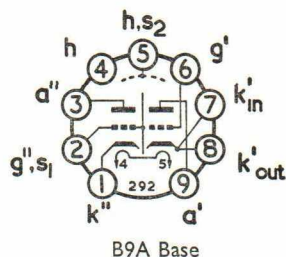


V.H.F. CASCODE DOUBLE TRIODE



GENERAL

This valve is a variable-mu double triode for use as a cascode R.F. amplifier in V.H.F. television tuners. Frame grids are used giving high gain and low noise while good stability has been achieved by careful arrangement of internal shielding and connections.

Heater Current	I_h	0.3	A
Heater Voltage	V_h	7.2	V

RATINGS

Maximum Anode Dissipation (Either section)	$P_a(\text{max})$	1.6	W
Maximum Anode Voltage (Each section)	$V_a(\text{max})$	150	V
Maximum Negative Grid Voltage (Each section)	$V_g(\text{max})$	50	V
Maximum Heater to Cathode' Voltage	$V_{h-k'}(\text{max})$	90*	V
Maximum Heater to Cathode'' Voltage (Heater Positive)	$V_{h-k''}(\text{max})$	90*	V
Maximum Peak Heater to Cathode'' Voltage (Heater Negative)	$V_{h-k''}(\text{pk})\text{max}$	250*†	V
Maximum Cathode Current (Each section)	$I_k(\text{max})$	18	mA
Maximum Grid' to Cathode' Resistance	$R_{g'-k'}(\text{max})$	1	MΩ
Maximum Effective Grid'' to Earth Resistance	$R_{g''-E}(\text{max})$	150‡	kΩ
Maximum Grid'' to Cathode'' Resistance	$R_{g''-k''}(\text{max})$	22¶	kΩ

INTER-ELECTRODE CAPACITANCES

			**	††	
Grid' to Cathode', Heater, Shields, Grid''	$C_{g'-k',h,s,g''}$	4.1	4.5	5.5	pF
Anode'' to Grid'', Shields, Heater, Cathode'	$C_{a''-g'',s,h,k'}$	3.3	3.8	4.8	pF
Anode' to Cathode', Heater, Shields, Grid''	$C_{a'-k',h,s,g''}$	1.8	2.0	2.9	pF
Cathode'' to Grid'', Shields, Heater, Cathode'	$C_{k''-g'',s,h,k'}$	6.3	6.7	7.5	pF
Anode' to Grid'	$C_{a'-g'}$	1.6	1.6	1.6	pF
Anode'' to Cathode''	$C_{a''-k''}$	.17	.18	.2	pF
Anode' to Anode''	$C_{a'-a''}$	.0025	.0065	.0085	pF
Grid' to Anode''	$C_{g'-a''}$	.003	.0095	.013	pF

NOTES

* Measured with respect to the higher potential heater pin.

† Maximum D.C. component—180V.

‡ With potentiometer bias from H.T. line.

¶ Grid current bias.

// In fully-shielded socket with cylindrical screen can (I.E.C. Publication 100).

** With holder capacitance balanced out but with cylindrical can (Holder as below).

†† Total capacitance including ceramic B9A holder with cylindrical screen (Plessey holder type CP.180024/3).

CHARACTERISTICS

		Section 1	Section 2	
Anode Voltage	V_a	75	75	V
Anode Current	I_a	15	15	mA
Amplification Factor (approx)	μ	40	40	
Mutual Conductance	g_m	16.5	16.5	mA/V
Valve Anode Resistance ($\delta V_a / \delta I_a$)	r_a	2.4	2.4	k Ω
Input Resistance at 50 Mc/s	$r_{in'}(50 \text{ Mc/s})$	10.5 $\pm\frac{1}{2}$		k Ω
Input Capacitance at 50 Mc/s (Working)	$C_{in'}(w)50 \text{ Mc/s.}$	7.9**		pF
Change of Input Capacitance produced by biasing valve to cut-off	$\Delta C_{in'}(w)$	2.4		pF

