



ANNEX A

STATEMENT OF REQUIREMENT

VHF/UHF AM/FM HANDHELD RADIOS

AND

ANCILLARY EQUIPMENT

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1 GENERAL

This document is the Statement of Requirement (SOR) for a Standing Offer (SO) being put forward by the Department of National Defence (DND) for Very High Frequency (VHF) and Ultra High Frequency (UHF) Amplitude Modulation (AM) Frequency Modulation (FM) handheld radio systems to be used for command and control of air and ground assets.

1.1 Scope

The Offeror must satisfy the DND requirements for the supply of VHF/UHF AM/FM handheld transceiver capable of operating in the 30 – 512 MHz band.

1.2 General Description

The primary purpose of this requirement is to provide DND with a handheld transceiver that will provide line-of-sight two-way voice and data communications between personnel on the ground and aircraft, vehicles, fixed sites and other personnel equipped with VHF/UHF AM/FM 30 – 512 MHz radio equipment. P25 protocol is not a requirement of this RFSO but if provided, it will be accepted.

1.3 ITAR/CTAT

For all items listed under this SO, the Offeror must provide in its Offer a list that includes items pertaining to ITAR/CTAT with their applicable codes. Where the code refers to either a Hazardous Material or special disposal requirements, the Offeror must identify both the hazardous material and the disposal code in its offer.

1.4 Hazardous Material

All hazardous material must be clearly marked in all technical publications and bulletins by hazardous material and part number. Disposal instructions must be provided as an Annex to either the technical publication or the bulletin.

1.5 Discontinuation of Production

The Offeror must identify, to the Technical Authority (TA) and Standing Offer Authority, any item that is scheduled for discontinuation, throughout the life of the SO. Within one month of a decision to discontinue an item, the Offeror must identify to the TA, new components that are form, fit and functional replacements. This would allow the TA to procure extra units prior to production termination. The technical data, of the replacement items, must be forwarded to the TA for verification of acceptability.

2 REQUIREMENTS

2.1 Transceiver Package Requirements

The Offeror must deliver radio package/s on “as and when requested” basis. Each radio package must consist of:

<u>Item</u>	<u>Quantity</u>	<u>Description</u>
1	1	VHF/UHF AM/FM Handheld Transceiver;
2	1	Rechargeable Battery;
3	1	Antenna;
4	1	Carrying Case with belt clip or loop; and
5	1	Operating manual (English and/or French in electronic format.)

2.2 Ancillary Equipment Requirements

The Offeror must provide the following Ancillary equipment on “as and when requested” basis. These items may be purchased individually as supplemental ancillary equipment, as needed.

Item	Description	Specification
1	Battery Charger	Single Port
2	Battery Charger	Multi-Port
3	Microphone Set	Lapel Microphone
4	Microphone Set	Speaker Microphone
5	Microphone Set	Headset Microphone
6	Spare Batteries	Identical to battery that comes with the radio kit.
7	Radio	Transceiver only
8	Programming Kit	Containing software, cables, and all other accessories needed to make the kit complete and provide tools to fully program a transceiver with software.
9	Programming Software	For programming and control of the transceiver or other major components. Must be compatible with Microsoft Windows 7.

10	Carrying Case	Identical to accommodate radio unit issued with offered package.
11	Antenna	Identical to antenna issued with offered package.
12	Standard Cable	As per the radio design requirements.
13	Standard Connector	As per the radio design requirements.

2.3 Non-Essential Ancillary Equipment Requirements

With its offer, the Offeror must submit price and availability for the equipment shown in the below table. These items may be incorporated in the standing offer by the Standing Offer Authority.

Item	Description	Specification
1	Spare Batteries	Alternative sized and/or high power batteries
2	Carrying Case	All applicable varieties
3	Antennas	Omni -band or band specific
4	Special Tools	Identify and provide information with regards to any special tools that will be required for maintenance of the equipment as applicable.
5	Operational Waveforms	Should be capable of utilizing operational waveforms.
6	Encryption	Must have the ability to operate in encrypted mode using AES 256 built in. It must not be a CCI (Controlled Crypto Device). Software loaded.
7	Spare Parts Kit	Manufacturer's Recommended Spare Parts Kit for Field Level Repairs.

3 INFORMATION AND PUBLICATIONS

3.1 Technical Bulletins

The Offeror must provide Technical bulletins relating to modifications, repairs and operation of the equipment to the TA throughout the life of the SO. Bulletins are to be forwarded to the TA in MS-Word or PDF format and should be within 3 months of bulletin release.

3.2 Maintenance Manuals

The Offeror must provide Maintenance Manuals for all major equipment, such as transceivers, power supply and vehicle adapters. The manuals must provide as a minimum the following;

- a) Operation and Testing Detail: This manual must contain all applicable cautions and warnings, theory of operation and maintenance instruction, both preventative and corrective. It must be an all-inclusive and detailed concept of operation, testing and repair procedures.
- b) Block Diagram: An all-inclusive and detailed Block Diagram of the equipment, together with an accurate technical description, including that of any varying configurations with the appropriate connections must be included.
- c) Schematics: An all-inclusive Schematic Diagram of the equipment with all of the components and test points clearly indicated must be included.
- d) Sketches: Sketches or photographs showing the general configuration, dimensions, weight and layout must be included.
- e) Parts List: An all-inclusive Parts List, including electrical or mechanical description of each part, OEM part numbers, circuit references and associated costs must be included.
- f) Media: The manuals are to be in English or French and can be in either MS-Word 2003 or compatible or Adobe portable documents format (PDF) files.

