# **Tethered UAS (T-UAS) Solves Persistence Problem**



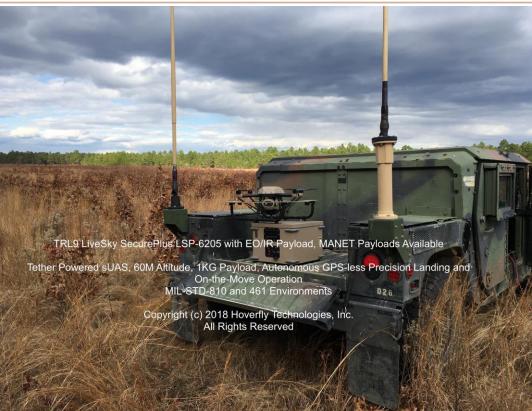
- LiveSky flys persistently using power over the tether
- Can fly for days & weeks at a time without operator input
- Does not require specialist operator pilot, airspace management, or mission support other than constant source of vehicle, vessel, or mains power



# 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





Secure Comms and Dual Video Over Tether – No RF Signals

- MAN

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** 



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

NOT FOR PUBLIC RELEASE

A State La general a series

GD MUTT

# LiveSky SENTRY LSP-6205 Background and Capabilities



HOVERFLY

- 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







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
- 40	• Ruggedized quadcopter with ground/vehicle power-over-tether kit
and the second s	Unlimited flight time with universal power input 120VAC
Sec.	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
and Service 17	coverage and 10x optical zoom
No. of Concession, Name	<ul> <li>Infrared camera option with 640x512 30fps and network video</li> </ul>
	Communications option Persistent Systems MPU5 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
A States	Automatic Operation and Enhanced Safety
A Carton B	<ul> <li>Advanced flight control technology with auto takeoff/landing</li> </ul>
	<ul> <li>Backup battery for emergency landing in case of power loss</li> </ul>
	<ul> <li>Continuous in-flight diagnostics and monitoring</li> </ul>
	.NET SDK and REST API with integration support available
	Impact resistant design, ruggedized carbon and ABS construction
	102.005.1502

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





### 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.



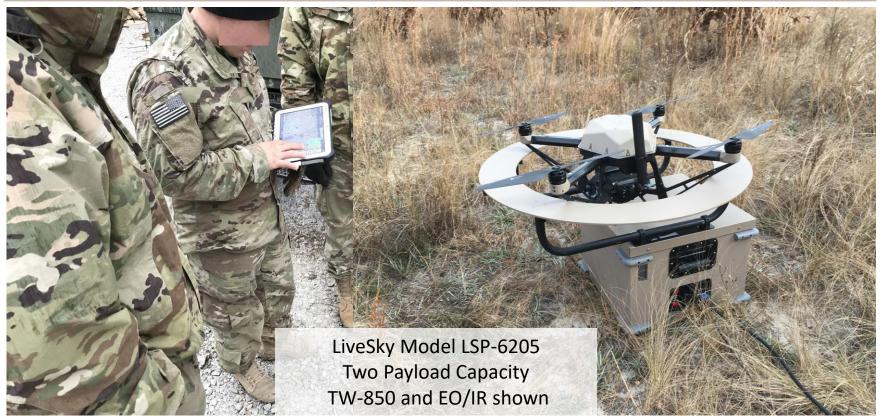
# **Unlimited ISR and Comms with LiveSky**





# FOB ISR and Comms with LiveSky





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# 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)

