GOVERNMENT OF INDIA  
(Ministry of Home Affairs)  
COMMUNICATION DIRECTORATE CRPF,  
EAST BLOCK-7, LEVEL-4, SECTOR-01,  
R. K PURAM, NEW DELHI-110066  

(Telephone/Fax:- 011-26109038/9209 email-Comncell@crpf.gov.in)  

No. R.XV.11/20-21-C (UAV) Dated, the 10th February’2021  

**Invitation of Expression of Interest**  
**For field trial of Mini UAV along with accessories**  

CRPF intends to procure Mini UAV along with accessories though GeM portal. Prior to creation of bid in GeM portal, field trial of above item will be conducted on NCNC basis to check performance of Mini UAV in field environment as well as to check compliance of the parameters of approved QRs and TDs. Only those firms would be allowed for the bid on GeM whose samples meet the requirement of the force as per approved QRs/TDs during the field trial.  

Accordingly, CRPF invites Expression of Interest (EOI) from OEM or their authorized agent. Copy of QRs/TDs of Mini UAV along with accessories is enclosed as Appendix “A”.  

The required information/details may please be forwarded, to this office through CPP portal site [https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app).  

Sd/10/02/2021  
(Harjinder Singh)  
DIG (Equipment)  
For and on behalf of the President of India
SCHEDULE TO EOI

GOVERNMENT OF INDIA

(Ministry of Home Affairs)

COMMUNICATION DIRECTORATE CRPF,

EAST BLOCK-7, LEVEL-4, SECTOR-01,

R. K. PURAM, NEW DELHI-110066

Tele/Fax: 011-26109038/9209, e-mail: comncell@crpf.gov.in


Last date and time of receipt of EOI through CPPP : By 1200 Hrs on 03/03/2021

Last date and time of receipt of EOI through e-mail and Offline : By 1200 Hrs on 04/03/2021

Time and date for opening of Online/Offline E.O.I : At 1200 Hrs on 04/03/2021

OEM or their authorized agent is advised to go through the clause of this EOI carefully before filling.

<table>
<thead>
<tr>
<th>SN</th>
<th>Name of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Mini UAV along with accessories as per Appendix “A” (Quantity-20Nos)</td>
</tr>
</tbody>
</table>

All documents attached with this invitation to EOI including the specifications are SACROSANCT.

It is therefore, important that **EOI Acceptance Letter** which is a written undertaking that all the terms and condition of the EOI are understood and accepted should be signed and submitted through e-Procurement site [https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app). Further, firm may also send the same to e-mail i.d comncell@crpf.gov.in or hardcopy to this office address Communication Directorate CRPF, East block-7, Level-4, Sector-1, R K Puram, and New Delhi-110066 by 04/03/2021.

Sd/10/02/2021

(Harjinder Singh)

DIG (Equipment)

For and on behalf of the President of India
EOI ACCEPTANCE LETTER
(To be given on Company Letter Head)

Date:

To,

____________________
____________________
____________________

Sub: Acceptance of Terms & Conditions of EOI.
EOI Reference No: ________________________
Name of EOI: -
____________________________________________________________________________________
____________________________________________________________________________________
Dear Sir,

1. I/ We have downloaded / obtained the document(s) for the above mentioned ‘EOI
   from the web site(s) namely:
   _____________________________________________________________________________
   _____________________________________________________________________________
as per your advertisement, given in the above mentioned website(s).

2. I / We hereby certify that I / we have read the entire terms and conditions of the
   EOI documents from Page No. _______ to ______ (including all documents like
   annexure(s), schedule(s), etc.,), which form part of the EOI and I / we shall abide
   hereby by the terms / conditions / clauses contained therein.

3. The corrigendum(s) issued from time to time by your department/ organizations too
   have also been taken into consideration, while submitting this acceptance letter.

4. I / We hereby unconditionally accept the EOI conditions of above mentioned
   document(s) / corrigendum(s) in its totality / entirety.

5. In case any provisions of this EOI are found violated, then your department/
   organization shall without prejudice to any other right or remedy be at liberty to reject
   this EOI including the forfeiture of the full said earnest money deposit absolutely.

   Yours Faithfully,
   (Signature of the firms, with Official Seal)
**Documents to be submitted online in scanned copy:-**

1. Compliance statement of all parameters of approved QRs/TDs mentioned at Appendix “C” separately. Relevant Lab test reports, OEM & Firm certificates as per TDs. (Original documents to be produced during the time of Sample evaluation/Field trial).

