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Broadening Opportunities
The Army Communicator is published as a command information e-publication for the men and women of the United States Army Signal Corps under the provisions of AR 360-1.

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On the Cover

Soldiers serving as Training With Industry Fellows are placed at major corporations such as Lockheed Martin (pictured here) and bring what they learn back to the Army. Photo provided by Michael Cuttler.
We are pleased to bring you another edition of the Army Communicator. This edition focuses on Broadening Programs, and discusses ways Officers, Warrant Officers and NCOs in the Regiment are given the opportunity to work outside their normal scope of military duties in other governmental agencies, civilian industry, or through advanced civilian education. These programs give high-performing individuals the chance to learn new skills, experience new cultures and build perspectives on how other organizations operate and bring new ideas back to the Army. Each year, the Signal Corps sends 12 Officers, six Warrant Officers and two Non-commissioned Officers to broadening programs including Fellowships, Training with Industry (TWI), and Advanced Civic Schooling (ACS). These programs are career enhancing, but the decision to pursue such a program must be taken in context of one’s career and family situation. Since these programs are typically one year in length, except for ACS, which is two to three years, applying for one of these programs must be considered within the timing of promotion board eligibility and personal considerations. The Broadening Program typically has follow-on assignment requirements that the Soldier must consider and must balance this with personal and professional goals. Please review the HRC Broadening website and submit an application to see if the broadening program is a viable opportunity for you.

Soldiers that are selected to attend a Broadening Program are exposed to cutting edge technology and commercial best practices, and in the case of Fellowships, gives the Soldier insight into high-level governmental decision-making and inter-agency coordination processes. This exposure to outside entities provides our Signal Soldiers a better understanding of how communication technology is developed, managed and in some cases regulated outside of the Department of Defense. This understanding provides a unique perspective to enhance our Signal Soldier’s knowledge and experience for follow-on and future assignments.

Every Soldier is encouraged to review the available broadening programs, and if eligible, consider applying. If the time is right an eligible Soldier can expect to gain valuable knowledge and insights into the world of communications outside of the DoD. This knowledge is of great value to the Army, and can be career enhancing. We recommend every Soldier consider a Broadening Program opportunity within his or her career plan.
Cyber Institute welcomes reserve Signal Soldiers

Lt. Col. Brett Lindberg, Army Cyber Institute, explains the Augmented Reality Radio Frequency Visualization, or ARFVIS, to Capt. Vikram Mittal, 335th Signal Command's Army Reserve Cyber Operations Group. Photos courtesy of Photo provided by Army Cyber Institute.
Capt. Lisa Beum
Army Cyber Institute

The weekend of January 25-27 marked an historic event for both the Army Cyber Institute at West Point and the 335th Signal Command's Army Reserve Cyber Operations Group, as an active duty component and a reserve element joined cyber forces for the benefit of our nation.

The Army Cyber Institute conducts cutting edge cyber research to explore the challenges facing the Army within the cyber domain in the next five to 10 years. Those research initiatives include cyber resiliency for critical infrastructure, cyber autonomy, high frequency communication and more.

Realizing that both units could benefit greatly from each other, the 335th SC(T) ARCOG agreed to have 10 members of the unit serve their duty with the ACI at West Point over the next couple of years.

"We established a strong foundation during our initial battle training assembly for the ARCOG ACI Research Team," Col. Michael D. Smith, 335th SC G39 chief, missioning and stationing, said. "It is an ideal partnership sharing the civilian acquired skill set and private sector expertise with the ACI on the tough research areas targeted by ACI."

This partnership allows the ACI research teams to leverage the U.S. Army Reserve Soldiers’ unique industry, government, private sector and academic expertise to expand the body of knowledge and support the advisement of senior military and government officials.

"The relationship we are having at ACI with reservists not only solidifies
the relationship between active and reserves, but it also harnesses skill sets in reserves and even the National Guard," Chris Hartley, deputy director, ACI, said. "This relationship gives sustainable access to skill sets and helps foster public-private partnerships because these reservists come from different sectors across the nation."