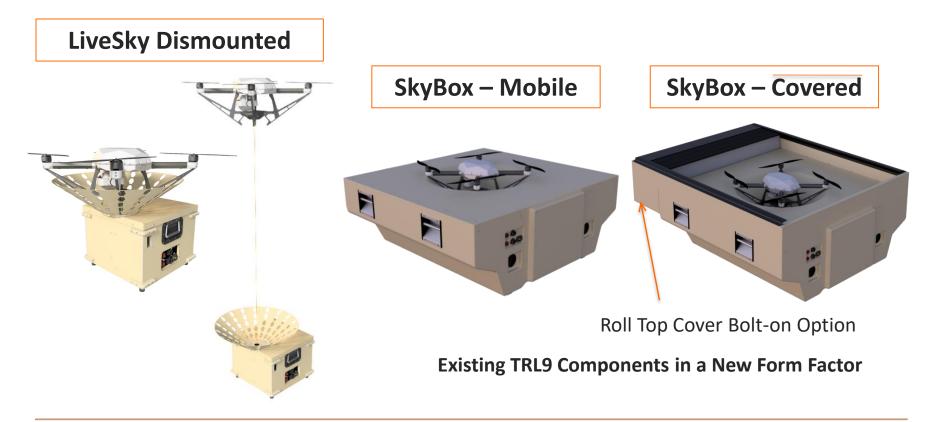


- Touch Screen Controls Operate LiveSky System
- Simple Operation: ARM, LAUNCH/LAND, UP, DOWN
- Touch Joystick Instantly Translates Camera (Finger Moves Video At a Speed to Match Finger Distance from Joystick Neutral)
- Video Sources Displayed Full Screen and PIPs
- Step and Continuous Zoom Functions
- Snapshot Image Recording
- Selectable IR Color Palettes
- Altitude Adjustment Buttons (+30m, +5m, +2m)
- Translate LiveSky in Flight Cone Reticle 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**





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#### Mobile Operation in Vehicles and Vessels - All Weather Operation

LiveSky SkyBox Covered Enclosure

Manned or Unattended Operation

**Designed for Fixed Installation and** 

- 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

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## **Covert Mission Solutions**





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### **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**

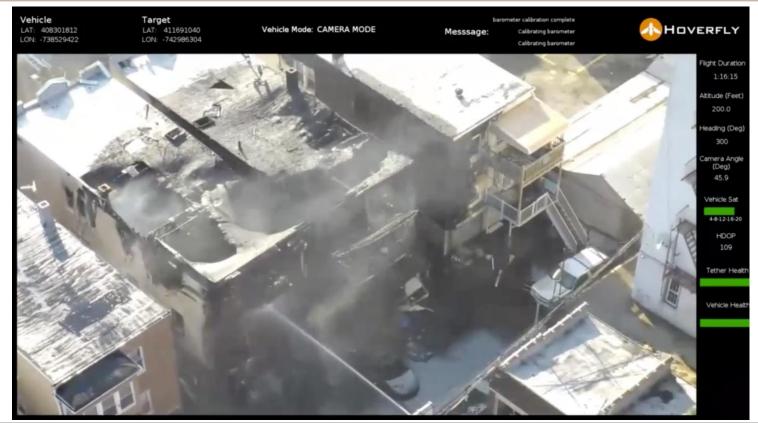
HOVERFLY Proprietary Information



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## Standard: Remote Video Format Example





## **Logistics and Deployment Summary**





<ul> <li>LiveSky AUGVW:</li> <li>System Weight:</li> <li>Shipping Weight:</li> <li>Shipping Size:</li> <li>Man Portability:</li> <li>Storage Temp:</li> </ul>	9.0 lbs 52.5 lbs 48 lbs (LiveSky) + 71 lbs (ATK) 37"x28"x17" and 22"x23"x24" Yes, one man lift -20 to 70 degrees C
<ul> <li>LZ Required:</li> <li>Set Up Time:</li> <li>Time to Altitude:</li> <li>Descent Time:</li> <li>Landing Controls:</li> <li>Pack Out Time:</li> </ul>	Min 68" circular clear area < 6 minutes with training < 1 minutes < 3 minutes dependent on winds Fully Autonomous, User HALT < 6 minutes with training
<ul> <li>External Connection</li> <li>Power Connection:</li> <li>Power Required:</li> <li>Power Compatibilit</li> <li>Vehicle Power:</li> </ul>	108-120VAC, cable included < 12A < 1,400 Watts

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</li>
  - SkyBox Mobile with LSP-6205-EOIR75 (NON ITAR)
     < \$92,000 USD 12 weeks ARO</li>
  - SkyBox Covered with LSP-6205-EOIR75 (NON ITAR)
     < \$94,000 12 weeks ARO</li>
- Prices Include ToughPad Controller
- Includes 1 Year Warranty
- Extended Warranty and Support Available



