



Tetrode Type TT 16 D

VHF AMPLIFIER OR MODULATOR

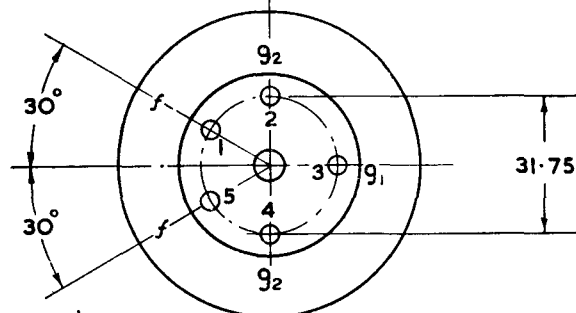
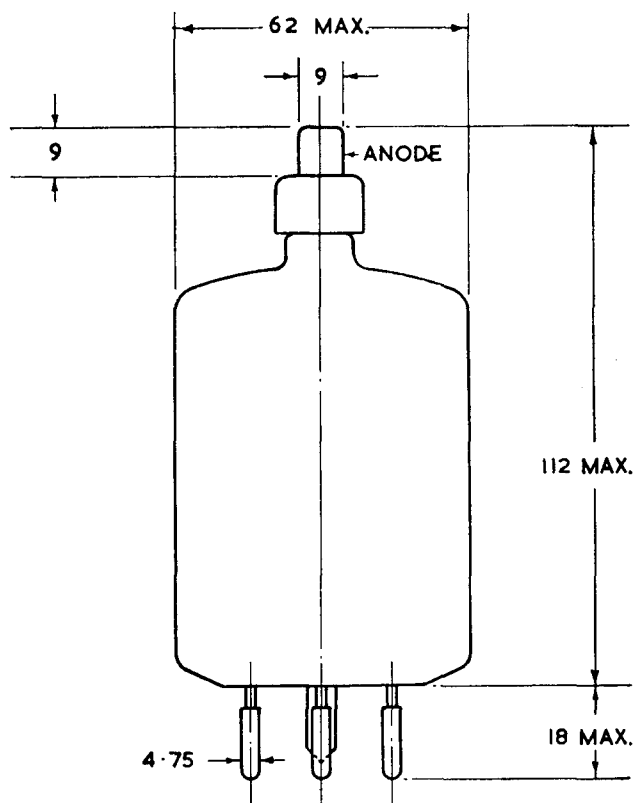
General. The TT 16D is a power tetrode fitted with a thoriated tungsten filament. The valve may be operated at full ratings at frequencies up to 120 Mc/s and, at reduced ratings, up to 200 Mc/s.

Cooling. The temperature of the anode seal must not exceed 220°C and that of the base pins must not exceed 180°C. It may be necessary to direct an air flow on to the anode seal and on to the base of the valve, when operating at frequencies above 50 Mc/s in order to keep within these temperature limits. The air stream on to the base should be so directed that it also passes over the valve envelope. At frequencies below 50 Mc/s radiation cooling from the envelope should be sufficient, but an anode connector of large surface area will be required to cool the anode seal.

Mounting. The valve should be mounted vertically. The base may be either at the top or the bottom.

APPROXIMATE DATA

V_f	5	V
I_f	6.5	A
$V_{a(max)}$	3	kV
$V_{g2(max)}$	600	V
$P_{a(max)} (a)$	125	W
$P_{g2(max)}$	20	W
$I_{k(max)}$	270	mA
$I_{k(pk)(max)}$	1.6	A
g_m	taken at V_a 2.5 kV, V_{g2} 350 V, I_a 40 mA	2.2 mA/V
u_{g1-g2}		6.2
C_{in}	10.8	pF
C_{out}	3.1	pF
C_{a-g1}	0.05	pF



WEIGHT $3\frac{1}{2}$ oz. (0.1 kg.)

DIMENSIONS IN MM.

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

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Typical Operation

(1) RF POWER AMPLIFIER CLASS C TELEGRAPHY OR FM TELEPHONY. SINGLE VALVE

Maximum ratings

V_a	3.0	kV
p_a (a)	125	W
I_k	300	mA
$i_{k(pk)}$	1.6	A
V_{g2}	400	V
p_{g2}	20	W
p_{g1}	5.0	W
V_{g1}	-500	V
I_{g1}	15	mA

Typical Operating Conditions at $f \leq 120$ Mc/s

V_a	2.0	2.5	3.0	kV
V_{g2}	350	350	350	V
V_{g1}	-100	-150	-150	V
I_a	200	200	167	mA
I_{g2}	50	40	30	mA
I_{g1}	9.0	9.0	6.5	mA
$V_{in(pk)}$	260	330	300	V
P_{dr}	2.4	3.0	2.0	W
p_a	125	125	125	W
p_{g2}	17.5	14	10.5	W
P_{out}	275	375	375	W
P_{load} (b)	220	300	300	W
η	69	75	75	%

(2) RF POWER AMPLIFIER CLASS B TELEPHONY. SINGLE VALVE

Maximum ratings

V_a	3.0	kV
p_a (a)	125	W
I_k	120	mA
$i_{k(pk)}$	350	mA
V_{g2}	400	V
p_{g2}	14	W

Typical Operating Conditions $f \leq 120$ Mc/s

V_a	2.0	2.5	3.0	kV
V_{g2}	350	350	350	V
V_{g1}	-50	-50	-50	V
I_a	83	70	60	mA
I_{g2}	1.5	1.0	1.0	mA

$V_{in(pk)}$	65	55	50	V
p_a	112	120	122	W
p_{g2}	0.52	0.35	0.35	W
P_{out}	54	55	58	W
P_{load} (b)	43	45	46	W
η for 100% mod.	32.5	31.5	32	%
I_{g1}	4.0	4.0	4.5	mA
P_{dr}	0.52	0.44	0.45	W

(3) RF POWER AMPLIFIER CLASS C TELEPHONY, ANODE AND SCREEN GRID MODULATION. SINGLE VALVE

Maximum ratings

V_a	2.5	kV
p_a	83	W
I_k	200	mA
$i_{k(pk)}$	2.0	A
V_{g2}	400	V
p_{g2}	20	W
V_{g1}	-500	V
I_{g1}	15	mA

Typical Operating Conditions at $f \leq 120$ Mc/s

V_a	2.0	2.5	kV
V_{g2}	350	350	V
V_{g1}	-220	-210	V
I_a	150	152	mA
I_{g2}	33	30	mA
I_{g1}	5.0	4.5	mA
P_{dr}	2.0	1.7	W
$V_{in(pk)}$	390	380	V
p_a	75	80	W
p_{g2}	11.5	10.5	W
P_{out}	225	300	W
P_{load} (b)	180	240	W
η for 100% mod.	75	79	%
P_{mod}	150	190	W
$V_{g2(pk)mod.}$	300	300	V

(4) AF POWER AMPLIFIER OR MODULATOR CLASS B. TWO VALVES IN PUSH-PULL

Maximum ratings

V_a	3.0	kV
p_a (a)	125	W

I_k	320	mA
$i_{k(pk)}$	1.0	A
$V_{g2} (I_{g1}=0)$	600	V
$V_{g2} (I_{g1}>0)$	400	V
P_{g2}	20	W
V_{g1}	-500	V
R_{g1-k}	150	k Ω

