

Tactically Expedient Aerostat – 45 cubic meter (TEA – 45)



Background:

SkySentry's TEA family of aerostats start with the patented Helikite hybrid aerostat, which derives its lift from the enclosed helium volume, as well as aerodynamic lift from the kite, attached to the bottom rear half. Resultant net lift in kilograms is approximately one-half the cubic meter helium volume, in no wind conditions; much more with a steady wind. Certain aspects of the Helikite were developed under a multi-million dollar USAF Small Business Innovative Research contract. Recent models have been thoroughly assessed by the US Army Rapid Equipping Force, both through design evaluation and flight trials and subsequently deployed to support US Forces in Afghanistan.

Description:

This small aerostat is designed for very rapid response, with flight altitudes usually about 165 to 330 meters above ground, although higher is feasible. The internal gas retention envelope is surrounded by a very tough ULTRA nylon covering to enhance survivability in the most difficult environments.

Operating parameters:

- High reliability, in winds up to 50 knots, dust, and other difficult operating conditions due to very tough covering fabric. A Moored TEA can survive wind events up to about 70 knots. Heavy rain does decrease lift performance.
- Retains approximately 45 cubic meters, or 1,550 cubic feet of helium lifting gas; approximately 10 standard helium cylinders. Permeability typically demands helium top-off about every 5 days.
- Lifts approximately 22 KG, or 48 pounds of payload to 330 meters or 1,000 feet above ground

- Enables a line-of-sight radius of about 66 KM or 38 miles line-of-sight to horizon.
- Towed by standard pickup or HMWVV-style vehicle
- Setup accomplished by two trained operators within about an hour; recovers in approximately 20 minutes for battery changes or maintenance
- Tremendously versatile, in both basing and payload options
 - Basing: Operates from trailer, inflatable tube base, or water craft



- Payloads: The TEA is totally integrated with day-night surveillance cameras and WiFi communications networks for data dissemination over an area of 750 square KM
 - The Cloud Cap TASE family of cameras is a very popular option for Electro-optical infrared cameras, gyro-stabilized and high resolution, but the TEA can also be integrated with customer-specified camera packages and less costly non-stabilized versions
 - The Mobile Ad Hoc Network family of peer-to-peer wireless nodes provides coverage over about a 15 KM radius with VoIP, texting, and streaming video. When coupled with SkySentry's SATCOM, the network also has internet and commercial phone reachback.

Enabling components

- Mooring trailer is totally self contained with power, helium, tools, all tiedowns.
- Launched and recovered with compact, highly reliable DC electric winch, powered by ultra-reliable Honda 120VAC generator
- GPS-programmable cut down device is FAA compliant (certified)
- The tether is generally unpowered, with a 2,000 KG breaking strength and weighing about 5 KG per 1,000 feet. In this case, the payload brings its own Li-Ion battery power, which typically must be retrieved and recharged about every two days.
- Transportable by C-130 size aircraft or by sea with standard ISO container
- For longer endurance flights, power is channeled up the tether through an on-board power convertor providing reliable 24-48 VDC current
- Low operating costs, for both helium and manpower; approximately 7 days between top-offs
- Replaceable inner balloon enhances on-site reliability
- Complete training, tools, and spares packages, as well as on-call technical support or full-time SkySentry operator crews are options for customer consideration

Survivability

- Customers are often concerned about the impact of small arms fire on the TEA. Such impact is minimal. The pressure differential from inside to outside the envelope is less than one PSI. Bullet holes allow very slow helium leakage, with consequent graceful degradation. The TEA is simply retrieved and the holes are patched for the next launch, a simple process learned in training. Meanwhile, adversaries conclude the payoff isn't worth the risk of getting close enough to fire upon it.