EXPRESSION OF INTEREST FOR MINI UNMANNED AIR VEHICLE (UAV) SYSTEM

1. The CRPF is planning to procure Mini Unmanned Air Vehicle System. With a view to identify probable vendors who can undertake the said project, the OEMs / Vendors are requested to forward information on the product which they can offer. The parameters / broad specifications of the item are mentioned in the questionnaire attached as **Appendix 'A'**. In addition the vendors are required to furnish details as per Performa at **Appendix 'B'**.

2. Apart from the information as per the Appendices the vendors are also requested to forward technical details / product brochures / literature etc pertaining to the item in question.

3. The required information / details may please be forwarded, in hard and soft copies (CD) at the following addresses by 15 June 2017.

 Directorate General CRPF
 Block No.1 CGO Complex, New Delhi – 110003
 (Tele/Fax: 011-24366630
 Email: comncell@crpf.gov.in

4. An early response is requested.

QRs FOR MINI UNMANNED AERIAL VEHICLE (UAV)

Sl No	Parameter	Specifications	Reply of Firm/ Vendor

1.		The specification/parameters outlined in succeeding paragraphs represent attainable objectives for UAV for use by the CAPFs are laid out under following heads
		  a. The UAV as a system
		  b. Physical characteristics
		  c. Operational Characteristics including payload.
		  d. Maintenance and Administrative back up.	

2.		The performance related attributes are with reference to environmental conditions and terrain features including urban obtaining in India.	
3.	UAS (UAV as a System)	The UAS should consists of :- a) The Aerial Vehicle- 01 Nos (However user department may also ask for two or more UAVs per MPGCS which will be operated one at a time or simultaneously) b) Man Portable Ground Control System (MPGCS) with suitable antenna-01 No. c) Compact remote video terminal (RVT)-01 No d) Suitable launch and recovery system. e) Outdoor Sun light readable video displays. f. Complete set of payload with each aerial vehicle. g) Adequate spares along with the necessary storage and carriage paraphernalia. (User department may identify and decide quantity of spares as per requirement, If any) h) Rugged, Compact and lightweight transportation box capable of accommodating whole UAS to enable Safe and Hassle free transportation of UAS by Air/Rail/Road. i) Three dedicated back packs for carrying UAS by UAV Team in field operations.	
4.	Physical Characteristics General	a. The UAV should be simple, compact, light weight, modular with a rugged and proven design. b. The UAV should be capable of rapid deployment with a detachment not exceeding three men. c. The UAV should have day and night operations capability.	
5.	Endurance	The UAV should have a minimum endurance of two hours or more with day /night payload (one at a time) or fusion camera with day and night capability (As per availability/requirement of User)	
6.	Mission Range	Minimum of 15 km in Diagonal line of sight from point of launch.	

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7.	Weight and external Dimensions	Weight of the following assembly taken all at a time UAV (1 No) +Day and Night Payloads+PGCS (1 No) +RVT (1 No)+3 backpacks for carrying UAS in field operations+ Launcher mechanism if required (Excluding weight of transportation box). Should not be more than 60 Kgs. The UAV should have dimensions commensurating to its weight, speed and endurance such that it should ensure easy handling and transportation by vehicles and aircrafts. It should be packable in Three dedicated back packs.	
8.	Speed	The UAV should be able to undertake Take-off, flight and l0andings upto wind speed of 20 knots. The UAV Should have minimum cruise speed of 20 Knots or more while ensuring the clarity and stability in transmission of video footage to RVT. It should have locational loiter facility.	
9.	Standard Operating Altitude above sea level (ASL)	Operational Altitude: 500 feet to 6000 feet AGL (Above Ground Level) at launch altitude of less than 3000 feet from sea level.	
10.	Operating Temperature	Minus 5 degrees centigrade to plus 55 degrees centigrade.	
11.	Storage	Minus 5 degree centigrade to plus 55 degrees centigrade.	
12.	Reconnaissance and Surveillance	The UAV should be capable of carrying out day and night real time reconnaissance and surveillance of an area of interest. For this UAV should transmit real time imagery to GCS with resolution of 1) 1440 x 1080 pixels (Minimum) for Day Payload. 2) 640 x 480 pixels (Minimum) for Night Payload. 3) Fusion camera for both day and night surveillance with above specified resolutions or better. (User department will chose type of payload as per its requirement)	
13.	Target Detection, Recognition, Identification and Acquisition.	The system must be able to detect and acquire the designated targets. The sensor packages must provide a high quality Imagery resolution to permit target detection, recognition, identification and accurate location of fixed targets, move of personnel and vehicles.	

