Twin Tetrode *Type TT15*

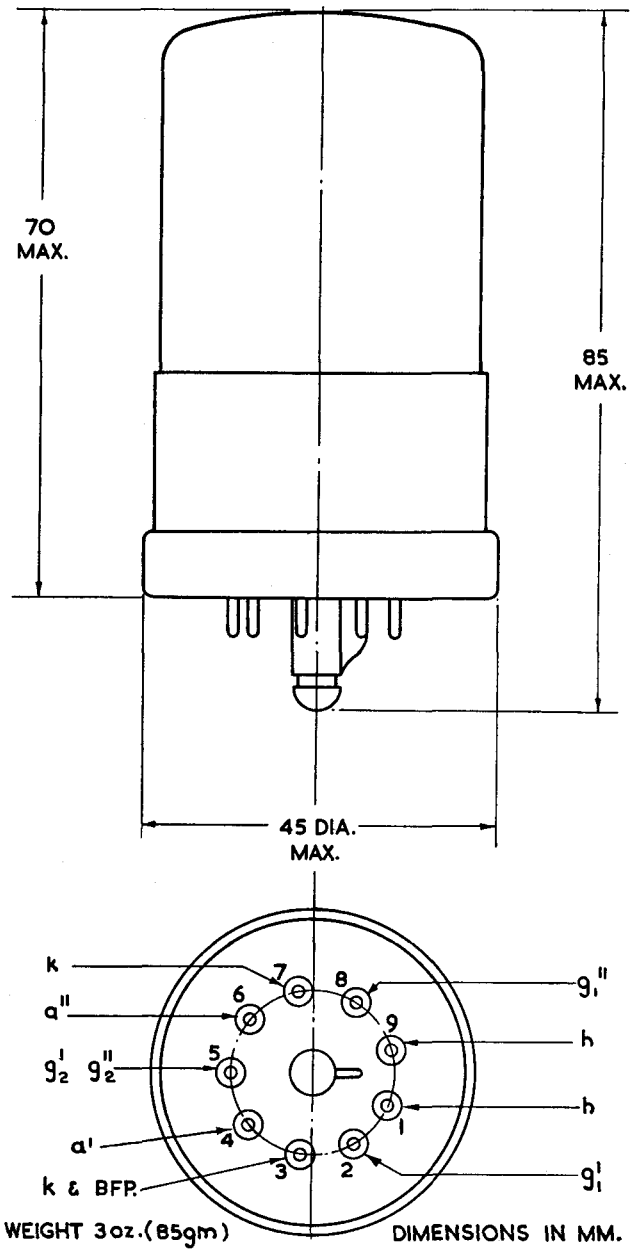
(RF AMPLIFIER)

General. The TT 15 has two beam-tetrode systems with indirectly heated oxide-coated cathodes. The valve is designed for use as a push-pull RF power amplifier for frequencies up to 160 Mc/s and, at reduced inputs, up to 250 Mc/s.

Cooling. The valve must have adequate ventilation. The temperature of the hottest part of the bulb must not exceed 250°C.

Mounting. The valve may be mounted in any position. A retaining device should always be fitted.

Screening. The metal skirt is connected to the centre spigot which should be earthed. No further screening is required.



APPROXIMATE DATA

V_h		6·3	V
I_h		1·6	A
V_a		400	V
V_{g1}		200	V
$I_{k(pk)(max)}$		2×0·4	A
$p_{a(max)}$		2×7·5	W
$p_{g2(max)}$		2×1·25	W
μ_{g1-g2}	taken at V_a 250 V,	6·5	
r_a	V_{g2} 135 V,	100	kΩ
g_m	I_a 30 mA	3·9	mA/V
c_{a-g1}	0·043 pF (mean)	0·05 pF (max.)	
c_{g1-all}	8·5 pF (mean)	9·0 pF (max.)	
c_{a-all}	9·3 pF (mean)	7·5 pF (max.)	