Typical Operating Conditions. Class B1

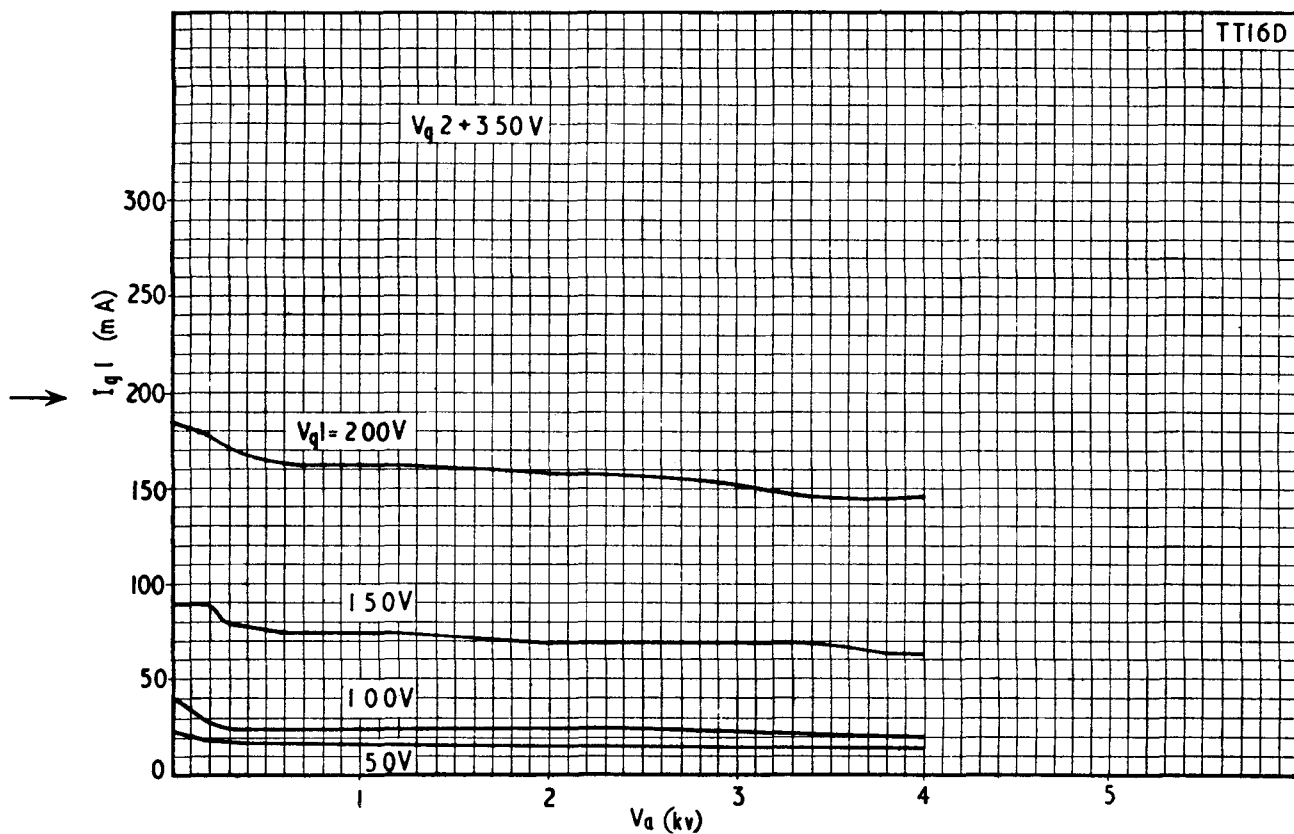
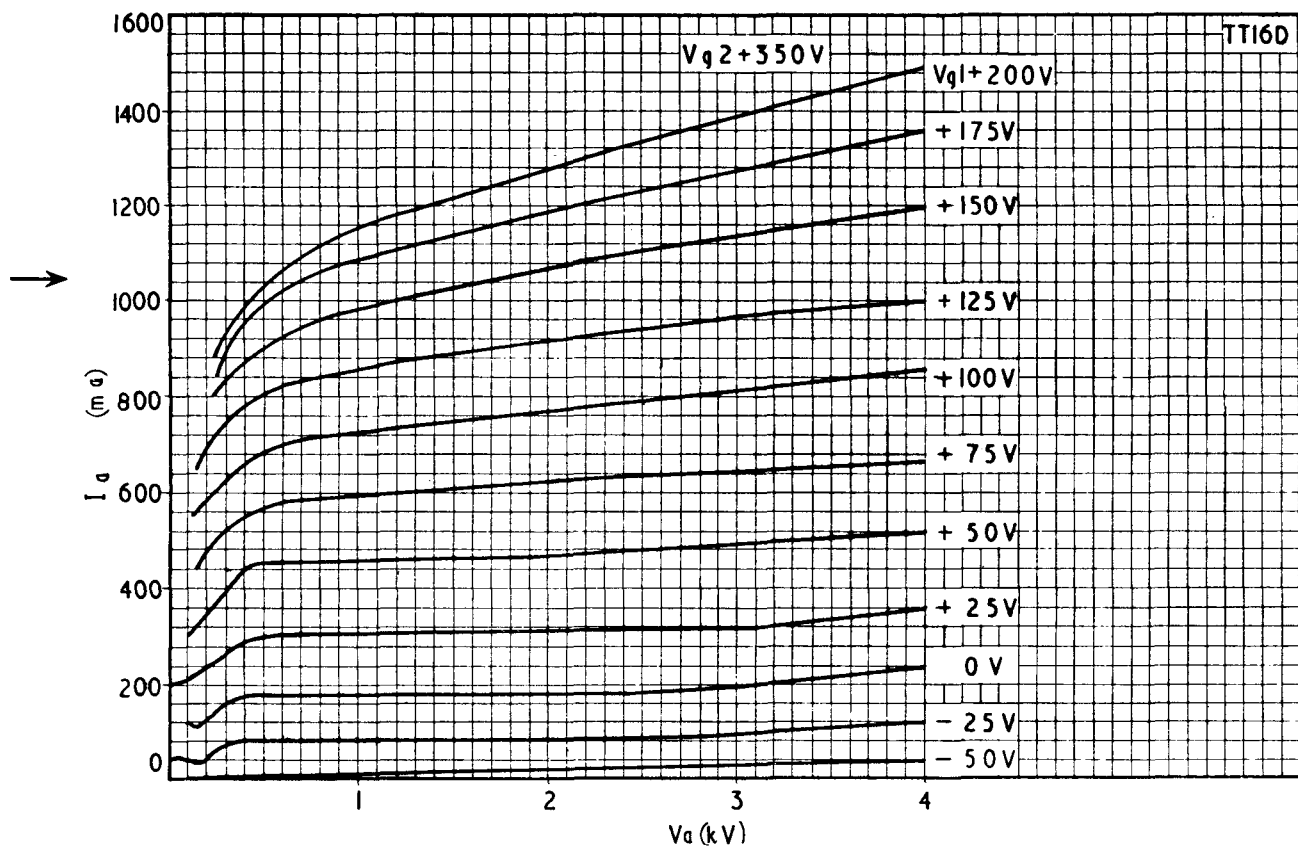
V_a	1.5	2.0	2.5	kV
V_{g2}	600	600	600	V
V_{g1}	-94	-96	-97	V
I_a (zero-sig)	2×30	2×30	2×30	mA
I_a (max-sig)	2×109	2×111	2×108	mA
I_{g2} (max-sig)	2×13.5	2×12	2×13	mA
$V_{in} (g1-g1)$ (r.m.s.)	130	132	134	V
P_a	2×78	2×92	2×95	W
P_{out}	170	260	345	W
R_{a-a}	12	17.6	25	k Ω
η	52	58.5	64	%
D_{tot}	3.5	3.6	4.0	%

