



HOVERFLY

LIVESKY™

TETHER-POWERED UAV



CHECKLIST

Model LSP-6205

Version 1.0

12/31/2020

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6205 CHECKLIST

LIMITATIONS

ENVIRONMENTAL

Cordon Area.....50FT/15M
Power Lines/EMI.....200FT

WEATHER

WIND

TAKEOFF and LANDING.....15MPH
IN FLIGHT SUSTAINED.....25MPH
IN FLIGHT GUSTS, 1 SECOND.....30MPH
AMBIENT TEMPERATURE RANGE.....32F-120F
PRECIPITATION.....4" PER HOUR
DENSITY ALTITUDE (DA).....5,000FT
LIGHTNING.....NOT WITHIN 10 MILES

ON THE MOVE (OTM), IF EQUIPPED

VEHICLE SPEED.....10 MPH
ALTITUDE.....LIMITED to 150 FT
LAUNCH AND LANDING.....STATIONARY
VISUAL OBSERVER.....REQUIRED

SYSTEM REQUIREMENTS

INPUT POWER.....90-240VAC at 1500 WATTS
GPS NAVIGATION.....MINIMUM 10 SATELLITES
GPS MANIFEST UPDATE.....15 MINUTES

WARNING: IF SYSTEM HAS MOVED OVER 100 MILES; ALLOW GPS ALMANAC TO UPDATE

BATTERY..... PRECONDITIONED TEMPERATURE, AS REQUIRED

MAINTENANCE

TETHER KIT

TETHER UNREEL/INSPECT.....25 HOURS
BATTERY.....EVERY 3 MONTHS OF STORAGE CHARGE FOR 6 HOURS
DEHUMIDIFY, AS REQUIRED.....4-6 HOURS

AIRCRAFT

BATTERY: CHARGER SETTINGS (HOVERFLY SUPPLIED ONLY)6S/1.3A/22.2V
BOOM ARM ASSEMBLY (REPLACE).....1500 HOURS

6205 CHECKLIST

NORMAL CHECKLIST

NOTE: An operating procedure, condition, or statement, which is essential to highlight.

CAUTION: An operating procedure, practice, condition, or statement, which if not strictly observed, could result in damage to or destruction of equipment, loss of data, loss of mission effectiveness, or long-term health hazards to personnel.

WARNING: An operating procedure, practice, or statement, which, if not correctly followed, could result in personal injury or loss of life.

System Unpack

1. Two (2) System Transit Cases.....Identify
2. Ethernet, Power Cables..... Identify
3. Controllers.....Identify
4. Tether Kit (TK)Remove
5. Landing Ring Remove and Install on TK
6. AircraftRemove and Inspect
7. PayloadRemove/Install

CAUTION: Visually Inspect all equipment prior to flight, and do not operate if damage is visible to propellers or any part of the LiveSky System

Pre-Flight (Tether Kit)

1. Drains..... Verify Clear
2. Screws/Latches.....Verify Secure
3. Tether Kit.....Set Level/Secure
4. Ground GPS.....Flip up and verify unobstructed view of the sky

Pre-Flight (Aircraft)

1. Propellers.....Verify correct configuration
2. Battery..... Inspect/Install

WARNING: Damaged or puffed batteries can lead to fire or even explosion and will cause personal injury; do not fly with a damaged battery

6205 CHECKLIST

CAUTION: Observe all safety regarding LIPO batteries, damaged or puffed batteries can lead to catastrophic failure or injury to personnel

CAUTION:

If ambient temperatures are below 32° F, pre-heat LiPo safety battery to 40°F prior to launch. LiPo batteries rapidly lose capacity below 32°F. Even if the voltage reads above 24.5V, capacity will be diminished significantly in cold temperatures and the safety landing battery may fail.