TYPICAL CASCODE OPERATION

Cathode Bias. See circuit 1 on page 3

Supply Voltage	$V_{a(b)}$	200	V
Anode" Decoupling Resistor		820	Ω
Anode Current	I_a	14.8	mA
Combined Mutual Conductance ($\Delta I_a / \Delta V_{g'}$)	g_m	14.5	mA/V
Bias Voltage to give combined Mutual Conductance 100 : 1 reduction (approx)		-8.0	V
Cathode' Self Bias Resistor	$R_{k'}$	82	Ω

Grid Current Bias. See circuit 2 on page 3

Supply Voltage	$V_{a(b)}$	200	V
Anode" Decoupling Resistor		3.9	k Ω
Grid' Current Bias Resistor	$R_{g'}$	560	k Ω
Anode Current	I_a	15.8	mA
Combined Mutual Conductance ($\Delta I_a / \Delta V_{g'}$)	g_m	18.3	mA/V
Bias Voltage to give combined Mutual Conductance 100 : 1 reduction (approx)		-8.2	V

Grid Current Bias with Delay. See circuit 3 on page 4

Supply Voltage	$V_{a(b)}$	200	V
Anode" Decoupling Resistor		3.9	k Ω
Grid' Current Bias Resistor	$R_{g'}$	560	k Ω
Anode Current	I_a	15	mA
Combined Mutual Conductance ($\Delta I_a / \Delta V_{g'}$)	g_m	19	mA/V
Bias Voltage to give combined Mutual Conductance 100 : 1 reduction (approx)		-11.5	V

NOTES

In operation pin 5 must be decoupled to earth (Ch-E > 500pF).

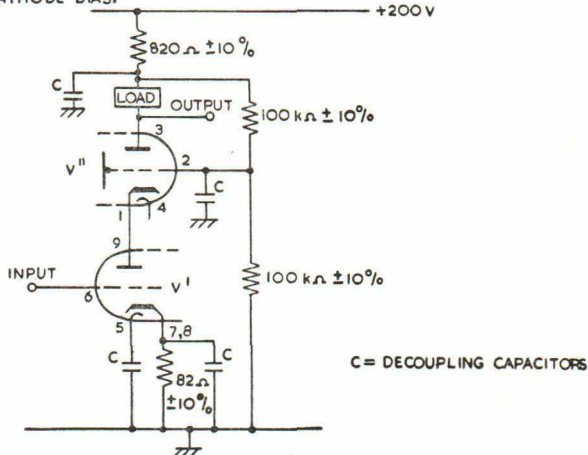
** With holder capacitance balanced out but with cylindrical screen can (Ceramic B9A holder).

‡‡ Cathode pins 7 and 8 strapped. Anode short circuited (see Page 11).

MOUNTING POSITION—Unrestricted

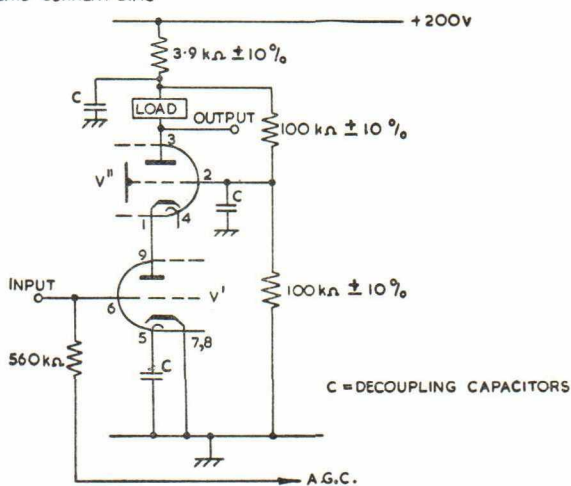
CIRCUIT 1

VALVE SECTION I CATHODE BIAS.



