DISC SEAL TRIODE

TD2-500A

Application: *R.F. oscillator, amplifier or frequency multiplier.*
Power output: *580W at f = 625Mc/s.*
Frequency: *400Mc/s at full ratings, 1Gc/s at reduced ratings.*
Construction: *Disc seal, ceramic envelope, forced-air cooled.*

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—TRANSMITTING VALVES included in this volume of the handbook.

FILAMENT

Thoriated tungsten

V_f (f <600Mc/s)	3.4	V
I_f	19	A

The TD2–500A operates at frequencies where transit time effects cause back bombardment heating of the cathode. At frequencies higher than 600Mc/s, the filament voltage must be reduced immediately after operation commences in accordance with the following table:—

f (Mc/s)	V_f (V)
<600	3.4
600 to 750	3.3
750 to 1000	3.2

MOUNTING POSITION

Vertical with anode up or down

CAPACITANCES

C_{a-g}	3.8	pF
C_{g-f}	11	pF
C_{a-f}	50	mpF

CHARACTERISTICS

V_a	2.0	kV
I_a	240	mA
V_g	−2.0	V
g_m	14	mA/V
μ	70	
r_a	5.0	kΩ

COOLING

Forced air

T_{seals} max.	200	°C

The amount of forced-air cooling required for this valve depends upon the anode dissipation and the height above sea level. Typical values of inlet temperature, rate of flow of air and pressure difference between the inlet and outlet of the housing are given in the following table:—

Anode dissipation	Height above sea level		Max. inlet temperature	Min. rate of flow of air per minute		Pressure difference between inlet and outlet	
P_a	h		T_{in}	(m^3)	(ft^3)	(mm of	(in. of
(W)	(km)	(ft)	(°C)			water)	water)
500	0	0	45	0.9	32	24	0.94
500	1.5	4920	35	0.9	32	20	0.79
500	3.0	9840	25	1.0	35	21	0.83

TD2-500A

DISC SEAL TRIODE

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Limiting values (absolute ratings)

f max.	400	625	940	Mc/s
V_a max.	2.7	2.5	2.2	kV
p_a max.		500		W
I_k max.		575		mA
$i_{k(pk)}$ max.		3.0		A
$-V_g$ max.		300		V
I_g max.		175		mA
p_g max.		30		W
R_{g-f} max.		10		kΩ

Typical operation (grounded grid)

f	400	625	Mc/s
V_a	2.5	2.2	kV
I_a	380	380	mA
V_g	−70	−60	V
I_g	160	170	mA
$P_{load(driver)}$	70	65	W
p_a	330	302	W
η_a	65	64	%
*P_{out}	620+50	533+47	W
P_{load} ($\eta_{transfer}$ = 80%)	536	464	W

*Includes power transferred from driver stage.

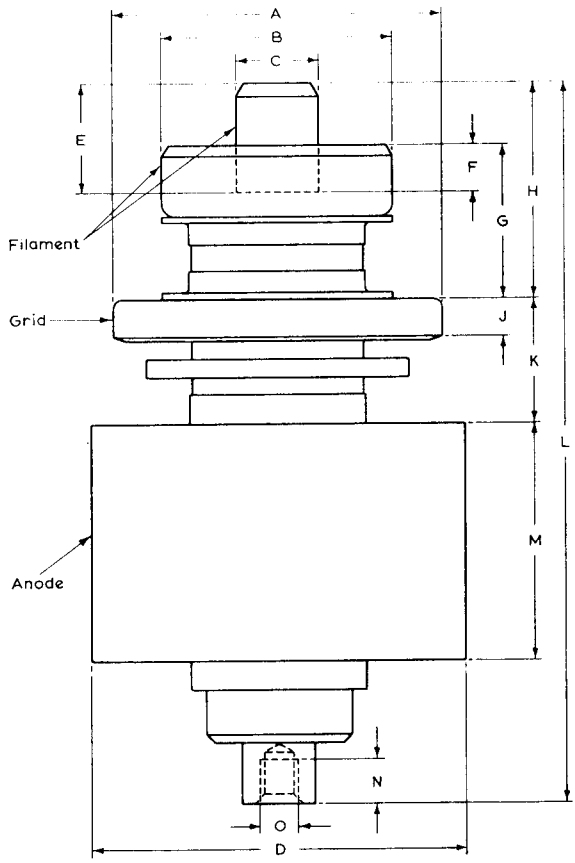
WEIGHT

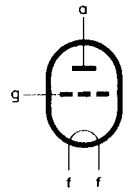
Valve only	6	oz
	160	g
Shipping weight	9	oz
	250	g