"I'm really excited about our new reservists whose energy industry experience dovetails well with our Jack Voltaic research," Lt. Col. Erica Mitchell, strategy and policy division chief at ACI and project lead for Jack Voltaic, said.

Jack Voltaic is a bottom-up research approach to critical infrastructure resilience, and Mitchell will be heading the research initiative for Jack Voltaic 2020, with additional help from reservists.

Capt. Vikram Mittal, currently transitioning from National Guard to the 335th SC(T)'s ARCOG, heard about the opportunity to work at ACI through a friend. Mittal is a systems engineering professor at West Point in his civilian capacity and had worked with Lt. Col. Brett Lindberg, ACI researcher, on a class about a year ago and kept in touch since then.

When Lindberg mentioned the opportunity to work at ACI in a reserve capacity, Mittal jumped at the opening.

"I'm really looking forward to doing cutting edge research and providing value back to the Army," Mittal said. "Being in the 335th SC(T)'s ARCOG and working with ACI will also improve my skills and ability to actually use those skills."

By the end of the first drill weekend, the Reserve Soldiers were heavily engaged with their particular ACI research initiatives based on their skills sets and strengths.

"Looking at the breadth and depth of the skillsets of these Soldiers, we hit a home run," Hartley said.
Training With Industry
The roots of the Training with Industry (TWI) program date to 1940 when the United States Department of War created a program then referred to as, “Training Within Industry.” The purpose was to provide consulting services to war-related industries whose personnel were being conscripted into the US Army at the same time the War Department was issuing orders for additional material. Within a year, it was determined that the training programs created to support the war effort were universally applicable to any type of organization.

Between 1945 and 1951 General MacArthur headed the Allied occupation of Japan and utilized TWI in the re-establishment of Japan as a democratic nation. In the 1970’s the Army redesigned the TWI program as a response to the shortage of Officers with advanced skills in civilian and private sector industrial practices that were not taught through military education at the time.

Today the Army TWI program is open to all branches and all three cohorts to serve as a work-experience program where Soldiers receive exposure to managerial techniques and industrial procedures within corporate America and understand the relationship of their industry as it relates to the functions of specific Army branches. Following TWI, Soldiers would then be utilized for a minimum of 24 months in assignments in order to utilize their acquired skills to improve upon existing training and doctrine based on successful procedures and practices they gained during their TWI participation.

TWI positions must be validated through the Army Educational Requirements System (AERS) in accordance with Army Regulation 621-108, paragraph 3-2 and 5-4. Annually, requesting agencies must review their organizations in order to identify positions where TWI experience is essential for optimum performance of duties, i.e., positions that require detailed, thorough, and explicit knowledge in a technical field. This review should also ensure that the training requirements cannot be satisfied through Civilian Education Short Course Training, or through the Army School System.

In conjunction with the annual AERS review, requests for TWI training position changes will be evaluated and validated in accordance with current External Utilization Review Board (EURB) guidance.

Soldiers with TWI experience will serve subsequent assignments in positions requiring TWI experience, based upon Army requirements and professional development considerations. Subsequent assignments to TWI positions will occur consistent with career development.
Insights from Microsoft TWI: Data Science for Brigade Combat Teams
I served as a Sustainment Automations Support Management Officer, Battalion S6, and Server Technician through a combination of one deployment, two duty stations, and six years of rigorous training exercises. At the time of this writing, I am continuing my adventure and exploration with Microsoft as a Training with Industry fellow. I have a unique opportunity at Microsoft to redefine what I believe we are capable of as contributors within our career field. There are many similarities between industry and the Army, large amounts of data dispersed between many locations is one familiar example. I discussed this topic with my colleagues and confirmed that this is a systemic problem. Sometimes we miss out on critical indicators as a result. Each section in the Brigade staff maintains countless numbers of spreadsheets, databases, SharePoint lists, and external recordkeeping systems. Imagine a system where you can combine and interact with data from each section that shows a clear picture driven by authoritative data sources.

