



Unlocking the Stratosphere[®]

Stratospheric Operations and Research Symposium (SOaRS)

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Voltitude Ltd - Operator Status Update

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A new company **Unlocking the Stratosphere[®]**

- Voltitude specialises in high altitude platforms, applications, and payloads.
- Our technology enables services from the stratosphere which are available globally and year-round.
- We are focused on complimentary systems of lighter-than-air and fixed-wing stratospheric technologies.

Paul Stevens CEng, MInsP, MPhys.

- CEO of VOLTITUDE LTD.
- Former Head of Design for Zephyr HAPS at Airbus.
- Over 25yrs of HAPS & UAS design and operating experience.



Voltitude Capabilities

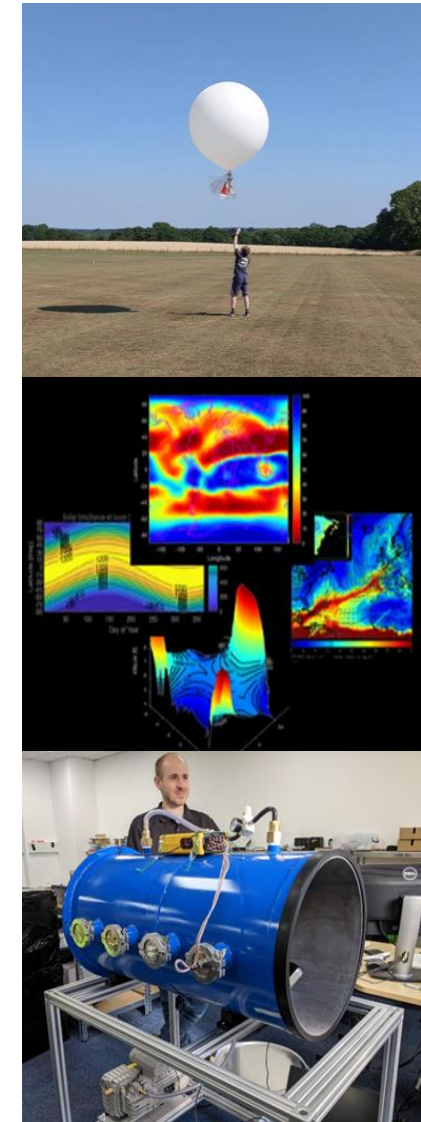
- **System engineering** – HAPS performance modelling, CONOPS & architectural design, systems integration, safety assessments, airworthiness and flight approvals.
- **Power system design & integration** – BMS design, PV-array integration, Propulsion design.
- **Aerodynamics, Aerostructure and Flight Control System (FCS)** – aeroelastic modelling expertise, structural component design and qualification testing, FCS implementation & flight testing.
- **Avionics** – Data-link encryption & protocol system design, FCS sensors and actuation, complex electronic hardware design, embedded software.
- **Flight testing & Operation** – extensive HAPS test flying experience, meteorological data analytics, HAPS/HAB performance and track prediction.

High Altitude Balloons (HAB) Design

- light and medium category
- Long endurance
- Altitude changing to support basic navigation

Stratospheric Payloads

- Stratospheric datalinks, Payload BLOS C2; Sensor data dissemination; Comms Relay; Wide-Band Ethernet Bridge.
- Environmental protection and 3rd party payload integration into lighter-than-air and fixed-wing stratospheric platforms.



