

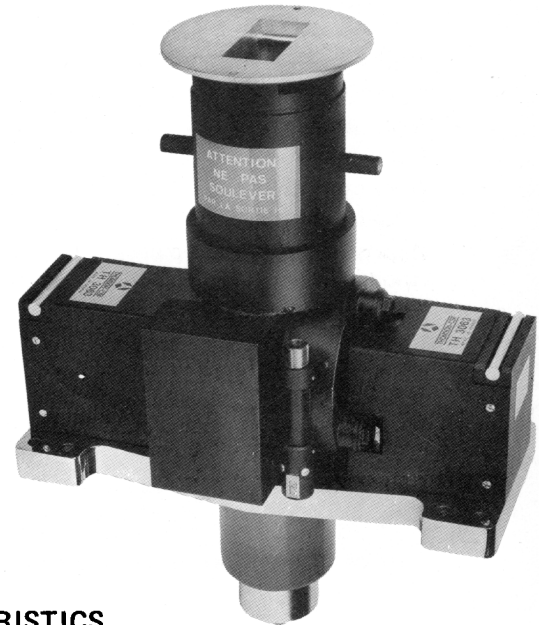


TH 3062 - TH 3063 MAGNETRONS

The TH 3062 and TH 3063 magnetrons are pulsed, high-power oscillators, each capable of delivering peak output power of one megawatt and an average power of two kilowatts.

Both of these tubes are mechanically tunable, from 2900 to 3050 MHz for the TH 3062 and from 3050 to 3200 MHz for the TH 3063. Of the integral-magnet type, they also require forced-air cooling.

These modern radar magnetron are especially designed for use in MTI systems where RF energy that is relatively free of time, frequency or amplitude jitter is required, and where low phase noise is also desirable.



GENERAL CHARACTERISTICS

Electrical

Frequency range	TH 3062	2900 - 3050	MHz
	TH 3063	3050 - 3200	MHz
Peak output power, typical		1.0	MW
Heater voltage (1)		8.5	V
Heater current, typical		9.0	A
Peak anode voltage		30 to 36	kV
Average anode current		150	mA

Mechanical

Mounting position	Vertical, cathode down
Tuning	Mechanical
Tuner turns to cover the frequency range, max.	220
Tuner torque, max.	50 oz - in (0.36 N.m)
Tuner rotation rate, max.	300 rpm
Weight, approx.	30 kg
Output : Waveguide	RG 48/U
Flange	Special (see outline drawing)
Coupler collar (2)	SARMA type C 6048/44 or equivalent

(1) See the Application Notes.
(2) Not supplied with the tube.



Maximum ratings (no single rating should be exceeded)

	MIN.	MAX.	UNITS
Heater voltage (1)	8.1	8.9	V
Heater starting current, peak	—	40	A
Cathode warm-up time	6	—	mn
Anode voltage, peak	30	36	kV
Anode current, peak	—	80	A
Input power, peak	—	2.3	MW
Input power, mean	—	4.6	kW
Duty cycle (2)	—	0.002	
Pulse length (2)	0.5	5.0	μ s
Rate of rise of voltage pulse	—	100	kV/ μ s
Anode temperature	—	140	$^{\circ}$ C
Cathode terminal temperature	—	160	$^{\circ}$ C
VSWR at the output coupler	—	1.3:1	
Rate of air flow (at 35 $^{\circ}$ C)	}	200	ft ³ /mn
		5.7	m ³ /mn
Pressure drop (on water gauge)	}	—	inches
		—	63.4 mm
Rate of air flow into magnetron waveguide	}	5.0	ft ³ /mn
		0.09	m ³ /mn

(1) No anode voltage may be applied until the cathode has been warmed up. During tube operation, the heater voltage must be adjusted according to the schedule, page 3.

(2) Consult us for other operating conditions of duty cycle or pulse length.

