

Special quality dual control pentode for use in equipment where mechanical vibration and shocks are unavoidable and where statistically controlled major electrical characteristics are required.

This data should be read in conjunction with the GENERAL NOTES—SPECIAL QUALITY VALVES which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

V_{h1}	6.3	V
I_h	175	mA

MOUNTING POSITION

Any

CAPACITANCES² (measured with an external shield)

C_{a-g1}	<20	mpF
C_{in}	4.2	pF
C_{out}	3.2	pF

CHARACTERISTICS³

V_a	120	120	V
V_{g2}	120	120	V
V_{g3}	-3.0	0	V
I_a	3.5	5.1	mA
I_{g2}	4.8	3.5	mA
V_{g1}	-2.0	-2.0	V
$g_{m(g1-a)}$	2.0	3.2	mA/V
$g_{m(g3-a)}$	660	450	$\mu A/V$
r_a	—	150	k Ω
$V_{g1}(I_a = 100\mu A)$	—	<-7.5	V
$V_{g3}(I_a = 20\mu A)$	-10	<-15	V
R_k	0	0	Ω

ABSOLUTE MAXIMUM RATINGS⁴

$V_{a(b)}$ max.	400	V
V_a max.	200	V
V_{g3} max.	30	V
$-V_{g3}$ max.	55	V
$V_{g2(b)}$ max.	310	V
V_{g2} max.	155	V
p_a max.	1.65	W
p_{g2} max.	550	mW
R_{g1-k} max.	4.0	M Ω ←
I_k max.	20	mA
V_{h-k} max.	100	V
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	450	g
T_{bulb} max.	165	°C

TEST CONDITIONS (unless otherwise specified)

V_h (V)	V_a (V)	V_{g3} (V)	V_{g2} (V)	V_{g1} (V)	R_k (Ω)	V_{h-k} (V)
6.3	120	0	120	-2.0	0	0

TESTS

GROUP A

	A.Q.L. ⁵ (%)		Individuals ⁶		Lot average ⁷		Lot standard deviation ⁸ Max.	
	Bogey ⁹	Min.	Max.	Min.	Max.	Min.	Max.	
Heater current	{ 0.65 — }	175	160	190	—	168	182	— 4.87
Heater-to-cathode leakage current $V_{h-k} = \pm 100V$	0.65	—	—	10	—	—	—	μA
Reverse grid current, $R_{g1} = 100k\Omega$	0.65	—	0	0.1	—	—	—	μA
Anode current	{ 0.65 — }	5.2	2.5	9.0	—	4.2	6.2	— 0.8
Mutual conductance	{ 0.65 — }	3.2	2.5	4.5	—	2.9	3.5	— 0.26
Sub-group quality level ¹⁰	1.0	—	—	—	—	—	—	mA/V
Inoperatives ¹⁶	0.4	—	—	—	—	—	—	mA/V

