

Triode heptode primarily intended for use as a frequency changer.

HEATER

Suitable for series or parallel operation, a.c. or d.c.

V_h	6.3	V
I_h	300	mA

CAPACITANCES

c_{ah-at}	200	mpF
c_{ah-gt}	<90	mpF
$c_{ah-(g3+gt)}$	<350	mpF
c_{g1-at}	<60	mpF
c_{g1-gt}	<170	mpF
$c_{g1-(g3+gt)}$	<450	mpF

Heptode section

$c_{in(g1)}$	4.8	pF
$c_{in(g3)}$	6.0	pF
c_{out}	7.9	pF
c_{a-g1}	<6.0	mpF
c_{g1-g3}	<300	mpF
c_{g1-h}	<170	mpF
c_{g3-h}	<60	mpF

Triode section

c_{in}	2.6	pF
c_{out}	2.1	pF
c_{a-g}	1.0	pF
c_{g-h}	<20	mpF

OPERATING CONDITIONS OF HEPTODE SECTION AS R. F. OR I. F. AMPLIFIER ←

V_b	250	250	V
V_a	160	248	V
V_{g3}	0	0	V
$R_{g2 + g4}$	22	22	k Ω
* V_{g1}	-	-35	V
$V_{g2 + g4}$	96	245	V
I_a	11	-	mA
$I_{g2 + g4}$	7	-	mA
I_{g1}	0.5	-	μ A
g_m	4500	45	μ A/V
r_a	0.24	>10	M Ω
μ_{g2-g1}	25	-	
R_{eq}	4.5	-	k Ω
R_a	8.2	8.2	k Ω
$R_{g2 + g4}$	22	22	k Ω

*Operating with grid current bias as obtained with $R_{g1-k} = 1M\Omega$ and with zero a.g.c. volts; resulting $V_{g1} = -500mV$.

OPERATING CONDITIONS OF HEPTODE SECTION AS A.M. FREQUENCY CHANGER* ←

V_b	250	250	V
V_a	225	240	V
$R_{g2 + g4}$	22	22	k Ω
$R_{g3 + gt}$	47	47	k Ω
V_{g1}	-	-28	V
$V_{g2 + g4}$	78	235	V
I_a	3.3	-	mA
$I_{g2 + g4}$	7.8	-	mA
$I_{g3 + gt}$	200	200	μ A
** I_{g1}	0.5	-	μ A
g_c	1100	11	μ A/V
R_a	8.2	8.2	k Ω
R_{eq}	30	-	k Ω

*Triode operating with $V_b = 250V$, $R_a = 33k\Omega$ and $V_{osc} (r.m.s.) = 8V$.

**Operating with grid current bias as obtained with $R_{g1-k} = 1M\Omega$ and with a.g.c. volts; resulting $V_{g1} = -500mV$.

CHARACTERISTICS

Triode section

V_a	100	V
I_a	13.5	mA
V_g	0	V
g_m	3.7	mA/V
μ	22	
r_a	6.0	k Ω
V_g max. ($I_g = +0.3\mu A$)	-1.3	V

Heptode section

V_a	160	V
V_{g3}	0	V
V_{g2+g4}	100	V
I_{g1}	0.5	μA
V_{g1}	-0.5	V
I_a	11	mA
I_{g2+g4}	7	mA
g_m	4.5	mA/V
μ_{g2-g1}	25	

OPERATING CONDITIONS OF TRIODE SECTION AS R.F. OSCILLATOR

V_b	250	V
R_{at}	33	k Ω
R_{gt+g3}	47	k Ω
I_{gt+g3}	200	μA
I_{at}	4.5	mA
g_m (eff)	650	$\mu A/V$

RATINGS (ABSOLUTE MAXIMUM SYSTEM)

