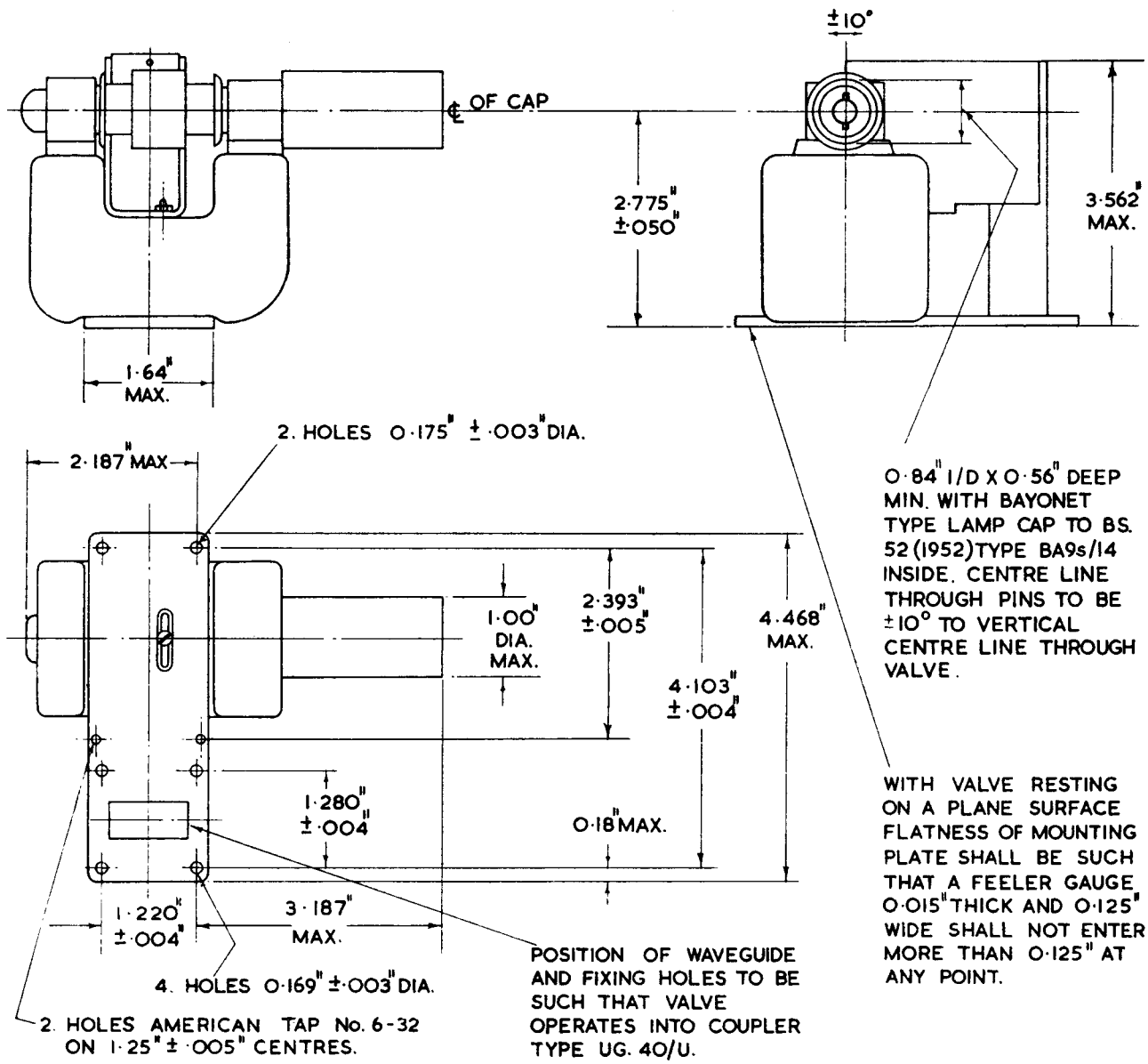
# Magnetron *Type M 503*




**MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED**

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

**General.** The M 503 is an air-cooled multi-resonator packaged magnetron, with a pre-plumbed waveguide output circuit. It has been designed for operation in the 3 cm band and is for use with systems using the standard American waveguide; the internal dimensions of which are 0·9 × 0·4 in.

**Cold Impedance.** The impedance of the valve at its operating frequency when not oscillating will be such as to give a standing wave ratio of at least 8:1 with a minimum distance of 16·5–22·5 mm from the flange towards the anode.

