

# Tethered UAS (T-UAS) Solves Persistence Problem

- **LiveSky flies persistently using power over the tether**
- **Can fly for days & weeks at a time without operator input**
- **Does not require specialist operator pilot, airspace management, or mission support other than constant source of vehicle, vessel, or mains power**



# Hoverfly LiveSky 6205 SENTRY TsUAS

- **Unlimited EO/IR and Comms**
- **Retrans Extends MANET Nets**
- **EO/IR for Security and Fires**
- **Tactically Repositionable**
- **Mobile On-The-Move Ops**
- **GPS Denied Operation**
- **Less than 2KW Power**
- **Non-Specialist 4-hour Training**
- **Integrates with Company and Higher Level Assets**
- **ToughBook/Pad Controller**
- **Enterprise Networkability**
- **Remote TOC Control and Long Term Unattended Operation**





# 5<sup>th</sup> Generation LiveSky 6205 Mobility



2017

**Secure Comms and  
Dual Video Over Tether – No RF Signals**

**Fully Autonomous Flight  
Dismounted and On-the-Move Operations**

**Programmable Looks and Sweeps  
Targeting Capability and Outputs  
Enterprise Networkability  
Remote Control Operations**

**1 Day Training Proficiency**

**NOT FOR PUBLIC RELEASE**



2018

**200' (60m) Altitude  
1KG Payload**

**Integrated on MRZR/Polaris, MUTT,  
Stryker...CV90 pending**

**GD MUTT**

# LiveSky SENTRY LSP-6205 Background and Capabilities



- COTS/NDI Commercial Item developed at private expense
- Fifth generation tether-powered sUAS built on long history of innovation with growing capability and mission set
- TRL9 and designed for MIL-STD-810 harsh environments
- Dismounted man portable, or fixed-base, and vehicle On-the-Move configurations...all with common components
- SkyBox deployment container suitable for permanent installs
- Local or remote (network) control from any TOC / SOC with enterprise compatibility to higher echelons or cloud
- Multi-payload capability
  - EO/IR (ITAR) sensor payload with simultaneous h.264 streams
  - Radios, MANET, MiMo, WiFi payloads
  - Special Payloads
- 1 year extendable warranty with support plans available

**LIVE SKY**  
TETHER-POWERED UAV



## PERSISTENT TETHER-POWERED sUAS

- Chemical Facilities
- Data Centers
- Search and Rescue
- Power Plants
- Solar Farms
- Sporting Events and Stadiums
- Critical Infrastructure
- Border Security
- Schools and Corporate Campuses

The LiveSky is a portable, persistent aerial imaging solution ideal for providing government, DoD, first responders, security professionals, and media, and with instant aerial imagery from up to 200 feet above launch level. With broadcast quality video, 10-times optical zoom and optional thermal imagery, the LiveSky can stay aloft indefinitely, providing persistent video coverage using Hoverfly's power-tether and video-over-tether technology. The tether provides endless power and provides additional safety by giving the LiveSky a physical connection to the ground, with the system always under positive control.



### FEATURES

#### Livesky Configuration and Advantages

- Ruggedized quadcopter with ground/vehicle power-over-tether kit
- Unlimited flight time with universal power input 120VAC 10A/220VAC 50/60Hz
- Wide-area coverage with 200 foot length tether
- Full 1080p 60fps HD network video h.264
- EO and EO/IR stabilized gimbal payloads with 360 degree coverage and 10x optical zoom
- Infrared camera option with 640x512 30fps and network video
- Communications option Persistent Systems MPUS MANAT radio
- Local user controller or remote control over network
- Easy to transport, easy to setup, quick to deploy
- Vehicle mounting and "On-The-Move" mode available
- Weather proof enclosure for temporary or permanent installation

#### Automatic Operation and Enhanced Safety

- Advanced flight control technology with auto takeoff/landing
- Backup battery for emergency landing in case of power loss
- Continuous in-flight diagnostics and monitoring
- .NET SDK and REST API with integration support available
- Impact resistant design, ruggedized carbon and ABS construction

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LTS-6205\_Adj2018

# LiveSky T-sUAS System SKU: LSP-6205-EOIR30

## Configuration

### System Includes:

LiveSky 6205  
EO/IR Payload  
Tether Kit  
Including Landing Ring  
Controller  
ToughPad/PC/Network