We communicators often struggle to articulate what our datasets represent in a way the Brigade Combat Team (BCT) Commanders understand. What do I mean? Consider the Army Training and Certification Tracking System (ATCTS) as an example. ATCTS contains important information about each user on the network. This system is our only check and balance to ensuring our users are authorized access on the network. Or is it? How do you cross-check security clearances for your active users? Do you have a constant flow of communication from the Security Office (G2/S2) when users lose their clearance? How often do you disable users when their Acceptable Use Policy (AUP),
Cyber Awareness training, or System Access Authorization Request (DD2875) expire? Do you report this data to your Commander? If you do, you must make the information easy to understand, irrefutable, and relevant.

You may have heard the term Data Science and Big Data. While it would be great to have an Operations Research / Systems Analyst (ORSA), or FA49 in the BCT, they are only assigned at the Division and Corp. These are the Army’s Data Scientist’s. They specialize in making large complex datasets meaningful. This is where Microsoft’s Power BI (Business Intelligence) software helps. Microsoft developed a powerful piece of software that enables regular people to analyze and visualize large and seemingly disparate data sets. Power BI allows you to import multiple raw and formatted data sets, link them together, and graphically interact with the data for further analysis. Power BI is free and available to download for home use and in corporate/government environments. I had the opportunity to use the software for one year while stationed in Europe and continue to leverage its capabilities in my daily routine at Microsoft.

Think of Power BI as a blend of Microsoft Access, Excel, and Power Pivot, all bundled into one application that is easy to use. You can import data from nearly 30 different sources, including Active Directory (AD). Importing, formatting, and shaping the data is as easy as clicking, dragging, and dropping. For example, the report shown in this article took about an hour to build. The hardest part was creatively styling the report. The artificial intelligence within the application makes complex mathematical formulas easy to use.

I exported a report from ATCTS and connected the report directly to AD. This allowed me to produce a comprehensive report that I showed Command-
er’s at each echelon. The report did several things for the organization. It identified users in AD without an ATCTS account, users in ATCTS without AD accounts, users whose AUP, Cyber Awareness training, and DD2875 were missing or expired. More importantly, it graphically depicted which units were following the Commander’s policy. This report was used during Command and Staff, Staff Syncs, and served as an artifact within the Tenant Security Plan. This single report drove actionable discussion between the Commanders and the S6. Updating the report took about 30 seconds. I eventually modified the report to show each tenant unit within US Army Europe.

I introduced the software to Ordnance, Engineer, Signal, Adjutant General, and Quartermaster officers. They quickly produced meaningful reports that were actionable and easily updatable. Imagine having a comprehensive and interactive report that merges data from any number of websites, spreadsheets, or databases you use daily. This concept fundamentally changed the way I show spreadsheet data to a group of people. For example, I would never put an ATCTS spreadsheet or an export from AD in front of the Commander, but when combined, it shows a very clear picture that is immediately useful.

I have built over 30 different reports that range from strength management, property accountability, lifecycle replacement, maintenance statistics, budget reports, and employee productivity reports. The possibilities are endless. Try it out for yourself, it’s free, it’s called Microsoft Power BI.
Soldiers serving as Training With Industry Fellows are placed at major corporations such as Lockheed Martin (pictured here) and bring what they learn back to the Army. Photo provided by Michael Cuttler.
For some employees, “we never forget who we’re working for” is more than just a corporate slogan. Thanks to the Department of Defense’s Training with Industry (TWI) Program, Lockheed Martin Cyber Solutions employees will never forget their customer, as they’ve spent the last year working alongside two U.S. Army personnel.

The TWI program was initiated in the 1970s in response to the Army’s critical need for enlisted Soldiers with state-of-the-art skills in industrial practices and procedures not available through military or civil education programs. This month Major Robert Alsfelder and Staff Sergeant Paul Murphy say they are completing their Lockheed Martin training period feeling empowered and with a new perspective. Here are their stories.