DIMENSIONS

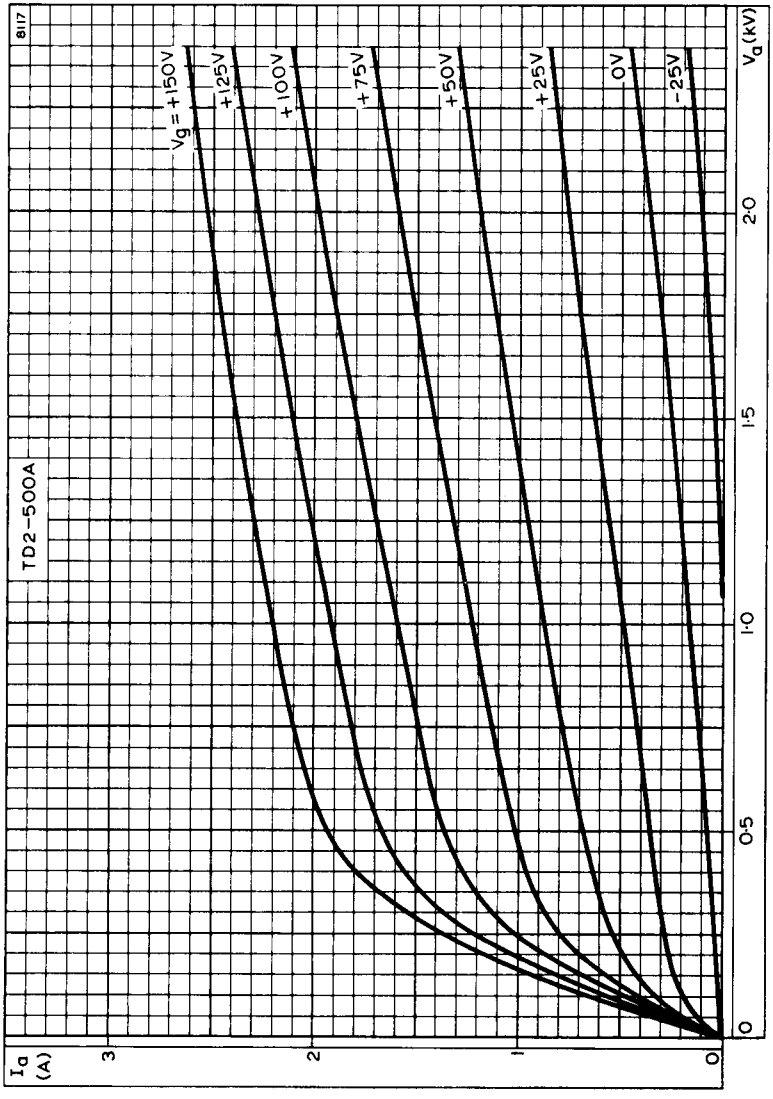
	Inches	*Millimetres*	
A	1.433±0.008	36.4±0.2	
B	1.0±0.008	25.4±0.2	
C	0.354±0.008	9.0±0.2	
D	1.626±0.008	41.3±0.2	
E	0.472	12	
F	0.236	6.0	
G	0.669±0.020	17±0.5	
H	0.925±0.039	23.5±1.0	
J	0.158	4.0	
K	0.551±0.020	14±0.5	
L	3.268	83	max.
M	1.024	26	
N	0.158	4.0	
O	4 millimetre metric thread		

