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Chemical Detection Capability Developed for UAV

In an effort to continuously upgrade the versatility and capability of the family of unmanned aerial vehicles (UAVs), the Program Executive Officer for Cruise Missiles and Joint Unmanned Aerial Vehicles recently conducted another successful advanced small UAV trial in the deserts of Nevada.

The focus of the demonstration was to test the capability of a small airborne point chemical agent sensor to detect, identify, and report the presence of a chemical vapor danger downwind from an emission source. This proof of concept demonstration coupled a small UAV and a chemical sensor, produced by Femtometrics from Irvine, CA., that could detect chemical vapor dangers emitted in the parts per billion concentrations. This union and field demonstration was accomplished in less than three months.

A team from the Navy's tactical systems office, Naval Air Warfare Center Aircraft Division Small UAV Shop, Central MASINT Office, and Femtometrics conducted eleven flights using a Pointer air vehicle that contained a Femtometrics surface acoustic wave chemical agent detector (SAWCAD) and commercial off-the-shelf RF modem transmitter. The first six flights gathered background air data and the last five flew during the release of the dimethyl methylphosphonate chemical test cloud. The SAWCAD sensor successfully detected the presence of the test cloud at the parts per billion concentration level, downwind from the vapor emission source. The test objectives to detect, locate, identify, and transmit accurate effluent data to a ground station were successfully accomplished during the field demonstration.

Performance testing and analysis of the SAWCAD point sensor is on-going. The sensor consists of two small circuit cards, system controller and sensor array, six custom surface acoustic wave solid state chemical vapor sensors, a gas manifold and a sampling pump. The package is enclosed in a 6" x 3" x 1.25" casing which operates on 6 to 24 volts DC and weighs 13 ounces. The data link was over a stand alone, spread spectrum, 10 ounce RS232 transceiver.

Future activities include the miniaturization and ruggedization of the sensor package, the development of a user friendly display, and continued refinement of the software to decrease the possibilities of false readings.

The Pointer UAV is managed by the Small UAV Project Team of the Program Executive Office, Cruise Missiles and Joint Unmanned Aerial Vehicles (PEO (CU)).

To learn more about the Program Executive Office, Cruise Missiles and Unmanned Aerial Vehicles, log on to our website at www.peocu.js.mil.

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