## APPROXIMATE DATA

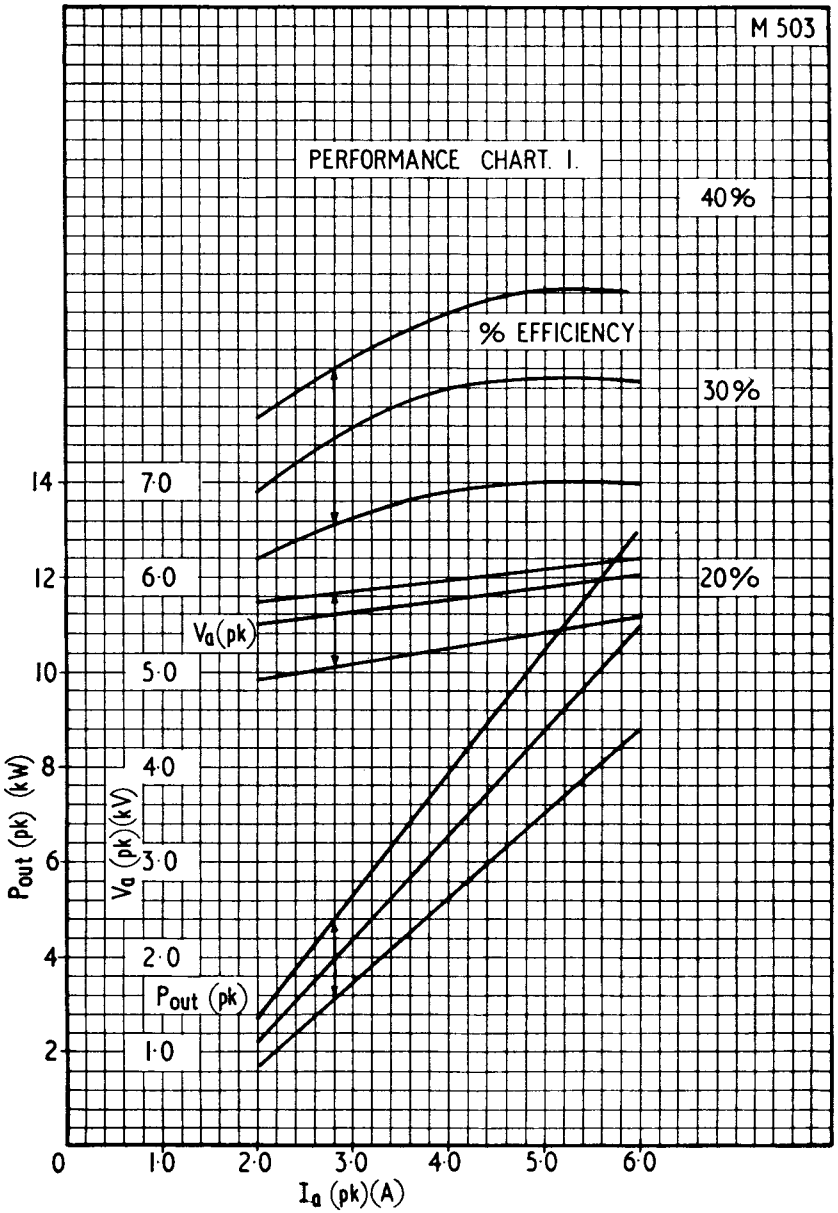
| | | | |
|---|---|---|---|
| $V_h$ (a) | | 6·3 | V |
| $I_h$ | | 0·5 | A |
| f | 9,345–9,405 | | Mc/s |
| $f_{pulling}$ (standing wave ratio 1·5:1 in all phases) | | 14 | Mc/s |
| Rate of rise of voltage (max) (at 4·5 A peak) | | 60 | kV/μs |
| Duty cycle (a) | | 0·001 | |
| $H_{int}$ | | 4,800 | Oersteds |
| $\eta_{min}$ | | 25 | % |