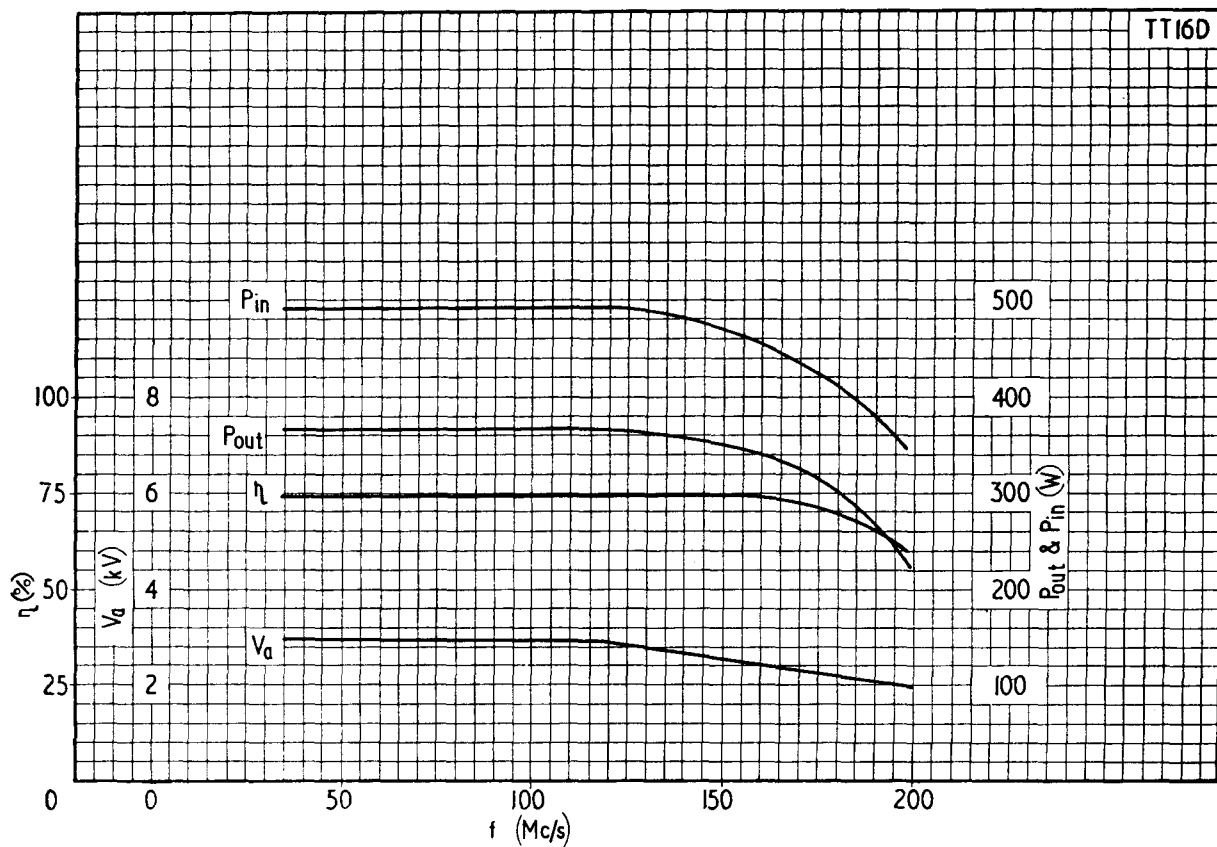
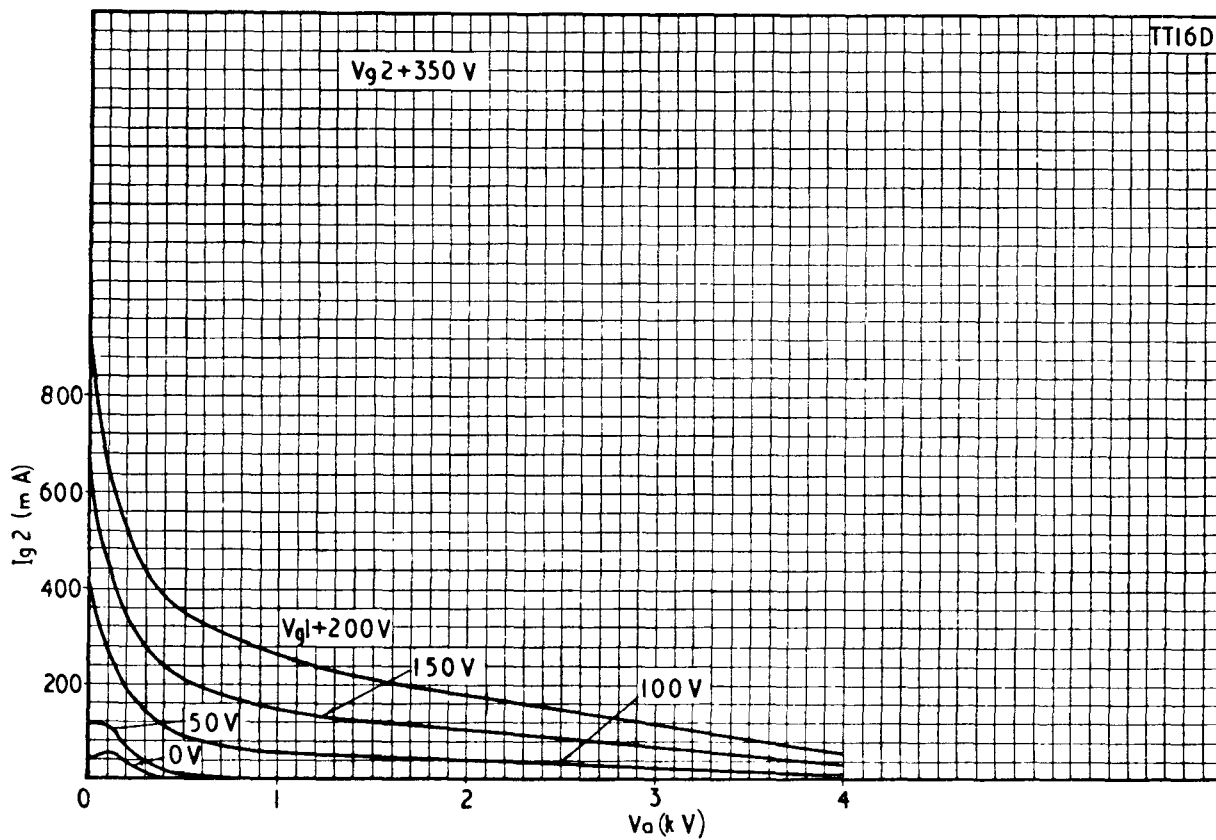
Typical Operating Conditions. Class B2

