

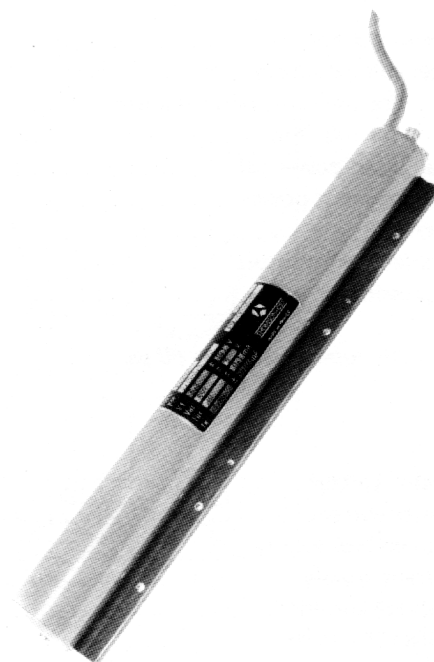
F4025B TRAVELING WAVE TUBE

The F4025B is a wide band, low noise, high gain, traveling wave tube which provides a saturated power output of 20 to 40 mW, from 4 to 7 GHz.

The typical noise figure is 10 dB and the small signal gain at least 40 dB.

The F4025B features periodic permanent magnet focusing, small size, light weight, Specifically intended for military airborne applications, an all ceramic and metal construction makes it highly rugged and ensures satisfactory operation under the most severe environmental conditions.

The F4025B traveling wave tube incorporates a voltage distributing network preset at the factory for optimum combination of noise figure and gain. Furthermore, power supply voltage requirements are reduced to heater voltage and high voltage.



GENERAL CHARACTERISTICS

Electrical

	min.	avg.	max.	
Heater voltage	-	6.3	-	V
Heater current	0.4	-	0.6	A
High voltage supply	-	850	-	V
Current supply	3	-	7	mA
Small signal gain (1)	35	-	-	dB
Saturated power output	20	-	40	mW
Insertion loss	70	-	-	dB
Input VSWR (2)	-	-	1.8 : 1	
Output VSWR (2)	-	-	2 : 1	
Stray magnetic field at 2 m	-	-	4	γ

(1) For $P_i = -45$ dBm

(2) Tube not supplied.

Mechanical

RF connections	
Supply connections	
Operating position	
Weight	

ATI coaxial socket, mini-ultra ref : 2008
DEUTSCH connector RSM 07.12.14.P.A.520!
any
1.5 kg



ABSOLUTE RATINGS (non simultaneous)

	min.	max.	
Heater voltage	6.2	6.4	V
High voltage supply			
- for the rated performances	845	855	V
- for tube life	800	900	V
Peak input power (3)	-	1	kW
Average input power	-	0.1	W
Warm-up time	120	-	s
Ambient temperature	-55	+110	°C
Depression	3	-	bar

(3) with pulse duration $\leq 50 \mu s$.

TYPICAL OPERATION

Heater voltage		6.3	V
Heater current		0.4	A
High voltage supply		850	V
Current supply		6	mA
Cathode current		900	μA
Collector current		890	μA
Frequency	4.2	5.7	6.9 GHz
Noise figure	10.8	10.5	10.5 dB
Small signal gain (4)	39	42	39 dB
Saturated power output	22	30	20 mW

(4) For $P_i = -45 \text{ dBm}$.

OPERATING INSTRUCTION

Electro-magnet

The F4025B is focused by an integral periodic permanent magnet. Before applying voltages, check that environmental magnetic field is less than 10 gauss, if not, tube performances are not guaranteed.

Helix grounding

After installation, the tube helix should be connected to ground by means of a DC short or a crystal rectifier.

Application of voltages

Before applying voltages, check that high voltage and heater voltage delivered by the supply unit are within the specified values indicated on the tube label. The meters used for this control should present an isolation from ground of at least 1000 V and accuracy of at least $\pm 1 \%$.

