

No. B.V-7/2015-16-C (QRs)-(3) / 550
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 7th Aug, 2015

To,

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


Subject: Trial Directives of Digital UHF Radio Sets (Hand Held, Mobile and Repeater Sets).

The undersigned is directed to refer to the subject mentioned above and to say that the Trial Directive in respect of Digital UHF Radio Sets (Hand Held, Mobile and Repeater Sets) as per Appendix-'A', 'B' & 'C' respectively have been approved by the competent authority in MHA.

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

Issued
10/8/2015

Yours faithfully,


(M. N. Sukole)

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 Trial Directives of Digital UHF Radio Sets (Hand Held, Mobile and Repeater Sets) on official website of MHA (under the page of Organizational Set up, Police Modernization Division- Communication Equipment). Soft copy is being sent through email also.


(R. K. Soni)

Section officer (Prov-I)

Copy to: Director (Procurement), MHA



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TDs FOR DIGITAL UHF HAND HELD TRANS RECEIVER

Appendix "A"

Sl No	Parameters	Specification	Trial Procedure
1	Frequency Range	403-470 MHz	Functional check: B.O.O will check operation of radio set by programming the lowest, highest and any random frequency in 403-470 MHz range with the help of measuring instruments.
	No of channel	256 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.
	Channel Spacing	12.5 KHz or better	
	Frequency Stability	± 1.0 PPM or better	
	Protocol	Digital TDM /FDM Technology	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.
	Type of Emission	Analog: 11K0F3E Digital: 4FSK or equivalent Modulation technique complying to Open Standard / non propriety Digital Protocol as defined by an international standards body like ETSI / FCC etc.	
	Type of Operation	Simplex press to talk	Simplex means set either works in receive mode or in transmit mode. Same will be checked practically.
	Type of Antenna	Helical Antenna	B.O.O will check Physically and Practically to assess fitment, flexibility & ruggedness of antenna.
	Weight	Less than 400 grams without battery	B.O.O. will check practically to measure weight by weighing machine.
Power Source	Ni-Mh or Li-on rechargeable battery with belt clips to meet the Operating time of 8 hours with 5:5:90 duty cycle at peak conditions.	B.O.O will Physically check battery to assess type, make & voltage/ capacity of battery and it should be as per specification. In addition Firm must also produce certificate of any Govt. accredited Lab. or NABL or ILAC approved laboratory.	

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TDs FOR DIGITAL UHF HAND HELD TRANS RECEIVER

Sl No	Parameters	Specification	Trial Procedure
2	RF Power out put	Programmable/ switchable up to 4 watt or more	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.
	FM Hum /Noise	12.5KHz : 40dB or better	
	Frequency Deviation	± 2.5 KHz in 12.5 KHz spacing	
	Modulation Sensitivity	2 to 10 mV	
	Modulation Distortion	Less than 3 % @ 1 KHz	
	Modulation Fidelity	+1,-3 dB of 6dB	
	Audio Distortion	Less than 3% @ 1 KHz	
3	Sensitivity	(i) Analog: 0.3 5 μV for 12 dB SINAD or better (ii) Digital: 0.30 μV 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.
	Selectivity (adjacent channel)	60 dB @12.5 KHz or better	
	Inter Modulation	60 dB or better as per ETSI standard or better	
	Audio out put	500 mW or higher	
	Audio Response	+1, -3dB of 6dB	
4	Operating Temperature	-30 to +60°C	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	Storage Temperature	-40°C to +70°C	
	Humidity	90% at 50°C (as per MIL810E)	
	Environmental Standard	MIL 810 C,D,E,F	
	Water Proof Protection	IP 54, IP 55 or better	

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TDs FOR DIGITAL UHF HAND HELD TRANS RECEIVER

