

GOVERNMENT OF INDIA
(Ministry of Home Affairs)
Communication & IT Directorate
CENTRAL RESERVE POLICE FORCE
EAST BLOCK-7, SEC-1, R.K. PURAM, NEW DELHI-110066
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No. B.V-7-C/2024-25-C(VHF)-Q

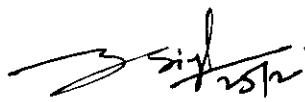
Dated, the 25 Feb'2025

Subject: - REQUEST FOR COMMENTS OF STAKEHOLDERS /OEM/FIRMS ON DRAFT QRS & TDS OF "DIGITAL HAND- HELD VHF TRANSCEIVERS, DIGITAL VHF BASE /MOBILE TRANSCEIVER SET AND DIGITAL VHF REPEATER SET."

1. The Draft QRs/TDs of "Digital hand-held VHF Transceivers, Digital VHF base/Mobile Transceiver set and Digital VHF Repeater set "" is attached as **Appendix 'A'**. The OEMs/Vendors are requested to forward information of the product, which they can offer and also forward correct specifications of their system against each parameter. Only complied or not complied remarks will not be accepted. The firms are also requested to furnish the following details:-
 - Whether you are OEM/Vendor?
 - If vendor details of OEM.
 - Authorization certificate from OEM.
2. The required information/details may please be forwarded at the following addresses by 12 March'2025.

Communication Directorate, CRPF
East Block-7, Sec-1, R.K. Puram, New Delhi-110066
Email: comncell@crpf.gov.in

3. An early response is requested.


{Ujjwal Kumar Singh, AC (QRs)}
For DIG (Equipment)
Communication & IT Branch
Directorate General, C R P F

Draft QRs/TDs of Digital Hand-Held VHF Radio Set

| S.N | Parameter | Specification | Trail directives |
|------------|--------------------------------|--|---|
| 1. | General | | |
| i. | Frequency range | 136-174 MHz | 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 instrument |
| ii. | No of channels | Minimum 255 | BOO will check practically |
| iii. | Channel spacing | 12.5 KHz or better in Analog & Digital mode | BOO will check practically |
| iv. | Frequency stability | ±1.5 ppm or better | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| v. | Protocol & Technology | Digital TDMA | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| vi. | Types of emission (modulation) | Analog: 11K0F3E Digital: 7K60FXE, 7K60FXD, 7K60FXW or equivalent technique complying to open standard/ nonproprietary Digital Protocol as defined by an international standards body like ETSI/FCC etc. | |
| vii. | Types of operation | Semi Duplex, push to talk (PTT) | BOO will check practically |
| viii. | Type of antenna | Rugged flexible helical antenna | BOO will check Physically |
| ix. | Weight | less than 400 grams with battery | BOO will check practically |
| x. | power source | Lithium –ion or Li-polymer battery pack of 2400 mAh or more with belt clip | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| xi. | Protection | Protection against high VSWR | BOO 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 |
| 2 | Transmitter | | |
| i. | RF Power output | 1/5 Watt (programmable/selectable) | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| ii. | FM Hum/Noise | -40dB 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: 0.25µV for 12 dB SINAD or better ii) Digital: 0.25µV at 5% BER or better | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| 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 | Less than 3% | |

