United States Army Europe executed the U.S. military’s premiere joint and combined artillery centric Exercise Dynamic Front 2019 (DF19), from March 2-8, 2019, with 2,673 participants from 27 countries firing 4,244 field artillery rounds and 200 rockets via 100 multinational artillery pieces from three different countries simultaneously at Grafenwoehr Training Area, Germany, Riga, Latvia and Torun, Poland.

The Dynamic Front (DF) exercise series is the match to the Artillery Systems Cooperation Activity’s (ASCA) kerosene that ignites North Atlantic Treaty Organization (NATO) and allied joint Fires processes and procedures to rapidly and significantly
implement NATO multinational Fires interoperability. DF19 continued the DF exercise series’ habit of pushing the envelope of joint Fires interoperability in Europe. The key conduit to achieving joint Fires interoperability is the ASCA interface. ASCA is the digital interface that allows all components of the shooting solution (observers, fire direction centers and fire platforms) to interact with each other as if they were operating with their own country’s systems. NATO has two official languages and 27 individual languages. ASCA is the digital language of NATO Fires. The DF Exercise series is “designed to increase readiness, lethality and interoperability by exercising allied and partner nations’ ability to integrate joint Fires in a multinational environment at both the operational and tactical levels.” The exercise has grown so much in the few years since its inception that it now requires multiple countries and training areas to meet its training objectives. DF matters because it produces bold developments in the field artillery (FA) and Fires community while expanding the relevance, use and improvement of the ASCA digital interface. ASCA is crucially important to the NATO Fires community. It is the Rosetta Stone technical interface to achieve multinational Fires interoperability. ASCA is a coalition-derived set of fire support command and control (FSC2) digital messages that each participating nation has implemented into their national FSC2 system. These derived digital messages enable each country’s system to send specific information (such as fire missions, ammunition status, etc.) between all other systems on a common Mission Partner Environment/Federated Mission Network. Successive DF exercises have perpetually enhanced ASCA usage in Europe and future DF iterations will continue down that path. DF is unique in that it brings together all ASCA participating nations intended to help and puts them together in a Fires-specific think tank and laboratory where multinational solutions result in bold developments for NATO joint Fires. This sets the example for NATO, partner and Allied nations that communication capabilities for the Fires community is more efficient and lethal. Without ASCA, delays and large work force requirements for liaison officer (LNO) packages and translators are required. The ASCA protocol does this for you. ASCA lessens the work force footprint of the LNO team, but doesn’t completely eliminate the need for LNOs. These bold developments include counter fire doctrine, revitalization of a theater-level Fires command structure, ASCA training, implementation and advancement, and exercising multinational Fires command and control across multiple nations in Europe simultaneously. DF19 tested NATO Counterfire doctrine developed during Dynamic Front 2018 (DF18). U.S. Army Europe’s Joint Multinational Readiness Center (JMRC) Fires observer/control team (Vampire) developed the NATO Counterfire doctrine and moved it through the approval process. The need for an overarching FA headquarters (HQ) to command and control all theater Fires in Europe occurred by testing the USAREUR Theater Surface Fires Command (TSFC) concept in DF18 and DF19. The TSFC concept used a U.S. FA brigade as the core of theater-level artillery HQ that integrated multinational Fires across the three countries. TSFC lessons learned have paved the way for the future development and refinement of the Fires Center of Excellence Theater Fires Command (TFC) concept. DF was a major platform for demonstrating the operational capabilities of ASCA, bringing it beyond mere theory. DF19 demonstrated FA interoperability across all three domains: human, procedural and technical. The human domain used augmentation within every HQ from battalion to Land Component Command level. The procedural domain implemented and utilized counterfire doctrine and LNO teams. While the technical domain used NATO’s digital Fires language: ASCA. Consequently, frequent multinational tactics, techniques and procedures (TTP) exchanges also occurred for common gunnery problems and other associated issues, such as extreme cold weather operations and their effects on the gunnery solution. DF19 was the first time DF occurred simultaneously in multiple countries. The Dynamic Front exercise series is critically important for multiple reasons. It is a joint and
combined test bed and experimentation site for NATO artillery munitions, systems, and artillery-specific tactical concepts. During DF19, coalition exercise threads were developed and executed during a command post exercise (CPX) portion, then executed during the LFX. The exercise enhances NATO members and allied FA modernization efforts of aspiring future members in fire support, gunnery procedures and modernization of systems.