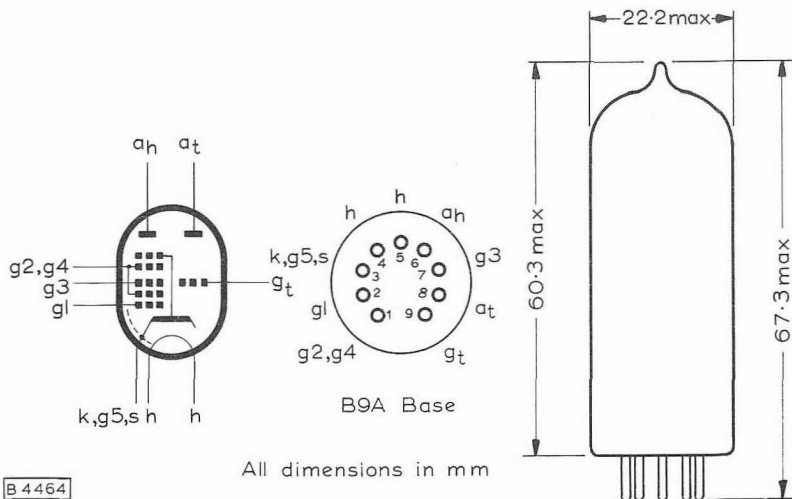
Triode section

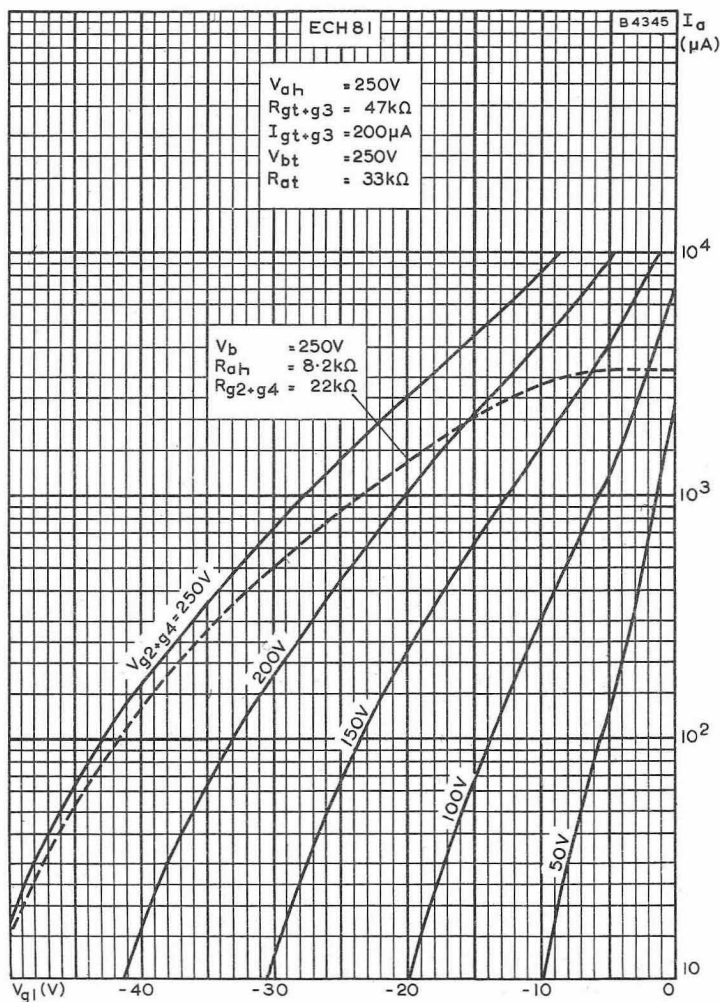
$V_{a(b)}$ max.	550	V
V_a max.	250	V
p_a max.	800	mW
I_k max.	6.5	mA
R_{g-k} max.	3.0	M Ω
V_{h-k} max.	100	V
R_{h-k} max.	20	k Ω

Heptode section

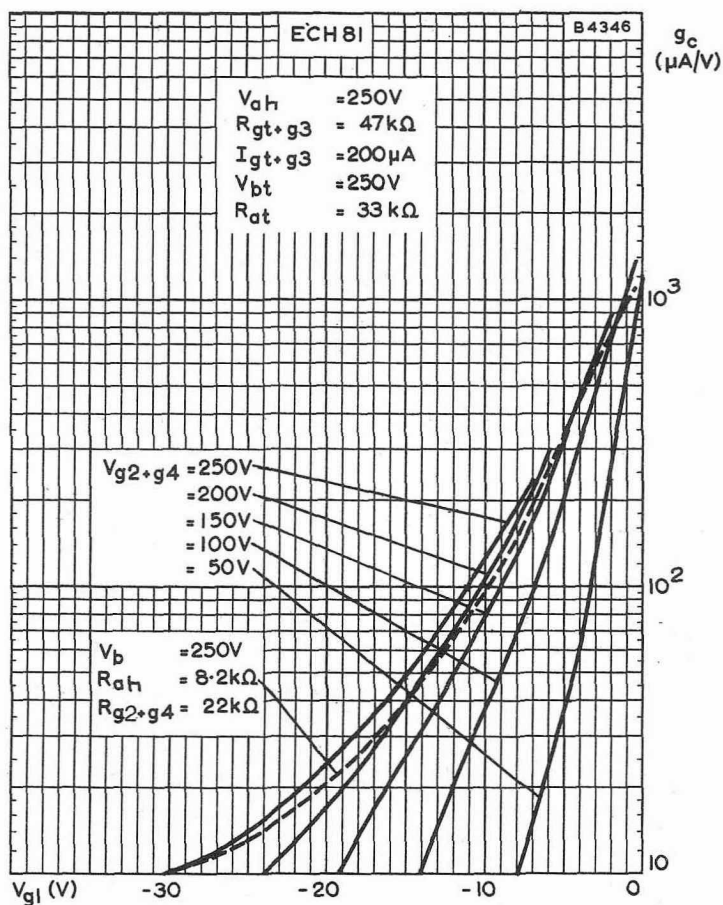
$V_{a(b)} \text{ max.}$	550	V
$V_a \text{ max.}$	300	V
$p_a \text{ max.}$	2.0	W←
$V_{g2+g4(b)} \text{ max.}$	550	V
$V_{g2+g4} \text{ max.}$	125	V
$V_{g2+g4} \text{ max. (} I_a < 1\text{mA)}$	300	V
$p_{g2+g4} \text{ max.}$	0.8	W←
$I_k \text{ max.}$	18	mA←
$R_{g1-k} \text{ max.}$	3.0	MΩ
$*R_{g3-k} \text{ max.}$	3.0	MΩ
$V_{h-k} \text{ max.}$	100	V
$R_{h-k} \text{ max.}$	20	kΩ

