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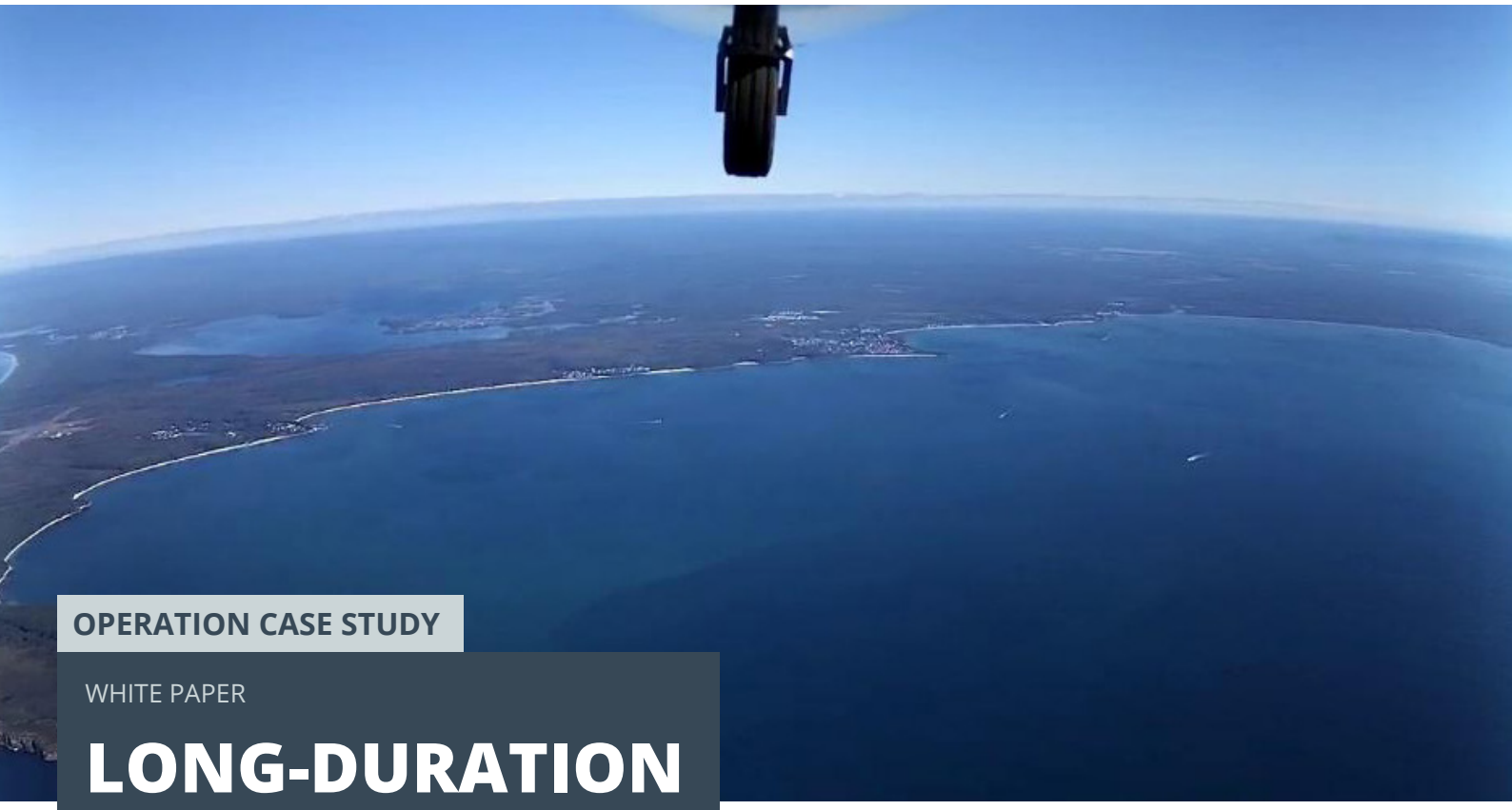


OPERATION CASE STUDY

WHITE PAPER

LONG-DURATION SURVEILLANCE

SILVERTONE UAV | 21 JULY 2022 | KEN TAYLOR

BACKGROUND

Silvertone was tasked by Australian Defence with providing an airborne mesh radio network node for their littoral marine activities for the duration of a multinational military exercise, Autonomous Warrior 2022. The exercise took place at the Jervis Bay Naval Precinct in New South Wales, and was planned to extend as far as 60km out to sea. Whilst providing this facility we also provided oversight capability through a real time video feed of the operational area.

