Triode *Type ACT16*

HF POWER AMPLIFIER AND OSCILLATOR

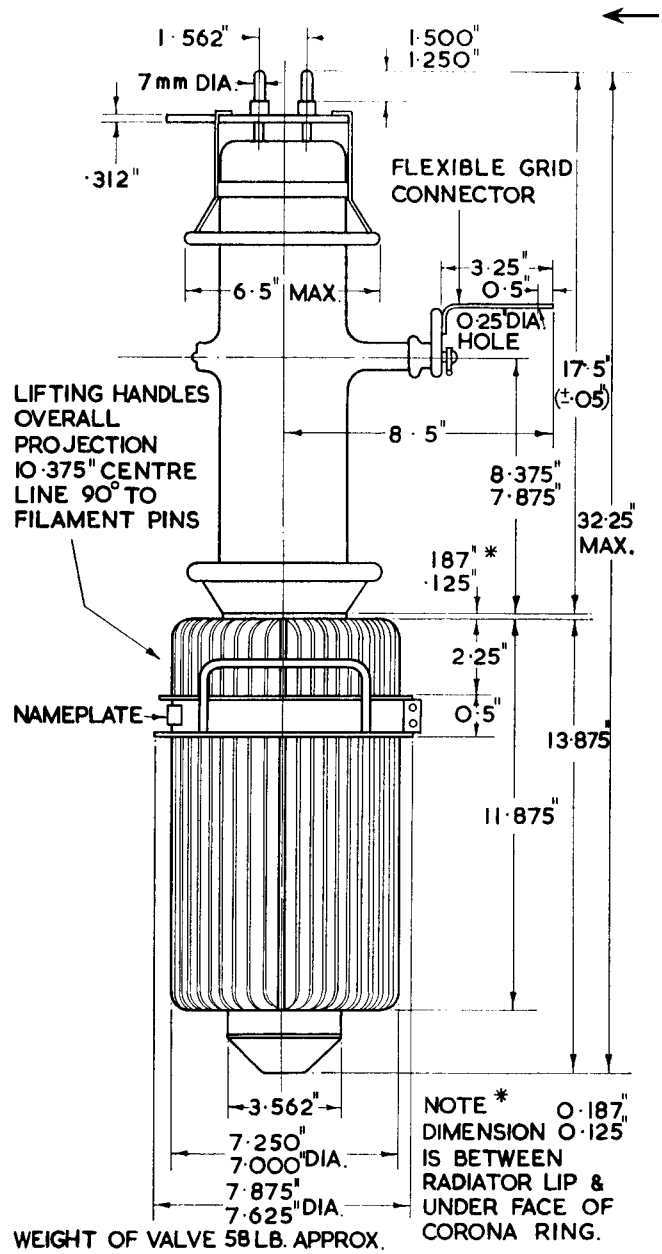
General. A forced-air cooled transmitting triode fitted with a tungsten filament.

Cooling. The anode requires cooling by air blast and the volume of air necessary is 600 cu. ft. per minute at a 10-in. head of water. The filament seal also requires to be cooled by air and the volume of air to the seal should be of the order of 4 cu. ft. perminute. All cooling supplies must be started before the application of any supply voltages, and the temperature of the air intake must not exceed 35°C (95°F).

Filament Starting. The cold resistance of the filament is approximately 0·0167 Ω. The filament current must never exceed 130 A at any time during the switching-on period. If the valve is operated for periods greater than 15 minutes without anode voltage being applied, the filament voltage must be reduced to one-half its normal value during the standby period.

Mounting. The valve must be completely supported by its cooling jacket with its axis in a vertical position. Rigid connections must be made to the anode only.

Seasoning. Whenever a new valve is put into service, or when a valve has been idle for periods of approximately 2 months, it must be seasoned by operating for at least one hour at half the normal anode voltage and current. The anode voltage should then be increased slowly to the normal value.



MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

Chelmsford, Essex, England. Telephone: Chelmsford 3221. *Telex:* 1953. *Telegrams: Expanse Chelmsford Telex*

APPROXIMATE DATA

V_f	18–20	V
I_f	100	A
$V_{a(max)}$	15	kV
$p_{a(max)}$	15	kW
$p_{gl(max)}$	500	W
$I_{gl(pk)\ (RF)\ (max)}$	30	A
μ (taken at Va 15 kV, V_{gl} 0)	45	
r_a (taken at Va 15 kV, V_{gl} 0)	4,500	Ω
g_m (taken at Va 15 kV, V_{gl} 0)	10	mA/V
$f_{(max)}$	40	Mc/s
$c_{a\text{-}gl}$	20·2	pF
$c_{a\text{-}k}$	1·7	pF
$c_{gl\text{-}k}$	27·2	pF

Each valve is marked with the filament voltage to give 12 A emission at 90% saturation.

Typical Operation

(1) HF POWER AMPLIFIER AND OSCILLATOR. CLASS C TELEGRAPHY

(Unmodulated, one valve, key down conditions)

V_a		15·0	12·0	10·0	kV
I_a		2·65	2·6	2·4	A
V_{gl}		–450	–375	–440	V
I_{gl}	(a)	250	280	300	mA
$v_{gl(pk)}$		1,450	1,375	1,440	V
P_{dr}	(a)	350	400	420	W
Z_a		2,900	2,400	2,000	Ω
p_a		12·5	10	7·7	kW
P_{out}		27·3	21·2	16·3	kW

(2) HF POWER AMPLIFIER. CLASS C

(Anode modulated, one valve, carrier conditions, permissible modulation 100%)

V_a	12·0	10·0		kV
I_a	1·05	1·1		A
V_{gl}	–740	–650		V
I_{gl}	(a) 70	72		mA
$v_{gl(pk)}$	1,230	1,140		V
P_{dr}	(a) 90	85		W
Z_a	5,200	4,150		Ω
p_a	3·0	3·2		kW
P_{out}	9·6	7·8		kW

(3) HF POWER AMPLIFIER. CLASS B TELEPHONY

(One valve, carrier conditions, permissible modulation 100%)

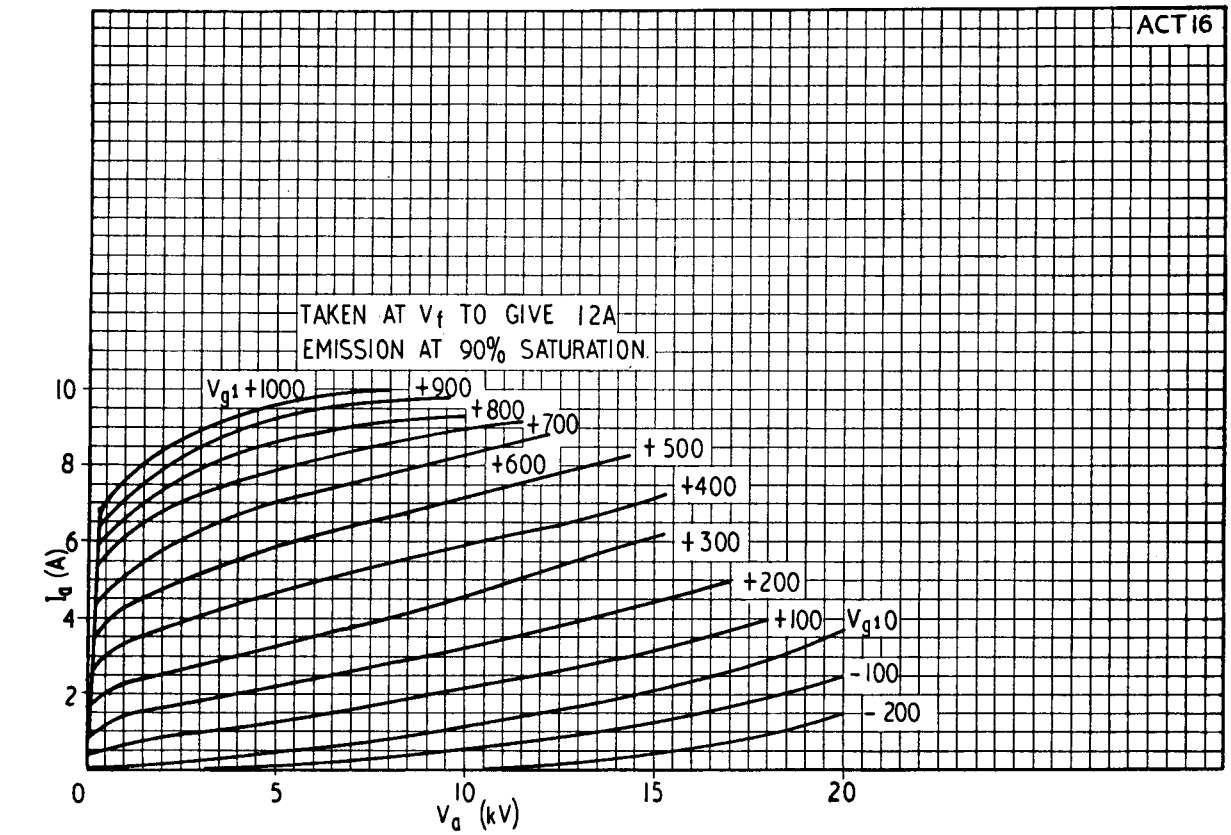
V_a	15·0	10·0		kV
I_a	1·2	1·2		A
V_{gl}	–330	–220		V
$v_{gl(pk)}$	570	510		V
P_{dr}	(a) (b) 85	80		W
Z_a	3,240	1,900		Ω
p_a	12·4	8·75		kW
P_{out}	5·6	3·25		kW

