MAGNETRON

JP9-7
JP9-7A
JP9-7B

Frequency: *'X' band, fixed.*
Power output: *7.5kW, pulsed.*
Construction: *Packaged, forced-air cooled.*

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—MICROWAVE DEVICES: INTRODUCTION and RADAR AND COMMUNICATION MAGNETRONS which precede this section of the handbook.

CHARACTERISTICS

		Min.		*Max.*	
Frequency (measured with the anode block at 45°C)	JP9–7	9.345	to	9.405	Gc/s
Fixed within the band	JP9–7A	9.210	to	9.270	Gc/s
	JP9–7B	9.525	to	9.585	Gc/s
Pulse voltage (I_{pulse} = 4.5A)		5.3		5.7	kV←
R.F. pulse power output (I_{pulse} = 4.5A)		7.0			kW
Frequency pulling factor (v.s.w.r. = 1.5)				15	Mc/s
Frequency temperature coefficient				–0.25	Mc/s per °C
Distance of v.s.w. minimum from face of mounting plate into valve		16.5		22.5	mm←
Input capacitance				8.0	pF

CATHODE

Indirectly heated

V_h	6.3	V
I_h	600	mA

Heating time. At ambient temperatures above 0°C the cathode must be heated for at least 2 minutes before the application of h.t. Below this temperature the heating time must be increased to at least 3 minutes.

For mean input powers greater than 25 watts, it is necessary to reduce the heater voltage immediately after the application of h.t. in accordance with the input power-heating voltage rating chart on page C2.

TYPICAL OPERATION

Heater voltage (running)	6.3	V
Pulse duration	1.0	μs
Pulse repetition frequency	1000	p/s
Duty cycle	0.001	
Pulse current	4.5	A
Pulse voltage	5.5	kV
R.F. pulse output power	7.5	kW←
Mean input current	4.5	mA
Mean input power	24.7	W
Mean r.f. output power	7.5	W←
Frequency pulling (v.s.w.r. = 1.5)	14	Mc/s←
Rate of rise of pulse voltage	50	kV/μs←

COOLING

In normal circumstances natural cooling is adequate, but where the ambient temperature is abnormally high a flow of cooling air between the radiator fins may be necessary to keep the block temperature below the permitted maximum.

JP9-7
JP9-7A
JP9-7B

MAGNETRON

ABSOLUTE MAXIMUM RATINGS

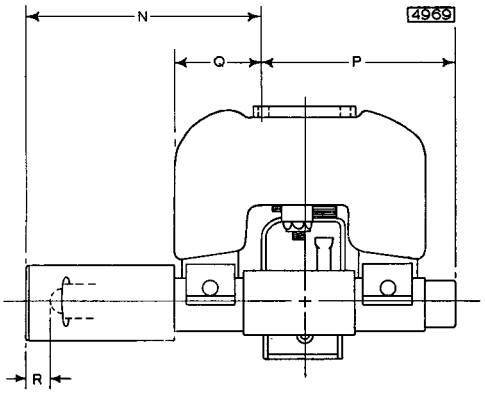
	Min.	Max.	
Pulse current	3.5	5.5	A
Pulse voltage	5.0	6.0	kV
Pulse duration		2.5	μs
Duty cycle		0.0025	
Mean input power		82.5	W
Rate of rise of voltage pulse		60	kV/μs
Load mismatch (v.s.w.r.)		1.5	
Temperature of anode block		120	°C

MOUNTING POSITION

Any

PHYSICAL DATA

Weight of magnetron	3.0	lb
	1.4	kg
Weight of magnetron in carton	5.7	lb
	2.5	kg
Dimensions of storage carton	7.75 × 8.0 × 9.75	in
	200 × 210 × 250	mm