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





### Hoverfly LiveSky / BigSky Solutions, Capes, Key Differentiators



40" tip to tip, 9 lbs MGVW	LiveSky Solution	Key Capabilities	Key Differentiators
LiveSky SENTRY 6205	<ul> <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>	<ul> <li>No RF Signals for Command/Control or VideoAll 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>Compatible with Vehicle Inverters and Small Gen</li> <li>All Weather Per MIL-STI Low Procurement and Extended Warranty Cos</li> </ul>	<ul> <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>
60" tip to tip, 24 lbs MGVW	BigSky Solution	Training Proficiency in 4 Hrs <ul> <li>Executes Programmable</li> </ul>	Key Differentiators
BigSky 7202	<ul> <li>Multi-Channel, Multi- Band Comms and Relay Payloads</li> <li>Special Payload Integration Canability</li> <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> </ul>		<ul> <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>

Common Components and Software for Simplified Manufacturing, Customer Operations, Logistics, Maintenance, Training

## 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

### **Product Warranties offer Continuous Coverage**



1-year Basic Warranty

BWSLA	Domestic	Version	- U.S
Contract N	lumber:		

#### Basic Warranty, Support and Licensing Provisions everfly Technologies, Inc. LiveSky<sup>TH</sup> UAS Aerial Robotic Systems

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#### **Optional 12-Month Extended Warranty**

EWSMA Domestic Version - U.S. Contract Number: Extended Warranty, Support, and Maintenance Agreement Hoverfly Technologies, Inc. LiveSky<sup>TH</sup> UAS Aerial Robotic Systems

Original Delivery Date:

Coverage Effective Date:

#### Customer Name: L Scope

System Name:

Northy Technologies Inc. Offers Gusteiner and Licenses ("Gusteiner") the following estimated weinrark, quagarit, and maintananes canditions for the Spare making Sendir Karakers are precided at the resign that American R. Weinrarks in an advect balance have relations at the data of Generage Effective Guite an advector balance and advector providence of the data of Generage that the state of the State of Constraint American Balance and providence of the state of the State of Constraint American Balance and providence and the state of the State of Constraint American Balance and providence and the state of the state of the State of Constraint American Balance and providence and the state of the state of the State of Constraint American Balance and the State Constraint. Balance State and State of the State of the State of the State of the State of State Constraint and the State of State Constraint.

#### 9. Extended Limited Warranty and Covered Warranty Conditions

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 Provisions. The Warranty and Support provisions of Hoverfly's Basic Warranty, Support, and licensing Agreement are continued under this Datended Coverage Agreement. IX. Covered Maletenance and Support

 Return to Factory Maintenance. Under this Agreement Hoverfly will also provide factory automotion and one (7) time one approximation for Agreement environment environment. matterrance services at one (1) time pre-annum provided this Agreement remains in continuous offect. Howerly will perform inspection, diagnostics, and replace components and subaccentilies as required at no additional charge provided the System-remains under continuous Warrants Coverage and has been stored, operative, and otherwise matchained in econdence with the Operator's Manual and addendum and updates therein. Factory Maintenance does not entend the Term of Entended Warranty.

2. Shipping. Howeverby well page for priority 3-day objective to from Conterner's continental U.S. to Factory Maintenance. Contact Howerfly for an RMA number and to arrange priority round trip shipping services.

Support. Howerfly will provide technical and operation support during the Coverage Period. During this period Hivenfly will provide support by via telephone, e-mail, er internet access to the web-based support facilities.

IV. General Prachises

sUAS Serial Number:

Tether Kit Serial Number:

Payload Serial Number:

No Assignment. Either party without the prior consent of the other, shall not assign this Agreement in whole in or part, and any attempt by alther party to so assign this Agreement shall be invalid.

2. No Wahwe. Nother party shall, by meen lapse of time, without going notice themed, he deemed to have wanted any breach by the other party of any terms or providence of this Agreement. The waiter by entire party of any such breach that not be construed as a waiter of subsequent breaches or as a continuing waiter of such breach.