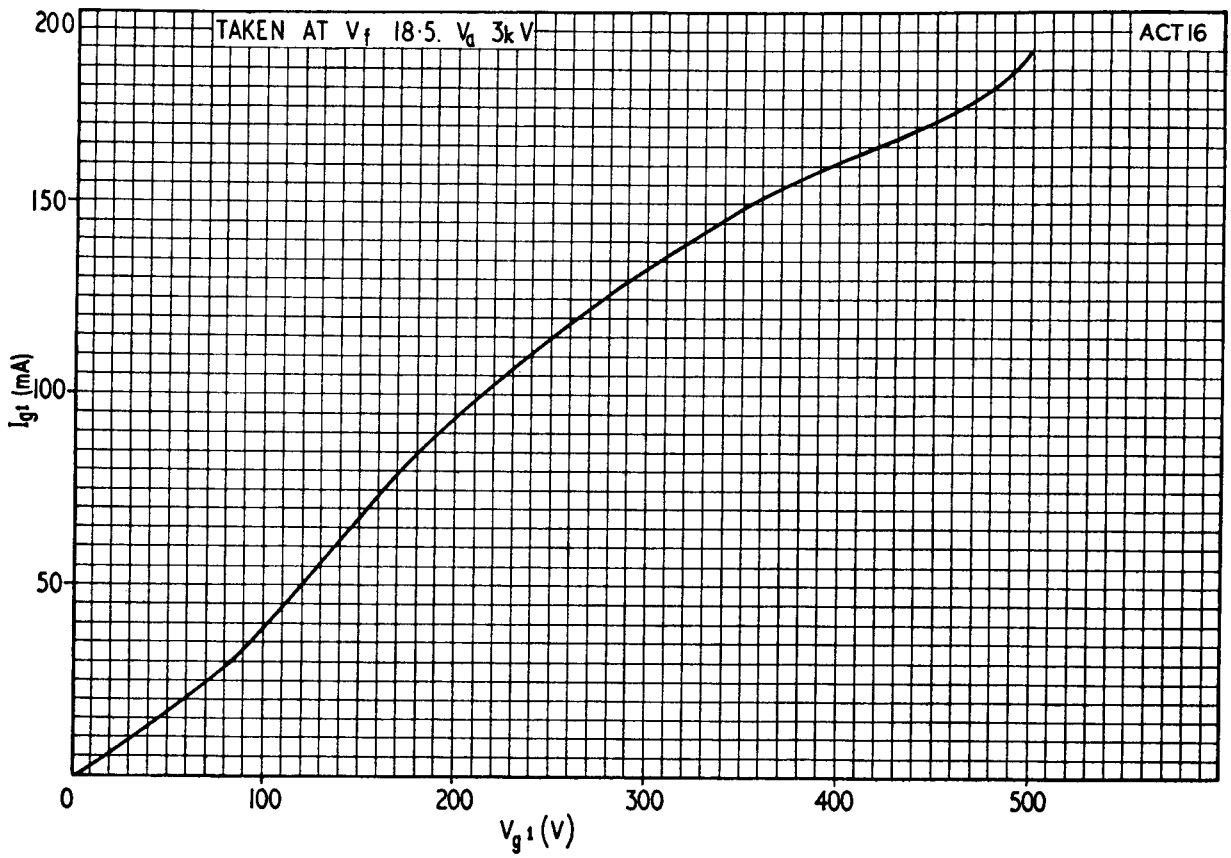
The figures quoted above are only applicable when operating at frequencies up to 20 Mc/s. At higher frequencies the anode voltage must be reduced to the following percentages of the maximum:

