

FA Journal

A professional journal for US Field Artillerymen

Issue 2, 2021



Presented by:

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Marines fire an M777A2 howitzer during training at Pohakuloa Training Area, Hawaii, Sept. 20, 2020.

Photo By: Marine Corps Sgt. Luke Kuennen

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On the Cover: U.S.M.C. Cpl. Adrian Lewis, a field artillery cannoneer with E Btry, Battalion Landing Team 3/4, 31st Marine Expeditionary Unit, pulls the lanyard on an M777 towed 155 mm howitzer during a direct fire range at Combined Arms Training Center Camp Fuji, Japan, March 15, 2021.
Photo By: Cpl. Cody Rowe, U.S.M.C.



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The United States Field Artillery Association was founded in 1910 by Major John E. Mahon, Captain William S. Snow and Captain W.S. McNair to promote the efficiency of the Field Artillery by maintaining traditions.

Over 100 years later, the Association stands strong as the only professional organization that serves the Field Artillery branch of the military exclusively.

Help continue the Field Artillery legacy by keeping your membership current, connecting with your local chapter, and encouraging other Redlegs to join and stay active.

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BG Phil Brooks
USAFAS Commandant
Fort Sill, OK

FIRES FIFTY #39

Leadership is a contact sport; it requires daily interaction.

A lot is happening in the world, within our ranks and within our branch.

Despite all of this change and upheaval, one thing remains clear, we cannot lose sight of how to lead Soldiers and take care of each other. As we go about our Army business we must never forget that trust, integrity, and respect between Leaders and the Led are critical components of Army readiness.

The findings of the Fort Hood investigation are both disheartening and upsetting. One major conclusion did emerge, we must put our people first.

Project Athena

We know that Army leaders grow through education, training, and

experience. Feedback is an integral component that can accelerate development by bringing attention to areas of individual strengths and weaknesses. Project Athena introduces standard assessments that complement specific instructional or training goals to provide greater insight into capabilities and tendencies that leaders do or do not have. The Army, through the Center for the Army Profession and Leadership, initiated this assessment program throughout all of its Basic Officer Leader Courses this past summer. Here at Fort Sill, we started with Basic Officer Leaders Course (BOLC) Class 6-20, and this is just the beginning. There will eventually be batteries of assessments tailored to each level of Professional Military Education from initial entry through Command and General Staff College. In fact, we are now piloting the program within our cadre certification course, WOBC and 13 series SLC.

The objective of Project Athena is to promote selfawareness through assessment, feedback, self-regulated performance, and developmental action. Leaders who are self-aware and actively work to improve themselves stand apart from their peers with the potential to become top Army leaders who create ready and resilient units that can accomplish the Nation's critical missions in complex operating environments. Project Athena provides comprehensive, progressive, standardized assessments of individual tendencies and abilities. Each assessment has a feedback report customized to the assessed individual and provides suggestions for development. Lists of additional resources corresponding to the assessed areas are also available to the assessed leaders.

Master Gunner Course

To address current and future training gaps based on emerging capabilities across the Field Artillery community and feedback from the Operational Force, we are making improvements on the Field Artillery Master Gunner (FA MG) Course and our goal is implementation in FY24.

This redesign incorporates all of our MOSs and this is the only FA Course for our enlisted personnel that trains the entire sensor to shooter system of systems. What has changed in the FA MG Course Curriculum?

We have added the role of the FA Master Gunner as a member of the CDR's battle staff; combined the FA Master Gunner "warfighter like exercise" as the culminating training event; added a virtual attachment of non-organic fires assets and emerging capabilities (LRHW, MRC, PrSM, ERCA) and are addressing CTC observed gaps. Lastly, the course was designed as unit training management, integration, and interoperability in competition and conflict, providing more applicable instruction.

The course will develop master trainers who can design and create training, safety, and qualification/certification programs to enable units to effectively integrate Field Artillery fires into the Combined Arms Team. Once they have graduated the course they will also become troubleshooting subject matter experts on weapon, sensor, and mission command systems and will enhance unit maintenance processes and procedures. Lastly, we have requested additional annual training seats to meet operational force demands.