Serving in the Army for 15 years, Maj. Robert Alsfelder currently works as a Signal officer where he specializes in information assurance for computers and networks. In that role, he regularly interfaces with brigade leaders. While participating in the TWI program at Lockheed Martin, he applied his technical expertise and soft skills to an integrated air defense program for a foreign customer.

“Joining this program, I was most interested in learning best business practices that I can use to support Army operations and improve processes,” he said. “Lockheed Martin is solution-focused as opposed to process-focused and is agile enough to work around their established processes if they aren’t helping the company. I am excited to take the cool tools and solutions that Lockheed Martin has back to the Army.”

Staff Sgt. Paul Murphy has served in a variety of roles during his ten years serving in the Army. From being a communications sergeant for three different generals in Africa, to working as a server admin, information assurance ana-
lyst, and defensive cyber specialist, he has experience with a multitude of various equipment and systems. Throughout the past year, he’s worked with the Computer Incident Response Team (CIRT). There, he spent most of his time reverse engineering malware and responding to employee issues.

“The CIRT team are top notch, diverse, and extremely intelligent,” he said. “I am most impressed by the CIRT’s single, comprehensive Knowledge Management System. Thanks to this historical archive, the on-boarding process at CIRT is unmatched because everything is historically recorded so the learning curve is shorter.”

Although Lockheed Martin is modeled on the structure and operations of our customers, both soldiers acknowledged there are similarities and differences. While the missions clearly align, Lockheed Martin can implement tactics more quickly to solve problems and avoid some of the bureaucratic challenges of the federal government. Despite that, both organizations can feel stove piping at times. Each soldier acknowledged the importance of making a conscious effort to communicate across the organization to empower others.

While they learned a lot from Lockheed Martin, both Murphy and Alsfelder left their Lockheed Martin teams with lessons from the Department of Defense to improve efficiency.

“The DoD does asset management and documenting every detail really well, and I was able to share these best practices with the CIRT team,” Murphy said.

Major Alsfelder left a legacy with his Lockheed Martin team by encouraging knowledge sharing and customer collaboration.

“The Army cannot use these cool tools and solutions at Lockheed Martin if they don’t know about them,” he said. “I am honored to have this experience and thrilled to tap into my newfound network of colleagues to tackle big challenges and bridge the gaps between the DoD and industry.”
Army, Industry Work Together to Speed up Signal Detection

Stryker crewmen with the 1st Squadron, 2nd Cavalry Regiment fire an M1128 Mobile Gun System during a joint live fire exercise in August 2018 at Bemowo Piskie Training Area, Poland. The Army Rapid Capabilities Office, in partnership with the Project Manager for Electronic Warfare and Cyber, opened a challenge to identify new approaches to signal detection to speed up the rate at which electronic warfare officers could eliminate the congestion that comes with signal detection. Photo by Sgt. John Onuoha.
The Army Rapid Capabilities Office, or RCO, does things differently. It has to. It's mandated in its charter and embedded in its culture.

So when it came time for the small acquisition shop to find a way to speed up signal detection, it knew it wouldn't seek answers using traditional methods.

Instead, the RCO studied commercial models for getting answers quickly and created a "challenge" that gave industry, academia, scientists and other agencies the opportunity to go head-to-head in a competition.

The challenge focused on using artificial intelligence and machine learning to speed up the rate at which electronic warfare officers, or EWOs, could sift through the congestion and noise that comes with signal detection.

"By structuring this as a challenge instead of an RFI, we were able to model what industry does and create something much more hands-on," said Rob Monto, director of the RCO's Emerging Technologies Office. "We invited anyone with a possible capability to participate and posted it on Challenge.gov and FBO.gov. This is very similar to the commercial model of posting on Kaggle.com, where data sets are sent out to communities of data scientists who want to compete against one another to determine who has the best solution."

The RCO's online challenge offered synthetically generated data based on what could be seen in the electromagnetic spectrum, and challenged participants to prove they had the best artificial intelligence and machine learning algorithm for performing "blind" signal classification quickly and accurately. The challenge was strictly performance-based and open to anyone. Because it was all online and completed in four months, it came with very little cost or burden placed on those participating.