Sl No	Parameters	Specification	Trial Procedure
5	Support GPS	Should be supplied with GPS with accuracy less than 15m to enable being tracked from Remote Control Station.	Firm will demonstrate features related with GPS, GIS to Board of Officers during the trial and all functions should work as per requirement.
	Support GIS	Radio should have application protocol interface along with software application to provide location and messaging on PC /Console.	
	Text Messaging	Should be capable of sending short messages from keypad and pre defined messages	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.
	Front Panel LCD Display	Digital hand held radio with key pad and display.	Practical /Physical check by switching on the radio set, there should be display on the LCD screen.
	Transmitter Time out Timer (TOT)	The time can be programmed to best suit the application	PTT of Radio set be kept pressed without any break. Radio set should come in reception mode automatically after completion of programmed duration of TOT option.
	Emergency Button	Allows a user to obtain help in critical situations	B.O.O. will check it practically by pressing emergency button.
	Scan with priority facility	Should be available	Radio sets programmed with priority scanning on pressing the scan button, will start scanning channels with the priority.
	Mode of calls	Selective call, Group call, inter and intra Group call facility	B.O.O. will check it practically by establishing satisfactory call links in all required call types.
	Contact list	Contact list of more than 100 user for SMS and selective calling	The board of officers will carry out functional check.
	Remote Radio killing /stun /Revive facility	Should be available	B.O.O. will check it practically by sending kill command to particular radio. Radio set receiving kill command must get killed. Similarly, Set must revive if we send the revive command to killed radio.
	Caller ID Display	Should be available	B.O.O will check it by programming two radio sets on same frequency but with different IDs. Make call from one radio and check display in receiver radio set, ID of caller radio should be displayed.
	Networking	IP based for features like automatic roaming	The board of officers will carry out physical and functional check. The vendor to demonstrate the same with all features
	Secrecy	Should provide internet protection against casual eavesdropping	Board will Physically check.

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TDs FOR DIGITAL UHF HAND HELD TRANS RECEIVER

Sl No	Parameters	Specification	Trial Procedure
6	Battery charger	Single unit rapid charger (100% of number of sets) Four way or more charger (25% of number of sets)	B.O.O will check it practically by charging the batteries from charger and note down whether the batteries are getting charged properly or otherwise.
	Hands free kit (VOX unit with PPT)	The vendor should be 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.
	Programing kit	All necessary programming software and hardware required for the set	Check Practically to assess that all necessary software and hardware required for programming of the set is available and working properly.
	Literature	i) User manual with each radio sets. ii) Technical repairing manual with complete block diagram. Circuit layout etc at a scale of 10% of equipments being procured. iii) Firm would train teams of four Operators and mechanics in handling Operating and repairing of radio receivers free of cost after procurement.	Vendor will submit user manual of each sets, technical repairing manual with complete block diagram and also provide training for a team comprising of four operators for handling of sets. The same to be mentioned in the contract documents.

Rajender Kumar
Rajender Kumar
(SI/Tele, ITBP)

S.P. Singh
Suresh Pal Singh
(Insp/T, BSF)

M.K.S.
M.K. Singh
(AC -I, NSG)

Sonu Sikarwar
Sonu Sikarwar
(Asst. Comdt, CISF)

Hem Prashn
Hem Prashn
(DY. Comdt. CRPF)

S.K. Thakur
S.K. Thakur
(Dy. Comdt, AR)

V.K. Savant
Major. Vikram Savant
(NSG)

Ashwani Sulhar
Major Ashwani Sulhar
(NSG)

Kapil
Kapil
(SSA(E), BPR&D)

Virendra Agrawal
Virendra Agrawal
DIG (Eqpt), CRPF

J.S. Sandhu
J.S. Sandhu
DIG (Comn), CRPF
16/3/15

Shailendra Kumar
Shailendra Kumar
IG (Comn), CRPF
16/3/15

Approved/ Not Approved

(Prakash Mishra, IPS)

DG, CRPF

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TDS FOR DIGITAL UHF MOBILE TRANS RECEIVER

Appendix "B"

