

THE SIREN



A First Responders Group (FRG) Newsletter

January/February 2017

The Evolution of RTACS: a Wearable, Hands-Free Comms System



First responders have an ongoing need to communicate easily and clearly during critical incidents. In support of this need, FRG partnered with Pacific Northwest National Laboratories and ADI Technologies to develop the Responder Technology Alliance Communications System (RTACS). The RTACS concept aimed to prove that it was possible to develop a wearable, hands-free communications system that could enable capabilities to support collaboration among multiple on-scene agencies and various incident command and control personnel. Examples of capabilities included hands-free intercom-style communications, noise filtering digital speaker/microphone, the ability to communicate in diverse environmental conditions, streaming video, translation capability, and more. FRG purchased four Golden-I mobile, wireless, voice and motion operated wearable headsets and modified them, and thus the RTACS—a combination of 10 performer capabilities in a single prototype—was born.

While FRG aims to develop technologies and get them into the hands of responders, in some cases that plan may not play out as such. In this particular instance, FRG's work supported further development of the Golden-I platform (central to the RTACS) and provided important responder input that was beneficial to an entrepreneur who ultimately further developed this technology. FRG's work ended at that stage, and a company called RealWear (formerly Wear Next) took the RTACS proof of concept forward.

RealWear realized that, like the first responder environment, heavy industry, energy, and aviation industries face much pressure. They must do more with less, be efficient, and always make safety a priority. Chris Parkinson, Chief Technology Officer of RealWear, member of the original RTACS team and a long-time supporter of an evolved RTACS-like technology, built off the initial lessons learned. After three revisions of the prototype, RealWear developed HMT-I, which has been commercialized, with distribution in volume (some 15,000 orders) set for July 2017. Key consumers are U.S. and European companies from logistics, maintenance, service and repair, and oil and gas industries. Parkinson attributes several ways the RTACS work helped in the development of HMT-I, including providing the funding to advance the technology and key user information that helped them prioritize and tweak certain capabilities over others.

FRG and RealWear recently reconnected and made plans to discuss potential first responder applications of this technology. During the days of the RTACS work, numerous responders were exposed to the technology and interest was exceptionally high. FRG is glad to have been a part of the initial efforts in developing this technology.

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Working Together to Improve Airport Screening Efficiency

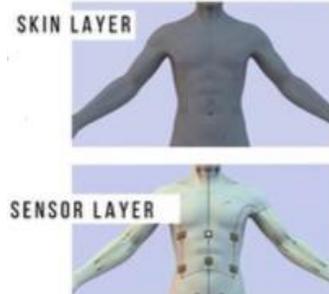
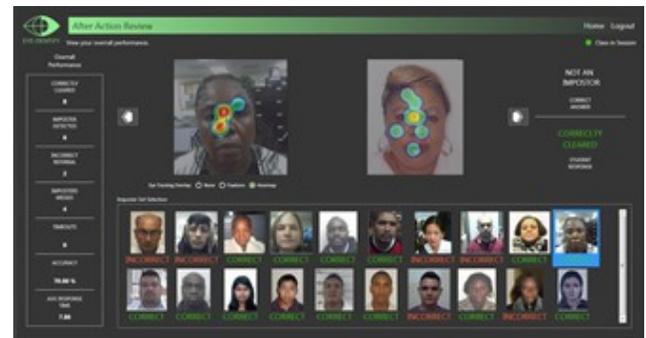
FRG works collaboratively with first responders and multiple Department of Homeland Security (DHS) components on a number of projects to provide those on the front lines of national security with efficient and effective tools and technologies.



FRG recently developed [ScreenADAPT](#), an advanced X-ray image analysis training technology in collaboration with the Transportation Security Administration (TSA). The use of this technology has resulted in a 45 percent increase in overall efficiency.

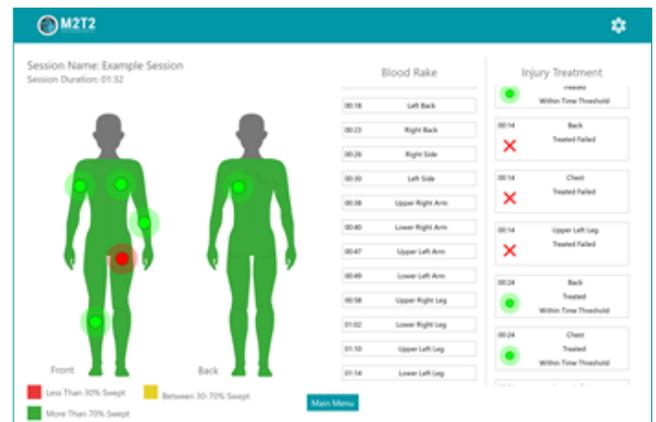
Fifty ScreenADAPT systems have been deployed at seven airports. It uses innovative eye-tracking technology to give trainees real-time feedback that improves their overall performance. It allows screeners to clear bags faster and increases screeners' confidence in their decision making. Once the program is implemented nationwide, these efficiencies could result in faster throughput at checkpoints for a safer and more satisfying traveling experience.