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14.	Air Vehicle (AV)	The UAV should be easy to handle and should have low noise (<40 db) at 300 meter to avoid detection and engagement by adversary. Air frame should be made of composite material or any other strong rugged light weight material and be rugged, durable and robust. The parts should be modular and easy to replace and maintain. It should have suitable secure data link with AES Encryption 128 bit or better to communicate with MPGCS. Fitment, removal and replacement of sensors should be quick and simple easily executable in field conditions.	
15.	Propulsion	The UAV is to be powered by battery operated system.	
16.	Portable Ground Control Station (PGCS)	a) The PGCS should be based on GPS and it should be able to control all aspects of UAV system operation like pre-flight checks, equipment self tests, take off/landing control of AV and payloads. It should have advance mission planning software features. It should provide secure communications for AV control and tracking, sensor operation and navigation. The PGCS should be based on ruggedized portable computers and should be capable of operating in a standalone mode. It should facilitate recording and replay of sensor data. Suitable ports should be provided for taking the data out on a network in the form of video freeze frames/video clipping. The Additional hardware (peripheral) facility for viewing live Imagery at (remote video terminal sun readable) should be provided. It should be able to control the aerial vehicle in manual mode with a control box, to cater for autopilot failure. The PGCS should have the following:- (a) Power supply system should cater for at least five hours of continuous operation with adequate back up. (b) The instrument should have trackball/ joystick /touch screen controls for operating various flight control modes and payloads and a Ruggedized Laptop. (c) Digital Mass storage for recording live Imagery along with metadata/telemetry and still Image data received from the sensor and mission flight date for post flight analysis capability. Capacity should be minimum 12 hours of recording data of multiple missions in MPEG4 or any other suitable format. Data transfer of recording to be downloadable to external storage and display systems by operator. (d) Self test facility for PGCS. (e) Compact RVT or wrist mountable video gadget. Should have ability to overlap the ground video data with geo-spatial data available.	

		(f) It should have suitable antenna. (g) PGCS should comply MIL-STD-810 (G) and IP65 rugged with water and dust resistant design for the flexibility to work freely in nearly any environment. The display screen should be multicolour, anti glare and sunlight readable.	
17.	Data-Link for UAV	a) UAV should have a suitable data uplink and telemetry and video down link with MPGCs with a range of Minimum 15 km LOS. The data link (Uplink and downlink) should be secure with AES Encryption 128 bit or better and should enable automatic tracking of AV in flight to minimize loss of communication link.	

18.	Programmed Flight Capability	The UAV shall be capable to-
		
		   a. Operate successfully despite intermittent presence of in-band signals from other RF systems.
		
		   b. Maintain secure communication link with PGCS by using AES 128 bit oe better to avoid deliberate attempts of jamming the up or down link and to reject attempt by an enemy to send commands to the air vehicle to prevent AV from crash, redirections/deviations.
		
		Since users never prefer link loss between air vehicle and Ground control Stations during real time operations, both telemetry data and video link should be well established.
		
		The UAV should have a facility of launching on a pre-programmed flight. The system should have dynamic programming in flight to provide flexibility for multi-mission planning. Slaving the UAV flight pattern to the payload LOS observation point so as to optimize payload image of the target should be permissible. The system should be capable of storing a minimum of 100 flight routes and each route may have minimum of 75 waypoints. The meteorological data for mission preparation should be configurable. The programming should also cater for loiter patterns in the target area. The system must have 'Manual Override facility or should be reconfigurable to permit over-ride of a pre-programmed flight at any time during the mission. GPS data should be integrated with data from mission specific sensors. In case of emergency/break in communication during the flight, the system should automatically change to programmable' return Home mode, till the communication gets re-established.	

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19.	Safety	In case of emergency/break in communication during the flight, the system should automatically change to programmable 'Return Home' mode, till the communication gets re-established. In case of loss it should give a *radio beacon* which would assist its recovery. IR (Infra Red) strobe should be provided for night recovery or any other suitable alternative system which can assist in recovery of a lost UAV.	
20.	Payload	The payload should provide both day night capabilities to the UAV. It should be capable of providing real time high quality video with full flight telemetry and capable of tracking ground targets, both static and mobile. 1) 1440 x 1080 Pixels (Minimum)　for Day Payload. 2) 640 x 480 Pixels (Minimum)　for Night Payload. 3) Fusion camera for both day and night surveillance with above specified resolutions or better. (User department will chose type of payload as per its requirement) UAV Will carry one payload at a time.	