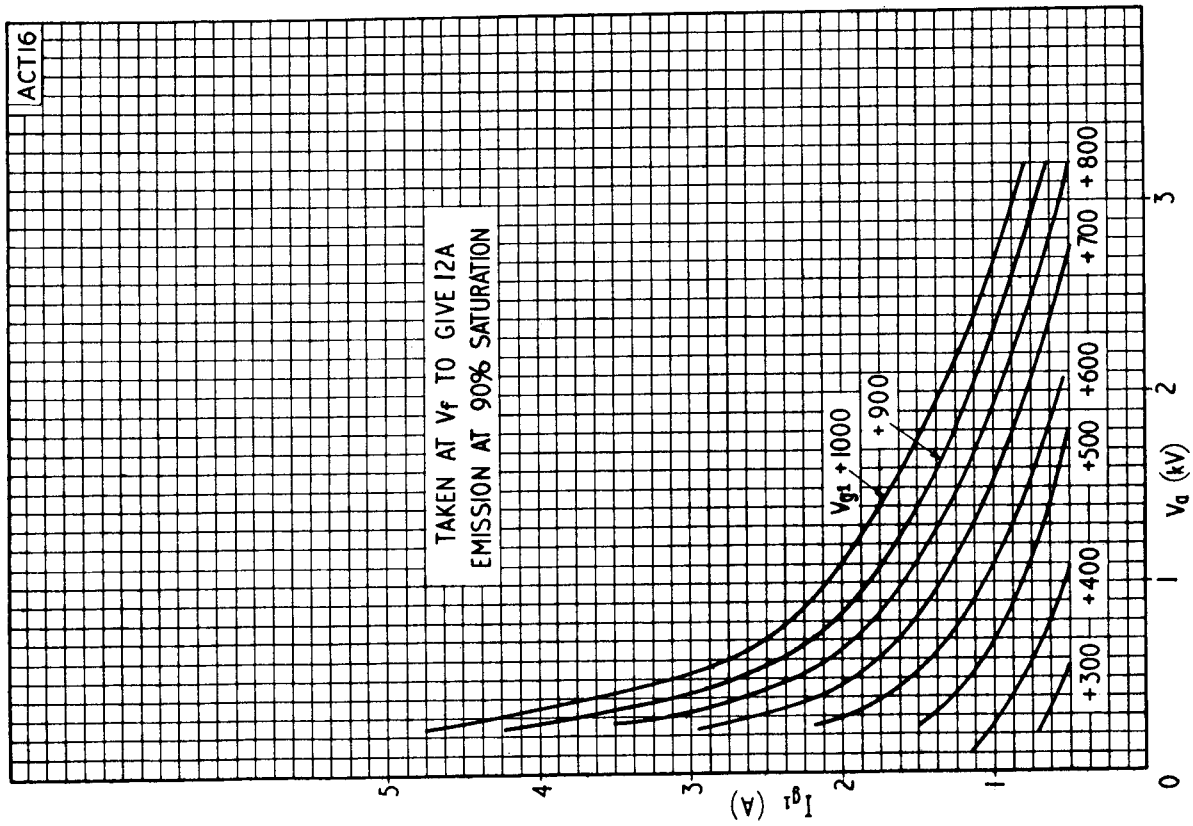
f (Mc/s)	20	25	30	40
$\%V_{a(max)}$	100	75	50	35