FRG built upon the success of this system to develop Eye-identify, a capability on the same ScreenADAPT platform, in collaboration with U.S. Customs and Border Protection. Eye-identify results in similar improvements regarding imposter detection training conducted at the Federal Law Enforcement Training Center (FLETC). Eye-identify will assist officers with authentication of travel documents and identification at our nation's borders.



In another effort to maximize performance, FRG is working with both FLETC and TSA to develop technology solutions to assist in the training of officers and agents on proper pat-down procedures and techniques. The Pat-down Accuracy Training Tool, or PATT, is a full-sized mannequin equipped with force-sensing technology that will provide previously unavailable information to trainers on the coverage and sequence of a trainee's search. Ultimately, this will lead to more consistent and thorough operational pat-downs, increasing national security, as well as officer and public safety.

FRG is leveraging the sensing technology built into the mannequins to meet needs in first aid training, which is also a common task across the Homeland Security Enterprise and first responder community. FRG developed the Medical Mannequin Training Tool (M2T2) in collaboration with FLETC's Physical Techniques Division. M2T2 is a medical training mannequin intended to improve skills in some of the most common critical tasks such as initial injury assessment, addressing sucking chest wounds, packing joint wounds, and properly applying tourniquets. The medical mannequin will provide vital feedback to trainers and trainees, resulting in saving lives with more efficient and effective injury care.



These collaborative efforts are just a few of the many ways FRG is reinforcing its position as a research leader and continuing to provide effective and innovative insight, methods, and solutions for the critical needs of the Homeland Security Enterprise.

FRG is continuing to play a major role in the S&T mission to deliver solutions for the critical needs of the Homeland Security Enterprise.

For more information on these training technologies, FRG is hosting an informative Facebook [“Tech Talk”](#) on April 5, 2017, at 11:30 a.m. EDT. Mark your calendar and join the event [here](#).

Flood Resilience Experiment Successfully Tests the Use of Social Media and Mutual Aid Tools

When Hurricane Katrina struck New Orleans in August 2005, the levees failed and exposed glaring weaknesses in preparedness and response efforts in the face of the massive storm. The impacts were catastrophic. The hurricane flooded 80 percent of the city. Seventy percent of the 134,000 housing units in New Orleans were damaged or destroyed. And despite that, almost 90 percent of New Orleans' residents were evacuated before the hurricane struck, many hundreds lost their lives. A hard lesson learned was the need to improve coordination and situational awareness among federal, state, and local first responders, emergency managers, and civilians.

Imagine a scenario in which a severe weather system is forecasted to pass through the Gulf region. A flash flood watch has been issued. Keeping the lessons learned from Katrina in mind, how do we get relevant info? How do we share info? How do we know who needs help? How do we improve mutual aid? What role do residents play in creating better situational awareness and coordination? And how can social media be leveraged to improve situational awareness?

FRG has been supporting research on leveraging social media in emergency response and the use of the Mutual Aid Resource Planner (MARP) tool for planning under its [Flood Apex program](#). As part of this effort, FRG sponsored a table top experiment with the New Orleans Office of Homeland Security and Emergency Preparedness (NOHSEP) and Greater New Orleans, Inc., last month in New Orleans. A total of 37 participants including first responders, emergency management personnel, and non-government volunteer organizations took part in the experiment.

The objective was to test the use of social media and mutual aid tools to reduce flood fatalities and property losses, and enhance community-wide resiliency. As part of the scenario, NOHSEP activated their digital volunteer team that monitored (simulated) social media and reported information back to the Emergency Operations Center. This included supporting NOHSEP in identifying and mitigating misinformation disseminated via social media.

The experiment successfully tested a full workflow involving operationalizing social media supported by digital volunteers. Given its successful demonstration during the exercise, MARP is now available for NOHSEP's operational use during emergencies. Members of the emergency management community interested in adopting MARP can contact the [National Information Sharing Consortium \(NISC\)](#) via: info@nisconsortium.org.



