

TENDER SPECIFICATION OF AERIAL TOPOGRAPHIC SURVEY SYSTEM

1. **Name of Equipment.** Aerial Topographic Survey System.
2. **Purpose.** To support and assist in Aerial Topographic survey, Photo grammetry, Mapping, Route Surveillance and Monitoring both day and night.
3. **Quantity.** 01 (one) complete system (Aerial Topographic Survey System (ATSS), along with all standard accessories required to operate the ATSS. In addition, 01 in no Lidar, 01 in no Multispectral Camera with IR facility, 01 in no Basic Visual Camera including INS and dual frequency GNSS system RTK configurable with the supplied ATSS as Payload and necessary software to be provided. The whole system must be portable and can be operate from anywhere including ship. Thus environmental protection carry box must be provided with the system).
4. **Brand/Model.** To be mentioned.
5. **Country of Origin.** USA, UK, Norway, Canada, Australia and EU Countries.
6. **Country of Manufacturer.** USA, UK, Norway, Canada, Australia and EU Countries.
7. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address are to be mentioned).
8. **Date of First Introduction in the Market.** To be mentioned.
9. **Year of Manufacture.** 2024 or later.
10. **Qualification of Bidder.** Only genuine manufacturer or authorized dealer (Foreign principal) can submit quotation through authorized agents/dealer enlisted in the Directorate General of Defense Purchase (DGDP). For participation by agents/dealer, authenticity certificate is required.
11. **Scope of Supply.** The ATSS will be supplied along with all accessories as per the specification mentioned in this document.
12. **Technical Specification.**
 - a. **Basic Parameter.** Basic parameter should be followed. Any change or upgradation have to be mentioned in the offer:

Ser	Parameter	Description
1.	Dimensions	Max 1.5m x 1.5m x 1.5m (Unfolded with propellers) Folded and unfolded Dimensions to be mentioned separately.
2.	Takeoff Weight	To be Mentioned (Including Payload and Main Battery).
3.	Payload Capacity	4.5 Kg or more.
4.	Control Range	Min 10 km.
5.	Speed	Min 12 m/s.
6.	Wind Resistance	Min 10 m/s.
7.	Flight Endurance	Min 40 min with max payload.
8.	Flight Altitude	Min 3000m.
9.	Power Source	Battery Type.
10.	Operating Frequency	To be mentioned.
11.	Operating Temperature	-10° to +40°C.
12.	Operating Environment	Suitable for operating in coastal environment of Bangladesh.

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Ser	Parameter	Description
13.	Dual GNSS	GPS, GLONASS, BeiDou, Galileo.
14.	IMU/INS	To be mentioned.
15.	Environmental Rating	IP 55 or better.
16.	Service Life	Minimum 10 years.
17.	Autopilot Mode	Yes (To be mentioned).
18.	Take off	VTOL (Vertical Take-off and Landing).
19.	Copter	At least 4 Arms and 4 Rotor (More preferred) which must be efficient to carry all payloads for desire duration as mentioned.
20.	Automatic Parachute as Safety Device	Redundancy for the autopilot and the sensors.

b. **Payload.** Payload will consist of a Lidar, Multispectral Camera with IR facility, Basic Visual Camera. The specification of the payload is as follows:

Ser	Parameter	Description
1.	Lidar.	Panoramic laser FOV for High Precision Surveying and mapping, Real-time mapping. To be compatible with the ATSS.
		Size. To be mentioned.
		Weight. To be mentioned.
		Dimensions. To be mentioned.
		Precision. 2.5cm or better.
		Accuracy. 2.5cm or better.
		Altitude. 100m or more.
		GNSS -Inertial Solution. Details to be mentioned.
		Flight Speed. To be mentioned.
		Scanning Range. At least 100Hz
		Echoes Per Shot. 5 or More.
		Shot per Second. 200000 or more.
		Internal Storage. As necessary to capture the raw data (Image/Video) for the full flight time.
		Scanning FOV. Panoramic 360 degree.
		Laser Class. To be mentioned.
		Laser Range. At least 160m or more.
		Laser Scanner. To be mentioned.
		Power Consumption. To be mentioned.
		Interface. To be mentioned.
		Battery. To be mentioned.
		Post Processing Software. To be mentioned.
		Uses. Surveying, Mapping.