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

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Typical Operation

(1) PUSH-PULL AUDIO AMPLIFIER. CLASS AB1

Values per valve (2 systems).

V_a	300	400	V
V_{g2}	175	175	V
V_{g1}	–21	–25	V
$V_{in(pk)(g'_1-g''_1)}$	41	48	V
$V_{out\ (r.m.s.)}$	324	480	V
$I_{a\ (zero\text{-}sig.)}$	50	33	mA
$I_{a\ (max\text{-}sig.)}$	100	92	mA
$I_{g2\ (zero\text{-}sig.)}$	2·6	1·4	mA
$I_{g2\ (max\text{-}sig.)}$	13·9	11·8	mA
$R_{L(a'-a'')}$	7	10	kΩ
D	2·25	4·2	%
P_{out}	16·8	22·7	W

Grid Resistor. The maximum permissible DC grid to cathode resistor for fixed bias applications is 0.1 MΩ.

These values assume that a stabilised power supply of very low impedance is used.

(2) PUSH-PULL RF POWER AMPLIFIER. CLASS C TELEGRAPHY

(*Unmodulated, key-down conditions.*)

Values per valve (2 systems).

f	20	20	Mc/s
V_a	300	400	V
V_{g2}	175	175	V
V_{g1}	–50	–50	V
$V_{in(pk)(g_1'-g_1'')}$	110	110	V
I_a	120	100	mA
I_{g2}	14	11	mA
I_{g1} (a)	2·5	2·5	mA
R_{g1}	20	20	kΩ
p_a	12	14·4	W
p_{g2}	2·5	1·9	W
P_{dr} (a)	0·3	0·3	W
P_{out}	24	25·6	W

(3) PUSH-PULL RF AMPLIFIER

(*Permissible modulation 100%, carrier conditions.*)

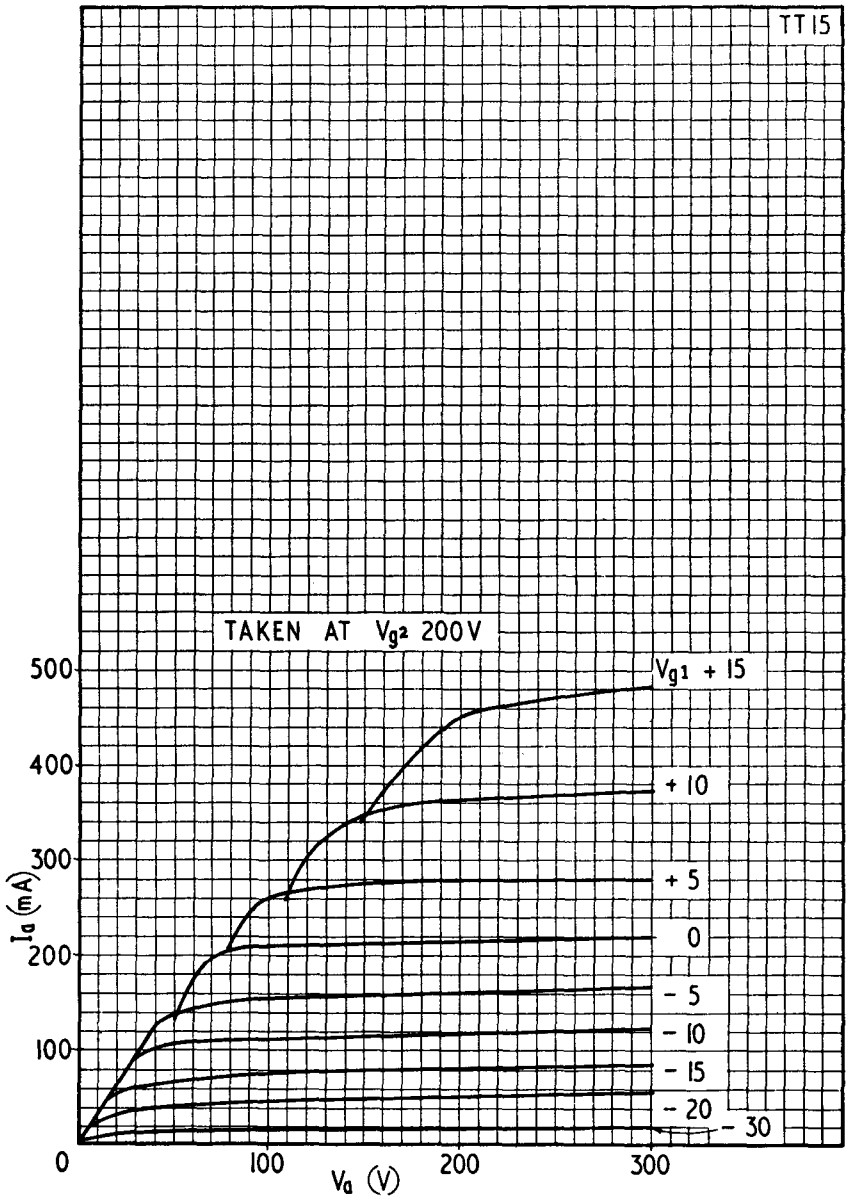
Values per valve (2 systems).