2. Technical Brochure of Mini UAV along with accessories and details of plant and machinery.

3. Contact address including Tele/Fax No., Email i.d of OEM/authorized agents.

4. OEM authorizations certificates (in case of authorized agent).

5. Duly filled proforma along with Undertakings as mentioned in annexure-A.

**INSTRUCTIONS**

1. Firms will be required to produce samples of their quoted model of Mini UAV along with accessories as per approved QRs and TDs before board of officers.

2. Date, time and location of submission of samples for field trial will be intimated in due course.

3. The authority shall reserve the right for conducting of fresh field trial at a subsequent date if the trial is not conducted properly or the trial could not be completed due to unavoidable / unforeseen circumstances on NCNC basis.

**Other Terms & Conditions**

1. Field trial will be conducted of those firms who will submit the complete lab test reports and certificates as per approved QRs/TDs.

2. For any query related to EOI will be entertained by DIG (Eqpt), Level-4, East Block-7, CRPF HQ sector-1 R. K Puram, New Delhi during working hours, except Saturday, Sunday and GH through email: comncell@crpf.gov.in.

3. The authority shall reserve the right to reject any "expression of interest" without assigning any reason thereof.

Sd/10/02/2021

(Harjinder Singh)

DIG (Equipment)

For and on behalf of the President of India
## Annexure-A

### PROFORMA

**Name of Firm:**

<table>
<thead>
<tr>
<th>SN</th>
<th>Descriptions</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type of UAV</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Make and Model.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Country of origin.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Technical brochure.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Compliance of QRs/TDs mentioned in Appendix-“A &amp; B”.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Undertaking Certificates of disclosure of critical components of communication equipment and certify that said equipment doesn’t have any embedded malware.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Undertaking of GOI Order 2017 vide D.O. No-082/2/4/2016-CA.IV dated 30/08/2017, Class-I local supplier or Class-II local supplier as per Make in India-2020 order dated 04/06/2020, order dated 16/09/2020 and its subsequent order/notifications issued by Concerned Nodal Ministry for specific goods/products</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Undertaking of Ministry of Finance Department of Expenditure Public Procurement Division, New Delhi order No.6/18/2019-PPD dated 23/07/2020 [Order (Public Procurement No.1)] regarding restrictions under Rule 144(xi) of the General Financial Rules (GFRs) 2017 (model clauses as per appendix-“a” , model certificate as per appendix-“b &amp; c”.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Any other instructions issued by Govt of India and subsequent orders/notifications which is related to equipment should be complied</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>OEM authorizations certificates (in case of authorized agent).</td>
<td></td>
</tr>
</tbody>
</table>

Signature of the firms, with Official Seal
### QRs FOR MINI UNMANNED AERIAL VEHICLE (UAV)