If main or tether power is lost, while safety landing battery is compromised, aircraft will lose all power and fall to the ground, causing damage or destruction of the aircraft. Above 120F, System may Auto-Land/Self Protect

3. Check Screws Top Fuselage
4. Craft..... Flip over
5. Check Screws..... Bottom Fuselage
6. ATS ConeVerify Screws Secure
7. ATS Gimbal.....Verify Free Movement
8. Fan..... Inspect
9. Sonar..... Verify Cover
10. Tether Connector.....Verify

Setup

1. Controller, Ethernet, Power Cables..... Remove
2. Power Switches..... OFF
3. Tether Connector..... Connect to Craft
4. Craft..... Place in Ring

Note: To prevent damage, carefully guide the tether as it reels in

5. Ethernet..... Connect to Internal Port
6. AC Power..... Connect to TK THEN to 1500W Power Supply
7. Cordon Area.....Establish

Note: System requirement: 50ft/15M radius

6205 CHECKLIST

Power Up

1. Power Source.....Check/Verify (1500W)
2. Power..... On
3. Gimbal (If Equipped).....Verify pointing forward
4. Safe Distance..... Attain
5. Connect.....Via GUI
6. Video.....Verify
7. Area Clear..... Verify

Note: System requirement: 50ft/15M radius

8. GUI Status Indications.....(Four Green)....Check
9. "Ready to ARM"Verify

Launch

1. Limitation.....Verify in limits
2. Craft..... ARM
3. Propellers.....Verify Rotation
4. Area Clear..... Verify

Note: System requirement: 50ft/15M radius

5. Craft.....Launch
6. Climb.....Observe for Anomalies
 - a. IF Halting.....Press **LAND**
 - b. IF Uncontrolled flight will result in harm to personnel or property**E-STOP**

Warning: Emergency stop function stops all motor rotation but does not kill power to the aircraft. The aircraft WILL fall to the ground. Ensure area is clear prior to executing E-STOP

WARNING: Tether will still be powered after E-STOP is initiated. If the Tether has been cut, turn off power before handling tether to avoid high voltage shock

Inflight

1. System..... Monitor/Scan

6205 CHECKLIST

Landing

1. Cordon Area..... Verify Clear

Note: System requirement: 50ft/15M radius

2. Limitations..... Verify within limits
3. Land..... Initiate
4. Descent.....Observe for Anomalies
 - a. IF Abort..... **HALT**
 - b. IF Uncontrolled flight will result in harm to personnel or property**E-STOP**

WARNING: Emergency stop function stops all motor rotation but does not kill power to the aircraft. The aircraft WILL fall to the ground. Ensure the area is clear PRIOR to executing E-STOP

WARNING: Tether will still be powered after E-STOP is initiated. If the Tether has been cut, turn off power before handling tether to avoid high voltage shock

5. Landing Complete.....Verify "Ready to Arm"

Power Down

1. Area Clear..... Prior to approaching
2. Power off....."CRAFT" and "REEL" switches off
3. System.....Inspect/prep for next flight

System Pack-up

1. Perform System Unpack in reverse order

6205 CHECKLIST

EMERGENCY CHECKLIST

NOTE: IF ON THE MOVE (OTM), Each Emergency Procedure SHALL begin with stopping the Ground Vehicle

1. **INDICATION:** ANY anomaly observed during the takeoff sequence and/or to prevent injury or damage to personnel or property
ABORT TAKEOFF.....LAND
2. **INDICATION:** ANY anomaly observed during the takeoff sequence below 15ft and/or to prevent injury or damage to personnel or property
ABORT LANDING BELOW 15FT.....HALT-REPOSITION-LAND
 1. Allow the aircraft time to climb back to MINIMUM ALTITUDE (15M) to a stabilized hover
 2. Reposition the aircraft to center over the ring
 3. Reinitiate the LAND command
 4. Repeat, as required
3. **INDICATION:** Aircraft begins moving in one direction, without being commanded to do so.
UNCOMMANDED FLYAWAY.....LAND
 1. After the aircraft begins to return press HALT
 2. Use D-pad or GUI to reposition over the landing ring
 3. Reinitiate LAND command
 4. Repeat, as required
4. **INDICATION:** The aircraft begins to spin rapidly; un-commanded
UNCOMMANDED ROTATION/SPIN.....LAND and AREA CLEAR
 1. Visually observe that the rotation has ceased, and landing has begun
5. **INDICATION:** Aircraft begins flying in a large un-commanded circular pattern
MAGNETOMETER FAILURE/EMI.....HALT-LAND-AREA CLEAR
 1. Repeat HALT and LAND commands, as required
 2. Most likely to occur at lower altitudes, recommend flight above Minimum altitude (15FT/30FT, as equipped) for best performance.
6. **INDICATION:** Aircraft is unable to climb to a commanded altitude and tether is not reeling out
TETHER LOCKUP.....LAND and AREA CLEAR
 1. Visually observe that the aircraft is going to land in the ring
 2. Use **ABORT LANDING BELOW 15FT**, as required

