



SB-UAV

Inmarsat's Unmanned Air Vehicle Service
using the Cobham AVIATOR 200 UAV

SB-UAV

UAVs are the fastest growing sector of the aerospace industry and governments are increasingly looking to harness the advantages that unmanned vehicles can provide.

Whilst initially celebrated for the role they could play in modern day C4ISR missions, their mission has now expanded beyond that of combat, intelligence and reconnaissance missions.

Development in capability and technology application now sees governments employ UAVs in operations as diverse as border protection, surveying, infrastructure inspections, emergency services and police surveillance.

A key enabler for the effectiveness of this increased UAV deployment lies in the corresponding development of the communication links from the aircraft to decision makers. By extending the ability to retrieve information off a UAV beyond line of sight, the value of each sortie is extended exponentially – allowing decisions to be made on-the-fly, with the benefit of full situational awareness. Inmarsat SwiftBroadband services now have plans available for all long endurance UAV's with the SB-UAV particularly targeting the LALE market and its very particular SWAP considerations.

Inmarsat SwiftBroadband

Operating on the Inmarsat I-4 constellation of satellites, the Swift Broadband service provides global voice and high-speed data, simultaneously, through a single installation on an aircraft.

SwiftBroadband is an IP-based packet-switched service offering 'always-on' data at up to 432kbps per channel. It can also provide IP streaming at various rates up to a full channel.

Inmarsat SB-UAV

As the latest iteration of the SwiftBroadband service offering, SB-UAV is a Class 4 single channel system that delivers high quality 'always-on' data services of up to 200kbps. Designed specifically for Low Altitude Long Endurance UAV platforms, the sub 2kg integrated antenna and electronics unit provides its own ground plane allowing easy installation with minimal wiring.





AVIATOR UAV 200

Mechanical overview

- › Single box solution
- › Weight 1.45 kg.
- › Dimensions: 24 x 16 x 6 cm
- › Mid-flange for ground plane and heat management
- › Micro-D connector interface
- › Protected user-accessible USIM

Aviator UAV 200

- › Single Line Replaceable Unit solution
- › Size, weight and power optimised for small tactical UAVs
- › Mounted within the airframe
- › Inmarsat Class 4 SwiftBroadband
- › Full Inmarsat hemisphere coverage to 5° elevation
- › Background data service up to 200 kbps
- › Streaming class services up to 32 kbps
- › User class context control
- › System BITE
- › Interfaces to aircraft
 - › DC Power (14 - 28 VDC)
 - › Nav in via RS-232 or Ethernet
 - › User interfaces
 - › 2 x Ethernet
 - › 2 x RS-232

Key benefits

- › Improved situational awareness
- › Real-time health monitoring
- › View near real-time imagery
- › Dynamic aircraft re-routing
- › Add crypto for a secure airframe
- › Reduce operational costs

By integrating everything into a single, compact, lightweight, and low-power package, the new AVIATOR UAV 200 satcom solution significantly enhances a tactical UAV's performance, range and payload flexibility.

The world's smallest, lightest Inmarsat UAV satcom solution. AVIATOR UAV 200 matches the connectivity and performance of larger, class-leading satcom systems, but in a far smaller, lighter and less power-demanding package.

Not only does this enhance the performance and capabilities of your tactical UAV, but it greatly expands its payload flexibility.

Tactical UAVs depend upon lightweight components to maximise range, endurance and operational use. However, until now, the size, weight and power requirements

of Inmarsat satcom hardware made it impossible to take advantage of the higher speed connectivity from today's satellite networks.

AVIATOR UAV 200, a revolutionary new solution from Cobham SATCOM, redefines UAV satcom connectivity by integrating everything into one compact, lightweight box. Weighing just 1.45 kg, AVIATOR UAV 200 is a remarkable 76% lighter than anything comparable on the market – yet still delivers Inmarsat Class 4 services, up to 200 kbps data and full, real-time control of payload channels.



SB-UAV Service

Inmarsat's Unmanned Air Vehicle Service using the Cobham AVIATOR 200 UAV

Enhanced aircraft control

With AVIATOR UAV 200 and SB-UAV, operators can now send flight commands to the UAV in real time thus significantly enhancing mission flexibility by allowing immediate route adjustments as and when necessary.

Visual capabilities and situational awareness are also significantly enhanced via the ability to send video and photos from the airframe. Previously, this was limited to LOS operations, however SB-UAV now opens up the full BLOS range to give UAVs the same operational and tactical advantages.

Constant health monitoring

Tactical UAVs are designed for durability. However, as they are often used in stressful environments the risk of damage or system faults is high. A UAV can now send extensive health data in near-real time, allowing operators to have a constant overview of on-board systems and structural integrity. Should any problems be detected, the operator can immediately reroute the UAV back to base for repairs or abort a mission with less risk of damage.

Live photo streaming

For true "surveillance and monitoring, it is vital that operators get near real-time visual feedback. Previously, tactical UAVs had limited connectivity, restricting all viewing and decision-to the limited range of LOS flight or after airframe return. By which time, data will have lost its tactical or value.