After applying heater voltage wait two minutes before applying the high voltage. A micro-ammeter connected according to the diagram given page 3 indicates if the tube is operating correctly, with respect to the values specified on the tube label. This meter should feature :

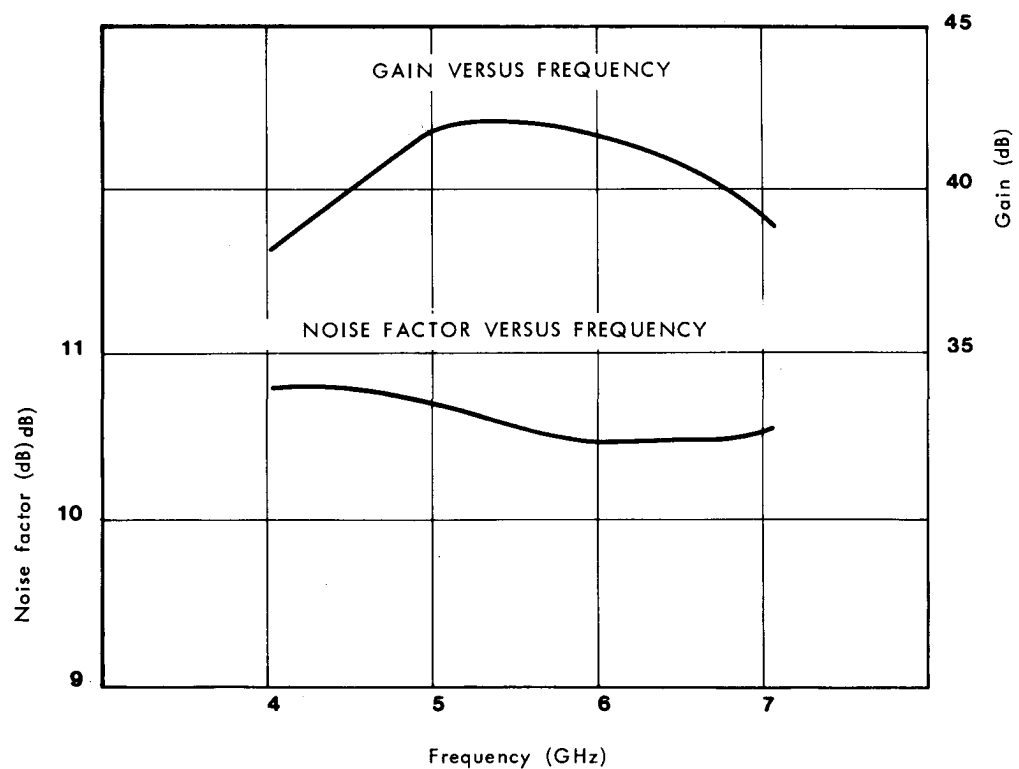
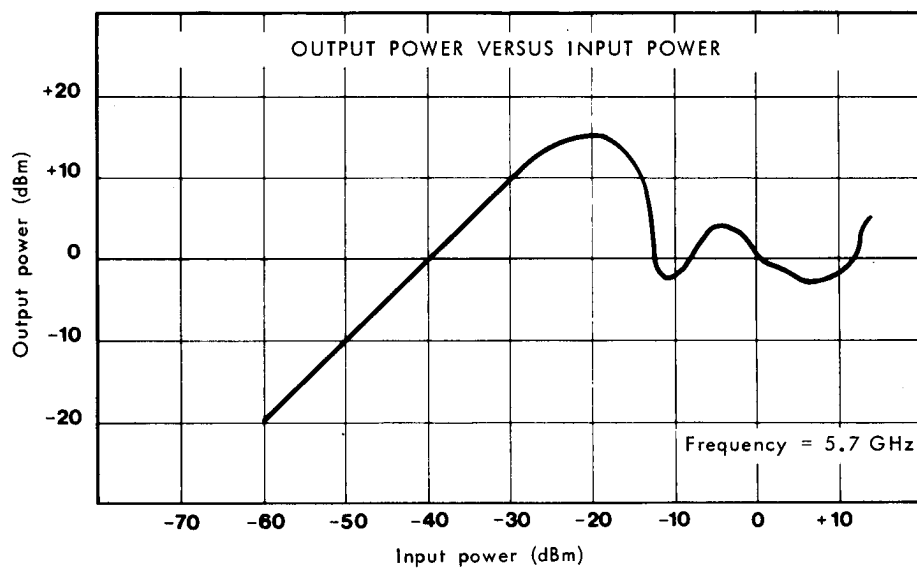
full scale deviation : 1000 μA
 internal resistance $\leq 1000 \Omega$
 isolation : 1000 V dc operating voltage.

