

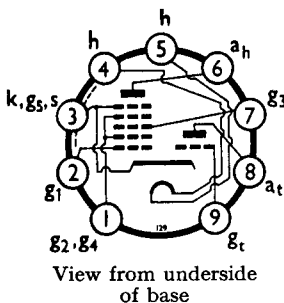


TRIODE-HEPTODE 6.3V INDIRECTLY HEATED

**X719/
ECH81**
ISSUE 1
JANUARY, 1958

Primarily designed for use as a frequency changer.

BASE CONNECTIONS AND VALVE DIMENSIONS



Base : B9A
Bulb : Tubular
Max. overall length : 67 mm.
Max. seated length : 60 mm.
Max. diameter : 22.2 mm.

HEATER

V_h	6.3	V
I_h	0.3	A

MAXIMUM RATINGS

Heptode Section

V_a	300	V
$V_{g2, g4}$ ($I_a < 1\text{mA}$)	300	V
$V_{g2, g4}$	125	V
V_{g3} ($I_{g3} = +0.3\mu\text{A}$)	-1.3	V
V_{g1} ($I_{g1} = +0.3\mu\text{A}$)	-1.3	V
p_a	1.7	W
p_{g2+g4}	1	W
I_k	12.5	mA
V_{h-k}	100	V
R_{g1-k}	3	MΩ
* R_{g3-k}	3	MΩ
R_{h-k}	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 $R_{g3-k} = 20\text{k}\Omega$.

Triode Section

V_a	250	V
p_a	0.8	W
I_k	6.5	mA
V_g ($I_g = +0.3\mu\text{A}$)	-1.3	V
V_{h-k}	100	V
R_{g-k}	3	MΩ
R_{h-k}	20	kΩ

CAPACITANCES

C_{ah-at} :	0.20 pF	C_{ah-gt} :	<0.09 pF	$C_{ah-(g3, gt)}$:	<0.35 pF
C_{g1-at} :	<0.06 pF	C_{g1-gt} :	<0.17 pF	$C_{g1-(g3, gt)}$:	<0.45 pF

Heptode Section

$C_{in(g1)}$:	4.8 pF	$C_{in(g3)}$:	5.8 pF	C_{out} :	7.9 pF
C_{a-g1} :	<0.01 pF	C_{g1-g3} :	<0.3 pF	C_{g1-h} :	<0.02 pF
				C_{g3-h} :	<0.06 pF

Triode Section

C_{in} :	2.6 pF	C_{out} :	2.1 pF	C_{a-g} :	1.0 pF
				C_{g-h} :	<0.02 pF

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CHARACTERISTICS

Triode Section

V_a	100	V
I_a	13.5	mA
V_g	0	V
g_m	3.7	mA/V
μ	22	

TYPICAL OPERATION

Heptode Section as r.f. or i.f. Amplifier

$V_a = V_b$	250	250	V
$V_{g2, g4}$	100	103	V
V_{g3}	0	0	V
V_{g1}	-2.0	-2.1	V
V_{g1} (for $g_m/100$)	-42	-42	V
I_a	6.5	6.5	mA
I_{g2+g4}	3.8	4.1	mA
$R_{g2, g4}$	39	22*	k Ω
R_{eq}	8.5	8.5	k Ω
r_{in} (at 100 Mc/s)	2.0	—	k Ω
g_m	2.4	2.4	mA/V
r_a	700	700	k Ω
$\mu_{g1-(g2, g4)}$	20	20	

*Common screen resistor for X719/ECH81 and W719/EF85. The current through this resistor is 6.7 mA.

Heptode Section as a.m. Frequency Changer

$V_a = V_b$	250	250	250	V
$V_{g2, g4}$	103	97	92	V
V_{g1}	-2	-1.9	-2	V
V_{g1} (for $g_c/100$)	-28.5	-28.5	-28.5	V
I_a	3.25	3	2.5	mA
I_{g2+g4}	6.7	6.1	5.5	mA
I_{g3+gt}	200	200	200	μ A
$R_{g2, g4}$	22	18*	22†	k Ω
R_{eq}	70	70	66	k Ω
g_c	775	750	700	μ A/V
r_a	1	1	1	M Ω

*Common screen resistor for X719/ECH81 and W719/EF85. The current through this resistor is 8.5 mA.