Typical operation

Heater voltage	0	V
Anode current, peak	70	A
Pulse length	4.0	μ s
Pulse repetition rate	500	pps
Anode voltage, peak	33	kV
Output power, peak	1.0	MW
Output power, average	2.0	kW
Frequency pushing (at 70 A)	40	kHz/A

APPLICATION NOTES

These applications notes provide basic information concerning the storage, installation and operation of the TH 3062 and TH 3063 magnetrons. More complete information, required, for example, for the construction of a new type of equipment, can be furnished upon request.

STORAGE AND INSTALLATION

Stored magnetrons are much more likely to remain in a ready-to-operate condition if left in their original packing or placed in correctly designed storage racks. Whenever transported, they should be correctly packed to guard against subjecting the tube to undue vibration, shock or stress.

These magnetrons must be protected from mechanical strain by the use of a section of flexible waveguide between the magnetron and the waveguide system.

APPLYING VOLTAGES

1. Apply the heater voltage gradually. The heater surge current must not exceed 40 amperes. Allow at least six minutes for the cathode to fully warm up before applying any high voltage to the tube.
2. Verify that the cooling system is operating correctly.
3. Apply the high voltage. On the application of anode voltage the heater voltage must be reduced as follows :

Mean input power (kW)	Heater voltage (V _{rms})
0 to 1	8.5
1 to 2	6.5
2 to 3	5.0
3 to 4	3.0
over 4	zero

The magnetron heater must be protected against arcing by the use of a minimum capacitance of 1.0 μF , shunted across the heater directly at the input terminals.

STARTING A NEW MAGNETRON

A new magnetron, or one that has been idle or stored for a while, may contain small traces of gas. This gas can cause internal arcing to occur when the high voltage is applied. These arcs are generally evidenced by fluctuations of the average anode current, and are usually short (less than two seconds long) and harmless.

When, however, these arcs or flashes are persistent or severe, causing rapid and uncontrolled fluctuations of the average cathode current, the following procedure must be followed to avoid damaging the tube :

1. Reduce the current to the level just below that at which arcing begins. Hold the current at this value for several minutes (about five).
2. When the operation of the tube is stable, gradually increase the anode current.
3. Repeat this procedure as often as necessary until stable operation at the desired operating current is achieved.

WARNING

All magnetrons operate with high anode potentials, which can cause lethal shocks to operating personnel. Suitable safety interlocks must be provided to avoid this shock hazard.