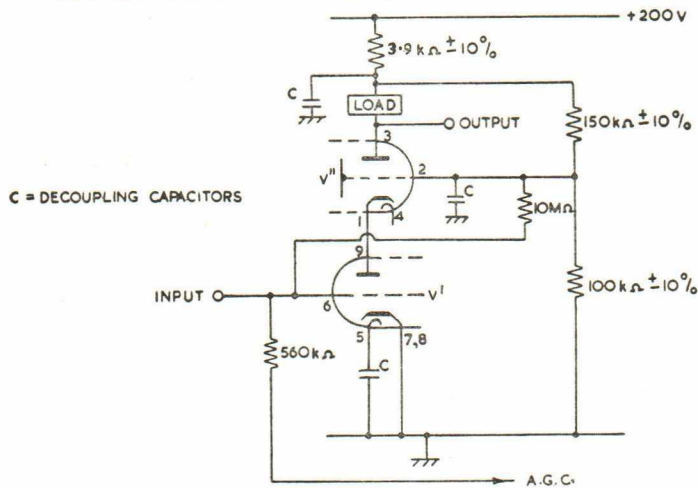
CIRCUIT 2

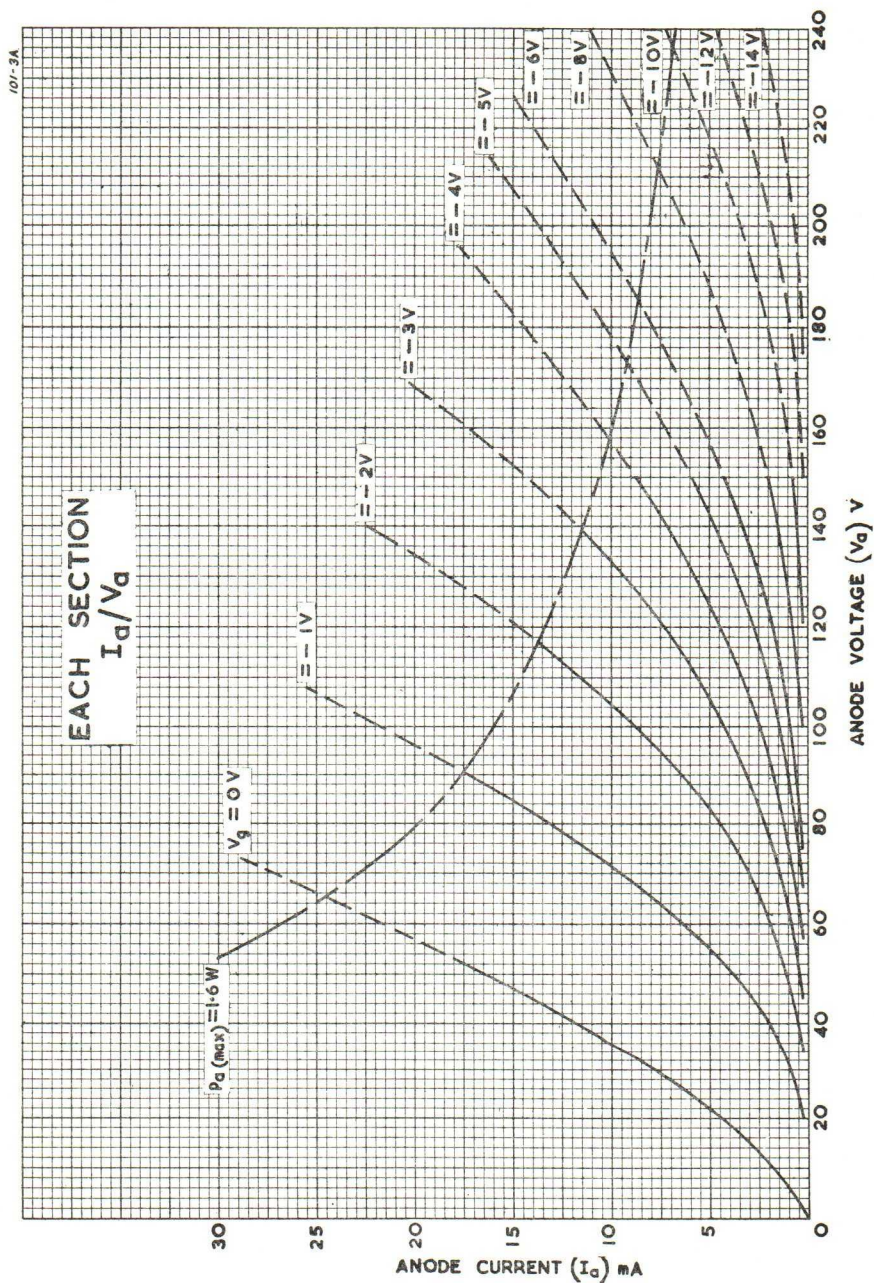
VALVE SECTION I GRID CURRENT BIAS

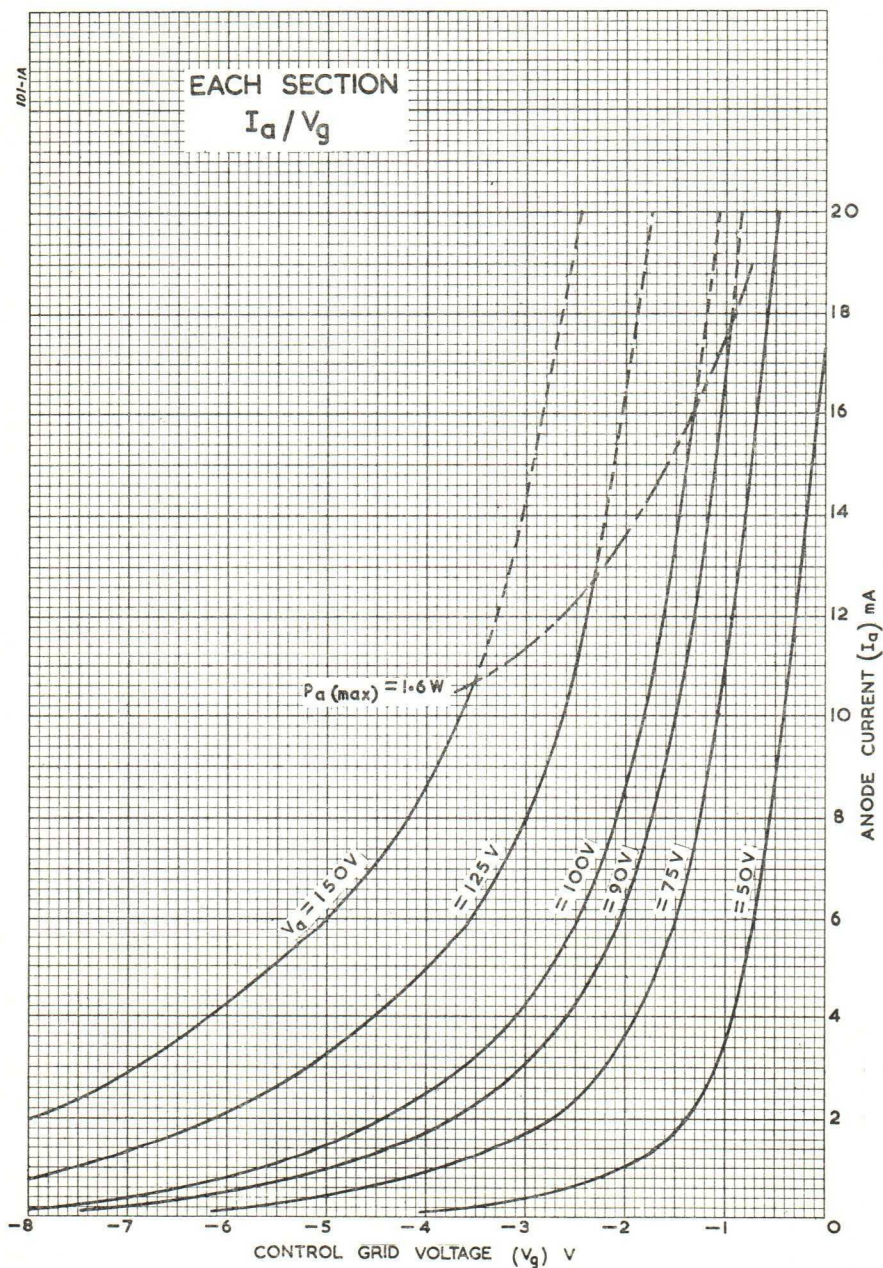


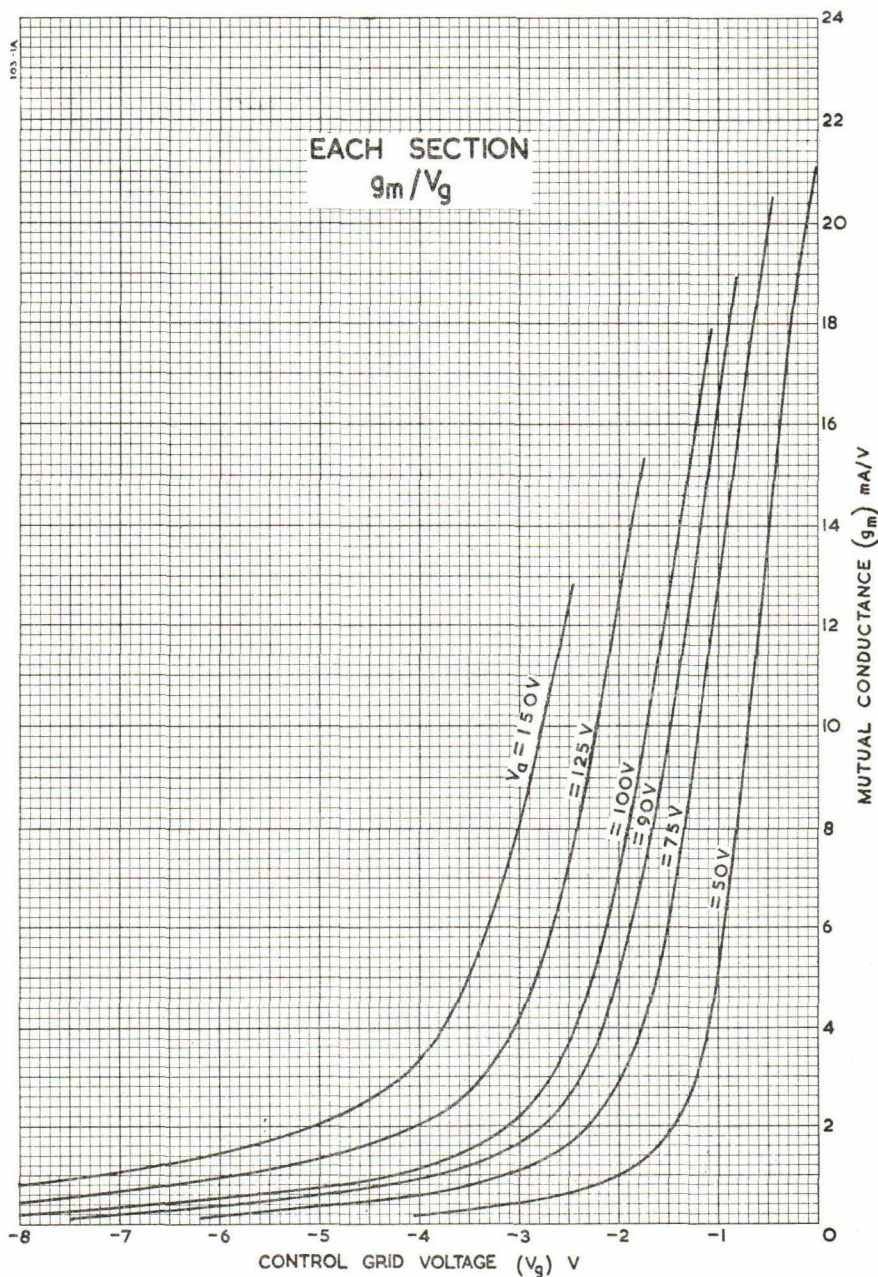