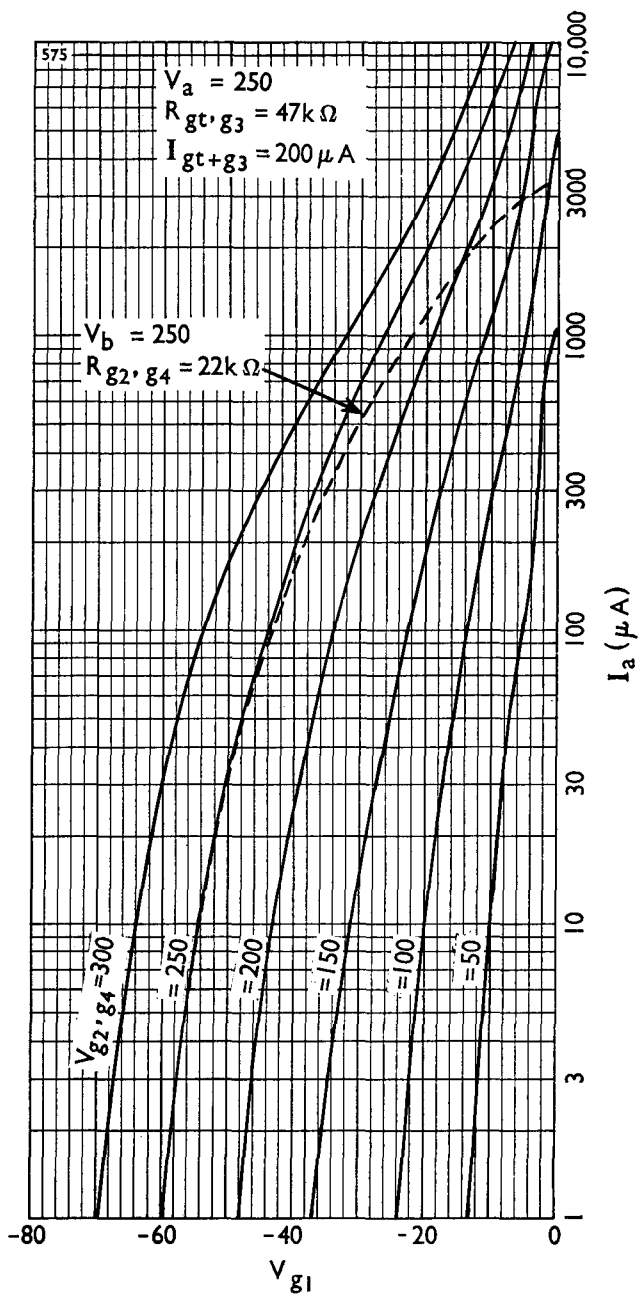
†Common screen resistor for X719/ECH81 and WD709/EBF80. The current through this resistor is 7.2 mA.