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| | Distortion | | | | |
| 4 | Environmental Specifications | | | | |
| i. | Operating Temperature | -30°C to + 60 °C | | | Firm will submit certificate of Govt. Lab. |
| 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, Rain, Salt Fog, Vibration, Dust & Shock | MIL-STD-810 G or above | | | Firm will submit certificate of Govt. Lab. |
| | | Standard | Method | Procedure | |
| | | Low pressure | 500.5 | II | |
| | | High Temp | 501.5 | I/A1, II/A1 | |
| | | Low Temp | 502.5 | I/C3, II/C1 | |
| | | Temp Shock | 503.5 | I-C | |
| | | Rain | 506.5 | I, III | |
| | | Salt fog | 509.5 | - | |
| | | Dust | 510.5 | I, II | |
| | | Vibration | 514.6 | I/Cat24, II/Cat5 | |
| | Shock | 516.6 | I, VI | | |
| v. | Dust & Water Intrusion | IP67 or better | | | Firm will submit certificate of Govt. Lab. |
| 5 | Accessories | | | | |
| i. | Battery Charger | Single unit smart charger | | | BOO will check practically |
| ii. | Hands free kit (VOX unit with PTT) (Optional- as per user requirement) | The vendor should provide minimum of two variants for trials | | | BOO will check practically |
| iii. | Programming kit | All necessary latest programming software and hardware required for the set will be provided | | | BOO will check practically |
| iv. | Literature | i) User's 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 in soft as well as hard copy. | | | BOO will check practically |
| v. | Battery | Two extra Lithium-ion batteries with each Radio set or as per user requirement. | | | BOO will check practically |
| 6 | Configuration | | | | |
| i. | Caller ID display | Should be available | | | BOO will check practically |
| ii. | Facility for locking the channel or key pad locking | Should be available | | | BOO will check practically |
| iii. | Scan with priority | Should be available | | | BOO will check practically |
| iv. | Transmitter Time Out Timer (TOT) | The time should be programmed to best suit the application | | | BOO will check practically |

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| v. | LCD Display | Display: Should be available (Min Display size 1.8 inch) | BOO will check practically. |
| vi. | Mode of calls | Selective Call, Group Call, Inter and Intra Group call facility | BOO will check practically |
| vii. | Remote radio Kill/Stun/Revive facility with authentication. | Should be available | BOO will check practically |
| viii. | Mode of operation | Radio should operate in analog mode and digital mode (compatibility with existing all type of VHF analog & DMR radio sets) | BOO will check practically |
| ix. | Emergency Button | Allows a user to obtain help in critical situations. | BOO will check practically |
| x. | SMS Texting | Should be capable of sending minimum 45-character pre-defined messages & short messages from keypad | BOO will check practically. |
| xi. | Programming | Front panel programming with password protection or PC programming. | BOO will check practically |
| xii. | DTMF front panel key-pad with back lit | Should be available | BOO will check practically |
| xiii. | Battery strength bar | Should be available | BOO will check practically. |
| xiv. | Support GPS | Inbuilt GPS system with accuracy of less than 5 meters or better | BOO will check practically |
| xv. | GIS (As per user requirement) | Radio should have application protocol interface along with software applications to provide location and messaging on PC /Console. | |
| xvi. | Networking | Should be IP based for automatic roaming etc. | |
| xvii. | Vocoder | AMBE+2 or better | Firm will submit of Govt. Lab |
| xviii. | Communication security with user defined key management system (Optional) | System have in-built AEC 256 bit or better encryption system and should also have provision to support 3 rd party | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| xix. | OTAP (over the air programming) facility (Optional) | should be available | BOO will check practically and Firm will submit OEM certificate |
| xx. | Bluetooth (Optional) | 4.0 version or better | Firm will submit OEM certificate |
| xxi. | Noise cancellation | with or without external mic active noise cancellation | BOO will check practically |
| xxii. | EMI/EMC | ETSI EN 301 489-1 and ETSI 301 489-5 / TEC/SD/DD/EMC-221/05/OCT-16 or equivalent | Firm will submit certificate of Govt Lab. |
| 7 | Field Trial | The actual performance of the radio set will be assessed by BOO consisting CAPFs with expert Organization and evaluate the actual field | 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 |

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| | | performance of radio. | 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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Draft QRs/TDs OF DIGITAL VHF MOBILE/BASE TRANSRECEIVER SET (25 W)

| Sn | Parameters | Specification | Trial directives |
|-----------|-----------------------------------|--|---|
| 1. | General | | |
| | i) Frequency Range | 136-174 MHz (Full Band) | BOO will check operation of radio set by programming lowest, highest and any random frequency in 136-174 MHz range with the help of measuring instrument |
| | ii) No. of channel | 500 or higher | BOO will check practically |
| | iii) Channel Spacing | 12.5 KHz or better in Analog & Digital mode | BOO will check practically |
| | iv) Frequency Stability | ± 1.5 PPM or better | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | v) Protocol & Technology | Digital TDMA Technology | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | vi) Type of Emission (Modulation) | Analog: 11K0F3E Digital: 7K60FXE, 7K60FXD, 7K60FXW | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | vii) Type of Operation | Semi Duplex, press to talk (PTT) | BOO will check practically |
| | viii) Weight | Less than 2000 grams | BOO will check practically |
| | ix) Antenna Impedance | 50 Ω | BOO will check practically. |
| | x) Power Source | 12 Volt DC $\pm 15\%$ | BOO will check practically |
| | xi) Protection | (i) Reverse polarity protection (ii) Protection against high VSWR | i) BOO 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) BOO 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. |
| 2. | Transmitter | | |
| | i) R.F Power | 25 Watt Programmable | BOO will check practically and |