TD2-500A





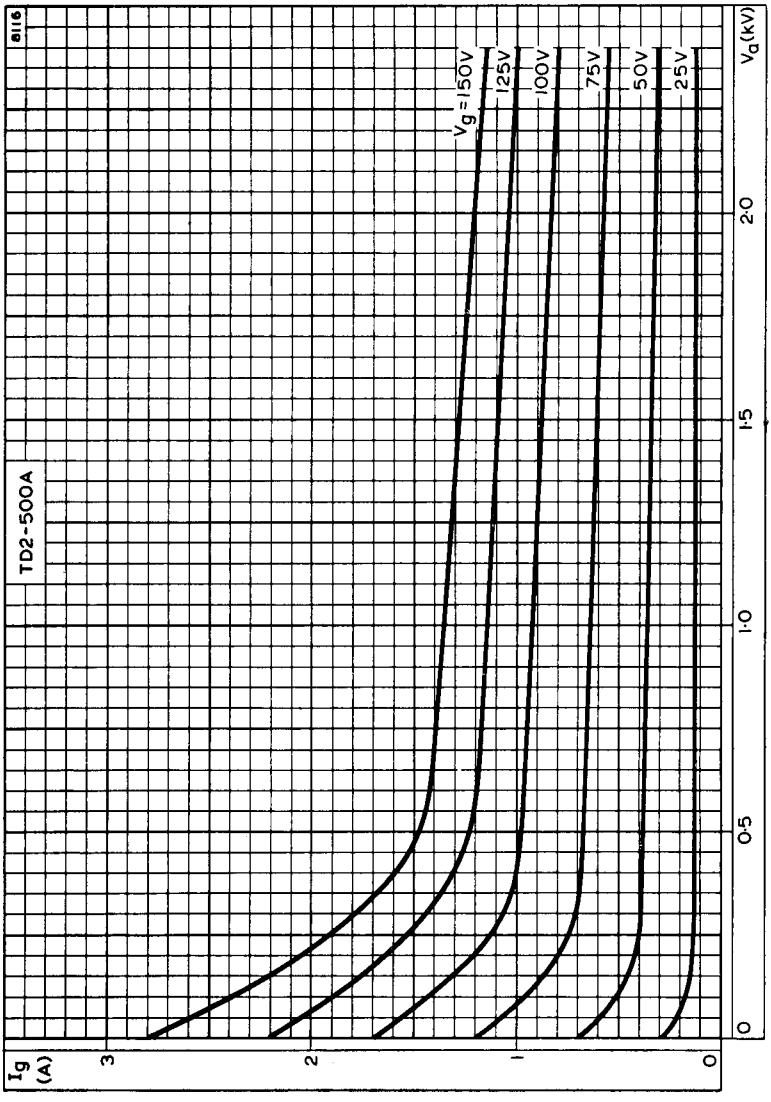
TD2-500A



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER

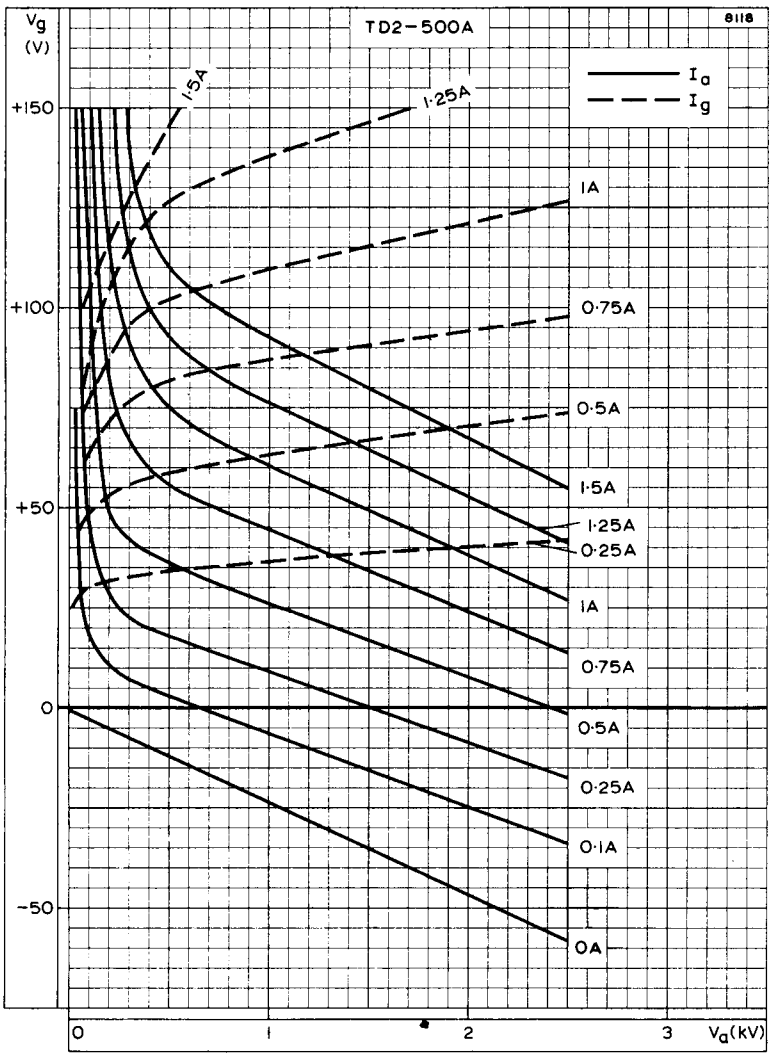
TD2-500A

DISC SEAL TRIODE



GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER

TD2-500A



CONSTANT CURRENT CURVES

DISC SEAL TRIODE TD2-500A

QUICK REFERENCE DATA

Disc seal triode with ceramic envelope intended for use as a power amplifier, oscillator or frequency multiplier.

f		400	625	Mc/s
P_{out}		670	580	W
f max.	400	625	940	Mc/s
V_a max.	2.7	2.5	2.0	kV
p_a max.	500	500	500	W

To be read in conjunction with
GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Maximum operating conditions for valve in common grid circuit amplifier

f	400	625	Mc/s
*P_{out}	620+50	533+47	W
P_{load}	470	405	W
η_a	64	64	%
V_a	2.5	2.5	kV
I_a	380	380	mA
V_g	70	60	V
I_g	160	170	mA
P_{load} (driver)	70	65	W
p_a	330	302	W

*Includes power transferred from driver stage.

ABSOLUTE MAXIMUM RATINGS

f max.	400	625	940	Mc/s
V_a max.	2.7	2.5	2.0	kV
V_g max.	300	300	300	V
I_k max.	575	575	560	mA
p_a max.	500	500	500	W

CATHODE

Directly heated, thoriated tungsten.

At frequencies higher than 600Mc/s, transit time causes back bombardment heating of the cathode. The filament voltage must be reduced immediately after operation commences in accordance with the following table:-

f	V_f
(Mc/s)	(V)
<600	3.4
600 to 750	3.2

I_f (at V_f=3.4V)	19	A

CAPACITANCES

c_{a-f}	50	mpF
c_{g-f}	11	pF
c_{a-g}	3.8	pF

CHARACTERISTICS (measured at V_a=2.0kV, I_a=240mA)

g_m	14	mA/V
μ	70	

MOUNTING POSITION

Vertical with anode up or down.

