



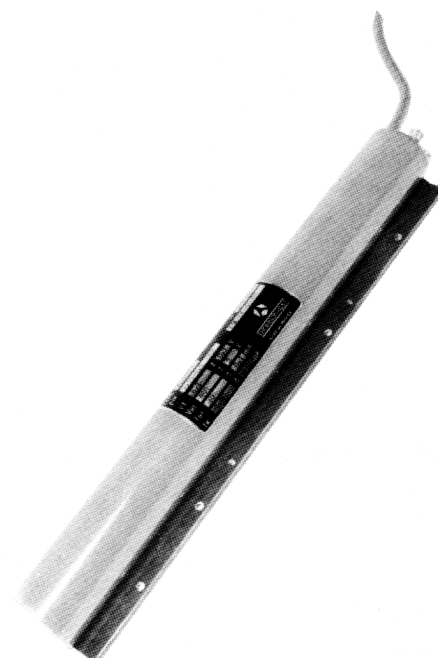
## F4024B TRAVELING WAVE TUBE

The F4024B is a wide band, low noise, high gain, traveling wave tube which provides a saturated power output of 30 to 60 mW, from 2.15 to 4.30 GHz.

The typical noise figure is 9 dB and the small signal gain at least 40 dB.

The F4024B 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 F4024B 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	-	650	-	V
Current supply	6	-	12	mA
Small signal gain (1)	35	-	-	dB
Saturated power output	30	-	60	mW
Insertion loss	70	-	-	dB
Input VSWR (2)	-	-	1.8 : 1	
Output VSWR (2)	-	-	2.0 : 1	
Stray magnetic field at 2 m	-	-	4	$\gamma$

(1) For  $P_i = -45$  dBm

(2) Tube not supplied.

#### Mechanical

RF connections	ATI coaxial socket, mini-ultra ref : 2008
Supply connections	DEUTSCH connector RSM 07.12.14.P.A.520
Operating position	any
Weight	1.5 kg


**ABSOLUTE RATINGS**  
 (non simultaneous)

	min.	max.	
Heater voltage	6.2	6.4	V
High voltage supply			
- for the rated performances	645	655	V
- for tube life	600	700	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  $\leq 50 \mu\text{s}$ .

**TYPICAL OPERATION**

Heater voltage			6.3	V
Heater current			0.4	A
High voltage supply			650	V
Current supply			10	mA
Cathode current			1630	$\mu\text{A}$
Collector current			1610	$\mu\text{A}$
Frequency	2.15	3.3	4.3	GHz
Noise figure	9.2	9.6	9.2	dB
Small signal gain (4)	38	41	39	dB
Saturated power output	31	39	28	mW
Input VSWR	1.22 : 1	1.20 : 1	1.40 : 1	
Output VSWR	1.20 : 1	1.24 : 1	1.60 : 1	

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

**OPERATING INSTRUCTION**
**Electro-magnet**

The F4024B 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  $\pm 1\%$ .