### Options Include: (not shown)

- **MANET Radio Plug-in Payloads** (Persistent Systems integration pending)
- **Software Integration Kit for Network Operation**
- **Mobile and Fixed Enclosures** for Vehicle or Permanent Installation



# LiveSky SENTRY Configuration

- HD Video and Thermal Sensors
- Secure Video and Command and Control Transport over Tether with no RF radio transmission
- Advanced Tether Sensor for Precision Take-off / Landing
- Non-GPS Operation Capability
- Advanced Tether Kit with proprietary automatic tether spooler and flight management computer with Ethernet and external software control
- Open SDK, Open Payload Interface
- Dual Video (EO and IR Simultaneous) Streaming Output
- 50Mb/s Tether Network



# Advanced Sensing from 200' (60M) Above the AO

## HoverView EO/IR

- > 5,000,000 sft 24/7 coverage
- Co-boresighted advanced EO and IR imagers in weather proof removable payload
- 120x Zoom HD Camera 1080p at 30fps, low lux
- 8x Digital FLIR Thermal Sensor (ITAR Restricted) with color pallet selection
- Provisions for future laser
- Same Open Payload Interface as BigSky with Swappable Payloads between platforms



# Open Payload Interface = Future Proof Payloads

## Hoverfly OpenPayload ICD

- Open Payload Interface Supports Rapid Development of New Payloads to Extend Missions and Asset Lifetime
- Supports 1KG of cargo / payload weight
- Allows Access to Power, Hoverfly Tether System Ethernet, h.264 video streams, Flight Management System, Operator GUI, Metadata and More
- ICD available under NDA to 3<sup>rd</sup> Parties
- EO/IR MANET, MIMO, WIFI Nets and Retrans Payloads.





# Unlimited ISR and Comms with LiveSky

LiveSky Model LSP-6205  
Tether Powered Secure TsUaS  
Swappable EO/IR or MPU5





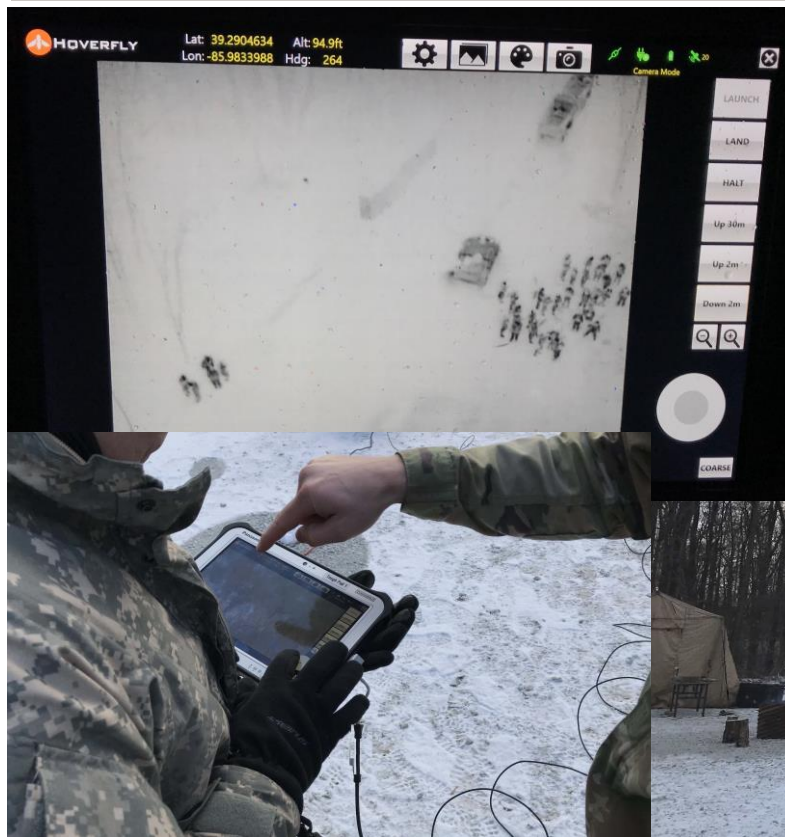
# FOB ISR and Comms with LiveSky



LiveSky Model LSP-6205  
Two Payload Capacity  
TW-850 and EO/IR shown



# Day/Night EO/IR and Network Retrans





# Intuitive LiveSky System Controller

- **HD 12" Rugged Tablet PC**
- **IP-65 Waterproof**
- **MIL-STD-810 Shock & Drop**
- **HDMI and h.264 Outputs**
- **Connects to TK via Ethernet**
- **Battery Operation** (has hot swap capability) **or Wired Power**
- **All-Season Fan-less Cooling**
- **Docking Station/Charging Station and Vehicle Mounts**