COOLING

Forced air

Maximum temperature

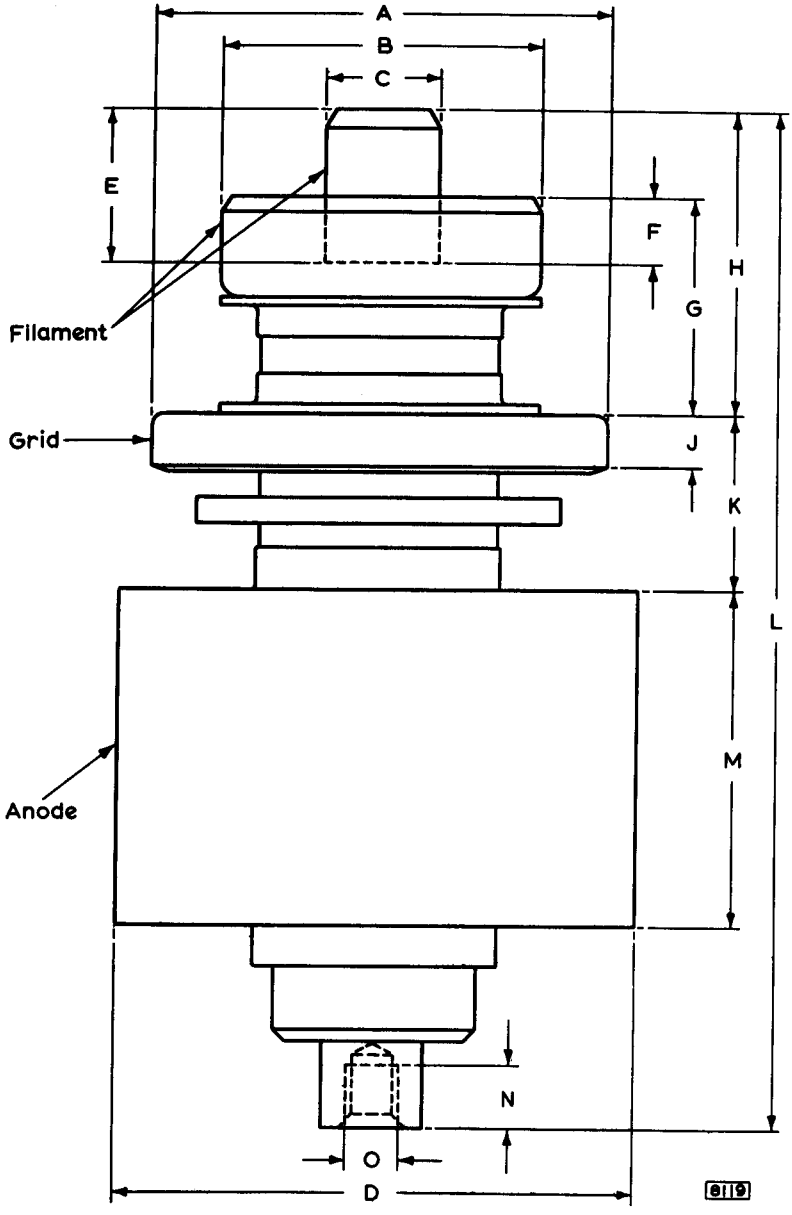
Seals	200	°C

The amount of forced-air cooling required for this valve depends upon the anode dissipation and the height above sea level. Typical values of inlet temperature, rate of flow of air and pressure difference between the inlet and outlet of the housing are given in the following table:-

Anode dissipation	Height above sea level		Max. inlet temperature	Min. rate of flow of air per minute		Pressure difference between inlet and outlet	
P_a (W)	h (km)	(ft)	T_{in} (°C)	(m^3)	(ft^3)	(mm of water)	(inches of water)
500	0	0	45	0.9	32	24	0.94
500	1.5	4920	35	0.9	32	20	0.79
500	3.0	9840	25	1.0	35	21	0.83