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<tr>
<th>SN</th>
<th>Parameter</th>
<th>Specification</th>
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<td>1</td>
<td>UAS (As a System)</td>
<td>a. Aerial Vehicle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Ground Control System</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Remote Video Terminal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Day &amp; Night Camera</td>
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<td></td>
<td></td>
<td>e. Data link Equipment/Antenna</td>
</tr>
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<td></td>
<td></td>
<td>f. Battery/Battery set for each Aerial Vehicle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>g. Water resistance (IP66) back packs to carry UAS</td>
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<tr>
<td></td>
<td></td>
<td>h. Rugged, compact and lightweight transportation box</td>
</tr>
<tr>
<td>2</td>
<td>Aerial vehicle (AV)</td>
<td>a. Air frame should be made of composite material rugged, durable and robust.</td>
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<td></td>
<td></td>
<td>b. The parts should be modular and easy to replace/maintain.</td>
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<td></td>
<td>c. Fitment, removal and/or replacement of sensors/payload should be simple and easily executable in field conditions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Suitable battery charger using normal commercial supply to charge the batteries.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. The Aerial vehicle should have the capability to operate during day and night.</td>
</tr>
<tr>
<td>3</td>
<td>Weight</td>
<td>a. Maximum Takeoff Weight – As per DGCA guidelines for Small category UAV</td>
</tr>
</tbody>
</table>
|    |                            | b. The complete weight of UAS should not be more than 40 Kg and system should be packable in three backpacks.  
Aerial Vehicle- 01  
Ground Control System- 01  
Remote Video Terminal- 01  
Data link equipment/Antenna- 01  
Day and Night cameras- 01 each  
Battery/Battery set for aerial vehicle- 02  
Waterproof (IP66) backpacks – 03  
<p>|    |                            | c. Each back pack should not be more than 15 kgs including the weight of back packs. |
| 4  | Launch and Recovery       | Vertical Takeoff and Landing (VTOL) within the area of 25 X25 meter. |
| 5  | Deployment time           | Not more than 20 minutes.                                   |
| 6  | Aural signature           | ≤ 40 dB @ 300 meters AGL (Above Ground Level)               |
| 7  | Wind Speed                | The AV should be able to Takeoff, Land and Fly up to the wind speed of 20 knots. |</p>
<table>
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<th>S.N</th>
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<th>Specification</th>
</tr>
</thead>
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<tr>
<td>8</td>
<td>Propulsion</td>
<td>The AV should be powered by battery.</td>
</tr>
<tr>
<td>9</td>
<td>Operational Endurance</td>
<td>2 Hours with minimum loiter time of 60 minutes at full range with max payload up to launch altitude of 1000 meter above mean sea level.</td>
</tr>
<tr>
<td>10</td>
<td>Mission Range</td>
<td>Minimum 15 Km</td>
</tr>
</tbody>
</table>
| 11  | Altitude | a. Minimum Operational Altitude: 1000 meter AGL (Above Ground Level)  
      b. Max Launch Altitude: 3000 meter AMSL (Above Mean Sea Level) |
| 12  | Temperature | Starting, Operating and Storage Temperature – From Minus 5°C to Plus 55°C |
| 13  | Flight Modes | The AV should be able to operate in following modes –  
            a. Fully Autonomous Mode  
            b. Semi Autonomous Mode  
            c. Loiter Mode  
            d. Target tracking Mode  
            e. Return to home mode |
| 14  | Payload | a. The payload should have Gyro based stabilized cameras.  
        b. Single payload assembly housing for day / night camera.  
        c. Payload should not damage during rough landings.  
        d. Locking and auto tracking of the selected target in the video imagery.  
        e. 360° pan and 90° tilt control during flight for Day and Night payloads independent of “YAW” movement of the UAV.  
        f. UAV should transmit real time imagery to GCS  
            Day payload-  
            i. 0 to 15 km – 1280 x 720p or better  
            Night Payload-  
            i. 0 to 15 km – 640 x 480 or better  
        g. Capabilities of payload  
            Parameter | Night Payload | Day payload |
            Resolution (Minimum) | 640 X 480 pixels or better | 1280 X 720 pixels or better |
            Digital Zoom | 4X or more | 4X or more |
            Optical Zoom | ----------- | ----------- |
            NFOV | ≤5° | ≥45° |
            WFOV | ----------- | ----------- |
| 15  | Target Detection, Recognition, Identification (Minimum Slant range) | The system must be able to detect, acquire and designate targets up to maximum mission range of 15 Km in the following criteria:-  
            Payload | Vehicle size (6x3 meter) | Group of 3-4 People |
            Day payload | Detection | 2000 m | 1000 m |
            | Recognition & Identification | 500 m | 500 m |
            Night payload | Detection & Recognition | 1250 m | 500 m |
<table>
<thead>
<tr>