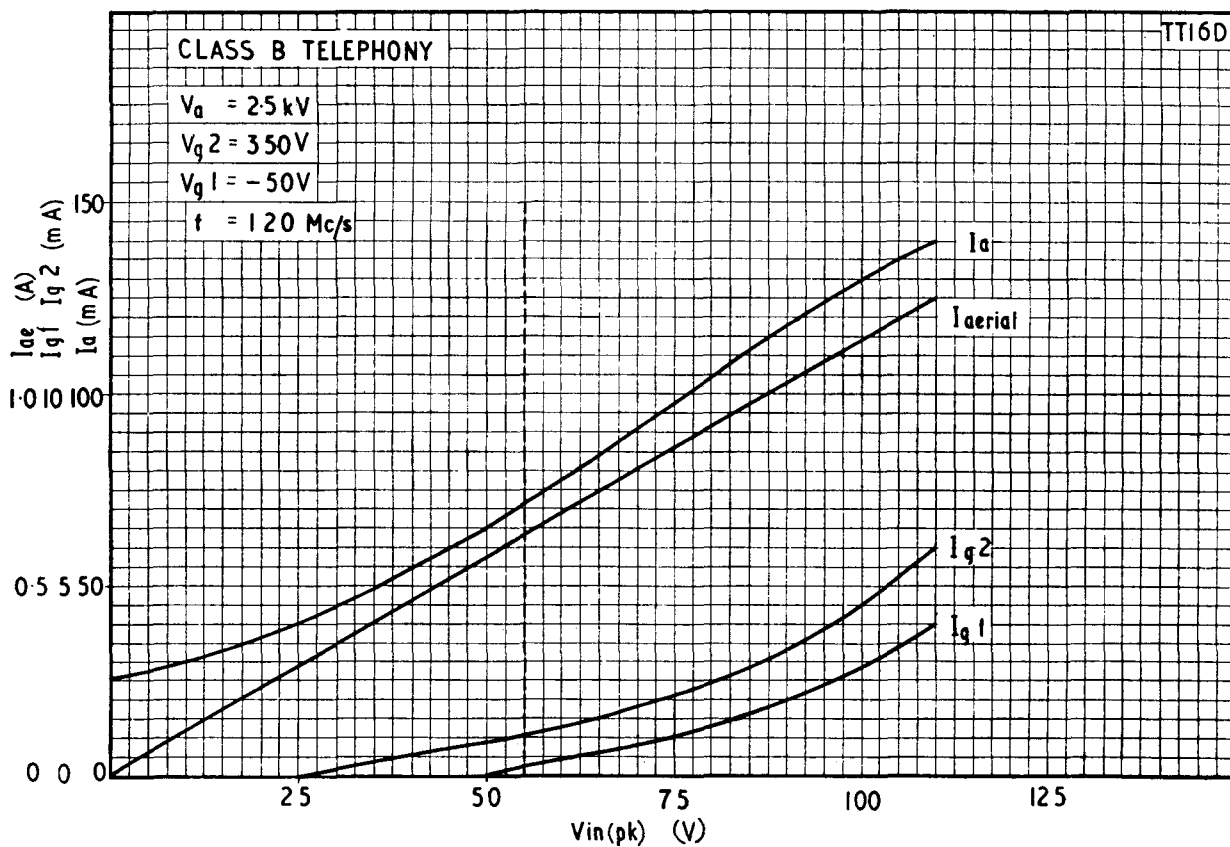
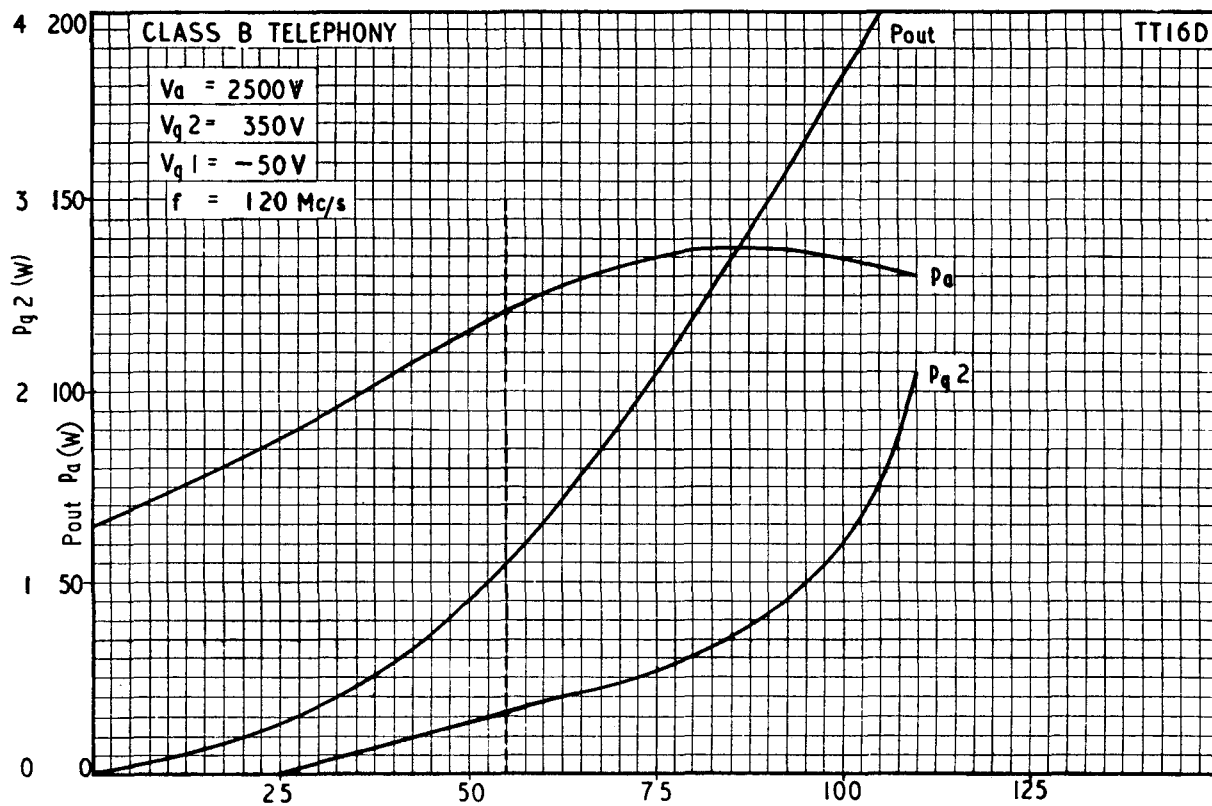
V_a	1.5	2.0	2.5	kV
V_{g2}	350	350	350	V
V_{g1}	-48	-50	-51	V
I_a (zero-sig)	2×30	2×30	2×30	mA
I_a (max-sig)	2×225	2×197	2×151	mA
I_{g2} (max-sig)	2×42	2×32	2×18	mA
I_{g1}	2×16	2×12	2×8.5	mA
$V_{in} (g1-g1)$ (r.m.s.)	234	210	170	V
P_{dr}	2×2.4	2×1.6	2×0.9	W
P_a	2×114	2×120	2×103	W
P_{out}	455	550	550	W
R_{a-a}	7.2	12	20	k Ω
η	66.5	69.5	72.5	%
D_{tot}	5.0	5.0	5.0	%

