



MANET / Mesh Network for Cooperative Unmanned Vehicles

Military and commercial unmanned vehicle operators have always needed communication relays built into their wireless networks for multiple applications. Persistent Systems, LLC has recently completed flight tests for Wave Relay®, their secure Mobile Ad-Hoc Networking (MANET) radio system for cooperative unmanned air vehicles.

The flight test consisted of:

- ▶ 3 aircraft
- ▶ 3 streaming video feeds hopping from plane to plane
- ▶ Command and control (C2) from a ground control station (GCS)
- ▶ Distance of over 100 miles

The main purpose of this test was to determine the throughput capabilities of a network consisting of three aircraft each separated by at least 23 miles and the first aircraft separated from the ground control station (GCS) by at least 50 miles. This configuration is shown below in **Figure 1**.

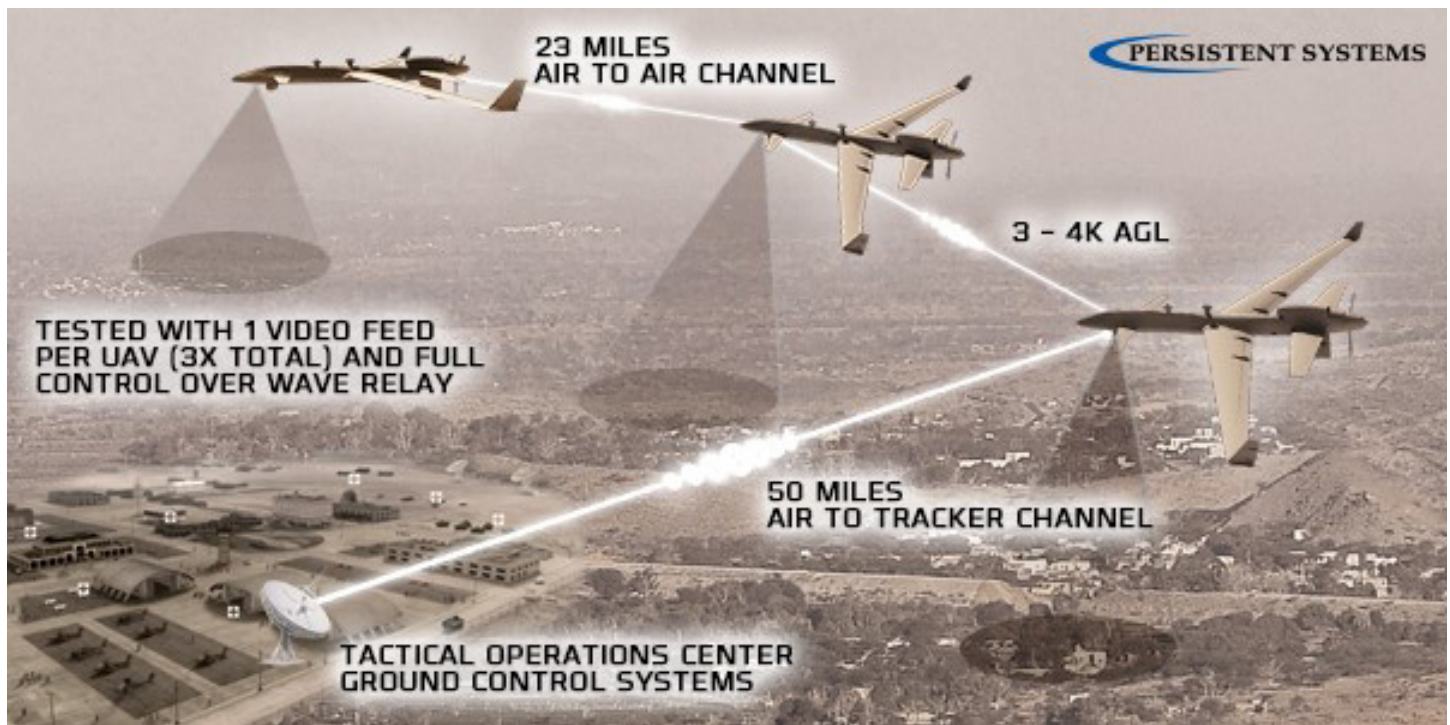


Figure 1: Flight Test Configuration

Persistent Systems, LLC spent multiple days running this test on live aircraft provided by Avwatch Inc. (<http://www.avwatch.us/>). The tests were run at multiple power levels and frequencies. The first link of greater than 50 miles from the GCS to the aircraft was accomplished with stock radios without external amplification.

Overall the tests were extremely successful and showed an exciting capability for an air-air-air-ground MANET system. Wave Relay®'s proven ability to handle full motion video hopping across multiple aircraft will greatly extend the range and capability of air systems. This same capability has been proven multiple times in other domains including ground vehicles, air to ground links, and dismounted operators.

Persistent has also done multiple tests with an aircraft to a ground station at over 130 miles with a full motion video streaming over the link. Wave Relay® provides the flexibility to adapt to mission needs for scaling to additional nodes, maximizing distance, adding additional video streams, multiple frequencies on each node, adding additional control systems, and more.