<th>S.N</th>
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</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Ground control station (GCS)</td>
<td>a The GCS should be portable, MIL-STD-810G or better. Rugged IP65 tablet/laptop, minimum display size 10” or more</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b Battery backup up to 3 Hrs.</td>
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<td></td>
<td></td>
<td>c Suitable battery charger using normal commercial supply.</td>
</tr>
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<td></td>
<td></td>
<td>d It should be able to control all aspects like pre-flight checks, self tests, control of takeoff/landing and payloads.</td>
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<tr>
<td></td>
<td></td>
<td>e Digital Mass storage: 1 TB for laptop or 512 GB for Tablet</td>
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<tr>
<td></td>
<td></td>
<td>f The laptop or tablet should have sunlight readable and touch screen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>g It should facilitate recording and playback of data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>h In flight, change of flight plan or waypoint.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>i Suitable ports should be provided for taking the data.</td>
</tr>
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<td></td>
<td></td>
<td>j It should be capable of storing 100 or more flight routes with each route having capacity to configure minimum 70 waypoints.</td>
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<tr>
<td></td>
<td></td>
<td>k The software should have following mission information:-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>i. Coordinates of target</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. AV position</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii. Distance of AV from GCS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iv. Air speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>v. Mission Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vi. Payload looking angle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vii. Communication link status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>viii. GPS status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ix. Health status of AV battery</td>
</tr>
<tr>
<td>17</td>
<td>Map Formats</td>
<td>a Should have the capability to integrate geo-referenced raster maps provided in at least one of the commonly used digital map formats (GIF, TIFF, DTED and SRTM etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b Ability to display 3D maps with the digital terrain data provided.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Option to switch between 2D and 3D maps in real time.</td>
</tr>
<tr>
<td>18</td>
<td>Remote Video Terminal (RVT)</td>
<td>a It should be minimum 10 inches tablet, must be MIL-STD-810G or more and IP65 or more, compact, light weight and portable with chest mountable holder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b UAV should be able to transmit video to RVT at a minimum distance of 3 Km or more from UAV.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C RVT to have capability to display video, map and OSD (On screen display) similar to GCS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D Capable to record, playback and freeze the imagery received from AV.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E RVT should have sunlight readable and touch screen.</td>
</tr>
<tr>
<td>19</td>
<td>Data link</td>
<td>a Secure communication links between Air Vehicle and Ground Control Station with minimum 128 bits encryption.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B Should operate on S-band and / or C-band frequency for uplink and down link preferably on license free band i.e. 2.4GHz or 5.8 GHz.</td>
</tr>
<tr>
<td>S.N</td>
<td>Parameter</td>
<td>Specification</td>
</tr>
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<td>-----</td>
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<td>---------------</td>
</tr>
<tr>
<td>20</td>
<td>Failsafe features</td>
<td>a In case of communication loss during flight, the system should automatically change to recovery mode after 10 seconds, till such time UAV should remain on its flight path.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B Automatic Return to Home/Land on low battery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C Multiple GPS on-board for GPS failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D There should be facility for on board light to facilitate visual signature for recovery, the operation of which should be GCS controlled.</td>
</tr>
<tr>
<td>21</td>
<td>Miscellaneous</td>
<td>a The comprehensive warranty of the UAS 2 yrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b Total technical life (TTL) 5 yrs or 750 landings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c Life of AV battery 200 charging cycles or 2 years, whichever is earlier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d Product support after warranty up to 3 yrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e Repair and maintenance including periodicity of midlife interventions/intent towards establishing maintenance hubs etc.</td>
</tr>
</tbody>
</table>
**Appendix-“B”**

