No. B.V-7/2012-13 (QRs)
भारत सरकार/Government of India
गृह मंत्रालय/Ministry of Home Affairs
पुलिस आधुनिकीकरण प्रभाग /Police Modernization Division
संभरण-I डेस्क /Prov.I Desk

26, Man Singh Road, Jaisalmer House,
New Delhi, the 2nd October, 2014

To,

The DsG: AR (through LOAR), BSF, CISF, CRPF, ITBP, SSB, NSG & BPR&D.

Subject: Revised Trial Directives of Digital Hand Held VHF Transceiver Set, Digital VHF Base/Mobile Transceiver Set and Digital VHF Repeater Set.

The undersigned is directed to refer to the subject mentioned above and to say that the revised Trial Directive in respect of Digital Hand Held VHF Transceiver Set, Digital VHF Base/Mobile Transceiver Set and Digital VHF Repeater Set as per Appdx-A, B & C respectively have been approved by the competent authority in MHA.

2. Concerned CAPF will be responsible for correctness of QRs.

3. Henceforth, all the CAPFs should procure the above items, required by them strictly as per the laid down Technical Specification/QRs.

4. Trial Directives of Digital Hand Held VHF Transceiver Set, Digital VHF Base/Mobile Transceiver Set and Digital VHF Repeater Set issued earlier vide letter of even No. dated 22.08.2013 is rescinded.

Yours faithfully,

(P.K. Srivastava)
Under Secretary to the Govt. of India

Encl: As above.

Copy forwarded for necessary action to:

SO (IT), MHA - with the request to host the revised Trial Directives on official website of MHA (under the page of Organizational Set up, Police Modernization Division) and remove earlier trial Directives vide letter of even number dated 22.08.2013(http://mha.nic.in/sites/upload_files/mha/files/QRSTrialDir_VHF_230813.pdf). Soft copy is being sent through email also.

(R. K. Soni)
Section officer (Prov-I)

Copy to: Director (Procurement), MHA

Appdx. "A"

TRIAL DIRECTIVE FOR DIGITAL HAND HELD VHF TRANSCEIVER SET

Sl No	Parameters	Specification	Trial/Test Procedure
1.	**General**		
	i) Frequency Range	136-174 MHz (Full Band)	Functional check ; B.O.O will check operation of radio set by programming lowest, highest and any random frequency in 136-174 MHz range with the help of measuring instruments.
	ii) No. of channel	255 or higher	B.O.O will check all these parameters one by one with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	iii) Channel Spacing	12.5 KHz or better	
	iv)Frequency Stability	± 1.5 PPM or better	
	v) Protocol & Technology	Digital TDMA or FDMA Technology or better User organization may decide protocol and technology as per their requirement/ choice.	B.O.O will check all these parameters with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	vi) Type of Emission (Modulation)	Analog ; 11K0F3E Digital;4FSK or cquivalent technique complying to open standard/non proprietary Digital Protocol as defined by an international standards body like ETSI / FCC etc.	B.O.O will check all these parameters with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	vii) Type of Operation	Simplex, press to talk	Simplex means set either work in receive mode or in transmit mode. Same will be checked practically.
	viii) Type of Antenna	Rugged flexible Helical Antenna	B.O.O will check Physically and Practically to assess fitment, flexibility & ruggedness of antenna.
	ix) Weight	Less than 450 grams with battery.	B.O.O. will check practically to measure weight by weighing machine.
	x) Power Source	Ni-Mh or Lithium-ion or Li-polymer battery pack of 2000 mAH or more with belt clip (Bidder shall mention DC Voltage and Chemistry).	Physical check to assess type, make & voltage/ capacity of battery and it should be as per specification. In addition Firm must produce certificate of any Govt. accredited Lab. or NABL or ILAC approved laboratory.
	xi) Protection	(i) Reverse polarity protection (ii) Protection against high VSWR	i) B.O.O will check it by connecting Radio set with DC supply in reverse polarity and switch the set to "ON" position. There should not be any harm to the Radio Set. ii) B.O.O will check by switching "ON" Radio set and removing antenna/ dummy load and PTT be pressed. In such a condition there should not be any harm to Radio set.

