

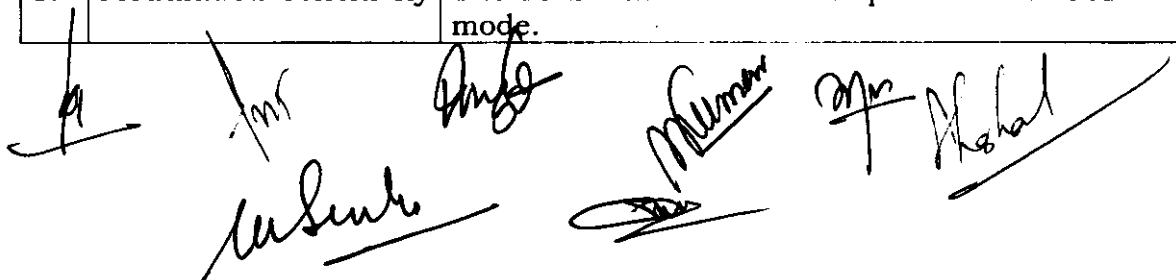
QRs OF STATIC HF TRANSCEIVER

1.1 General Specification

S.N	Parameter	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 or 24V ± 10% DC Nominal & 230V ± 10% AC
7.	Power Consumption	≤40W in Receive & ≤ 450W in Transmit
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 20 KG
10.	Antenna Impedance	50 Ω Unbalanced
11.	Protection	(i) Reverse Polarity protection (without fuse) (ii) Protection against high VSWR. (iii) Over Voltage and under Voltage Protection.
12.	Roles	Fixed/Transportable/Mobile
13.	Headphone Impedance	Up to 600Ω
14.	Cooling	Built in fan/ Heat sink
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 Specification

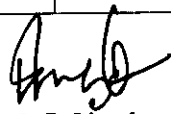
1.	RF Power	20W to 100W PEP (Low, Medium , High) As per user requirement with programmable feature.
2.	Spurious Emission Suppression	≥ 46 dB below PEP
3.	Side Band Suppression	≥ 50 dB or better
4.	Carrier Suppression	≥ 40 dB or better
5.	Inter modulation distortion	30 dB minimum below PEP
6.	Audio Response	Within 6d B from 350Hz to 2700Hz.
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.




S.N	Parameter	Specifications
1.3 Receiver Specification		
1.	Receiver Sensitivity	-107 dBm for 10dB 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
1.4 Environmental Parameters		
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	
1.5 Features		
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.	In built Data Modem	MIL-STD -188 -110A/B/C single tone ≥ 4800 bps
6.	Data Communication	Provision for data communication
7.	Tele Call	The Radio set should have capability to dial and operate data.
8.	RS-232 control	The Radio set should have capability to operate at 4800 baud rate or better.
9.	Tuneable receiver	Continuous tuneable.
10.	Radio kill/un-kill	Should have kill/un-kill function.
11.	Remote Operation	Capable to operate from remote location.
12.	Audio input sockets	Mic and external socket.
13.	Squelch	Voice/Digital squelch
14.	Push to talk.	Suitable Microphone to be provided.
1.6 Optional Features (As per user requirement)		
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


S.N	Parameter	Specifications
3.	Frequency Hopping	Hop Rate: >6 hops per second
4.	GPS Interface	Inbuilt GPS with polling facility
5.	Data Terminal Specifications: Should also be compatible with existing HF Radio	
a)	Processor	Intel Core i5 or better
b)	Speed	2.5 GHz or better
c)	RAM	Minimum 2GB DDR3 or better
d)	Memory Speed	1333 MHz or better
e)	HDD	1 TB or better
f)	Display Size	Minimum 15.6 Inch
g)	Interface	USB Port
h)	Keyboard	Multimedia
i)	Mouse	Optical Mouse
j)	Operating System	Window 7/8 or latest version OS
k)	Data communication software	Compatible with Window 7/8 or latest version OS