RF LEAKAGE

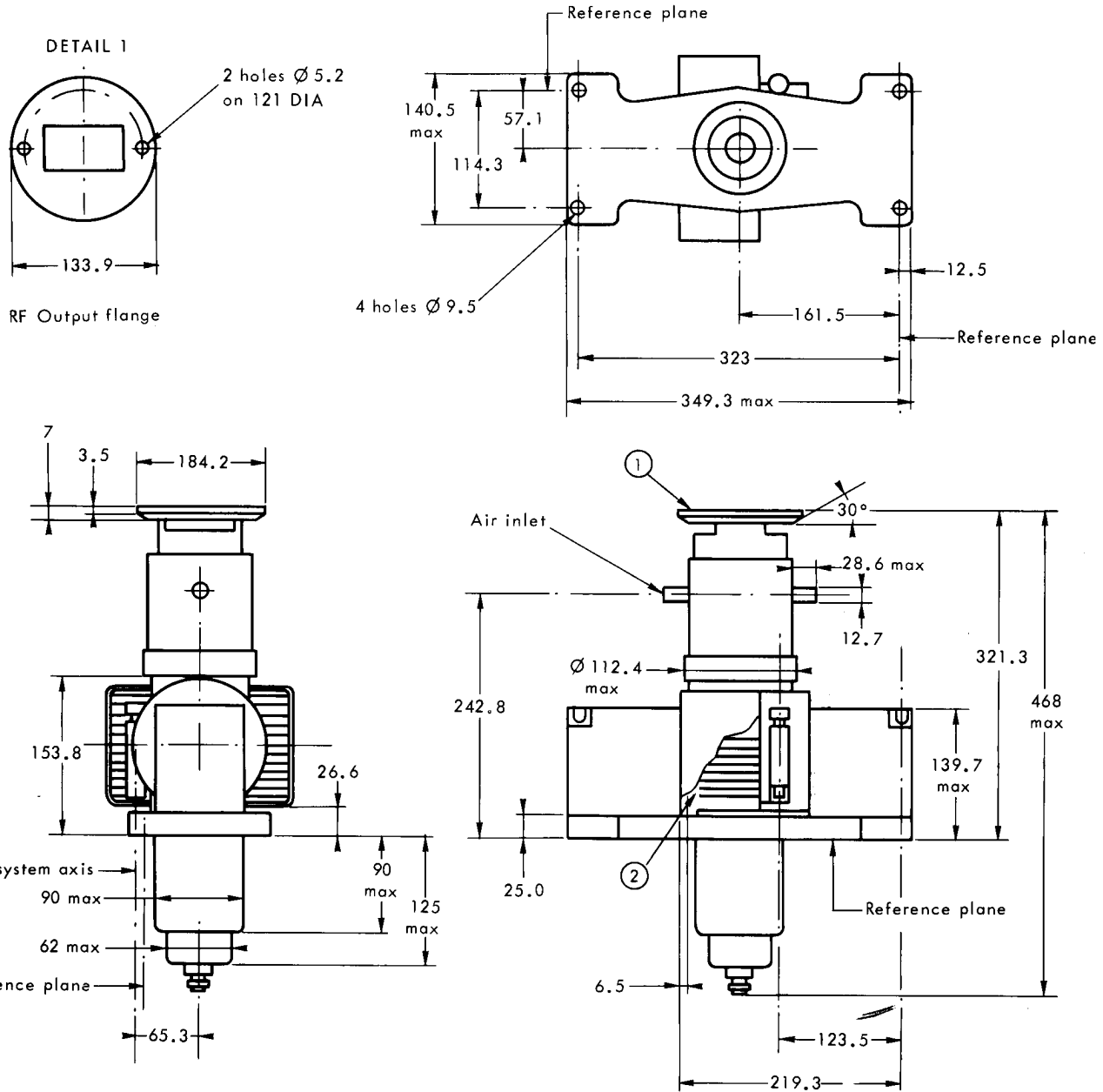
Sufficient RF power may be radiated through the cathode stem and other openings to interfere with adjacent circuit components. This radiation may be hazardous to human beings, especially to the eyes when arcing or the cathode temperature are being observed. Adequate precautions must be taken to guard against these hazards.

X-RAYS

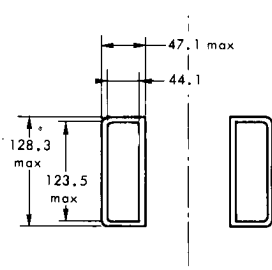
High power magnetrons emit a significant level of X-rays in the areas of the cathode and the RF output. Appropriate shielding should be installed to protect the operating personnel.



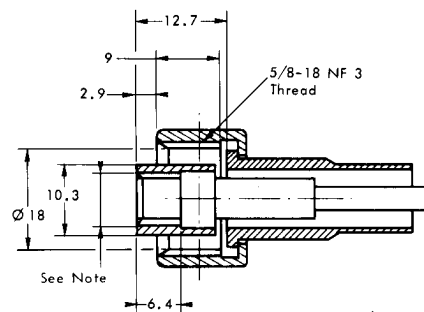
OUTLINE DRAWING



DETAIL 2



TUNING-CONTROL FLEXIBLE CONNECTOR



Dimensions in mm, nominal except for those marked "max".

Note : 12 teeth DP 6.3 - Modulus 0.5 - Pressure angle 14°30'