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2.	**Transmitter**		**Amended Trial Directive**
	i) R.F Power output	1/5 Watt (Programmable /Selectable)	B.O.O will check all these parameters in the entire frequency range mentioned in the QR with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	ii) FM Hum / Noise	-40 dB or better	
	iii) Modulation Limiting	± 2.5 KHz @ 12.5 KHz	
	iv) Adjacent Channel Power	-60 db or better	
	v) Audio Distortion	Less than 3%	
3.	**Receiver**		
	i) Sensitivity	i) Analog :- 0.30µV for 12 dB SINAD or better ii) Digital : - 0.30µV at 5% BER or better	B.O.O will check all these parameters in the entire frequency range mentioned in the QR with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	ii) Selectivity (Adjacent channel)	60 dB or better	
	iii) Inter Modulation	60 dB or better	
	iv) Audio Output	500 mW	
	v) Audio Response	+1,-3 dB	
	vi) Rated Audio Distortion	Less than 3%	
4	**Environmental Specification**		Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	i) Operating Temperature	-30°C to + 60 °C	
	ii) Storage Temperature	-40°C to + 70 °C	
	iii) Humidity	Max. 95% @ +40°C non-condensing	
	iv)Environmental standard (i.e) Low & High Temperature, Low pressure, Temperature Shock, Solar Radiation, Rain, Salt Fog, Vibration, Dust & Shock		Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory for the desired or better MIL standard.
	v) Dust & Water Intrusion	IP 57 or better	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
5	**Accessories**		
	i) Battery Charger	Single unit smart charger (capable to charge Lithium-Ion, Ni-MH, Lithium-Polymer batteries.	B.O.O will check it practically by charging the batteries from smart charger and note down whether the batteries are charge properly or otherwise.
	ii) Hands free Kit (VOX unit with PTT) (optional)	The vendor should provide minimum of two variants for trials	Check Practically by connecting Hands free kit with radio set. By making voice call Radio set should start transmission without pressing PTT. On 'no speech' Radio set should switch automatically to reception mode.
	iii) Programming kit	All necessary software and hardware required for programming of the set	Check Practically to assess that all necessary software and hardware required for programming of the set is available and working properly.

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	iv) Literature	i) Users manual with each radio sets should be provided free of cost in soft as well as hard copy. ii) Technical repairing manual with complete block diagram, circuit layout etc should be provided as per users' requirement in soft as well as hard copy.	Physically check to confirm that User and Technical manual are available in Hard as well as in Soft Copy.
	v) Battery	Two extra Lithium –ion or Ni-Mh or li-polymer batteries with each Radio Set	Physical/Practical check to assess that extra battery is as per specification, compatible with Radio set and working properly.
	vi) Leather case (Optional)	One good quality leather case with belt clip & shoulder strip.	Practically/ physically check by inserting radio set in it to assess that radio set can be easily inserted in leather case. Leather case should have belt clip and shoulder strip of sufficient length.
6.	**Configuration**		
	i) Caller ID display	Should be available	B.O.O will check it by programming two radio sets on same frequency and different ID. Make call from one radio and check display in another radio set, ID of caller radio should be displayed.
	ii) Facility for locking the channel or key pad locking	Should be available	Program locking channel or key pad facilities in radio set and check whether the channel or key pads locked or otherwise.
	iii) Scan with priority	Should be available	Radio sets programmed with priority scanning on pressing the scan button, will starts scanning channels with the priority.
	iv) Transmitter Time Out Timer (TOT)	The time should be programmed to best suit the application	PTT of Radio set pressed continuously. Radio set comes automatically in reception mode after completion of time programmed for TOT option.
	v) LCD Display	Should be available	Practical /Physical check by switching on the radio set, there should be display on the LCD screen.
	vi) Mode of calls	Selective Call, Group Call, Inter and Intra Group call facility	B.O.O. will check it practically by making call.
	vii) Remote Radio Kill / Stun /Revive facility	Should be available	B.O.O. will check it practically by sending kill command to particular radio. Radio set received kill command will get killed. Similarly, Set should revive if we send the revive command to killed radio.

