

**GOVERNMENT OF INDIA**  
**(Ministry of Home Affairs)**  
**Communication & IT Directorate**  
**CENTRAL RESERVE POLICE FORCE**  
**EAST BLOCK-7, SEC-1, R.K. PURAM, NEW DELHI-110066**  
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No. B.V-7-C/2024-25-C(UAV)-Q


Dated, the 9<sup>th</sup> Jan'2025

**Subject:- REQUEST FOR COMMENTS OF STAKEHOLDERS /OEM/FIRMS on Draft QRs & TDs of "Small UAV for ISR Purpose (180 Minutes)".**

1. The Draft QRs/TDs of "Small UAV for ISR Purpose (180 Minutes)" is attached as **Appendix 'A'**. The OEMs/Vendors are requested to forward information of the product, which they can offer and also forward correct specifications of their system against each parameter. Only complied or not complied remarks will not be accepted. The firms are also requested to furnish the following details: -
  - Whether you are OEM/Vendor?
  - If vendor details of OEM.
  - Authorization certificate from OEM.
2. The required information/details may please be forwarded at the following addresses by 6 **Feb'2025**.

Communication Directorate, CRPF  
East Block-7, Sec-1, R.K. Puram, New Delhi-110066  
Email: [comncell@crpf.gov.in](mailto:comncell@crpf.gov.in)

3. An early response is requested.

  
(Amit Taneja)  
**DIG (Equipment)**  
**Communication & IT Branch**  
**Directorate General, C R P F**

**Draft QRs/TDs of Small UAV for ISR purpose (180 Min Endurance)**

<b>S N</b>	<b>Parameter</b>	<b>Specifications</b>	<b>Trial Directives</b>
<b>1</b>	<b>UAS (As a system)</b>		
1.1	Aerial Vehicle-01 No		BOO will check practically.
1.2	Ground Control Station- 01 No		
1.3	Remote Video Terminal -01 No		
1.4	One payload assembly. It can be (a)Day & Night payload (01 No for each) or (b)Integrated day and night payload -01 or For mapping drone (a) 2-D mapping payload (b)3-D mapping payload  (As per user requirement, the user can any payloads for trial and settle with one of the above before order)		
1.5	Data link Equipment/ Antenna -01 No		
1.6	Battery/Battery set for each Aerial Vehicle-01 No		
<b>2</b>	<b>Drone Characteristics</b>		
2.1	Nomenclature	Small UAV (180Min), Weight category $7 > W \leq 10$ KG	BOO will check practically.
2.2	Design	Fixed Wing/Hybrid	BOO will check practically.
2.3	Role	Surveillance, Reconnaissance and DRI during day & night operation (2D & 3D Mapping as per user requirement)	BOO will check practically.
2.4	Launch and recovery mode	Automatic vertical takeoff and landing (VTOL) up to 50m within the area of 10X10m & then loiter	BOO will check practically.
2.5	Aural Signature	$\leq 40$ dbs at 300 m above AGL	The firm will submit certificate of Govt Lab. Or NABL/ILAC accredited laboratory.
2.6	Propulsion system	Electrical with rechargeable batteries	BOO will check practically.
2.7	Payloads carrying capability	The Payload should have Gyro based stabilized.  Housing should be available for relevant payload with locking and auto tracking of the selected target in the video imagery.  360° pan 90° tilt control during flight for day and night payloads independent of "YAW" movement of the UAV	BOO will check practically.