CIRCUIT 3

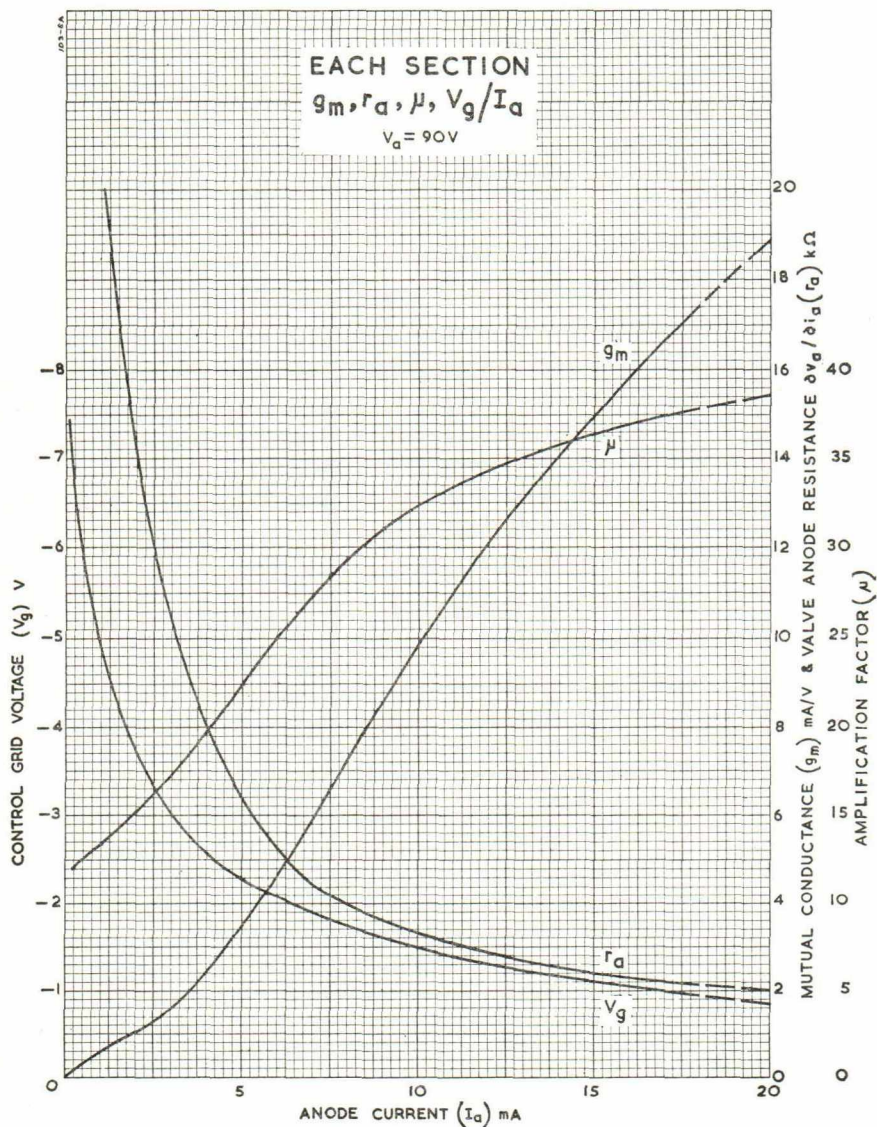
VALVE SECTION I GRID CURRENT BIAS, WITH DELAY











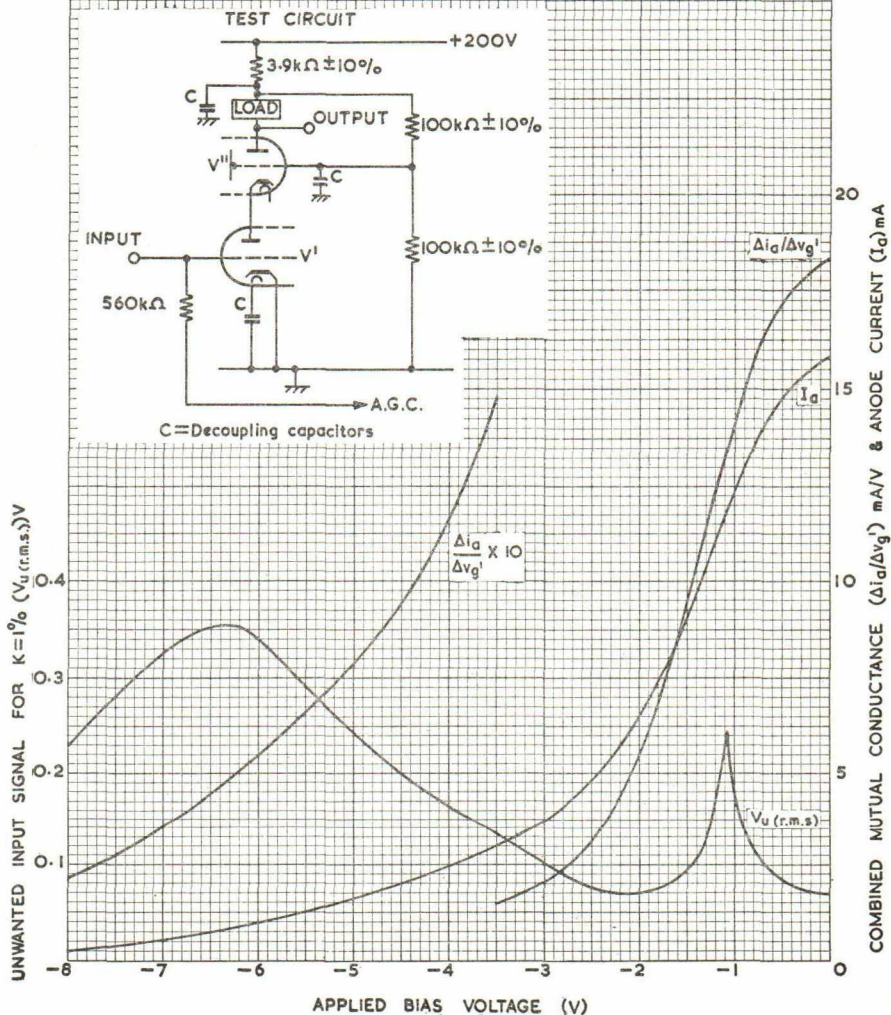
20G-2A

CROSS MODULATION

GRID CURRENT BIAS OPERATION.

R_L m K