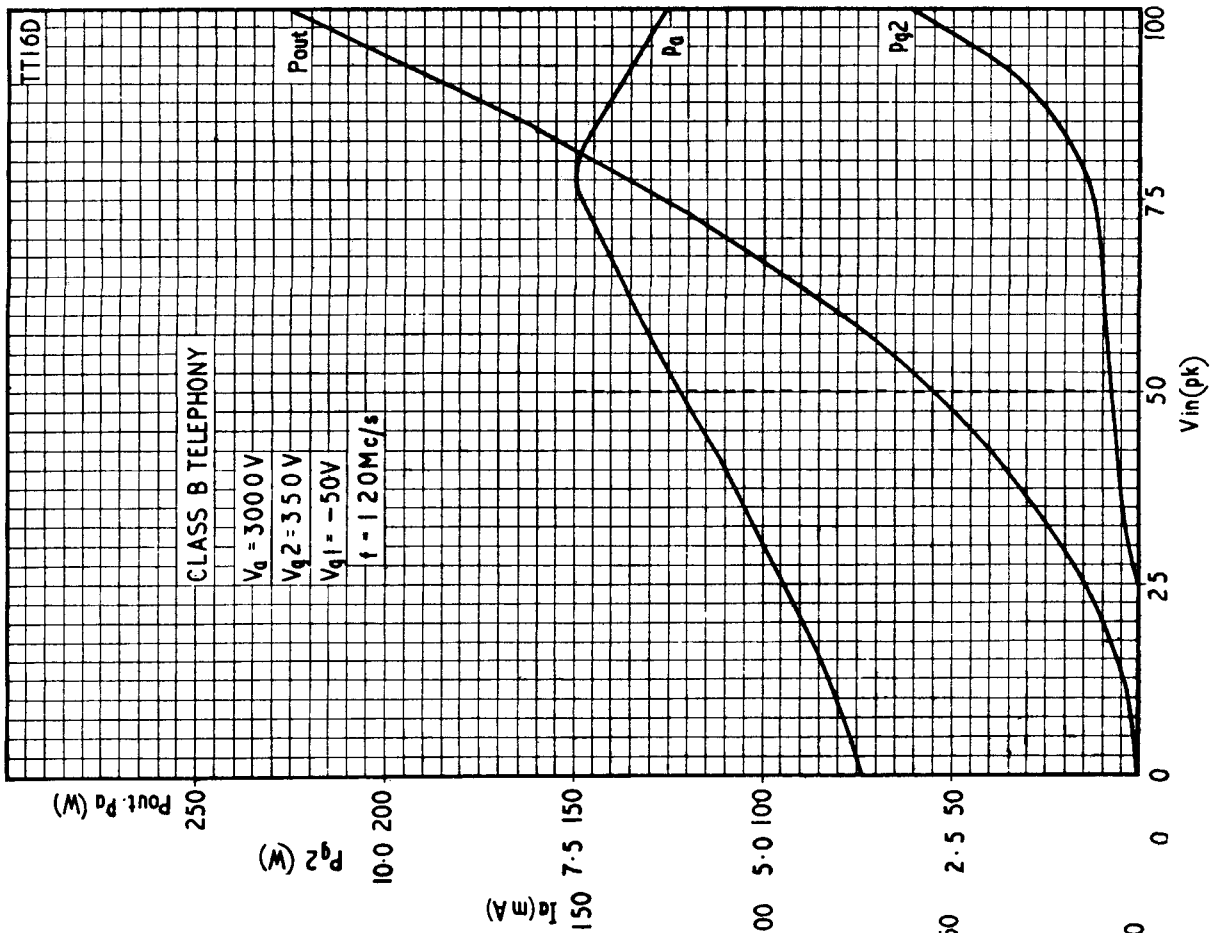
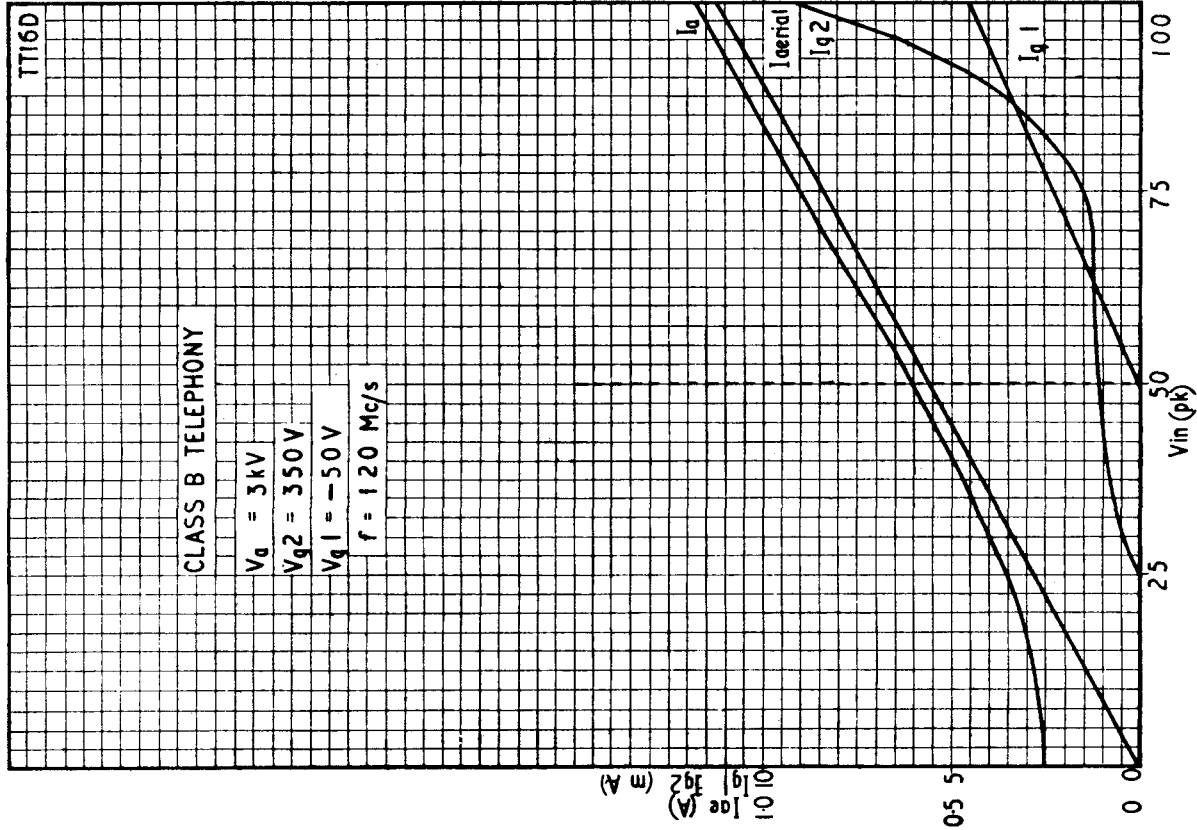
NOTES

1. The RF circuit returns must be brought to the filament connection on Pin No. 1.
 2. To ensure equal distribution of the currents through the seals, the screen-grid leads should be strapped together at the valve holder and the circuit connections joined to the mid-point of the strap. This should not be allowed to impair the free flotation of individual contacts.
- (a) Corresponding to anode temperature of 850°C, i.e. red heat.
(b) With a circuit transfer efficiency of 80%.