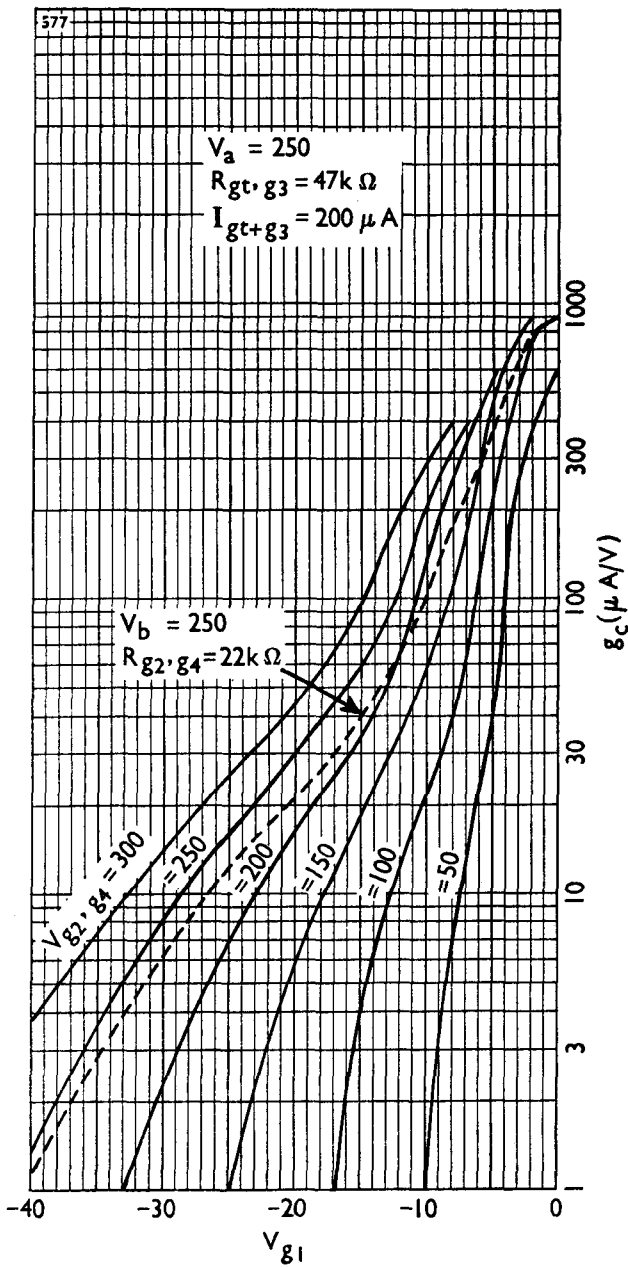
Triode Section as r.f. Oscillator

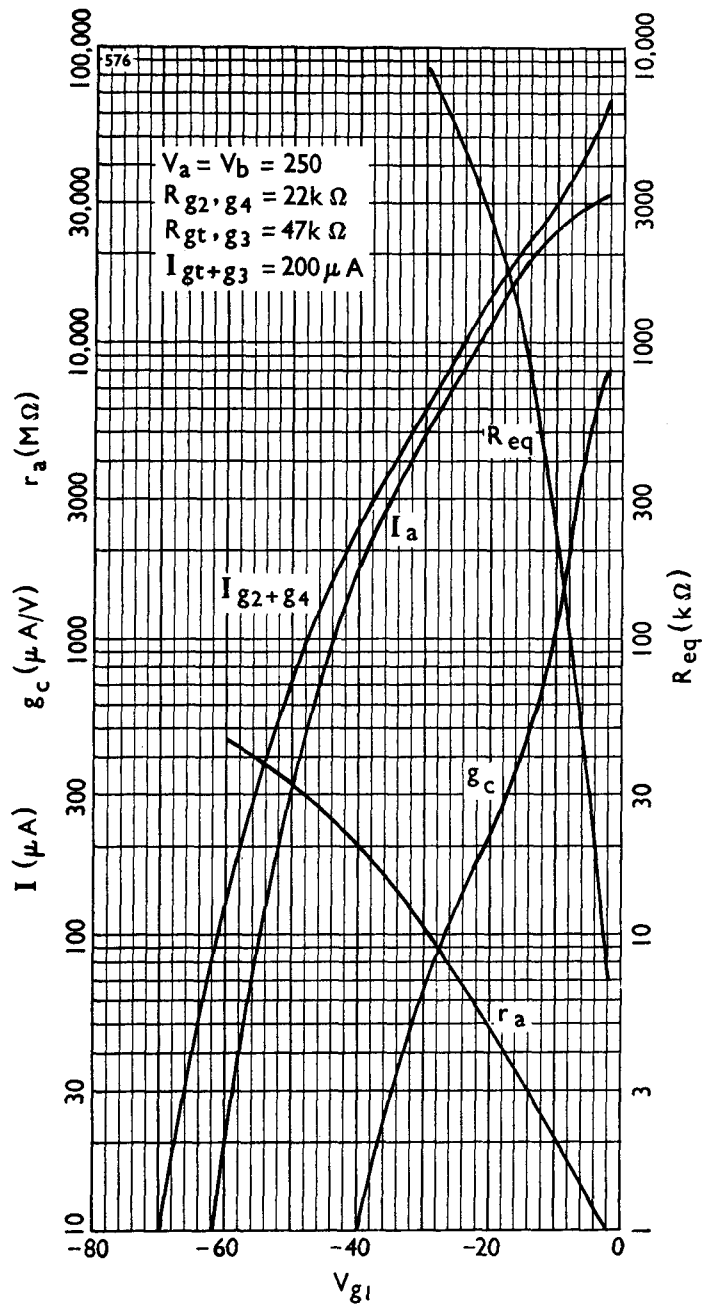
V_b	250	V
R_{at}	33	k Ω
I_{at}	4.5	mA
$R_{g3, gt}$	47	k Ω
I_{g3+gt}	200	μ A
g_m (effective)	650	μ A/V