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Ser	Parameter	Description
2.	Multispectral Camera with IR facilities.	<p>It should be robust and lightweight ATSS EO/IR gimbal featuring both visible and LWIR cameras with optical zoom capabilities as well as a high-resolution panchromatic, spectral sensors and compatible laser pointer. To be compatible with the ATSS.</p> <p>Size. To be mentioned.</p> <p>Weight. To be mentioned.</p> <p>Dimensions. To be mentioned.</p> <p>Sensor Model. To be mentioned.</p> <p>Sampling Point. To be mentioned.</p> <p>Spectral Brand. Blue, Green, Red, Red Edge, Near IR or more.</p> <p>Pixel Size. 3.75 µm or better.</p> <p>Resolution. 1456 x 1088 (1.6MP per Multispectral band), 2464 x 2056 (5 MP panchromatic band) or better.</p> <p>Multispec GSD. 8cm per pixel (per band) or better at 120mm AGL.</p> <p>Wave Length. To be mentioned.</p> <p>RGB Colour Output. Global Shutter, Aligned with all bands, 5MP or better.</p> <p>Capture Rate. 3 Capture per second (all bands).</p> <p>Field of View. 45°-50° HFOV (Multispectral), VFOV 35°-40° (Panchromatic) or better.</p> <p>Vision. Day and Night.</p> <p>Interface. To be mentioned.</p> <p>Power: To be mentioned.</p> <p>Battery. To be mentioned.</p> <p>Uses. 3D Mapping and Topographic surveying.</p>
3.	Basic Visual Camera.	<p>It should be lightweight, compact, Electro optical camera and gimbal housed enclosure with robust environmental sealing. It should be a minimum 10x or more optical zoom visible camera. It will have superb image resolution speed and focus. To be compatible with the ATSS. Other specifications are as follows:</p> <p>Focus Type. Fast hybrid AF (Phase detection AF/ Contrast detection AF).</p> <p>Sensor Size. To be mentioned, (Full-frame sensors are preferred).</p> <p>Weight. To be mentioned.</p> <p>Sensor Model. To be mentioned.</p> <p>Standard ISO. 100-32000.</p> <p>Resolution. 60 MP or More.</p> <p>Lens. The lens should have a wide field of view, allowing the camera to capture as much of the landscape as possible. Additionally, the lens should have a low distortion rate.</p>



RESTRICTED

Ser	Parameter	Description
		Lens Focal Length. At least 35mm or more (Wide-angle lenses, fixed aperture are preferred).
		High Speed Shootings. Up to 10fps.
		Vision. Day.
		Power. To be mentioned.
		Interface. To be mentioned. It should be compatible with supplied ATSS.
		Anti-Dust System. To be mentioned.
		Anti-Flicker Shoot. Yes.
		Battery. To be mentioned.
		Mountings. Necessary compatible mountings need to be provided with the payload.
		Storage. To be mentioned. It should be enabled to store full flight time raw data (Image/Video) for post processing.

c. **Power supply.** The specification of ATSS power supply as follows:

Ser	Parameter	Description
1.	Power Source.	Type. Battery. Detail information of power source must be provided with the offer.
2.	Battery.	Type. Lithium Polymer (LiPo) or Lithium Ion (Li-Ion) or Both. Capacity. To be Mentioned Weight. To be Mentioned Battery Voltage. 22 VDC to 48 VDC Battery Cycle. To be mentioned. Battery life. To be mentioned. Battery Efficiency. To be mentioned. Standard. Need to be maintained ISO standard. To be mentioned.
3.	Battery Charging Station.	Type. Portable. Model. To be mentioned. Power Input. To be mentioned. Power Output. To be mentioned. Maximum Current Output. To be mentioned. Charging Mode. To be mentioned. In case of emergency fast charging option will be necessary. Charge Indication. The system need to be incorporated with automatic charging ON/OFF system with signal light indication and alarm system. Detail information of charging station must be provided with the offer.



RESTRICTED

Ser	Parameter	Description
		Standard. Need to be maintained IEC standard. To be mentioned.
		Safety. Need to be incorporated with over current and over voltage protection.

d. **Ground Station/Controller:**

Ser	Parameter	Description
1.	Transmission Distance	10 km or more.
2.	Transmission Power & Operating Frequency	To be mentioned.
3.	Operating Environment	Suitable for operating in coastal environment of Bangladesh.
4.	Remote Control with Display.	Preferable LED/LCD touch and manual display with a standard firewall version.
		Brand/Model. To be Mentioned.
		Datalink. To be Mentioned.
		Battery Voltage. To be Mentioned.
		Power Consumption. To be Mentioned.
		Extra Battery Pack. At least 02 sets for emergency and continuous operating.
5.	Supported Port Types	To be mentioned.
	WiFi & Bluetooth Protocol	To be mentioned.
7.	Operating Time	Min Full Flight time with maximum payload.
8.	Ground Control Station Hardware	Laptop (Portable), Windows 11 latest generation with high graphics and SSD storage capacity (Minimum RAM 8GM and ROM 1TB SSD).
9.	Ground Control software	Real time data facilities, Data log facilities, Image processing facilities and other standard options.
10.	Work Station with dedicated software	Post processing software with valid license key need to be provided. License must be perpetual. Full description must be mentioned with the offer.
11.	Mission Mapping Software	Mission mapping with auto return home (ATH) facilities. Full description must be mentioned with the offer.

