

## QRs OF HF MANPACK TRANSCEIVER

### 1.1 General Specification

S.N	Parameters	Specifications
1	Frequency Range	2.0 MHz to 29.9999 MHz channel spacing 10 Hz.
2	Modes	SSB(J3E) USB, LSB, AM, CW/MCW
3	Preset	100 Channels or more
4	Frequency Stability	±1 PPM or better
5	Built-in-test	Front panel testing.
6	Input Power	+12V DC Nominal (10.8V to 14.8V)
7	Battery life Duty Cycle:5 / /90	10 Ah (Li-Ion or Ni-Mh) or more 20 Hrs or More
8	EMI / EMC	MIL-STD- 461/462C or ETSI or CISPR 22 or IEC 61000-4 Series (TEC/EMI/TEL-001/01 FEB-09) or latest standard.
9	Weight	Less than 7 Kg with battery
10	Antenna Impedance	50 Ω Unbalanced
11	Protection	(i) Reverse Polarity protection (ii) Protection against high VSWR.
12	Roles	Manpack
13	Headphone Impedance	Up to 600Ω
14	Cooling	Convection from case
15	VSWR	Better than 1.5
16	Visual display	Front panel LCD/LED display or latest technology
17	Interface	RS-232 / USB
18	Programming	PC programming software and front panel Programming.


### 1.2 Transmitter Specifications

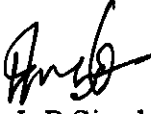
1.	RF Power	5W to 25W PEP (Low, Medium , High) (User programmable)
2.	Spurious Emission Suppression	≥ 46 dB below PEP
3.	Side Band Suppression	≥ 50 dB or better
4.	Carrier Suppression	≥ 40 dB or better
5	Inter modulation distortion	30 dB minimum below PEP
6.	Audio Response	Within ±6 dB from 350Hz to 2700Hz.

*[Handwritten signatures and initials]*

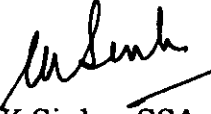
S.N	Parameters	Specifications
7.	Side Tone Level	Better than 0.1 mW into 150Ω load for 5mV of audio input at 1 KHz.
8.	Modulation Sensitivity	1 to 10 mV at 1 KHz for full power under SSB mode.
<b>1.3</b>	<b>Receiver Specification</b>	
1.	Receiver Sensitivity	-107 dBm for 10 dB SINAD or better
2.	Image Rejection	≥70 dB or better
3.	IF Rejection	≥70 dB or better
4.	In band Inter Modulation Distortion	35 dB minimum below PEP
5.	Audio Response	Within ±6 dB from 350Hz to 2700Hz
6.	Audio Output	1W or more across loudspeaker
7.	Audio Frequency Harmonics Distortion.	≥ 25 dB or better
<b>1.4</b>	<b>Environmental Parameters</b>	
1.	Operating Temperature	-30°C to +55° C
2.	Storage Temperature	-30°C to +60°C
3.	Humidity	95% non-condensing @ 40°C.
4.	Dust	MIL-STD-810F or better
5.	Vibration	or
6.	Shock	JSS-55555 (As laid down in Class L3 of JSS-55555, revision No.2)
7.	Water Intrusion	
8.	Altitude	
<b>1.5</b>	<b>Features</b>	
1.	Selective calling	Digital FSK Coding
2.	Scanning	5 channels per second or better
3.	Flash messages	Minimum 60 characters
4.	Vocoder	MELP/CELP (1200/2400bps) or better
5.	RS-232 control	The Radio set should have capability to operate at 4800 baud rate or better.
6.	Inbuilt Data Modem	MIL-STD -188 -110A/B/C single tone ≥ 4800 bps
7.	Tunable receiver	Continuous tunable.
8.	Radio kill/un-kill	Should have kill/un-kill function.
9.	Audio input sockets	Mic and external socket.
10.	Squelch	Voice/Digital squelch
11.	Push to talk.	Suitable Microphone to be provided.