GROUP B

Insulation

a-rest, measured at -300V
g₁-rest, measured at -100V
g₃-rest, measured at -300V

} 2.5 {	—	100	—	—	—	—	—	M Ω
	—	100	—	—	—	—	—	M Ω
	—	100	—	—	—	—	—	M Ω

Anode current								
$V_{g1} = -3V, V_{g3} = -10V$	2.5	—	—	200	—	—	—	μA
$V_{g1} = -3V, V_{g3} = -6V$	2.5	—	5.0	—	—	—	—	μA
$V_{g1} = -8V$	2.5	—	—	200	—	—	—	μA
$V_{g1} = -6V$	2.5	—	5.0	—	—	—	—	μA
Screen-grid current								
Change in mutual conductance, $V_h = 5.7V$	2.5	—	1.5	5.5	—	—	—	mA
Reverse grid current	2.5	—	—	15	—	—	—	%
$V_h = 7.5V, V_{g1} = -10V, R_{g1} = 100k\Omega$	2.5	—	0	1.0	—	—	—	μA
†R.F. noise at anode, $V_{g1} = 0V, R_k = 200\Omega, V_{sig} = 15mV, C_k = 0.2\mu F$	2.5	—	—	—	—	—	—	
Vibration, 2.5g min. peak acceleration, $f = 50c/s, R_a = 10k\Omega$								
Mutual conductance (g _a -a), $V_{g3} = -3V$	6.5	—	—	150	—	—	—	mV
Mutual conductance (g ₁ -a), $V_{g3} = -5V$	6.5	—	0.35	1.05	—	—	—	mA/V
Capacitances ² (shielded). No applied voltages	6.5	—	0.7	1.7	—	—	—	mA/V
C_{in}	—	—	—	—	—	—	—	pF
C_{out}	—	—	3.5	4.5	—	—	—	pF
C_{a-g1}	—	—	2.6	3.4	—	—	—	mpF
Low pressure voltage breakdown Pressure = $55 \pm 5mm$ Hg								
Voltage = $500V_{r.m.s.}$. . No other applied voltages.	6.5	—	—	—	—	—	—	
Microphonic noise at the anode at 50c/s, 15g min. peak acceleration, $V_{a(b)} = V_{g2(b)} = 200V, R_a = 100k\Omega, R_{g2} = 500k\Omega, C_{g2} = 2\mu F, V_{g1} = 0V, R_k = 1k\Omega, C_k = 1000\mu F, V_{g(sig)} = 175mV$	2.5	—	—	—	—	—	—	

†The valve is tapped with a specified hammer and the output observed on a meter of specified dynamic response.

TESTS

GROUP C

Base strain test¹²

Glass strain test^{11B}. No applied voltages

Fatigue¹⁴

$V_h = 6.3V$. No other voltage applied.
2.5g min. peak acceleration, fixed frequency
 $f = 25c/s$ min. 60c/s max. for 32 hours in
each of 3 mutually perpendicular planes.

Post fatigue tests

Heater-to-cathode leakage current

$V_{h-k} = \pm 100V$

Mutual conductance

Reverse grid current, $R_{g1} = 100k\Omega$

Vibration as in group B

Sub-group quality level¹⁰

Shock¹⁵

$V_{h-k} = 100V$, No other applied
voltages, 500g.

Post shock tests

Heater-to-cathode leakage current

$V_{h-k} = \pm 100V$

Mutual conductance

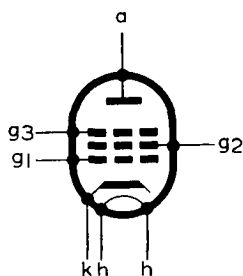
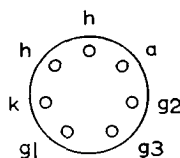
Reverse grid current, $R_{g1} = 100k\Omega$

Vibration as in group B

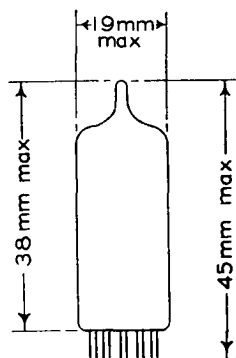
A.Q.L. ⁵ (%)	Individuals ⁶		Lot average ⁷		Lot standard deviation ⁸ Max.
	Bogey ⁹	Min.	Max.	Min.	
—	—	—	—	—	—
2.5	—	—	—	—	—
—	—	—	—	—	μA
—	—	—	—	—	mA/V
—	—	—	—	—	μA
—	—	—	—	—	mV
6.5	—	—	—	—	—
—	—	—	—	—	μA
—	—	—	—	—	mA/V
—	—	—	—	—	μA
—	—	—	—	—	mV
—	—	—	—	—	—
—	—	—	—	—	μA
—	—	—	—	—	mA/V
—	—	—	—	—	μA
—	—	—	—	—	mV
—	—	—	—	—	—



