APPENDIX 01 OF ANNEX 'D' TO
TENDER NO- 06.06.0000.275.07.209.25
DATED: 02 DECEMBER 2025

TECHNICAL SPECIFICATION OF VHF/UHF AIRBAND SIGNAL MONITORING SCANNER (EB500) INCLUDING DIRECTION FINDER, RECORDER AND ANALYZER ALONG WITH ALL ACCESSORIES

TECHNICAL SPECIFICATION		
S/N	**Specifications**	
1	Technical specification for procurement and of VHF/UHF air band signal monitors scanner, recorder and analyzer along with accessories qty-01 Ea for BAF.	
a	General Features	
	1	Name of the System/Equipment: VHF/UHF as band signal monitoring system comprising of (a) Direction Finder with Antenna (b) Recorder (c) Analyzer (d) Signal Tracker (e) Visual display system (f) System software
	2	Name of Address of the Manufacturer: Rohde & Schwarz GmbH & Co KG Muehldorfstr. 15 81671 Muenchen Germany
	3	Make and Model: Rohde & Schwarz Direction Finder DDF205 with DF antenna ADD295
	4	Country of Origin: Germany
	5	Country of Manufacturer/ Assembly for Major Equipment: Germany
	6	Shipment: From Country of Origin/Manufacturer/Assembly: Germany
	7	Year of Production: Not earlier than one year from the signing of the purchase order: Equipment is manufactured on a build-to-order basis.
b	Capability of the system: The system is to be installed by the supplier at BAF specified place as a "Turn Key" basis with the following capabilities: (1) Scanning and monitoring of multiple VHF/UHF air band signals. (2) Decoding of the receipt signal. (3) Recording of multiple receptions. (4) Locating the co-ordinate of emitter. (5) Tracking of the emitter. (6) Target base track report generation on time line. (7) Offline and online analyzing to the receipt signals. (8) Report generation. (10) Visual Monitoring system.	
c	System Characteristics: (1) Name of the system/sub system along with model number: Rohde & Schwarz DDF205, ADD295, CA100 and RAMON Control software (2) General Characteristics of the System/ Subsystem: (a) Interception, direction finding, displaying, monitoring, recording and analyzing. (b) Capability of classification, demodulation, decoding of frequency spectrum and output in terms of audio, graphical and other acceptable formats. (c) The system shall have automatic signal processing including content recovery capability to be mentioned. (d) The system shall have ability of target transmitters direction and location in terms of latitude, longitude, grid reference, bearing after inclusion of 01x DF (DDF205 and DF antenna ADD295) in future (e) The system shall gave recording capacity of audio / voice input of all types of signal within range.	

(f) The system shall have the capability of automatic interception and monitoring of, VHF and UHF signals covering a comprehensive array of modulation types and transmission system.

(g) The system shall have the ability of online and offline analysis of available spectrum in the library. The system shall have the capability of decoding wide range of transmission systems, including voice, text, fax, telemetry, signaling and date.

(h) The system shall have the capability of classifier and extensive signal processing library for demodulation, decryption and decoding.

(i) The system shall have the capability to analysis algorithms (decoders & demodulators) and extended bit stream analysis /manipulation function (CA250) to provide readable audio /test output.

(j) The system shall be of open interface for independent extension of signal processing capabilities (User defined decoder) by the user.

(k) The system shall have the function as monitoring and DF station with Command & Control (C2) and signal analysis station.

(l) The system shall meet the requirement for minimum number of crews /operators at each station.

(m) The system shall have built in test (BIT) and calibration facilities.

d

Technical Parameters/specification:

(1) Technical Features:

(a) Monitoring and DF Features:

(b) Frequency range: 20 MHz to 3 GHz

(c) Frequency accuracy: ≤ 1 × 10–6

(d) Receiver Sensitivity: -130 dBm or better.

(e) Real time Bandwidth: 20 MHz

(f) Demodulation bandwidth: 100/150/300/600 Hz,
1/1.5/2.1/2.4/2.7/3.1/4/4.8/6/9/12/15/30/50/
120/150/250/300/500/800 kHz,
1/1.25/1.5/2/5/8/10/12.5/15/20 MHz

(g) Demodulating techniques: AM, FM, φM, pulse, I/Q, LSB, USB, CW & ISB

(h) VSWR: Antenna Input ≤ 2

(i) Input Impedance: N female, 50 Ω

(j) SNR. Not applicable without signal

(2) Analysis Software

(a) General Features: CA100

(b) Signal Interception: The system must be able to carry out the following.
(i) Process signals from different sources.
(ii) Process a signal for visual presentation and audio output.
(iii) Digital recording and replay for further use of received signals.
(iv) Manual signal measurement for complex signal scenarios.