*If the two sections of the valve are switched during operation so that there is no direct connection between g_3 and g_t , as may occur in f.m./a.m. receivers, then $R_{g3-k} \text{ max.} = 20\text{k}\Omega$.

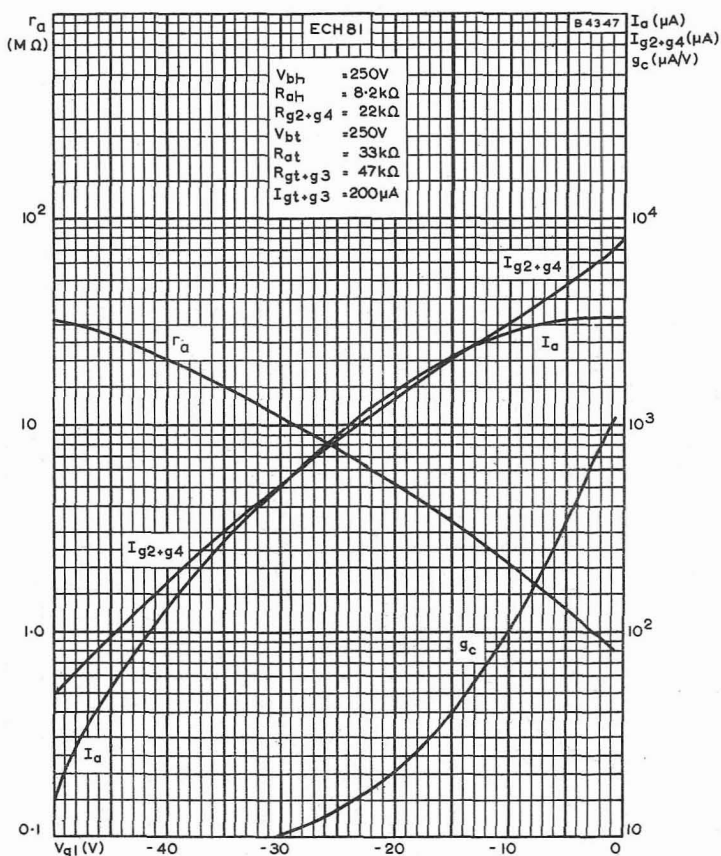




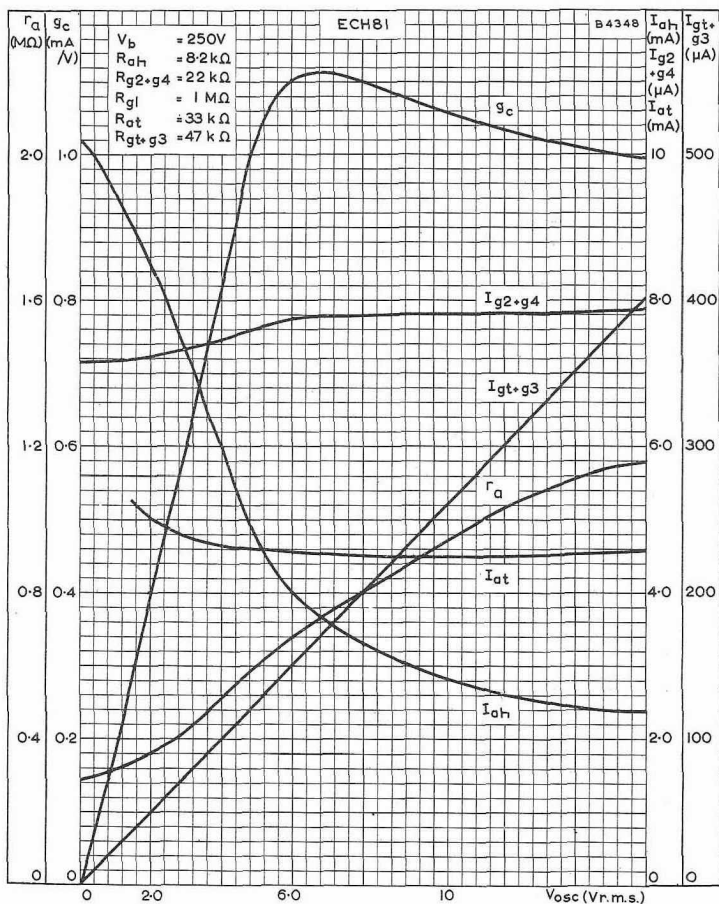
ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE WHEN
USED AS A FREQUENCY CHANGER



