

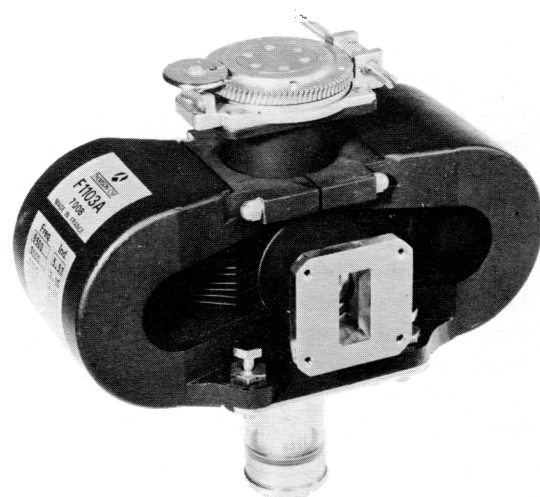
F 1103A (7008) MAGNETRON

The F 1103A (7008) is a magnetron capable of delivering a peak power output of at least 200 kW over the frequency range of 8.5 to 9.6 GHz.

It features an integral magnet and is cooled by forced air. The frequency is mechanically tunable.

The F 1103A (7008) has improved compact design and rugged construction making it extremely reliable under the most severe environmental conditions.

This magnetron is used in airborne and ground-based radars, such as F 104 Nasarr radars and Fledermaus and Superfledermaus fire control systems.



GENERAL CHARACTERISTICS

Electrical

	min.	nom.	max.	
Stand-by heater voltage	—	13.75	—	V
Stand-by heater current	2.9	—	3.3	A
Heater voltage in operation (1)	—	—	0	V
Frequency range	8.5	—	9.6	GHz
Power output, peak	200	—	—	kW
Anode voltage, peak	20	—	23	kV
Pulling (VSWR = 1.5 : 1)	—	—	13.5	MHz
RF bandwidth (1 μ s)	—	—	2.5	MHz
Pushing	—	—	500	kHz/A
Side lobe level (1 μ s)	9	—	—	dB
Stability, missing pulses (1 μ s)	—	—	0.25	%

Mechanical

Weight	5 kg
Dimensions	see drawing
Operating position	any
Cooling	forced air
Tuning characteristic	158 turns
Tuning torque	600 cm/g
Shaft rotation rate	1200 r/mn
RF output flange	mates with UG 52/U

(1) Average anode current = 27.5 mA


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ABSOLUTE RATINGS

	min.	max.	
Peak power input	—	630	kW
Average power input	—	630	W
Peak anode voltage	—	23	kV
Peak anode current	15	30	A
Duty cycle	—	0.0011	
Pulse duration	0.2	2.5	μs
Anode temperature	− 55	+ 125	°C
Cathode bushing temperature	− 55	+ 165	°C
Load VSWR	—	1.5 : 1	
Rate of rise of voltage	70	225	kV/μs
Heater surge current	—	12	A
Warm-up time	150	—	s
Cooling air flow	0.70	—	kg/mn

NOTA

The heater voltage in operation should be set to the value given by the following formula :

$$V_f = 13.75 \left(1 - \frac{P_i}{450}\right) \quad \text{for } P_i = V_c \times I_{avg} \leq 450 \text{ W}$$

$$V_f = 0 \text{ when } P_i \geq 450 \text{ W}$$

P_i being the average input power

TYPICAL OPERATION

Frequency range	8.5 — 9.6	9.2 — 9.55	9.2 — 9.55	GHz
Pulse duration	0.37	0.6	1.4	μs
Duty cycle	0.00063	0.00077	0.0009	
Stand-by heater voltage	13.75	13.75	13.75	V
Stand-by heater current	3	3	3	A
Heater voltage in operation	4.5	0	0	V
Anode current peak	26	27.5	27.5	A
Average current	16	21.5	24.5	mA
Anode voltage peak	22	23	23	kV
RF power output, peak	210	230	230	kW
Average power output	130	175	205	W
Side lobe level	10	10	9	dB
RF bandwidth	3.3	2	0.8	MHz
Pulling (VSWR 1.5 : 1)	10	10	10	MHz
Load VSWR	1.1 : 1	1.1 : 1	1.1 : 1	
Temperature coefficient	0.25	0.25	0.25	MHz/°C
Rate of rise of voltage	170	180	180	kV/μs
Stability, missing pulses	< 0.1	< 0.1	< 0.1	%