TT16D

TWO VALVES CLASS B1

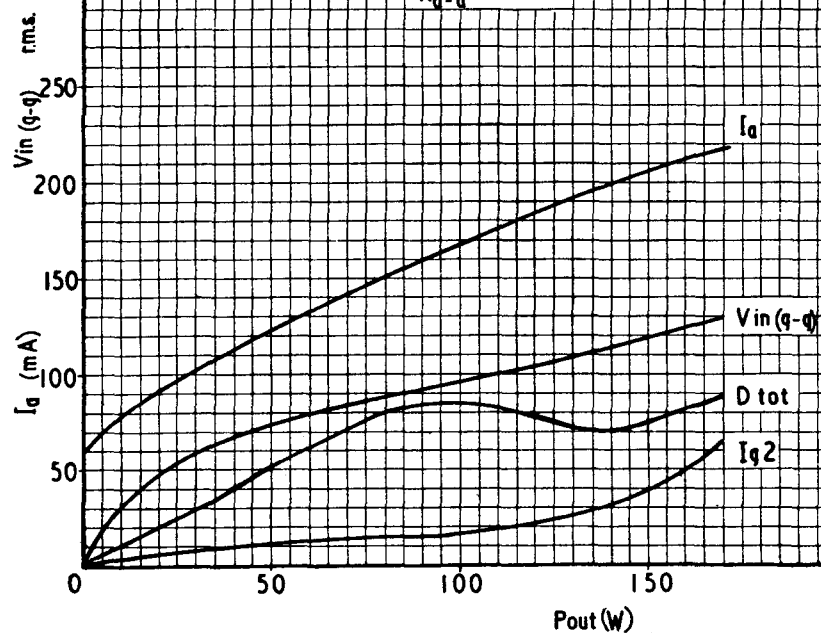
$V_a = 1.5 \text{ kV}$

$V_{g2} = 600 \text{ V}$

$V_{g1} = -94 \text{ V}$

$R_{a-g} = 12 \text{ k}\Omega$

D_{tot} (%)	I_{g2} (mA)
5	50
4	40
3	30