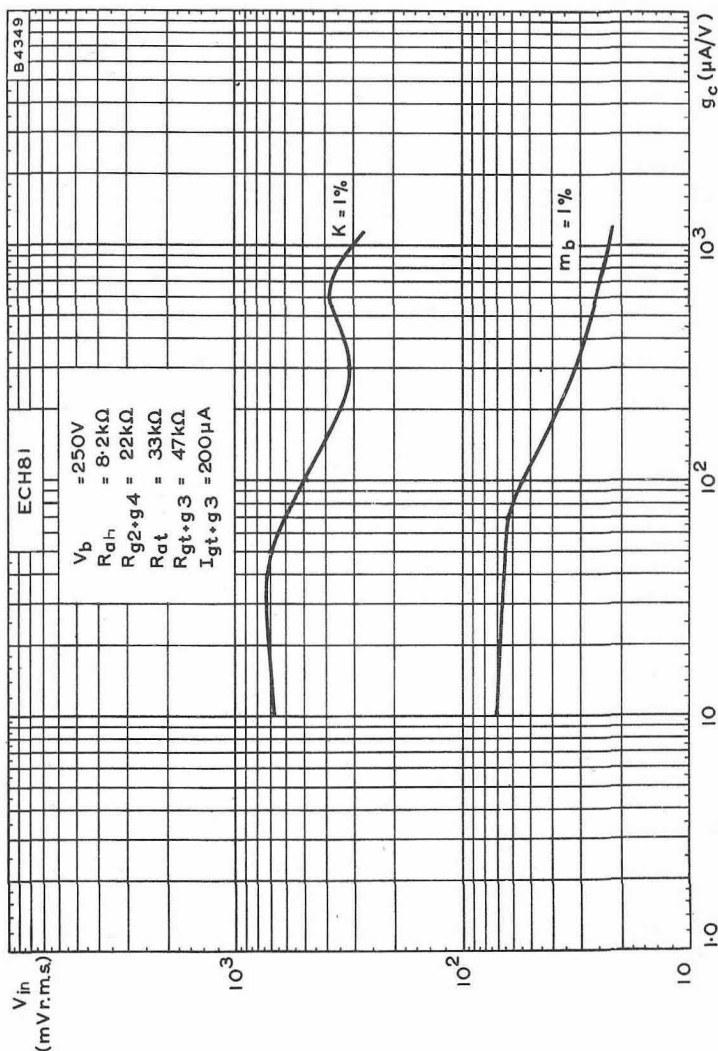
CONVERSION CONDUCTANCE PLOTTED AGAINST CONTROL-GRID
VOLTAGE WHEN USED AS A FREQUENCY CHANGER