	viii) Mode of operation	Radio should operate in analog mode and digital mode. (Compatible with existing all type of VHF analogue radio sets viz : Motorola, Icom, Kenwood, Vertex etc)	B.O.O will be check practically by making call from existing analog sets to digital set after setting it in Analog mode and vice –versa. For checking interoperability with existing digital radio system, if available, make calls between them and the proposed radio sets (in digital mode) and verify. Proper communication should happen if both digital radio systems are based on same technology.
	ix) Emergency Button	Allows a user to obtain help in critical situations.	B.O.O. will check it practically by pressing emergency button.
	x) SMS Texting	Should be capable of sending pre defined messages & short messages from keypad as Optional.	B.O.O. will check it practically by sending pre-defined messages from one radio to another. Message should be displayed on the screen of receiving radio.
	xi) Programming	Front panel programming with password protection or PC programming.	B.O.O. will check it practically by programming radio from front panel having password protection. Similarly, Board will also program radio with the help of PC. Radio set should be programmed from front panel as well as from PC also.
	xii) DTMF front panel key pad with back lit	Should be available	B.O.O. will check it Physically/ Practically that radio set is having DTMF key pad with back lit.
	xiii) Battery strength bar	Should be available	B.O.O. will check it practically that battery strength bar indicates the strength bar as increasing / decreasing when battery is charged/ discharged.
	xiv) Support GPS	Inbuilt GPS system with accuracy of less than 10 meters.(Optional-As per user requirement)	Firm will demonstrate features related with GPS, GIS and Networking mentioned at Sl No.6 xiv) to xvi) to Board of Officers during the trial and all function should work as per requirement.
	xv) GIS	Radio should have Application protocol interface along with software applications to provide locations and messaging on PC/ Console. (Optional-As per user requirement)	
	xvi)Networking	Should be IP based for automatic roaming etc. (Optional-As per user requirement)	

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7	**Field Trial**	The actual performance of the radio set will be assessed.	Field trial of equipment will be conducted by a Board of Officers in the operational area of the force in the presence of Vendor/representative of firms to ascertain the user satisfaction before the proposal is accepted. Radio equipment with all required accessories will be provided by the participating firm's on "**No Cost No Commitment**" basis at the indenter discretion.

(Sohrab Ansari,SI/Exe, CISF) (R.K. Khumbhare, AC, SSB) (M.S.Yadav, AC, CRPF)

(O.S.Chauhan, AC, NSG) (Gautam kumar AC, ITBP) (Brajesh Kumar, DC, BSF)

(Rajesh Ekka,DD, DCPW) (Lt. Col Rajnish Kishore, AR)

[Sumit Gupta, Scientist "PSO (E)", BPR&D) (Dr. Mayank Dwivedi Sc."F" DLIC/DRDO)

[Virendra Agrawal, DIG (Eqpt), CRPF] [Mahesh Kumar,DIG(Comn), CRPF]

[Shailendra Kumar, IG (Comn), CRPF] 16/7/14

Approved/~~Not Approved~~

17/7

(Dilip Trivedi, IPS)
(DG, CRPF)

Appdx "B"

TRIAL DIRECTIVE FOR DIGITAL VHF BASE/MOBILE TRANSCEIVER SET

Sl No	Parameters	Specification	Trial/Test Procedure
1.	**General**		
	i) Frequency Range	136-174 MHz (Full Band)	Functional check: B.O.O will check operation of radio set by programming lowest, highest and any random frequency in 136-174 MHz range with the help of measuring instruments.
	ii) No. of channel	255 or higher	B.O.O will check all these parameters one by one with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	iii) Channel Spacing	12.5 KHz or better	
	iv) Frequency Stability	± 1.5 PPM or better	
	v) Protocol & Technology	Digital TDMA or FDMA Technology or better (User organization may decide protocol & Technology as per their requirement/ choice)	B.O.O will check all these parameters with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	vi) Type of Emission (Modulation)	Analog;11K0F3E Digital ; 4 FSK or equivalent technique complying to open standard / non proprietary Digital Protocol as defined by an international standards body like ETSI / FCC etc.	B.O.O will check all these parameters with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory..
	vii) Type of Operation	Simplex, press to talk	Simplex means set either works in receive mode or in transmit mode. Same will be checked practically.
	viii) Weight	Less than 2000 grams	B.O.O. will check practically to measure weight by weighing machine.
	ix) Power Source	13.8 Volt DC ± 15%	Apply 13.8VDC ±15% from power supply and check that whether set is working properly or otherwise.
	x) Protection	(i) Reverse polarity protection (ii) Protection against high VSWR	i) B.O.O will check it by connecting Radio set with DC supply in reverse polarity and switch the set to "ON" position. There should not be any harm to the Radio Set. ii) B.O.O will check by switching "ON" Radio set and removing antenna/ dummy load and PTT be pressed. In such a condition there should not be any harm to Radio set.