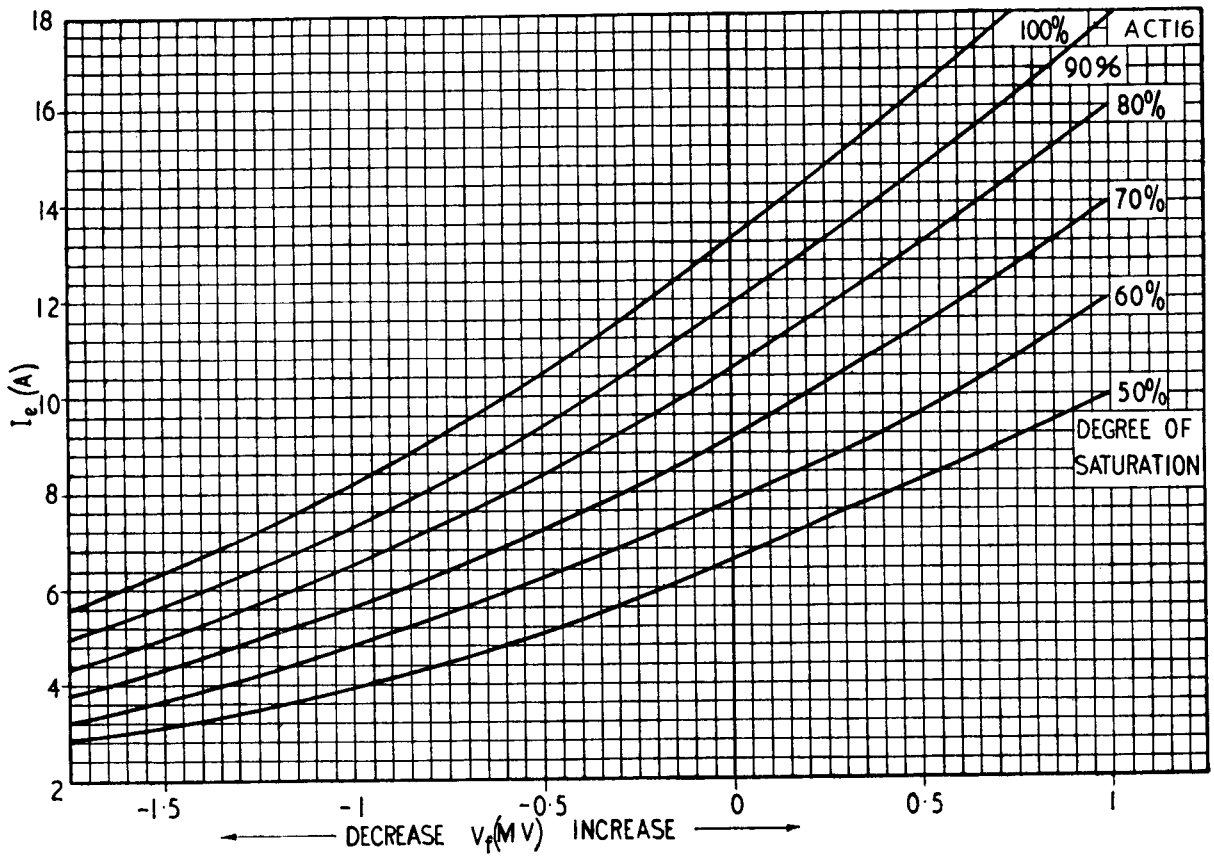
NOTES

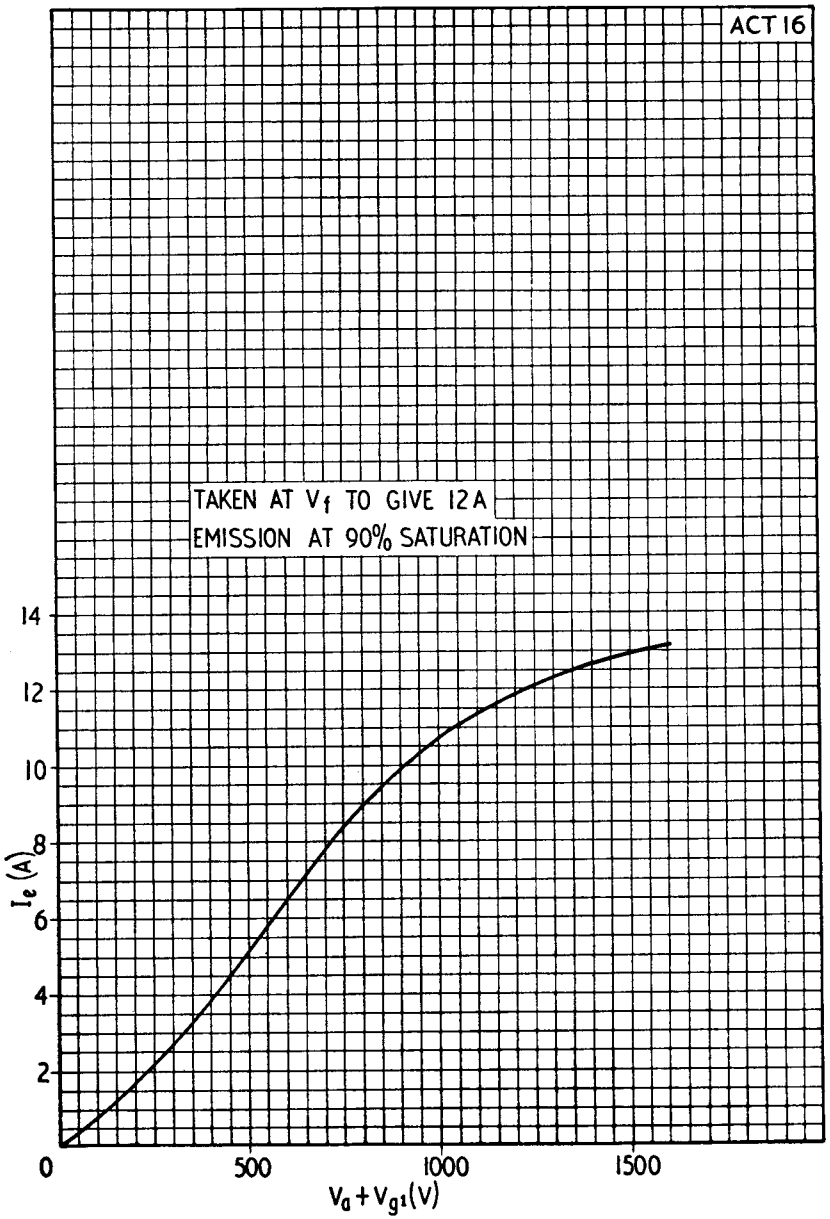
(a) Subject to wide variation. The figures are approximate only.
(b) At crest of audio cycle with 100% modulation.