S.N	Parameters	Specifications
12	Audio Socket	Suitable headgear should be provided.
<b>1.6 Optional Features (As per user requirement)</b>		
1.	Communication Security	AES 128 bit or AES 256 bit or SAG approved (As per user requirement)
2.	ALE 2G/ALE 3G	ALE 2G as per Appendix "A" and ALE 3G as per Appendix "C" of MIL-STD-188-141B
3.	Frequency Hopping	Hop Rate: $\geq 6$ hops per second
4.	GPS Interface	Inbuilt GPS with polling facility.


  
WO/C Satnam Singh  
Assam Rifles


  
INSP/T. L.P. Singh  
BSF

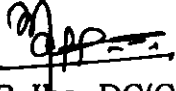
  
AC-I Khim Singh  
NSG

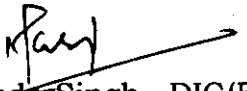
  
K.K. Sinha, SSA  
BPR&D

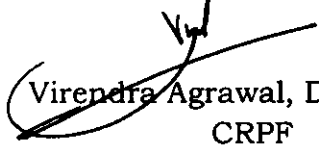
  
Ravindra Kumar, AC  
SSB


  
Shashank Sharma, AC  
CISF

  
Karan Singh, AC  
ITBP

  
P.R. Jha, DC(Comn)  
CRPF

  
Harjinder Singh, DIG(Eqpt)  
CRPF

  
Virendra Agrawal, DIG(Comn)  
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Ajay Kumar Yadav, IPS,  
IGP(Comn &IT), CRPF

  
Md. Jawed Akhtar, IPS,  
ADG (Work&Comn), CRPF

Approved/Not Approved

  
Rajeev Rai Bhatnagar, IPS  
DG, CRPF

**TRIAL DIRECTIVES OF HF MANPACK TRANSCEIVER**

All parameters/specifications mentioned in QRs will be checked by the Board of Officers by ascertaining/verifying following checks in the presence of Vendor/Supplier/Manufacturer. In case of any discrepancies/problem, the vendor/rep of firm will demonstrate the features to the Board of officer of the force concerned. Further, if proper testing instrument for testing these parameters is not available with user organization, firm will provide the same.

(a) Physical Checks: In this category, specifications of the equipment will be checked physically as per QRs.

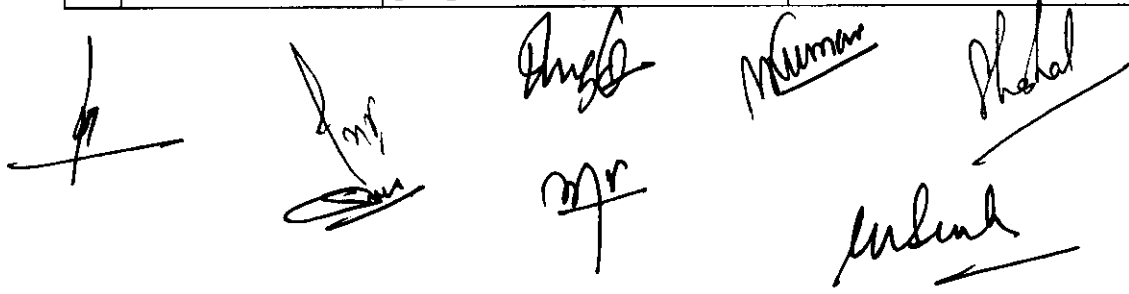
(b) Functional Checks: The vendors will show all the features/configuration of the equipment functioning on ground to the board of officers during trials.