With SB-UAV, the UAV now enables streaming of photos and low resolution video to operators, thus enabling immediate response such as rerouting the UAV to gather additional data, and/or to retrieve time and spatially mapped high resolution data for decision making.

Flight plan risk management

The ability to safely operate unmanned aircraft in commercial and controlled airspace is a major driver in UAS deployment. With increasing regulatory pressures in this sector, the ability to manage and mitigate risk is invaluable. Now the UAV operator and local ATC authorities can stay in close contact either indirectly or potentially through an aircraft based IP radio. Should a change to the flight path be required, the aircraft can be dynamically rerouted using the connectivity offered by Inmarsat SB-UAV.

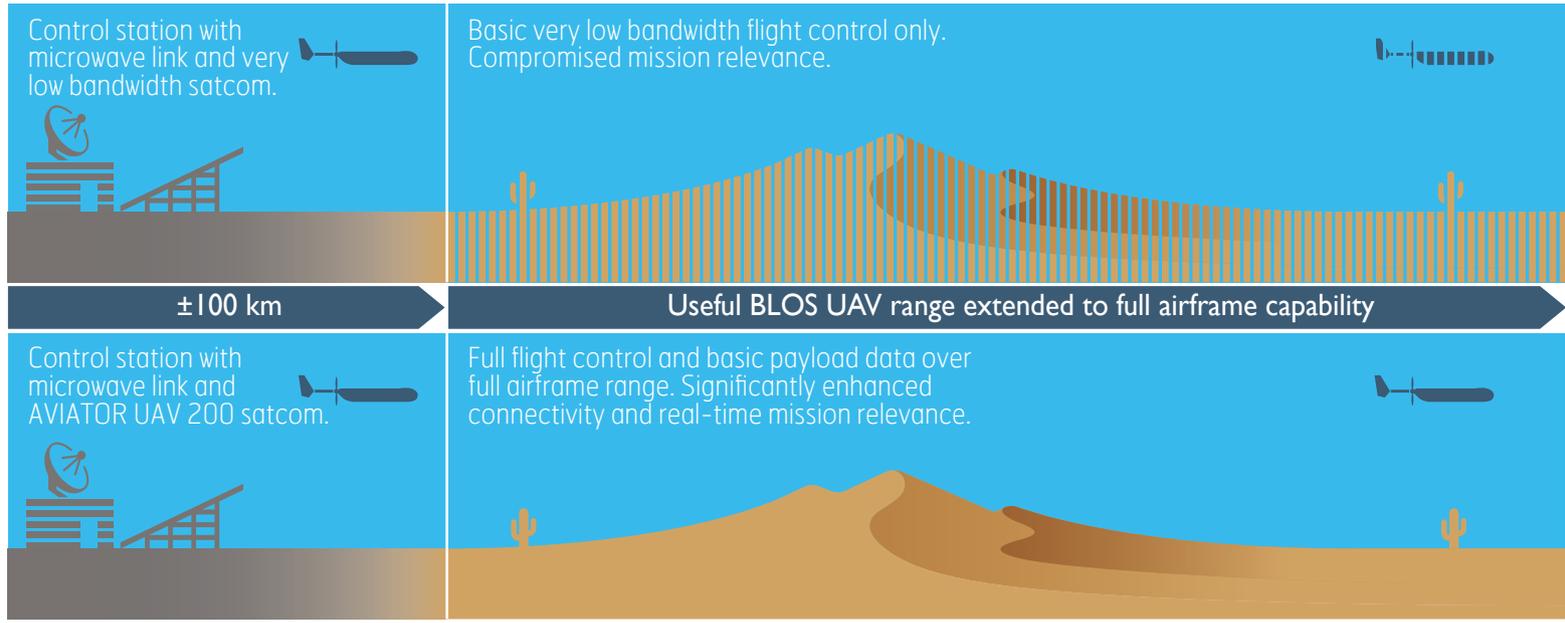
Greater payload flexibility

The ability to fit smaller unmanned aircraft with data pipe and smart video/photo processing solutions that can move visual data efficiently from the platform allows fleet operators to procure and operate smaller air vehicles, saving procurement costs, increasing operational flexibility and reducing operational costs. UAV operators are now able to receive time-critical data and re-task their smaller, long endurance UAV in real time. This can lead to significant savings in operational costs as well as maximising mission success.