WO/C Satnam Singh
Assam Rifles



INSP/T. L.P. Singh
BSF

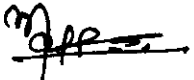

AC-I Khim Singh
NSG



K.K. Sinha, SSA
BPR&D

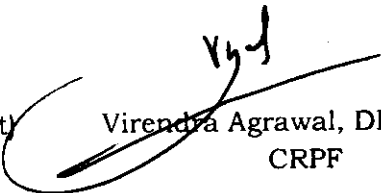

Ravindra Kumar, AC
SSB



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 STATIC HF TRANSCEIVER

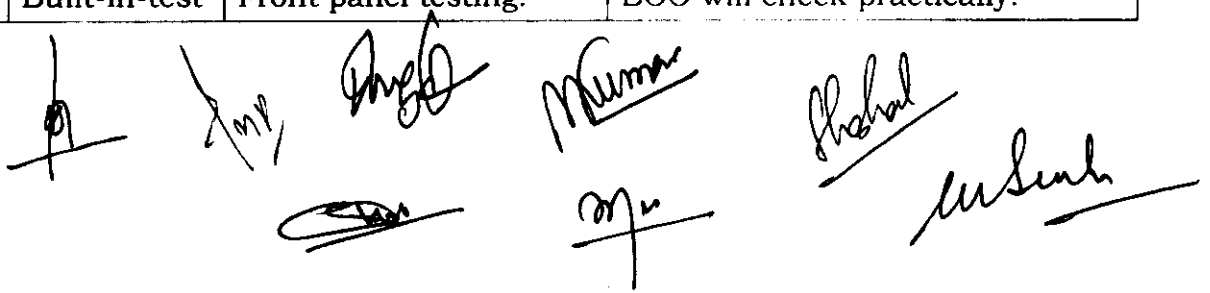
All parameters/specifications mentioned in QRs will be checked by the Board of Officers by ascertaining/verifying following checks in the presence of Vendor/Supplier/Manufacturer. In case of any discrepancies/problem, the vendor/rep of firm will demonstrate the features to the Board of officer of the 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	Parameter	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.



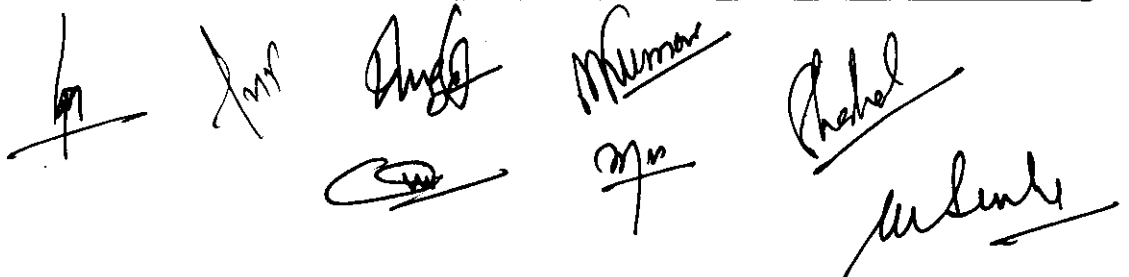
S.N	Parameter	Specifications	Trial Directives
6.	Input Power	+12V or 24V \pm 10% DC Nominal & 230V \pm 10% AC	BOO will check practically by connecting mentioned DC/AC voltages to radio set and will ensure that set works properly.
7.	Power Consumption	\leq 40W in Receive & \leq 450W in Transmit	BOO will 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 20 KG	BOO will measure weight with help of weighing machine
10.	Antenna Impedance	50 Ω Unbalanced	BOO will check practically.
11.	Protection	(i) Reverse Polarity protection (without fuse)	BOO will check practically and firm will produce OEM certificate.
		(ii) Protection against high VSWR.	
		(iii) Over Voltage and under Voltage Protection.	
12.	Roles	Fixed/Transportable/Mobile	BOO will check practically.
13.	Headphone Impedance	Up to 600 Ω	BOO will check practically/Firm will produce OEM certificate.
14.	Cooling	Built in fan/ Heat sink	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.

S.N	Parameter	Specifications	Trial Directives
1.2 Transmitter Specification			
1.	RF Power	20W to 100W PEP (Low, Medium , High) As per user requirement with programmable feature.	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	30 dB 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.
1.3 Receiver Specification			
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.

