}	3·3	—	mA
Mutual Conductance	g_m	12	5·7	mA/V
Amplification Factor	μ	—	17	
Inner Amplification Factor	$\mu_{g_1\text{-}g_2}$	70	—	
Valve Anode Resistance ($\delta v_a/\delta i_a$)	r_a	>350	—	kΩ
Equivalent Grid Noise Resistance	R_{eq}	1·0	—	kΩ

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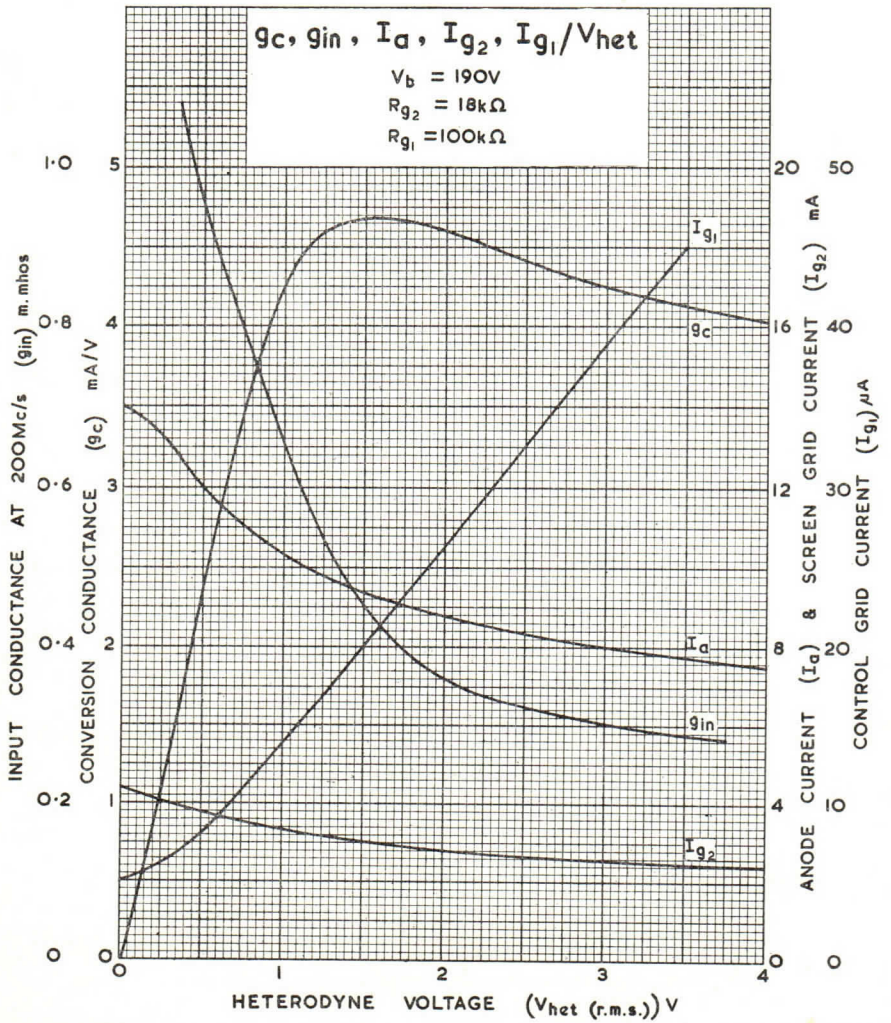
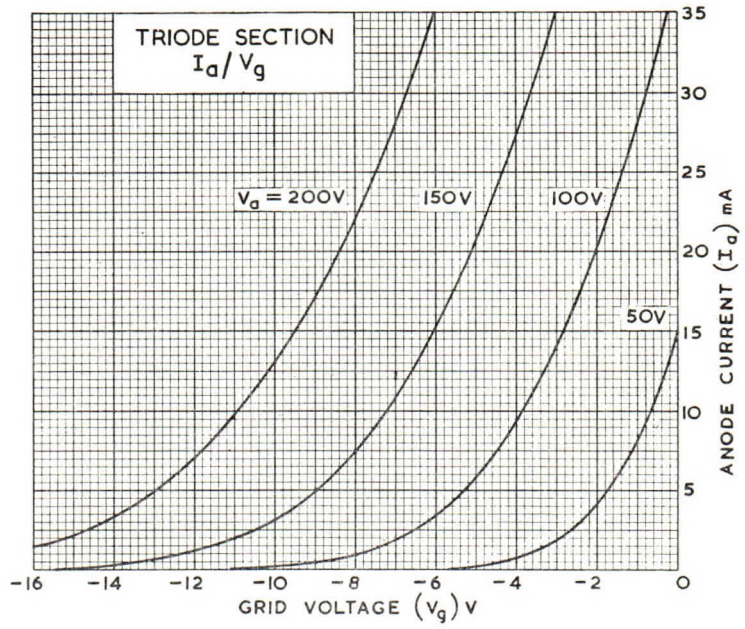
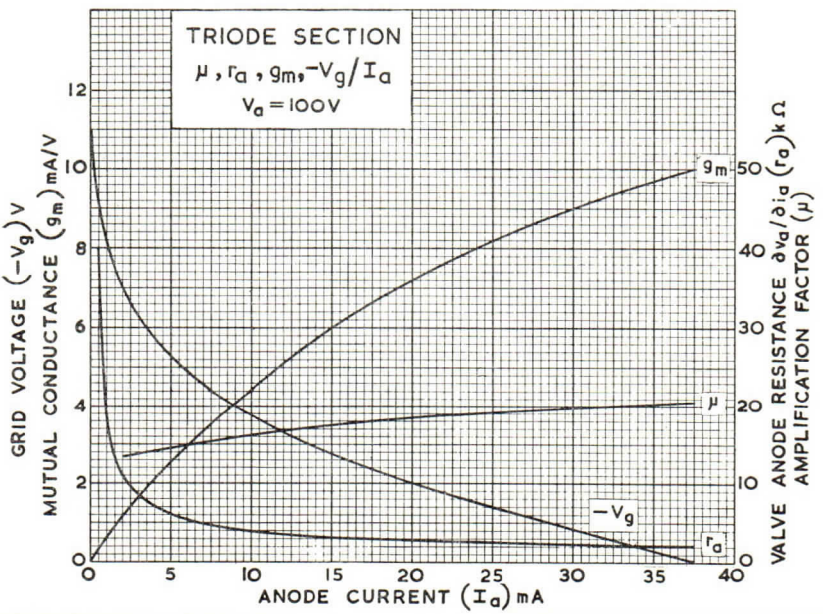
TYPICAL OPERATION—As a Frequency Changer