# Non Specialist Controls (proficiency with 2 hours of training)

- Touch Screen Controls Operate LiveSky System
- Simple Operation: ARM, LAUNCH/LAND, UP, DOWN
- Touch Joystick Instantly Translates Camera (Finger Moves Video At a Speed to Match Finger Distance from Joystick Neutral)
- Video Sources Displayed Full Screen and PIPs
- Step and Continuous Zoom Functions
- Snapshot Image Recording
- Selectable IR Color Palettes
- Altitude Adjustment Buttons (+30m, +5m, +2m)
- Translate LiveSky in Flight Cone Reticule Overlay
- Selectable Meta Data Display Overlay
- Other Advanced Control and Display Features
- ARE THERE RADIO CONTROLS THAT SHOULD / COULD BE INTEGRATED OVER HOVERFLY TETHER



# All Weather Enclosures

## LiveSky Dismounted



## SkyBox – Mobile



## SkyBox – Covered



Roll Top Cover Bolt-on Option

**Existing TRL9 Components in a New Form Factor**



# LiveSky SkyBox Covered Enclosure

- **Designed for Fixed Installation and Mobile Operation in Vehicles and Vessels - All Weather Operation**
- **Manned or Unattended Operation**
- **Remote Control over Networks**
- **Power Less than 2KW from mains or vehicle inverter (120VAC @15A)**
- **Fits small and full-size pick-up trucks**
  - **Operate from the inside cab**
  - **Covert deployment / operation**
  - **Works on-the-move**
- **Shipping late 2QCY19**



**LiveSky 6205 in Outdoor / Vehicle / Vessel Enclosure**

# Covert Mission Solutions



SkyBox Integration in Pick Up Truck Shell



# Covert Installation Mobile ISR

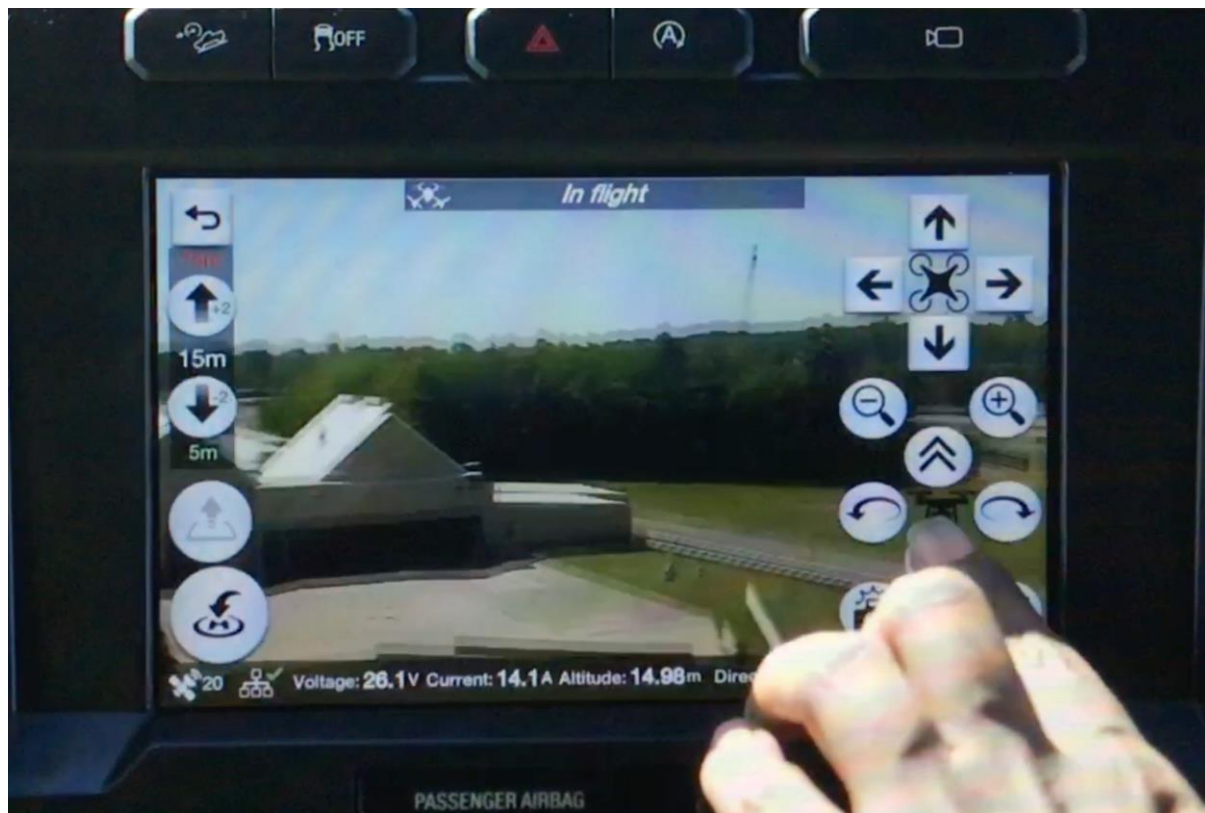
- Camper shells can accept SkyBox
- Bed installations made easy with SkyBox – Covered configuration
- Requires 2KW vehicle inverter
- GUI can be ToughBook/Pad or integrated into vehicle operating system
- Integration using Hoverfly SDK