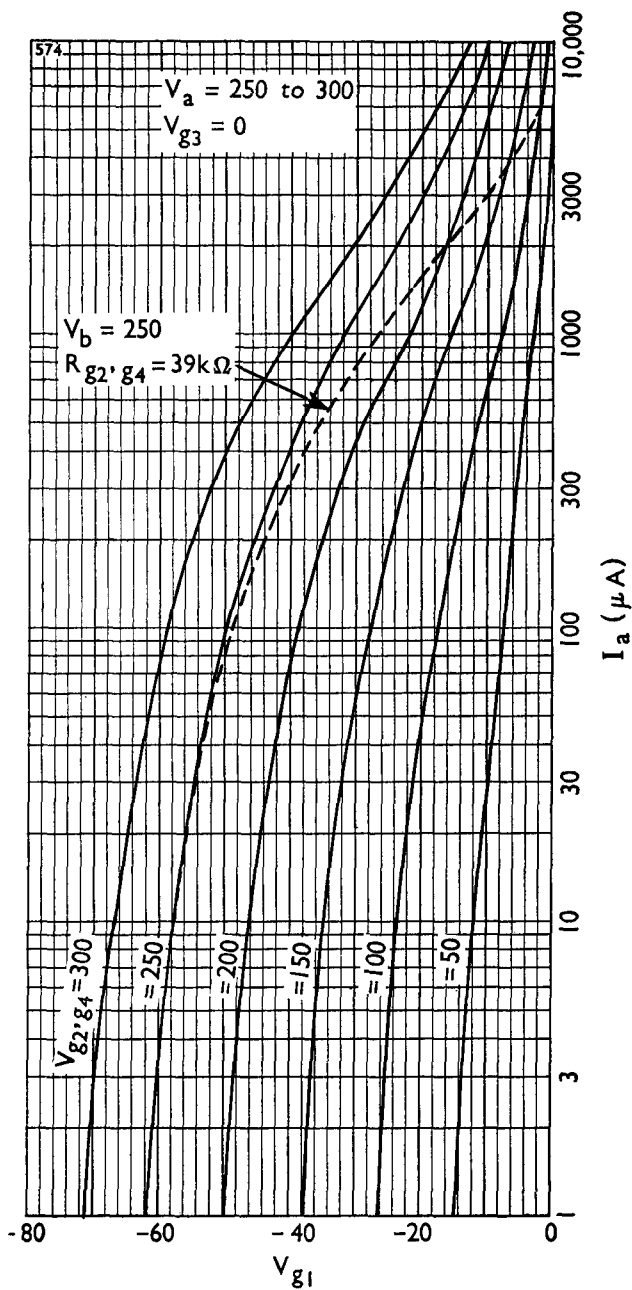
MOUNTING

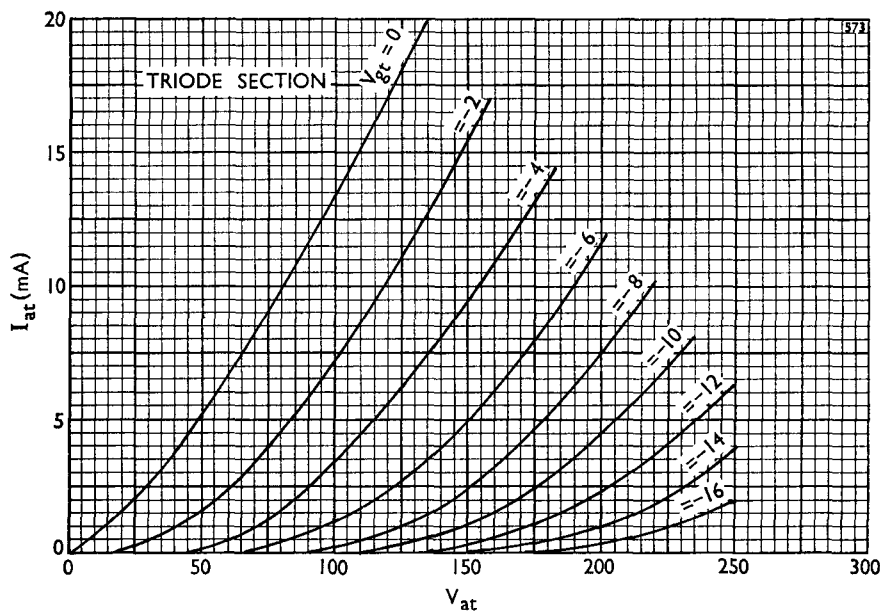
Any position.











X719/ECH81