**1.1 General Specification**

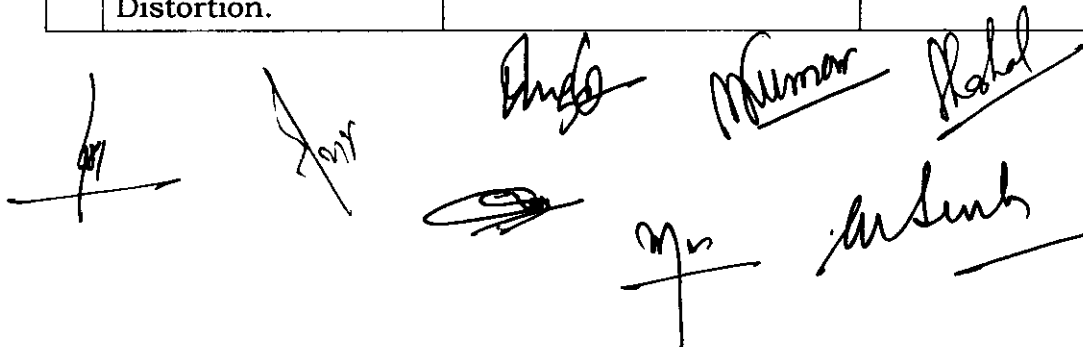
S.N	Parameters	Specifications	Trial Directives
1	Frequency Range	2.0 MHz to 29.9999 MHz channel spacing 10 Hz.	BOO will check frequency range of HF set by programming lowest, highest and any random frequency in 2.0-29.9999 MHz range and will measure with the help of standard testing instruments. The RF output and sensitivity of radio set in entire band should be same.
2	Modes	SSB(J3E) USB, LSB, AM, CW/MCW	BOO will check Modulation practically after switching "ON" the radio set and setting these modes one by one and firm will produce OEM certificate.
3	Preset	100 Channels or more	BOO will check it practically by setting the channels in the radio set.
4	Frequency Stability	±1 PPM or better	BOO will check parameter practically by using the standard test instrument.
5	Built-in-test	Front panel testing.	BOO will check practically.

*[Handwritten signatures and initials are present below the table, including names like 'Munna', 'Shahid', and others.]*

S.N	Parameters	Specifications	Trial Directives
6	Input Power	+12V DC Nominal (10.8V to 14.8V)	BOO will check practically and will ensure that radio set works properly.
7	Battery life Duty Cycle:5 / 5 / 90	10 Ah (Li-Ion or Ni-Mh) or more 20 Hrs or More	The firm will produce certificate of Govt. Lab. or NABL/ILAC accredited laboratory and BOO will check practically.
8	EMI / EMC	MIL-STD- 461/462C or ETSI or CISPR 22 or IEC 61000-4 Series (TEC/EMI/TEL-001/01 FEB-09) or latest standard.	The firm will produce certificate of Govt. Lab. or NABL/ILAC accredited laboratory.
9	Weight	Less than 7 Kg with battery	BOO will measure weight with help of weighing machine
10	Antenna Impedance	50 $\Omega$ Unbalanced	BOO will check practically.
11	Protection	(i) Reverse Polarity protection	BOO will check practically and firm will produce OEM certificate.
		(ii) Protection against high VSWR.	
12	Roles	Manpack	BOO will check practically.
13	Headphone Impedance	Up to 600 $\Omega$	BOO will check practically and firm will produce OEM certificate.
14	Cooling	Convection from case	BOO will check Physically.
15	VSWR	Better than 1.5	BOO will check practically.
16	Visual display	Front panel LCD/LED display or latest technology	BOO will check practically.
17	Interface	RS-232 / USB	BOO will check practically.
18	Programming	PC programming software and front panel programming.	BOO will check practically by software and front panel programming.


  
 A series of handwritten signatures and initials are present below the table. From left to right, there is a signature that looks like 'A', a signature that looks like 'S', a signature that looks like 'R', a signature that looks like 'M', a signature that looks like 'S', and a signature that looks like 'M'.