2	20
1	10
0	0



TT16D

TWO VALVES CLASS B1

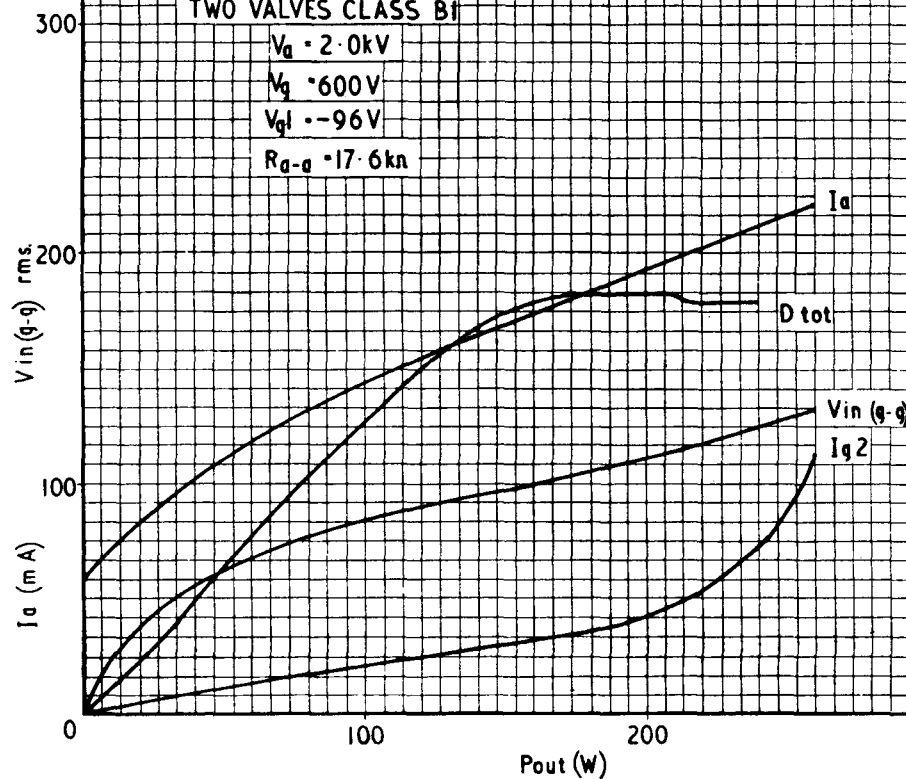
$V_a = 2.0 \text{ kV}$

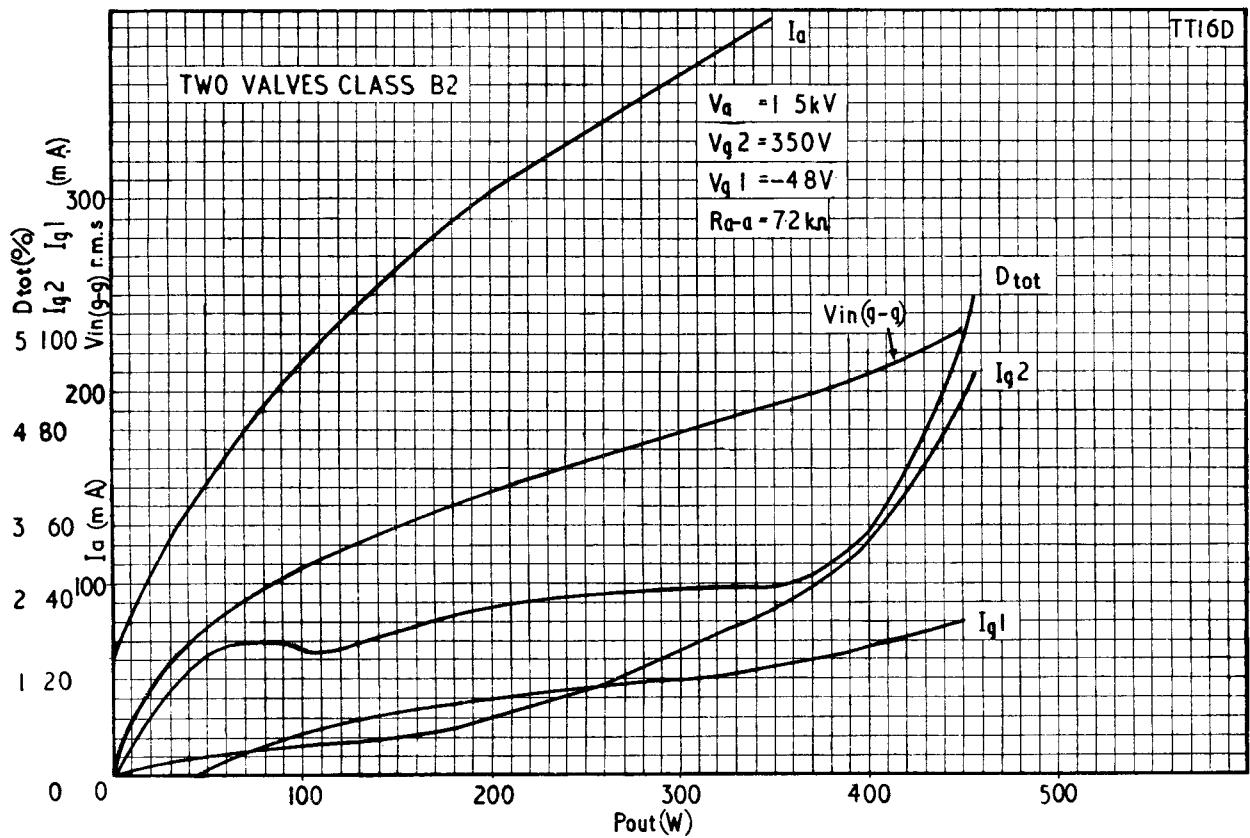
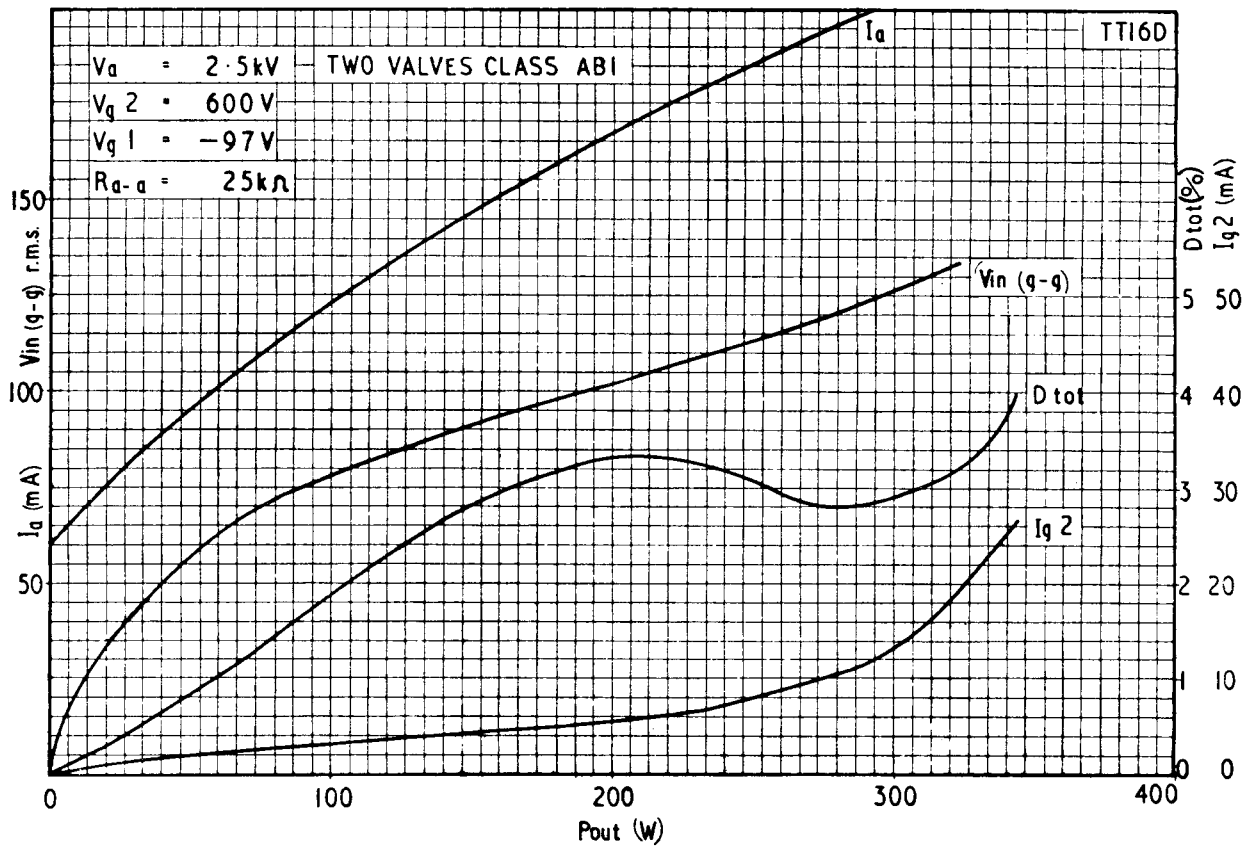
$V_{g2} = 600 \text{ V}$