5k Ω 30% 1%

Where $K = \frac{m_u}{m}$ = cross modulation factor, m_u is the percentage modulation acquired by an originally unmodulated wanted signal, due to the presence on the same grid of an unwanted signal modulated m percent.



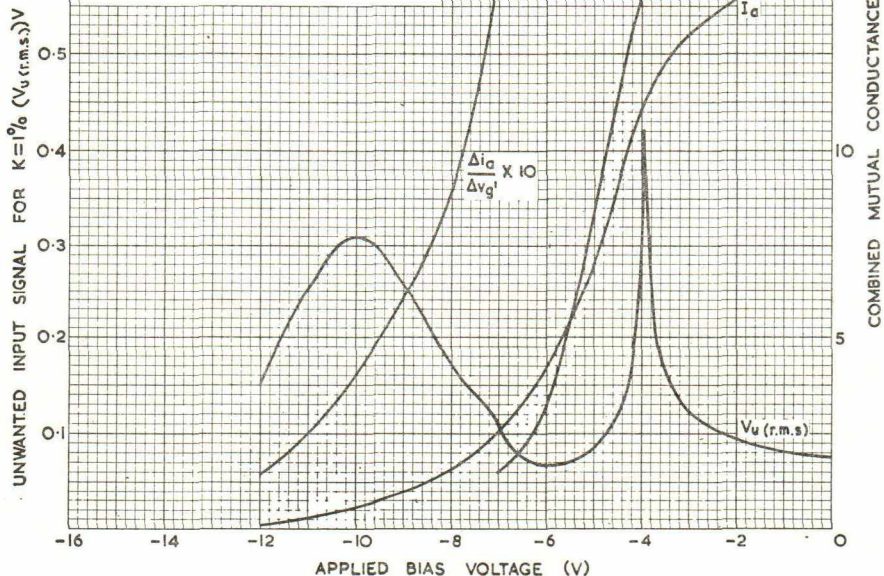
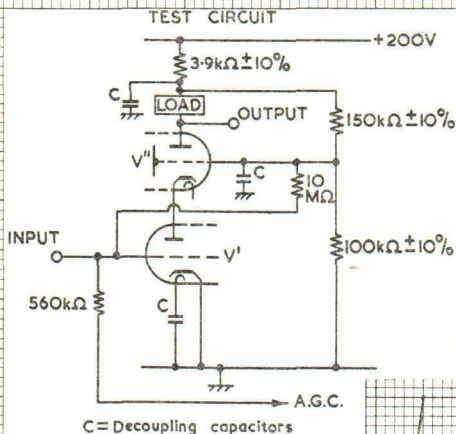
206-3A

CROSS MODULATION

GRID CURRENT BIAS OPERATION WITH DELAY

R_L m K
5k Ω 30% 1%

Where $K = \frac{m_u}{m}$ = cross modulation factor, m_u is the percentage modulation acquired by an originally unmodulated wanted signal, due to the presence on the same grid of an unwanted signal modulated m percent.



106-6

