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No.IV.17017/48/2002-Prov.I
Ministry of Home Affairs
Prov.I

New Delhi, the 27 April 2004

To

The DGs: Assam Rifles, BSF, CISF, CRPF, ITBP, NSG, SSB, BPR&D

Sub. Finalization of QRs/Specifications surveillance Equipments.

Sir,

The Sub-Group constituted by MHA (Vide Memorandum No.IV.17017/18/2001-Prov.I dated 5/7/2002) for laying down QRs/ Specifications in respect of communication equipments for which at present there is no designated agency under DGS&D and DGQA of MOD, has finalised and submitted the QRs in respect for the following equipments:

- (a) ~~III Mobile/Static Repeater Radio sets~~
- (b) ~~III Hand Held Radio Set~~
- (c) ~~Satellite Phones~~
- (d) ~~Satellite Terminal~~

2. These QRs have been approved by MHA and are forwarded herewith as Appendix-A, B, C and D. Henceforth, all the CPMFs should procure the above items required by them to meet their operational needs strictly as per the laid down QRs/specifications.

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By. NO. _____
E. W&D _____
New Delhi _____
Dated 28/4/04

Yours faithfully

Alok
(Alok Mukhopadhyay)
Under Secretary (Prov)

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Dinendra Red
SEO (E)
SEO (W)

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QUALITATIVE REQUIREMENT : UHF MOBILE / STATIC/REPEATER R/SET

Following Qualitative Requirements (QR) for the UHF Mobile / Repeater Set have been framed:-

Essential Physical Characteristics

2. Radio set must be easy to maintain and must have common features as a building block. The transceiver should be in service without major modification for the next 8 (eight) yrs.
3. The Radio set should be able to communicate under, and in the following situations/ environments:
 - (a) Airport / Dense electronic environment.
 - (b) From inside an aircraft to outside with all the aircraft doors closed.
 - (c) Communication between moving vehicles at speeds up to 70 Kmph. from a mobile set.
 - (d) Communication between moving vehicle to base station when on the move.
 - (e) Static communication covering the complete National Capital Region with a Repeater stn if necessary installed at a suitable place within the NCR.
4. Front Panel Control. All the controls should be available on the front panel of mobile Radio set.
5. Alphanumeric Display. It should have an easy to read alphanumeric Liquid Crystal Display to provide the user with instant mode and radio status information. It should be backlit for night time use with control switch.

Essential Technical Characteristics

6. The common features are as under: -

(a) Frequency Range -400 Mhz to 450 Mhz. It should be synthesizer controlled.

(b) Channel Spacing -12.5/25 KHz

(c) Modulation -Frequency Modulated

(d) Microprocessor Controlled- The Radio sets should be microprocessor controlled, Software programmable and easy to update to the latest operating software release.

(e) Digital Series- The Radio sets should be Digital with an option to work in analogue mode. Modulation should be QPSK/BPSK.

(f) Sensitivity

(a) Analog Mode -0.25 micro volt at 12 db Signal to Noise ratio.

(ii) Digital Mode -0.25 micro volt at 5 percent BER 0.40 micro volt at 1 percent BER.

(g) Frequency stability -Plus 0.00025 percent (minus 20 to plus 60 degC).

(h) Receiver Selectivity

(i) Adjacent Channel -70 db or better

(ii) Inter modulation rejection -65 db or better

(iii) Spurious response rejection -65 db or better

- (i) BITE/Repair- Software programme be available to aid fault diagnosis .
 - (i) Dual Mode Operation- Should have digital and analogue modes.
 - (k) Advanced Scanning- It should be able to scan a list of modes such as non-priority operation, Talk Back Scan and Auto-scan priority user programme etc.
 - (l) Advanced Features- It should have advanced features such as Unit identification, Call alert, Emergency alarm, Radio check option of priority check scan etc.
7. Mobile/Static Station -The additional technical features for the Mobile / Radio sets are as under: -
- (a) RF power output-35/40 W with a choice of 2 to 3 level programmable from the front panel selector switch/toggle switch .
 - (b) Communication Range
 - (i) 25 -30 Km while static
 - (ii) 15 -20 Km while on move
 - (iii) 10 -15 Km in built up area
 - (c) Audio Output -It should have an inbuilt speaker with audio output (approx) with volume control features.
 - (d) DTMF Dialling /Telephone Interconnect -Should have features provide access to either a private or public telephone network.
 - (e) Power source
 - (i) The Radio set fitted in the vehicle should be able to work with the vehicle Bty.