Thank you for all your hard work in such unprecedented times.



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A message from USAFAS Command Sergeant Major



CSM Michael McMurdy
USAFAS Command Sergeant Major
Fort Sill, OK

Redlegs,

BG Phil Brooks and I want to wish you a Happy New Year - 2021 promises to be another exciting time across the Field Artillery community for our Redlegs and capabilities! We also want to thank you for your leadership across the branch during difficult times, requiring difficult and necessary conversations. One thing is for certain, we will be a stronger and better Army because of it. For anyone who has yet to see the Fort Hood Independent Report, you can download it at:

https://www.army.mil/e2/downloads/rv7/forthoodreview/2020-12-03_FHIRC_report_re-dacted.pdf

What you should expect to see from me based on the Commandant's published priorities:

- Working with HRC and stakeholders to ensure we get the right Redleg, in the right place, at the right time.
- Flat, synchronized, and habitual information sharing in written and virtual forums from and across the Operational/Generating/Institutional Field Artillery Community

that is systematic and enduring.

- Revamping the FA Master Gunner (Facility, Duration, Allocation, and Composition) as our premier cornerstone course to ensure Enlisted SMEs are able to advise Commanders and units as new capabilities and platforms mature.
- Ensuring the AIT/NCOPDs POI retains or increases the rigor necessary to produce the best trained Field Artillery Soldiers and Leaders possible.
- Be accessible to all members and units for dialogue, discussion, and visits. This includes virtual, in person when able, and on Social Media Platforms.

- Reviews of our Career Maps to ensure we maintain relevancy in the future, enable leader development at echelon, and provide opportunities to compete at the most senior levels.

In closing, we are here to serve. We want to hear from you, get your input, and help solve your challenges. The Field Artillery has a bright future, and we look forward to seizing and exploiting opportunities with you.

Time to do work, Guns Up.
KING OF BATTLE!



A gunner with C Battery, 1-119th Field Artillery Regiment, Michigan National Guard, views the deflection and quadrant alignments before firing the M777 Lightweight 155mm howitzer. Soldiers with the 1-119th FA regiment conducted direct fires training during Northern Strike 20 at Camp Grayling, part of the National All-Domain Warfighting Center in Northern Michigan during Northern Strike 20, July 26, 2020. Northern Strike fills Joint All-Domain training and task iteration gaps in both the Army/Air National Guard training strategies, which sustains and enhances reserve component proficiency. (Master Sgt. David Kujawa/U.S. Air National Guard)



USFAA EVENTS

United States Field Artillery Association

The United States Field Artillery Association
presents



a Musical Tattoo Honoring
Lieutenant General Joseph F. Weber
U.S. Marine Corps Retired
and
General Membership Meeting
with special presentation of the
Esteemed Artillery Order of Molly Pitcher
to Joyce Ott

Presenting Partners:



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on Wednesday, the 1st of September at eight o'clock in the evening (EST)
Virtual Livestream

register to watch on-line at www.fieldartillery.org/events
questions: email events@fieldartillery.org or call 580.355.4677



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USFAA AWARDS

Announcing

The Esteemed Artillery Order of Molly Pitcher

The Esteemed Order is reserved for an elite few who have made a long-term commitment to mentoring military spouses and/or volunteers, who have contributed in significant and meaningful ways to the improvement of the Field Artillery Community. It recognizes the select individuals who have served as mentors and are recognized as role models with a life-time of service for or on behalf of the Field Artillery Community.

The Esteemed Artillery Order of Molly Pitcher Joins
the Ancient Order of Saint Barbara, Honorable Order of Saint Barbara and the Artillery Order of Molly Pitcher
Field Artillery Awards



Ancient Order of Saint Barbara



Honorable Order of Saint Barbara



Esteemed Artillery Order of Molly Pitcher



Artillery Order of Molly Pitcher



The 1st Annual King of Battle Virtual Fitness Challenge kicked off on November 17th 2020.