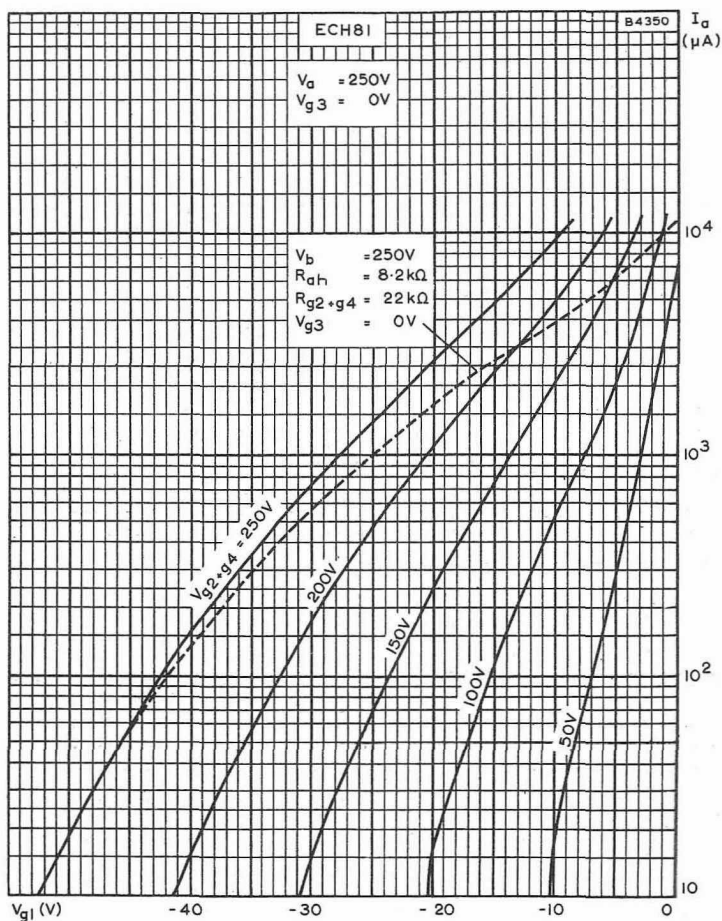
ANODE AND SCREEN-GRID CURRENTS, CONVERSION CONDUCTANCE
ANODE IMPEDANCE AND EQUIVALENT NOISE RESISTANCE PLOTTED
AGAINST CONTROL-GRID VOLTAGE WHEN USED AS A FREQUENCY
CHANGER



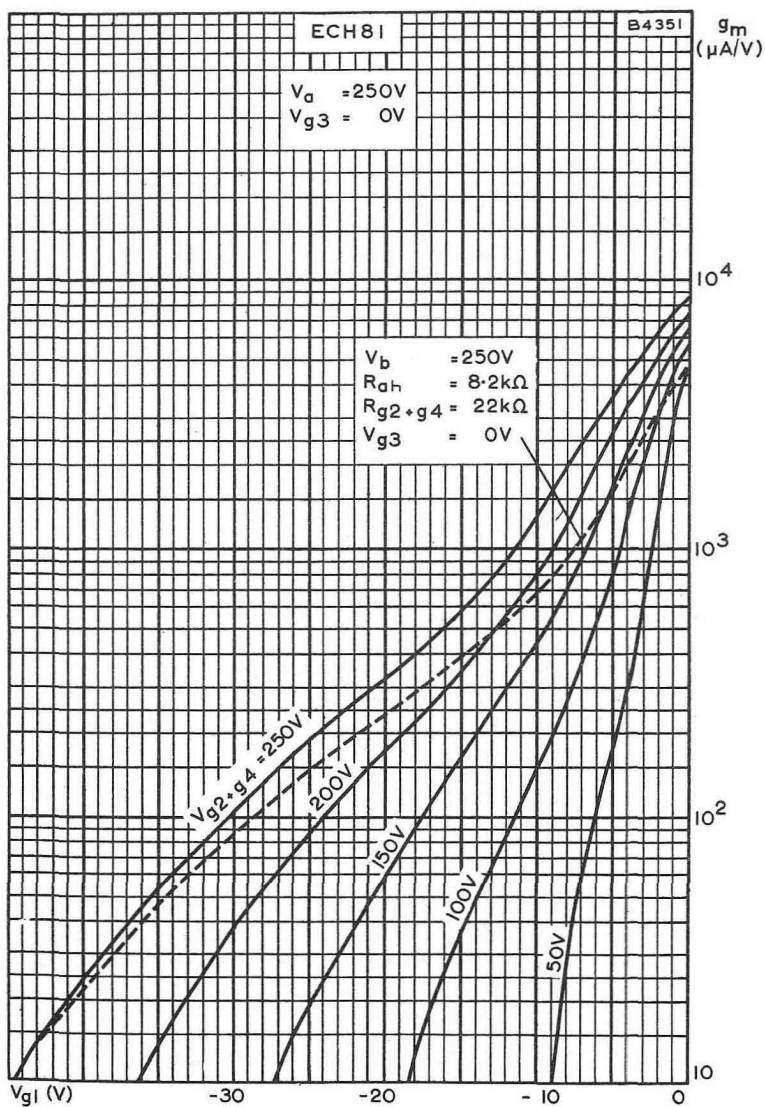
ANODE, SCREEN AND OSCILLATOR GRID CURRENTS, CONVERSION
CONDUCTANCE, AND EQUIVALENT NOISE RESISTANCE PLOTTED
AGAINST OSCILLATOR VOLTAGE