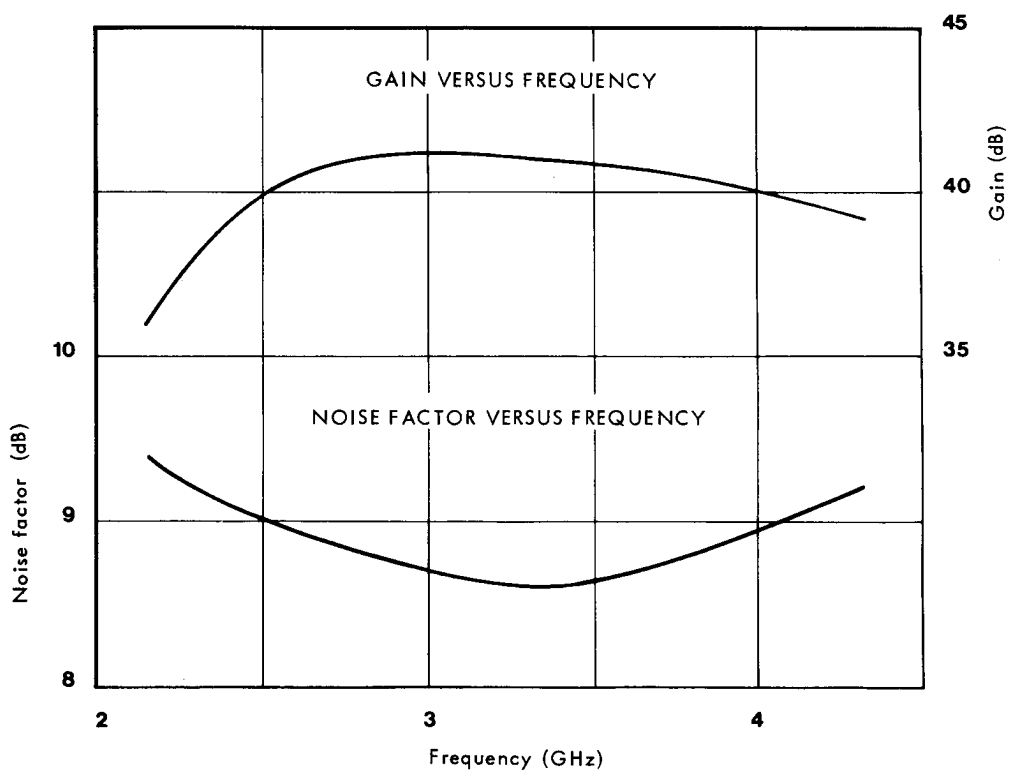
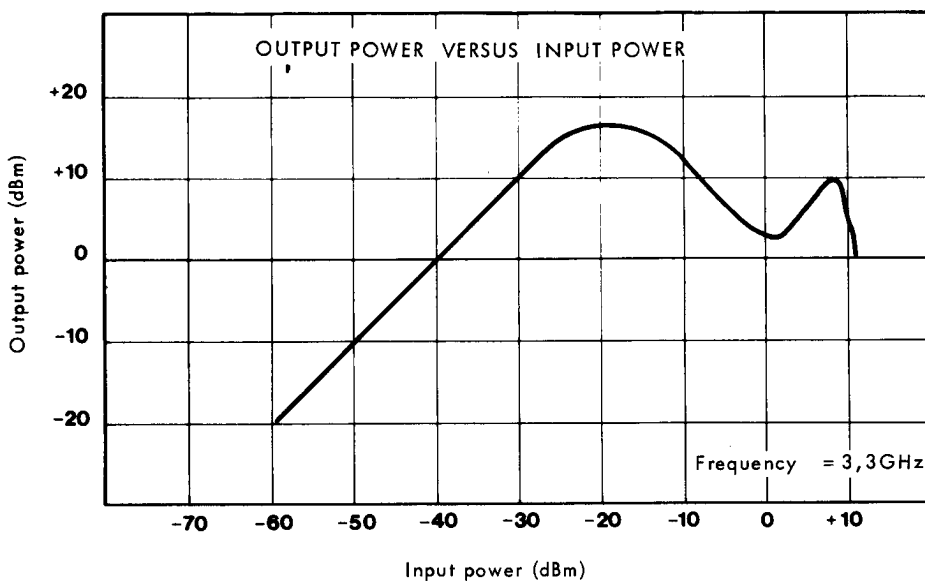
After applying heater voltage wait two minutes before applying the high voltage. A micro-ammeter connected according to the diagram given page 3 indicates if the tube is operating correctly, with respect to the values specified on the tube label. This meter should feature : full scale deviation : 2000  $\mu\text{A}$  - 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".