Listed here are the First 100 finishers. Thank you to everyone who participated.

The event will be live until August 17, 2021. There is still time to join and finish with a medal!

Look for the complete rankings and next year's second-annual challenge information in the August issue of the FA Journal.

TOP 100 TOP 100 TOP 100 TOP 100 TOP 100 TOP 100 TOP 100

- | | | |
|--------------------------|------------------------|---------------------------|
| 1. Angel Powell | 34. Mike Hutton | 67. Alesandra Lipari |
| 2. Jonathan Robb | 35. Alfredo Guerrero | 68. JoelRay Santos |
| 3. John Bustamante | 36. Thomas Hawn | 69. Richard Santiago |
| 4. Cameron Boyet | 37. John Passet | 70. Joshua Overstreet |
| 5. John Bamba | 38. Elizabeth Fox | 71. Chris Went |
| 6. Christopher Praino | 39. Frank Westbrook | 72. Nathan Anderson |
| 7. Elliott Harris | 40. Bill Sadlick | 73. Charles Hanson |
| 8. Todd Chance | 41. Ian Sheffield | 74. Angel Diaz Gonzalez |
| 9. Nathaniel Rennicks | 42. Nicholas Davis | 75. Freddie Thompson |
| 10. Bryan Whitaker | 43. Jordan Scales | 76. Jeff Easterhouse |
| 11. Matt Laman | 44. Richard Ikena | 77. Izzy Gerencer |
| 12. Jeffery Weiss | 45. Richard Lacquement | 78. Ryan Steenberge |
| 13. John Moriarity | 46. Dustin Blair | 79. Jeremy Flake |
| 14. Lisabeth Quinn | 47. Andrew Poller | 80. Jason Carter |
| 15. Kelly Bierwirth | 48. Jeffery Horn | 81. Dan Faughnan |
| 16. Lucas Leinberger | 49. Skip Fox | 82. Blake Wilson |
| 17. Michael Hanlon | 50. RJ Stafford | 83. Victoria Wilson |
| 18. Tim Mathews | 51. Richard Sapp | 84. Killian Richards |
| 19. Alex Diaz | 52. Shaun Callahan | 85. Jacklyn Otey |
| 20. Jim Butzen | 53. Edward Guelfi | 86. Misselie Rodriguez |
| 21. Max Teufel | 54. Stefan Hutnik | 87. Bill Ford |
| 22. Toby Bialzik | 55. Colin Bell | 88. Jason Miller |
| 23. Carla Figueroa-Matos | 56. Raymond Acevedo | 89. Elizabeth Marsteller |
| 24. Jason Turner | 57. Erin Ropelewski | 90. Christopher Tavuchius |
| 25. Kyle Walker | 58. Emily Laverty | 91. Damien Benway |
| 26. Jesse Rodriguez | 59. Sara Young | 92. Dave Pasquale |
| 27. Simi Dhaliwal | 60. Ben Ferguson | 93. Gus Garant |
| 28. Jacob Ellis | 61. Samuel Nirenberg | 94. James Winnefeld |
| 29. Rodney Freeman | 62. Ruth Stokes | 95. Jared Smith |
| 30. Zack Forrester | 63. Christine Hawn | 96. Jarek Mccray |
| 31. Jason Williams | 64. Reginald Williams | 97. Joseph Scanlin |
| 32. Donald Durgin | 65. Sarah Smith | 98. Kurt Jarvis |
| 33. Juan Posades | 66. Daniel Smith | 99. Lauren Pascale |
| | | 100. Richard Vertrees |