(c) Automatic Classification and Processing: The system must be able to
(i) Carry out automatic wideband monitoring and classification of signal.
(ii) Have user-specific expansion of classification capabilities
(iii) Have automatic/manual signal processing with user-defined rules via script editor.

(d) Library /Database. The system must.
(i) Contain a comprehensive database, which automatically detects, demodulates, decrypt and decodes any signal.
(ii) Show alarm on the previously recorded signal if it appears again.
(iii) Fast recognition of signals using spectral matching.
(iv) Enhancement of detect, search and classify work flows using detection list filtering.
(v) Spectral collector and spectral detector should be available.

(e) User Specific Expansion. The system should have open programming interface for integration of user specific modules. More so it has to be capable of integration with a wide variety of user- programmed modules such as universal demodulation decryption, decoding, transmission system, classification etc. Open Interface for DDF205 and CA100

(f) Simultaneous Processing and Analysis of Multiple Signals. The system should provide manual/automatic parallel processing of multiple signals, even by several users.

(g) Simultaneous Recording of Multiple Signals. The system should be able to record multiple signals simultaneously

(h) Hardware Architecture. Hardware must have modular design with the provision of expansion of resource.

(j) Scan Characteristics.

(i) Memory Scan. 10,000 programmable memory locations, up to 500 channels/s

(ii) Frequency Scan. User-selectable start/stop frequency and step width, up to 500 channels/s

(3) Common Features of the System.

(a) Graphical User interface (GUI). GUI should be available with the system.

(b) Map integration. Open Street Map is to be provided by the supplier

(i) Integrated display of high resolution street maps in various zoom levels to visualize the radio location.

(ii) System software shall integrate digital topological base map of Bangladesh (and surrounding), UTM map (BUTM 2010), online open street map, Google map etc in the user interface.

(iii) Map data should be stored on device/workstations internal memory of the system.

(iv) On line and off line map view should be available.

(v) Location of all emitter within the range should be shows on map after integration with second DF

(c) Control Software. The supplied RAMON software (provided with equipment) have the following features:

(i) Software shall provide various function like Measurement, Calibration, Sweep Functions. Trace Functions, Marker Function, pan Display Function, Monitor receiver functions. Signal analysis function, Task and result management functions Band scan, Channel scan, features etc.

The system shall include the propagation calculation tools/function to calculate the radio coverage in order to plan the deployment of stations.

(iii) It shall include mission planning tools/software for the siting of various stations on the control software map display before moving to the ground.

(iv) Enhanced Map Display functions.

(v)Task and result management (Manual and automatic)

(vi) System health monitoring function.

(vii) Powerful User Management is to be provided for the definition of user roles and access rights.

(viii) Automatic Radio Network Recognition is to be provided including functions for further evaluation.

(ix) Internal recording for different measurements.

(x) Must be compatible to use with Laptop devices/workstation.

(d) Data Transfer/Storage Capacity.

(i) Extended storage capabilities and offline analysis of DF and radiolocation results.

(ii) Large number of Internal storage capacity.

(iii) It shall transfer data using flash drive/external Hard Disk Drive /removable disk etc.

