

# TACAN Tester PBN 4123 ( made in France by LMT in 1958 )

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## Purpose

This early TACAN tester was placed on the platform, a few meters from the aircraft. Bearing and range were set on the tester, and will be received by the on-board TACAN set ARN21B when channel 3 (964 MHz) or channel 118 (1205 MHz) is selected. Bearing and Range should become visible on the cockpit instruments

This tester emits no squitter pulses, but continuous ID tone including equalize pulses. The tester is powered by 115 or 230Vac via a long cable.

The tester is also used in the workshop. For this purpose, a cable with N-connector and HN connector, a 40dB attenuator and a handbook are supplied as part of the system

## Technology

The tester contains 20 tubes, a few diodes, and 3 transistors in the power supply. The complete pulse pattern is generated by free-running oscillators and monostable multivibrators. This required a lot of adjustments inside.

The transmit frequency is crystal controlled, with a frequency multiplier that is nearly identical to the one in the ARN21B set. The crystal oscillates at 26.777 MHz, which gives 241 MHz after two triplers. Finally, there is a diode multiplier, the fourth or fifth harmonic should be received

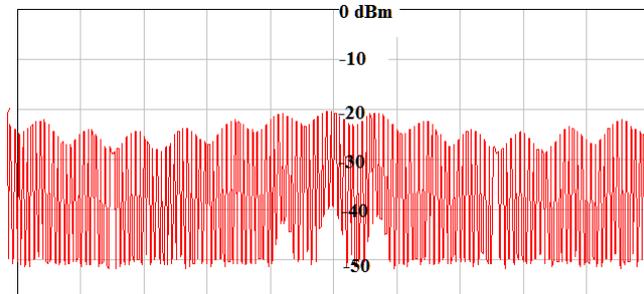
by the TACAN set on CH3 resp. CH 118. The receiver in the tester is just a diode, sufficient for pulses of 500W or more over the whole band.

## Specifications

Supply	115V or 230V (selectable) $\pm$ 10%, 110VA, 50 - 1000 Hz
Frequency	964 MHz ( <b>CH3</b> ) and 1205 MHz ( <b>CH 118</b> )
Sensitivity	- 70 dBm ( suitable for 500W transmitter at 8 meter distance) includes check for proper 12 us double pulses from airborne set. - 30 dBm ( suitable for ARN21B at same distance)
Output power	Typical tacan pulse pattern, but with continuous ID tone, <b>no squitter</b> .
- modulation	
Range	0 ... 300 nautical miles $\pm$ 2 nm
Bearing	0 ... 359 degrees $\pm$ 2 deg
Identity tone	1350Hz, 100us continuously present
Size, weight	23cm wide, 27 cm high, 30cm long. Weight 9.8 kg
Operation	with mini antenna ( included ) at >2 meter from aircraft or in the workshop with HN to N coax cable, and 40dB attenuator (included)

## Measurements

The output of the frequency multiplier at 241MHz is modulated with the tacan pattern, with a highest peak of 300mV (+1.7 dBm) and smallest peak of 100mV (-6.3 dBm). Inbetween the pulses there is just noise, however some carrier is present in the pauses around the highest peaks as can be seen on the graph below.



In een 1N23C diode wordt het 241MHz signaal vervormd zodat er harmonischen ontstaan, die ook weer puls-gemoduleerd zijn. De grootste puls op de N connector, in de 50Ω afsluiting van de spectrum analyser en met de wijzer op 30uA ( rode streepje) is:

<u>Harm.</u>	<u>Frequency</u>	<u>Highest top of tacan pattern</u>
1	241 MHz	+ 1.2 dBm
2	482	- 7.2
3	723	- 16.5
4	964	- 24.6
5	1205	- 25
6	1446	- 37

The manual states that the red mark in the meter corresponds with -30dBm, presumably for the highest pulse in the tacan pattern. The smallest pulse is 10 dB lower.

The control range of the "SET TO 30 uA" adjustmen is

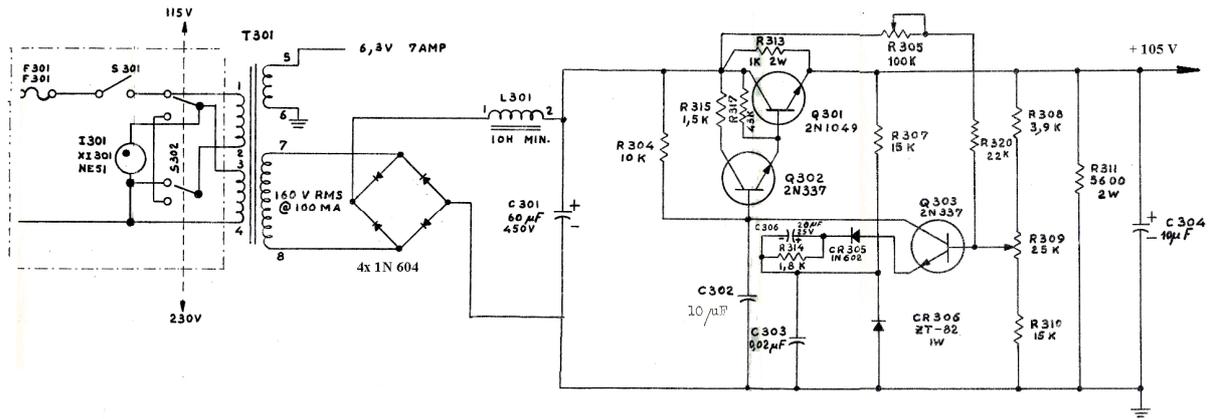
Meter Highest peak

10 uA -37 dBm

20 uA -35

30 uA -26

33 uA -25 dBm (max)



Power supply circuit

Topview of the tacan tester