- (ii) The Radio in static role should be able to work on 12 Volts Secondary Battery or must be able to operate on commercial mains viz 220V 50 Hz with a proper AC/DC adapter for switching in the event of commercial failure. The Radio set should have reverse polarity protection.
- (f) **Microphone**. It should have hand held /fixed microphone with PTT switch on it.
- (g) **Vehicle Kit** -Suitable kit to fit the Radio set on any vehicle is necessary .
- (h) **Antenna** -All Radio sets to be provided with high gain antennas. For vehicular use Magnetic bases for the antennas should also be provided. The same antenna must be capable of being used in the static/ground stn mode also. The antenna provided for static use must be fitted with proper, highly flexible and compatible coaxial feeders of at least 30 mtrs length.
- (i) **Low Current Consumption** -Be as less as possible to avoid drainage of the vehicular bty.
- (j) **Low Battery Indication** -Low Bty indication is a must.
- (k) **Trans Indicator** -Should have a visual indication in transmit-mode
- (l) **Weight** - Not more than 3 Kg.
- (m) **Multiple modes of operation**- Should be able to operate in both digital and analogue modes.
- (n) **Compatibility** -Compatible with handheld Radio sets in UHF Range.
- (o) **Data Transmission** -Should be able to transmit data at a min speed of 9.6 Kbps and 19.5 Kbps desirable.

- (p) **Programmable Switch/Button**- Should be available on front panel which should help in setting various modes of operation and facilities.
- (q) **Mobile/Man pack**- It is desirable that it must be possible to carry a limited number of Radio sets in mobile/ Man pack roll with proper carrying harness and suitable power source with transmit power output between 5 to 10 W (desirable).
- (r) **Battery Charger** -Suitable bty chargers must be provided to charge the 12 Volts Secondary btys of given capacity.
8. **Repeater Station** - The additional features for the UHF Repeater Stn are given below:-
- (a) **RF Output** -35W or more Higher output is desirable .
- (b) **Channels** -Should have 32 channels that can be programmed in field .
- (c) **Antenna** -A high gain antenna of 6 to 8 db gain. A single antenna using duplexer will be preferable.
- (d) **Role**- Repeater Must be capable of being used in a mobile as well as static role. Should be capable of being mounted on a Gypsy / Teep/any other light weight veh.
- (e) **Power Source** -Should work on a DC power supply of 12V/24V, 120 AHC/110 AHC secondary bty / Ni-Cd / Ni-Metal Hydride / Lithium / state of the art rechargeable btys .
- (f) **Audio Output** -4 to 5 watt .
- (g) **Frequencies** -Duplex frequencies in the range of 400 Mhz to 450 Mhz
- (h) Should be able to establish Communication at the airport in the presence of highly active Radars and other electronic gadgets .

- (i) Digital/ Analog -should have option to work in both digital and Analog modes.
9. Accessories -All radio sets must be supplied with all the essential accessories to make it a complete unit
- (a) Whip Antenna with magnetic base for Digital/Analog/Mobile/Static Radio Set at the scale of 1 per R/Set.
- (b) High Gain 3 db Omni-Directional Antenna with half inch LDF cable of 30 mtr length alongwith Quarter inch Super Flex Jumper cable at the scale of 1 between two mobile R/Set.
- (c) AC/DC power supply unit for Digital/Analog/Mobile Static Radio Set at the scale of one between two R/Set.
10. Spares -The firm offering the radio sets should be able to supply the spares for the assessed life of 8 years .
11. Training -The firm Should train a team of 4x Mechanics in repairing of the radio sets free of cost. The firm should also include in its proposal to supply any accessory / special kit or test equipment required for repair of sets.
12. Literature -The following literature / manual will be supplied along with radio sets:-
- (a) User manual with each radio sets
- (b) Technical repairing manual at a scale of 5% of the population of radio sets procured .

13. Radio Programming -The firm shall include in their proposal all necessary Radio set programming software and hardware packages that may be required for the proposed Radio system.
14. Attachment for data transmission- The firm shall include in their proposal if any attachment / software / hardware packages that may required for transmission of data.
15. Trial of Radio System -The firm shall provide adequate qty of Radio Sets and Repeaters stns for field trials at no cost and no commitment basis, to ascertain the user satisfaction before the proposal is accepted.
16. After Sales Services -The firm should mention the warranty period/AMC ,system of repairs and after sales service.