**TDs FOR MINI UNMANNED AERIAL VEHICLE**

Trial/Technical evaluation of UAV will be conducted by a Board of Officers (B.O.O.) to assess actual performance of the equipment.

2. All parameters/Specifications mentioned in QRs will be checked by the Board of Officers in the presence of representative of firm.

i) **Physically check:** In this category, specifications of the equipment will be checked physically as per QRs.

ii) **Practically check:** The representative of firm will show all the features/configuration of the equipment to the board of officers during trial.

iii) **Submission of certificates:** Firm will provide certificate from Govt. Lab. Or DRDO or NABL accredited or ILAC accredited laboratory, OEM and firm certificates which are mentioned in respective parameters.

<table>
<thead>
<tr>
<th>S N</th>
<th>Parameter</th>
<th>Specification</th>
<th>Trial directives</th>
</tr>
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<tbody>
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<td>1</td>
<td>UAS (As a System)</td>
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<td>Aerial Vehicle</td>
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<td>Rugged, compact and lightweight transportation box</td>
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<td>Air frame should be made of composite material rugged, durable, and robust.</td>
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<td>Fitment, removal and/or replacement of sensors/payload should be simple and easily executable in field conditions.</td>
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<td></td>
<td>D</td>
<td>Suitable battery charger using normal commercial supply to charge the batteries.</td>
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<td>E</td>
<td>The Aerial vehicle should have the capability to operate during day and night.</td>
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<td>---------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>Weight</td>
<td>a. Maximum Takeoff Weight – As per DGCA guidelines for Small category UAV</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. The complete weight of UAS should not be more than 40 Kg and system should be packable in three back packs. Aerial Vehicle- 01 Ground Control System- 01 Remote Video Terminal- 01 Data link equipment/Antenna- 01 Day and Night cameras- 01 each Battery /Battery set for aerial vehicle- 02 Waterproof (IP66) backpacks – 03</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Each back pack should not be more than 15 kgs including the weight of back packs.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Launch and Recovery</td>
<td>Vertical Takeoff and Landing (VTOL) within the area of 25 X 25 meter.</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td>5</td>
<td>Deployment time</td>
<td>Not more than 20 minutes.</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td>6</td>
<td>Aural signature</td>
<td>≤ 40 dB @ 300 meters AGL (Above Ground Level)</td>
<td>Firm will produce certificate of Govt. Lab. Or DRDO or NABL/ ILAC accredited laboratory.</td>
</tr>
<tr>
<td>7</td>
<td>Wind Speed</td>
<td>The AV should be able to Takeoff, Land and Fly up to the wind speed of 20 knots.</td>
<td>Firm will produce OEM certificate.</td>
</tr>
<tr>
<td>8</td>
<td>Propulsion</td>
<td>The AV should be powered by battery.</td>
<td>Board will check practically.</td>
</tr>
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<td>9</td>
<td>Operational Endurance</td>
<td>2 Hours with minimum loiter time of 60 minutes at full range with max payload up to launch altitude of 1000 meter above mean sea level.</td>
<td>Board will check practically and Firm will produce OEM certificate. Acceptable for degradation in endurance 10% per 1000 meter beyond 1000 meter above mean sea level.</td>
</tr>
<tr>
<td>10</td>
<td>Mission Range</td>
<td>Minimum 15 Km</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td>11</td>
<td>Altitude</td>
<td>a. Minimum Operational Altitude: 1000 meter AGL (Above Ground Level)</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Max Launch Altitude: 3000 meter AMSL (Above Mean Sea Level)</td>
<td>Firm will produce OEM certificate.</td>
</tr>
<tr>
<td>S.N</td>
<td>Parameter</td>
<td>Specification</td>
<td>Trial directives</td>
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<td>Temperature</td>
<td>Starting, Operating and Storage Temperature – From Minus 5°C to Plus 55°C</td>
<td>Firm will produce certificate of Govt. Lab. Or NABL/ILAC accredited laboratory.</td>
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<td>Flight Modes</td>
<td>The AV should be able to operate in following modes –</td>
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<td></td>
<td>A Fully Autonomous Mode</td>
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<td></td>
<td>b Semi Autonomous Mode</td>
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<td></td>
<td></td>
<td>c Loiter Mode</td>
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<td></td>
<td>d Target tracking Mode</td>
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<td></td>
<td></td>
<td>e Return to home mode</td>
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</tr>
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<td>14</td>
<td>Payload</td>
<td>a The payload should have Gyro based 12stabilized cameras.</td>
<td>Firm will produce OEM certificate.</td>
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<td>b Single payload assembly housing for day / night camera.</td>
<td>Board will check physically.</td>
</tr>
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<td></td>
<td>c Payload should not damage during rough landings.</td>
<td>Board will check practically.</td>
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<td>f UAV should transmit real time imagery to GCS Day payload-</td>
<td>Board will check practically real time imagery and firm will produce OEM certificate.</td>
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<td>i. 0 to 15 km – 1280 x 720p or better</td>
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<td>g Capabilities of payload</td>
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<td>Parameter</td>
<td>Night Payload</td>
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</tr>
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<td>Resolution (Minimum)</td>
<td>640X480 pixels or better</td>
<td>1280X720 pixels or better</td>
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<td>15</td>
<td>Target Detection, Recognition, Identification (Minimum Slant range)</td>
<td>The system must be able to detect, acquire and designate targets upto maximum mission range of 15 Km in the following criteria:-</td>
<td>Board will check practically. Detection- Ability to distinguish an object from the 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 vehicle)</td>
</tr>
<tr>
<td></td>
<td>Payload</td>
<td>Vehicle size (6x3 meter)</td>
<td>Group of 3-4 People</td>
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<tr>
<td>Day payload</td>
<td>Detection</td>
<td>2000 m</td>
<td>1000 m</td>
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<tr>
<td></td>
<td>Recognition &amp; Identification</td>
<td>500 m</td>
<td>500 m</td>
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<tr>
<td>Night payload</td>
<td>Detection &amp; Recognition</td>
<td>1250 m</td>
<td>500 m</td>
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<td>16</td>
<td>Ground control station (GCS)</td>
<td>The GCS should be portable, MIL-STD-810G or better.</td>
<td>Firm will produce certificate of Govt. Lab. Or NABL/ILAC accredited laboratory for MIL-STD-810G and IP. Board will check display size practically.</td>
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<td></td>
<td>a</td>
<td>Rugged IP65 tablet/laptop, minimum display size 10” or more</td>
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<td>b</td>
<td>Battery backup upto 3 Hrs.</td>
<td>Board will check practically.</td>
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<td>c</td>
<td>Suitable battery charger using normal commercial supply.</td>
<td>Firm will produce OEM certificate.</td>
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<td></td>
<td>d</td>
<td>It should be able to control all aspects like pre-flight checks, self tests, control of takeoff/landing and payloads.</td>
<td>Board will check practically.</td>
</tr>
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<td>e</td>
<td>Digital Mass storage: 1 TB for laptop or 512 GB for Tablet</td>
<td>Board will check practically.</td>
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<td>f</td>
<td>The laptop or tablet should have sunlight readable and touch screen.</td>
<td>Board will check practically.</td>
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<td>g</td>
<td>It should facilitate recording and playback of data.</td>
<td>Board will check practically.</td>
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<td>h</td>
<td>In flight, change of flight plan or waypoint.</td>
<td>Board will check practically.</td>
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<td>i</td>
<td>Suitable ports should be provided for taking the data.</td>
<td>Board will check practically.</td>
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<td>j</td>
<td>It should be capable of storing 100 or more flight routes with each route having capacity to configure minimum 70 waypoints.</td>
<td>Board will check practically.</td>
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<td>k</td>
<td>The software should have following mission information:-</td>
<td>Board will check practically.</td>
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<tr>
<td></td>
<td></td>
<td>i. Coordinates of target</td>
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<td></td>
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<td>ii. AV position</td>
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<td>iii. Distance of AV from GCS</td>
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<td>iv. Air speed</td>
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<td>v. Mission Time</td>
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<td>vi. Payload looking angle</td>
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<td>vii. Communication link status</td>
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<td>viii. GPS status</td>
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<td>ix. Health status of AV battery</td>
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<td>17</td>
<td>Map Formats</td>
<td>a Should have the capability to integrate geo-referenced raster maps provided in at least one of the commonly used digital map formats (GIF, TIFF, DTED and SRTM etc.)</td>
<td>Board will check practically and firm will also submit OEM certificate.</td>
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<td>b Ability to display 3D maps with the digital terrain data provided. Option to switch between 2D and 3D maps in real time.</td>
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<tr>
<td>18</td>
<td>Remote Video Terminal (RVT)</td>
<td>a It should be minimum 10 inches tablet, must be MIL-STD-810G or more and IP65 or more, compact, light weight and portable with chest mountable holder.</td>
<td>Board will check practically and firm will produce certificate of Govt. Lab. Or NABL/ILAC accredited laboratory for MIL-STD-810G or more and IP65 or more.</td>
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<td></td>
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<td>b UAV should be able to transmit video to RVT at a minimum distance of 3 Km or more from UAV.</td>
<td>Board will check practically.</td>
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<td></td>
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<td>c RVT to have capability to display video, map and OSD (On screen display) similar to GCS.</td>
<td>Board will check practically.</td>
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<td></td>
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<td>d Capable to record, playback and freeze the imagery received from AV.</td>
<td>Board will check practically.</td>
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<td></td>
<td>e RVT should have sunlight readable and touch screen.</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td>19</td>
<td>Data link</td>
<td>a Secure communication links between Air Vehicle and Ground Control Station with minimum 128 bits encryption.</td>
<td>Firm will produce OEM certificate for AES encryption for both telemetry &amp; video.</td>
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<td></td>
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<td>b Should operate on S-band and / or C-band frequency for uplink and down link preferably on license free band i.e. 2.4GHz or 5.8 GHz.</td>
<td>Firm will produce OEM certificate.</td>
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<tr>
<td>20</td>
<td>Failsafe features</td>
<td>a. In case of communication loss during flight, the system should automatically change to recovery mode after 10 seconds, till such time UAV should remain on its flight path.</td>
<td>Board will check practically.</td>
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<td>B. Automatic Return to Home/Land on low battery.</td>
<td>Board will check practically.</td>
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<td>C. Multiple GPS on-board for GPS failure.</td>
<td>Firm will produce OEM certificate.</td>
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<td></td>
<td>d. There should be facility for on board light to facilitate visual signature for recovery, the operation of which should be GCS controlled</td>
<td>Board will check practically.</td>
</tr>
<tr>
<td>21</td>
<td>Miscellaneous</td>
<td>a. The comprehensive warranty of the UAS 2 yrs</td>
<td>Firm will produce OEM certificate.</td>
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<td>b. Total technical life (TTL) 5 yrs or 750 landings</td>
<td>Firm will produce OEM certificate.</td>
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<td></td>
<td>c. Life of AV battery 200 charging cycles or 2 years, whichever is earlier.</td>
<td>Firm will produce OEM certificate.</td>
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<td></td>
<td>d. Product support after warranty up to 3 yrs</td>
<td>Firm will produce OEM certificate.</td>
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<tr>
<td></td>
<td></td>
<td>e. Repair and maintenance including periodicity of midlife interventions/intent towards establishing maintenance hubs etc.</td>
<td>Firm will produce undertaking.</td>
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</table>
# COMPLIANCE STATEMENT FOR SPECIFICATION OF MINI UNMANNED AERIAL VEHICLE (UAV)