Coverage Period: One Year From Effective Date

 Limitation of Liability. Howerful's currentative liability to Licensee or any other party for an b. Underland of Liability. Note Phys. Journal 2014. In the Discost or any setting party for any grants, descuting the setting in the Discost of antigen particular to the Antigen particular to the Discost of Antigen particular to t

4. Governing Law. This Ameenterst shall be construed and exercted in accordance with the

5. Entire Asmement. Donat for the provision (Provision) cited in (Inworld's Basic Warner) Entime Agreement. Except for the provisions (Provisions) closed in invoverly's Basic Warranty, Support and Licensing Agreement as closed hereis, and/or any additional Service Level Agreement that may be executed separately, this Agreement constitutes the entire Agreement between the Costorier and Rosenty with respect to the Warranty applicable use of the System and Software. This Agreement supervedes all collateral communications, whether written or verbal with respect to all matters hereof.

EXCEPT FOR THE WARRANTES SET FORTH ABOVE, THE SYSTEM AND THE SOFTWARE CONTAINED THEREIN, ARE SOLD, DELIVERED, AND LICENSED YAS IS," AND HOUSENLY TECHNIC DESIGN. UNC. DISCIDENT ANY AND AND INCOME WARRANTES, MANDRISS, OR DESIGN. UNC. DISCIDENT, ANY AND AND AND THE DESIGNMENT. INPLIED, INCLUDES, WITHOUT UNITATION ANY IMPLED WRAFANTES OF MERCHANTABLITY OR FITNESS FOR A PARTICULAR PURPOSE

#### Optional Service Level Agreement: 0-48 hours

LVSSLA Domestic Version - U.S.

#### Service Level Agreement

Hoverfly Technologies, Inc. LiveSky<sup>TH</sup> UAS Aerial Robotic System

System Name: Original Delivery Date: Coverage Effective Date:

**V. Service Level Defloition** 

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Term of Senice Level. Howerfly will replace any System that whichs an electronic, electrical, mechanical/humana/lifetane, or spaties defect of that which a detection workmanify during remain used traveling which the Cheerage Product associated as the following table subject to contain-additional conditions as indicated letrem and in the Linking Community Caledition (CC), hearanger that "Orabesian System".

Previsions. Howerfly will replace the Defective System with a new or refurbished Syste

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 225-02
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4. Shigabg, Hoverfly Willowyfor expedited priority shigabg to and from our factory in the event of a Covered Warrang Condition to replace a Defective System. Sin socieansal Resumas Factory/Maintenance, Hoverfly will Coso Alipa a spare System to ensure availability of an equivalent System during Resum 5 Factory Maintenance.

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System Serial Number: Customer and Licensee: Coverage Period: One Year From Effective Date

Support, Hoverfly will provide technical and operation support during the Coverage Parks

II. General Provisions

#### No Assignment. Either party without the prior consent of the other, shall not assign this Agreement in whole in or part, and any attempt by either party to so assign this Agreement

2. No Waker. Nother party shall, by mere lapse of time, without giving notice thereache deared to have waked any breach by the other party of may term or provision of this. Agreement. The wakers by either party of any suchibrach shall not be construed as a sealer of subsequent tenables or as a contraining waker of such breach.

3. Limitation of Liability, Howerful's curved atten liability to Licenses or any other party for a Lineations of Liabity, issued/viscustation tability in clansmone analystice party for any lines of leanges scalaring flow naw claims, demands, an catalos scalaring of or wholey this Agreement of Lianzen of the SoliNaves public table costed the purpluse proceed the Systemmand Solinaves. In one most that Hardware Julia Isakida en any schware, incelestat, consequentia, special, or exempting via maging or late prefixes, seen Harverfi has been administration the purplusing with animages. A statistical instances, neurated cataloxies lineareas parties, information, and System consequentials and challing transmerse consequent as administration, and System consequentials and challing transmerse.

Governing Law. This Agreement shall be construed and governed in accordance with the laws of the State-of Dalaware, United Status of America.

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COTS / NDI LiveSky is shipping 8 Weeks ARO