Pre-Departure Checklist:
(1-3 Days Prior to Departure)

Procedure

1. Check Charging Checklist. All batteries charged and ready to go?
2. Call **Lockheed Flight Services** to file NOTAM's.

     -Phone number: **(1-877-487-6867)**

     -File at least **3-days** prior to departure
3. Prefetch imagery, mapping data into Mission Planner
4. Check to ensure sectional is loaded in google maps on GCS
5. Establish plot locations, load corners in to GPS or phone
6. Create library in Trimble Pathfinder Office
7. (1 day before): Check NOTAM processing. Confirm Processing
8. Call Seattle center to hours before flight

     -Phone Number: (Insert number here)
9. Contact nearest airport (if within 25 miles of flight) on departure date
10. Double check Equipment Checklist
11. Check functionality of (turn on and make sure operational)

     -Range Finder

     -Laptop

     -Netbook/iPAD/tablet

     -UAS

     -Controller

     -Cameras

     -GPS
11. Test gimbals and perform test flight if UAS has not been flown in last **5 days**.
12. Update Cameras to GPS time
13. Run through field packing lists again
14. Print directions
15. Pack food (if needed) and water

Charging Checklist
(1-2 Days Prior)

Batteries and Electronics

Charged/Charging?	QTY	Battery
○	_____	22,000 mAH 6S
○	_____	1000-2000 mAH 3S
○	_____	GoPro
○	_____	NEX Camera
○	_____	Canon G15
○	_____	RC Transmitter
○	_____	FARO
○	_____	Laptop/Netbook
○	_____	Tablet/iPAD
○	_____	Cell phone(s)
○	_____	Geo Explorer
○	_____	Timble Li. Ion
○	_____	Multispectral

Mission Packing Checklist - Page 1
(Day Prior)

Batteries (1/2 Charged or Charged)

- Matrix (22,000 mAh)

    Qty:_____

- Gimbal

    Qty:_____

- NEX

    Qty:_____

- Canon G15

    Qty:_____

- FARO LIDAR

    Qty:_____

- R8 Li Ion

    Qty:_____

- GoPro

    Qty:_____

- Spare AA/AAA Batteries

    Qty:_____

- Multispectral

    Qty:_____

Charging Equipment

- Power Supply(ies)

    Qty:_____

- Charging Units

    XT60:_____

    XT90:_____

    Balance Port Adpt._____

    Lith. Bat Charger_____

- GoPro USB Charging Cable

    Qty:_____

- GoPro Battery Charger

    Qty:_____

- Generator

    Qty:_____

- Extension Cords

    Qty:_____

- Laptop/Tablet Charging Cable

- iPAD Charging Cable

- Netbook Charging Cable

- Multispectral Battery Charger

Mission Packing Checklist - Page 2
(Day Prior)

Camera Equipment
- ❑ IR GoPro
- ❑ Color GoPro
- ❑ Canon Telephoto
- ❑ Lens cleaning kit
- ❑ Color NEX
- ❑ IR NEX
- ❑ Gimbal Mounting Kit (box)
- ❑ 64 GB Micro SD Cards

  Quantity: _____
- ❑ Micro SD - SD Adaptor Chip
- ❑ 128 GB SD Cards

  Quantity: _____
- ❑ Calibration Targets, White

  Quantity: _____
- ❑ Calibration Targets, Black

  Quantity: _____
- ❑ Gray Card
- ❑ Mounting Screws Box

AIS Lab UAS Ops. Info
- ❑ Preflight checklist
- ❑ CoA
- ❑ Medical Certifications
- ❑ Pilot Certifications

Additional Electronics
- ❑ FARO Scanner Kit
- ❑ iPAD
- ❑ HP Netbook
- ❑ Range Finder
- ❑ External Hard Drive (cords too!)
- ❑ Cell Phone(s)

Tool Kit Supplies
- ❑ Socket Wrench Set
- ❑ Allen Wrench Set
- ❑ Needle-Nose Pliers
- ❑ Hex Driver Set
- ❑ Electrical Tape
- ❑ Packing Tape
- ❑ Duct Tape
- ❑ Extra Velcro straps
- ❑ Zip Ties
- ❑ Rotor Blade wrench (IRIS, Solo)

Field and Safety Gear
- ❑ Backpack (electronics)
- ❑ Backpack (solo)
- ❑ Hardhats

  Quantity: _____
- ❑ Sunscreen
- ❑ Cruising Prism
- ❑ Cruising Vest
- ❑ Rain Gear
- ❑ Jacket
- ❑ Hat/hood
- ❑ Rain Pants
- ❑ Toilet Paper
- ❑ Hand Sanitizer
- ❑ Water Bottle(s)

  Quantity: _____
- ❑ Field boots

  Quantity: _____
- ❑ Sun Hat
- ❑ Fire Extinguisher

  Exp. Date:_____
- ❑ First Aid Kit
- ❑ DBH Tape
- ❑ Tape Measure

Mission Packing Checklist - Page 3
(Day Prior)

Ground Control Gear

- ❏ Bipod
- ❏ Antenna Mast
- ❏ Tornado Antenna
- ❏ R8 Base Antenna/Receiver
- ❏ R8 Rover Antenna/Receiver
- ❏ Trimble GEO XH
- ❏ Antenna Cable
- ❏ Targets
- ❏ Box of staples/stakes
- ❏ Surveying Tripod
- ❏ Rover Bipod
- ❏ Surveying Tape Measure
- ❏ Field Notebook (write-in-the-Rain)
- ❏ Pens, pencils