HAB Design and Operation

Data Analytics

Integration and Environment Testing

Stratospheric Operations

- Long endurance light category balloon operations
 - Started operating light and medium category balloons in 2021
 - In the last 12 months flown ~500hrs in the stratosphere in balloon R&D flight testing
- Operational capability demonstration for UK MOD project Aether
 - Highly available tactical launch capability
 - Multi-day endurance over remote regions of interest
 - Demonstrated rapid projection of capability on strong jet-streams
 - Supporting payloads <2kg

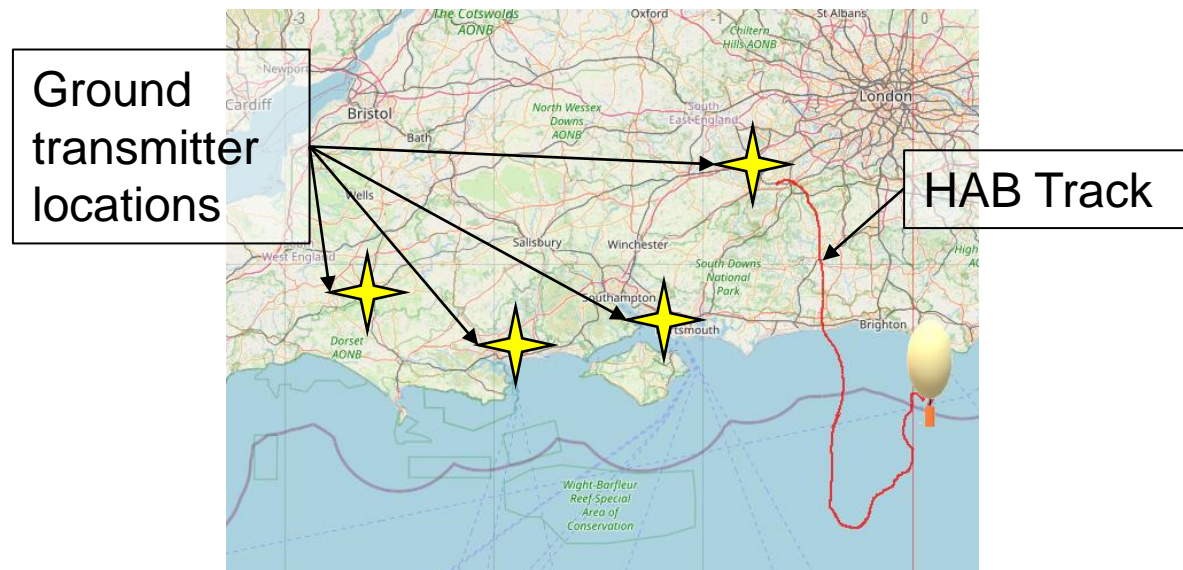
High Service Availability: Video of high surface wind (30knts) launch of long endurance light and medium category stratospheric balloons



Demonstration of ISR Capability

Successful demonstration of Guardsman Electronic Surveillance payload from stratosphere.

- Regular detection of beacons (ground transmitters) from Fareham, Bournemouth and Farnborough at > 135 km slant range.