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| | output | /Selectable) | | | Firm will submit certificate of Govt. Lab. |
| | 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 | | | | |
| | i) Sensitivity | i) Analog: 0.25µV for 12 dB SINAD or better ii) Digital: 0.25µV at 5% BER or better | | | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | 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. | | | | | |
| | i) Operating Temperature | -30°C to + 60 °C | | | Firm will submit certificate of Govt. Lab. |
| | 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, Rain, Salt Fog, Vibration, Dust | As per MIL STD 810 G or better | | | Firm will submit certificate of Govt. Lab. |
| | | Standard | Method | Procedure | |
| | | Low pressure | 500.5 | II | |
| | | High Temp | 501.5 | I/A1, II/A1 | |
| | | Low Temp | 502.5 | I/C3, II/C1 | |
| | | Temp Shock | 503.5 | I-C | |

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| | & Shock | Rain | 506.5 | I, III | |
| | | Salt fog | 509.5 | - | |
| | | Dust | 510.5 | I, II | |
| | | Vibration | 514.6 | I/Cat24, II/Cat5 | |
| | | Shock | 516.6 | I, V,VI | |
| | v) Dust &Water Intrusion | IP 54 or better | | | Firm will submit certificate of Govt. Lab. |
| 5. | Accessories | | | | |
| | i) Microphone | DTMF Microphone should be supplied with Radio | | BOO will check practically. | |
| | ii) Battery cable & Mounting fixtures | Should be supplied with Radio | | BOO will check practically | |
| | iii) Antenna | i) 3dB gain whip antenna with 3 meters co-axial cable with connector, magnetic base/ mounting bracket for vehicle use will be provided. ii) 6dB or high gain Omni Directional antenna with 30-meter RF (LDF ¼" LDF ¼" attenuation 1.5 dB per 100 feet or better) Cable for base station will be provided. | | BOO will check practically. Firm will submit certificate of Govt. Lab. | |
| | iv) Programming kit | All necessary latest programming software and hardware required for the set will be provided | | BOO will check practically programming are available and working properly. | |
| | v) Literature | i) User's 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 in soft as well as hard copy. | | BOO will check practically | |
| 6 | Configuration | | | | |
| | i) Caller ID display | Should be available | | BOO will check practically | |
| | ii) Busy channel locks out | Should be available | | BOO will check practically | |

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| | iii) Scan with priority | Should be available | BOO will check practically |
| | iv) Transmitter Time Out Timer (TOT) | The time should be programmed to best suit the application. | BOO will check practically |
| | v) LCD Display | Display: Should be available | BOO will check practically |
| | vi) Mode of calls | Selective Call, Group Call, Inter and Intra Group call facility | BOO will check practically |
| | vii) Remote Radio Kill/Stun/Revive facility with authentication. | Should be available | BOO will check practically |
| | viii) Mode of operation | Radio should operate in Analog and Digital mode (compatible with existing all type of VHF Analog & DMR radio sets.) | BOO will check practically |
| | ix) Emergency Button | Allows a user to obtain help in critical situations. | BOO will check practically. |
| | x) SMS Texting | Should be capable of sending minimum 45 character pre-defined messages & short messages from keypad as Optional. | BOO will check practically |
| | xi) Programming | Front panel programming with password protection or PC programming. | BOO will check practically |
| | xii) Support GPS | GPS system with accuracy of less than 5 meters. | BOO will check practically. |
| | xiii) Networking | Should be IP based for automatic roaming etc. | |
| | xiv) GIS (As Per user requirement) | Radio should have application protocol interface along with software applications to provide location and messaging on PC /Console. | |
| | xv) Communication security user defined key management system (Optional) | System have in-built AEC 256 bit or better encryption system and should also have provision to support 3 rd party encryption | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | xvi) OTAP (over the air programming) | should be available | BOO will check practically |