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2.	**Transmitter**		B.O.O will check all these parameters in the entire frequency range mentioned in the QR with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	i) R.F Power output	25 Watt Programmable /Selectable)	
	ii) FM Hum /Noise	-40 dB or better	
	iii) Modulation Limiting	± 2.5 KHz @ 12.5 KHz	
	iv) Adjacent Chanel power	-60 db or better	
	v) Audio Distortion	Less than 3%	
3.	**Receiver**		B.O.O will check all these parameters in the entire frequency range mentioned in the QR with the help of standard testing instruments If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	i) Sensitivity	i) Analog:- 0.30 µV for 12 dB SINAD or better ii) Digital :- 0.30µV at 5% BER or better	
	ii) Selectivity (Adjacent channel)	60 dB or better.	
	iii) Inter Modulation	70 dB or better	
	iv) Audio Output	3 W or more	
	v) Audio Response	+1,-3 dB	
	vi) Rated Audio Distortion	Less than 3%	
4.	**Environmental Specification**		Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	i) Operating Temperature	-30°C to + 60 °C	
	ii) Storage Temperature	-40°C to + 70 °C	
	iii) Humidity	Max. 95% @ +40°C non-condensing	
	iv) Environmental standard (i.e) Low & High Temperature , Low pressure, Temperature Shock, Solar Radiation, Rain, Salt Fog, Vibration, Dust & Shock	As per MIL 810 C,D,E,F	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory for the desired or better MIL standard.
	v) Dust &Water Intrusion	IP 54 or better	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
5.	**Accessories**		
	i) Microphone	DTMF Microphone should be supplied with Radio	B.O.O. will check physically and practically that DTMF Microphone supplied with radio and is working properly.
	ii) Battery cable & Mounting fixtures	Should be supplied with Radio	Physically check by connecting battery cable & mounting fixtures with radio.

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	iii) Antenna	i) 0dB/3dB gain whip antenna with 3 meters. Co-axial cable with connector, magnetic base/ mounting bracket for vehicle use will be provided as per user's requirements. ii) 3dB/6dB gain Omni Directional antenna with 30 meter RF Cable for base station will be provided as per user's requirements.	Physically check by connecting antenna with all its accessories with radio set and check serviceability whether antenna matched or not.
	iv) Programming kit	All necessary programming software and hardware required for the set will be provided as per user's requirements.	Practically check to assess that all necessary software and hardware required for programming are available and working properly.
	v) Literature	i) Users manual with each radio sets should be provided free of cost in soft as well as hard copy. ii) Technical repairing manual with complete block diagram, circuit layout etc should be provided as per users' requirement in soft as well as hard copy.	Physically check to confirm that User and Technical manual are available in Hard as well as in Soft Copy.
6	**Configuration**		
	i) Caller ID display	Should be available	By Programming two radio sets with same frequency and different ID. And Making call from one radio and check display in another radio set, ID of caller radio should be displayed.
	ii) Busy channel lock out	Should be available	Programmed one radio with busy channel lock out option and make call from another radio on same frequency. In the mean time if we want to make call from first radio, its transmitter will remain disable till PTT of second radio is released.
	iii)Scan with priority	Should be available	Radio sets programmed with priority scanning on pressing the scan button will start scanning channels with the priority.
	iv)Transmitter Time Out Timer (TOT)	The time should be programmed to best suit the application.	iv) PTT of Radio set programmed with TOT option be pressed continuously. Radio set comes automatically in reception mode after completion of time programmed for TOT option.
	v) LCD Display	Should be available	Practical/Physical check by switching on the radio set, there should be display on the LCD screen.
	vi) Mode of calls	Selective Call, Group Call, Inter and Intra Group call facility	B.O.O. will check it practically by making call.

