

**DIRECTOR GENERAL BORDER SECURITY FORCE**  
**PROVISIONING DIRECTORATE (MOD CELL)**

**EXPRESSION OF INTEREST**

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The Sub-group of Technical Experts constituted by MHA vide their letter No. IV-24011/12/2011-Prov-I dated 13 Jun 2012, No. IV-24011/12/2011-Prov-I dated 28 Dec 2012 & UO No. IV-24011/12/2011-Prov-I- 350 dated 27 Jun 2013 held its meeting at BSF Headquarters on **21<sup>st</sup> April 2017, 13<sup>th</sup> July 2017 and 29<sup>th</sup> August 2017** to formulate the Qualitative Requirement of **“Man Portable Automatic Direction/Location Finder”**. After detailed deliberations the referred Sub-group has formulated the QRs/TDs which are as under:-

**Draft QRs of Man Portable Automatic Direction/Location Finder**

S.No	Parameters
<b>General:</b> For operational deployment in jungle/hilly terrain, man portable automatic radio direction finder system should be able to find the direction of the clandestine/hostile transmitter (Line of Bearing) and location fixing (LF) while on move. It should have minimum following capabilities:	
a	Frequency range of the system should be 10 KHz to 6 GHz. The equipment should be able to work in DF mode & receive mode by press of a button. It should show the direction of signal (Line of Bearing) in the DF mode and in receiver mode the system should be able to detect, listen & record the demodulated audio signals.
b	High scan speed of a user defined frequency range or the entire frequency range to provide a fast overview of the spectrum and waterfall for active transmissions. The equipment should be able to carry out automatic library base (memory channel scanning) target frequency search/Memory search to find if they are active for listening and then Direction/location finding.
c	Should provide real time bandwidth of min 10 MHz for finding out the Radio transmission network talking to each other.
d	Should be laptop controllable via LAN as well as front panel controllable. It should have built-in internal signal recording & reply capability (in the equipment) as well as possible to record signals on Laptop.
e	Should be self-sufficient with built-in battery operated as well as mains for operation and charging the internal batteries.
f	Demodulated signal audio listening by headphone or by built in loudspeaker.
g	Direction finding antenna should have built-in GPS and compass for automatic DF and LF while on continuous move.
h	DF antenna to be based on correlative interferometer/Watson Watt principle for direction finding (Line of Bearing). Equipment's own position as well as signal LOB should be displayed on Map.
1	Frequency range for DF and receiver mode      20 MHz to 1 GHz
2	<b>Rx Sensitivity</b>
(i)	Amplitude Modulation/6      KHz      1μ V at 10 dB SINAD bandwidth
(ii)	Frequency Modulation/15      KHz      1μ V at 15 dB SINAD bandwidth

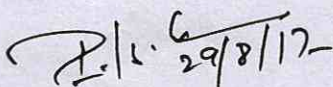




3	Frequency resolution	1Hz
4	Display	Average, RMS, Max Peak, Sample
5	<b>Rx- Pre-selection</b>	
	(i) >30MHz	Low Pass Filter
	(ii) < 1.5 GHz	Tuned band pass filters
6	Rx IF Spectrum Display range	1 KHz to 10 MHz
7	De-Modulation	AM, FM, Pulse, I/Q, USB, LSB, CW
8	Rx scan modes	Frequency scan, Memory scan, Panorama scan (Fast Fourier Transform based scanning)
9	Rx scan speed	10 GHz's or more
10	I/Q output( ≤ 200 KHz)	Ethernet port
11	<b>Output</b>	
	(i) Audio Output	Built in speaker & headphone
	(ii) Digital output	Ethernet port
	(iii) Analogue output (IF filter & de-modulation)	10 Hz/300Hz to 12.5 KHz
12	Data, Control, interfaces	Ethernet port
13	Recording	USB & SD card
14	Map display function	Built in automatic display of own position & line of bearing (LoB) on Map
15	Power Supply	It should work on AC mains 90V to 270V, 50Hz & 12 to 48 V DC
16	Battery operating time <b>(Spare Battery to be provided)</b>	3 Hrs (Min)
17	Built in display	Color graphic, RF spectrum, IF spectrum, Water Fall, Polar Diagram for Bearing, Map, Distance from target.
18	Weight	≤ 6 Kg (Excluding Antenna & Battery)
19	<b>Antenna System</b>	
	(i) Frequency Range	10KHz to 6 GHz
	(ii) DF method	Correlative Interferometer/Watson Watt/Doppler
	(iii) GPS & Compass	In built GPS & electronic compass
	(iv) System DF Accuracy	1° or better
20	<b>Environmental Specification:</b>	
	(i) Operating temp	-10 °C to +55 °C
	(ii) Storage temp	-20 °C to +55 °C
	(iii) Climatic & mechanical	MIL-STD810F or More

The Sub-group has decided to upload the QRs on MHA & BSF website for 15 days to invite the views/comments/suggestion of prospective bidders to make the QRs more broad.

Note - All the firms are requested to comment upon the above mentioned QRs and furnish Brochure/catalogue of their products from the OEMs.



(Rishipal Singh)  
Second-In-Command (Mod)