"The response was overwhelming," Monto said. "We had more than 150 participants from across traditional and nontraditional industry partners, universities, labs and government."

The idea for the challenge stemmed from the RCO's partnership with the Project Manager for Electronic Warfare and Cyber, within the Program Executive Office for Enterprise Information Systems, which recently delivered new electronic warfare prototype systems in response to an operational needs statement from U.S. Army Europe. Soldiers are using the equipment to implement electronic protection for their own formations, to detect and understand enemy activity in the electromagnetic spectrum and to disrupt adversaries through electronic attack effects.

However, in enhancing the signal footprint for EWOs, the prototype sys-
tems also brought more data to an already complex electromagnetic spectrum. Through the challenge, the RCO wanted to determine if artificial intelligence and machine learning, or AI/ML, could assist them in digesting that data and sorting through what is and isn't important.

"We knew industry was already making leaps and bounds in applying AI/ML for image recognition and video recognition, but found that there was very little work being done in this specific area of signal detection," Monto said. "What we discovered in a very short period of time is that AI/ML could in fact be applied to a data set that could translate to being integrated into an electronic warfare system on the battlefield."

After opening registration online, competitors were given access to the training data set, consisting of over 4.3 million instances across 24 different modulations, which included a noise class. (The noise class represents "white" noise to replicate the real-life environment that signals would be detected in, rather than a pristine lab environment.) The effort sought solutions that could perform "blind" signal classification quickly and accurately. Blind signal classification requires little to no prior knowledge about the signal being detected in that specific instance. Instead, the solution would automatically classify the modulation, or change of a radio frequency waveform, as a first step toward signal classification.

The challenge gave participants 90 days to develop their models and to work with the training data sets. That was followed by two test data sets of varying complexity that were the basis for judging submissions. The first data set was released 67 days after the challenge launch, with a solution submission window of 15 days. A second, more complex test data set was released 84 days after the challenge launch, with a shorter submission window of only seven days.

"We really enjoyed the challenge process, which included the hard problem curation, providing training data and a specific scoring algorithm," said Dr. Andres Vila, an engineering specialist for the Aerospace Corp. and a member of the challenge-winning Team Platypus. Over the next several months, the RCO will begin to advance what was learned from the challenge, potentially prototyping the leading artificial intelligence and machine learning algorithms into Army electronic warfare systems.

Team Platypus from The Aerospace Corp. won first prize in the Army Signal Classification Challenge. The team includes (front row, from left) Eugene Grayver, Alexander Utter and Andres Vila; and (back row, from left) Donna Branchevsky, Esteban Valles, Darren Semmen, Sebastian Olsen and Kyle Logue. Photo provided by Elisa Haber.

An expanded version of this article was published in the January - March 2019 issue of Army AL&T and is also available at https://www.army.mil/article/213530/cutting_through_the_noise.
TWI Fellow helps build ‘the Bridge to Possible’

Smartboard at Cisco's Executive Briefing Center in San Jose, Ca. Photo by John Pekol.
Maj. Gregory Stewart, Jr.  
Cisco Training With Industry Fellow

“The Bridge to Possible,” Cisco’s current branding campaign, means connecting the world and enhancing resource possibilities through bridging problems and solutions. Initially founded as a switch and router product company, Cisco has invested into next generation technology that provides customers with cutting edge solutions utilizing artificial intelligence (AI) and machine learning (ML) computing. This also relates to the evolution of the Signal Corps by integrating all capabilities from tactical to strategic through global communications to enhance the warfighter and operational picture for commanders at all levels. The training with industry (TWI) program increases the Army’s knowledge to integrate private sector ideas and technology to enrich the current network to the Army’s future network campaign plan of the Department of Defense Information Network-Army (DoDIN-A).