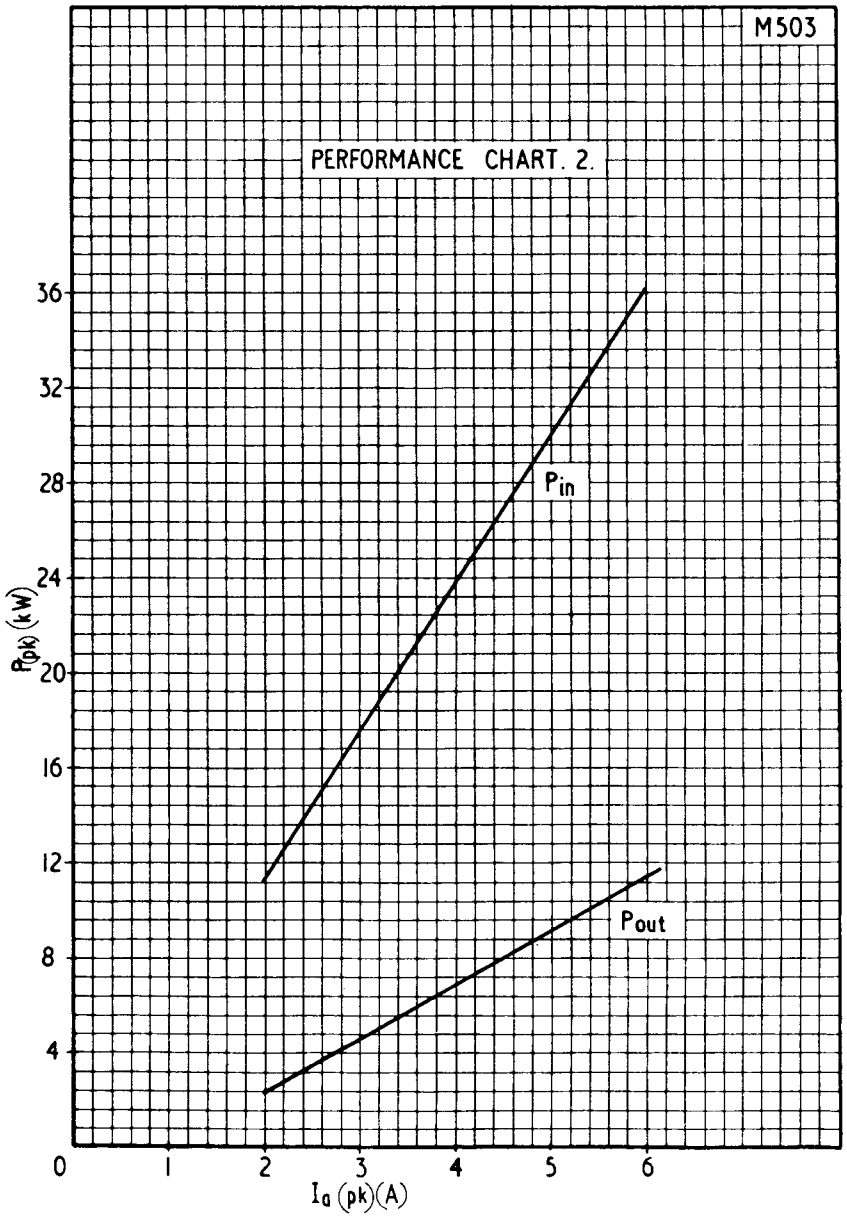
### Typical Operation

| | | | |
|---|---|---|---|
| $V_a$ pk | | 5·5 | kV |
| $I_a$ pk | | 5 | A |
| $t_p$ | 1 | 0·1 | μs |
| PRF | 1,000 | 1,000 | pps |
| $P_{out}$ (pk) | | 8 | kW |

**NOTE**

(a) The heater voltage should be maintained at 6·3 V for at least 2 minutes before switching on the HT. For duty cycles greater than 0·001 the heater voltage should be reduced to 4·5 V after switching on the HT.

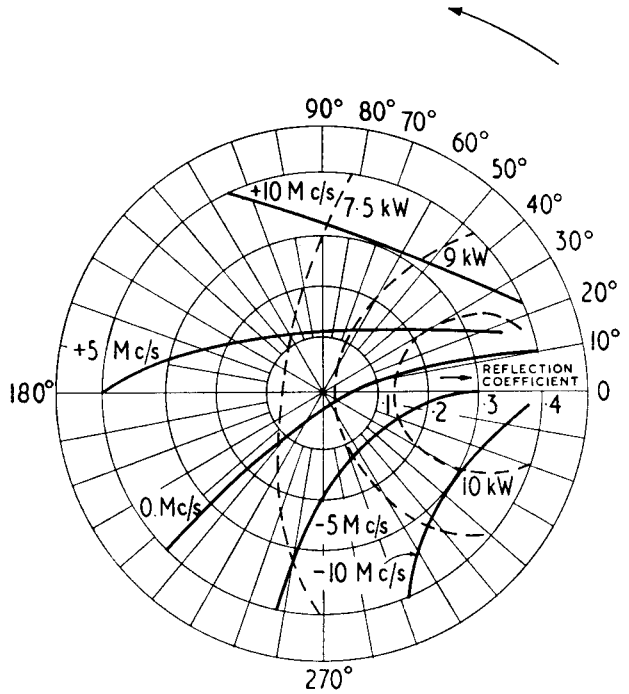

M 503
PERFORMANCE CHART. 1.
40%
% EFFICIENCY
30%
20%
7·0
6·0
5·0
4·0
3·0
2·0
1·0
Va(pk)
Va (pk)(kV)
Pout (pk)
Pout (pk) (kW)
14
12
10
8
6
4
2
0
1·0
2·0
3·0
4·0
5·0
6·0
Ia (pk)(A)


M503
PERFORMANCE CHART. 2.
Pin
Pout
P(pk) (kW)
36
32
28
24
20
16
12
8
4
0
1
2
3
4
5
6
Ia (pk)(A)

M 503

TAKEN AT 5A PULLING
FIGURE 14 M c/s.

$\theta = 360^\circ L/\lambda_g^\circ$ AWAY
FROM VALVE.




——— FREQUENCY DEVIATION M c/s
– – – – PEAK POWER IN kW
L = DISTANCE OF SW MINIMUM FROM OUTPUT FLANGE.

PRINTED IN ENGLAND