13. **Additional Feature.**

a.	It should be able to return home automatically by pre route planning and hovering in a designated place for a predefined time interval. Mentioned full description with the offer.
b.	Advance Auto Navigation system with necessary software for maintaining plan line of the survey should be provided. Software license must be perpetual. Mentioned full description with the offer.
c.	It should be able to control over altitude above ground level using active RADAR altimeter perpetual.
d.	Vibration shock mounting pad or landing stand for smooth landing and takeoff.



RESTRICTED

14. **Package List.** ATSS shall contain the following standard accessories:

Ser	Name	Qty
1.	Carry Box.	01 in no.
2.	Low Noise Propellers.	01 x Set with the system 02 x Set as additional
3.	Landing Stand and Vibration Mounting.	02 sets.
4.	Portable Charger Station.	01 in no.
5.	Charger Cable.	02 sets.
6.	Ground Station hard Case.	01 in no.
7.	Payload case (each or combined).	01 in no.
8.	Battery.	03 Sets (01 in no for flight & 02 in no as additional).
9.	Additional (Camera) battery.	01 in no for basic camera & 01 in no for multispectral camera.
10.	Additional Memory card for storing (Min 128GB).	02 in no.
11.	Ground Control Hardware (Portable Laptop with latest configuration) with dedicated firewall or software.	01 in no.
12.	Workstation (Portable Laptop with latest configuration).	01 in no.
13.	Required processing software with valid license.	Installed in a separate workstation. All provided software license must be perpetual.
14.	Miscellaneous.	Standard accessories need to be provided which is essential for smooth and safety of flight operation.

15. **Lifetime of the Equipment.** At least 10 years.
16. **Condition of the Equipment.** The offered equipment must be brand new and in operational condition.
17. **Catalogue/Brochure.** Two sets of original Catalogue/Brochure ATSS and equipment in English to be supplied with the offer.
18. **Quality Management System.** To assess the quality management system (QMS) of the manufacturer, ISO or equivalent certificate has to be provided with the offer.
19. **Certificate/Document of Authentication.** The local supplier must provide following original certificate/document with the offer/quotation to ascertain the ingenuity of source and items in order to establish chain of links from the original source to supply items.
- a. One certificate/document by the manufacturer in favour of the supplier (In case of manufacturer as direct source).
 - b. Two certificates/documents, one by the manufacturer in favour of the authorized agent and other by the authorized agent in favour of the supplier (In case of authorized agent as immediate source).
20. **Manuals/drawings.** Following manuals are to be supplied free of cost with the equipment at the time of delivery:
- a. Two sets of operating manual in English.
 - b. Two sets of technical manual in English (If any).
 - c. Two sets of maintenance manual.

21. **Pre Shipment Inspection (PSI) and Factory Acceptance Test (FAT).**

- a. Pre Shipment Inspection (PSI) and Factory Acceptance Test (FAT) will be carried out by a team of 02 (Two) BN officers for a duration of 03 (three) working days excluding journey period, at the buyer's expense (including return air ticket, food and accommodation). The supplier should inform the buyer about the date and schedule of PSI and FAT at least 08 (eight) weeks prior to the date of commencement of the said PSI and FAT. After inspection, a joint inspection report will be prepared and signed by both the seller and buyer's representatives.
- b. All types of movement/transportation of the PSI/ FAT team within the manufacture/ supplier's country, reception and arrangement for entry into country/ concerned area for the PSI and FAT are to be arranged by the supplier. The PSI and FAT will be carried out at manufacturer's factory premises.
- c. On return from the country of manufacturer, the PSI and FAT team will submit report to the concerned directorate of Naval Headquarters (NHQ). NHQ will, in turn, forward final decision along with PSI and FAT report at the earliest, basing on which DGDP will render clearance for shipment of stores to the supplier concerned. The supplier will not make shipment of any item of the contract without clearance from the DGDP.
- d. During PSI/FAT, tests will be carried out to fulfil the required conditions mentioned in the technical specification of the ATSS. Various tests for checking performance are to be carried out and recorded.

22. **Test and Trial.** Manufacturer representative will carry out test and trial of the ATSS in a suitable coastal area at Chattogram under arrangement of BNHOC.

23. **Training.** 05-06 BN personnel are to be trained for 05 (five) working days by the manufacturer's engineer or by a person certified by the manufacturer to be adequately qualified and experienced on the system for troubleshooting and maintenance in Bangladesh. International OEM certificate need to be given for trained personnel. The training should cover the following:

- a. Operating and advance function of all components.
- b. Periodical maintenance, troubleshooting, and rectification.
- c. Theoretical and practical training on calibration and data acquisition.
- d. In-depth training in Controller, Ground Station software, real time data processing, post data processing software, transferring and archiving.

