

Aerospace Electronics & Information Technology

Courtesy U.S. Air Force



For the U.S. Air Force, SwRI engineers are redesigning aging avionics for the A-10 and other aircraft. A new heads-up display (inset) integrates standard symbology, greater functionality and added functions.

Southwest Research Institute supports national defense needs, especially those related to military aircraft, helping our clients with design and development solutions for the problems of aging aircraft and aerospace support equipment. Using our multidisciplinary expertise, SwRI helps increase the useful service life of aircraft once destined for retirement as well as helps expand the operational usage of various aircraft.

One of our largest programs, led by Lockheed Martin Systems Integration, is upgrading avionics and support equipment for the A-10 aircraft. The renewed hardware will transform the aircraft into an integrated weapon system increasing effective service life projected for another 20 years. This work will increase the aircraft's allowable flying hours, expand its usage and improve the availability of aircraft.

SwRI engineers are also involved in the redesign of aging avionics for the U.S. Air Force. We designed a new heads-up display for the A-10 aircraft to integrate standard symbology, greater functionality and added functions for future growth.

The Buster reconnaissance and surveillance system has successfully progressed through block upgrades to increase ground station radio links, video processing, and both hardware and software functional improvements. SwRI recently developed a militarized telemetry link and designed an automated directional antenna for Mission Technologies Inc., the Buster developer and systems integrator. The system performed successfully in exercises at military installations.

SwRI is using internal research funds to develop innovative technologies to enhance the flying qualities of small

UAVs. Another internal effort will improve UAV imaging capabilities, as well as the associated electronics and firmware.

For many years, SwRI has provided engineering support to Air Force Logistics Centers from satellite offices across the country. Our Oklahoma City office offers the Air Logistics Center at Tinker Air Force Base advanced diagnostic expertise to the turbine engine community. We also design replacement hardware by reverse engineering a number of military aircraft electronics systems. We support the Warner-Robins Air Logistics Center, improving software for electronic warfare equipment, upgrading test equipment systems and developing information management systems. At Warner-Robins, we recently corrected software problems in the operational flight program associated with an airborne electronics countermeasures pod.

unmanned aerial vehicles • flight controls • foreign military support equipment • turbine engine diagnostics • ORACLE™ databases • trigger-based management • natural language interfaces • automatic test program set development •



For the Air Force, our staff members analyzed turbine engine performance data. This resulted in development of training and technical manuals that assist with the detection of impending aircraft engine problems, such as the wear in the turbine blade shown.

Additionally, we provided a test and repair method for the JSTARS radar that will help reduce costs. We also staff a Layton, Utah, office to support reliability and maintainability upgrades for F-16 avionics and related equipment at the Ogden Air Logistics Center.

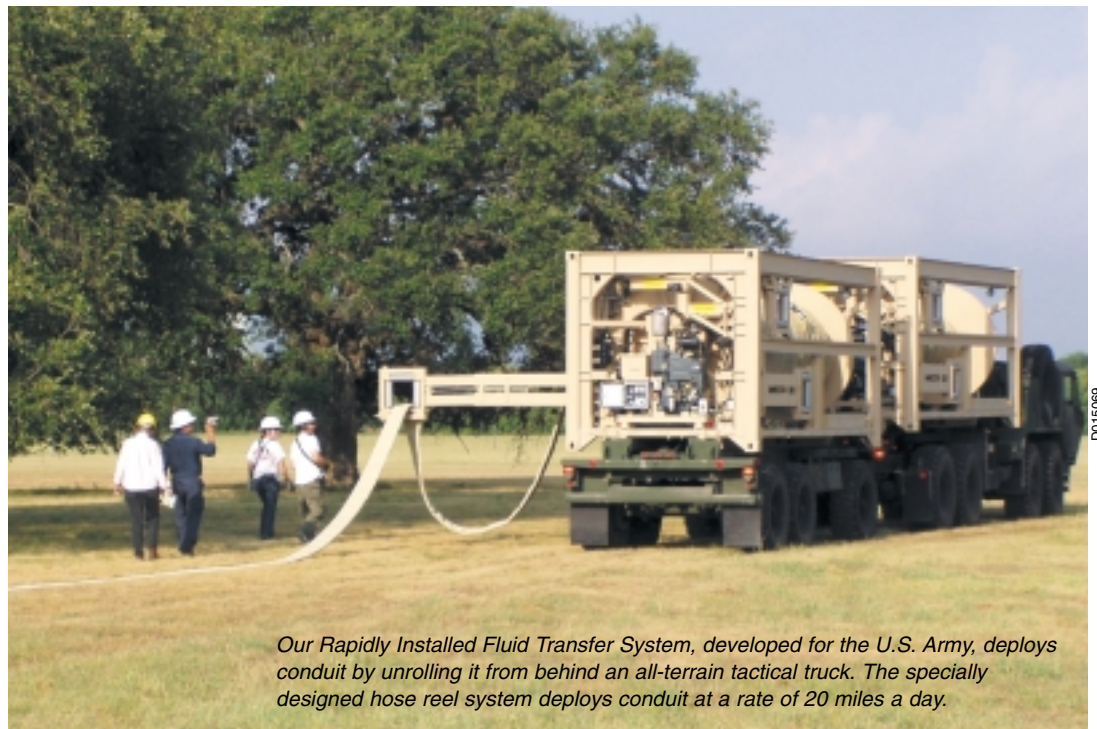
SwRI **electronic warfare** subject matter experts support Air Force clients in Warner Robins and at Eglin Air Force Base, Florida, with software changes for the complex electronics for the AN/ALQ-131 pod system providing anti-aircraft missile defense for military aircraft. SwRI engineers also provide automatic test equipment for simulation and testing of the electronic warfare pods.

For the U.S. Army, we are developing a flexible hose system to rapidly **supply fuel and water to advancing tanks, trucks and troops**. The Army is expediting delivery of the system, which deploys at a rate of 20 miles a day, because current portable rigid piping systems are more difficult and time-consuming to deploy and more prone to leaks. In cooperation with subcontractors, we developed and fabricated automated pumping stations, hose reels, and hose and support equipment, and are currently performing the system-level integration and testing. Full-scale production of the system is planned to begin in 2006. ❖

Visit avionics.swri.org for more information or contact Vice President Richard D. Somers at (210) 522-3188 or rsomers@swri.org.



Since 1993, SwRI has performed a lead role in developing automated flight control systems for small-scale unmanned aerial systems and unmanned aerial vehicles, such as the Buster system shown.



Our Rapidly Installed Fluid Transfer System, developed for the U.S. Army, deploys conduit by unrolling it from behind an all-terrain tactical truck. The specially designed hose reel system deploys conduit at a rate of 20 miles a day.