MATRIX Equipment

- ❏ VHF Radio
- ❏ GCS Laptop
- ❏ 915 Hz Telemetry Radios
- ❏ Spare GPS module
- ❏ Spare 3DR 6 Wire Extension
- ❏ Spare 3DR 5 Wire Extension
- ❏ Matrix Arm Mount. Screws
- ❏ Matrix UAS + Case
- ❏ RC Transmitter
- ❏ GoPro Mounting Bracket
- ❏ Spare Rotor Blades

    Quantity:_____
- ❏ Spare Motors (cw & ccw)

    Quantity:_____

SOLO Equipment

- ❏ UAS Case + Solo
- ❏ Spare Blades

    Quantity:_____
- ❏ Spare Blades

    Quantity:_____
- ❏ Spare Motors (cw & ccw)

    Quantity:_____
- ❏ Hex Tool set
- ❏ Quick Start Guide (Solo and IRIS)
- ❏ Other Manuals

DJI Equipment

- ❏ UAS Case
- ❏ Spare Blades (cw)

    Quantity:_____
- ❏ Spare Blades (ccw)

    Quantity:_____
- ❏ Spare Motors (cw & ccw)

    Quantity:_____
- ❏ Hex Tool set
- ❏ Quick Start Guide
- ❏ Other Manuals

Pre-Mission General Procedure (Before First Flight)

Steps

1. Assemble (as needed) UAS

   -check any and all screws

   -blades correctly mounted (cs and ccw tightened appropriately)

   -legs, arms correctly mounted

   -Gimble (if needed, correctly mounted and balanced?

   -Velcro for battery system in good condition (Matrix)?

2. Turn on GCS and check

3. Boot up Mission Planner Software, check

4. Plug in Telemetry Radio (if applicable)

5. Conduct Safety Briefing

6. Follow pre-flight instructions

Pre-Flight Safety and Hazardous Scenarios Checklist - Page 1

Safety and Observer Brief: For PIC, CO-Pilot and other observers, workers

1. Review 14 CFR 91.113 (next page, for reference)
2. Establish safe distance from aircraft while it's operational

-20m for non-pilot personnel

-150m for unaffiliated people

1. Establish, if necessary, a barrier between non-flight personnel and the aircraft itself
2. Incident reporting procedures **(clarify this with Jon. FAA procedures, as if an incident occurred in a plane?)**
3. Make sure everyone know where fire extinguisher is, and that everyone can easily access and use it
4. Establish location of first aid kit
5. Anyone within 150m required to wear a hard-hat
6. Phone, radio emergency contact procedures established.
7. Discuss pilot-observer distractions. When is it appropriate to talk to PIC, co-pilot? Etc...

Hazardous Situation Response Procedures

1. <u>TX Communications lost</u>
    i. If loitering, then reduce physical distance until control regained
    ii. if in RTL, stand a safe distance from landing location, attempt to regain control
2. <u>Telemetry Communications lost</u>
    i. If loitering, then reduce physical distance until control regained
    ii. if in RTL, stand a safe distance from landing location, attempt to regain control
3. <u>Bird in Vicinity: circling craft</u>
    i. If within **10m** of aircraft: FOR MATRIX

-Climb to max ceiling (400ft) to test whether bird will lose interest in craft

-IF NO: bring aircraft to home position and land.

    ii. If within **10m** of aircraft: FOR SOLO

-Geofence will not allow craft to fly higher than 100m (330ft), therefore:

-bring craft to home position and land

Pre-Flight Safety and Hazardous Scenarios Checklist - Page 2

4. Sudden Loss of Altitude or Crash

    i. Steer aircraft away from any and all personnel and bystanders

    ii. Communicate situation concisely and quickly to all bystanders

    iii. Reduce throttle/slow descent as much as is possible

    iv. If Possible, not last geo position on your GCS

    v. Find and obtain fire extinguisher

    vi. Recover craft. Follow shut-down procedures if craft is still powered on

Right-of-way rules: Except Water Operations

§ 91.113 Right-of-way rules: Except water operations. ***(a) Inapplicability.*** *This section does not apply to the operation of an aircraft on water.*

(b) General. *When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear.*

(c) In distress. *An aircraft in distress has the right-of-way over all other air traffic.*

(d) Converging. *When aircraft of the same category are converging at approximately the same altitude (except head-on, or nearly so), the aircraft to the other's right has the right-of-way. If the aircraft are of different categories—*

(1) A balloon has the right-of-way over any other category of aircraft;

(2) A glider has the right-of-way over an airship, powered parachute, weight-shift-control aircraft, airplane, or rotorcraft.

(3) An airship has the right-of-way over a powered parachute, weight-shift-control aircraft, airplane, or rotorcraft.

However, an aircraft towing or refueling other aircraft has the right-of-way over all other engine-driven aircraft.

(e) Approaching head-on. *When aircraft are approaching each other head-on, or nearly so, each pilot of each aircraft shall alter course to the right.*

(f) Overtaking. *Each aircraft that is being overtaken has the right-of-way and each pilot of an overtaking aircraft shall alter course to the right to pass well clear.*

(g) Landing. *Aircraft, while on final approach to land or while landing, have the right-of-way over other aircraft in flight or operating on the surface, except that they shall not take advantage of this rule to force an aircraft off the runway surface which has already landed and is attempting to make way for an aircraft on final approach. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way, but it shall not take advantage of this rule to cut in front of another which is on final approach to land or to overtake that aircraft.*

[Doc. No. 18334, 54 FR 34294, Aug. 18, 1989, as amended by Amdt. 91-282, 69 FR 44880, July 27, 2004]

Notes