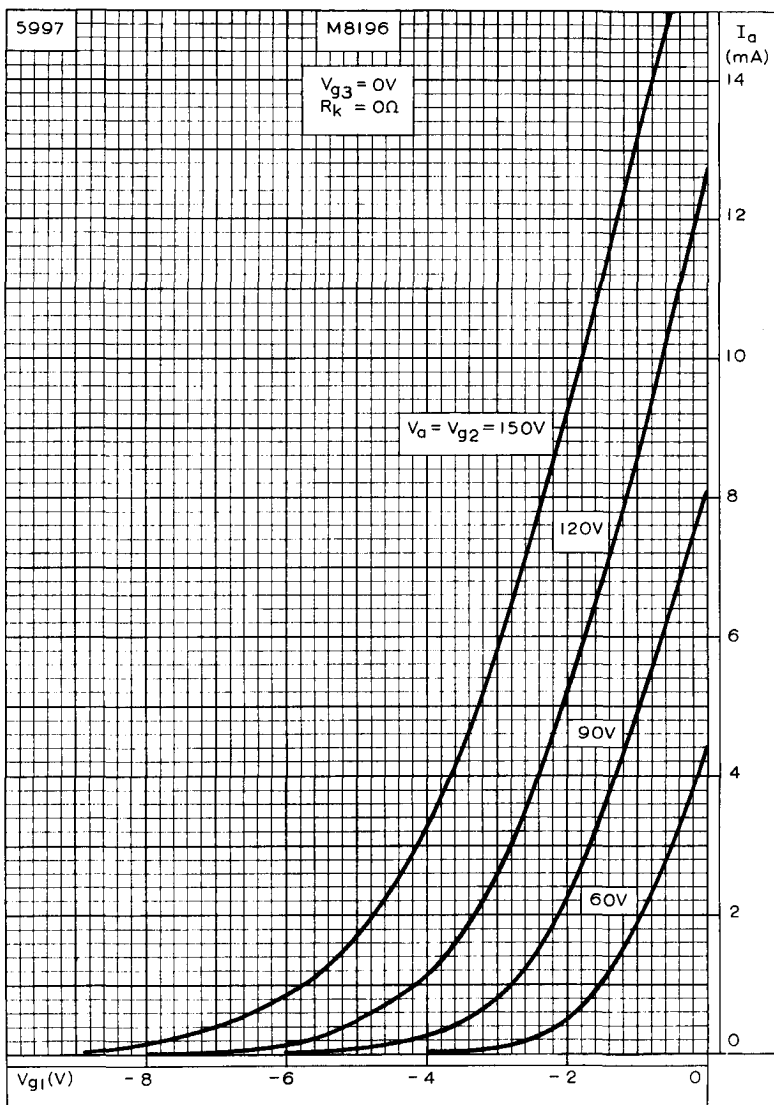
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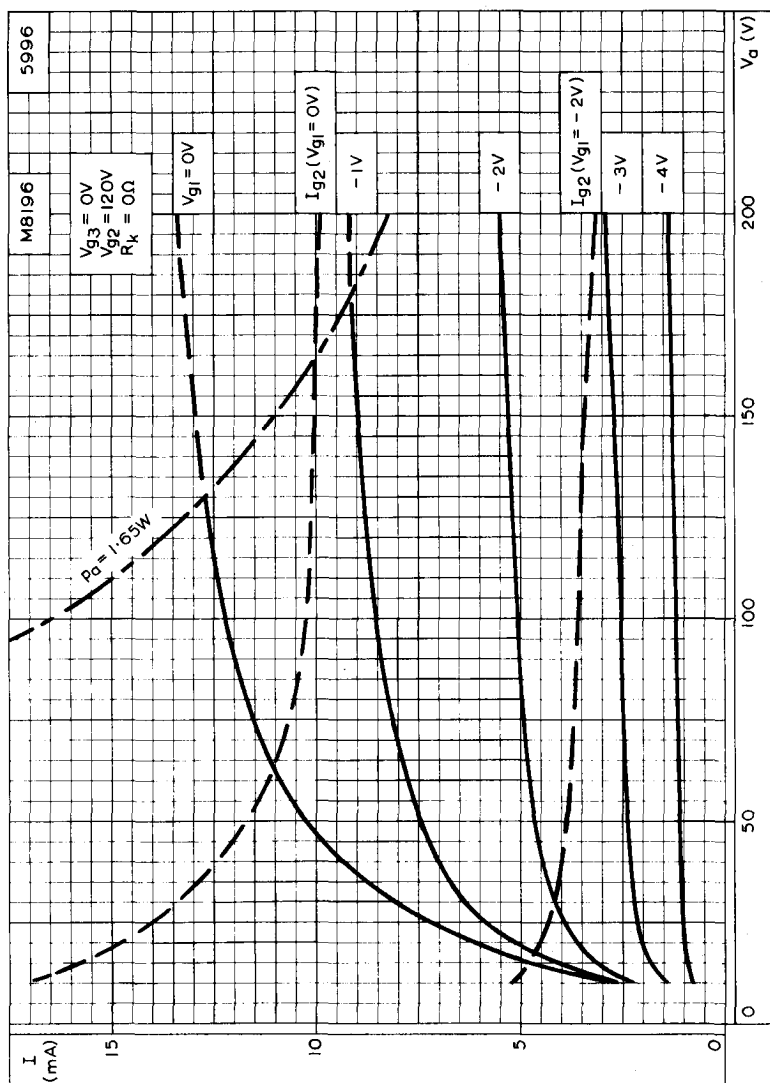
B7G Base