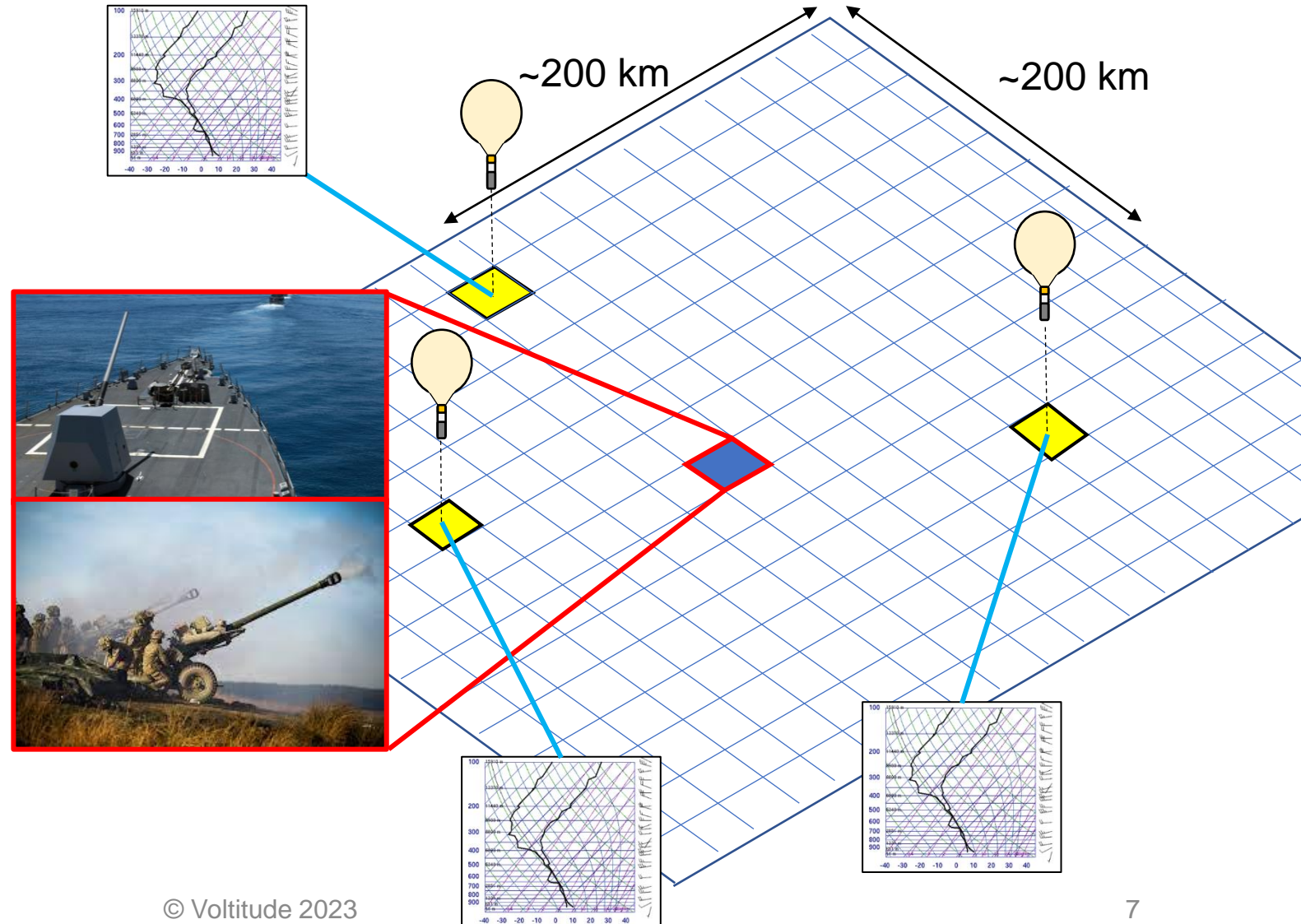


Showcased a new low-cost stratospheric payload Test and Evaluation (T&E) capability

Artillery or Naval Fire Support

Challenge – improve first shell accuracy

- Operate the HAB StratoSonde system into the artillery region of influence.
- A fine grid “mesoscale” numerical weather prediction model covers this area, providing enhanced forecast spatial and temporal resolution, picking up boundary conditions from larger area models.
- StratoSonde micro-dropsonde data used to enhance mesoscale model accuracy ensuring most accurate data is used in determining firing solutions.
- In most scenarios HAB can be launched and operated remotely from regions outside the conflict area.



What next

- Balloons
 - Focusing on new 14day endurance light-medium category HAB featuring solar regenerative flight and optimised for C2ISR payloads under 2kg.
 - Retaining altitude changing for navigation.
- New Payload
 - VOLT-SDR Humanitarian Aid and Disaster Relief (HADR) and Maritime Security use cases
 - Self contained (own BLOS C2 datalink) – only requires host platform DC-power
 - Rx on 64 channels =<1.5W and doesn't need heating
 - Tx on up to 8 channels simultaneously
 - NXDN, dPMR & Tetrapol mobile radio equipment - used by emergency services globally
 - Tx dynamic power 2W to 16W RF output depending on comms demand
 - Maximum DC input power 80W - doesn't over heat
 - <1kg including all thermal systems

Thank you

Questions