Medium Range Mobile (MRM) Unmanned Air Vehicle Salient Characteristics

Medium-Range SUAS System Requirements

Medium Range SUAS Required General Characteristics	
Range	10km (T) ≥ 20km (O)
Endurance	Threshold (T): ≥ 60 Minutes Objective (O): ≥ 90-210 Minutes
Dash Speed (Minimum)	T: 30 Miles Per Hour (MPH) O: 50 MPH
Wind Speed	T: ≤ 20 knots O: ≤ 30 knots
Wingspan	N/A *modular components must not exceed 18”x 10”
Length	N/A*
Aircraft/ System Weight	UA < 4.5.lbs; System 22lbs (T) ≥ 12 lbs (O)
Mission Altitude	500 (T),750(O) ft (AGL)
Service Ceiling	T: 10,500 feet Mean Sea Level (MSL) (10,500 feet Density Altitude (DA)) O: 16,000 feet MSL (16,000 feet DA)

No.	Short-Range SUAS Additional Requirements
1	The entire system (aircraft, ground control station, and remote video terminal) shall be capable of operation using only rechargeable battery power.
2	The battery charger shall be an AC and DC source charger capable of charging any two system batteries simultaneously.
3	The AC Charging Power requirements are: • 110v (T). • 110/220v NATO (O) The DC Charger Power requirements are as follows: • The DC charger shall operate from a 12-24 V DC power source • Power input interface shall include: NATO slave cable, 12 V cylindrical automotive connector, and alligator clips for direct battery connection (T); portable solar adapter for system power supply and battery recharge (O).
4	The battery charger (s) will automatically recognize system batteries, and evaluate cells, and charge batteries with no operator interface other than connecting batteries. A simple status indicator shall be provided.
5	All GPS offerings shall be Selective Availability Anti-Spoofing Module (SAASM) or Military GPS User Equipment (MGUE) compliant and shall be capable of receiving and loading secure key data for the SAASM or MGUE GPS solution via a Secure Key Loader (SKL) device available to fielded Army units.
6	Before operator system preflight the system shall perform a BIT for 95% identification of faults and isolate failed components ≤ 3min to complete.
7	n/a
8	The control RF link and video/imagery RF link shall both be able to operate within 1625-

	1710 MHz. Under a separate configuration, both RF links shall be capable of operating within 1755-1850 MHz. The system shall allow for tuning the RF links to center frequencies at 1 MHz spacing. All spectrum dependent components require spectrum certification in compliance with DoD, National, and International Spectrum Management policies and regulations. At a minimum, DD Form 1494 shall be submitted/verified for all equipment, including Commercial off-the-shelf (COTS) items, to ensure the availability of the required spectrum.
9	The aircraft shall transmit its information in such a manner that the One-System Remote Video Terminal (OSRVT) is capable of receiving and decoding its video and metadata in accordance with the Interoperability Standards published by PM UAS Interface Control Working Group, located here: https://www.us.army.mil/suite/grouppage/100592 (CAC required).
10	A load out required to conduct one (1) 60 minute flight with fully operational capability (1x UA w/1 battery, 1x modular payload, 1x FRK, 1x Controller w/1 battery, 1x RSTA, 1 antenna, necessary cables) shall fit in a tactical carry bag and weigh < 21lbs (T); or shall fit in a small MOLLE Assault Pack with dimensions of 18”x10”x10” and weigh 12lbs (O).
11	The maximum time between repetitive launches of the same aircraft following any flight to include a flight of 60 minutes, including post-flight inspections, and complete any discrepancies is 10 minutes (T) or 5min (O) with standard crew of two (2) requiring no tools and while wearing the full protective ensemble MOPP IV. The operator may be on the move in a mounted position.
12	The system shall be capable of automatically tracking stationary and mobile targets or assigned waypoints designated by the operator with the EO or IR camera.
13	The system’s Ground Control Station shall provide the ability to control both the long-range system, the medium-range system, and the short range micro system. All GCS equipment shall have the option of being powered via tie ins/plugs to accommodate being powered from standard SOF ground and maritime mobility vehicles. The system shall support external power sources including 110-220 VAC, 24 VDC, and shall include a NATO power adapter.
14	Navigation – in Fully autonomous mode, the system shall execute a pre-programmed mission, including navigation to preplanned easting/northing/altitude waypoints, loiter, and mission termination, without operator interference using a SAASM compatible GPS (T) with self location error not to exceed SAASM accuracy standards. The mission shall be reprogrammable while in-flight. For fully autonomous operation, there shall be a Home Mode where the aircraft automatically flies to the Home waypoint when Home mode is selected by the operator. Additionally, there shall be a Loiter Mode where the aircraft flies a pattern allowing the operator to maintain eyes-on-target with the modular equipped payload.
15	Navigation – in Semi-autonomous mode, the system shall allow operator to manually change mission in real-time, includes intelligent aircraft control enabling operator to provide general input to aircraft without focusing to keep the platform airborne. For semi-autonomous operation, there shall be an Altitude Hold mode: the aircraft maintains a constant height above sea level. The desired altitude is set by the operator.
16	Navigation – in Manual Mode, the system shall provide the operator direct control over the aircraft. The controller shall provide the operator a method to control flight speed, heading and elevation.

17	The system shall provide color daylight video, night (passive IR) video (≥640x480), and high-resolution still imagery (≥5 Megapixel), selectable during the mission to the GCS display. The system shall provide stabilized imagery and the ability to observe a stationary object/location while the MRM is sending and receiving command and control/data to/from the H-GCS while on the ground (ARMY) and airborne. The SRM shall have the ability to view the characteristics of the underside of an object with ~30deg FOV above the UA.
18	The aircraft shall execute loss of link procedures to attempt to reacquire the link in the event of data link loss.
19	If the data link cannot be reacquired, the aircraft will return to a preplanned or pre-designated recovery point and execute a recovery sequence.
20	The aircraft shall be hand-launched and shall not require special launch mechanisms. The aircraft shall be launched from a standing position. No runway shall be needed to perform the launch.
21	The aircraft shall accommodate modular payloads including digital zoom day/night EO/IR cameras with laser illuminator (T). The laser illuminator shall be viewable with US Military Image Intensification (I2) devices and illuminate under nighttime conditions from 0-100% moon illumination level a ~25ft diameter area at a slant range of 200 meters (T), ~10ft diameter area at a slant range of 600m (O). All payloads shall be modular in design to allow them to be easily added and removed from the aircraft in a field environment with no tools.
22	The contractor shall have developed an Interface Control Document (ICD) defining mechanical, electrical, and software requirements for the Modular Payload Interface (MPI) to facilitate future payload development by the prime contractor and/or other DoD contractors selected by the government.
23	The GCS shall be able to pan, and tilt the camera payload using the proportional speed joystick or thumb-stick type device.
24	The GCS shall be able to command the aircraft to automatically activate the strobe on landing. The strobe shall be powered by an independent power source to facilitate recovery in the event of a system power failure.
25	The GCS shall include a Mission Planning Laptop that is interoperable with SOF Portable Flight Planning Software (PFPS) 4.1, and uses Falconview capable of loading the map data and Digital Terrain Elevation Data (DTED) as required for PFPS to support the mission planning functions specified in this appendix.
26	The system shall be capable of being launched, flown via waypoints, performing sensor control, and being landing with or without the use of the Mission Planning Laptop. Autonomous landings of the UA must be within 50m accuracy (T), 5m (O).
27	A Remote Video Terminal (RVT) shall be provided with each system, and shall receive video and data for remotely located teams that are in LOS range of the aircraft.
28	The aircraft shall be fully operational during and after exposure to rain up to 0.25 inches per hour (T), 0.50 in/hr (O). Decrease of 50% range/duration is acceptable at (O) limits.
29	The UA shall produce an inaudible acoustic signature while at an autonomous steady state cruise at 500ft AGL with a background noise of 65dBA (T), 400ft AGL/35dBA (O).
30	The aircraft shall have a remotely activated/deactivated dual function IR/visual strobe to provide protection against collisions and to aid in vehicle recovery. The mode of the strobe (IR/Visual) shall be selectable from the GCS. The IR strobe shall be viewable only with I2 devices from the ground operator or flight crew in manned aircraft while

	airborne from at least 400m slant range.
31	The UA shall have a locator transmitter than can be remotely activated/de-activated by the operator before launch, during flight , and after UA recovery with or without the H-GCS and without tools.