	vii) Remote Radio Kill / Stun /Revive facility	Should be available	B.O.O. will check it practically by sending kill command to particular radio. Radio set received kill command will get killed. Similarly, Set should revive if we send the revive command to killed radio.
	viii) Mode of operation	Radio should operate in analog mode and digital mode. (Compatible with existing all type of VHF analogue radio sets viz ::Motorola, Icom, Kenwood, Vertex etc)	B.O.O will be check practically by making call from existing analog sets to digital set after setting it in Analog mode and vice –versa. For checking interoperability with existing digital radio system, if available, make calls between them and the proposed radio sets (in digital mode) and verify. Proper communication should happen if both digital radio systems are based on same technology.
	ix) Emergency Button	Allows a user to obtain help in critical situations.	B.O.O. will check it practically by pressing emergency button.
	x) SMS Texting	Should be capable of sending pre defined messages & short messages from keypad as Optional.	B.O.O. will check it practically by sending pre-defined messages from one radio to another. Message should be displayed in the screen of receiving radio.
	xi) Programming	Front panel programming with password protection or PC programming	B.O.O. will check it practically by programming radio from front panel having password protection. Similarly Board will also programmed radio with the help of PC. Radio set should be programmed from front panel as well as from PC also.
	xii) Support GPS	Inbuilt GPS system with accuracy of less than 10 meters. (Optional-As per user requirement)	Firm will demonstrate features related with GPS, GIS and Networking mentioned at Sl No.6-(xii to xiv) to Board of Officers during trail).
	xiii) Networking	Should be IP based for automatic roaming etc.(Optional-As per user requirement)	
	xiv) GIS	Radio should have Application protocol interface along with software applications to provide locations and messaging on PC/Console. (Optional-As per user requirement)	

7.	**Field Trial**	The actual performance of the radio set will be assessed.	Field trial of equipment will be conducted by a Board of Officers in the operational area of the force in the presence of Vendor/ representative of firms to ascertain the user satisfaction before the proposal is accepted. Radio equipment with all required accessories will be provided by the participating firm's on **"No cost No Commitment"** basis at the indenter discretion.

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[Sumit Gupta, Scientist "PSO (E)",BPR&D) (Dr. Mayank Dwivedi Sc. "F" DLIC/DRDO)

[Virendra Agrawal, DIG (Eqpt), CRPF] [Mahesh Kumar,DIG(Comn), CRPF]

[Shailendra Kumar, IG (Comn), CRPF]

Approved/Not Approved

(Dilip Trivedi, IPS)
(DG, CRPF)

TRIAL DIRECTIVE FOR DIGITAL VHF REPEATER SET

Sl No.	Parameters	Specifications	Trial/Test Procedure
1	**General**		
	i) Frequency Range	136-174 MHz (Full Band)	Functional check : B.O.O will check operation of radio set by programming lowest, highest and any random frequency in 136-174 MHz range with the help of measuring instruments.
	ii) No. of channel	16 or more	B.O.O will check all these parameters one by one with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	iii) Channel Spacing	12.5 KHz or better	
	iv) Frequency Stability	± 1.5 PPM or better	
	v) Protocol & Technology	Digital TDMA or FDMA Technology or better(User organization may decide protocol & Technology as per their requirement/ choice)	B.O.O will check all these parameters with the help of standard testing instruments If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	vi) Type of Emission (Modulation)	Analog ; 11K0F3E Digital;4FSK or equivalent technique complying to open standard / non proprietary Digital Protocol as defined by an international standards body like ETSI / FCC etc.	B.O.O will check all these parameters with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	vii) Weight	Less than 15 Kg	B.O.O. will check Physically to measure the weight by weighing machine.
	viii) Power Source	i) DC -13.8 Volt ± 15% ii)AC-230Volt±15%,50Hz iii)There should be provision to shift automatically on DC supply during mains failure & when mains supply restored it should be shifted on mains from DC supply	Apply 230 VAC ±15% and 13.8VDC ±15% one by one and check that whether set is working properly or otherwise.

