Removing Manpower and Automating to Scale UAV Missions and Drive Safe Operations

## A Holistic Approach to Scaling UAV Missions

In just a few years, short mission, Line-of-Sight (LOS) battery-based drones have been extremely effective at providing near real-time data across multiple industries, and at a fraction of the cost of manned fixed wing or helicopter aircraft. What does not work is that these missions require 2-3 operator and ground technicians and recharging batteries limiting scalability in numbers of missions per day and sufficient manpower.

Top Flight Technologies, since company inception in 2014, has been addressing the Total Cost of Ownership (TCO) of UAV missions by **introducing heavy-lift, long-range, fully autonomous Beyond-Visual-Line-of-Sight (BVLOS) hybrid-electric power system UAVs** and by **highly automating** every aspect of a UAV mission, simplifying its maintenance and deploying the least number of field technicians, mission planners and autonomous UAV operators **to increase the number of missions** and therefore creating the lowest possible cost per mission.

Manpower Remains Highest Cost

Top Flight introduced the patented Micro Hybrid-Electric Generator engine and the Airborg® UAVS to increase missions from minutes to hours, to remove the need for recharging batteries, to carry payloads up to 20kg and to have ample power for data coms and power-hungry sensors and auxiliary equipment. These innovations address new industrial grade UAV applications while reducing maintenance of mechanical gearboxes associated with heavy-lift, longer-range aircraft. It was imperative to further reduce manpower costs by deploying a high level of automation in each phase of a UAV mission linked to manpower. Specifically:

- Field/Ground Technicians – those that place or service the UAV
- Mission Planners – those that create a UAV flight plan
- UAV Operators/Safety Pilots – those that launch or fly the actual mission
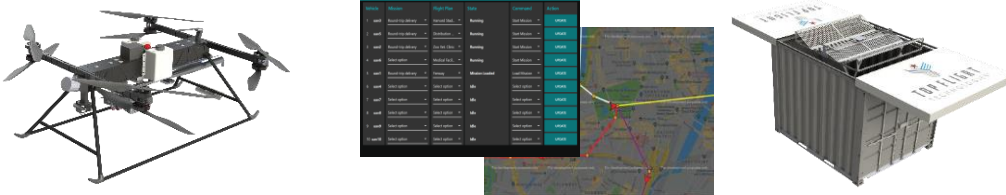
Products That Improve Cost per Mission and Address 24x7 Scalability

Top Flight has a **product solution set** that minimizes operational costs through high levels of sensors and automation. The implementation model mimics skill-specific roles with safety redundancies and audit trails allowing productivity efficiencies without sacrificing safety. With automation of refueling, weatherized UAV garages, and proactive readiness onboard sensors, missions can operate 24x7 further improving final costs per mission for any application.

Top Flight Scalable Products

- *Top Flight Airborg® 10k/20K UAVs*
  - Top Flight patented Micro Hybrid-Electric Engine – no batteries to recharge; 2-minute safe landing
  - Remotely operated
  - No local operation required
  - AutoStart Airborg®
  - Fully autonomous
  - 2+ hr missions, up to 20kg payloads
  - Cargo-transport, Inspection and Spraying configurations
  - 35 mph speed; sustainable in up to 15 mph gusts of wind
  - Lidar, transponder, UTM solutions
  - Simple replacement parts
  - APIs for numerous 3rd party post-capture data systems
  - Onboard computing

- *Top Flight Mission Simulator*
  - Trained Mission Planner creates primary/backup missions
  - Missions tested in 3-D physics-based simulation environment
  - Tested Missions moved into Fleet Management product

- *Top Flight Fleet Management System*
  - Single operator can control up to 10 UAVs simultaneously
  - Override mission capability
  - Database of actual vs. planned mission, by operator
  - Post-mission analysis repository

- *Top Flight Guardian Automated Airport*
  - Weatherized Airborg® Automated Refueling Garage
  - Sensor and camera-based UAV readiness mechanisms limiting human intervention
  - Programmable mission triggers
  - Many use cases – 24x7

TOP FLIGHT TECHNOLOGIES®
MASTERY. INNOVATION. RESULTS.

Contact Us

info@topflighttech.com
109 Madison St. Malden, MA 01248
P: 774.855.6811 www.topflighttech.com