6205 CHECKLIST

7. **INDICATION:** User cannot control aircraft and/or data fails to update on the GUI
COMMUNICATION FAILURE.....AREA CLEAR AND ACCOMPLISH STEPS BELOW
1. Unplug and reconnect ethernet cable that goes to the control tablet or computer
 2. Close and reopen the control GUI, then attempt to reconnect to the air vehicle
 3. If unsuccessful, continue. Otherwise resume normal operations
 4. Unplug Ethernet cable from control tablet or computer, leave cable unplugged
 5. Immediately clear the area and wait for the landing sequence to complete
 6. Disconnect power if observed that the craft will not land
8. **INDICATION:** Any status indicators on the GUI are **RED** or the craft is observed to be descending un-commanded.
UNCOMMANDED LANDING.....STOP GROUND VEHICLE
1. Observe for anomalies
 2. IF aircraft is not going to land in the ring**POWER OFF**

SYSTEM FAILSAFE FEATURES

CAUTION: Communication Failsafe: If communication is interrupted with the controller for 60 seconds or as user defined, the Aircraft will Autoland. If communication fails between the Tether Kit (TK) and aircraft for 5 seconds, the Aircraft will Autoland. Ensure the area is clear

CAUTION: Battery Landing Failsafe: If the Tether Kit (TK) power is interrupted or battery falls below 24.0V. The Aircraft will Autoland. Ensure the area is clear

CAUTION: Power limit descent feature will automatically descend the aircraft in 10M increments to 10M minimum altitude IF the aircraft senses that it is at its Power Limit Line. This feature is strictly to protect the system and not to be used to determine max operable altitude or in lieu of the performance charts.

WARNING: Precision Land Disabled: ATS IMU failure detected, Aircraft will no precision land. Exercise extreme caution if this indication is seen as the craft will descend in place and will NOT land in the ring.

6205 CHECKLIST

PERFORMANCE CHARTS

Purpose – The LiveSky performance charts are designed to assist the operator determine whether the conditions allow for safe operation of the aircraft.

Requirements – To use the chart the operator will need to know the following

- Wind Speed
- Desired Flight Altitude
- Payload Weight (1.6lbs Max)
- Density Altitude

Explanation:

STEP 1: Determine the desired mission altitude and select the appropriate chart. 50FT, 100FT, 150FT, 200FT

STEP 2. Determine Density Altitude and move to that position on the X axis.

STEP 3. Determine Wind Speed and move straight up from the position determined in the previous step until the Wind Speed line is intersected.

STEP 4. If the final point is above the **Power Limit Line**, then the planned mission is outside the craft limits. If it is below the **Power Limit Line**, the planned mission is within the craft limits.

NOTE: If any one chart shows out of limits; consult the next lower altitude chart, as a lower altitude may allow a flight within limits.

CAUTION: **Power limit descent feature** will automatically descend the aircraft in 10M increments to 10M minimum altitude **IF** the aircraft senses that it is at its Power Limit Line. This feature is strictly to protect the system and not to be used to determine max operable altitude or in lieu of the performance charts of this sub section.

6205 CHECKLIST

EXAMPLE 1: Out of Limits

STEP 1: Determine the desired mission altitude and select the appropriate chart. 50FT, 100FT, 150FT, 200FT

Example: 200FT

STEP 2. Determine Density Altitude and move to that position on the X axis.

