AMRDEC News from the Center

THE U.S. ARMY AVIATION AND MISSILE RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

FALL 2016

Degraded visual environment researchers conduct milestone testing

A science and technology program designed to increase the capability and safety of the aviation fleet achieved a major milestone Sept. 15 during testing.

The Degraded Visual Environment Mitigation Program held a VIP Day for the NATO Yuma Flight Trials. The dust and brownout testing is the first time the program has tested an integrated cueing, sensor and flight control solution in a relevant operational environment, said Maj. Joe S. Minor, Program Manager and Experimental Test Pilot for the DVE-M Program, led by the AMRDEC's Aviation Development Directorate.

"This DVE M program is a concerted effort to attack not only brownouts, but to build the capability of being able to fight in all weather conditions," said Col. Steven Braddom, director of the Aviation Applied Technology Directorate.

"Dark night went from being a hazard to our greatest tactical advantage," he said. **"Now, we prefer to operate in the darkest night we can find.** We'd like to transform operating in other weather environmental conditions to our advantage, just like this."

The agenda included a program overview briefing from Minor, as well as briefings from all the ground and air sensor participants and updates on the DVE-M efforts in cueing, flight control and guidance.

About 100 government and industry attendees witnessed the testing. Foreign representatives were from the British, Australian, Swiss, German and Canadian governments.

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Army technologies participate in counter-UAS demonstration

Several AMRDEC technologies were in play during the Department of Defense's largest live-fly, live-fire counter-unmanned aerial system technology demonstration.

Black Dart 2016's mission was to assess the DOD, interagency and industry's counter-UAS capabilities, according to Navy Cmdr. Ryan B. Leary, Black Dart project officer.

"Black Dart is designed to be a venue where participants from industry and government can bring systems of various levels of technical maturity," Leary said. "It provides an environment where military services, combatant commanders, other U.S. government agencies and industry partners can share awareness of the latest developments in C-UAS capabilities. The intent is to foster an atmosphere of experimentation and innovation, where many potential solutions, or pieces of solutions can be shared and combined," Leary said.

The exercise tested capabilities including surveil, detect, identify and track, and the C-UAS platform's abilities to attach, shoot and defend.

AMRDEC's mission set enables the organization to work across the center in C-UAS science and technology initiatives, many of which were demonstrated at the exercise.

One of the key technologies in the demonstration, the Joint

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Forcible Entry C-UAS Kit, is an integrated system which incorporates the AMRDEC-developed Maneuver Aviation Fires Integrated Application, known as MAFIA -- Pocket-sized Forward Entry Device Incr II, common tactical air picture.

"JFECK employs system-of-systems approach, integrating a suite of sensors capable of performing all facets of the Detect-Identify-Defeat functions for C-UAS," said Michael Murray, Battle Operations Software Suite team program lead at AMRDEC'S Weapons Integration Directorate. "JFECK re-missions existing Army programs of record systems at the lowest tactical level, including the MAFIA for Command and Control of all systems to include a common tactical air picture, the Army Global Engine 3D mapping software, a mobile Doppler radar with air surveillance capabilities, an EO/IR sensor camera for targeting and full motion video, and Electronic Attack capabilities," he said.

Also at the demonstration, the Joint Multi-Platform Advanced Combat incorporates multiple technologies, including acoustic, image processing and radar sensors primarily developed at AMRDEC.

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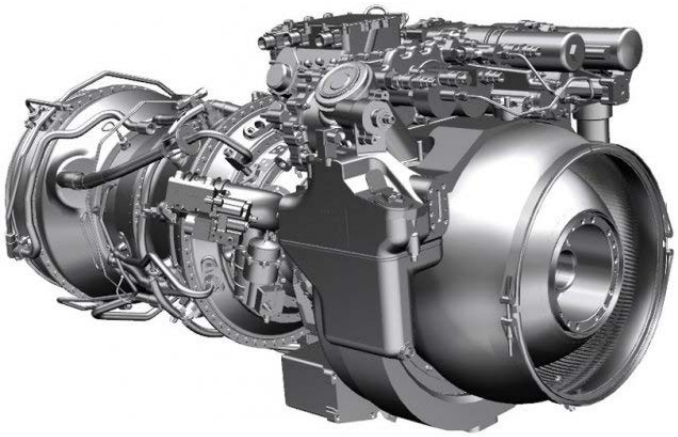
Future Helicopter Engine
more power, less fuel



The Advanced Affordable Turbine Engine program is a 3,000-horsepower engine demonstrator program to provide advanced propulsion capability for future Army rotorcraft platforms. AATE focuses on developing a new, advanced turboshaft engine to support modernization requirements to ensure the Apache and Black Hawk remain operationally effective well into the future.

AMRDEC's Aviation Development Directorate led the science and technology effort to develop a new centerline engine, focusing on three objectives: significant reduction in specific fuel consumption, significant improvement in shaft horsepower to weight ratio, and significant reduction in life cycle cost.

>> FULL ARTICLE

Army's Russell Tower
to be revived

The U.S. Army is refurbishing Russell Tower to support renewed development and testing efforts.

AMRDEC's Weapons Development and Integration Directorate owns and operates the instrumentation tower. The Measurement Facility was completed in 1988 and named after Robert F. Russell, a radar technology branch chief who was instrumental in getting the project started and passed away the same year. It was congressionally funded and cost approximately $5 million.

"Russell Tower is one of two 300-foot towers in the country," said Robert Milton, Fabrication and Evaluation function chief. At 329 feet tall, it has full views of the south, west and north. "The only other instrumentation towers of this size and caliber are at Eglin Air Force Base, Fl."

Windows in the air-conditioned 500-square-foot laboratory on the top landing are removable for unobstructed view. This line of sight allows observations of test systems against physical targets as well as live rocket motor plumes from statically fired propulsion systems. The Solid Rocket Motor Static Test Area, Building 9010, was strategically located in order for optimum viewing angles from the tower.

The facility is equipped to support development and testing of optical sensors, radar sensors, fire control systems, target acquisition systems, target signature measurements, evaluation of atmospheric effects, determining impact of clutter (natural or man-made), and smoke obscurants can be generated.

The facility's turntables are not currently functional but funding is being pursued. Tactical ground targets such as tanks or helicopters can be mounted and moved to simulate virtually any missile approach angle, from a horizontal direct fire to a vertical top attack. Different full-size vehicles are available for use as laser and radar targets.

"Our first priority is to get the elevators up and running again, unless we want to take all 485 steps to the top," said Milton. The tower's two elevators fell into disrepair and are not currently usable. Once complete, the main elevator will transport personal and equipment to the top or any of the floor landings.

"This allows a customer to stop at different levels and get different look down angles on the target."

Another elevator serves as a movable laboratory area where tests can be conducted at any elevation from zero to 300 feet. Funding for the elevator repair has been secured, and work is scheduled to begin next week.

Russell Tower can be used by any government agency or private contractor sponsored by a government agency. Points of contact are Jay Lilley (256) 876-3225 and Robert Milton (256) 842-0104.