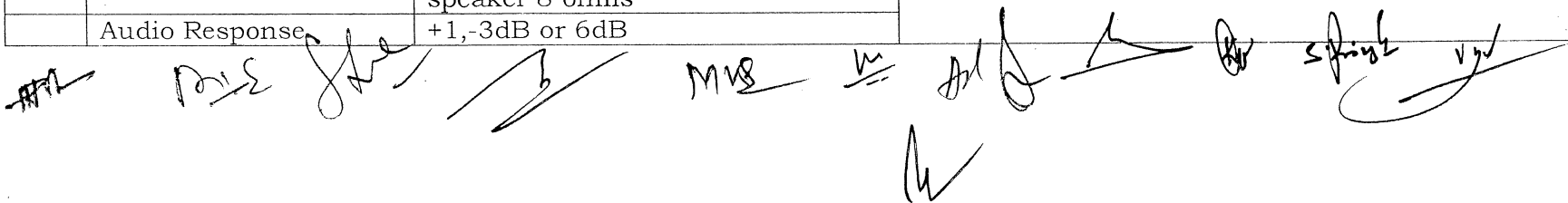
Sl No	Parameters	Specification	Trial Procedure
1	General		
	Frequency Range	403-470MHz	Functional check: B.O.O will check operation of radio set by programming the lowest, highest and any random frequency in 403-470 MHz range with the help of measuring instruments.
	No of Channel	256 or higher	B.O.O 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.
	Channel Spacing	12.5 KHz or better	
	Frequency Stability	± 1.0 PPM or better	
Protocol	Digital TDM/FDM technology	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.	
	Type of Emission	Analog : 11K0F3E Digital : 4 FSK or equivalent Modulation technique complying to open standard / non propriety 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.
	Type of operation	Simplex press to talk	Board will check practically and will ensure that, at a given point of time, set either works in receive mode or in transmit mode.

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TDS FOR DIGITAL UHF MOBILE TRANS RECEIVER

Sl No	Parameters	Specification	Trial Procedure
	Weight without External battery & Antenna	Less than 2000 grams	Board will measure weight practically with the help of weighing machine & will ensure that it is not more than 2000 grams.
	Power Source	Typical 13.8V DC $\pm 10\%$	Apply 13.8VDC $\pm 10\%$ from power supply and check ensure that set is working properly.
	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, PTT be pressed after removing antenna/ dummy load. In such a condition there should not be any harm to Radio set.
2	Transmitter		
	RF Power output	20 watt Programmable /Selectable or more	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.
	FM Noise	40 dB or better (12.5 KHz)	
	Frequency Deviation	± 2.5 KHz in 12.5 KHz spacing	
	Modulation Sensitivity	2 to 10 mV	
	Modulation Distortion	Less than 3% @ 1 KHz	
	Modulation Fidelity	+1,-3 dB of 6 dB	
	Digital Modulation	4 FSK Modulation or equivalent	
3	Receiver		
	Sensitivity	(i) Analog 0.30 μ V for 12dB SINAD or better (ii) Digital 0.30 μ V 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.
	Selective (Adjacent channel)	60dB @12.5 KHz or better	
	Inter Modulation	65 dB or better as per ETSI standard /equivalent or better	
	Audio output	3 W internal or 7.5 W external speaker 8 ohms	
	Audio Response	+1,-3dB or 6dB	


 A series of handwritten signatures and initials are present below the table, including names like 'MVS', 'S. Singh', and others, likely representing approvals or verifications.

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TDS FOR DIGITAL UHF MOBILE TRANS RECEIVER

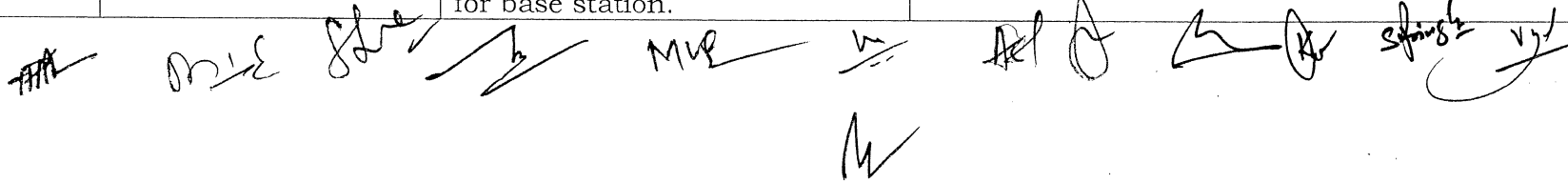
Sl No	Parameters	Specification	Trial Procedure
4	Environmental Specification		
	Operating Temperature	-30°C to + 60°C	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	Storage Temperature	-40°C to + 70°C	
	Humidity	90% at 50°C (as per MIL810E)	
Environmental standard	MIL 810 C,D,E & F Standards		
5	Features		
	Support GPS	Should be supplied with GPS with accuracy less than 15m, to enable being tracked from Remote control station with appropriate system.	Firm will demonstrate features related with GPS, GIS and Text Messaging to Board of Officers during trail).
	Support GIS	Radio should have application protocol interface along with software application to provide location and messaging on PC /Console.	
	Text Messaging	Should be capable of sending short Messages from keypad and pre-defined Messages	
	Front Panel LCD Display	The radio should be supplied with alphanumeric display to view various setting and function of the set.	Practical/Physical check by switching on the radio set, there should be display on the Front Panel LCD screen.
	Transmitter Time out Timer (TOT)	The time should be programmed to best suit the application.	PTT of Radio set programmed with TOT option be kept pressed continuously. Radio set should come in reception mode automatically after completion of programmed duration of TOT option..
Emergency Button	Covert emergency signaling to allow users to send help signals to user defined individual or group in critical situations.	B.O.O. will check it practically by pressing emergency button.	