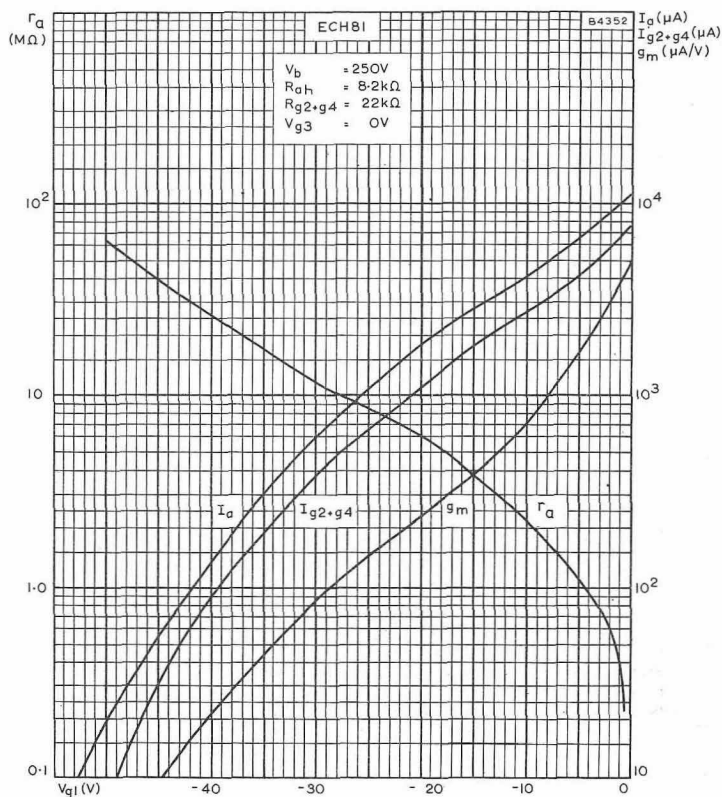
INDICATING THE R.M.S. VALUE OF THE VOLTAGE OF AN INTERFERING
SIGNAL AT THE GRID PRODUCING 1% CROSS AND HUM MODULATION
AS A FUNCTION OF THE CONVERSION CONDUCTANCE



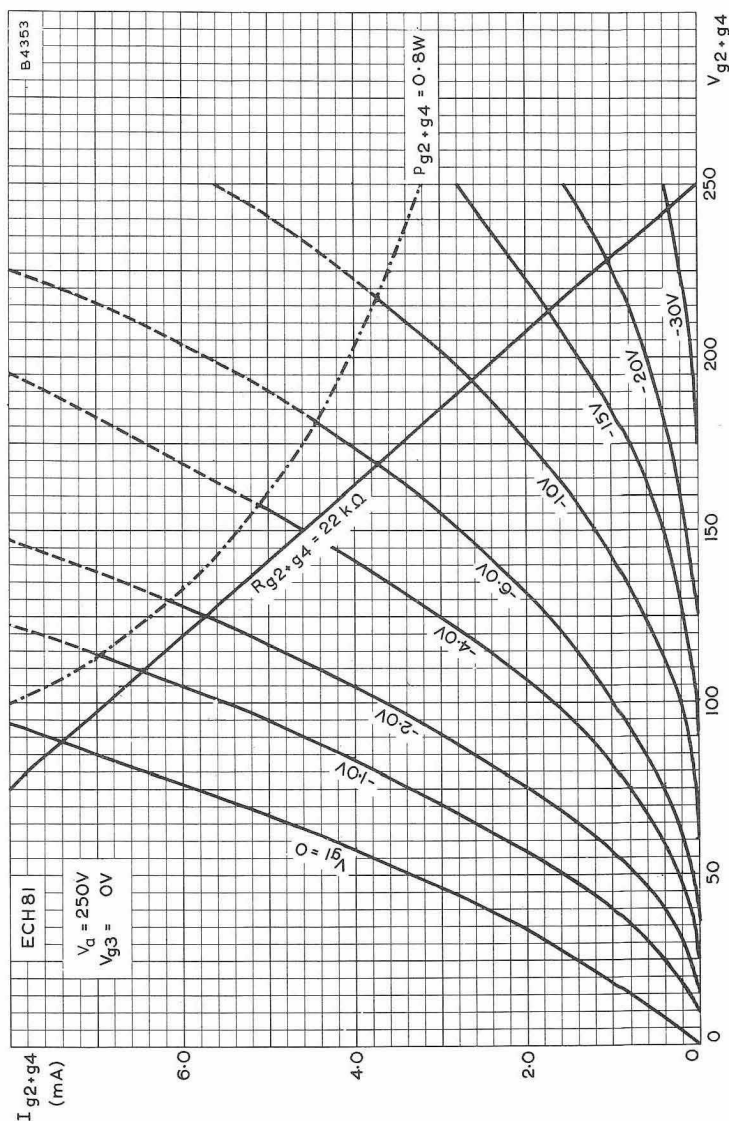
ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE FOR
HEPTODE SECTION