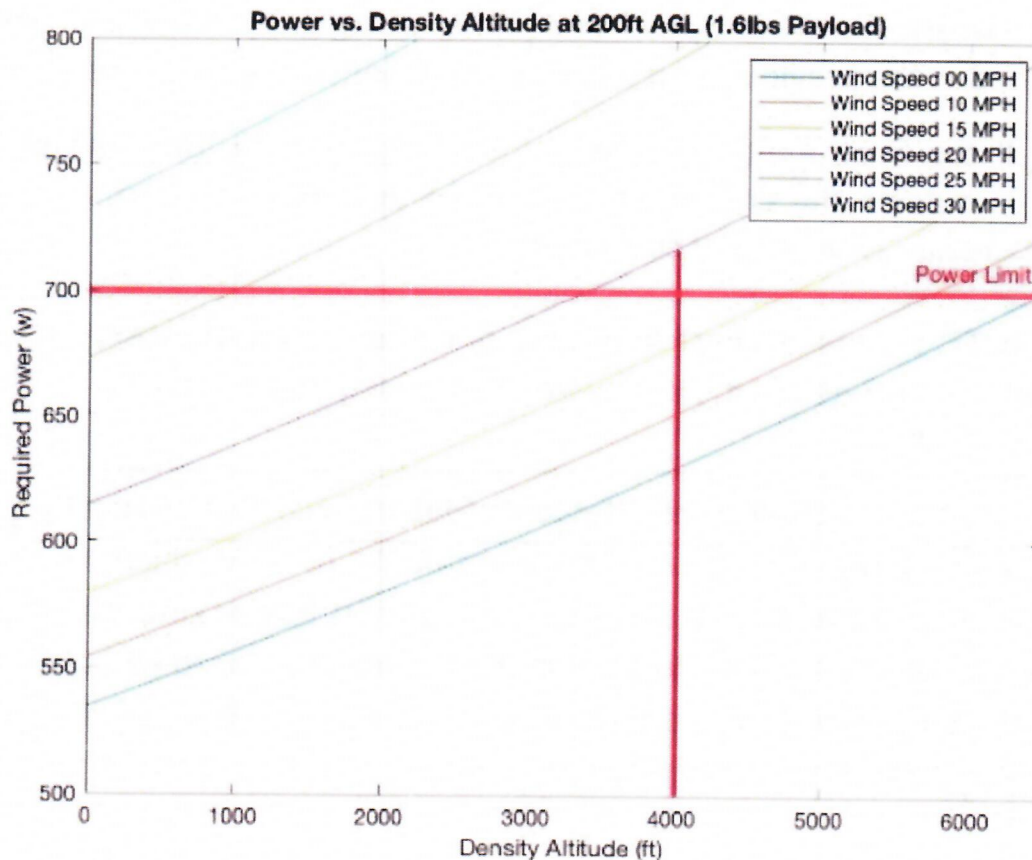
Example: 4,000FT

STEP 3. Determine Wind Speed and move straight up from the position determined in the previous step until the Wind Speed line is intersected.

Example: 20 MPH

STEP 4. If the final point is above the **Power Limit Line**, then the planned mission is outside the craft limits. If it is below the **Power Limit Line**, the planned mission is within the craft limits.

Example: Above RED Power Limit Line, Out of Limits



6205 CHECKLIST

EXAMPLE 2: Within Limits

STEP 1: Determine the desired mission altitude and select the appropriate chart.
50FT, 100FT, 150FT, 200FT

Example: 150FT Chart

STEP 2: Determine Density Altitude and move to that position on the X axis.