PHYSICAL DATA

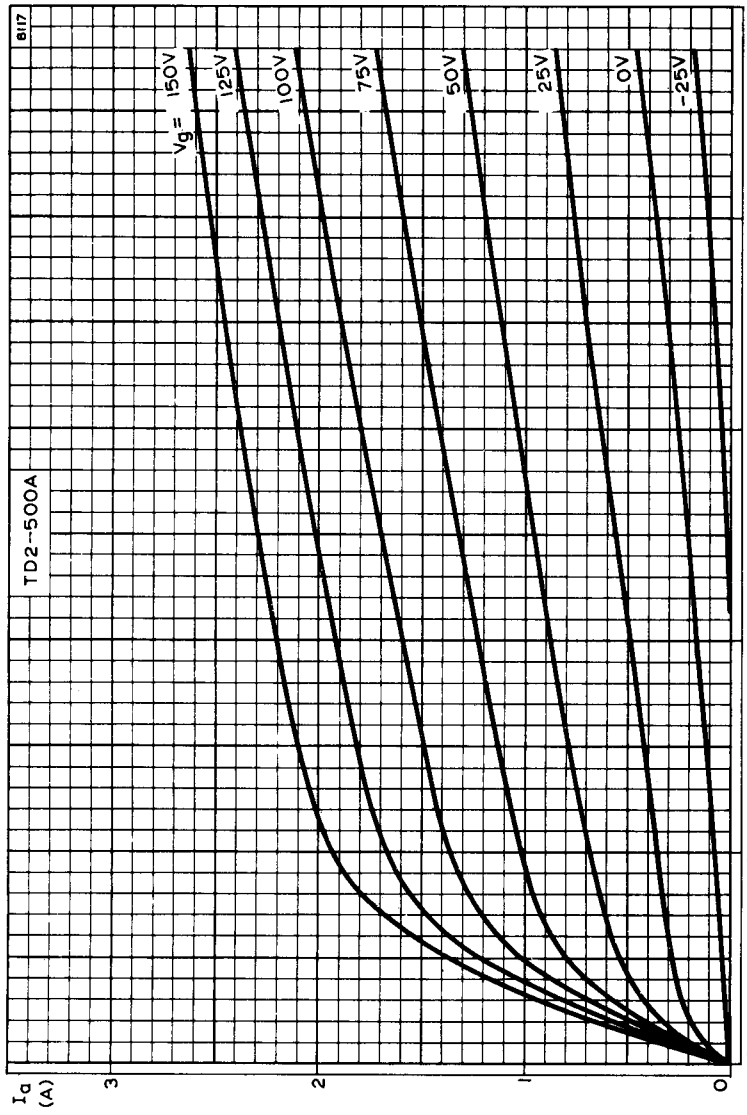
	oz	g
Weight of valve	6.0	170
Weight of valve plus carton	9.0	255