SAVER One-Stop-Shop Procurement Decision Resources Now Available for Download

[System Assessment and Validation for Emergency Responders \(SAVER\) Program](#) documents are now available for download on the S&T website, as a one-stop-shop for resources to help responders make better purchasing decisions. Available at: [science-and-technology/saver](https://www.dhs.gov/science-and-technology/saver). Assessment Reports, Market Surveys, TechNotes and other types of SAVER reports provide unbiased comparative assessments of commercially available tools and equipment. The equipment is selected, then tested and evaluated by responders themselves in realistic operational environments.

“SAVER reports are valuable to the responder community for their readability, comparisons of technology, and ability to capture end-user feedback. This helps first responders to see the pros and cons, easily review the specs, and make a better purchasing decision as a result,” said SAVER Program Manager Brian Warner.

In 2016 alone, SAVER assessed technology resulting in 23 new reports in seven Federal Emergency Management Agency Authorized Equipment List (AEL) categories, including: [Ballistic-Resistant Body Armor for Women](#), [Handheld Thermal Imagers](#), [Personal Cooling Systems](#), and [Throwable Robots](#).

A promotional graphic for the SAVER program. On the left, the U.S. Department of Homeland Security logo is above the SAVER logo, which consists of the word 'SAVER' in large, bold, blue letters with a white outline, set against a blue background with a white star. Below the SAVER logo is the text 'System Assessment and Validation for Emergency Responders'. On the right, the text 'DOWNLOAD NOW!' is in large, bold, white letters. Below that, it says 'SAVER Assessments available at:' followed by the URL 'https://www.dhs.gov/science-and-technology/saver'. At the bottom right is the Homeland Security Science and Technology logo.

SAVER reports are free to download and written in plain language “Consumer Reports” style. In addition, they are searchable by AEL category to facilitate the opportunity to align grant funds to AEL equipment. The goal: provide cost and time savings to federal, state, and local responders as they decide which equipment to purchase.

The SAVER Program is a National Urban Security Technology Laboratory (NUSTL) effort. NUSTL is responsible for all SAVER ac-

tivities, including selecting and prioritizing program topics, developing SAVER knowledge products, coordinating with other organizations, and ensuring flexibility and responsiveness to first responder requirements.

FRG Takes Off with Unmanned Aerial Systems for First Responders



Stephen “Herbie” Hancock represented FRG at the first National Unmanned Aerial Systems (UAS) Drone Conference and Summit in Charlottesville, VA on February 28. Cosponsored by the Virginia Department of Emergency Management (VDEM), the event was held in collaboration with Piedmont Virginia Community College (PVCC). At the summit, participants demonstrated and discussed the use of drones in public safety, with speakers and panels on fire, search and rescue, and law enforcement. It was organized by Charles Werner, former chief of the of the Charlottesville Fire Department, currently a consultant to VDEM, and longtime collaborator with and friend of FRG.

Hancock spoke on FRG’s growing interest in drones (generally referred to as unmanned aerial vehicles, or UAVs) as a supplement—and often a low-cost replacement—for conventional manned aerial photography and reconnaissance. UAVs can also provide close support for SWAT teams, bomb squads, search and rescue operations, and firefighting.

As they become integrated into these traditional missions, UAVs open up new or better ways to carry them out. A drone can look into high windows in a building to find stranded people. They can deliver lightweight cargos such as medicines or medical devices. They can help guide a robot to a bomb, providing an outside video feed that helps avoid obstacles and therefore quickens the robot’s progress. Most importantly, they can substitute for putting a human in harm’s way, allowing first responders to be better prepared and more likely to succeed—and survive in dangerous situations.



Hancock’s talk focused on federal efforts to integrate UAVs into the current (manned) national air space, noting that it will take years to fully address all safety, privacy, navigation, and logistics hurdles before the potential of drones can be fully realized.



Attendance at the summit was high, especially for a first-year event. Numerous state and local first response agencies attended, along with an excellent representation of UAS vendors for the U.S. and Europe. Participants expressed strong interest in teaming with FRG to help develop detailed operational requirements for first response missions and join in future DHS testing operations at FRG’s [NUSTL](#) and elsewhere.

Many of FRG’s programs will be integrating unmanned vehicles of all sorts into their toolkits. The [Next Generation First Responder Apex Program](#) is a natural beneficiary, but Flood Apex also foresees UAVs as playing an essential role, not just in flood response but as low-cost light imaging, detection, and ranging platforms to accurately assess flood risk through detailed terrain measurements. A tethered drone carrying a signal repeater can be deployed very quickly and stay up indefinitely—a so-called “tower in a box.” Beyond UAVs, the next step will be to look at unmanned surface vehicles, robotic boats, and even robotic submarines. The next several years are bound to see a rapid proliferation of multipurpose robots playing key roles in unexpected places.



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