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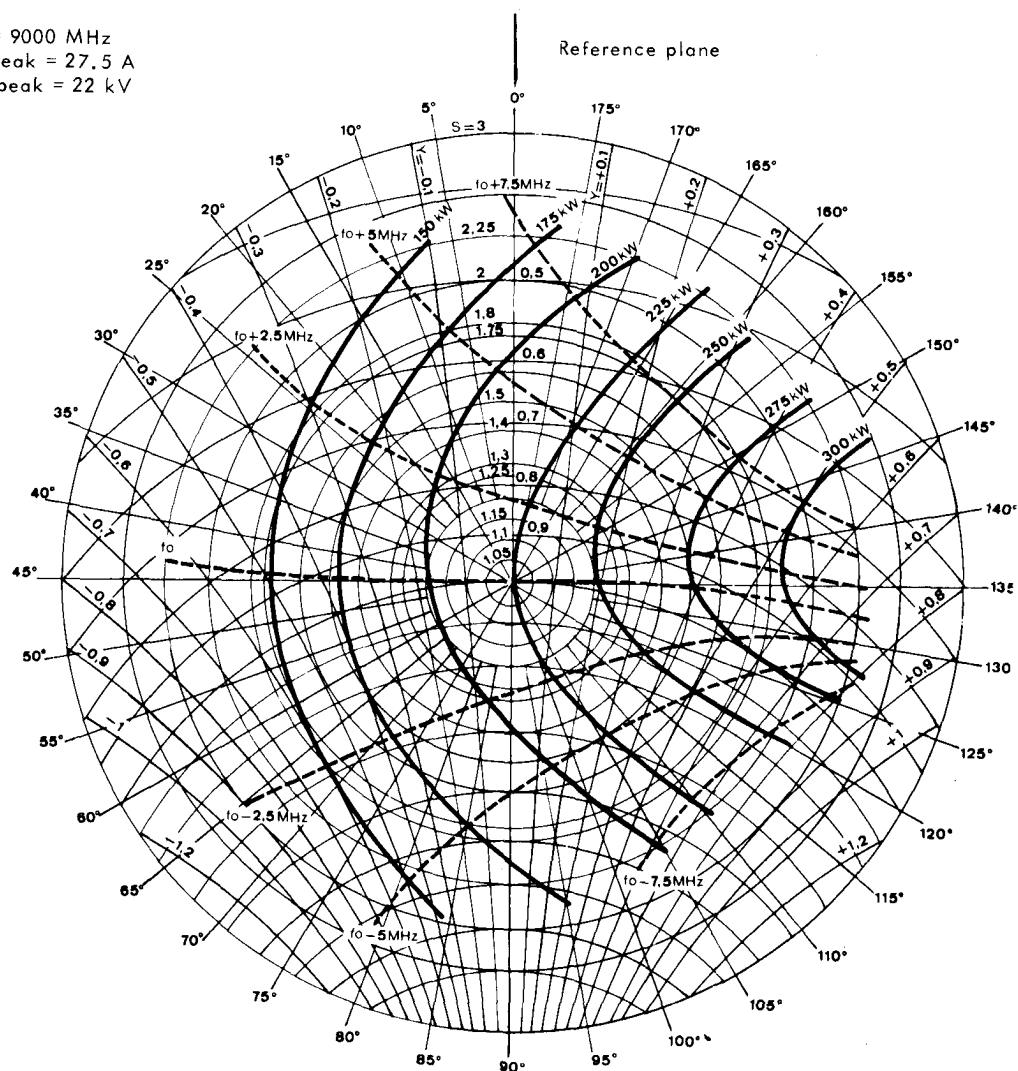
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RIEKE DIAGRAM