A
B
C
E
F
G
H
J
K
L
M
N
O
D
Filament
Grid
Anode
8119

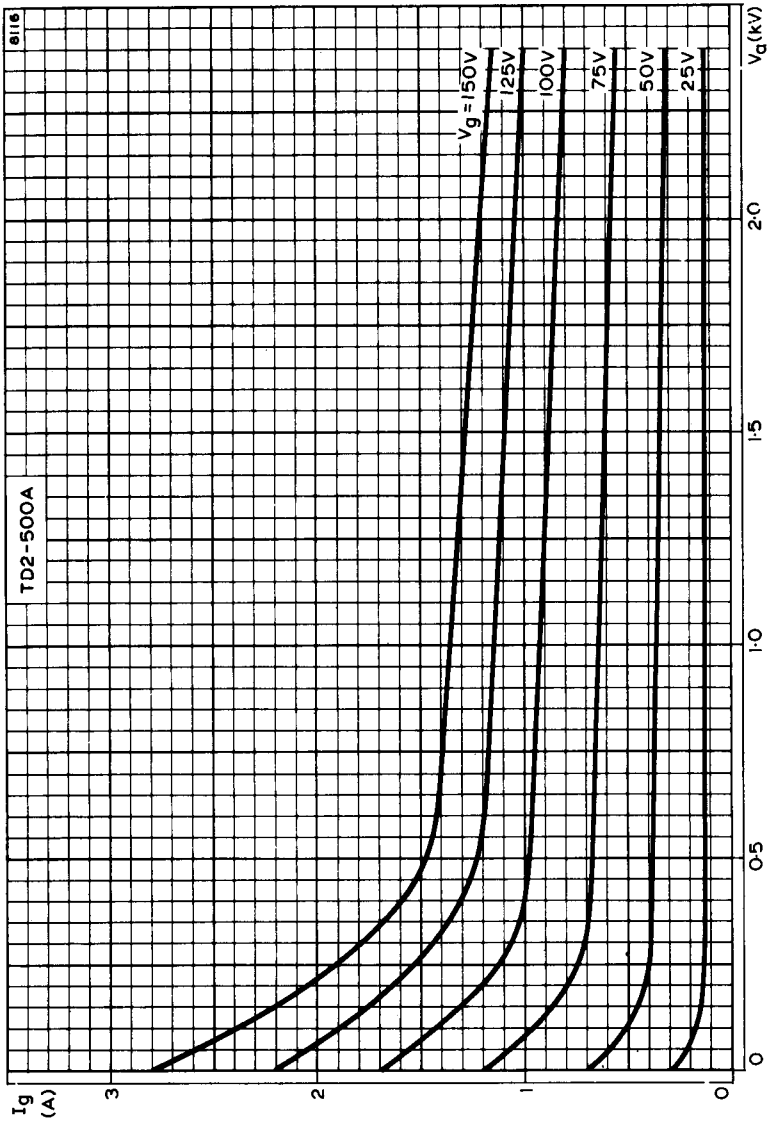
DIMENSIONS

	Inches	Millimetres	
A	1.433 ± 0.008	36.4 ± 0.2	
B	1.0 ± 0.008	25.4 ± 0.2	
C	0.354 ± 0.008	9.0 ± 0.2	
D	1.626 ± 0.008	41.3 ± 0.2	
E	0.48	12	min.
F	0.236	6.0	
G	0.669 ± 0.020	17 ± 0.5	
H	0.925 ± 0.039	23.5 ± 1.0	
J	0.158 ± 0.020	4.0 ± 0.5	
K	0.551 ± 0.020	14 ± 0.5	
L	3.26	83	max.
M	1.02	26	
N	0.158	4.0	
O	4 millimetre metric thread		

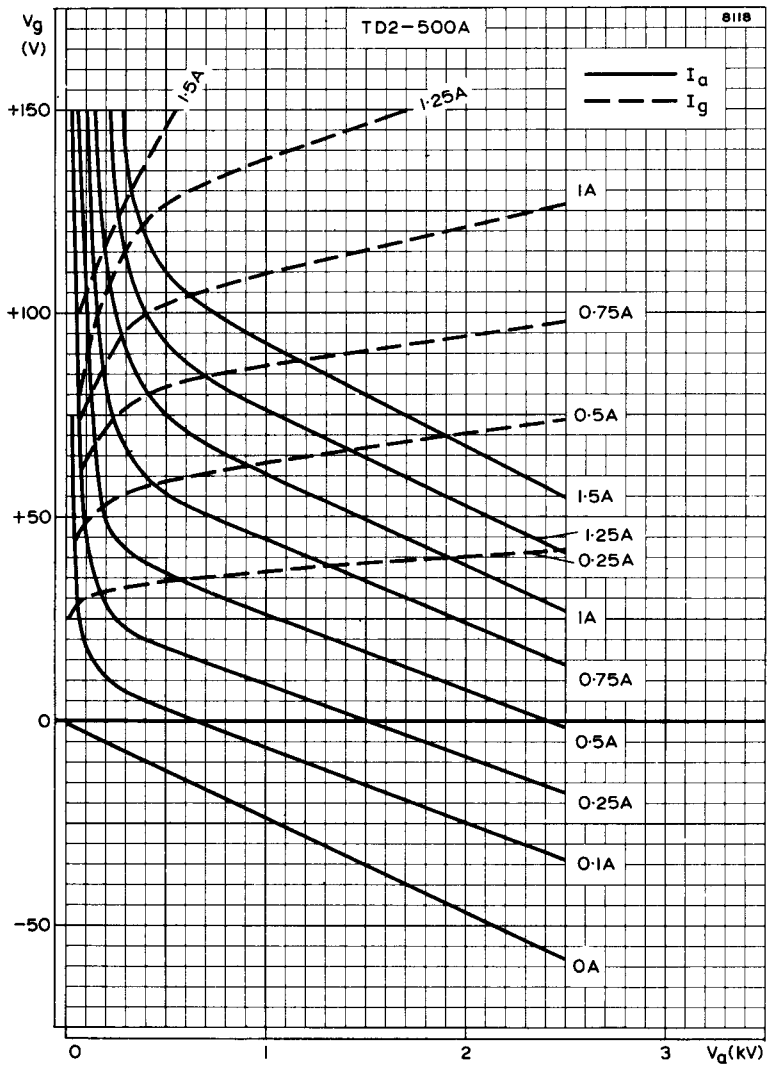
Inch dimensions derived from original millimetre dimensions



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER



GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER



CONSTANT CURRENT CHARACTERISTICS