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2.8	Flight modes	a) Fully autonomous Mode b) loiter at a defined waypoint c) loiter mode d) Target tracking mode e) Real-time target tracking of designated static and moving targets. f) Should be controllable in real time from the GCS up to recovery g) Fully autonomous and stabilized	BOO will check practically.
2.9	Endurance	Min. 180 Minutes with day or night or integrated payload at MSL or Min 90 Minutes with Mapping Payload	BOO will check practically and firm will produce OEM certificate.
2.10	Minimum Operating altitude above ground level (AGL)	1000m AGL (Above Ground Level) or more.	BOO will check practically and
2.11	Maximum Launch altitude above mean sea level (AMSL)	4000m AMSL (Above Mean Sea Level) or more (Acceptable for degradation in endurance 10 % for every 1000m increase from AMSL)	Firm will submit OEM certificate
2.12	Operating wind conditions	a) Take off: 40 km/h or more b) Landing: 40 km/h or more c) Operate: 40 km/h or more	Firm will submit OEM certificate.
2.13	Cruise Speed	Minimum 45 Kmph in low wind condition	Firm will submit OEM certificate
2.14	Collision Avoidance sensor	Should be available during take and landing omnidirectional.	BOO will check practically and
2.15	Range of live transmission (LOS) (un-obstructed & interference free)	Minimum 20 Km line of sight	BOO will check practically and firm will produce OEM certificate
3.0	Failsafe features	a) Automatic change to recovery mode after 10 seconds on communication loss, again on mission if communication restore. b) Automatic Return to Home/Land on battery low/imbalance/sudden voltage drop c) Multiple GNSS on-board for GPS failure redundancy including NAVIC d) Auto-Return to home and land on exceeding Wind limit or gust or rainstrom. e) Auto-Return to home and land on exceeding the UAV health parameters (Temperature, vibration and throttle limit of the system) f) Should support one motor failure during flight	BOO will check practically and firm will produce OEM certificate  Firm will submit OEM certificate.  BOO will check practically and firm will submit OEM certificate.  Firm will submit OEM certificate.

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4	<b>Payload characteristics</b>		
4.1	Payloads required	<p>Electric Optic (EO) for day (Colour), Thermal Imager (TI) for night payload</p> <p>Or</p> <p>Integrated day and night payload (As per user requirement)</p> <p>Or</p> <p>Minimum 42megapixel camera for 2D mapping payloads and 5X24 MP camera for 3D mapping payload</p>	BOO will check practically.
4.2	Payload and video stabilization	<p>a) Electronic and Gimbal stabilization of video output at all zoom levels in real-time (Applicable only with surveillance payload)</p> <p>b) Payload should not damage during rough landings.</p> <p>c) Locking and auto tracking of the selected target in the video imagery.</p> <p>d) 360° pan &amp; 90° tilt control during flight for Day and Night payloads independent of “YAW” movement of the UAV</p> <p>e) Single payload assembly housing for day/night camera or integrated both day and night camera in one payload case (as per user requirement)</p> <p>f) UAV should transmit real time imagery to GCS</p> <p>g) Day Payload:- 0-20 KM- 1920 X 1080P or better</p> <p>h) Night Payload:- 0-20 KM- (i)640 X 480P or (ii)640 X 512 (as per user requirement)</p> <p>i) Quality of video should not be affected by UAV vibrations</p>	<p>BOO will check practically.</p> <p>Board will check practically real time imagery and firm will produce OEM certificate.</p>
4.3	Electro optic (EO) daylight Payload	<p>a) UAV should transmit real time imagery to GCs</p> <p>b) Resolution: 1920X1080P or better</p> <p>c) Optical zoom: -30X or more with minimum-NFOV≤5°, maximum- WFOV ≥ 45° (wide field). Digital Zoom: - 4X or more</p>	<p>BOO will check practically.</p> <p>Firm will submit OEM certificate.</p> <p>BOO will check practically &amp; firm will submit OEM certificate.</p>