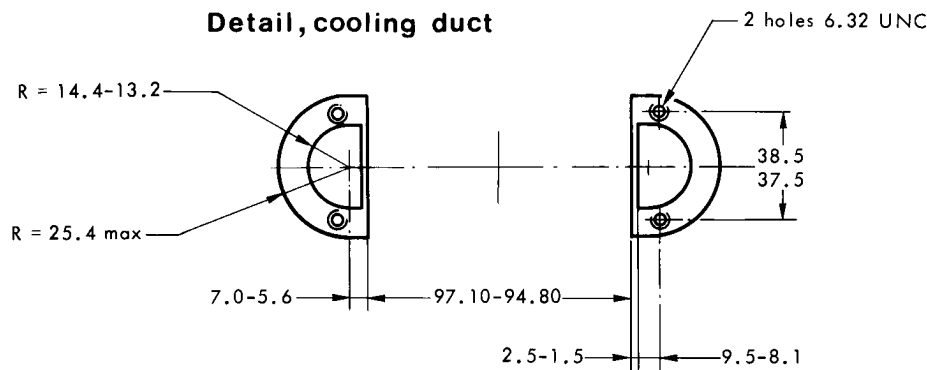
$f_0 = 9000 \text{ MHz}$
 $I_a \text{ peak} = 27.5 \text{ A}$
 $V_a \text{ peak} = 22 \text{ kV}$



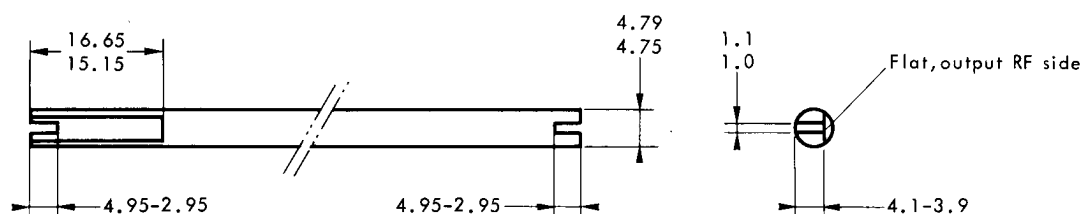


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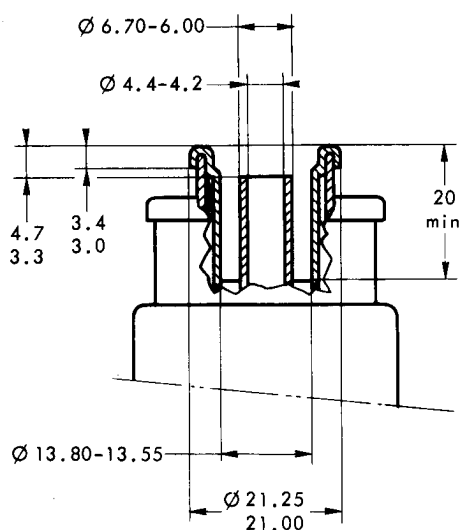
Detail, cooling duct



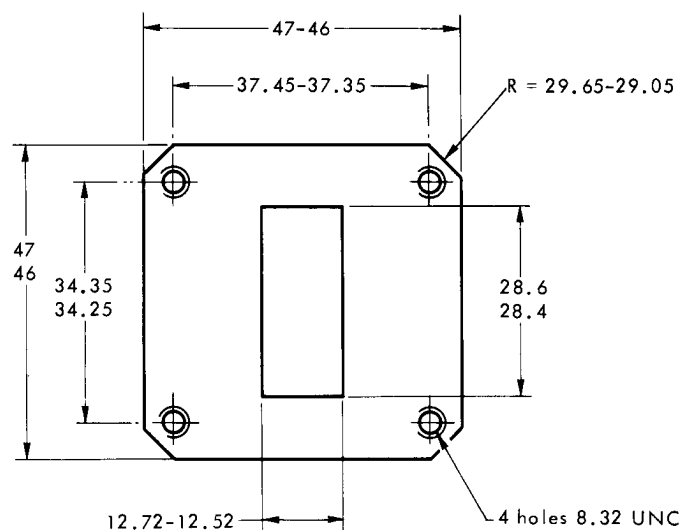
Detail, tuner shaft



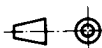
Detail, input connection



Output flange



Dimensions in mm.