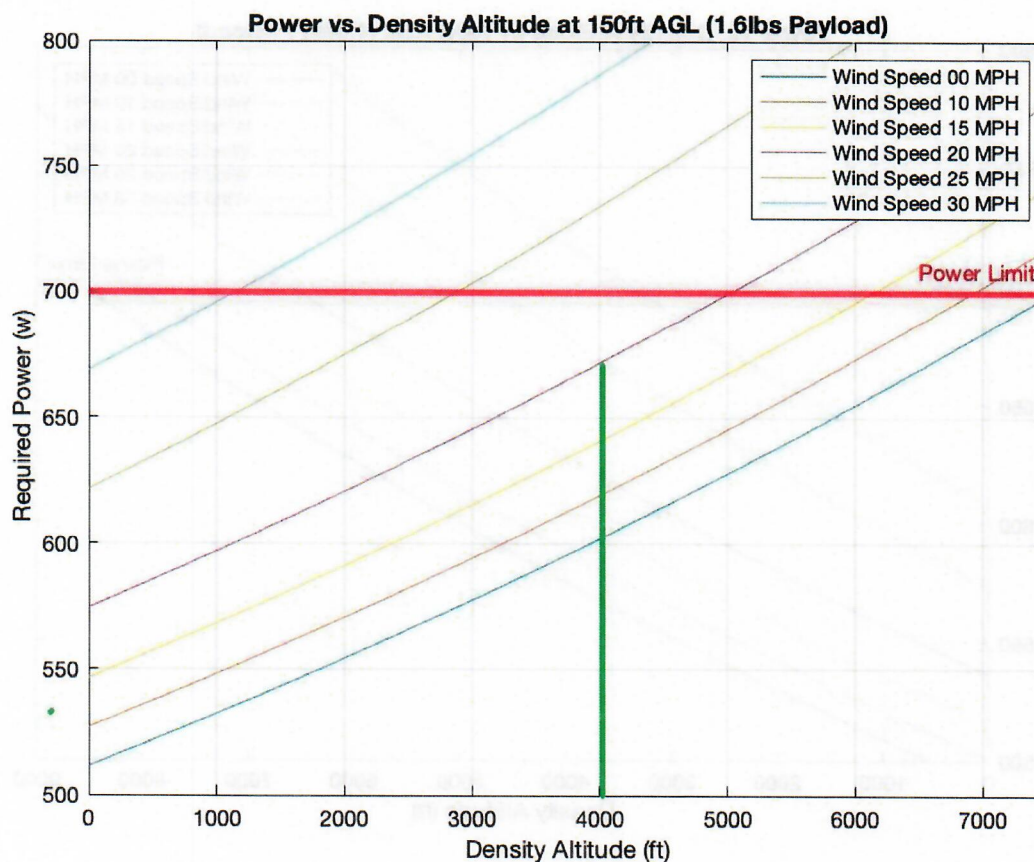
Example: 4,000FT

STEP 3: Determine Wind Speed and move straight up from the position determined in the previous step until the Wind Speed line is intersected.