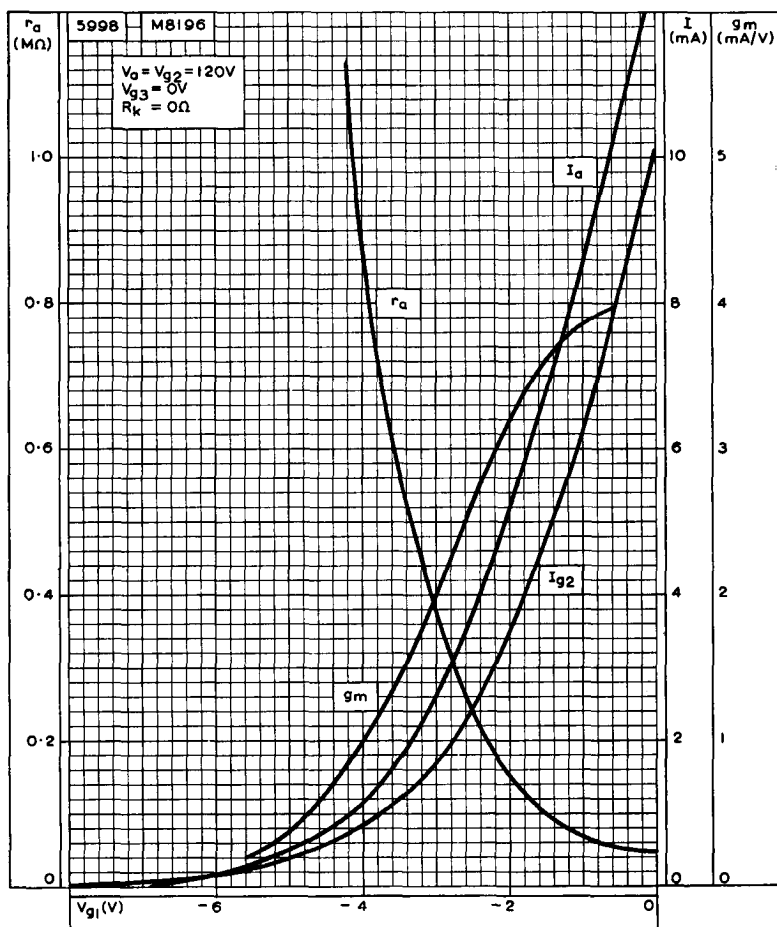
The bulb and base dimensions of this valve are in accordance with BS448, Section B7G.