4 EXTENDED WARRANTY

The Offeror must provide extended warranty. All extended warranty periods must contain the same conditions as the initial manufacturer's warranty. Offerors must provide warranty for 5 and 10 year periods. The extended warranty must be available for purchase at the time of equipment purchase, or any time after initial purchase until the expiry of the manufacturer's warranty.

5 GLOSSARY

AES 256 Advanced Encryption Standard 256 bit

AGA	Air Ground Air
AM	Amplitude Modulation
C	Celsius
CCI	Controlled Crypto Device
CTAT	Canadian Technology Access and Transfer
db	Decibel
DC	Direct Current
DES Proc	Directorate of Electronics Procurement
DND	Department of National Defence
FM	Frequency Modulation
ITAR	International Traffic in Arms Regulations
ISED	Innovation, Science and Economic Development Canada
JSCSS	Joint Strategic Communications Support Services
kHz	Kilohertz
MHz	Megahertz
OEM	Original Equipment Manufacturer
PC	Personal Computer
PDF	Portable Document Format
PPM	Parts Per Million
RF	Radio Frequency
SINAD	Signal-to-noise and distortion ratio
SOA	Standing Offer Authority
SOR	Statement of Requirements
TA	Technical Authority
UHF	Ultra High Frequency
VHF	Very High Frequency



ANNEX B

TECHNICAL SPECIFICATIONS

VHF/UHF AM/FM HANDHELD RADIOS

AND

ANCILLARY EQUIPMENT

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1 General

Department of National Defence (DND) has a requirement for Handheld Very High Frequency (VHF) and Ultra High Frequency (UHF) Amplitude Modulation (AM) Frequency Modulation (FM) radios. This document will define DND's technical and physical requirements.

1.1 Scope

This Statement of Technical Specification identifies the performance and construction specifications of the Handheld VHF/UHF AM/FM Radios required by DND. The primary use of these radios will be Air to Ground and Ground communications in both VHF and UHF bands.

2 Mechanical Requirements

2.1 Transceiver Package

The transceiver package is listed at Annex A para 2.1.

2.2 Mounting and Configuration

- 2.2.1 The transceiver must come complete with a mounting harness/carrying case that is either strapped or buckled to a belt or webbing.
- 2.2.2 This equipment must be in low visibility non-reflective colours such as black or green.

2.3 Chassis Construction

The complete transceiver and power supply must be contained within an enclosed and hardened case that is ruggedly constructed so as to withstand shock and vibration (ref para 2.7 listed below).

2.4 Panel Arrangement

The following indicators, controls and switches, must be provided as a minimum on the transceiver:

- a) On/Off Power Switch;
- b) Volume Control;
- c) Transmit Indicator;
- d) Squelch Control;
- e) Channel Selector;
- f) Low battery Indicator;
- g) Backlit Keypad;
- h) Display Screen;

- i) Antenna Connector;
- j) PC Connector; and
- k) Push-To-Talk Switch.

2.5 Environmental Conditions

The transceiver and attachments must be capable of withstanding the following conditions;

- a) Temperature: Operating -30° to 60° C
Storage -20° to 60° C
- b) Humidity: 90%
- c) Altitude: 30,000 feet
- d) Immersion: 2 meters of water

2.6 Environmental Factors

All switches, knobs and keypads must be capable of being operated during extreme cold weather where the operator could be wearing heavy gloves.

2.7 Environmental Specifications

The Transceiver must adhere to EIA-603-1992 or MIL-STD-810G or MIL-STD-810F (Annex B, Section 4 – References).

3 Technical Requirements

3.1 Radio Characteristics

The Transceiver must be capable of operating in the VHF Civilian and UHF Military Bands. The Offeror must provide Proof of Compliance to substantiate that they meet these requirements.

Table I – Radio Requirements

Item	Description	Specification
1	Band	Selectable Range: 30 to 512 MHz
2	Mode	AM and FM
3	Channels	Minimum of 25 programmable pre-set channels
4	Transmit Power	Output must be adjustable between 0.1 and 5.0 watts
5	Transmit Audio Distortion	Must be < 12%

6	Receive Sensitivity	-116 dBm 12 dB SINAD or better
7	Frequency Stability	Must be $> \pm 5$ PPM
8	Adjacent Channel Rejection	Must be ≥ 45 dB at ± 25 kHz at minimum
9	Receive Audio Distortion	Must be $< 12\%$ at rated audio power
10	Battery Indication	Must have an indication of battery charge level
11	Power Source	Must be powered by rechargeable battery Duty cycle must last a minimum of 8 hours based on 5/5/90 (transmit/receive/standby) usage
12	Connectors	Must be immersion sealed, connectors must be capable of being submersed in up to 2 meters of water.