# Embedded Vehicle Control using SDK

- Easy embeddable objects
- Open GUI widgets
- JAVA,C SDK...REST API
- Combined with Network Map, Enterprise Control, and Open Hot Shoe ICD, makes new Network Capabilities and Payloads Easy to Add and Integrate



# Custom GUIs are Easy to Create




# Standard: Remote Video Format Example


**Vehicle**  
LAT: 408301812  
LON: -738529422

**Target**  
LAT: 411691040  
LON: -742986304

**Vehicle Mode:** CAMERA MODE

**Message:** barometer calibration complete  
Calibrating barometer  
Calibrating barometer

 **HOVERFLY**




**Flight Duration**  
1:16:15


**Altitude (Feet)**  
200.0

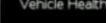
**Heading (Deg)**  
300

**Camera Angle (Deg)**  
45.9

**Vehicle Sat**  
  
4-8-12-16-20

**HDOP**  
109

**Tether Health**  


**Vehicle Health**  




# Logistics and Deployment Summary



- LiveSky AUGVW: 9.0 lbs
- System Weight: 52.5 lbs
- Shipping Weight: 48 lbs (LiveSky) + 71 lbs (ATK)
- Shipping Size: 37"x28"x17" and 22"x23"x24"
- Man Portability: Yes, one man lift
- Storage Temp: -20 to 70 degrees C

- LZ Required: Min 68" circular clear area
- Set Up Time: < 6 minutes with training
- Time to Altitude: < 1 minutes
- Descent Time: < 3 minutes dependent on winds
- Landing Controls: Fully Autonomous, User HALT
- Pack Out Time: < 6 minutes with training

- External Connections: Ethernet, cable included
- Power Connection: 108-120VAC, cable included
- Power Required: < 12A < 1,400 Watts
- Power Compatibility: 2 KW Standard Generator
- Vehicle Power: 2 KW Inverter Power

**Fast Deployment and Pack Out, Autonomous Precision Landing (non-GPS), Unattended / Networkable Operation, No Piloting Training**

# LiveSky Pricing and Delivery

- **LiveSky 6205 SENTRY Series of Systems**
  - **Dismounted LSP-6205-EOIR75 (NON ITAR)**  
**< \$80,000 USD, 8 weeks ARO**
  - **SkyBox – Mobile with LSP-6205-EOIR75 (NON ITAR)**  
**< \$92,000 USD 12 weeks ARO**
  - **SkyBox – Covered with LSP-6205-EOIR75 (NON ITAR)**  
**< \$94,000 12 weeks ARO**
- **Prices Include ToughPad Controller**
- **Includes 1 Year Warranty**
- **Extended Warranty and Support Available**