S.N	Parameters	Specifications	Trial Directives
<b>1.2 Transmitter Specifications</b>			
1.	RF Power	5W to 25W PEP (Low, Medium , High) (User programmable)	BOO will check practically.
2.	Spurious Emission Suppression	≥ 46 dB below PEP	BOO will check practically.
3.	Side Band Suppression	≥ 50 dB or better	BOO will check practically.
4.	Carrier Suppression	≥ 40 dB or better	BOO will check practically.
5	Inter modulation distortion	30dB minimum below PEP	BOO will check practically.
6.	Audio Response	Within ±6 dB from 350Hz to 2700Hz.	BOO will check practically.
7.	Side Tone Level	Better than 0.1 mW into 150Ω load for 5mV of audio input at 1 KHz.	BOO will check practically.
8.	Modulation Sensitivity	1 to 10 mV at 1 KHz for full power under SSB mode.	BOO will check practically.
<b>1.3 Receiver Specification</b>			
1.	Receiver Sensitivity	-107 dBm for 10dB SINAD or better	BOO will check practically.
2.	Image Rejection	≥70 dB or better	BOO will check practically.
3.	IF Rejection	≥70 dB or better	BOO will check practically.
4.	In band Inter Modulation Distortion	35 dB minimum below PEP	Firm will produce OEM certificate.
5.	Audio Response	Within ±6 dB from 350Hz to 2700Hz	BOO will check practically.
6.	Audio Output	1W or more across loudspeaker	BOO will check practically.
7.	Audio Frequency Harmonics Distortion.	≥ 25 dB or better	BOO will check practically.



  
 A collection of handwritten signatures and initials in black ink, including names like 'Rahul', 'Munim', and 'Arjun', along with various scribbles and initials.

S.N	Parameters	Specifications	Trial Directives
<b>1.4 Environmental Parameters</b>			
1.	Operating Temperature	-30°C to +55° C	The firm will produce certificate of Govt. Lab. or NABL/ILAC accredited laboratory.
2.	Storage Temperature	-30°C to +60°C	
3.	Humidity	95% non-condensing @ 40°C.	
4.	Dust	MIL-STD-810F or better	
5.	Vibration	or	
6.	Shock	JSS-55555 (As laid down in Class L3 of JSS-55555, revision No.2)	
7.	Water Intrusion		
8.	Altitude		
<b>1.5 Features</b>			
1.	Selective calling	Digital FSK Coding	Firm will produce OEM Certificate.
2.	Scanning	5 channels per second or better	
3.	Flash messages	Minimum 60 characters	BOO will check practically.
4.	Vocoder	MELP/CELP (1200/2400bps) or better	Firm will produce OEM certificate.
5.	RS-232 control	The Radio set should have capability to operate at 4800 baud rate or better.	BOO will check practically.
6.	Inbuilt Data Modem	MIL-STD -188 -110A/B/C single tone ≥ 4800 bps	Firm will produce OEM Certificate.
7.	Tunable receiver	Continuous tunable.	BOO will check practically.
8.	Radio kill/un-kill	Should have kill/un-kill function.	BOO will check practically.
9.	Audio input sockets	Mic and external socket.	BOO will check practically.
10.	Squelch	Voice/Digital squelch	BOO will check practically.
11.	Push to talk.	Suitable Microphone to be provided.	BOO will check practically.
12.	Audio Socket	Suitable headgear should be provided.	BOO will check practically.

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S.N	Parameters	Specifications	Trial Directives
<b>1.6 Optional Features (As per user requirement)</b>			
1.	Communication Security	AES 128 bit or AES 256 bit or SAG approved (As per user requirement)	Firm will produce OEM Certificate.
2.	ALE 2G/ALE 3G	ALE 2G as per Appendix "A" and ALE 3G as per Appendix "C" of MIL-STD-188-141B	Firm will produce OEM Certificate.
3.	Frequency Hopping	Hop Rate: $\geq 6$ hops per second	Firm will produce OEM Certificate.
4.	GPS Interface	Inbuilt GPS with polling facility.	BOO will check practically.

  
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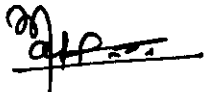
  
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BPR&D

  
Ravindra Kumar, AC  
SSB


  
Shashank Sharma, AC  
CISF

  
Karan Singh, AC  
ITBP

  
P.R. Jha, DC(Comn)  
CRPF

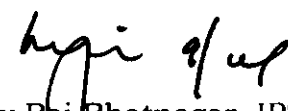
  
Harjinder Singh, DIG(Eqpt)  
CRPF

  
Virendra Agrawal, DIG(Comn)  
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Ajay Kumar Yadav, IPS,  
IGP(Comn &IT), CRPF

  
Md. Jawed Akhtar, IPS,  
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~~Approved / Not Approved~~

  
Rajeev Rai Bhatnagar, IPS  
DG, CRPF