DIMENSIONS

	inches	mm					
A	4.47	113.5	max.	M	1.0	25.4	max.
B	4.103±0.004	104.2±0.1		N	3.19	81.0	max.
C	0.17±0.003	4.32±0.08		P	2.19	55.6	max.
D	0.175±0.003	4.45±0.08		Q	1.19	30.2	max.
E	0.19	4.8	max.	R	0.25	6.4	max.
F	4.0	102	max.	S	0.125±0.01	3.18±0.25	
G	1.93	49	min.	T	3.25	82.6	max.
H	1.64	41.7	max.	U	2.52±0.13	64±3	
J	1.22±0.003	30.99±0.08		V	3.0±0.13	76±3	
K	1.22±0.004	30.99±0.1		X	0.400±0.003	10.16±0.08	
L	1.28±0.004	32.51±0.1		Y	0.640±0.004	16.25±0.10	
				Z	0.900±0.003	22.86±0.10	

MAGNETRON

Fixed frequency forced-air cooled multi-cavity magnetron incorporating a permanent magnet system for pulsed operation within the 'X' band.

JP9-7
JP9-7A
JP9-7B

FREQUENCY (measured with the anode block at 45 °C)

JP9-7	JP9-7A	JP9-7B	
9345 to 9405	9210 to 9270	9525 to 9585	Mc/s

CATHODE

Indirectly heated

V_h	6.3	V
I_h	600	mA

Under some conditions of operation it is desirable to reduce the heater voltage immediately after applying the anode power, to compensate for additional heating of the cathode by back bombardment. See appropriate section of 'General operating recommendations – microwave devices.'

Heating Time. At ambient temperatures above 0°C the cathode must be heated for at least 2 minutes before the application of h.t. Below this temperature the heating time must be increased to 3 minutes.

LIMITING VALUES (Absolute ratings)

Anode pulse current		
Maximum	5.5	A
Minimum	3.5	A
Maximum anode input pulse power	33	kW
Maximum duty cycle	0.0025	
Maximum pulse duration	2.5	μs
Maximum anode mean input current	14	mA
Maximum anode mean input power	82.5	W
Maximum rate of rise of voltage pulse	60	kV/μs
Distance of V.S.W. minimum from mounting plate inward	16.5 to 21.5	mm
Maximum block temperature	120	°C

CHARACTERISTICS

Anode pulse voltage		
Maximum	6.0	kV
Minimum	5.0	kV
Frequency pulling (for V.S.W.R.=0.67)	<15	Mc/s
Minimum output pulse power ($I_{a(pulse)}$=4.5A)	7.0	kW

TYPICAL OPERATION

Pulse duration	1.0	μs
Pulse repetition frequency	1000	p/s
Anode pulse current	4.5	A
R.F. power output during pulse	>7.0	kW
Anode mean current	4.5	mA
R.F. mean power output	>7.0	W
Frequency pulling (for V.S.W.R.=0.67)	<15	Mc/s

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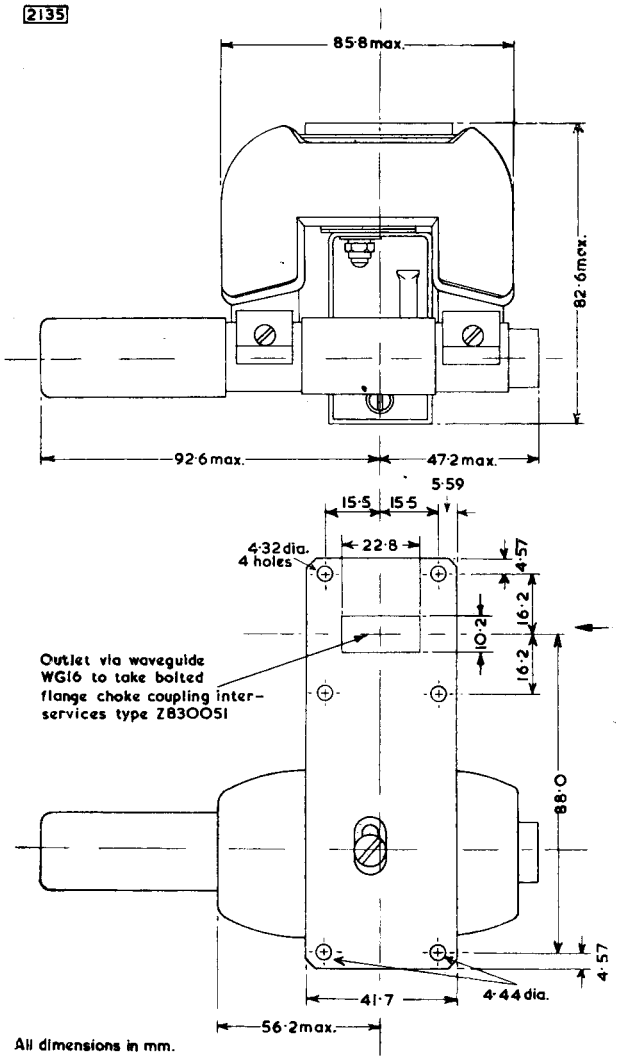
MAGNETRON