	(iv) Two Ethernet connectivity to be provided to transfer measured date from C2 Analyzing equipment to the workstation. (v) The microwave system should support min 1 Mbps dedicated data transfer between all stations (Monitoring and DP and Analyzing station) (vi) VHF radio must be capable to be used as backup communication means with required data rate to allow interconnectivity. (vii) Rugged Laptop/workstation to be integrated with the system. (e) Determination of Own Location (GPS and Compass). (i) Built-in Electronic GPS to find Lat-Long of own position precisely. It also integrates user grid identification (UTM format) system. (ii) GPS and electronic compass installed with the system (f) Inter System Communication. (i) All the stations (DF, C2 analysis and Jamming Station) are under same network arrangement. (ii) The system has the provision of redundant communication network to provide real-time data and voice communication. (iii) The system has the facilities to include local mobile service provider connectivity for internal communication between stations. (iv) The system should have facilities to send sufficient data to ensure inter functionality. (4) Antenna System. (a) Name of Antenna Equipment. Rohde & Schwarz Direction Finder and Atenna. (b) Make and Model. ADD295, DF antenna (c) Country of Origin. Germany (d) Country of Assemble. Germany (e) Year of Manufacture. Equipment is manufactured on a build-to-order basis (f) General Features. DF Antenna ADD295 (g) Technical Features. (i) Frequency Range. Support the range from 20 MHz to 3 GHz (for directional and monitoring purpose) (ii) Capability. Direction Finding and monitoring (iii) Sensitivity. 6µV/m to 4µV/m (iv) Polarization. ADD295: vertical (v) Accuracy. typ. 1° RMS with installed lightning protection (vi) Antenna Type. Multi element DF antenna (nine active elements and eight passive elements in concentric circles in a radome) (vii) Field Strength Resistance. To be mentioned (viii) MTBF. 43,000h. (ix) Min Wind Speed to Withstand. 50 m/s; ADD295: 275 km/h (without ice deposit) (x) Weight. ADD295: 36kg (approx.). (xi) Dimensions. ADD295: 1,1m x 0.45m. (xii) Temperature Range. (a) Operation. -40°C to +65°C (b) Storage. -40°C to +85°C (xiii) Natural Environment of Operation. Must withstand Rain, Humidity, Salt, Fog, Sand and dust condition of Bangladesh. In line with EN 60068-2-30
f	Spares. The bidder is to offer critical spares of the equipment as optional which will be required for smooth operation of the system after expiry of the warranty period. If any spares require within 2 years warranty, the supplier is to provide the same free of cost.
g	Test Equipment and Tools. The equipment should have built in test equipment (BITE) facility.

h	Testing/Trial Run. On completion of the installation of the system, the same is to be given trial run and operation for at least 1 months in presence and under direct supervision of supplier's technical experts at BAF site. The installation Engineer should be available at the site during whole period of the working hours and remain stand by for on call service after cease hours.
j	Acceptance and Cut-over Service. After satisfactory trial run for a period of 01 months (30 days) the supplier shall carry out acceptance check of the system in presence of the BAF Team if the system is found unsatisfactory acceptance check will be held up till the equipment is made serviceable by the supplier. Necessary rectification/replacement of the equipment, if needed during acceptance check, is to be completed within 01 month by the supplier in free cost.

TENDER TERMS AND CONDITIONS FOR PROCUREMENT AND INSTALLATION OF VHF/UHF AIRBAND SIGNAL MONITORING SCANNER (EB500) INCLUDING DIRECTION FINDER, RECORDER AND ANALYZER ALONG WITH ALL ACCESSORIES, QTY-01 EA

Terms & Condition:

Technical Terms and Conditions

1. Offers are invited from the competent/ prospective bidders for supply of 01 X VHF/UHF Signal Monitoring Scanner (EB500) including Direction Finder, Recorder and nalyzer along with all accessories qty-01 Ea. Detail technical specification of the item is given in Appendix-1 of Annex 'D;.

2. The equipment should be from well-known manufacturer, brand new, unused and of recent model (produced not earlier than one year from the date of signing the contract), proven reliability in the field at least one-year of operation and the bidder ensuring continuity of the operation in case of equipment obsolete over time.

3. The offered system shall satisfactorily operate in the environment and climatic conditions of Bangladesh. Further, the system shall be capable of satisfying the future BAF requirement with least modifications.

4. Bidder is to comply with all the clauses of this tender specification. Bidder is to submit full specification and relevant documents, latest brochures in English language for the equipment/system along with the offer. The information in the brochure needs to be self-explanatory and must support and validate the information mentioned in the specification. Deviation or variation of information between the brochure and formally offered documents would be treated as non-compliance.

5. All technical data provided with the quotation must be supported by the original brochure/ catalogue to be submitted with the offer.

6. Bidder is to provide performance/ technical data, specific figures and information as asked against each condition of the tender specification.

7. Offered items must be compatible to interface with Direction Finder (DF) model: DDF205 and Antenna model: ADD295 to ascertain target transmitter's direction and location in terms of latitude and longitude, grid reference, bearing etc through Map view software. The supplier is to interface the system with each other.