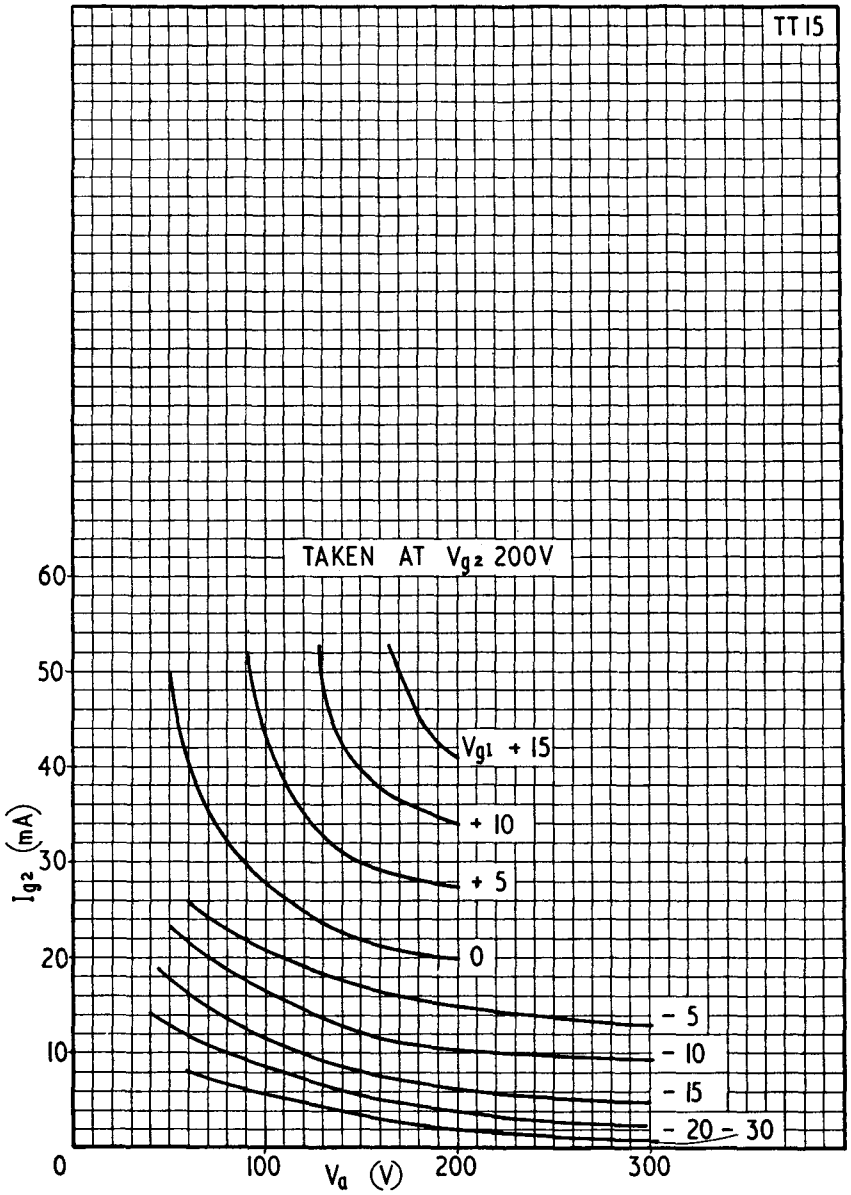
f	20	Mc/s
V_a	325	V
V_{g2}	200	V
V_{g1}	–60	V
$V_{in(pk)(g_1'-g_1'')}$	130	V
I_a	90	mA
I_{g2}	12·5	mA
I_{g1} (a)	2·5	mA
R_{g2}	10	kΩ
$Z_{to\ mod}$	3,130	Ω
p_a	10	W
p_{g2}	2·5	W
P_{dr} (a)	0·35	W
$P_{audio\ mod.}$	17	W
P_{out}	19·2	W