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4.4	Thermal imager (TI) night payload	a) Colour camera with 360° pan and 90° tilt control during flight.	BOO will check practically.			
		b) Resolution: 1280 X 720 pixels or better	Firm will submit OEM certificate.			
		c) Digital Zoom: 4X or more	BOO will check practically.			
		d) White/Black hot modes	BOO will check practically.			
4.5	Target Detection, Recognition, Identification	Should be able to detect human size target at 750m slant or more	Day Payload	Board will check practically. Detection- Ability to distinguish an object from background. Recognition- Ability to classify the object class (Animal, Human, Vehicle, Boat etc) Identification- Ability to describe the object in details (man with weapon, hat, Uniform/Colour of cloths, type/colour of vehicles)		
			Vehicle size (4.5mX 1.5 m)		Group of 3- People	
			Detection		4000M	2500M
			Recognition		3000M	1500M
			identification		1500 M	1000 M
			Detection & recognition		Night Payload	
					1500M	1000M
5	<b>Ground control station characteristics</b>					
5.1 (Option-1)	GCS should be portable minimum 8-inch display with rugged IP 65 tablet/laptop which is compatible with GCS for surveillance or GCS should be portable minimum 10-inch display with rugged IP 67 tablet/laptop which is compatible with GCS for surveillance (as per user requirement)		Firm will submit certificate of Govt. Lab. or NABL/ILAC accredited laboratory.			
5.2 (Option-2)	Computing Hardware (as per user requirement)					
	CPU	CPU- Intel core i7 quad core processor (Intel 11 <sup>th</sup> generation, minimum 2.3 GHz or better	BOO will check practically and firm will also submit OEM certificate.			
	Storage	1 TB for Laptop or 500 GB for tablet				
	RAM Memory	8 GB or more				
	Display	10 inch or more – 1920 x 1200 XGA sunlight readable screen with minimum 1000 nits, anti-glare				
	Keyboard & input	Touch screen				
5.3	Battery operation	Minimum 04 hours at peak utilization with one (01) hot swappable battery.				
5.4	Battery charging time of GCS	Suitable battery charger using normal commercial supply				

5.5	Data portability	Suitable port for taking data and compatible with GCS	
5.6	Interface	HDMI, USB-A, USB-C, RJ-45 (LAN Port)	
5.7	Capability	<p>a) Transmit control commands to UAV</p> <p>b) Receive UAV flight and propulsion parameters</p> <p>c) Receive, display and transfer real time day and night video to display unit from GCS</p> <p>d) Capability to control UAV while on the move.</p> <p>e) Record real time video in display unit.</p> <p>f) Capable to storing 100 or more flight routes with each route having capacity to configure minimum 70 waypoints in GCS</p>	BOO will check practically and firm will also submit OEM certificate.
5.8	GCS application software	<p>a) Able to control all aspect like pre-flight checks, self-tests, control of takeoff/landing and payloads</p> <p>b) The software should have following mission information: -</p> <ol style="list-style-type: none"> <li>i. Coordinate of target</li> <li>ii. Target distance.</li> <li>iii. AV Co-ordinates</li> <li>iv. Distance of AV from GCS</li> <li>v. AV Speed</li> <li>vi. Mission time</li> <li>vii. Payload looking angle</li> <li>viii. Communication link status</li> <li>ix. GPS Status</li> <li>x. Health status of AV battery (remaining flight time in minutes)</li> <li>xi. UAV heading /true North indication</li> <li>xii. Bearing (Azimuth) of UAV from GCS.</li> <li>xiii. Geographic map and real time video should be displayed at all times during the flight</li> <li>xiv. Geographic map &amp; real time video views should be resizable and/or switchable to allow user to switch between big map/small video and small map/big video views through a single click input.</li> <li>xv. Artificial horizon indicating UAV altitude.</li> <li>xvi. Switchable between 2D/3D views, capability to tilt/rotate 3D maps as per user input.</li> <li>xvii. Perpetual proprietary software of the system product support for minimum 5 years</li> <li>xviii. AI/ML capability for identification &amp; detection of targets/humans/friendlies.</li> </ol>	BOO will check practically and firm will also submit OEM certificate.
5.9	Map formats	<p>a) Should have the capability to integrate geo-referenced raster maps provided in at least one of the commonly used digital map forms (GIF, TIFF, DTED and SRTM etc.)</p> <p>b) Ability to display 3D maps with the digital terrain data provided. Option to switch between 2D and 3D maps in real time.</p>	Board will check practically and firm will also submit OEM certificate.