# Made in U.S.A. LiveSky and BigSky



- 2.2lb (1KG) Payload
- 200' (60M) Altitude
- Single Payload Bay
- Aux Payload Deck

- 8.8lb (4KG) Payload
- 400' (120M) Altitude

- Dual Payload Bays
- Other Payload Interfaces

- Folding Frame Design
- MIL-STD-810 Pending

## Common Components and Software for Simplified Operations, Logistics, Maintenance, Training



- Same Flight Management Computer
- Same Controller Options
- Common Payload Interfaces
- Same Precision Landing Sensor (ATS)
- Same Enterprise Software Dev Kit
- Common Scalable Power System Components
- Common Safety, Built-in-Test, and Monitoring Systems

**Both LiveSky and BigSky have US Army Airworthiness Release**



# Hoverfly LiveSky / BigSky Solutions, Capes, Key Differentiators



<p>40" tip to tip, 9 lbs MGWV</p>  <p><b>LiveSky SENTRY 6205</b></p>	<p><b>LiveSky Solution</b></p> <ul style="list-style-type: none"> <li>• 200' Day/Night ISR</li> <li>• Single Channel / Band Communications Relay</li> <li>• Public Safety</li> <li>• Temporary, Mobile, &amp; Fixed-base Security</li> <li>• SkyBox Enclosure for Permanent Vehicle or Building Installation</li> </ul>	<p><b>Key Capabilities</b></p> <ul style="list-style-type: none"> <li>• No RF Signals for Command/Control or Video...All are Sent over Secure Tether Network</li> <li>• Operates from the Ground, Buildings, Mobile Platforms</li> <li>• Can Operate "On-the-Move" from Moving Platforms using Follow-Me Capability</li> <li>• Does Not Require GPS (TRL8)</li> <li>• No Pilot Required – Operator Training Proficiency in 4 Hrs</li> <li>• Executes Programmable Looks, Sweeps, and Stares using Software Dev Kit (SDK)</li> </ul>	<p><b>Key Differentiators</b></p> <ul style="list-style-type: none"> <li>• &lt; Six (6) Minute Set-Up Time</li> <li>• Fully Autonomous Operation</li> <li>• Tactically Repositionable</li> <li>• Low Power Required &lt; 2KW Compatible with Vehicle Inverters and Small Generators</li> <li>• All Weather Per MIL-STD-810</li> <li>• Low Procurement and Extended Warranty Cost</li> </ul>
<p>60" tip to tip, 24 lbs MGWV</p>  <p><b>BigSky 7202</b></p>	<p><b>BigSky Solution</b></p> <ul style="list-style-type: none"> <li>• 400' Day/Night ISR</li> <li>• Multi-Channel, Multi-Band Comms and Relay Payloads</li> <li>• Special Payload Integration Capability</li> </ul>	<p><b>Key Capabilities</b></p> <ul style="list-style-type: none"> <li>• Targeting Capabilities</li> <li>• Has Open Interface Payload Hot Shoe for 3<sup>rd</sup> Party Devs</li> <li>• Can Fly Using Local Control or Network Control with SDK</li> <li>• System is in Two Lightweight Man-Portable Transit Cases</li> </ul>	<p><b>Key Differentiators</b></p> <ul style="list-style-type: none"> <li>• &lt; Ten (10) Minute Set-Up Time</li> <li>• Fully Autonomous Operation</li> <li>• Flies Multiple Payloads Simultaneously</li> <li>• Low Power Required &lt; 3KW</li> <li>• Compatible with NATO Generators and Receptacle</li> </ul>
<p><b>Common Components and Software for Simplified Manufacturing, Customer Operations, Logistics, Maintenance, Training</b></p>			

# BigSky Gen II TBS-7202 Made in Orlando, FL U.S.A



BigSky at 400' with Auxiliary Fiber Downlink

- **4kg (8.8lb) payload**
- **Dual payload bays**
- **400' altitude**
- **Precision autonomous take-off and landing**
- **Mobility and OTM operation**
- **Common GUI, SDK, and control set with LiveSky**
- **Common Flight Management System with LiveSky**





# For Further Information

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- **COTS / NDI LiveSky is shipping 8 Weeks ARO**