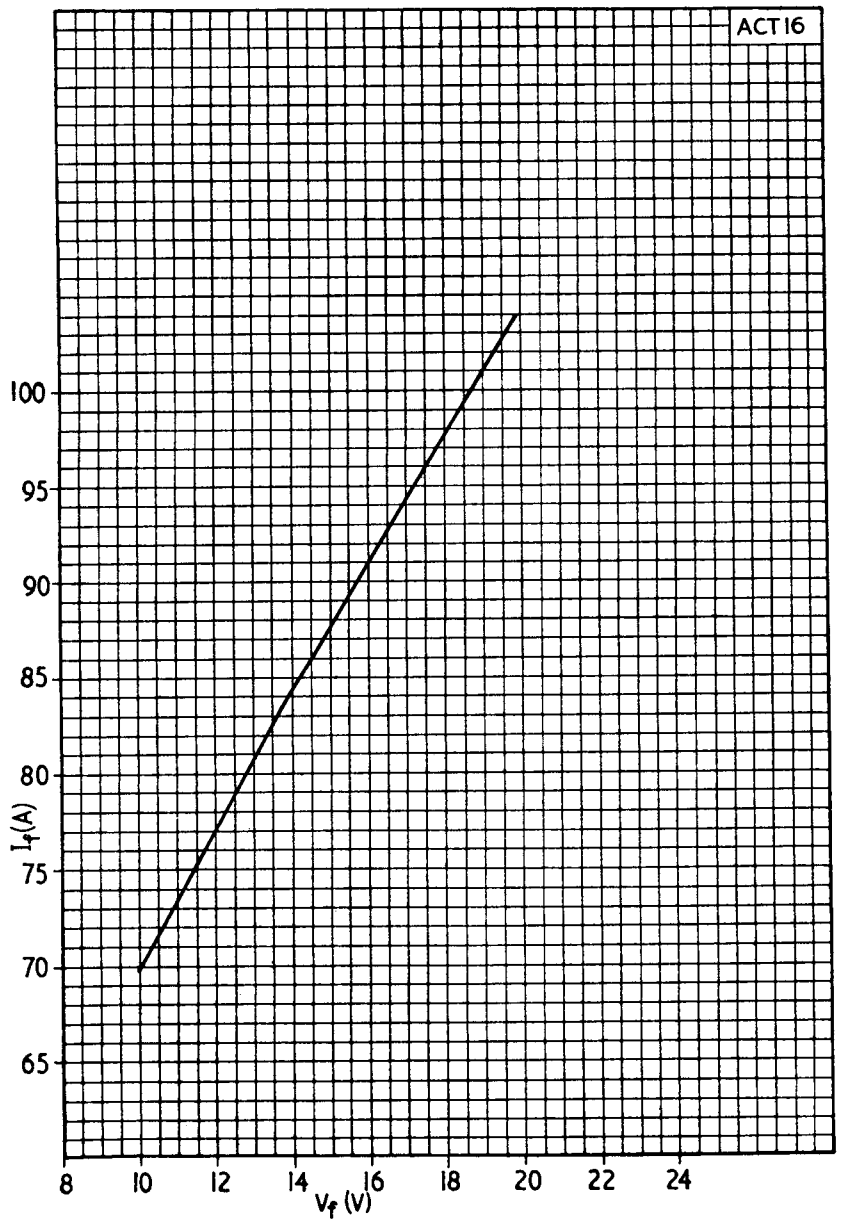

ACT16
TAKEN AT V_f TO GIVE 12A
EMISSION AT 90% SATURATION.
V_{g1} +1000
+900
+800
+700
+600
+500
+400
+300
+200
+100
V_{g1} 0
-100
-200
I_a (A)
V_a (kV)
0
5
10
15
20
2
4
6
8
10


ACT16
TAKEN AT V_f 18·5. V_a 3k V
I_{g1} (mA)
V_{g1} (V)
0
100
200
300
400
500
50
100
150
200


ACT16
TAKEN AT Vf TO GIVE 12A
EMISSION AT 90% SATURATION
Vg1 +1000
+900
+800
+700
+600
+500
+400
+300
Va (kV)
Ig1 (A)


ACT16
100%
90%
80%
70%
60%
50%
DEGREE OF SATURATION
Ie (A)
DECREASE Vf (MV) INCREASE


ACT 16
TAKEN AT V_f TO GIVE 12A
EMISSION AT 90% SATURATION
14
12
10
8
6
4
2
0
500
1000
1500
I_e (A)
$V_a + V_{g1}$ (V)


ACT 16
100
95
90
85
80
75
70
65
8
10
12
14
16
18
20
22
24
I_f (A)
V_f (V)

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