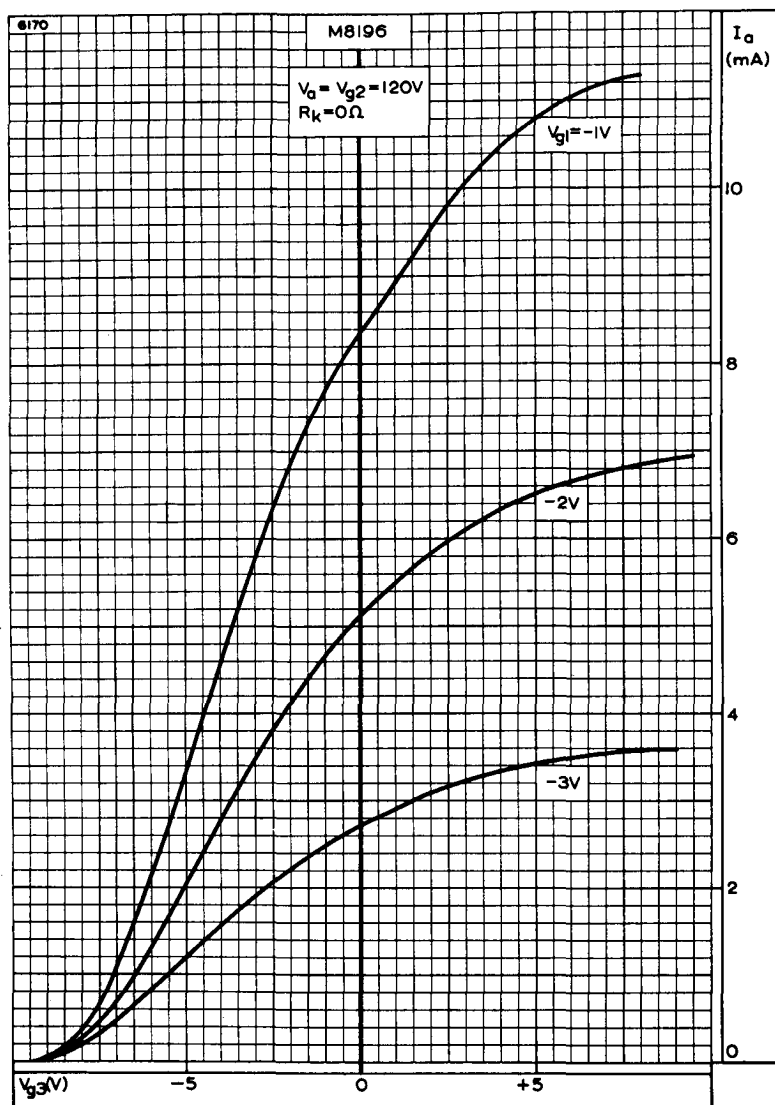
ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE WITH ANODE AND SCREEN-GRID VOLTAGES AS PARAMETER



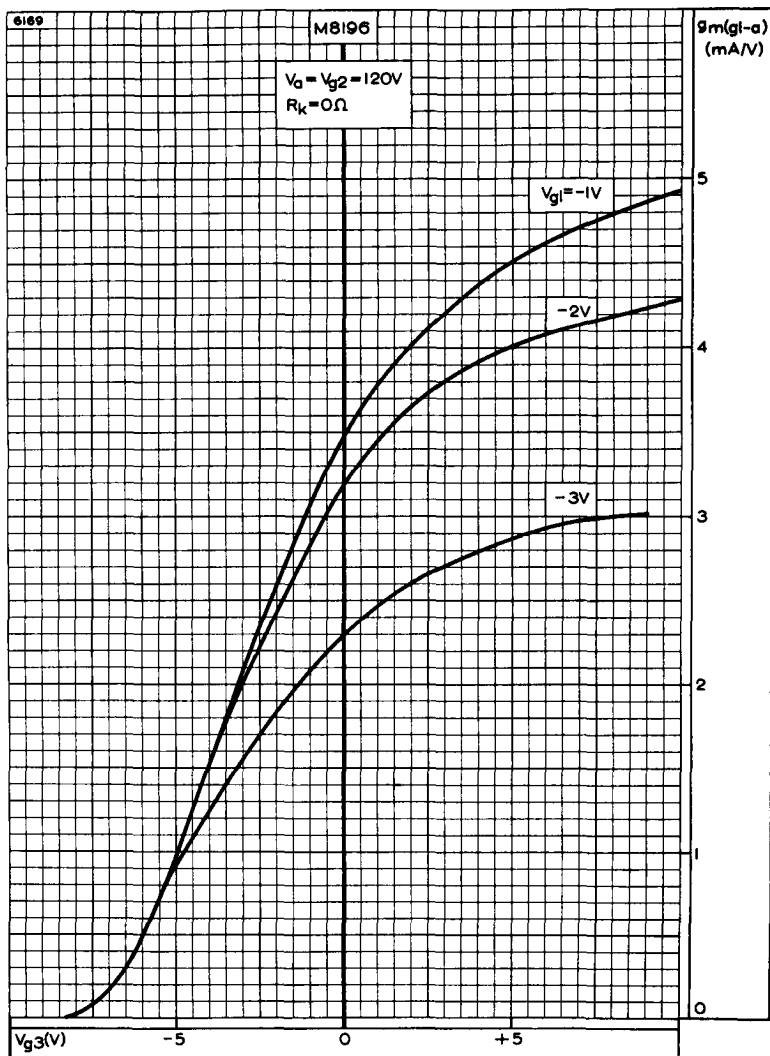
ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER



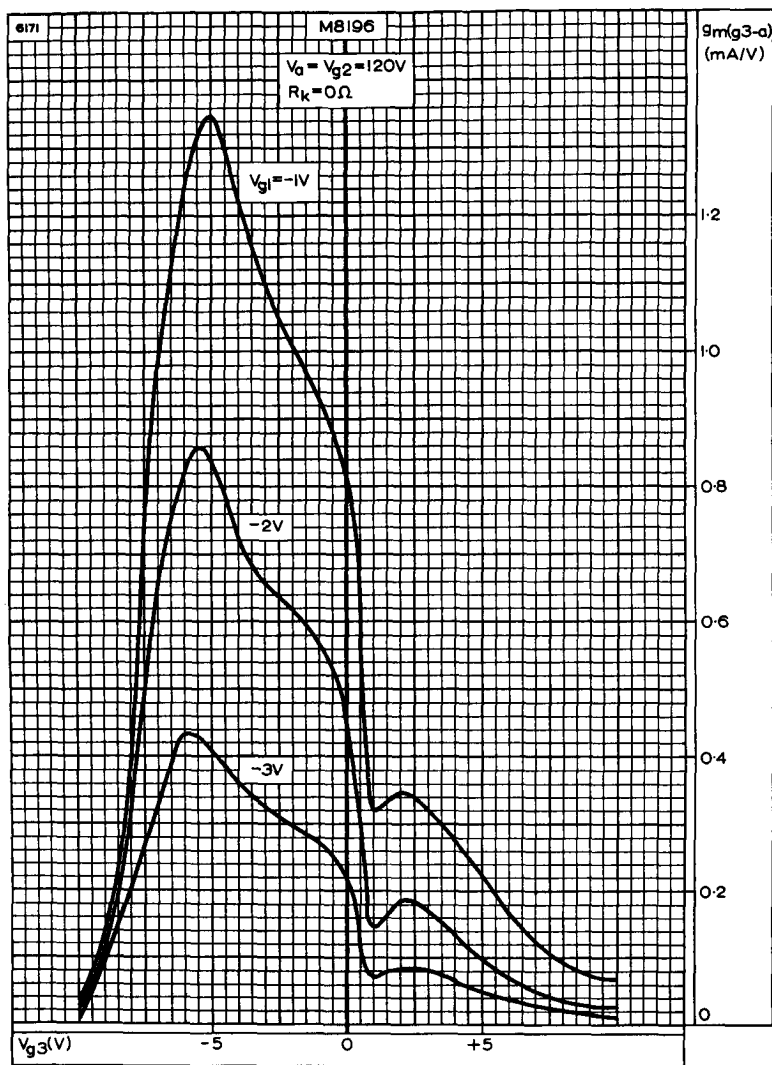
ANODE AND SCREEN-GRID CURRENTS, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE



ANODE CURRENT PLOTTED AGAINST SUPPRESSOR-GRID VOLTAGE
WITH CONTROL-GRID VOLTAGE AS PARAMETER



MUTUAL CONDUCTANCE (g_{1-a}) PLOTTED AGAINST SUPPRESSOR-GRID VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER



MUTUAL CONDUCTANCE (g_{3-a}) PLOTTED AGAINST SUPPRESSOR-GRID VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER