

**Attachment 4 – Long Range Reconnaissance and Surveillance (LRRS)
Small Unmanned Aircraft System (SUAS) System Requirements**

LRRS SUAS Required General Characteristics	
Range (Line Of Sight)	≥ 15 km
Endurance	Threshold (T): ≥ 90 Minutes (1.5 Hrs) Objective (O): ≥ 180 Minutes (3.0 Hrs)
Dash Speed (Minimum)	T: 30 Miles Per Hour (MPH) O: 50 MPH
Wind Speed	T: ≤ 20 knots O: ≤ 30 knots
Wingspan	≤ 10 feet
Length	≤ 5 feet
Aircraft Weight	≤ 15 lbs
LRRS SUAS Weight	≤ 32 lbs
Mission Altitude	300 to 500 feet Above Ground Level (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.	LRRS SUAS Additional Requirements
1	The LRRS SUAS (i.e., aircraft, Ground Control Station (GCS), and Remote Video Terminal (RVT)) shall be operable using only rechargeable battery power.
2	The battery charger shall be an AC and DC source charger capable of charging two batteries simultaneously shall be provided with the LRRS SUAS. The charger-battery interface and indicators shall be identical between two chargers. The charger will provide sufficient adapters to charge all LRRS SUAS peculiar batteries.
3	The DC Charger Power requirements are as follows: <ul style="list-style-type: none"> • The DC charger shall operate from a 12-24 VDC power source. • The power input interface shall include: NATO vehicle power plug adaptor, 12 V cigarette lighter connector, and alligator clips for direct battery connection.
4	The AC and/or DC battery charger (s) will automatically recognize LRRS SUAS batteries, and evaluate cells, and charge batteries with no operator interface other than connecting batteries. A simple LED status indicator shall be provided, such as yellow-battery being evaluated, red-charging, and green-charged.
5	The LRRS SUAS shall be capable of receiving and loading secure key data for a Selective Availability Anti-Spoofing Module (SAASM) compliant GPS solution.
6	The aircraft shall successfully meet the requirements of MIL-STD-810F Method 512.4 leak test, and shall be fully operational within 15 minutes of recovery.
7	The aircraft shall float, as if landed in fresh water or salt water, for 4 hours and then shall be fully operational within 15 minutes of recovery.
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 LRRS SUAS 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 (<u>NOTE</u> : Based on the U.S. Government's Radio Frequency Relocation Study, the above operating bands are subject to change. Regardless of these findings and subsequent changes, the LRRS SUAS shall operate in the newly designated bands).
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 .
10	A load out required to conduct two (2) 90-minute flights with fully operational capability shall fit in water proof and ruggedized case numbering no greater than 2 cases (current Army Standard Configuration: 1 X aircraft w/2 batteries, 1 X GCS w/2 batteries). Each case shall weigh less than 75 lbs.
11	The maximum time between repetitive launches of the same aircraft following any flight to include a flight of 90 minutes, not including conducting additional mission planning is 15 minutes with 2 operators.
12	The LRRS SUAS shall be capable of automatically tracking stationary and mobile targets or assigned waypoints designated by the operator with the EO/IR camera payload.
13	The LRRS SUAS' GCS shall provide the ability to control both the LRRS SUAS and the Medium Range Mobile (MRM) SUAS. 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 LRRS SUAS 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 LRRS SUAS shall execute a pre-programmed mission, including navigation to preplanned easting/northing/altitude waypoints, loiter, and mission termination, without operator interference. 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 gimbaled sensor system.
15	Navigation – in Semi-autonomous mode, the LRRS SUAS 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 LRRS SUAS 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 LRRS SUAS shall provide color daylight video, IR video (≥640x480), and high-resolution still imagery (≥5 Megapixel), selectable during the same flight to the GCS display. The LRRS SUAS shall provide stabilized imagery.
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 shall 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 gimbaled day/night EO/IR cameras with laser illuminator. The laser illuminator shall be viewable with US Military Image Intensification (I2) devices. 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 pan and tilt the camera payload using the proportional speed joystick or thumb-stick type device.
24	The GCS shall 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 LRRS SUAS power failure.
25	The GCS shall include a Mission Planning Laptop that is interoperable with Special Operations Forces (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 LRRS SUAS 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.
27	An RVT shall be provided with each LRRS SUAS, and the RVT shall provide video and data to 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.
29	The aircraft shall have a non-reflective matte finish and color that minimizes its visual signature under normal atmospheric conditions.
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.