Fixed frequency forced-air cooled multi-cavity magnetron incorporating a permanent magnet system for pulsed operation within the 'X' band.



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Fixed frequency forced-air cooled multi-cavity magnetron incorporating a permanent magnet system for pulsed operation within the 'X' band.

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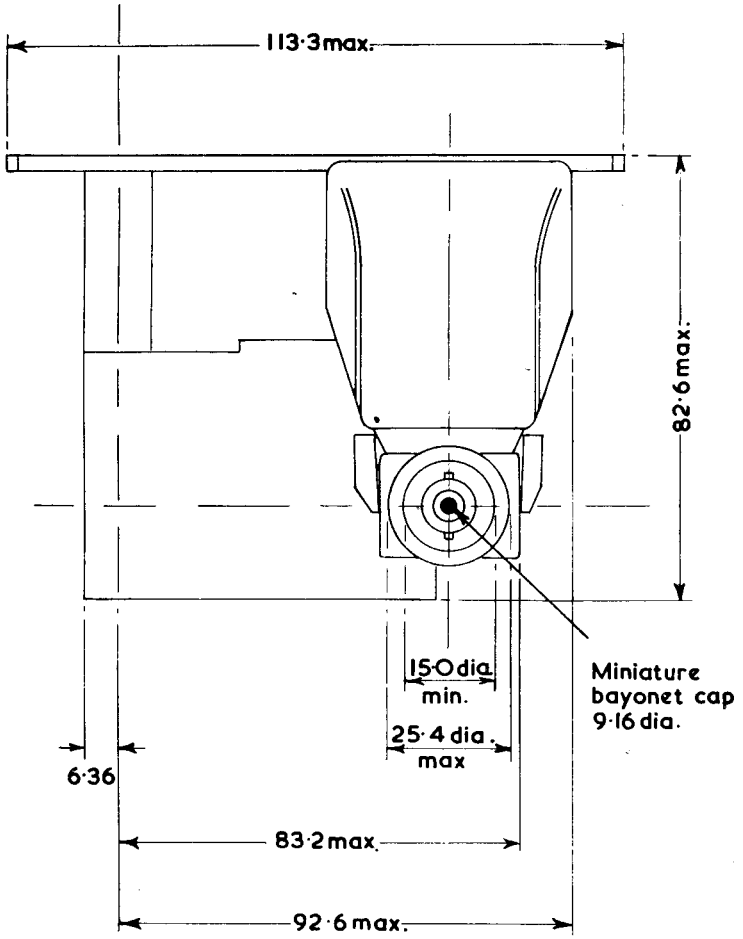

All dimensions in mm.