8. Bidder may suggest and/or offer features for the system additional to what is described in this tender schedule. In this case, bidders have to explain the details advantage of that/those features of the system.

9. 01 set of operation and 01 set of maintenance/ service manual in English (Hard Copy) including calibration procedures along with Illustrated Parts Catalogue (IPC) are to be provided with each equipment.

10. Unit price of maintenance manual with illustrated parts catalogue in English (Hard Copy) is to be quoted separately, if the same is not provided free of cost.

11. Delivery of the items is to be completed within 120 days from the date of receiving the purchase order.

12. Warranty period of each item shall be minimum 02 (two) years from the date of satisfactory acceptance of the item by BAF.

13. Manufacture's/supplier's warranty / guarantee certificates are to be submitted along with the item during shipment. Original Equipment Manufacturers (OEM) certificates are also to be provided with the items.

14. If any item is found unsatisfactory / unserviceable during functional check or within warranty period, that must be replaced / repaired free of cost by the supplier within 30 days from the date of reporting. Both ways Airfreight and insurance charges for the unsatisfactory / unserviceable item will be borne by the supplier.

15. If the supplier fails to repair / replace any item / equipment under warranty claim within the stipulated days as given above, then the warranty period would be extended by the number of days of delay in repairing/ replacing the item / equipment under warranty.

16. Functional check of the equipment will be carried out in presence of supplier's representative at Dhaka in BAF specified location. All the Equipment's are to be handed over to BAF by the supplier in serviceable and operational condition on turn key basis. If any item found unserviceable / improper during inspection / acceptance check is to be replaced with serviceable one by the supplier within 30 days.

17. **Installation**. The items are to be installed at Teknaf, Cox's Bazar in "Turn Key" basis by the supplier. All the items are to be handed over to BAF in service able and operational condition. Final acceptance will be given on satisfactory operation report after completion of installation and trial run.

18. No conditional offer will be accepted.

19. BAF reserves the right to increase / decrease the quantity of item depending on the cost and requirement or accept or reject any bid or to annul the bidding process and reject all bids at any time prior to contract award (without thereby incurring any liability to the bidders).

20. Part shipment and part payment: May be allowed.

21. Compliance of tender terms and conditions should be mentioned in the quotations by the bidders as per the above sequence.

22. **Training**. A comprehensive theoretical and practical training will be conducted by foreigner for both operators and technicians at seller's site. Training will start one month prior to the delivery schedule of the system. The bidder will intimate training program to BAF within one month after signing the contract. The training syllabus and curriculum will be approved by BAF with the provision of addition/deletion. Supplier will carry all the training cost for foreigner. Detailed theoretical and practical training will be as under:

(a) **Operator's Training**. Detailed theoretical and practical training for 05 x BAF personnel on operation of the whole system will be arranged by the supplier which will include class room training and hands on equipment training at installation premises. Duration of training will be 01 week, 08 hrs/day, 05 working days per week (holidays not to be counted).

(b) **Technical Training**. Required operation and maintenance training will be provided at installation premises and also during the time of installation, so that they can operate and maintain the items independently.The training will include 1st, 2nd and 3rd line maintenance in detail including transfer of knowledge. More emphasis is to be given on practical training, but essential theoretical background is required to be provided. Duration of training will be 01 weeks (except during the time of installation), 08 hrs/day, 05 working days per week (holidays not to be counted) at the installation premises.

23. Payment Terms. Payment in foreign currency will be made through an irrevocable letter of credit (LC). LC will be opened at the expense of the supplier. LC amounting to 100% CPT value will be made operative in favour of supplier. Payment terms will be as under:

a. 70% CFR/CPT value will be paid on production of following documents to the bank:

(1) Original Airways Bill must be issued by Air lines or authorized agent of Air lines. Contract No, LC No and Bank Registration No are to be mentioned in the AWB. Freight amount must be shown in the Air Way Bill otherwise only FCA value will be paid. In addition to this, following will be considered:

(a) Name of the carrier must be indicated in AWB.
(b) Must be signed by the carrier or a named agent for on behalf of the carrier.