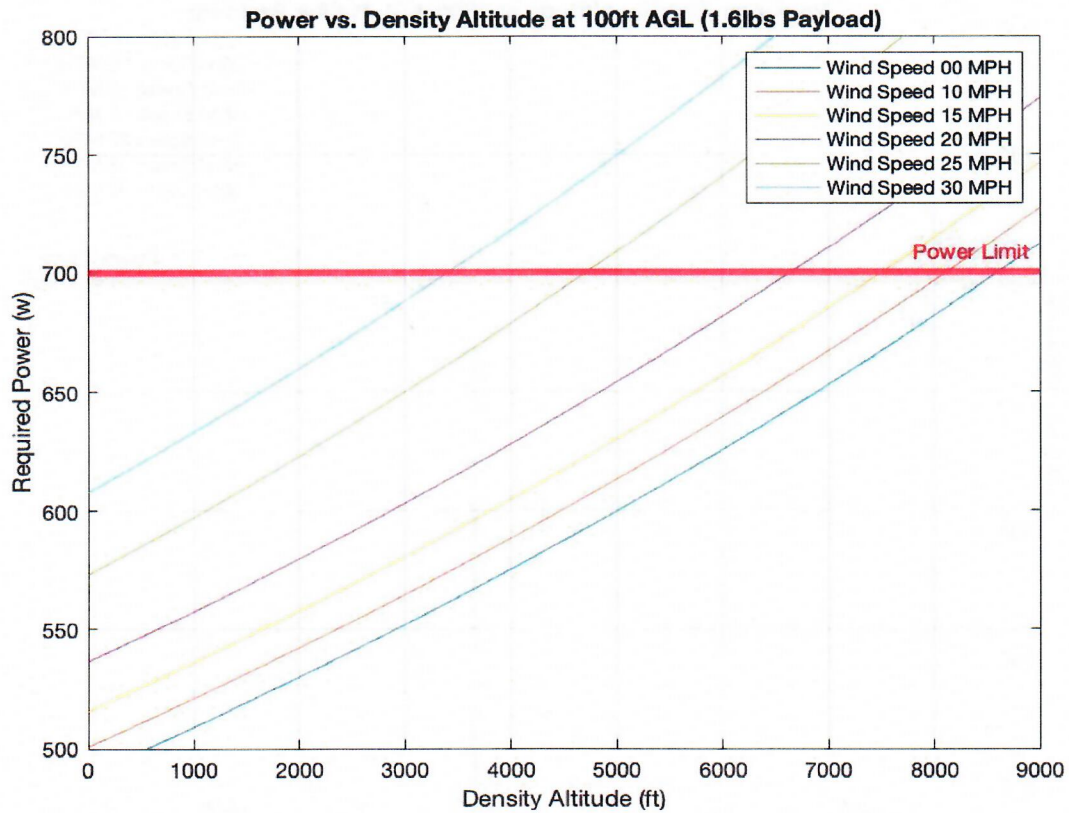
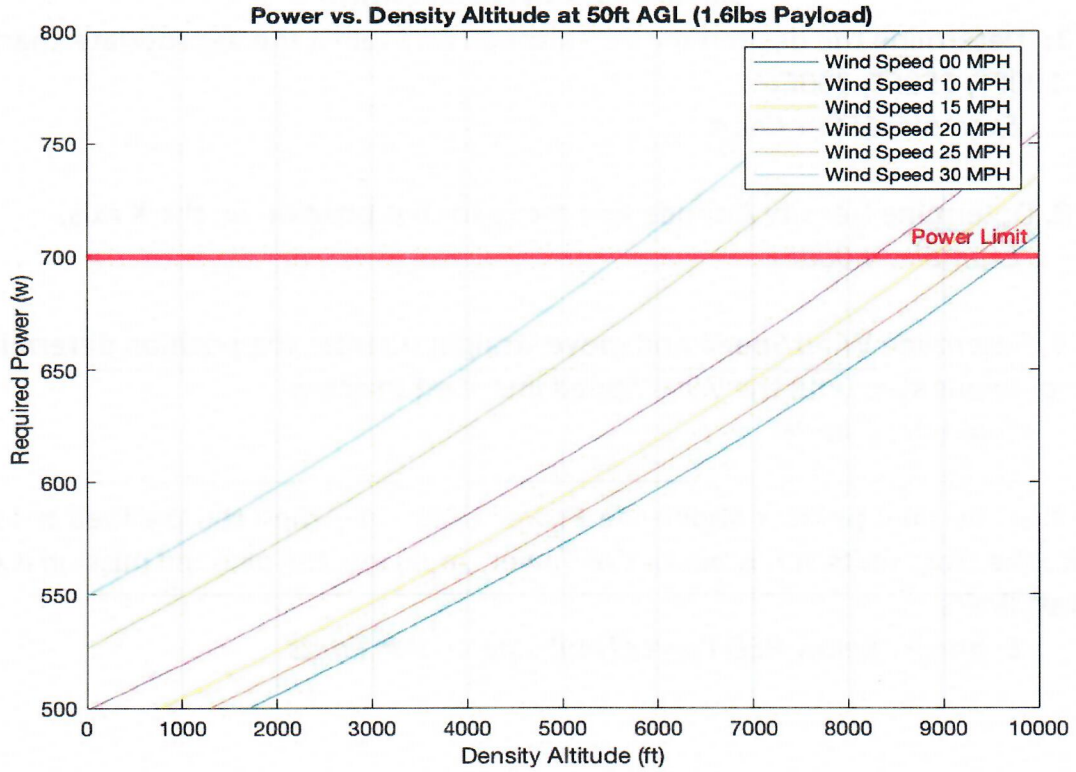
Example: 20MPH

STEP 4: If the final point is above the **Power Limit Line**, then the planned mission is outside the craft limits. If it is below the **Power Limit Line**, the planned mission is within the craft limits.

Example: Below RED Power Limit Line; within limits



6205 CHECKLIST



6205 CHECKLIST

