



# RAPIDLY ELEVATED AEROSTAT PLATFORM (REAP) XL-B

## SYSTEM INFORMATION AND SPECIFICATION SHEET

**SYSTEM TYPE:** REAP XL-B modular compact aerostat and payload deployment unit. Launch is commanded with hand held controller  
**USE:** Elevate cameras, comms relays, and other sensors to 1000 ft (305 m) in 20 minutes  
**DURATION:** Up to 4 days or more without top off  
**CREW:** Two to three crew members  
**PORTABILITY:** The entire system – including helium bottles or high-pressure cylinder assembly (HPCA) – is easily transported by military vehicle (e.g., FMTV size). The REAP XL-B can also be trailer-mounted and towed by MATV or HMMWV.



**ENVELOPE AND CONTAINER:** Fabricated from urethane-impregnated nylon with an integrated external ballonet, the aerostat is 5000 ft<sup>3</sup> (142 m<sup>3</sup>) in volume, 39 ft (12 m) long, and 20 ft (6 m) tall. Operational radial ground footprint is <30 ft (9 m). Deployment is <20 minutes from envelope inflation to maximum altitude at 1000 ft (305 m) above ground level (AGL). The deflated aerostat is housed in a reusable container (aka the “can”) for rapid loading, launch, and reloading. Envelope can also be inflated from the mast, outside of the canister.

**BASE UNIT AND ROTATING GANTRY:** The base unit supports aerostat launch, flight management, and recovery. It includes integrated rotating gantry with a payload cradle. An integrated mooring mast supports storage and maintenance of the aerostat while the envelope is inflated. The rotating gantry houses an integrated winch assembly with automatic level wind and powered tether, with a converter to provide 384 VDC to the sensor payload through the winch slip ring and tether. The base unit also houses two 12V HMMWV batteries, PLC controller, rotation system with hydraulic dampening, power distribution module, payload containment, and helium valves, regulator, and re-supply hose. The base’s footprint is 60 in (152 cm) square, which fits FMTV and MTRV military vehicles, similar-sized trucks, or tactical trailers via an interface plate. The Hand Held Controller provides one button deployment as well as winch controls.

**PAYLOADS:** The REAP XL-B uses a modular bar assembly to support a wide variety of payloads, such as imaging sensors (e.g., EO, IR, HS/MS, FMV, laser designators), signals intelligence, direction finding, communications relay, or special-purpose devices. The tether supplies 384 VDC that is then converted to 24 or 28 VDC, with 360 W continuous and 500 W peak power available. A full aerostat health and telemetry system is included. Typical data transfer is via encrypted wireless Internet protocol (IP) bridge to a compact ground control system (GCS) laptop computer workstation, with standard commercial network interfaces. Other options are available, including communications through the tether line (now in development).



*Approved for Public Release – Case No. 12-S-1108*



# RAPIDLY ELEVATED AEROSTAT PLATFORM (REAP) XL-B

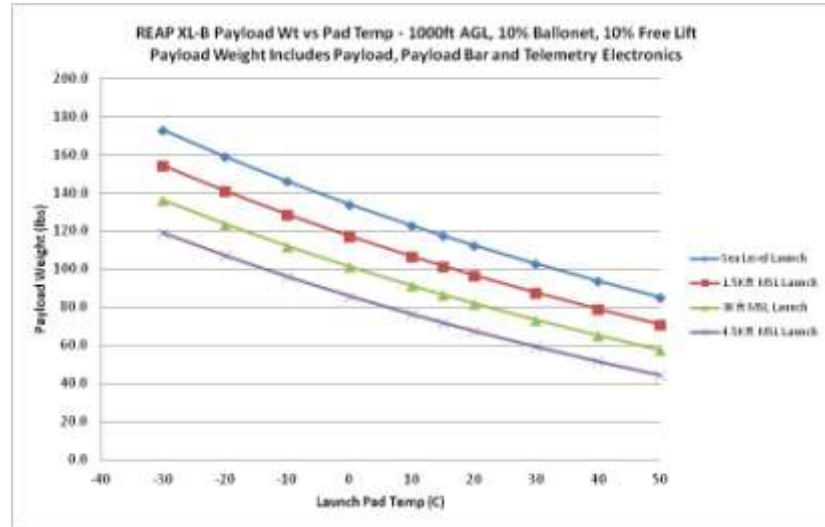
## SYSTEM INFORMATION AND SPECIFICATION SHEET