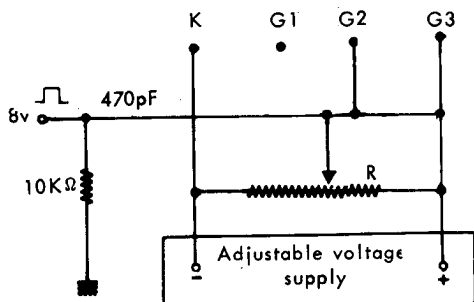
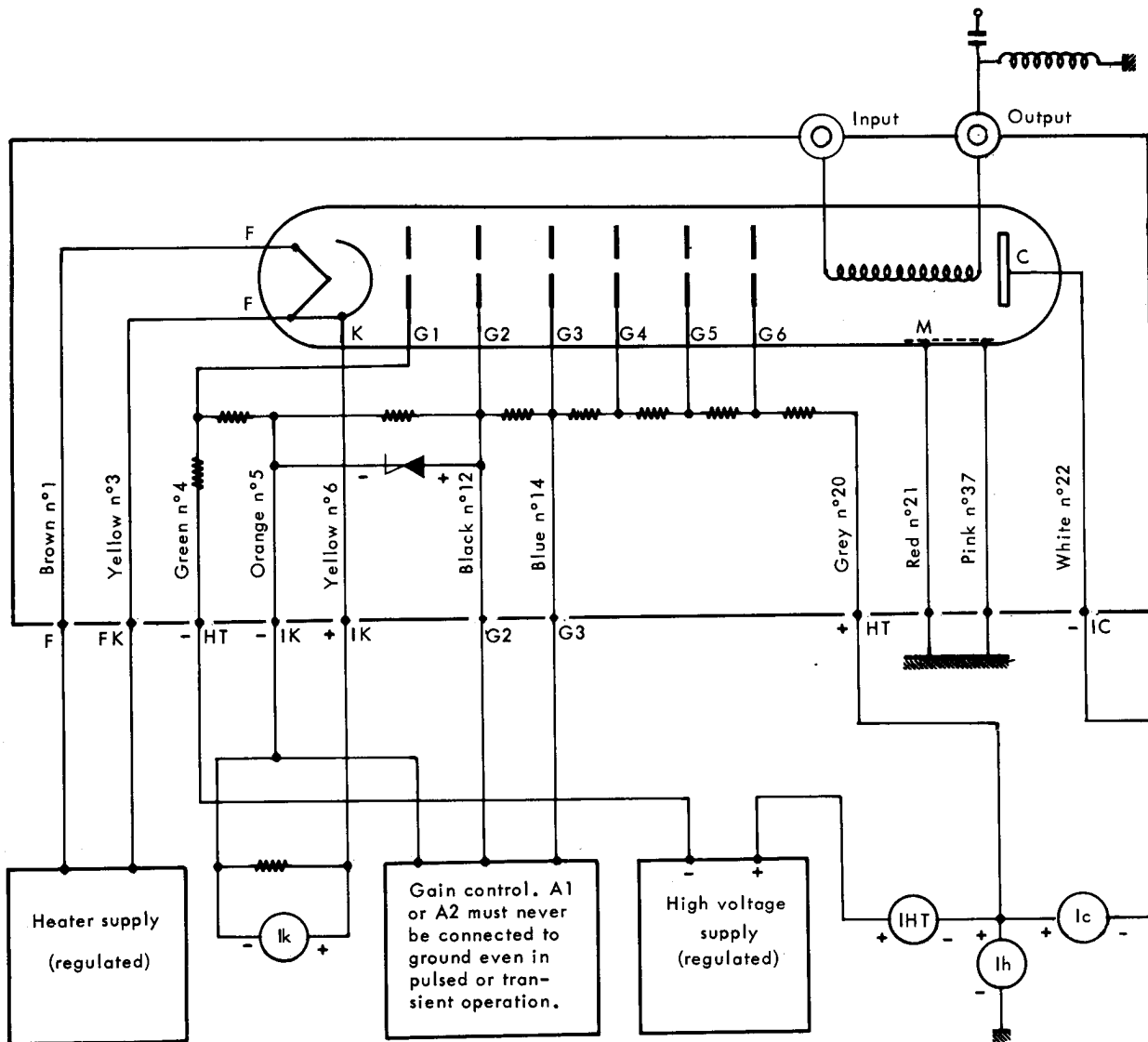