(2) Supplier's Signed Invoice.
(3) Packing List.
(4) Certificate of origin.
(5) Manufacturer/Supplier's Warranty/Guarantee Certificate.
(6) Pre-shipment Inspection report from Supplier.

b. 20% CFR/ CPT value will be paid on satisfactory acceptance of the 100% items by BAF after inspection/functional test (as applicable) and on production of CRV from 201 MU BAF.

c. 100% cost of local training will be paid on completion of training, on production of training completion certificate by the competent authority of BAF and on production of CRV of all items from 201 MU BAF.

d. Rest 10% CFR/ CPT value will be paid after expiry of warranty period.

24. Technically accepted lowest bidder will be determined basing on the total price as a package.

25. For failure to supply the ordered goods in time, BAF may cancel the purchase order with necessary punitive action.

26. Any other terms and conditions not covered here will be as per DGDP rules and regulations.

MISC TERMS & CONDITION

1. The bidder must mention the full address including Telephone number, Fax number and e-mail address in the offer. The bidder also mentions the name and full address (including Telephone number, Fax number and e-mail address) of the local agent (if any) in the offer.

2. Due to the fault of the bidder, if any change/amendment is required in the contract/LC, all such expenses/charges shall be borne by the bidder.

3. The cost of additional equipment /FOB including all charges is to be 'Firm and Fixed'. No increase of price at any stage after signing the contract will be accepted. If any item other than those already contracted is required, those are to be provided by the bidder within the contracted price.

4. Freight charges will be paid at actual, but not more than the contracted freight charge. As such, freight charge is to be mentioned in appropriate column of AWB/BL. Otherwise, FOB value of the supplied items will be paid.

5. Cost of freight/transportation charge and insurance for any surplus spares/accessories, which will be taken back after completion of assembly of Spatial Disorientation (SD) Trainer is to be borne by the bidder.

6. Bidders have to quote charges for air freight up to Dhaka, Bangladesh. The transportation of the equipment in Bangladesh (from airport to BAF site) is to be arranged and paid by the bidder.

. The bidder is to quote FCA/ FOB cost and freight charges (by both air and sea) separately & clearly in financial offer. If freight is not quoted separately for each item, total freight will be distributed against each item based on its proportionate FCA/ FOB cost of all items. Any price/ cost quoted in the pages of quotation other than financial offer will not be considered.

8. The bidder is to mention the country of origin, country of manufacture and port of shipment of the items in the offer. After submission of offer country of orgin, country of manufacturer will not be changed.

9. Offer must remain valid till 30 June 2026 from the date of opening the tender. Within the validity of the offer, withdrawal of offer or unwillingness to sign the contract by the bidder will not be accepted and in such cases action would be taken against the principal supplier and local agent as per DGDP rules.

10. Part shipment: Not allowed.
11. Part payment: Not Allowed.

12. AWB/BL must be in the name of consignee.

13. Normally transshipment is not allowed. However, if the bidder needs transshipment, they are to mention in the offer about their requirement. In case of such requirement, the transshipment may only be allowed under single AWB/BL.

14. Compliance of tender terms and conditions should be mentioned in the quotations by the bidders as per the above sequence.

15. Payment Terms. Payment in foreign currency will be made through an irrevocable letter of credit (LC). LC will be opened at the expense of the supplier. LC amounting to 100% CPT value will be made operative in favour of supplier. Payment terms will be as under:

a. 70% CFR/CPT value will be paid on production of following documents to the bank:

(1) Original Airways Bill must be issued by Air lines or authorized agent of Air lines. Contract No, LC No and Bank Registration No are to be mentioned in the AWB. Freight amount must be shown in the Air Way Bill otherwise only FCA value will be paid. In addition to this, following will be considered:

(a) Name of the carrier must be indicated in AWB.
(b) Must be signed by the carrier or a named agent for on behalf of the carrier.

(2) Supplier's Signed Invoice.
(3) Packing List.
(4) Certificate of origin.
(5) Manufacturer/Supplier's Warranty/Guarantee Certificate.
(6) Pre-shipment Inspection report from Supplier.

b. 20% CFR/ CPT value will be paid on satisfactory acceptance of the 100% items by BAF after inspection/functional test (as applicable) and on production of CRV from 201 MU BAF.

c. 100% cost of local training will be paid on completion of training, on production of training completion certificate by the competent authority of BAF and on production of CRV of all items from 201 MU BAF.

d. Rest 10% CFR/ CPT value will be paid after expiry of warranty period.

16. Any other terms and conditions not covered here will be as per DGDP rules and regulations.