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	xi) Protection	(i) Reverse polarity protection (ii) Protection against high VSWR	i)B.O.O will check it by connecting radio set with DC supply in reverse polarity and switch the set to "ON" position. There should not be any harm to the Radio Set. ii) B.O.O set be switched "ON" removing antenna/ dummy load and PTT be pressed. In such a condition there should not be any harm to Radio set.
2	**Transmitter**		B.O.O will check all these parameters in the entire frequency range mentioned in the QR with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	i) R.F Power output	45 Watt or more (Programmable/ Selectable)	
	ii) FM Hum / Noise	-40 dB or better	
	iii) Modulation Limiting	± 2.5 KHz@ 12.5 KHz	
	iv) Adjacent Chanel Power	-60 dB or better	
	v) Audio Distortion	Less than 3%	
3	**Receiver**		B.O.O will check all these parameters in the entire frequency range mentioned in the QR with the help of standard testing instruments. If the standard test instruments are not available then firm must produce certificate of any Govt. accredited lab or National Accreditation Board for Testing and Calibration Laboratories (NABL) approved laboratory or International Laboratory Accreditation Corporation (ILAC) approved laboratory.
	i) Sensitivity	i) Analog:- 0.30 µV for 12 dB SINAD or better ii) Digital :- 0.30µV at 5% BER or better	
	ii) Selectivity (Adjacent channel)	60 dB or better	
	iii)Inter Modulation	70 dB or better	
	iv) Audio Response	+1,-3 dB	
	v) Rated Audio Distortion	Less than 3%	
4	**Environmental Specification**		Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	i) Operating Temperature	-30°C to + 60 °C	
	ii) Storage Temperature	-40°C to + 70 °C	
	iii) Humidity	Max. 95% @ +40°C non- condensing	
5	**Networking**	Should be capable to support IP site connects.	Firm will show Networking and Interfaces related function of repeater practically by connecting it in user organization network.
6	**Interfaces**	Ethernet port RJ-45 to provide a) Wide area IP connectivity for Voice and Data. b) Remote monitoring and status check.	
	Accessories		
7	i) Battery cable & Mounting fixtures	Should be supplied with Repeater	B.O.O. will check it practically by connecting battery cable & mounting fixtures with repeater.
	ii) Antenna	3dB/6dB gain, Omni Directional antenna with 45 meter RF Cable RG-217 for base station will be provided as per user's requirements.	B.O.O. will check it practically by connecting antenna & accessories with repeater. During transmission there should be no mismatch between radio and antenna.

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	iii) Programming kit	All necessary programming software and hardware required for the set will be provided as per user's requirements.	B.O.O. will check it practically that all necessary programming software and hardware are available as per user requirement.
	iv) Literature	i) Users manual with each radio sets should be provided free of cost in soft as well as hard copy. ii) Technical repairing manual with complete block diagram, circuit layout etc should be provided as per users' requirement in soft as well as hard copy.	B.O.O will check it Physically that user and technical manual are available as per user requirement.
8.	**Field Trial**	The actual performance of the radio set will be assessed.	Field trial of equipment will be conducted by a Board of Officers in the operational area of the force in the presence of Vendor/ representative of firms to ascertain the user satisfaction before the proposal is accepted. Repeater equipment with all required accessories will be provided by the participating firm's on **"No cost No Commitment"** basis at the indentet discretion.

(Sohrab Ansari, CISF)

(R.K. Khumbhare,AC,SSB)

(M.S.Yadav,AC,CRPF)

(O.S.Chauhan, AC, NSG)

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(Lt. Col Rajnish Kishore, AR)

[Sumit Gupta, PSO(E) , BPR&D)

(Dr. Mayank Dwivedi Sc. "F" DLIC/DRDO)

[Virendra Agrawal, DIG (Eqpt), CRPF]

[Mahesh Kumar,DIG(Comn), CRPF]

[Shailendra Kumar, IG (Comn), CRPF]

Approved/~~Not Approved~~

17/7

(Dilip Trivedi, IPS)
(DG, CRPF)