The DF series is a constant in affirming and assessing the operational capabilities of the ASCA interface, and is a major recruitment tool. It showcases NATO artillery capabilities and is a show-and-tell comparison that influences newer NATO member countries on modernization of their fire support systems. The exercise also refines the ability for a FA HQ to command and control (C2) multinational artillery units. In DF19, a U.S. Division Artillery (DIVARTY) controlled six multinational firing battalions (no U.S. battalions). A Canadian DIVARTY, with a U.S. Digital Liaison Detachment (DLD), controlled three multinational battalions and one U.S. battalion. Other unintended training opportunities included a M777 Cold Weather TTPs exchange. The DF Exercise series is the key U.S. military opportunity to identify Fires interoperability gaps and implement solutions in rapid order.
Bold developments

DF19 was an international platform for emerging NATO Fires interoperability developments and doctrine. It brought together 27 nations to work in the three domains of interoperability.

“This exercise is enabling the artillery community across multiple nations, NATO and non-NATO, to come together and work through the frictions of our interoperability in human, procedural and technical domains,” said Maj. Andrew Champion, DF 19’s exercise officer in charge.

The exercise experimented with new C2 doctrine, specifically the need for a theater-level command and control node to synchronize and coordinate multinational joint Fires and NATO counterfire.

Col. Joe Hilbert, JMRC commander said, “Counter artillery is a critical doctrine for any military. The ability to take out the artillery of the opposing force, removes a strategic capability that they need, and gives you an advantage.”

This is a significant development as the NATO alliance has lacked a cohesive counterbattery fire doctrine in its game plan until now, military officials said. In DF19, this new doctrine was applied to a large joint and multinational artillery exercise spread across three countries simultaneously.

During the exercise, Champion said, “The U.S. has its own counter battery fire doctrine, and individual NATO allies have their own doctrine, but NATO doesn’t have a specific doctrine in place,” until now.

Why Exercise Dynamic Front is important

DF started in 2015 as a non-com-
The Fires Complex: Organizing to win in large-scale combat operations, Fires Bulletin, May-June 2018, Compton, Christopher and Boothe, Lewis L.

The DF exercise series will continue to be the key Fires exercise for U.S. and NATO Fires doctrine, ASCA interoperability of fire control systems, new munitions and other aspects of interoperability. This is due to the necessity to evolve and expand NATO Fires capability across Europe, USA-REUR’s close relationship with nations in its area of operations, and DF has emerged as a major platform for NATO allies and partners to train with and observe other NATO members, and eventually modernize and expand their Fires capabilities, if required.

To clearly describe the success of DF19, one must use the old saying “the proof is in the pudding.”

“We massed all of the units across all three locations at one time on target so every firing unit fired onto one location, at each location,” said Champion. “We are able to take multinational firing units and coordinate those mass destructive Fires.”

Theater Surface Fires Command (TSFC)

The TSFC was a U.S. Army Europe concept to plan, coordinate and execute joint and allied Fires through organizational mission command. DF19 had the TSFC headquartered at Grafenwoehr, Germany, by the 197th Field Artillery Brigade (New Hampshire National Guard), coordinating Fires to 1st Cavalry Division DIVARTY and additional multinational DIVARTYs in Poland and Latvia.

The TSFC concept addressed the need for TFC and control in order to synchronize multinational Fires and counterfire operations. It was designed to coordinate Fires information between the land command and the firing units. The TSFC took both the digital and analog systems of communications from the firing units and coordinated firing plans for the land component commander.

An overarching Fires command is significantly required in Europe “to face the increasingly lethal threats of today and tomorrow.” Such an organization, at the theater echelon, would ensure “the seamless integration and synchronization of cross-domain Fires throughout the depth of an expanded and contested battlefield.”

The concept emerged due to necessity. “We need to be able to synchronize our widely dispersed units to get the right effects at the right target at the right time,” said Col. Andrew Anderson, commander of the TSFC. It coordinated Fires alongside allied and partner nations for several multinational division artillery in Poland, Germany and Latvia. "The TSFC is designed to synchronize and integrate Fires across the entire theatre on behalf of the [Coalition Forces Land Component Command],” said Anderson, brigade commander of 197th FAB and deputy commander of the TSFC. "It allows allies and partners to work alongside us.”

Recognizing the importance of such an organization, the TSFC inspired and helped shape the emerging TFC concept that will replace the TSFC concept that will be tested in DF20.

According to the chief of Concepts Development Division, Capabilities Development & Integration Directorate, at the Fires Center of Excellence, “The TFC preserves the TSFC’s design to synchronize multi-national Fires and control counterfire opera-

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5 Europe’s largest annual U.S.-led artillery war games underway in Germany, Stars and Stripes.
10 http://www.army.mil

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tions across the theater, but also provides a true fire support coordinator to the land component commander and adds significant targeting and fire support planning capability that allows the Army to be an equal player in joint targeting,” said Col. Christopher Compton.