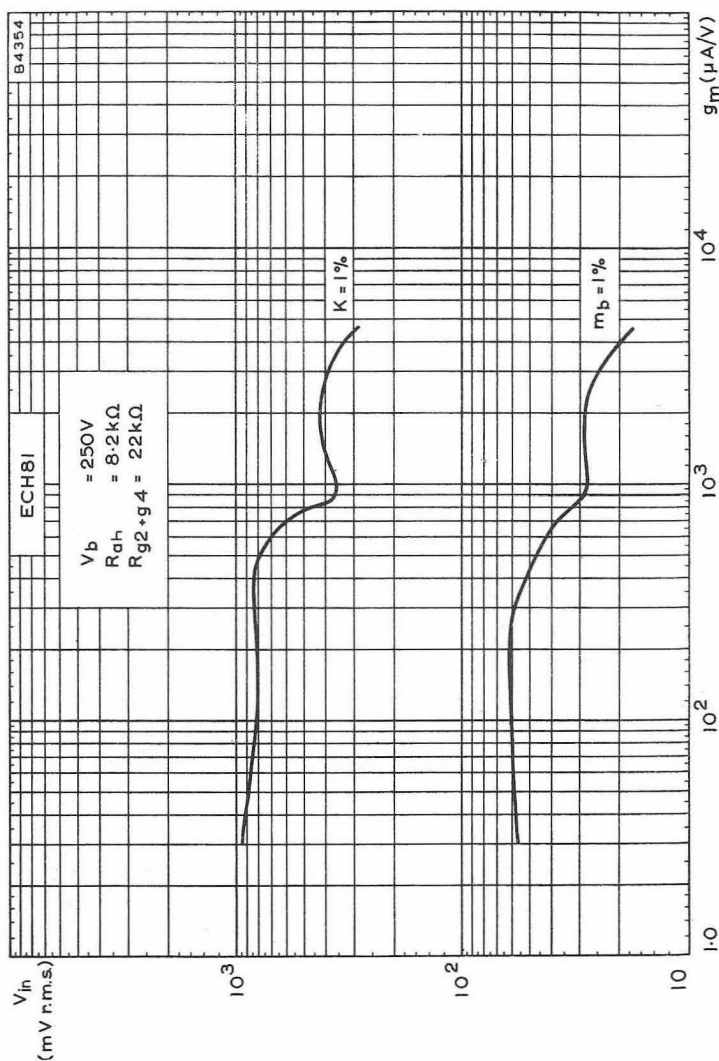
MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE
FOR HEPTODE SECTION



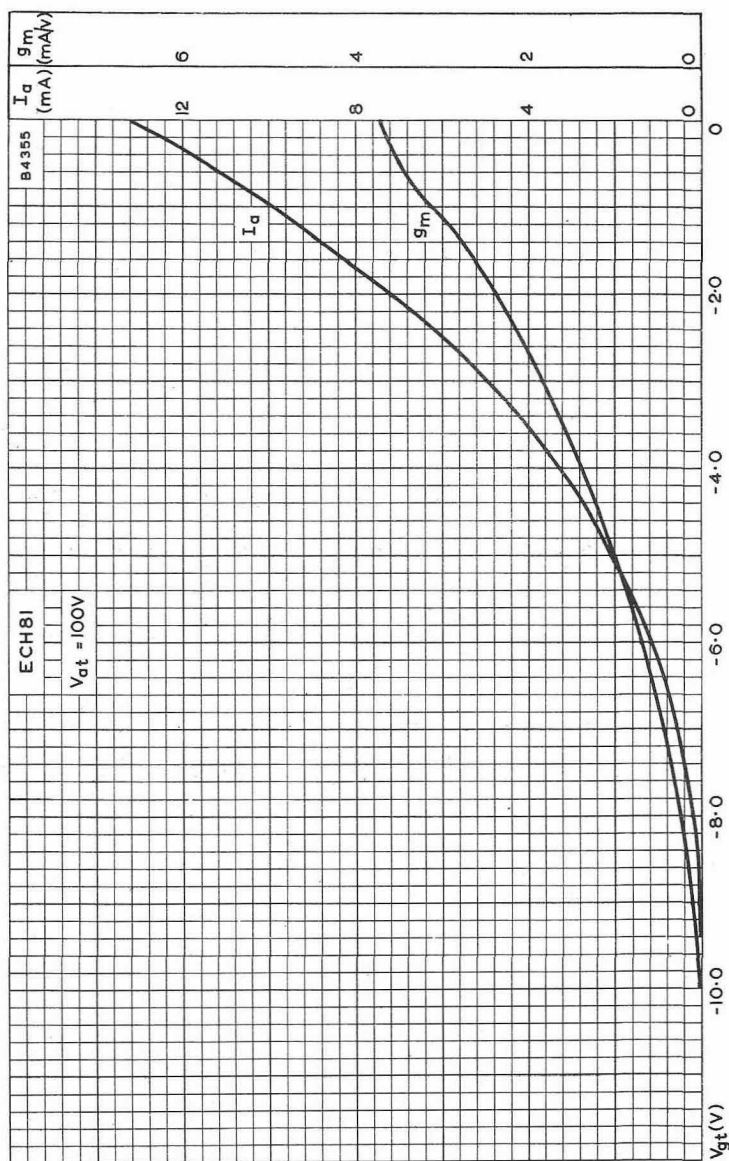
ANODE AND SCREEN-GRID CURRENTS, MUTUAL CONDUCTANCE,
AND EQUIVALENT NOISE RESISTANCE PLOTTED AGAINST CONTROL-GRID
VOLTAGE FOR HEPTODE SECTION



