No.IV-17017/48/02-Prov.I
Ministry of Home Affairs
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New Delhi. The

To

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

Subject: **Finalization of QRs/Specifications Surveillance Equipments.**

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

1. 1KW HF SSB TX/RX Radio Set

These QRs have been approved by MHA and are forwarded herewith. 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.

No. 1266
Date: 9.12.02

Yours faithfully,

(R.C. Gupta)
Under Secretary(Prov.I)

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Appendix "A"

QUALITATIVE REQUIREMENT: 1 KW HF SSB TX/RX RADIO SET

Following Qualitative Requirements (QR)/Specifications have been framed for 1 KW HF SSB Tx/Rx Radio set.

Essential Physical Characteristics

2. Radio set must be easy to maintain. The transreceiver should be in service without major modification for the next 8 (eight) years.

3. **Front Panel Control :** All the controls should be available on the front panel of Radio set.

4. **Essential Technical Characteristics:** The features of 1 KW SSB TX/RX must be as under.

(i) **Frequency Range :** 2 Mhz to 21 Mhz or higher.

(ii) **Channel Spacing :** 100 HZ.

(iii) **Mode of Operation :** SSB (LSB or USB)
AM (Compatible) CW/MCW.

(iv) **Frequency control :** Synthesiser

(v) **Frequency Stability :** ± 1 PPM

(vi) **Roles :** Static

(vii) **Antenna Impendence :** 50 Ohms (Nominal)

(viii) **Protection :** Reverse polarity protection should be provided.

(ix) **Power Supply :** Mains operated 220V, 50 Hz ±10% AC or Genr power supply.

(x) **Speaker/Headphone Impendence :** To be specified by the firm.

(xi) **Accessories :** All essential accessories such as Antenna ATU, Power Supply, RF Cable and connectors are to be quoted to make one complete system.

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(xii) **Cooling** : Air cooling fan must be provided in the set.

(xiii) **Wt** : Wt not more than 60 Kgs excluding all accessories.

(xiv) **Display unit**: LCD Display with a backlit key pad.

(xv) **Power Output**: Capable of being operated at different power levels upto 1 KW

(xvi) **ALE** : Automatic link Establishment(ALE) for reliable skywave communication.

(xvii) **DTE** : Should be able to operate with DTE at 4.8 kbps.

(xviii) **Data Interface**: RS 232 interface.

(xix) **Remote Operation**: provision for operating transmitter from remote.

(xx) **BITE** : Built in Test equipment facility to be available.

(b) **TRANSMITTER**

(i) **RF Power Output**: 1 KW ± 0.5 dB Measured at CW.

(ii) **Spurious Suppression**: Better than 40 dB

(iii) **Harmonics Suppression**: Better than 40 dB below single tone.

(iv) **Suppression of carrier & unwanted side band** (a) 40dB min.for 15 W (b) 50dB min.for 100 W

(v) **Audio Response**: Within 6dB from 300 Hz to 3000 Hz.

(vi) **Inter Mudulation distortion**: Better than 25 dB.

(vii) **Keying Speed**: 25 WPM by Morse key.

(viii) **Side Tone Level**: Better than 0.1 mW into 150 Ohms load for 5 mV audio input at 1 KHz.

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(c) **RECEIVER**

(i) **Sensitivity**

(aa) CW : 0.5 µV for 10 dB SINAD at 1 KHz

(ab) SSB : 0.5 µV for 10 dB SINAD at 1 KHz

(ac) A M (Compatible) : 3 µV,50% modulated at 1 KHz for 10 dB SINAD.

(ii) **Selectivity**

(aa) CW : -6 dB better than 300 Hz.
-60 dB less than 2.5 KHz.

(ab) SSB : for -6 dB better than 2.7 KHz.
For -60 dB less than 4.8 KHz.

(iii) Inter Modulation distortion: Better than 30 dB.

(iv) Image Rejection : Better than 60 dB

(v) IF Rejection : Better than 60 dB

(vi) AGC : Audio power output variation less than -6 dB for 100 dB level variation in the input RF signal.

(vii) Audio Response : Within ± 6dB from 300 Hz to 3000 Hz with 1 KHz as reference.

(viii) Audio Output : 1 W across loudspeaker. Should be greater than 5 mW across 150 Ohm head phone.

(ix) Audio Distortion : Less than 5% at 1 KHz. for CW/SSB/AM at specified AF output.

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(d) **POWER SUPPLY**

12 V 10 / 30 Amp. (SMPS/LINEAR) Power Supply Unit should have following Technical Specifications.

(i) Input variation 190 V to 270 V AC.

(ii) Variation in output voltage should be 11 V to 14 V for input variation of 190 V to 270 V AC.

(iii) Continuous Operation.

(iv) Automatic change over to battery in case main power supply failure alongwith float charging capabilities.

(v) Reverse polarity protection should be provided.

(vi) Efficiency should be 45% and above.

(e) **ENVIRONMENT**

(i) Operating Temp. Range: -20deg.C to +55deg.C

(ii) Storage Temp. Range : -40deg.C to +70deg.C

(iii) Relative Humidity : 95% Max.at +40 deg.C non-condensing.

(f) Compatibility with existing NSG Voice/Data encryption devices to be mentioned at the tendering stage.

(g) **OPTIONAL FEATURES/ACCESSORIES FOR THE RADIO SET.**

(i) Modem for FAX integration.

(ii) Telephone network interface for integrated radio/wire operation.

(iii) Provision for connectivity with IP(Internet protocol) based devices network.

(iv) ECM protection against jamming by use of frequency hopping.

(v) Simultaneous operation with co located receivers and transmitters.

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