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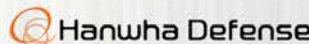
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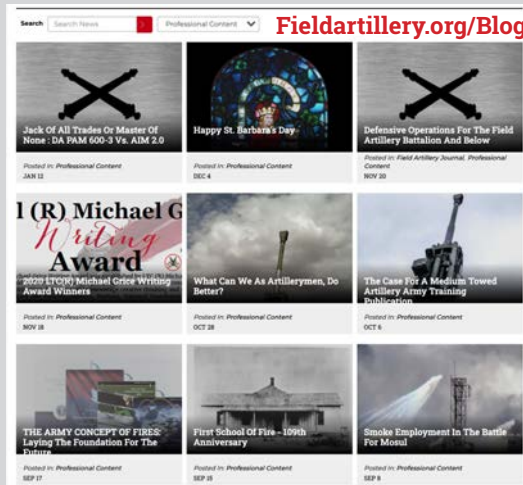
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EPISODE TWO:

Update from the USAFAS

Featuring:

LTG (R) Richard Formica, BG Phil Brooks and CSM Michael McMurdy

Look for more episodes throughout 2021!

www.fieldartillery.org/King-of-Battle-Podcast-and-Webinars

2021
2nd Annual Award

LtCol (R) Michael Grice

Writing Award

First place will receive \$500
Second place will receive \$250
Third place will receive \$100

Each level will receive an award plaque.

This Writing Award was established by LTC (R) Michael Grice and USFAA to promote involvement in the creation of content for FA Journal. It was meant to encourage creative thinking and sharing of ideas among both officers and enlisted, Soldiers, Marines, National Guardsmen and Reservists throughout the branch. Eligibility is open to any new article published in the four FA Journal issues of 2021. The topic of this year's contest, "Challenge the status quo - What can we as artillerymen do better?". See *Submission Guide on Page 64*.

Field Artillery History Documentary

This six-part, documentary was produced by USFAA in conjunction with the US Field Artillery Museum.

See the King of Battle's history unfold from the first steps of Henry Knox to the precision of modern rocket artillery.

View all six parts at www.fieldartillery.org/field-artillery-history

Download videos for use in classrooms or presentation purposes at:



vimeo.com/usfaa

USFAA is proud to share this resource with the FA community.

CHAPTER 1:

GENESIS OF AMERICAN
ARTILLERY

CHAPTER 2:

FORT SILL

CHAPTER 3:

WORLD WAR ONE
TO 1923

CHAPTER 4:

PRE-WAR, WWII AND
THE KOREAN WAR

CHAPTER 5:

THE COLD WAR
+ VIETNAM WAR

CHAPTER 6:

MODERN ARTILLERY
AND THE FUTURE



USFAA MEMBERSHIP

United States Field Artillery Association

The Field Artillery Association was founded in 1910 and consists of over 6000 active members and 55 chapters world-wide. For over 100 years, USFAA has stood strong as the only professional organization that serves the Field Artillery branch of the military. The USFAA mission is to support, preserve and perpetuate the esprit, traditions, and standards of the Field Artillery.

- By joining your of local chapter,

the chapter you affiliate with gets 10 - 15% of your membership fees annually.

- Receive the Field Artillery Journal mailed to your residence quarterly.
- Access to our historical issues on-line (back to 1911).
- Eligibility for our scholarships.
- Eligibility for the Honorable Order of Saint Barbara and your spouse is eligible for the Artillery Order of Molly Pitcher.

- Members receive a 15% discount in store and on-line at USFAA STORE.
- Receive a complementary membership with AUSA.
- We also have a robust board of retired senior leaders who are available to advise and support our chapters professionally.

The team at the USFAA is eager to support you! If you have ideas on how we can provide better support please feel free to contact us.

Long-range Fires Gap

By WO1 Conor McCarrell

Engagements against insurgency elements throughout Southwest Asia and Africa have occupied the United States Military and its allies for most of the young 21st Century. These irregular and hybrid threats have been the primary focus for nearly a whole generation of Service Members. The conventional doctrine developed for decades against uniformed forces served little relevance against an enemy not willing to fight in a typical fashion. In the nearly two decades of counter-insurgency, we have largely remained the same while the World has changed. The near-peer threat concept has gained significant relevance as we begin to shift our focus back toward conventional warfare. Due to strengthening economies and emerging technologies, countries such as Russia, China, and North Korea have gained militarized momentum and created several capability gaps within our Armed Forces. One such gap resides within the U.S. Army's Field Artillery, where aging equipment and munitions have shown a severe vulnerability in providing vital counter-fire and engaging in shaping operations to assist maneuver elements on the battlefield. Modernization is required for all Field Artillery echelons that will not only affect our lethal capabilities but also provide innovative methods of application and thinking when engaging against potential near-peer threats.