A Flamingo Mk3, fitted with an EO/IR sensor, MANET radio and a positional transponder was to be flown for up to 6-8 hours per day during the exercise. In addition, Silvertone planned to fly numerous test flights in the lead-up to gain familiarity with the exercise area and interoperability with the various Naval participants involved.

PAYLOAD

An Ascent Vision CM62 EO/IR gimbal, mounted in the payload bay of the Flamingo Mk3, captured the exercise as it unfolded. One of the MANET radios on board the aircraft provided this footage to the operations room in real time. At the same time another MANET radio installed to the aircraft was relaying video and tactical data from unmanned surface vessels back to the operations room for interrogation.

In a previous iteration of this exercise (Autonomous Warrior 2018), Navy had control of the camera gimbal on board the aircraft using STANAG 4586 protocol while the flight crew controlled the aircraft. This split of operational controls was not required in 2022.

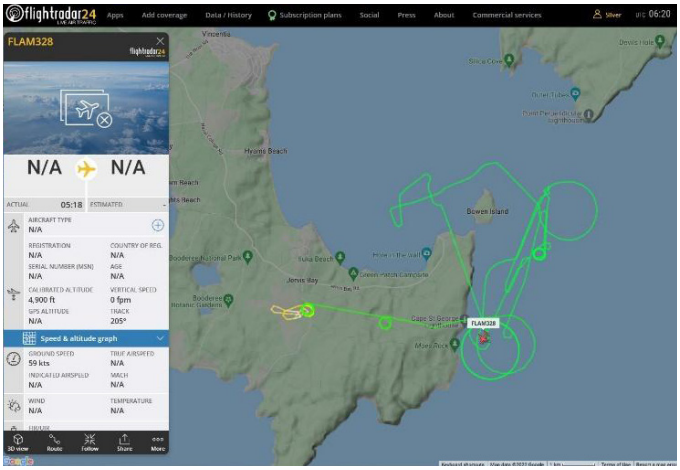
Beyond Visual Line of Sight operations took place at between 3,000 feet and 6,000 feet AMSL and out to 30km from the GCS. Full time health monitoring of the aircraft's state and critical systems was maintained using our proprietary Systems Panel software.

Operational status from the onboard autopilot, ECU, power management unit, communications network and payload are all connected via our PicoLAN and presented on a user friendly GUI we call Systems Panel.

A Silvus MANET radio system from Ambertech provided connectivity for air, ground and sea-based craft in the exercise. Full IP connectivity was available, with segregated traffic for video links, voice operations and aircraft telemetry and control.

OPERATION

1 The first week of operations were devoted to shake-down flights and liaison with relevant authorities to establish operational norms for the exercise.



2 Multiple daily flights of up to 6 hours duration became the norm and led to land, sea and air uncrewed systems having a dependable radio link throughout their operations.

3 All flights were in the air within minutes of the go-ahead and continued as required during all the days of the exercise itself.

RESULTS

A single Flamingo aircraft was able to cover the entirety of the exercise area for hours at a time, and a second Flamingo was available to take up duty on point so that coverage was continuous if required.

Operating at 5,000 feet ASL and above, the aircraft provided communications relay and covert surveillance across the exercise area on demand, with a logistic footprint that was far less than required to support crewed aircraft.

The central operations room had eyes-on-target as and when required, direct communications to equipment payloads and personnel in the field and data connectivity at their beck and call.