Handwritten signatures and initials including: HPL, M/S, and several other illegible signatures.

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TDS FOR DIGITAL UHF MOBILE TRANS RECEIVER

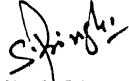
Sl No	Parameters	Specification	Trial Procedure
	Scan with priority facility	Should be available	Radio sets programmed with priority scanning on pressing the scan button will start scanning channels with the priority.
	Mode of calls	Selective call, Group call, Inter Group call and Intra Group call facility	B.O.O. will check it practically by establishing satisfactory call links in all required call types.
	Contact list	Contact list of more than 100 user for SMS and selective calling	The board of officers will carry out functional check. The vendor to demonstrate the same with all features.
	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 receiving kill command must get killed. Similarly, Set must revive if we send the revive command to killed radio.
	Caller ID Display	Should be available	B.O.O will check it By Programming two radio sets with same frequency but with different IDs. Make call from one radio and check display in receiver radio set, ID of caller radio should be displayed.
	Networking	IP based for features like automatic roaming.	The board of officers will carry out physical and functional check. The vendor to demonstrate the same with all features.
	Secrecy	Should provide inherent protection against casual eavesdropping	Board will Physically check.
6	Accessories		
	Microphone	DTMF Microphone	B.O.O. will check physically and practically that DTMF Microphone is supplied with radio and is working properly.
	Antenna	(i) 3dB gain whip antenna with 3 Mtrs. Co-axial cable with connector, magnetic base /mounting bracket for veh. use (ii) 6dB gain Omni Directional antenna with 30 meter RF cable for base station.	Physically check by connecting antenna with all its accessories with radio set and check serviceability whether antenna matched or not.





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TDS FOR DIGITAL UHF MOBILE TRANS RECEIVER


Sl No	Parameters	Specification	Trial Procedure
	Programming Kit	All necessary programming software and hardware required for the set	Practically check to assess that all necessary software and hardware required for programming are available and working properly.
	Literature	User manual with each radio sets ii) Technical repairing manual with complete block diagram, circuit layout etc at a scale of 10% of equipments being procured. iii) Firm should train teams of four operator and mechanics in handing, operating and repairing of radio receiver free of cost after procurement.	Physically check to confirm that User and Technical manual are available in Hard as well as in Soft Copy and also provide training for a team comprising of four operators for handling of sets. The same to be mentioned in the contract documents.


Rajender Kumar
(SI/Tele, ITBP)



Suresh Pal Singh
(Insp/T, BSF)

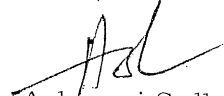

M.K. Singh
(AC -I, NSG)

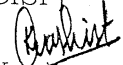

Sonu Sikarwar
(Asst. Comdt,
CISF)


Hem Prashp
(DY. Comdt.
CRPF)



S.K. Thakur
(Dy. Comdt, AR)

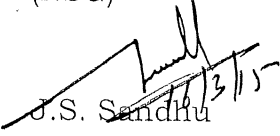

Major. Vikram Advant
(NSG)



Major Ashwani Sulhar
(NSG)


Kapil
(SSA(E), BPR&D)


Col. A.K. Sharma
(NSG)


Virendra Agrawal
DIG (Eqpt), CRPF


J.S. Sandhu
DIG (Comn), CRPF


Shaileendra Kumar
IG (Comn), CRPF

Approved/ Not Approved


(Prakash Mishra, IPS)

DG, CRPF

TDs FOR DIGITAL UHF 25W REPEATER

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Appendix "c"