TWI’s presence at Cisco is decades old and strengthens all candidates’ network system knowledge. With many solutions embedded into the Army network globally, developing an understanding of industry best practices with efficiency and cost effectiveness gives TWI Fellows a better perspective to ensure mission assurance for a commander’s network. Classified Network Services (CNS) is Cisco’s link to creating test environments and proof of concepts for the public sector. CNS possesses an entire lab environment that represents customers’ networks that allows engineers to Maj. Gregory Stewart performs troubleshooting on the Department of a Veteran Affairs test network. Photo by Matt Smith.
identify shortfalls, provide better solutions and introduce future designs. For the Army, CNS provides troubleshooting customer support, performs the necessary steps to get solutions Joint Interoperability Test Command (JITC) certified, and assists in future architecture designs with the Army organizations, an example being the Army Network Cross Functional Team. Cisco’s public sector continuously enables customers the ability to evolve from traditional routing and switching to emerging concepts to help fortify all seven Open System Interconnection (OSI) layers.

As this year’s TWI Fellow, learning Cisco’s business practices and customer experience methodologies gives me an understanding of how private sector companies maintain the balance of keeping customers satisfied, increasing the company’s bottom line, and satisfying shareholders. This can be contrasted with Signal officers’ duties of maintaining assurance of the network, enabling the commander with situational awareness, enhancing warfighter capabilities, all while efficiently spending tax payer dollars in a financially constrained environment. Working at Cisco has given me a different viewpoint to understand their problem analysis and resolution process to develop better approaches to operating, maintaining and defending networks. From an architecture perspective, any network changes require the understanding of industry best practices for network design and management, and analysis of how other customers in the public sector, beyond the Defense Department, plan and implement changes.

Working at Cisco has given me the insight into how to best work with industry partners to accelerate and enhance networking and security capabilities within the Army. I have gained a perspective on ways to approach industry with requirements and capitalize on the latest innovations to evolve network design and implementation. The pace at which networking technology is evolving within industry provides a strategic advantage that must be integrated in Army future planning. Continuous collaboration through the TWI program between the Army Signal Corps and Cisco is key to unlocking great potential for closing the gap on modernizing the network, introducing industry methods to problem solving and leadership, and identifying current and future shortfalls to network enhancements and migration.

The 27th Chief of Signal officer’s distinguished 31 year career ended as deputy commander in chief of U.S. Army Europe and Seventh Army; he was the first Signal general to be appointed to this position, a job usually reserved for combat-arms officers. Before becoming deputy commander, he was U.S. Army Europe and Seventh Army’s chief of staff. More upper-level jobs included 35th Signal Brigade commander, Fort Bragg, N.C.; deputy commanding general, U.S. Army Signal Center, Fort Gordon, Ga.; deputy director for plans, programs and systems, Office of the Secretary of the Army, during Operation Desert Shield/Desert Storm; then Chief of Signal at the Signal Center.

It was during Gray’s tenure as Chief of Signal that he made his most lasting impact on the Signal Regiment. Responsible for training Signal soldiers and leaders in a time of Army downsizing and cutbacks in money and staff, he oversaw Fort Gordon’s expansion just after the Persian Gulf War during the nation’s Base Realignment and Closure (BRAC) initiatives, when three units moved to Fort Gordon. He was also at the helm during the greatest revision to date of enlisted jobs in the Signal Corps’ history, when major changes were made in 47 MOSs and new MOSs were created to answer the Army’s needs. The Signal School reorganized and revamped in the early 1990s to develop and train soldiers for an Army becoming digitally based. Although completed after Gray retired, he was responsible as well for initiating the major changes later occurring with Signal warrant officers, as warrant MOSs consolidated to reflect the Army’s evolution.

Gray also created the first Battle Command Battle Lab at the Signal Center to help the Army better use commercial-off-the-shelf technology and speed the Army’s procurement process. He was the first senior officer to see that automation and communications had to be linked and started the effort with officer training programs at the Signal Center to cross-train Signal officers in automation functions, and Functional Area 53 officers in Signal functions.

(This article was compiled from information originally published on [signal.army.mil](http://signal.army.mil) and [www.army.mil](http://www.army.mil))
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We Want You for the US Army Signal Corps!