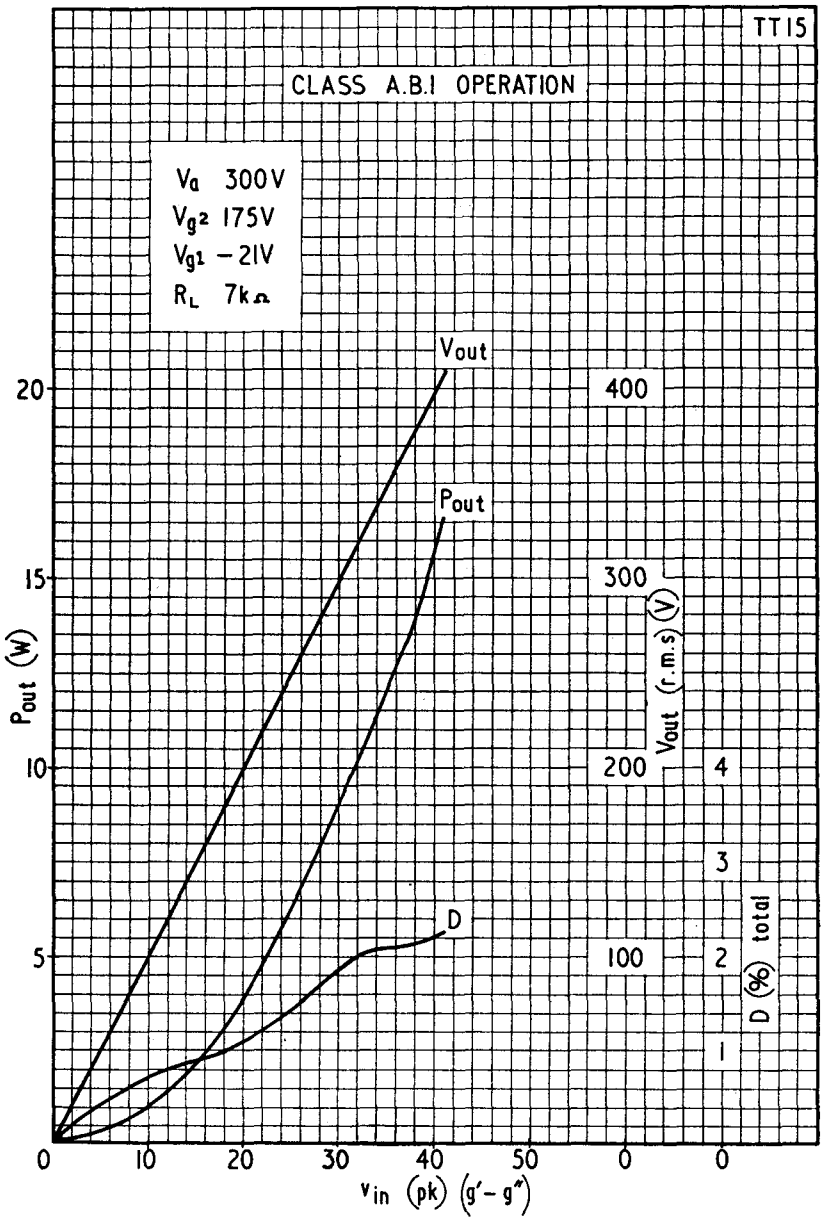
Greater anode inputs in the carrier conditions may be permissible if the mean modulation depth is very low. The anode dissipation must not exceed 15 W under modulation conditions.