Input power

The tube helix can be damaged if the input power (peak and average values) exceeds the limits given in the paragraph "Absolute Ratings".

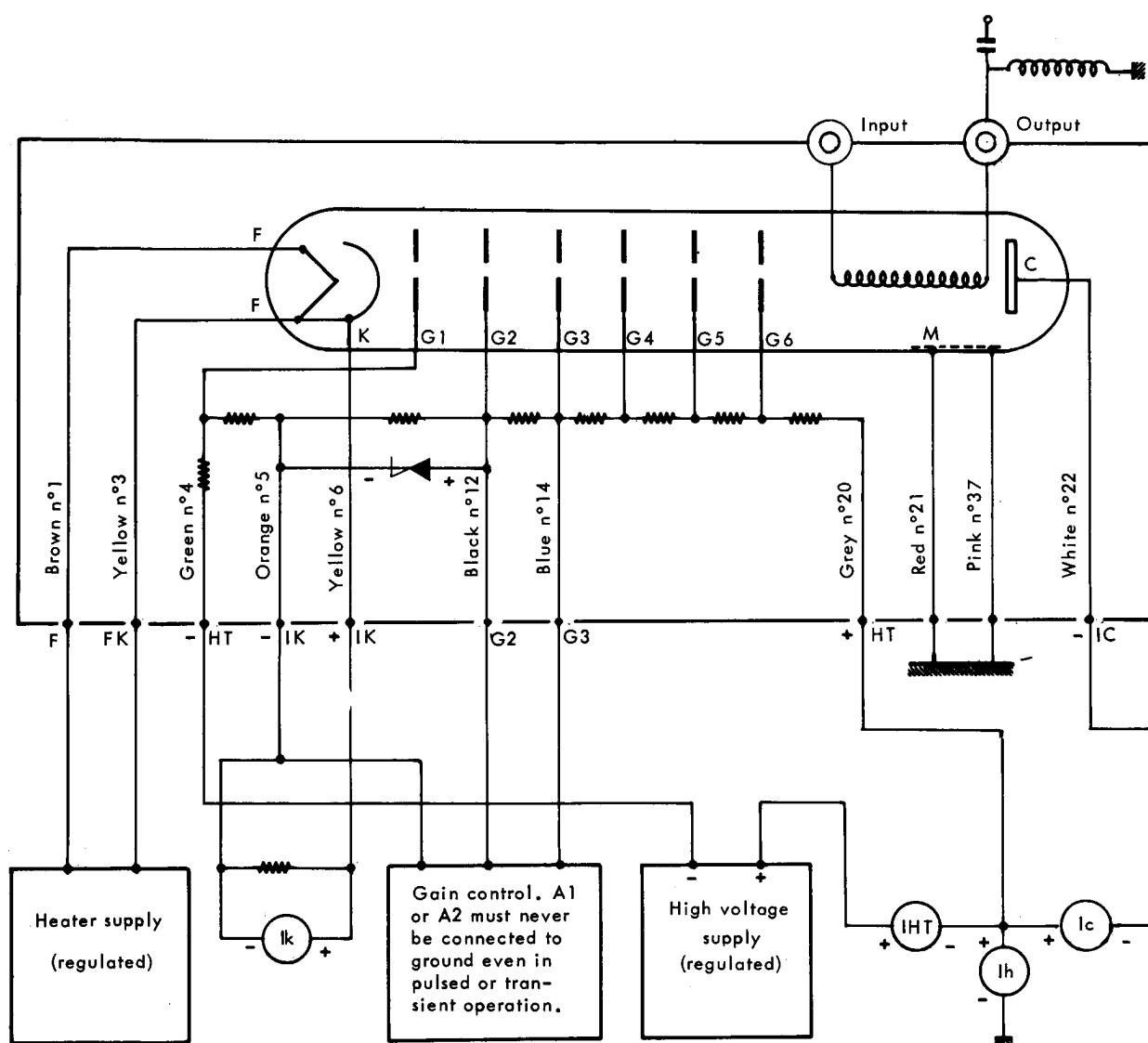


CHARACTERISTIC CURVES





SUPPLY DIAGRAM



PULSE OPERATION

- The control pulse is applied to G2 through the 470pF capacitor..
- The TWT cut off conditions are G2 and G3 voltage decreased to 0 volt in a constant ratio fixed by R and given by the nominal values.