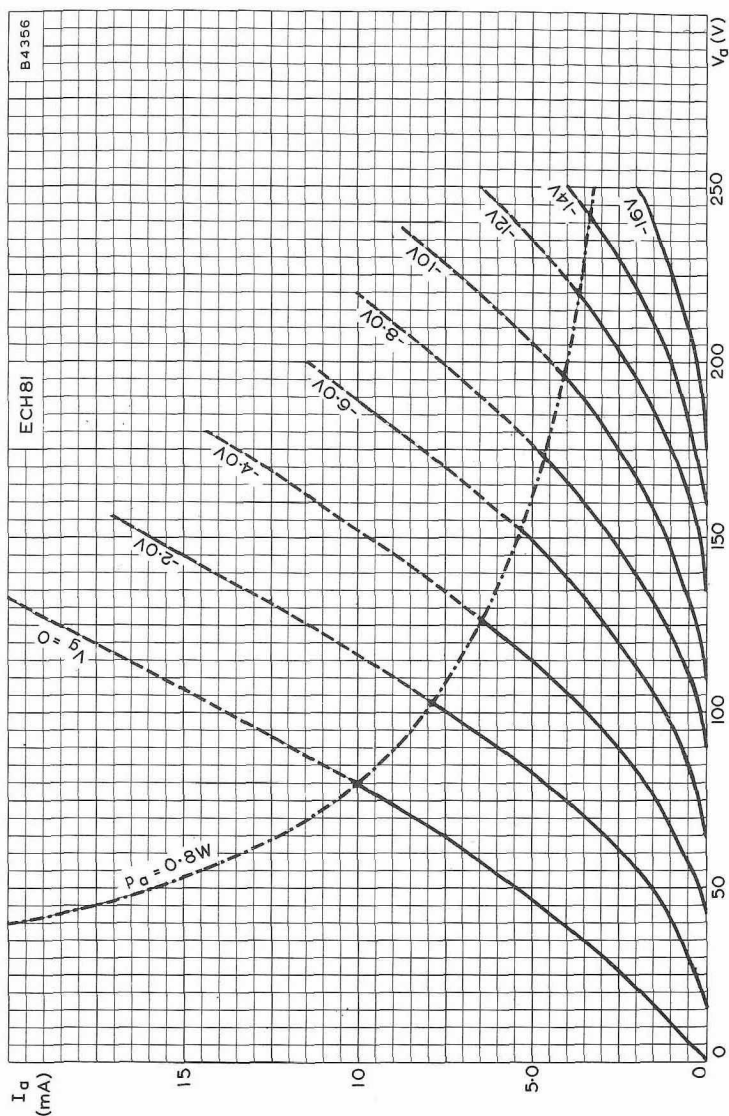
SCREEN-GRID CURRENT PLOTTED AGAINST SCREEN-GRID VOLTAGE
WITH CONTROL-GRID VOLTAGE AS PARAMETER FOR HEPTODE SECTION



INDICATING THE R.M.S. VALUE OF THE VOLTAGE OF AN INTERFERING
SIGNAL AT THE GRID PRODUCING 1% CROSS AND HUM MODULATION
AS A FUNCTION OF THE MUTUAL CONDUCTANCE



ANODE CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST
GRID VOLTAGE FOR TRIODE SECTION



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH
CONTROL-GRID VOLTAGE AS PARAMETER FOR TRIODE SECTION