

The OBSERVER fully autonomous battlefield observation system was designed and developed by Cranfield Aerospace Ltd (CAe) in collaboration with QinetiQ. This UAV combines “gust insensitive technology” and a fully autonomous digital flight control system to deliver an “information at the fingertip” capability. The sophisticated flight control system translates very simple commands, from the ground station based operator, into a complex flight trajectory that delivers the demanded image autonomously.



A Unique Solution

- Whole systems approach
- Readily deployable
- Intuitive interface
- Real-time data link
- Autonomous and simple operation
- Easily supportable
- Automatic launch and recovery

Robust airframe

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OBSERVER System Roles

OBSERVER carries daylight TV or thermal imaging sensors to provide 24-hour coverage of a commander’s Area of Interest. It may be used for:

- Surveillance
- Reconnaissance, including Battle Damage Assessment (BDA)
- Target acquisition (in support of Battle Group operations)

Operational functions that would benefit from OBSERVER support include:

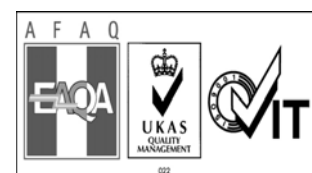
- Battle group reconnaissance
- Direction of artillery / mortar fire
- Naval Gunfire support
- Special Forces operations

OBSERVER System Concept

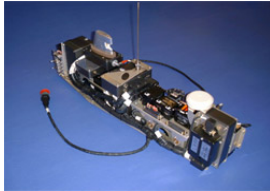
The OBSERVER system concept is unique in that the operator controls the path of the sensor footprint rather than controlling the flight path of the air vehicle. A sensor incorporating either daylight television or TI cameras has replaced the traditional complex sensor turret. This semi-strapped-down sensor array is pointed by the air vehicle and directed by the operator at an intuitive touch-screen control console with digital map and imagery displays side-by-side. A touch on either the imagery or tactical map display is all that is required to initiate a search routine, close on a target, or closely observe a key point.

Footprint control at the touch of a finger

Footprint control algorithms resident on the air vehicle reduce the operator workload, allowing operators to focus on imagery gathered by the systems, switching the operator emphasis from flying the vehicle to “flying the sensor”.



Daylight TV payload



The image from three CCD cameras is electronically stitched together to provide a single image in the ground control station. This

combined image has a 40 x 90 field of view, allowing excellent spatial awareness and the resolution to identify features on the ground using the same sensor. The image provides the operator with a 'head-up' control capability, resulting in a highly reactive reconnaissance system.

Thermal imaging payload

To complement the electro-optic sensor, we have developed a highly advanced uncooled infra-red sensor. Unlike the TV payload the TI sensor package produces a footprint that includes, at its centre, a high-resolution fovea patch, which can be driven to cover the area of interest.

OBSERVER Air Operations

An OBSERVER flight section consists of a mobile ground control station, a self-propelled launcher, support vehicles and a number of air platforms. Flight-ready air vehicles are brought forward and, following an automatic check-out, are launched by catapult. Parachute recovery is automatic to any point designated by the operator on his touch screen or map display. The robust delta platform minimises recovery damage. The modular system design of OBSERVER allows simple exchange of sensor payload and rapid replenishment of consumables, thereby enabling fast turnarounds.

OBSERVER System Characteristics

- Optimum range **25km**
- Sensor coverage **100 km²/hr**
- Resolution **recognise MBT at 500 m**
- Air Vehicle Mass **30 kg**
- Endurance **2+ hrs**
- Optimum operating height **300 m**
- Ceiling **5000 m AMSL at ISA +25**
- Speed **120kts dash, 60kts cruise**
- Climb rate **> 1000 ft/min at sea level**
- Target location **+/-50 m**

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Registered in England No. 2415720 Registered Office: Cranfield University, Cranfield, Beds, MK43 0AL
 EASA / CAA Approval References EASA.21J.145; UK.21G.2382; AD/2015/05;
 Part-145 Approval Reference UK.145.00377
 Registration to ISO9001:2000; AS/EN ISO 9100B; plus TickIT, assessed in accordance with the requirements of AS 9104
 MoD (UK) Design Approval under DAOS

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