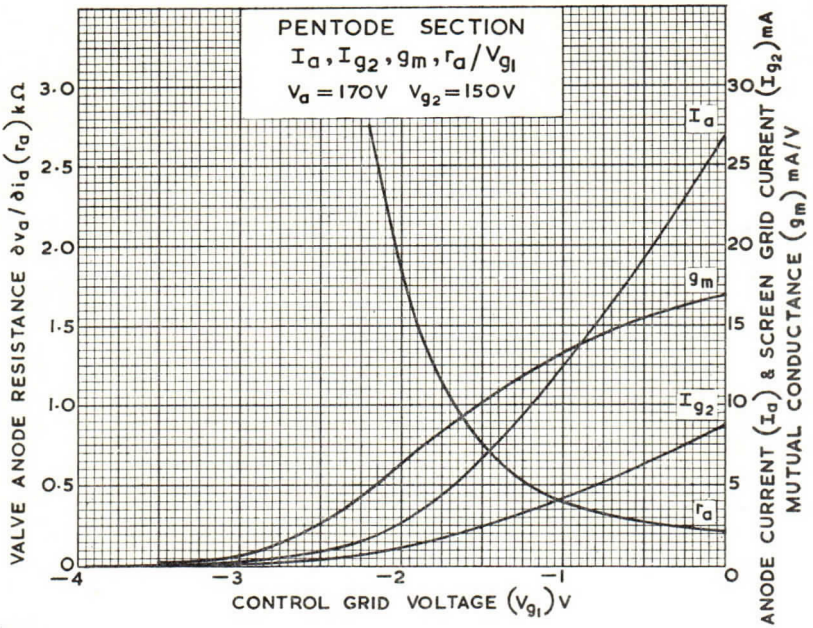
Anode Voltage	V_a	190	V
Screen Supply Voltage (R_{g_2} = 18kΩ)	$V_{g_2(b)}$	190	V
Control Grid Resistance	R_{g_1}	100	kΩ
Heterodyne Voltage (R.M.S.)	$V_{het(r.m.s.)}$	2·3	V
Anode Current	I_a	8·5	mA
Screen Grid Current	I_{g_2}	2·7	mA
Conversion Conductance	g_c	4·5	mA/V