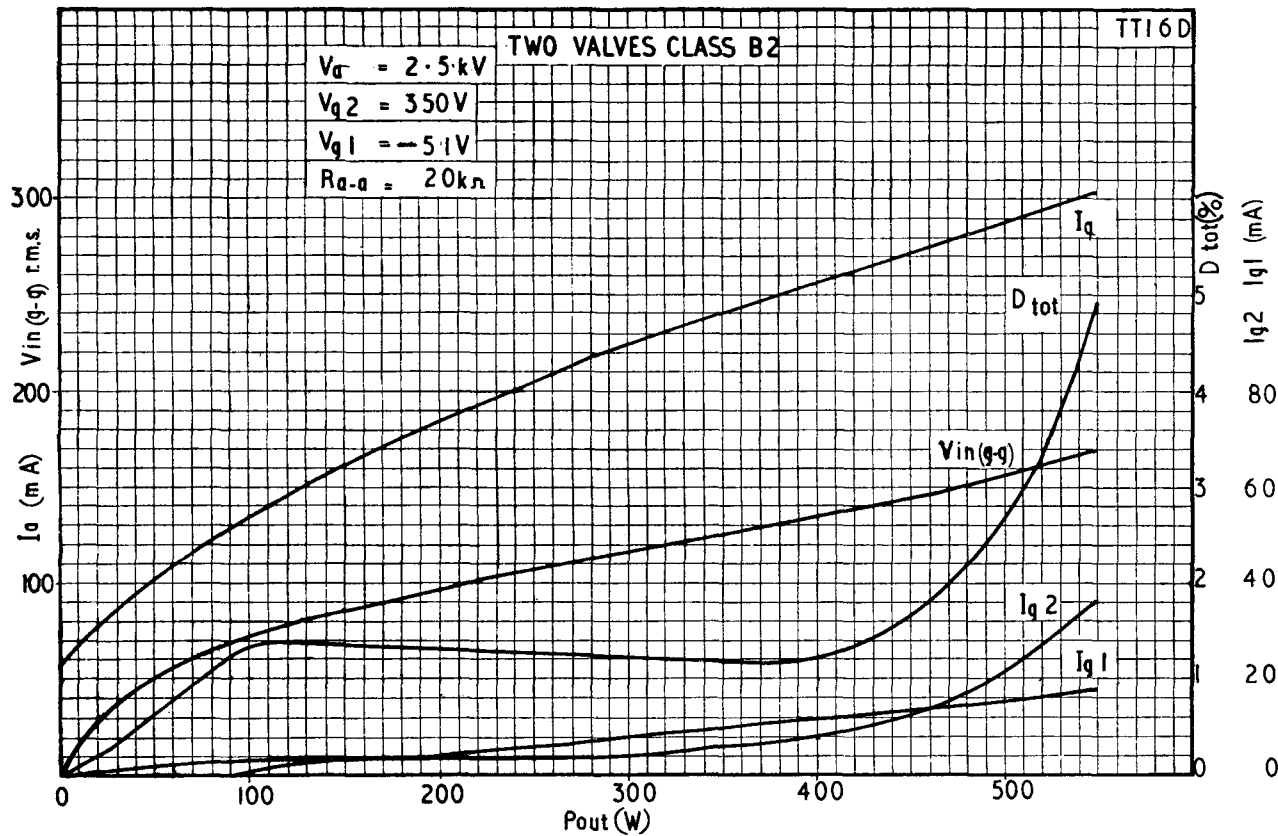
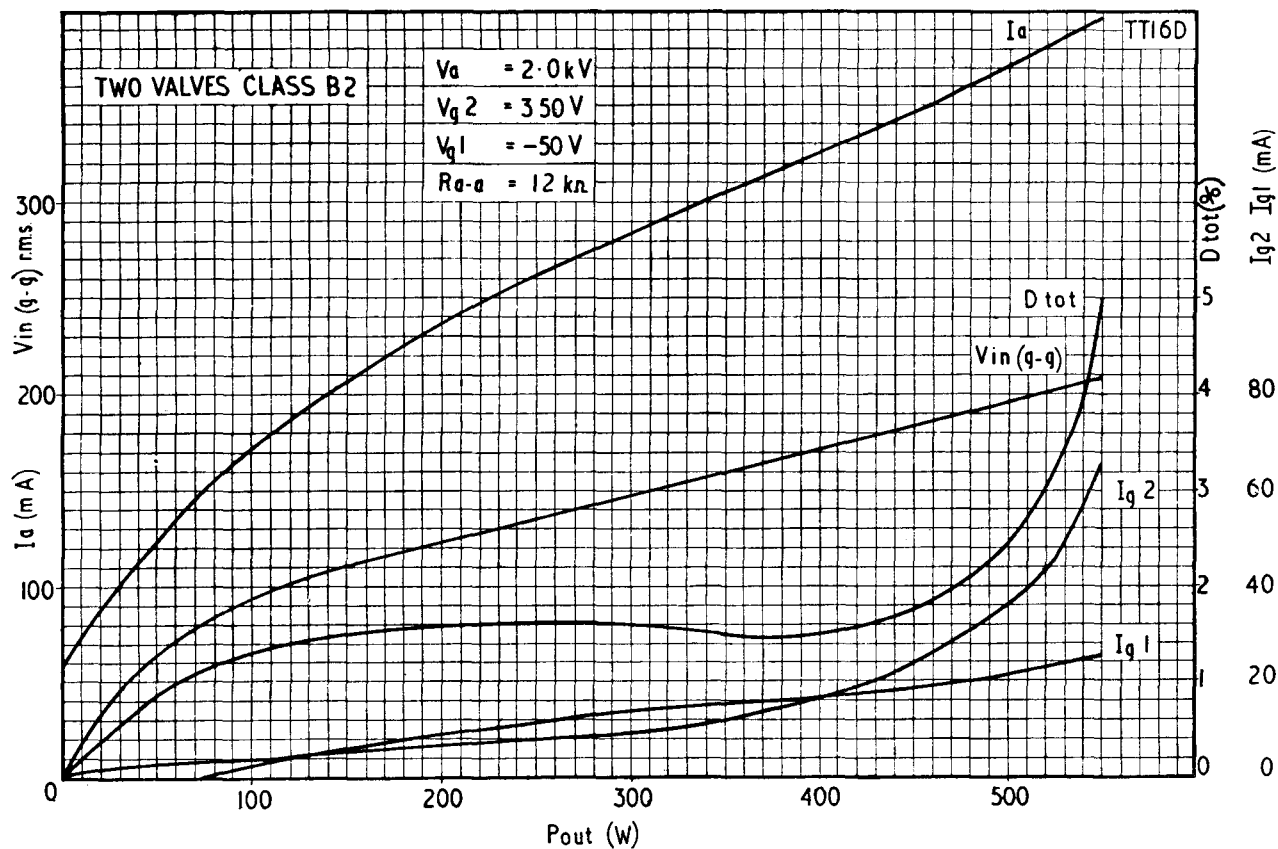
$V_{g1} = -96 \text{ V}$

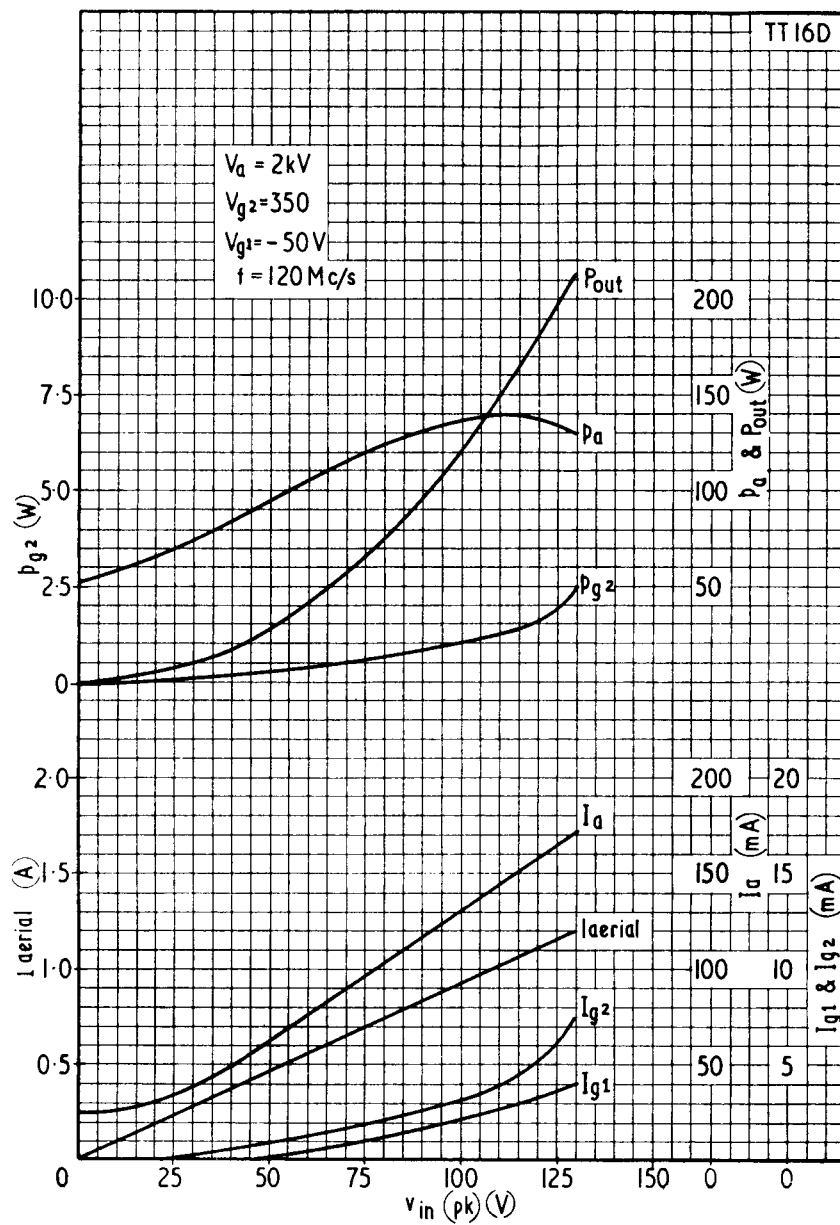
$R_{a-g} = 17.6 \text{ k}\Omega$

D_{tot} (%)	I_{g2} (mA)
5	50
4	40
3	30
2	20
1	10
0	0











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