**HELIUM:** Initial inflation requires ~5000 ft<sup>3</sup> (141 m<sup>3</sup>) of standard helium (98% purity). Approximately 24 conventional commercial bottles are required per launch. The REAP XL-B is compatible with the DLA provided HPCA with use of the fill port.

**PLATFORM PERFORMANCE:** The REAP XL-B is designed to be inflated by a three-member crew in less than 10 minutes, in order to carry a payload to 1000 ft (305 m). The aerostat's lift capability is dependent on air density, which is a function of altitude, temperature (and, to a lesser extent, pressure), and humidity.

At right, a chart outlines REAP XL-B performance in terms of lift margin versus launch pad temperature. It also shows lift available **in addition to** the lift required to elevate a 45-lb (20-kg) Tase 300M camera payload to 1000 ft (305 m) with a 10% free lift stability reserve.

Additional payload calculations are available on request.



### AEROSTAT

- Length: 39 ft (12 m)
- Height: maximum 20 ft (6 m)
- Diameter: maximum 16 ft (5 m)
- Hull volume: 5000 ft<sup>3</sup> (142 m<sup>3</sup>)
- Fin volume: 293 ft<sup>3</sup> (8 m<sup>3</sup>)
- Ballonet size: 15%
- Weight: 127 lbs (58 kg)

### DEPLOYMENT SYSTEM (LESS HELIUM)

- Footprint: 60 x 60 in (152 x 152 cm)
- Length: 156 in (396 cm)
- Width: 60 in (152 cm)
- Height: 76 in (198 cm)
- Height with mooring mast: 120 in (305 cm)
- Total weight: ~2500 lbs (1134 kg)

### POWER

- Deployment battery system: 24 VDC
- Charging system: 90 to 240 VAC at 50/60 Hz
- Tether line: 384 VDC
- Continuous power at aerostat: 360 W
- Peak power at aerostat: 500 W

### HELIUM

- Deployment: 5000 ft<sup>3</sup> (142 m<sup>3</sup>)
- Purity requirement: optimum 98% (minimum 96%, which reduces available lift by 2%)

### TETHER

- Usable length: 1100 ft (335 m)
- Composition: Aramid core and polyester braid
- Break strength: 5000 lbs (2268 kg)
- Conductors: 2
- Wire size: 20 AWG stranded copper
- Weight: 23 lbs/1000 ft (10 kg/305 m)

### CREW REQUIREMENTS

- Assembly: 3 crew members
- Deployment: 1 crew member
- Recovery: 3 crew members
- Operation: 1 crew member

### OPERATIONS

- Deploy to 1000 ft (305 m): <20 min
- Recover from 1000 ft (305 m) & deflate: 20 min
- Flight duration: 4 days, weather permitting
- Top-up time: 20 min on ground
- Redeploy with 2<sup>nd</sup> envelope container: 40 min
- Envelope field-repairable (e.g., small arms fire damage)

### LIMITATIONS

- Deployment wind speed: maximum 10 kts, with experienced crew: maximum 14 kts
- Operational wind speed: maximum 30 kts
- Survivable wind speed: maximum 40 kts
- Aerostat altitude: maximum 1000 ft (305 m)
- Launch pad height: maximum 4500 ft (1372 m) with performance degradation above maximum – see chart
- Launch pad diameter: minimum 60 ft (18 m)

*Approved for Public Release – Case No. 12-S-1108*