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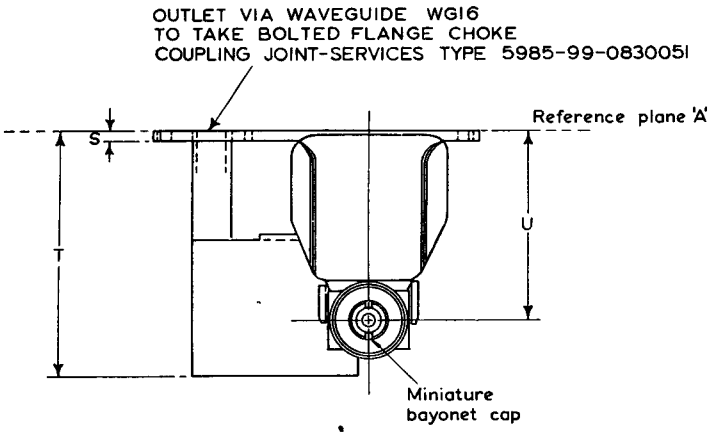
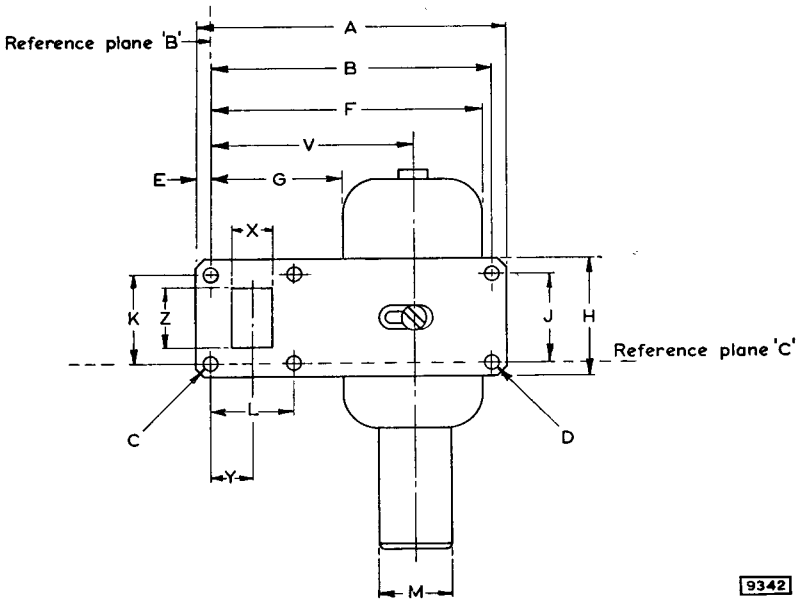
CONNECTIONS

The common heater cathode terminal is the sleeve of the bayonet cap, the other heater terminal is the centre contact. The anode connection is terminated at the base plate.


OUTLET VIA WAVEGUIDE WG16
TO TAKE BOLTED FLANGE CHOKE
COUPLING JOINT-SERVICES TYPE 5985-99-083005I
Reference plane 'A'
S
T
U
Miniature
bayonet cap


