

Signal Exploitation & Geolocation



For nearly seven decades, Southwest Research Institute engineers and scientists have conducted research in direction finding, surveillance, geolocation, and tracking, supporting the United States and its allies in these important areas. Last year we consolidated our defense industry-related electronics expertise by combining our geolocation and signal technology research with avionics and support systems, electronics integration, and cyber technology expertise.

We are continuing our role as a major provider of geolocation network data sensors and control and management solutions. This past year, an SwRI-developed network became operational, replacing a worldwide geolocation management system that had been in operation for decades. The new network supports defense-related initiatives for the U.S. government.

To protect our warfighters in all branches of the military, we develop systems that can locate threats, identify friendly forces, or interfere with enemy radar signals. Under contract to the Naval Air Systems Command, we are developing enhanced tactical technology as part of an electronics instrumentation package for military aircraft. We successfully delivered four models for flight testing, with the first test flight completed this past June on a rotary-wing platform. The electronics package represents a new tactical capability that allows air crews to change their missions midflight.

We have multiple projects for the U.S. Air Force's ALQ-131, an electronics suite that jams radar signals to prevent an aircraft from being tracked by enemy forces or targeted by a missile. We perform software maintenance and independent verification and validation of the ALQ-131 operation flight programs, mission data generators, and automated test stations.

- Signals Intelligence
- Aircraft Data Recorders
- Cyber Exploitation
- Information Operations
- Analysis, Analytics, Visualization & Reporting
- GPS Engineering
- Array Processing
- Intelligence, Surveillance & Reconnaissance
- Autonomous Sensing
- Cloud Computing
- RF Design
- Condition-Based Maintenance
- Tactical Networking
- Aircraft Simulation
- Electromagnetic Modeling
- Electronic Warfare
- Flight Controls
- Flight-Line Testers
- Geolocation
- Antennas & Propagation
- Software-Defined Radios
- Information Exploitation
- Aircraft Systems Engineering
- Aircraft Component Testing
- Intelligence Networking
- Automatic Test Program/Set Development
- Life-Cycle Support
- Multi-INT Processing & Exploitation
- Communications Solutions
- Signal Processing
- Situational Awareness
- Information Assurance
- Surveillance Systems
- Cross-Domain Solutions
- Tagging, Tracking & Locating Solutions
- Trigger-Based Management



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SwRI direction finding equipment and software were featured prominently at a successful multinational intelligence collection exercise.

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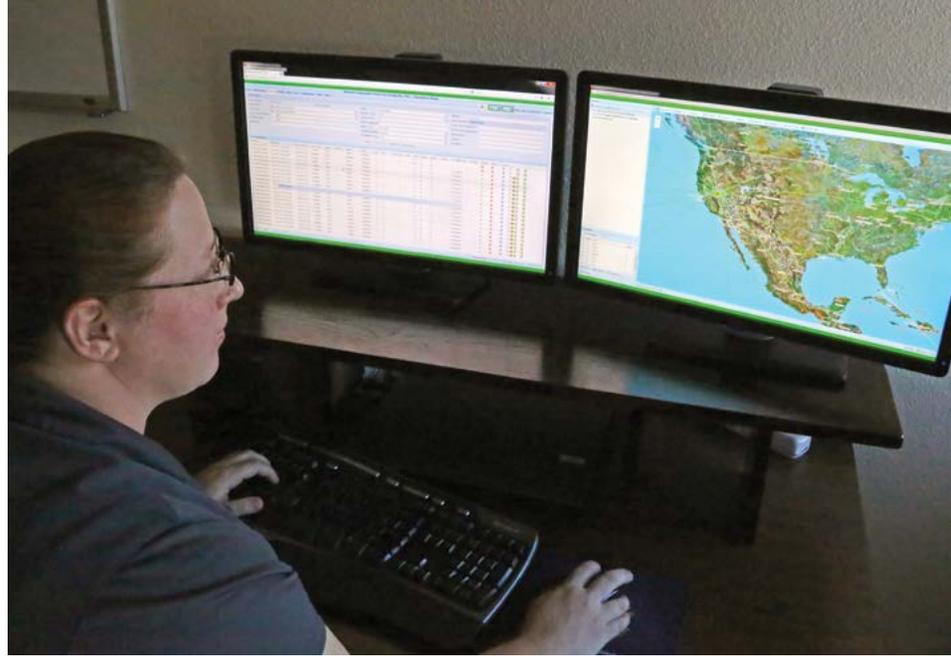
We successfully completed acceptance testing for the video processor assembly, identification friend or foe (IFF) interface, and threat-timing generator circuit card assemblies for the Mini-Multiple Threat Emitter System (Mini-MUTES). Mini-MUTES simulates an enemy's air defense radar system and is used to train U.S. Air Force flight crews. We completed site testing to certify that Mini-MUTES properly generated threat signals and could accurately track aircraft using the IFF system.

Using internal research funding, we enhanced the capabilities of Scout™, an SwRI-developed man-portable system for locating signal sources. We also used internal funding to develop our Frontier tactical networking interfaces, allowing SwRI systems to collaborate with various wireless signal location technologies.

We upgraded our in-house data collection systems to improve client support. The new systems can now collect data five times faster. In addition, we upgraded our transmitter and rotary test facilities with advanced technology.

To leverage our expertise in avionics and related support systems, we established an office near Wright-Patterson Air Force Base, Ohio, home of the Air Force Research Laboratory. Currently the office staff is collaborating with the General Services Administration and Air Force major commands to set up contract vehicles for future research efforts. ●

Signal Exploitation and Geolocation is being renamed Defense and Intelligence Solutions, effective Fiscal Year 2016. Visit defense.swri.org for more information or contact Vice President Nils Smith, P.E., at (210) 522-3685 or nilsmith@swri.org.



A new SwRI-developed geolocation network supports defense-related initiatives for the U.S. government.

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Our Rotary Test Facility includes a six-meter turntable (above) to evaluate antenna assemblies. Recent additions to the facility include a permanent control room building (above, in background) with new hardware and software that measure and display antenna patterns quickly and easily (left).

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