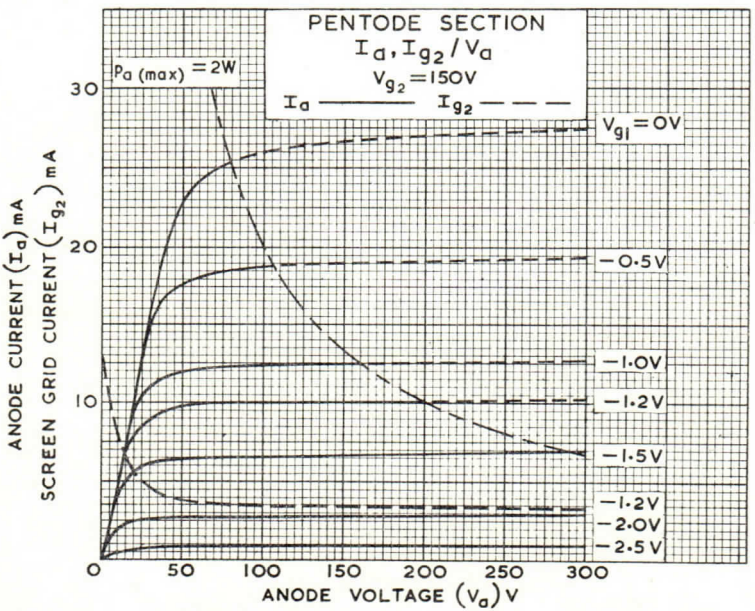
MOUNTING POSITION:—Unrestricted




TRIODE SECTION
I_a / V_g
$V_a = 200V$
150V
100V
50V
35
30
25
20
15
10
5
ANODE CURRENT (I_a) mA
−16 −14 −12 −10 −8 −6 −4 −2 0
GRID VOLTAGE (V_g) V


TRIODE SECTION
μ , r_a , g_m, $-V_g / I_a$
$V_a = 100V$
GRID VOLTAGE $(-V_g)$ V
MUTUAL CONDUCTANCE (g_m) mA/V
VALVE ANODE RESISTANCE $\partial v_a / \partial i_a$ (r_a) kΩ
AMPLIFICATION FACTOR (μ)
g_m
μ
$-V_g$
r_a
0 2 4 6 8 10 12
0 10 20 30 40 50
0 5 10 15 20 25 30 35 40
ANODE CURRENT (I_a) mA


PENTODE SECTION
$I_a, I_{g_2}, g_m, r_a / V_{g_1}$
$V_a = 170V$ $V_{g_2} = 150V$
VALVE ANODE RESISTANCE $\delta v_a / \delta i_a (r_a)$ kΩ
ANODE CURRENT (I_a) & SCREEN GRID CURRENT (I_{g_2}) mA
MUTUAL CONDUCTANCE (g_m) mA/V
I_a
g_m
I_{g_2}
r_a
3·0
2·5
2·0
1·5
1·0
0·5
0
30
25
20
15
10
5
−4
−3
−2
−1
0
CONTROL GRID VOLTAGE (V_{g_1}) V


PENTODE SECTION
$I_a, I_{g_2} / V_a$
$V_{g_2} = 150V$
I_a ——— I_{g_2} — — —
P_a (max) = 2W
ANODE CURRENT (I_a) mA
SCREEN GRID CURRENT (I_{g_2}) mA
$V_{g_1} = 0V$
−0·5V
−1·0V
−1·2V
−1·5V
−1·2V
−2·0V
−2·5V
30
20
10
0
50
100
150
200
250
300
ANODE VOLTAGE (V_a) V