To compete with emerging militaries that will become near-peer threats imminently, or within the next decade, the United States Army will need to embrace innovations and dedicate more funding toward upgrading its Field Artillery Corps. While the U.S. Air Force and Navy enjoy significant current advantages over our competitors abroad, our Field Artillery assets lag in a variety

of metrics, which presents a major concern toward delivering crucial support for maneuver efforts and counter-fire. Nearly all Field Artillery weapon systems within the current U.S. Army arsenal were developed between the 1960s to early 2000s, relying heavily on upgrades to maintain relevancy. The mainstay assets of long-range Field Artillery fires in the U.S. Army arsenal are currently the M142 HIMARS and M270A1 MLRS. The modern M31A1 GMLRS rocket, supplying both systems, has a range of 84km using precise GPS technology for guidance. The aging ATACMS missile extends the reach of these systems to 300km, which provides for theater ballistic missile capabilities. Outside of MLRS assets, long-range fires have become limited within the current arsenal. The 155mm Howitzers, M777A2, and M109A7, currently range 24km and 22km, respectively, with conventional HE munitions and between 30km and 40km for RAP munitions (Pike, 2020). These systems have demonstrated valuable effectiveness against lesser threats and counter-insurgency efforts, relying on their capabilities to enforce their will on mismatched enemy forces

to shape the battlefield for the maneuver effort. An engagement in Large-Scale Combat Operations against a near-peer threat may expose these systems due to inferior capabilities.

The Range Capability Gap

It's expected that Field Artillery range capabilities and precision will become primary attributes amongst the dominant world ground forces due to escalating technology innovations. Both Russia and China employ very capable artillery systems that are either in equivalence or exceed American systems. The Russian built 9A52-2 "Smerch," a common long-range threat in Warfighter exercises has a 90km range with their HE-FRAG 300mm rockets and 70km with other munition variants (Department of Defense, 2015). Built during the Soviet era, the "Smerch" was upgraded recently to the 9A52-4 "Tornado" to be a lightweight version of its predecessor, akin to the M142 HIMARS transition from the M270 MLRS. Additionally, the Tornado boasts GPS enabled munitions using the Russian GLONASS satellite navigation system, which significantly improves the Russians' precision fires capabilities. Russia claims that



the Tornado's upgraded rockets will extend to 75 miles (120km), which can't be undermined by rival nations due to their no-table history with rocket technology (Peck, 2018). The 9A52-4 may have a nearly 40km advantage over the M142/M270 MLRS systems, a massive gap that exposes a critical mismatch in deep-threat capabilities. Medium-ranged Russian MLRS, such as the 9P140 and the older BM-21, may force a direct American MLRS engagement, giving Russian ground forces a free hand and tactical advantage in delivering long-range fires. The U.S. Army will not have success in direct engagement with Russia's current long-range assets operating at their current limits. Russian cannon weapon systems also have a range advantage over the American M777A2 and M109A7. The 152mm caliber 2S19 "Msta" has been the main self-propelled Howitzer for the Russian Ground Forces since the 1980s with a standard range up to 29km (Department of Defense, 2015). Its replacement, the 2S35, will have a reported 40km max range with conventional munitions and up to 70km for rocket-assisted munitions (Brown, 2017). The 152mm caliber 2A65 is Russia's main towed howitzer that has a similar range as the self-propelled 2S19, which still exceeds the American capabilities by several kilometers at max ranges. The disadvantages in range for the M777A2 and M109A7 against standard Russian cannon artillery systems expose a vulnerability in counter-fire operations. These assets will be planned to carry out operations in support of maneuver elements on the battlefield. Engaging in counter-fire against the enemy's fire support assets will be inevitable as they also support their maneuver operations. The Russian advantage in range will force American fire support assets to assume the tactical risk and move dangerously close into the fight. This situation is not ideal considering the loss of Field Artillery assets will strain maneuver elements as they directly engage enemy forces.