### CHARACTERISTIC CURVES





SUPPLY DIAGRAM

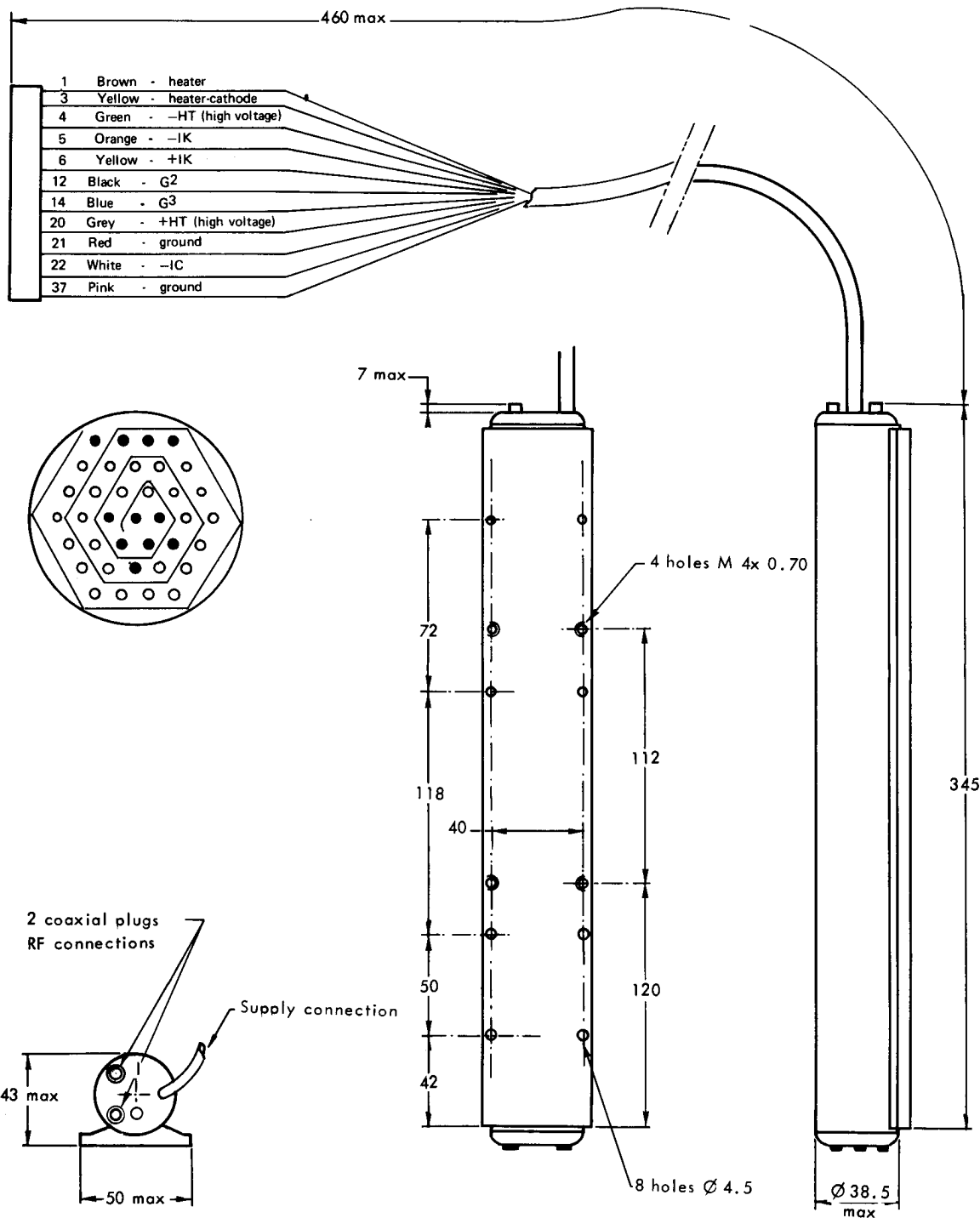


PULSE OPERATION

- 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.



**OUTLINE DRAWING**



Dimensions in mm.