1. Name of Item: **Mini Unmanned Aerial Vehicle**
2. Brand of Item/Country of origin: 
3. Make & Model: 

Vendors are requested to give Compliance of each Specification whether equipment being offered by them is complying with Specification or otherwise.

**QRs compliance for Mini Unmanned Aerial Vehicle.**

<table>
<thead>
<tr>
<th>SN</th>
<th>Parameter</th>
<th>Specification</th>
<th>Complied</th>
<th>Not Complied</th>
<th>Page no. at which this technical literature attached</th>
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<tbody>
<tr>
<td>1</td>
<td>UAS (As System)</td>
<td>a Aerial Vehicle 02&lt;br&gt;b Ground Control System 01&lt;br&gt;c Remote Video Terminal 01&lt;br&gt;d Day &amp; Night Camera 02 each&lt;br&gt;e Data link Equipment/Antenna 01&lt;br&gt;f Battery/Battery set for each Aerial Vehicle 04&lt;br&gt;g Water resistance (IP66) back packs to carry UAS 03&lt;br&gt;h Rugged, compact and lightweight transportation box 03</td>
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<td>2</td>
<td>Aerial vehicle (AV)</td>
<td>a Air frame should be made of composite material rugged, durable and robust. B The parts should be modular and easy to replace/maintain. C Fitment, removal and/or replacement of sensors/payload should be simple and easily executable in field conditions. D Suitable battery charger using normal commercial supply to charge the batteries. E The Aerial vehicle should have the capability to operate during day and night.</td>
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<td>3</td>
<td>Weight</td>
<td>a Maximum Takeoff Weight – As per DGCA guidelines for Small category UAV&lt;br&gt;b The complete weight of UAS should not be more than 40 Kg and system should be packable in three backpacks. Aerial Vehicle- 01&lt;br&gt;Ground Control System- 01&lt;br&gt;Remote Video Terminal- 01&lt;br&gt;Data link equipment/Antenna- 01&lt;br&gt;Day and Night cameras- 01 each&lt;br&gt;Battery /Battery set for aerial vehicle- 02&lt;br&gt;Waterproof (IP66) backpacks – 03</td>
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<td></td>
<td></td>
<td>c Each back pack should not be more than 15 kgs including the weight of back packs.</td>
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<td>4</td>
<td>Launch and Recovery</td>
<td>Vertical Takeoff and Landing (VTOL) within the area of 25 X25 meter.</td>
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<td>5</td>
<td>Deployment time</td>
<td>Not more than 20 minutes.</td>
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<td>6</td>
<td>Aural signature</td>
<td>≤ 40 dB @ 300 meters AGL (Above Ground Level)</td>
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<tr>
<td>7</td>
<td>Wind Speed</td>
<td>The AV should be able to Takeoff, Land and Fly upto the wind speed of 20 knots.</td>
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<td>8</td>
<td>Propulsion</td>
<td>The AV should be powered by battery.</td>
<td></td>
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<tr>
<td>9</td>
<td>Operational Endurance</td>
<td>2 Hours with minimum loiter time of 60 minutes at full range with max payload up to launch altitude of 1000 meter above mean sea level.</td>
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<tr>
<td>10</td>
<td>Mission Range</td>
<td>Minimum 15 Km</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>Altitude</td>
<td>a Minimum Operational Altitude: 1000 meter AGL (Above Ground Level)</td>
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<td></td>
<td></td>
<td>b Max Launch Altitude: 3000 meter AMSL (Above Mean Sea Level)</td>
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<td>e 360° pan and 90° tilt control during flight for Day and Night payloads independent of “YAW” movement of the UAV.</td>
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<td>Capabilities of payload</td>
<td><strong>Parameter</strong></td>
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<td></td>
<td>Identification</td>
<td>targets up to maximum mission range of 15 Km in the</td>
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<td></td>
<td><strong>(Minimum Slant range)</strong></td>
<td>following criteria:</td>
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<td></td>
<td>Payload</td>
<td><strong>Payload Vehicle size</strong></td>
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<td></td>
<td></td>
<td>(6x3 meter)</td>
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<td></td>
<td><strong>Group of 3-4 People</strong></td>
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<td></td>
<td>Day payload</td>
<td><strong>Detection</strong></td>
<td>2000 m</td>
<td>1000 m</td>
<td></td>
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<td></td>
<td></td>
<td><strong>Recognition &amp; Identification</strong></td>
<td>500 m</td>
<td>500 m</td>
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<tr>
<td></td>
<td>Night payload</td>
<td><strong>Detection &amp; Recognition</strong></td>
<td>1250 m</td>
<td>500 m</td>
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<tr>
<td>S.N</td>
<td>Parameter</td>
<td>Specification</td>
<td>Complied</td>
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<td>Page no. at which this technical Literature attached</td>
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<td>16</td>
<td>Ground control station (GCS)</td>
<td>a The GCS should be portable, MIL-STD-810G or better. Rugged IP65 tablet/laptop, minimum display size 10” or more</td>
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<td></td>
<td>b Battery backup upto 3 Hrs.</td>
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<td>c Suitable battery charger using normal commercial supply.</td>
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<td></td>
<td>d It should be able to control all aspects like pre-flight checks, self tests, control of takeoff/landing and payloads.</td>
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<td></td>
<td></td>
<td>e Digital Mass storage: 1 TB for laptop or 512 GB for Tablet</td>
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<td>f The laptop or tablet should have sunlight readable and touch screen.</td>
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<td>g It should facilitate recording and playback of data.</td>
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<td>h In flight, change of flight plan or waypoint.</td>
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<td></td>
<td></td>
<td>i Suitable ports should be provided for taking the data.</td>
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<td>j It should be capable of storing 100 or more flight routes with each route having capacity to configure minimum 70 waypoints.</td>
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<td>k The software should have following mission information:- i. Coordinates of target ii. AV position iii. Distance of AV from GCS iv. Air speed v. Mission Time vi. Payload looking angle vii. Communication link status viii. GPS status ix. Health status of AV battery</td>
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<td>17</td>
<td>Map Formats</td>
<td>a Should have the capability to integrate geo-referenced raster maps provided in at least one of the commonly used digital map formats (GIF, TIFF, DTED and SRTM etc.)</td>
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<td></td>
<td>b Ability to display 3D maps with the digital terrain data provided. Option to switch between 2D and 3D maps in real time.</td>
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<td>S. N</td>
<td>Parameter</td>
<td>Specification</td>
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<td>18</td>
<td>Remote Video Terminal (RVT)</td>
<td>a It should be minimum 10 inches tablet, must be MIL-STD-810G or more and IP65 or more, compact, light weight and portable with chest mountable holder.</td>
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<td>b UAV should be able to transmit video to RVT at a minimum distance of 3 Km or more from UAV.</td>
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<td>c RVT to have capability to display video, map and OSD (On screen display) similar to GCS.</td>
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<td>d Capable to record, playback and freeze the imagery received from AV.</td>
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<td>e RVT should have sunlight readable and touch screen.</td>
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<td>19</td>
<td>Data link</td>
<td>a Secure communication links between Air Vehicle and Ground Control Station with minimum 128 bits encryption.</td>
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<td>b Should operate on S-band and / or C-band frequency for uplink and down link preferably on license free band i.e. 2.4GHz or 5.8 GHz.</td>
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<td>20</td>
<td>Failsafe features</td>
<td>a In case of communication loss during flight, the system should automatically change to recovery mode after 10 seconds, till such time UAV should remain on its flight path.</td>
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<td>b Automatic Return to Home/Land on low battery.</td>
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<td>c Multiple GPS on-board for GPS failure.</td>
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<td>d There should be facility for on board light to facilitate visual signature for recovery, the operation of which should be GCS controlled.</td>
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<td>21</td>
<td>Miscellaneous</td>
<td>a The comprehensive warranty of the UAS</td>
<td>2 yrs</td>
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<td>b Total technical life (TTL)</td>
<td>5 yrs or 750 landings</td>
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<td></td>
<td>c Life of AV battery</td>
<td>200 charging cycles or 2 years, whichever is earlier.</td>
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<td></td>
<td>d Product support after warranty</td>
<td>up to 3 yrs</td>
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<td>e Repair and maintenance including periodicity of midlife interventions/intent towards establishing maintenance hubs etc.</td>
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</tbody>
</table>

Sd/10/02/2021
(Harjinder Singh)
DIG (Equipment)
For and on behalf of the President of India.

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