The possible mismatch with the U.S. Army's current field of long-range Field Artillery systems may be exposed even more against the Chinese. The Chinese People's Liberation Army employs a variety of long-range multiple launch rocket systems within their arsenal, including some technology transfer with Russia. Over the last couple of decades, the emergence of the Chinese economy has enabled rapid advancements in technology, which has also fueled their growing self-reliant military. The new PHL-16 MLRS reportedly has the capability of firing a pod of eight 370mm rockets at a range of 220km, with smaller calibers ranging between 70km and 130km (Suciu, 2020). This would give the Chinese People's Liberation Army a significant advantage over the M142/M270 in direct conflict, forcing the usage of different assets or methods of engagement. The PLZ-05, China's main modern self-propelled Howitzer, also exceeds the range of M777A7 and M109A7 by several kilometers. Similar to the disadvantages against Russian Field Artillery equipment, the Chinese capabilities can exploit the Americans' limitations and support their maneuver elements more effectively with their extended range of influence.

Range Capability Gap Solutions

The common theme when comparing U.S. Army Field Artillery assets against near-peer threats is the range capabilities are severely lacking. The gap may be only a few kilometers in each case, but this knowledge will be known and exploited to ensure American forces are not guaranteed superiority on the battlefield. One solution to this issue is to match or exceed range capabilities with innovations in rocket and munition technology. New advancements have been made in recent years and planned projects continue. Multiple prototypes are being tested through the Extended Range Cannon Artillery program that is designed to extend the ranges much farther than current capabilities offered by the M777A2 and M109A7 Paladin.

The M1299 is an upgraded version of the Paladin, which uses a new weapon integrated on the same chassis designed in the 1960s. The extended barrel and upgraded Excalibur munitions may extend the range of the U.S. Army's main self-propelled asset from 40km with RAP to between 70km and 100km, rivaling some near-peer MLRS ranges (Gould, 2018). The M777 is also receiving upgrades to its weapon system, attempting to improve the barrel's geometry as well as the munitions fired from it. Increasing barrel pressure to provide additional propulsion damaged the conventional Cold War-era munitions generally fired from the M777. The XM113 munition is being developed to replace the M549 HERA and when used in conjunction with the upgraded M777, it's expected to extend the range more than 40km. Extending the ranges on these howitzer systems will greatly improve the shaping and counter-fire operations at lower echelons assisting maneuver forces. The added range will subdue the threat's leverage that they otherwise would have had against American forces, thus stressing their capabilities across the battlefield to compete.

At echelons above brigade, the M142 and M270 MLRS systems will likely see a replacement for the 1980s era ATACMS. The new Precision Strike Missile (PrSM) provides the U.S. Army with all the benefits of the long-range tactical missile from mobile artillery, but with an extended range up to 500km (Gouré, 2019). After the recent pull out of the Intermediate-Range Nuclear Forces Treaty with Russia, the PrSM's capabilities may extend even further. Regardless, the extended range that the new munition brings to the M142 and M270 strengthens the Army's influence well beyond previous capabilities and would be a potent deterrent against a near-peer. Each PrSM fired would be an expensive investment, requiring the Commander's commitment to trust the staff in identifying key target systems that would cause cascading degradation to the enemy from this weapon.