3.2 Radio Support

The Transceiver must be software driven with the flexibility to not only be capable of clear voice communications but also be adaptable to alternate modes through encryption or operational software. The Offeror must provide Proof of Compliance (OEM literature, brochure...etc.) to substantiate that they meet the requirements.

Table II – Radio Administration

Item	Description	Specification
1	Software	All software used for programming/control must be identified in the technical offer.
2	Software Installed	Radios must come equipped with all the required software
3	Software Compatibility	All software supplied must be compatible with Microsoft Windows 7.
4	Reliability	Must have a proven Mean Time Between Failures of a minimum of 25,000 hours. Mean Time to Repair, for Level 1 corrective maintenance must be less than 10 minutes.

3.3 Ancillary Equipment

Please refer to Section 2.2 of Annex A – Statement of Work for a full description of the Ancillary equipment.

3.4 Non-Essential Ancillary Equipment

The offered Non-essential ancillary equipment must be compatible with the offered radios.

Please refer to Section 2.3 of Annex A – Statement of Requirement for the list of Non-Essential Ancillary Equipment.

4 References

- a) Electronic Industries Alliance - <https://www.ihs.com/products/eia-standards.html>
- b) United States Military Standard MIL-STD-810G or MIL-STD-810F (Environmental Engineering Considerations and Laboratory Tests)

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Annex C - Basis of Payment

UHF & VHF Handheld Radios

Transceiver Package and Ancillary Equipment Requirement

Item No.	Description	Unit of issue	SOR Reference	Year-1 Price			Year-2 Price			Year-3 Price			Option Period-1 Price	Option Period-2 Price
				Offered Price for Qty. 1 to 9	Offered Price for Qty. 10 to 25	Offered Price for Qty. 26 and up	Offered Price for Qty. 1 to 9	Offered Price for Qty. 10 to 25	Offered Price for Qty. 26 and up	Offered Price for Qty. 1 to 9	Offered Price for Qty. 10 to 25	Offered Prices for Qty. 26 and up		
1	General Equipment													
1.1	Transceiver Package	Kit	Annex A										TBD	TBD
2	Warranty													
2.1	Extended Warranty for 5 years	Each	Annex A										TBD	TBD
2.2	Extended Warranty for 10 years	Each	Annex A										TBD	TBD
3	Ancillary Equipment													
3.1	Single Port Battery Charger	Each	Annex A										TBD	TBD
3.2	Multi-Port Battery Charger	Each	Annex A										TBD	TBD
3.3	Lapel Microphone	Each	Annex A										TBD	TBD
3.4	Speaker Microphone	Each	Annex A										TBD	TBD
3.5	Headset Microphone	Each	Annex A										TBD	TBD
3.6	Spare Battery	Each	Annex A										TBD	TBD
3.7	Radio	Each	Annex A										TBD	TBD
3.8	Programming Kit	Each	Annex A										TBD	TBD
3.9	Programming Software	Each	Annex A										TBD	TBD
3.10	Carrying Case	Each	Annex A										TBD	TBD
3.11	Antenna	Each	Annex A										TBD	TBD
3.12	Standard Cable	Each	Annex A										TBD	TBD
3.13	Standard Connector	Each	Annex A										TBD	TBD
Total of Year 1, 2 and 3 Prices Excluding Option Years														
Total Offer Price (Aggregated total of all offered unit and kit prices for all items)														

*Should any Offeror wish to supply an item at no charge, they must indicate this by inserting "N/C" (no charge) in the appropriate cell.

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Annex C - Basis of Payment

UHF & VHF Handheld Radios

Non-Essential Ancillary Equipment

Prices from the Non-Essential Ancillary Equipment will not form part of the Financial Evaluation

Item No.	Description	Unit of issue	SOR Reference	Year-1 Price			Year-2 Price			Year-3 Price			Option Period-1 Price	Option Period-2 Price
				Offered Price for Qty. 1 to 9	Offered Price for Qty. 10 to 25	Offered Price for Qty. 26 and up	Offered Price for Qty. 1 to 9	Offered Price for Qty. 10 to 25	Offered Price for Qty. 26 and up	Offered Price for Qty. 1 to 9	Offered Price for Qty. 10 to 25	Offered Prices for Qty. 26 and up		
1	Non-Essential Ancillary Equipment													
1.1	Spare Batteries	Each	Annex A										TBD	TBD
1.2	Carrying Case	Each	Annex A										TBD	TBD
1.3	Antennas	Each	Annex A										TBD	TBD
1.4	Special Tools	Each	Annex A										TBD	TBD
1.5	Operational Waveforms	Each	Annex A										TBD	TBD
1.6	Encryption	Each	Annex A										TBD	TBD
1.7	Spare Parts Kit	Kit	Annex A										TBD	TBD

*Should any Offeror wish to supply an item at no charge, they must indicate this by inserting "N/C" (no charge) in the appropriate cell.