Reference plane 'B'
A
B
F
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Reference plane 'C'
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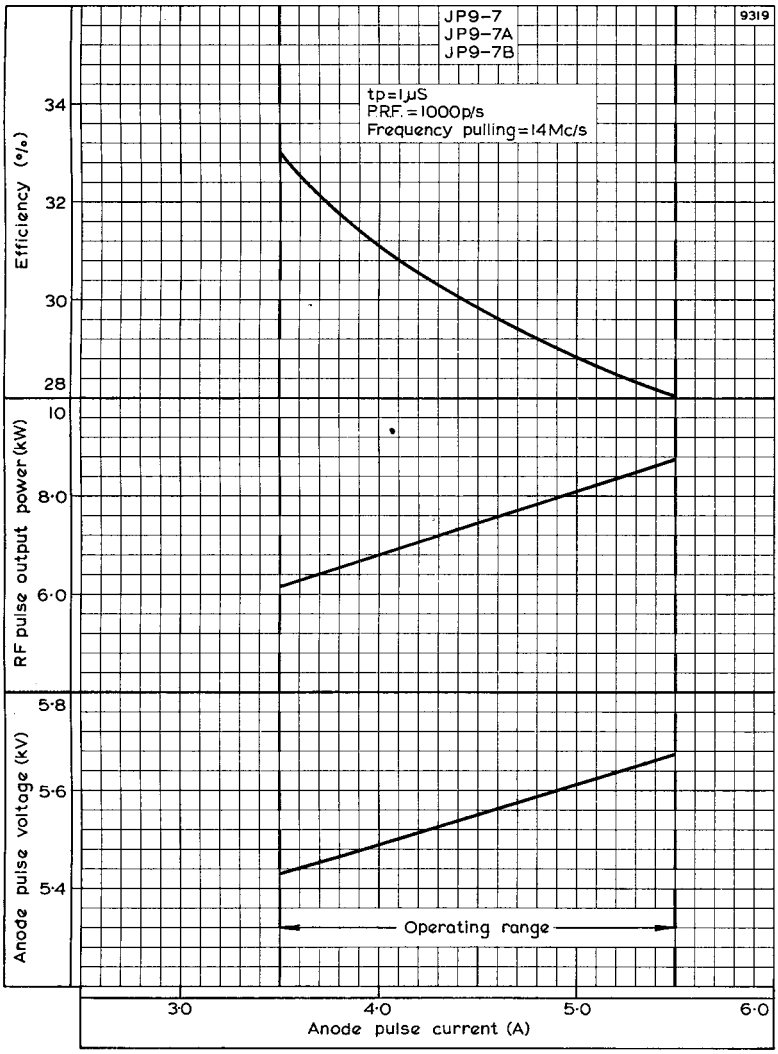
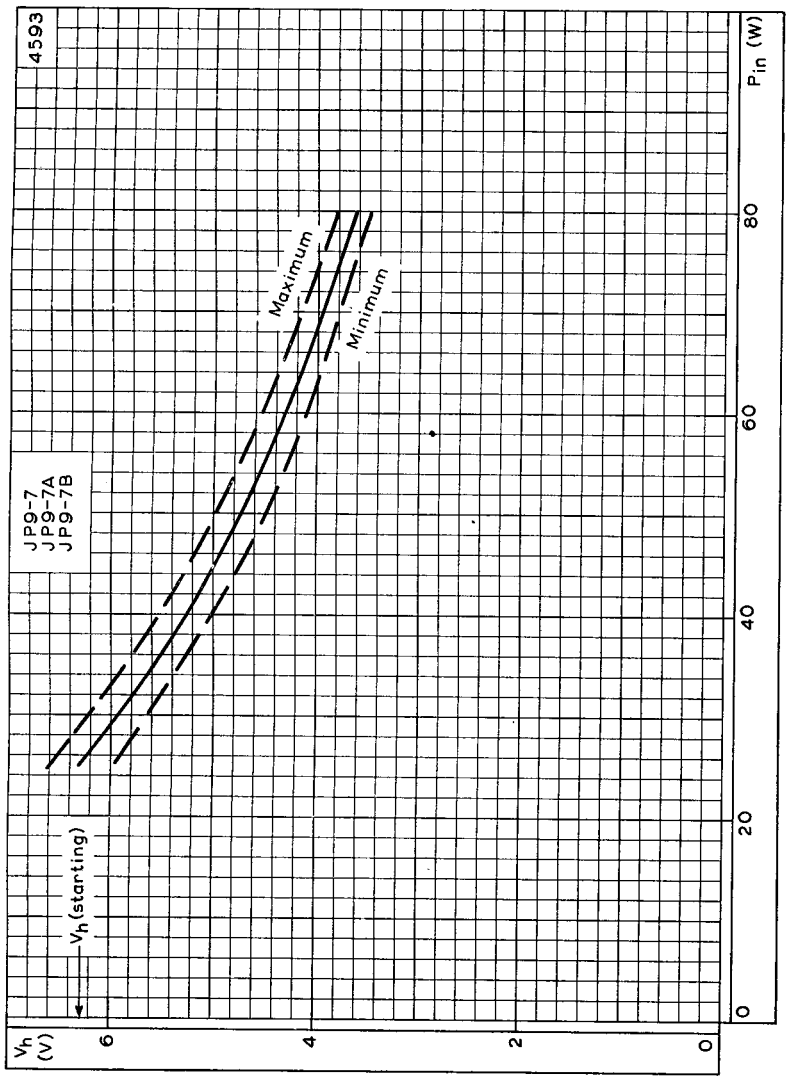


ANODE PULSE VOLTAGE, R.F. PULSE OUTPUT POWER AND EFFICIENCY PLOTTED AGAINST ANODE PULSE CURRENT



HEATER VOLTAGE PLOTTED AGAINST MEAN INPUT POWER