S.N	Parameter	Specifications	Trial Directives
1.4 Environmental Parameters			
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.	The firm will produce certificate of Govt. Lab. or NABL/ILAC accredited laboratory.
4.	Dust	MIL-STD-810F or better	
5.	Vibration	or	
6.	Shock	JSS-55555 (As laid down in	
7.	Water Intrusion	Class L3 of JSS-55555,	
8.	Altitude	revision No.2)	
1.5 Features			
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.	In built Data Modem	MIL-STD -188 -110A/B/C single tone ≥ 4800 bps	Firm will produce OEM certificate.
6.	Data Communication	Provision for data communication	BOO will check practically.
7.	Tele Call	The Radio set should have capability to dial and operate data.	Firm will produce OEM certificate.
8.	RS-232 control	The Radio set should have capability to operate at 4800 baud rate or better.	BOO will check practically.
9.	Tuneable receiver	Continuous tuneable.	BOO will check practically.
10.	Radio kill/un-kill	Should have kill/un-kill function.	BOO will check practically.
11.	Remote Operation	Capable to operate from remote location.	BOO will check practically.


A series of handwritten signatures and initials are present below the table. From left to right, they include: a signature that appears to be 'A', initials 'MP', a signature 'Anand', a signature 'Munna', initials 'MP', a signature 'Shekhar', and a signature 'Arjun'.


S.N	Parameter	Specifications	Trial Directives
12.	Audio input sockets	Mic and external socket.	BOO will check practically.
13.	Squelch	Voice/Digital squelch	BOO will check practically.
14.	Push to talk.	Suitable Microphone to be provided.	BOO will check practically.
1.6 Optional Features			
(As per user requirement)			
1.	Communication Security	AES 128 bit or AES 256 bit or SAG approved (As per user requirement)	Firm will submit 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: >6 hops per second	Firm will produce OEM certificate.
4.	GPS Interface	Inbuilt GPS with polling facility	BOO will check practically.
5. Data Terminal Specifications:			
Should also be compatible with existing HF Radio			
a)	Processor	Intel Core i5 or better	BOO will check physically and firm will produce OEM certificate.
b)	Speed	2.5 GHz or better	
c)	RAM	Minimum 2GB DDR3 or better	
d)	Memory Speed	1333 MHz or better	
e)	HDD	1 TB or better	
f)	Display Size	Minimum 15.6 Inch	
g)	Interface	USB Port	
h)	Keyboard	Multimedia	
i)	Mouse	Optical Mouse	




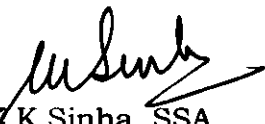
 A collection of handwritten signatures and initials in black ink, including names like 'Munim', 'Shahid', and 'Munim', along with various initials and scribbles.


S.N	Parameter	Specifications	Trial Directives
j)	Operating System	Window 7/8 or latest version OS	BOO will check physically and firm
k)	Data communication software	Compatible with Window 7/8 or latest version OS	will produce OEM certificate.

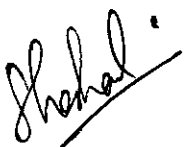

WO/C Satnam Singh
Assam Rifles

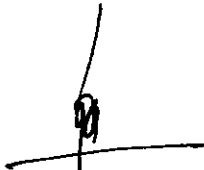

INSP/T. L.P. Singh
BSF

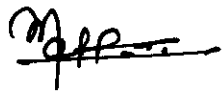

AC-I Khim Singh
NSG

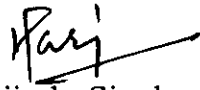

K.K. Sinha, SSA
BPR&D



Ravindra Kumar, AC
SSB



Shashank Sharma, AC
CISF


Karan Singh, AC
ITBP


P.R. Jha, DC(Comn)
CRPF

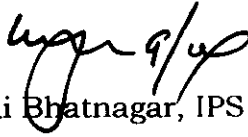

Harjinder Singh, DIG(Eqpt)
CRPF


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CRPF


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


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ADG (Work&Comn); CRPF

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