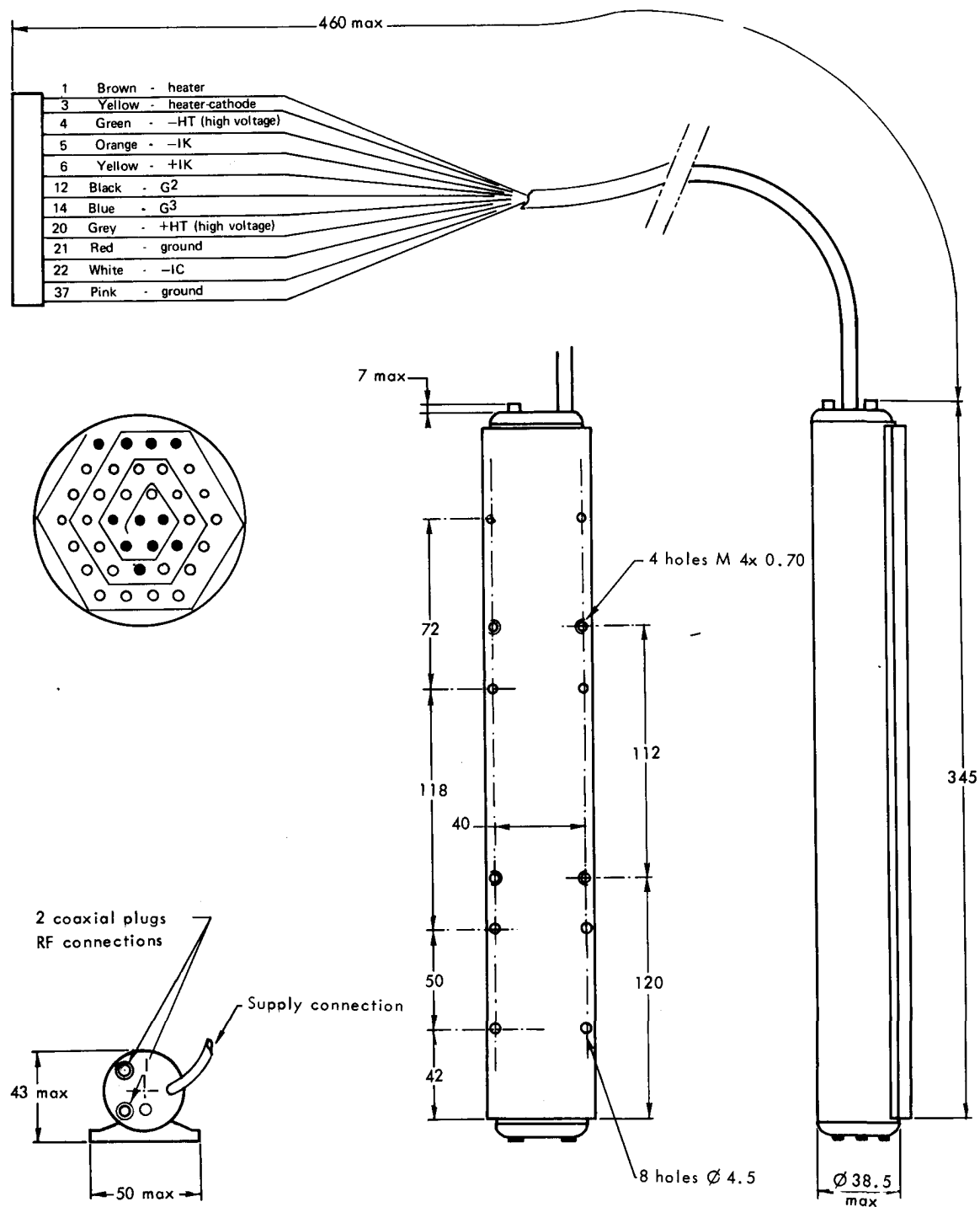
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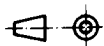
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OUTLINE DRAWING



Dimensions in mm.





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