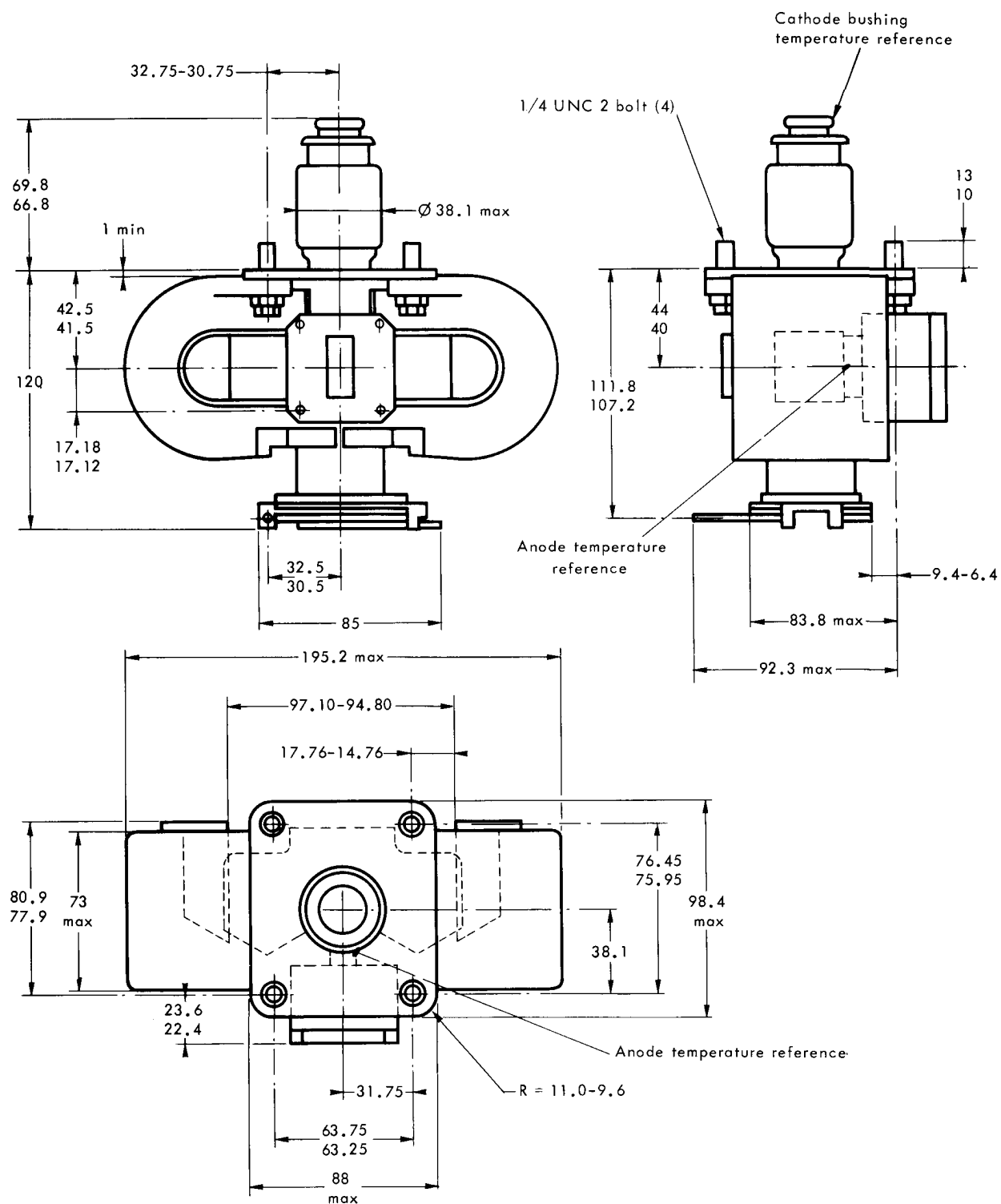


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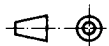
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OUTLINE DRAWING



Dimensions in mm.



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