Note: The supplier should provide two copies of supporting manuals for the above mentioned topics in English. Training should be conducted by OEM experienced trainers/engineers having in-depth knowledge of data acquisition, processing and maintenance. The name and detail profile of the trainer is to be submitted with the offer. The price of the training is to be quoted separately.

24. **Acceptance.** On completion of satisfactory test and trial final acceptance certificate will be signed jointly by the representative of manufacturer and the buyer.

25. **Warranty.**

- a. At least two years warranty for ATSS and One year warranty for all equipments after satisfactory acceptance by BN is to be provided.
- b. For warranty repair/replacement, the supplier will collect the defective item from NSD Chattogram and re-supply the same to collecting place after warranty repair or replacement within 90 (ninety) days from the date of defect. Cost of the replaced unit/component including air freight is to be borne by the supplier.
- c. Warranty period will be extended for the duration of non-operational time for the equipment.

26. **Tools.** Tools required for servicing and maintenance for the ATSS and equipments are to be supplied at the time of delivery. List of tools are to be provided with the offer.

RESTRICTED

27. **Standard Accessories.** All standard accessories to be provided by the supplier. It must include every item and accessories, which are essential to install and operate the ATSS in standard level, whether those are mentioned in this specification or not.

28. **Spares.** Following are to be given with the offer for the ATSS and equipments:

- a. One set of spare battery is to be provided at the time of delivery of ATSS.
- b. Spares require for 05 years trouble free operation are to be quoted separately.
- c. Supply of spares for minimum 10 years is to be ensured and in this regard a certificate is to be submitted in original pad of the manufacturing company.
- d. List & price of consumable/spares are to be submitted separately.
- e. If the item is of one time use/not reparable that is to be mentioned clearly.

Note: Quoted price of spares will influence the evaluation of final acceptance.

29. **Optional Items.** Any optional items which may be provide are to be quoted, indicating item wise price. However, 100% performance guarantee of the main equipment is to be given without such optional items.

30. **Documents.** Following documents are to be submitted with the offer:

- a. Two sets of original catalogue/brochure in English.
- b. List of standard accessories with pattern number and other specification.
- c. List of optional accessories.
- d. List of 10 years spares parts.
- e. List of Tools.
- f. User list.
- g. Manufacture's authenticity certificate.
- h. Design/drawing of portable installation method and associated fittings (if not included in original catalogue).

31. **Record of Sale.** The offered ATSS must be used by any of the reputed government Hydrographic Offices like SHOM (France), NOAA (USA), UKHO (UK), JHD (Japan), AHS (Australia), IIDM (Italy), KHOA (Korea) etc. Record of sale for last five years indicating year and name of the user to be provided in the offer.

32. **Offer Validity.** Up to 30 June 2025.

33. **Shipments and Delivery.**

- a. The supplier will arrange shipment of all items by sea/air to Chattogram sea/air port, Bangladesh within 180 days from the date of contract signed.
- b. All items are to be delivered in proper packing to ensure safe transit by sea/air.
- c. All packages are to have packing notes showing their contents in detail and all packages shall be marked with the name and address of the consignee and gross weight.
- d. The supplier will supply the item at NSD Chattogram. While delivering, the supplier will carry the items from Chattogram sea/air port (as applicable) to NSD Chattogram at the cost and risk of supplier.

34. **Source of Supply.** The bidder is to mention the name, address and contact detail of original source (Manufacturer) from where the ATSS will be imported.

35. **Port of Shipment.** Any port of the manufacturing country (to be mentioned).

36. **Consignee.** The Commanding Officer, Naval Store Depot, New Mooring, Chattogram, Bangladesh.

37. **Price without Import Duties.** Quoted price is to exclude all import duties as those will be consigned against BN.

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38. **Terms of Payment.** Necessary letter of credit will be opened for full purchase amount in favor of the principal with the following terms of payment.

- a. 80% of CFR value will be paid on delivery of the items described under the scope of supply on production of necessary shipping document.
- b. Remaining 20% CFR value and 100% cost of test/trial and training amount will be paid after satisfactory acceptance by BN.

39. **Condition for Acceptance of Quotation.** Quotation may not be considered if detailed information/specification, original maker's books and catalogue about the same model of the offered item, accessories, scope of supply etc are not provided.

40. **Compliance Statement.** A complete statement fulfilling all the requirements of the tender is to be submitted for evaluation as required:

- a. Article wise compliance report must be given. An incomplete compliance statement may attribute to cancellation of the offer.
- b. If any clause of this specification does not commensurate with offered item, the deviation has to be spelt out clearly.

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