**ASCA**

The ASCA interface allows broad inclusion of multinational allies and partners into a single synchronized Fires network spread across multiple echelons. This enables the echelonment of multinational Fires across the battlefield by leveraging the most capable firing unit available, regardless of nationality. It also requires our adversaries to analyze systems and capabilities of 29 NATO and select Partner for Peace nations, not just one.

The ASCA Software interface allows nations to digitally link and exchange operational data between participating nations FA and fire support systems, enabling faster, more-effective firing missions among allied and partner FA units.

The ASCA program is a HQ Department of the Army (DA) Security Cooperation program authorized by the office of the Secretary of Defense (OSD). The ASCA memorandum of understanding is negotiated by HQ DA. It is signed between the participating nations equivalent. It is executed by the Program Executive Office Command Control Computers, Tactical, Product Manager Fire Support C2. The ASCA interface was ratified by NATO Standard Agreements (STANAG) 2245 (FA and Fire Support Data Interoperability), and is further shaped by the following documents and Artillery Publications (AArtyP): AArtyP 1 - NATO Land Based Fire Support, AArtyP 2 - NATO Counter Battery Fires, AArtyP 3 - Artillery Procedures for Automatic Data Processing (ADP) System Interoperability, and STANAG 2484 (AArtyP-5): NATO Fire Support Doctrine, and ATP-04: Allied Naval Fire Support.

During DF19, Canada’s participation provided a verifiable example. “The Canadian Army’s contribution to Exercise DF19 helped refine our role as an integral member of the ASCA network, while strengthening our relationships with gunners serving with our allied nations. Interoperability and joint readiness is all about getting to know your Allies, ensuring you can speak the same language on the battlefield in order to execute operational effects when it truly counts,” said Lt. Col. Paul Williams, commanding officer, 4th Regiment General Support.

DF19 included numerous ASCA training priorities. First, air coordination measure dissemination (either on live fire or simulated). Second, sensor-to-shooter link using multiple options – any sensor, best shooter regardless of nation. Third, a minimum of three nations had to be interoperating digitally rather than by multiple bi-lateral strands. Fourth, radar deployment orders dissemination. Fifth, deployment orders for other assets. Sixth, the network had to support fire mission initiation and allocation at corps level. Seventh, the fire direction database design was provided to participants at the planning conferences. Eighth, meteorological data sharing. Next, main planning conference input from participants into the requirements for the “ASCA University” to take place before start of the exercise. Then, the development of the Effects Guidance Matrix and dissemination through ASCA, and finally, validation of AARTY-P 1, 2, 3, and 5.

According to Dana Hatcher, project manager, Mission Command Fort Sill, “Dynamic Front (exercise series) is a reality check on just how well the ASCA interface works operationally between the participant’s as well as helping to define the voids and vacuums for the ASCA community to try and close/minimize.”

**ASCA University**

The use of ASCA related procedures and key strokes on Advanced Field Artillery Tactical Data System (AFATDS) and other allied fire control systems to process multinational fire missions and joint Fires requests is a unique knowledge set not fully proliferated to the U.S. military services. Problems experienced by fire direction operators are not new problems. They are problems the operators have either not been trained upon or not repeated enough to be part of their professional knowledge. The short-term fix to this training impediment is the ASCA University.

The ASCA University is a block of instruction developed by JMRC to resolve this deadlock. JMRC (Vampire Team) provides a week-long block of instruction to all DF exercise participants operating fire control systems in order to increase ASCA-related knowledge prior to the start of any DF exercise. For many, it is the first time they have ever heard of ASCA or utilized it during a major exercise or operation.

During DF19 ASCA University, all ASCA member nations were linked and digitally connected via a mini-CPX. It also included the 14th Marine Regiment and active participants from several sponsored, observer nations and interested nations from all three locations.

**Interoperability**

NATO defines interoperability as “the ability to operate in synergy in the execution of assigned tasks.” Even after many years of emphasizing interoperability and NATO STANAG to foster it, recent missions have shown the limits of interoperability. To standardize
interoperability planning, the U.S. Army recognizes four levels of interoperability. They are Level 0 (Not Interoperable), Level 1 (Deconflicted), Level 2 (Compatible), and Level 3 (Integrated). The DF exercise series maintains various levels of interoperability from levels 1-3 with the various NATO and allied partners as they continually improve and upgrade their artillery systems and capabilities. The DF exercise series continually proves that “we can no longer allow ourselves the luxury of using equipment that doesn’t work together.”

As a result, the DF exercise series was designed to increase readiness and interoperability by exercising allied and partner nation ability to integrate joint Fires in a multinational environment at both the operational and tactical levels.

ASCA interoperability of fire control systems easily allows the command and control of multinational forces spread across multiple countries at once.

"This is a multinational FA formation consisting of seven battalions from seven different nations," said U.S. Army Col. Brett Forbes, commander of Force Field Artillery HQ for Dynamic Front 19. "We take those seven different formations, put them all together and fight as one cohesive unit."