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5.10	Remote Video Terminal (RVT)	Tablet:- Minimum 10" MIL STD-810G or more and IP 65 or More, compact. Light weight and portable with wrist/chest mountable holder (as per user requirement). UAV should be able to transmit video to RVT at a minimum distance of 3KM or more from UAV. RVT have capability to display video, map and OSD (on screen display) similar to GCS. Capable to record, playback and freeze the imagery received for AV. Sunlight readable and touch screen.	Board will check practically and firm will submit certificate of NABL/ILAC accredited laboratory for MIL-STD 810G or more and IP65 or more.
5.11	Payload controls	a) Selection and switch on/off of payload b) Pan/Tilt/Zoom controls c) Point payload to ground co-ordinate function d) Recording ON/OFF e) Switch ON/OFF night recovery beacon	BOO will check practically.
5.12	Joystick controls	a) Full Camera Control Pan/Tilt b) Zoom In/Out Black/White Hot c) RPV Mode d) Altitude Control	BOO will check practically.
5.13	Pre-flight checks	Self-test of UAV system, Output: go/no go	BOO will check practically.
6	<b>Communication Link</b>		
6.1	Communication link equipment capability	i) Transmit control commands from GCS to UAV ii) Transmit parameter of UAV and payload to GCS iii) Transmit day and night video from UAV to GCS	BOO will check practically.
6.2	Type of link	Secured communication links between air vehicles and GCS with minimum 128 bits encryption	Firm will submit OEM certificate
6.3	Frequency Band	Sys. should operate on S & C frequency Band uplink and down link, on license free band (i) 2.4 GHz (ii) 5.8 GHz or (iii) 2.4 and 5.8GHz (as per user requirement)	
7	<b>General System requirements</b>		
7.1	Weight	Complete weight of the UAS not more than 40 kg and system should be packable in 3 backpacks	BOO will check practically.
7.2	Assembly/Disassembly time	Less than 30 minutes	
7.3	Environmental conditions for operation and storage	The UAV and associated systems should operate and stored at following environment conditions. i) Damp heat: 40°C at RH not less than 95% ii) Starting operating temperature & Storage temp: -5°C to +55°C iii) Ability to withstand dust, drizzle and humid conditions	Firm will submit certificate of Govt lab or NABL/ILAC accredited laboratory

<b>S N</b>	<b>Parameter</b>	<b>Specifications</b>	<b>Trial Directives</b>
7.4	Portability and operation	The UAV should be battery operated portable, light in weight, compact for day and night surveillance, capable of being carried and operated by two men.	BOO will check practically.
7.5	Battery of AV	The intelligent standard lithium-based battery pack should have the back up of minimum 180 minutes.	
7.6	Battery charger of AV battery	Suitable universal battery charger to charge the batteries within two to three hours	BOO will check practically and firm will submit OEM certificate.
7.7	<b>Accessories</b>	i. Field repair kit:1 Nos	BOO will check practically
		ii. Lithium based battery packs: 2 Nos	BOO will check practically
		iii. Spare propeller set: 2 nos	BOO will check practically
		iv. Spare landing gear sets: 2 nos	BOO will check practically
		v. Associated cables & mounting: 1Set	BOO will check practically
		vi. User, technical & maintenance manual:1 set	BOO will check practically
		vii. Water resistance (IP 66 ) back packs to carry UAS- 03 Nos	Firm will submit certificate of Govt lab or NABL/ILAC accredited laboratory
		viii. Rugged, Compact and light weight transportation box -03 Nos	BOO will check practically
7.8	<b>Night recovery Beacon</b>	Switchable LED light when operating with night payload	BOO will check practically