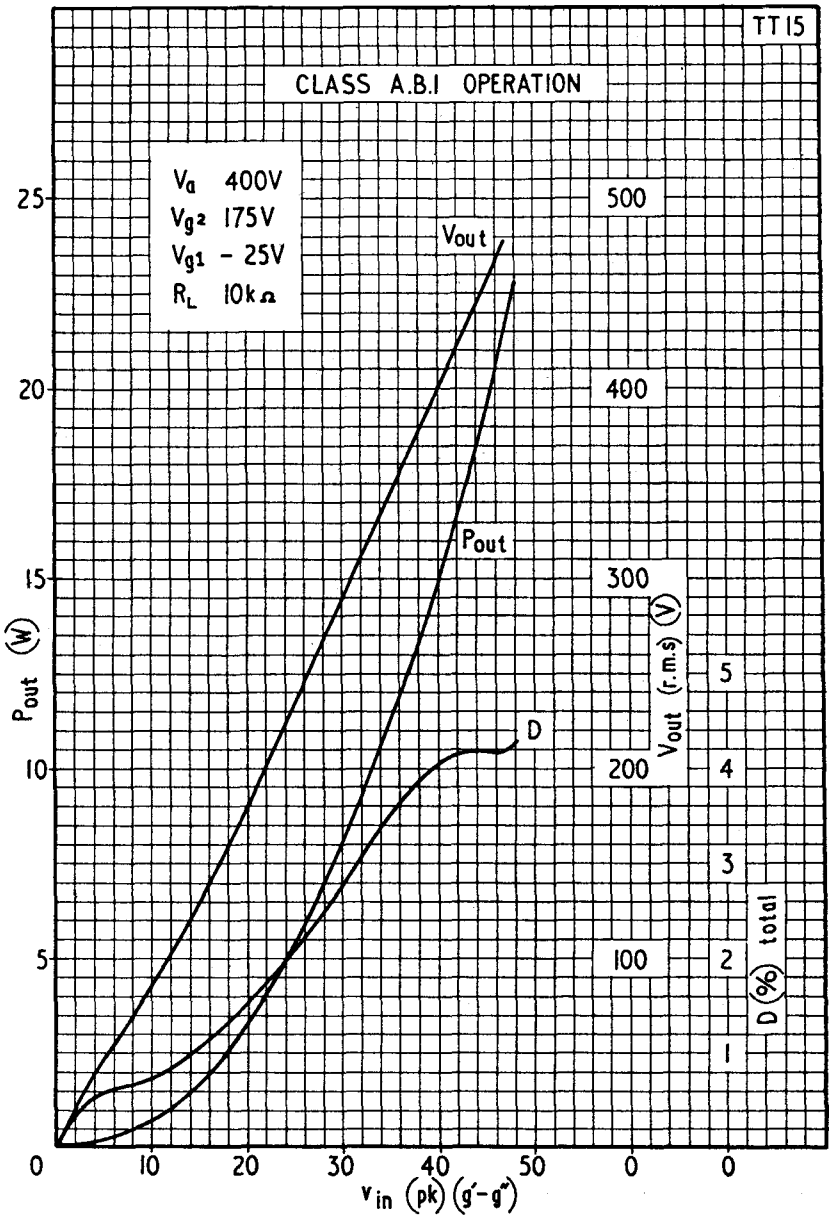
NOTE

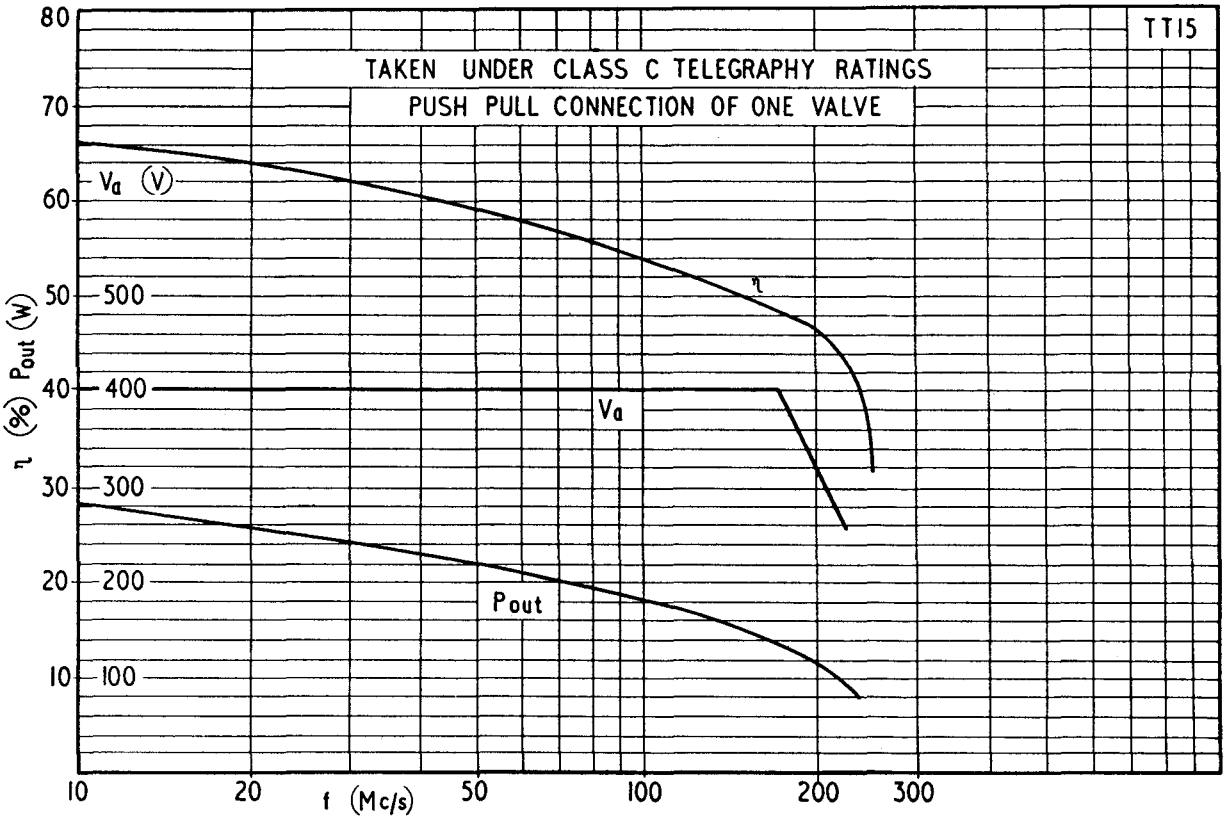
(*a*) Subject to wide variations. The figures are approximate only.