DF19 integrated participating nations into every echelon of the exercise’s structure to develop interoperability between all participants from the simulated land command to the individual units conducting the live Fires in the training areas. Col. Patrick Macklin, commanding officer of the 53rd Digital Liaison Detachment said, “This training builds joint readiness by enabling staffs to network infrastructure and doctrine with this common language. Interoperability is a fundamental condition of how our armies plan to fight tonight, tomorrow and in the future.”

DF19 significantly enhanced NATO Fires interoperability and built upon successes in previous DF iterations.
curred across the three domains (human, technical and procedural) of interoperability. Key interoperability milestones were enhanced and roadblocks to further interoperability were identified.

**Interoperability successes**

ASCA protocols significantly enabled digital fire mission processing from the Combined Joint Forces Land Component Command (CJFLCC) to a multinational firing unit. The use of an ITN cross-domain solution was tested and proven. The TSFC utilized Joint Air Defense Operation Centers to track, coordinate and assign fire missions on behalf of the CJFLCC commander. For non-ASCA countries, the use of LNO teams in the lowest HQ of interoperability enabled them to input fire mission data into their systems directly and transmit to the firing units over their national means.20

**International agreements**

DF19, and multinational Fires interoperability, were successfully established due to the hard work and behind-the-scenes work of numerous specialized subtasks. A key element is negotiating and signing intricate and detailed international agreements with all participating nations. The USA-REUR International Agreements Divisions (IAD) not only codified handshakes and promoted economy and efficiency, but also protected Army equities, eliminated redundancy and protected against violations of U.S. Law.

DF19 required 11 international agreements with participating nations. As a rule, agreements and arrangements are intended for the primary purpose of recruiting, organizing, supplying, equipping, training, servicing, mobilizing, demobilizing, maintaining, outfitting and constructing Army forces, equipment and facilities.

Stefanie Bivins, USAREUR G8, IAD lead agreements specialist for DF19 said, “The agreements we concluded are necessary to identify and clarify responsibilities on both sides and to capture vital provisions like entry and exit, force protection and financial matters. Stakeholders might not want to deal with the bureaucracy, but are happy they did, if questions arise.”

Codifying and enacting such agreements allowed all DF19 multinational partners to fully focus on the interoperability tasks at hand.

**Keen interest ASCA and Dynamic Front**

The Dynamic Front Exercise series sees significant interest in not only multinational participation but also significant interest by multinational military leadership. The DF19 Distinguished Visitor Day was no different. Key visitors included, the USAREUR commander, Lt. Gen. Christopher G. Cavoli, French Lt. Gen. Vincent Guionie, the French Land Forces commander and U.S. Army Lt. Gen. John Thomson III, the NATO-U.S. Allied Land commander. Various other general officers from NATO, Turkey, Romania, United Kingdom, Italy, Belgium and Czech Republic (Czechia) attended. The myriad of nations participating in this annual exercise signals its importance and usefulness to attending nations.

**Way ahead**

The Dynamic Front Exercise series is an enduring USAREUR exercise that will continue to expand and execute in various countries in Europe. It will continue to be “THE” exercise for NATO Fires interoperability, emerging doctrine, ASCA expansion and interface improvement, and a myriad of other ideas, doctrine and concepts still to be developed. To facilitate this learning lab of NATO Fires, several things need to occur to assist in future iterations of the exercise.

First, All NATO members and Partnership for Peace nations must gain ASCA membership or affiliated status. Second, all U.S. FA units must continually train upon ASCA TTP’s. ASCA TTP’s should be taught to all U.S. AF-ATDS operators as part of their core curriculum for interoperability purposes, noncommissioned officers associated courses, and as a pre-deployment training required for inbound Regionally Aligned Forces to Europe. Third, add ASCA tasks to the Joint Task List. Fourth, establish a permanent “ASCA University” to facilitate ASCA implementation. Fifth, NATO should consider establishing a NATO Fires Center of Excellence (NFCoE) to run a permanent “ASCA University” and take charge of all other fire support-related training (targeting, concept, development and experimentation, etc.) currently being taught by NATO. This NFCoE would be the proponent for all NATO Fires related-standardization agreements and doctrine. Finally, NATO doctrine and terminology is the doctrinal bridge that brings together all the nations. Training and understanding of those terms is essential in working in multinational operations involving primarily NATO nations.

Mr. Robert K. Gunther is the U.S. Army Europe lead planner for the Dynamic Front (DF) exercise series. Additionally, Gunther plans and executes all USAREUR joint Fires related exercises. He is a retired artillery officer with 22 years of service and served in artillery positions in Bosnia-Herzegovina, Kosovo, South Korea, Iraq and Afghanistan.

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