Sl No	Parameters	Specification	Trial Procedure
1	General		Functional check: B.O.O will check operation of radio set by programming the lowest, highest and any random frequency in 403-470 MHz range with the help of measuring instruments.
	Frequency Range	403-470 MHz (in split band or full band)	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.
	No of channel	Two or more	
	Channel Spacing	12.5KHz or better	
	Frequency Stability	±1.0 PPM or better	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.
	Protocol	Digital TDM /FDM Technology	
	Type of Emission	Analog 11KOF3E Digital 4 FSK or equivalent Modulation complying to open standard/ non propriety. Digital protocol as defined by an international standards body like ETSI /FCC etc.	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	Type of Operation	Repeater Mode at 100% duty cycle	
Weight without External battery & Antenna	Less than 18 Kgs	B.O.O. will check Physically by measuring the weight using weighing machine.	
Power source	Integrated power source with (i) Operating supply voltage 230v AC ±10%,50Hz ±2% (ii) 12V/24V DC ±10%(negative ground) (iii) Automatic change over to battery in case of mains failure.	Apply 230 Volt AC ±15% and 13.8 Volt DC ±15% one by one and ensure that set is working properly or otherwise.	

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TDs FOR DIGITAL UHF 25W REPEATER

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Sl No	Parameters	Specification	Trial Procedure
2	Transmitter		
	RF power out put	25 watts or more at 100% duty cycle	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.
	FM Hum/Noise	12.5 KHz : 40dB or better	
	Frequency Deviation	±2.5 KHz in 12.5 KHz spacing	
	Modulation Sensitivity	2 to 10mV	
	Modulation Distortion	Less than 3% @ 1 KHz	
	Modulation Fidelity	±1,-3db of 6dB	
Audio distortion	Less than 3%@ 1KHz		
3	Receiver		
	Sensitivity	i)Analog: 0.30μV, +12dB SINAD or better ii)Digital: 0.30 μV 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.
	Selectivity (Adjacent channel)	60dB @12.5KHz or better	
	Inter Modulation	60dB or better as per ETSI stds or better	
Audio Response	+1,-3 dB of 6 dB		
4	Environmental Specification		
	Operating Temperature	-30° C to +60°C	Firm must produce certificate of any Government accredited Lab. or NABL or ILAC approved laboratory.
	Storage Temperature	-40° C to +70°C	
	Humidity	-90% at 50°C	

TDs FOR DIGITAL UHF 25W REPEATER

Sl No	Parameters	Specification	Trial Procedure
5	Features		
	Networking	IP based with capability to network up to 12 or more repeater stations to enable Wide area network of user Radio set operating in the network from one network to another without manual intervention	Vendor will demonstrate Networking and Interfaces related functions of repeater practically by connecting it in user organization network.
Interface	Ethernet port RJ 45 to provide following: (i) Wide area IP connectivity for voice and data up to 12 Nos repeaters. (ii) Remote monitoring and status check.		
6	Accessories		
	Carry case	Repeater carrying case with lock and key for easy portability. (To be outsourced if not available with the OEM)	Board will check carry case physically & Practically and will ensure that it is locked properly & is capable of carrying repeater.
	Antenna	6 dB gain Omni directional antenna with 30 meter flexible feeder cables with connector. Antennas should be supplied with clamping mast and supporting mast of 3M height	Board will check it practically by connecting antenna & accessories with repeater. During transmission there should be no mismatch between radio and antenna.
Literature	(i) Users manual with each repeater sets (ii) Technical repairing manual with complete block diagram, circuit layout etc at a scale of 50% of equipments being procured.	Board will check physically and will ensure that user manual & Technical manual are as per requirement.	

TDs FOR DIGITAL UHF 25W REPEATER

[Signature]
Rajender Kumar
(SI/Tele, ITBP)

[Signature]
Suresh Pal Singh
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[Signature]
M.K. Singh
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[Signature]
Sonu Sikarwar
(Asst. Comdt,
CISF)

[Signature]
Hem Pushp
(DY. Comdt. CRPF)

[Signature]
S.K. Thakur
(Dy. Comdt, AR)

[Signature]
Major. Vikram Advant
(NSG)

[Signature]
Major Ashwani Sulhar
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[Signature]
Kapil
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DIG (Comm), CRPF

[Signature]
Shailendra Kumar
IG (Comm), CRPF

Approved/ Not Approved



(Prakash Mishra, IPS)

DG, CRPF