21.	Stabilisation of Sensor	The sensor should have stabilized cameras capable of high quality Imagery and also to ensure auto locking and tracking of the selected targets.
		<u>(a) Sensor Mounting</u>
		Sensors should be mounted on adaptive modular payload platform and located at such a place where it should not sustain damage during rough landings. The mounting should have electrical/mechanical and software interfaces to accept other modular payload:
		<u>(b)Sensor:</u>
		
		   a. Day CCD colour sensor with FOV of wide >45° and narrow < 5.5° and OPTICAL　zoom 10x.(Minimum)
		   b. Standard IR Camera with FOV of > 15°
		
		<u>(c) Resolution</u>
		The resolution should be such that human & vehicle targets are observed as following minimum criteria:-
		
		<u>(d)</u>
		<table><tr><td>Criteria</td><td>Vehicle and Group of 3-4 People.</td></tr><tr><td>Detection</td><td>1200m</td></tr><tr><td>Recognition</td><td>300m</td></tr><tr><td>Identification</td><td>150m</td></tr></table>Accuracy of the gimbal movement in Az/El axis should be specified in arc mins.	

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22.	Compact Remote Video Terminal	The Compact Remote Video Terminal (CRVT) should be capable of being tuned to the UAVs downlink frequency. It should be light weight and portable computer based and be capable of the following:- a) Display payload output received from mission UAV. b) Record, play back and freeze the imagery and real time printing/editing of Imagery received from UAV.	
23.	Launch and Recovery	UAV should be capable of Taking off and landing from space of 30 meter x 50 meter with clear approach visibility of 100 meter.	
24.	System Accuracy	The altitude accuracy should be better than 30 meter and the target acquisition accuracy in guided flight should be less than 30m central error of probability (CEP) to avoid deviation from the routes/target.	
25.	Ease of Operation	a. The system should be easily transportable and be man portable in dismantled configuration in back packs. b. The UAV should have an Inherent simplicity in launching, flight programming, basic operation and recovery. c. It should be possible to deploy UAV within 20 to 30 minutes to respond to a mission request from transportable condition by a two to three men team. d. It should be operable from within armoured vehicles.	
26.	Miscellaneous	The warranty period of the UAV shall be 02 Years.	

INFORMATION PROFORMA

1. **Name of the Vendor/Company/Firm**.

    (Company profile, in brief, to be attached)

2. **Type (Tick the Relevant Category)**.

    (a)   Original Equipment Manufacturer (OEM)   Yes ☐ No ☐

    (b)   Government sponsored Export Agency   Yes ☐ No ☐
                                    (Details of Registration be provided)

    (c)   Authorised Representative of OEM   Yes ☐ No ☐
                                                        (attach details)

    (d)   Other (give specific details)

    (e)   Any collaborator/partner in India (in case of foreign vendors).

3. **Contact Details**

    Postal Address
    City:_____ Province :_____

    Country:_____ Pin/Zip Code:_____

    Tele:_____Fax:_____

    URL/Website:_____

4. **Local Branch/Liaison Office/Authorised Representatives in Delhi (if any)**.

Name and Address
City :_____   Province:_____

Country:_____ Pin/Zip Code:_____

Tele:_____   Fax:_____

5. **Financial Details**.

(a)   Annual turn over:_____ USD

(b) Earlier contracts with Indian Ministry of Defence / Government agencies:-

Agency	Contract Number	Equipment	Quantity	Cost

(c) Details   of   manufacturing   infrastructure available:_____

6. **Certification by Quality Assurance Organisation (If Applicable)**.

Agency	Certificate	Applicable from (Date & Year)	Valid till (Date & Year)

7. **Equipment/Product Profile (to be submitted for each product Separately).**

(a) Name of the Product:_____
(Should be given category wise for e.g. all products under night vision devices to be mentioned together)

(b) Description (attach technical literature) : _____

(c)Whether OEM or Integrator:_____

(d) Status (in service/Design development state): _____

(e)Production capacity per annum : _____

(f) Countries where equipment is in service : _____

(g) Whether export clearance is required from respective government (Foreign Vendors only).

(h) In case of equipment and ammunition JV/MoU compliance to be specified.

(j) Details of any collaboration/joint venture/co production/ authorised dealer with Indian Industry (Foreign Vendors only):

Name & Address: _____

_____

Tele: _____   Fax:_____

8.   (a) Are you making the full equipment or is it being integrated by you? Give details.

    (b)   What are the components, sub system or sub- assemblies of the equipment which are not manufactured by you? Please give details.

9.   Details of participation in similar procurement cases in India in the past.

10. **Any other Relevant Information**.