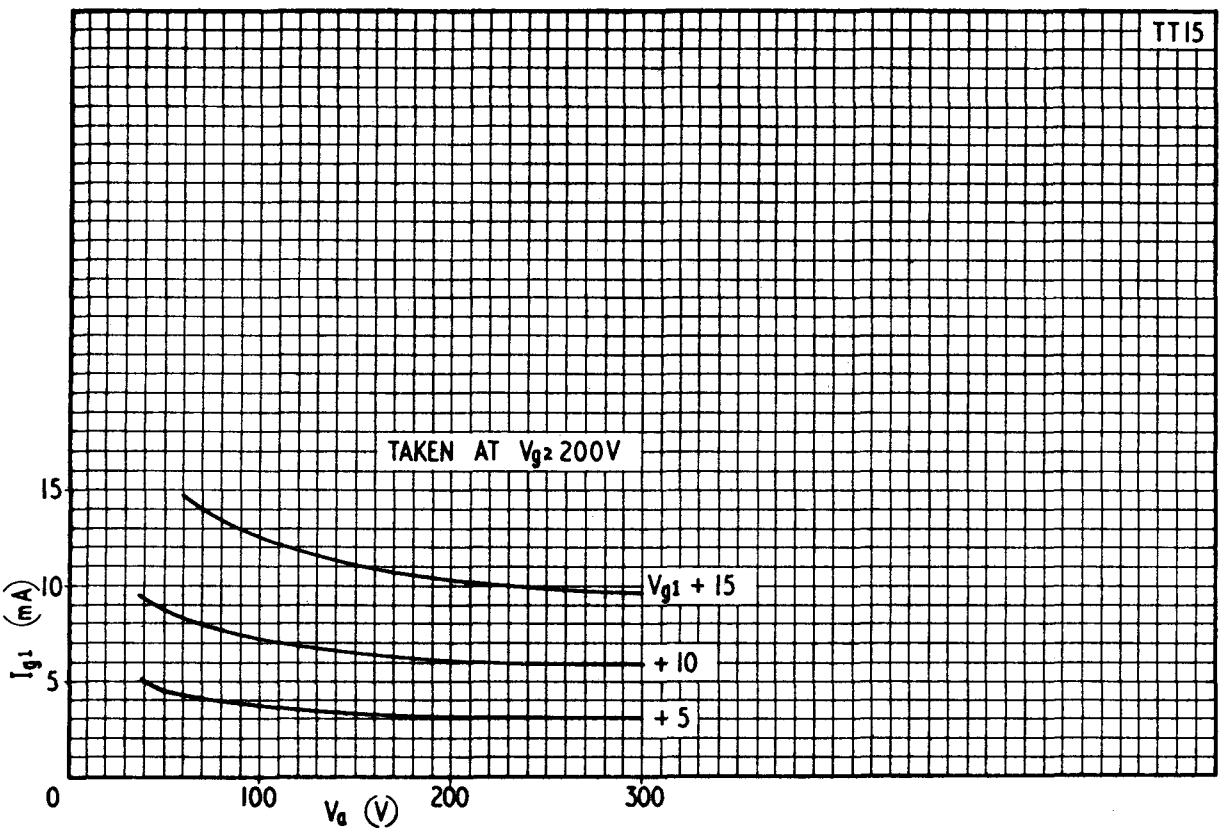

TT15
TAKEN AT Vg2 200V
Vg1 + 15
+ 10
+ 5
0
- 5
- 10
- 15
- 20
- 30
500
400
300
200
100
0
100
200
300
Ia (mA)
Va (V)