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| | facility (Optional) | | |
| | xvii) EMI/EMC | ETSI EN 301 489-1 and ETSI 301 489-5 / TEC/SD/DD/EMC-221/05/OCT-16 or equivalent | Firm will submit certificate of Govt. Lab. |
| 7 | Field Trial | The actual performance of the radio set will be assessed by BOO consisting CAPFs with expert Organization and evaluate the actual field performance of radio | 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. |

Draft QRs/TDs OF DIGITAL VHF REPEATER SET

| Sl No | Parameters | Specification | Trial directives |
|--------------|-----------------------------------|--|---|
| 1. | General | | |
| | i) Frequency Range | 136-174 MHz (Full Band) | BOO will check operation of radio set by programming lowest, highest and any random frequency in 136-174 MHz range with the help of measuring instrument. |
| | ii) No. of channel | 16 or more | BOO will check practically |
| | iii) Channel Spacing | 12.5 KHz or better | BOO will check practically |
| | iv) Frequency Stability | ± 1.5 PPM or better | BOO will check practically and Firm will submit certificate of Govt. Lab |
| | v) Protocol & Technology | Digital TDMA | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | vi) Type of Emission (Modulation) | Analog: 11K0F3E Digital: 7K60FXE, 7K60FXD, 7K60FXW | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | vii) Weight | Less than 10 Kg | BOO will check practically |
| | viii) Power Source | i) DC: 12 Volt ± 15% ii) AC: 110V-260V 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 | BOO will check practically |
| | ix) Protection | (i) Reverse polarity protection (ii) Protection against high VSWR | BOO will check practically |
| | x) EMI/EMC | As per ETSI EN 301 489-1 and ETSI 301 489-5 / TEC/SD/DD/EMC-221/05/OCT-16 or equivalent | Firm will submit certificate of Govt. Lab. |
| | xi) Duplexer (Optional) | 136 to 174 MHz (Frequency as per user requirement) | BOO will check practically |

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| | xii) Mode of operation | Repeater should operate in Analog and digital mode and Compatible with existing all type of VHF digital and Analog radios in both plain and secure mode | BOO will check practically |
| | xiii) Antenna Impedance | 50Ω | BOO will check practically. |
| | xiv) duty cycle | Should be 100 % | OEM will submit certificate |
| 2. | Transmitter | | |
| | i) R.F Power output | 50 Watt or more (Programmable /Selectable) | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | 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: 0.25 μV for 12 dB SINAD or better ii) Digital: 0.25μV at 5% BER or better | BOO will check practically and Firm will submit certificate of Govt. Lab. |
| | ii) Selectivity (Adjacent channel) | 60 dB or better. | |
| | iii) Inter Modulation | 70 dB or better | |
| | vi) Audio Response | +1, -3 dB | |
| | v) Rated Audio Distortion | Less than 3% | |
| 4. | Environmental Specification | | |
| | i) Operating Temperature | -30°C to + 60 °C | Firm will submit certificate of Govt. Lab. |
| | 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 |

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| 6 | Interfaces | <p>Ethernet port RJ-45 to provide</p> <p>a) Wide area IP connectivity for voice and data</p> <p>b) Remote monitoring and status check</p> | organisation network. |
| 7. | Accessories | | |
| | i) Battery cable & Mounting fixtures | Should be supplied with Repeater | BOO will check it practically by connecting battery cable & mounting fixtures with repeater. |
| | ii) Antenna | 6dB or high gain Omni Directional antenna with 45-meter RF (LDF ¼" LDF ¼" attenuation 1.5dB per 100 feet or better) Cable for repeater base station will be provided | Firm will submit certificate of Govt. Lab.. |
| | iii) Programming kit | All necessary programming software and hardware required for the set will be provided. | BOO will check it practically that all necessary programming software and hardware are available as per user requirement. |
| | iv) Literature | <p>i) User's manual with each radio sets should be provided free of cost in soft as well as hard copy.</p> <p>ii) Technical repairing manual with complete block diagram, circuit layout etc should be provided in soft as well as hard copy.</p> | BOO 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 by BOO consisting CAPFs with expert Organization and evaluate the actual field performance of radio | 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 indenter discretion. |