Features

- › Improved situational awareness
- › LOS to BLOS
- › Near real-time route adjustments
- › Improved airspace integration
- › Real-time health monitoring
- › Full flight control
- › Real-time mission relevance
- › Emergency risk reduction
- › View near real-time imagery
- › Enhanced BLOS surveillance
- › Enhanced tactical/commercial advantages
- › The right surveillance in the right location
- › Risk management and mitigation
- › Dynamic aircraft re-routing
- › Greater operational safety
- › Expanded payload capability
- › Attach additional components
- › Add crypto for a secure airframe
- › Extended range and endurance
- › Procure and operate smaller air vehicles
- › Receive time-critical data in near real-time
- › Reduce operational costs

Connectivity **without** Inmarsat Satcom



Connectivity **with** Inmarsat Satcom

MAV

Altitude: <1200 ft
Range: Line of Site
Endurance: <2 Hours
Weight: <20kg



LALE

Altitude: <18,000 ft
Range: ~160km
Endurance: <24 hours
Weight: 20-55kg



MALE

Altitude: <30,000 ft
Range: ~160km
Endurance: 24 – 48 hours
Weight: <1320kg



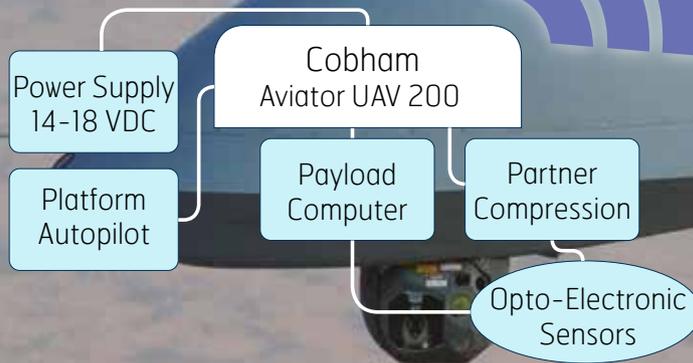
HALE

Altitude: >30,000 ft
Range: >160km
Endurance: 24 – 48+ hours
Weight: >1320kg



SB-UAV: Perfect for the Low Altitude, Long Endurance Unmanned Air Vehicle

SB - UAV
Service





	SB-UAV	SB 200
System Weight	1.4kg	7.8kg
Elements	Single LRU	Separate Diplexer, Antenna and SDU (+ Cables – Not Shown)
Size	215 mm by 140 mm x 70 mm	Roughly 4 times the volume of SB-UAV

Requirements from **platform** for beam steering:

GPS Position (accurate to 50m)

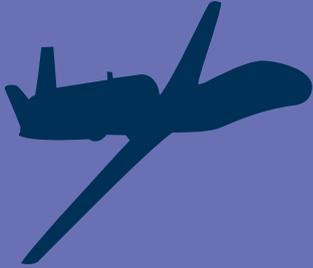
Velocity Data (accurate to 1m/s)

Attitude [Pitch & Roll] (accurate to 0.25 degrees)

Heading (accurate to 1 degrees)

All of the above are required with
a minimum update rate of 8Hz

Platforms

	 Low Altitude Long Endurance	 Medium Altitude Long Endurance	 High Altitude Long Endurance
Platform	ScanEagle, Aerosonde	Predator, IAI Heron	Global Hawk RQ-4B
Command and Control	SB-UAV	SB Class 4 / 7	B Class 4 / 7
ISR Payload Data Offload	SB-UAV	Multi-Channel SB / GX / LAISR	High Altitude - GX Low Altitude - LAISR
Throughput	<200kbps	<15Mbps	<15Mbps
Inmarsat G2 Focus	SB-UAV	SB / SB-UAV	SB
			

User Scenarios

Military applications

Today, tactical UAVs are widely used by military forces in war zones worldwide, with multiple applications ranging from “eye in the sky” surveillance and tactical communications for forward troops to path clearing operations in minefields.

By enabling basic image streaming, greater range, real-time flight control and an expanded payload, AVIATOR UAV 200 delivers invaluable tactical enhancements to an already indispensable piece of military hardware.

- > Greater mission range
- > Expanded payload
- > Image streaming and situational awareness

Commercial use

Businesses across a variety of industries and sectors rely on commercial variants of these tactical UAVs for a broad range of commercial applications, including mapping surveys, mineral exploration and oil pipeline monitoring.

With smaller and lighter satcom technology, AVIATOR UAV 200 enables businesses to get more value from each flight through faster data transfer, greater operational range and the ability to preview and move increased data from a variety of sensors to ground control and data collection/analysis points.

- > Crop management
- > Geophysical surveys
- > Pipeline monitoring

Safety and security

Real-time surveillance is essential for safety and security organisations that need effective ways to patrol restricted areas, such as borders or fishing zones, or for monitoring fires, volcanos, floods and other environmental disasters.

By extending their range and capabilities through better connectivity and higher data throughput, AVIATOR UAV 200 enables tactical UAVs to play an even more pivotal role in enforcing border security and ensuring public safety.

- > Enhanced border security
- > Search and rescue
- > Real-time scene surveillance
- > Disaster management

Scientific research

Tactical UAVs are used extensively within the scientific community for observing events or places that pose a potential danger or are inaccessible to human beings, for example volcanoes, and rural, arctic or mountain areas.

With the ability to carry a broader array of scientific equipment further and for longer, AVIATOR UAV 200 transforms tactical UAVs into a highly flexible, multi-purpose tool for many types of scientific research and exploration.

- > Improved research capabilities
- > Monitor natural disasters in real time
- > Conduct detailed, non-invasive research



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