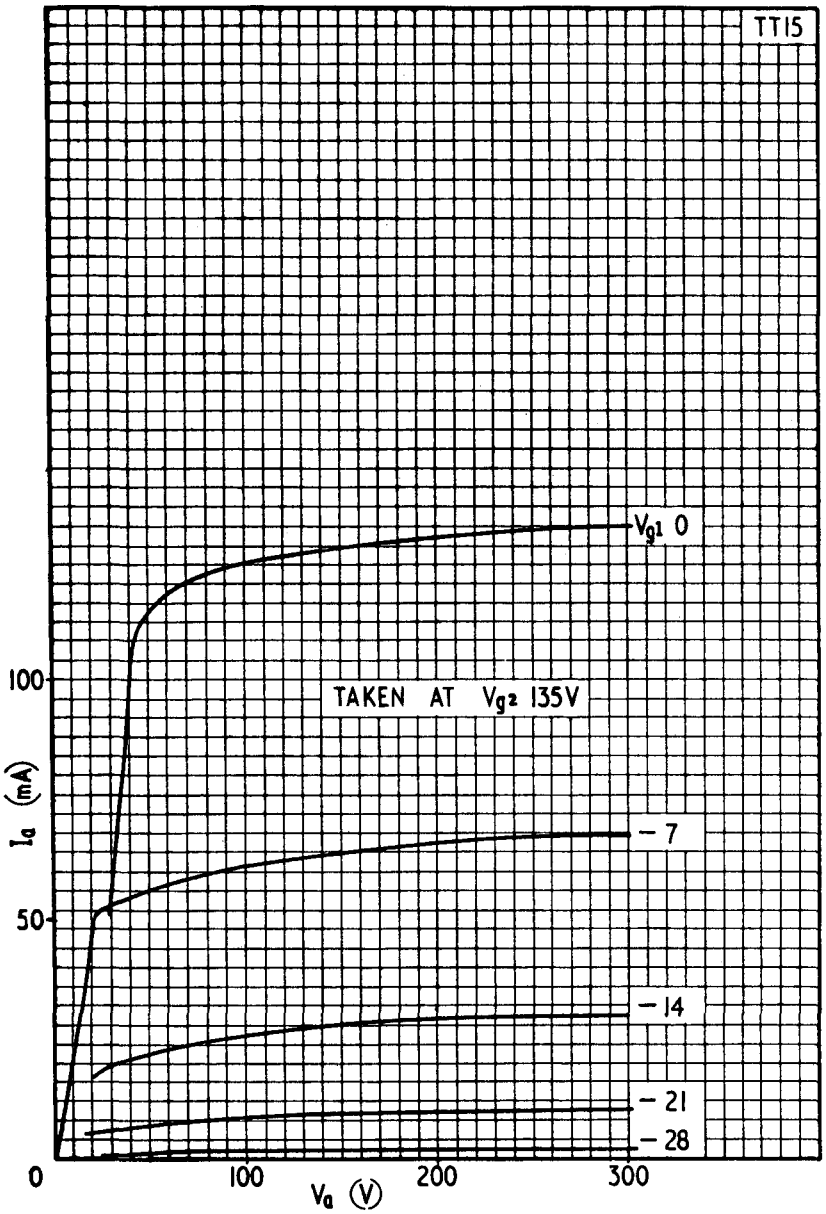

TT15
TAKEN AT Vg2 200V
Vg1 + 15
+ 10
+ 5
0
- 5
- 10
- 15
- 20
- 30
60
50
40
30
20
10
0
100
200
300
Ig2 (mA)
Va (V)


TT15
CLASS A.B.I OPERATION
Va 300V
Vg2 175V
Vg1 −21V
RL 7kΩ
Vout
Pout
D
Pout (W)
Vout (r.m.s) (V)
D (%) total
vin (pk) (g′−g″)


TT15
CLASS A.B.I OPERATION
Va 400V
Vg2 175V
Vg1 − 25V
RL 10kΩ
Vout
Pout
D
Pout (W)
Vout (r.m.s) (V)
D (%) total
vin (pk) (g′−g″)


TT15
TAKEN UNDER CLASS C TELEGRAPHY RATINGS
PUSH PULL CONNECTION OF ONE VALVE
Va (V)
500
400
300
200
100
η
Va
Pout
η (%) Pout (W)
80
70
60
50
40
30
20
10
10
20
50
100
200
300
f (Mc/s)


TT15
TAKEN AT Vg2 200V
Vg1 + 15
+ 10
+ 5
Ig1 (mA)
15
10
5
0
100
200
300
Va (V)


TT15
V_{g1} 0
TAKEN AT V_{g2} 135V
− 7
− 14
− 21
− 28
100
50
0
I_a (mA)
100
200
300
V_a (V)

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