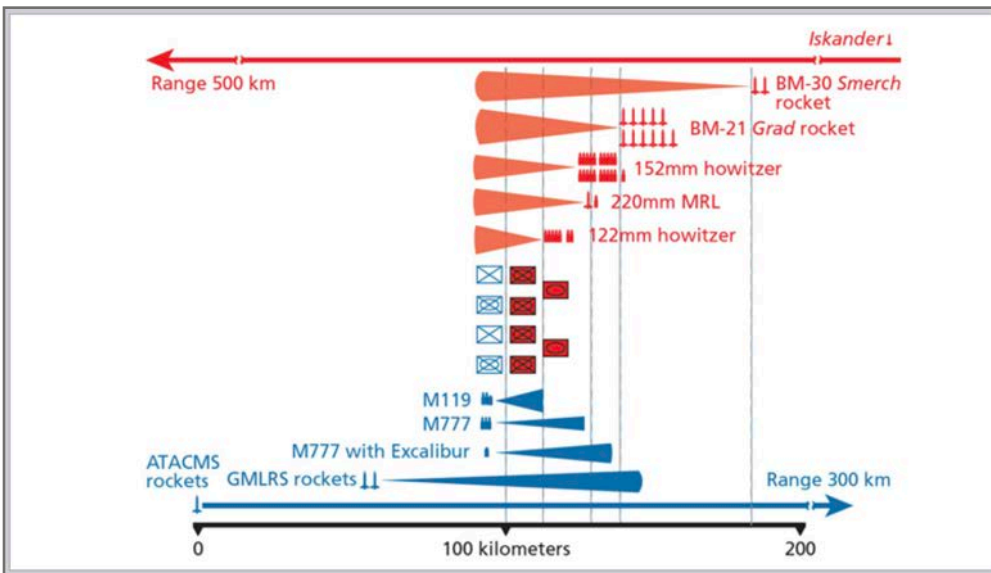


Figure 7.2 from Rand Corporation's "Army Fires Capabilities for 2025 and Beyond", showing the balance of fires between U.S. (blue) and Russian (red) artillery munitions in a theoretical Baltic Sea scenario. Center of the figure shows a notional line of contact between forces, with corresponding disposition of fire support capabilities based on battlefield positioning and mass of systems, highlighting a distinct advantage for the Russians. (Courtesy illustration)

Tactics and Operation to Bridge the Gap

The task to upgrade nearly every Field Artillery asset in the U.S. Army arsenal is an expensive and potentially long endeavor that pins the service in a tough position, especially considering many near-peer threats are well ahead in terms of Artillery accessibility. The U.S. Army, in its current form, is outranged and outnumbered, which places a significant strain on its ability to support maneuver elements through shaping and counter-fire operations. Waiting for upgrades to key Artillery systems may be too late if an engagement against a near-peer ignites sooner than expected.

The U.S. Army shouldn't expect to engage a near-peer threat alone. Joint assets are available and likely necessary to defeat an enemy with similar capabilities. The U.S. Air Force and Naval air assets have been unimpeded by counter-insurgency forces in the recent decades, eliminating key ground targets with quickness and ease. Even in a contested environment, the USAF/USN will remain a strong asset for the Army with its deep-strike capabilities. This is essentially the status quo, in terms of the relationship with the Army, but further coordination is required since the USAF/USN will likely not have air superiority due to very capable near-peer air forces, as well as potent ADA

systems. Additional Joint assistance from partner nations must be considered as they may have very capable weapons systems that can provide fire support to maneuver elements. Coordination with allied countries will require even more patience and management due to language/communication barriers, doctrinal differences, and overall capabilities.

If the U.S. Army can't rely on Joint assets for fire support assistance, Commanders must assume tactical risk to influence operations with fire support assets. This is a requirement when nearly every U.S. Field Artillery asset is outranged on the battlefield. Continuous movement may be required to shape the operation for the maneuver forces. At any given point in time, these elements will be in the range of enemy indirect fire assets, which puts them in constant danger. Commanders must understand this, but maintain constant pressure to ensure the mission continues. Fire support assets may need to be relatively close to the maneuver front line to maintain sufficient coverage for shaping operations as well as reducing the indirect fire threat. This will put Artillery units in relative danger, but the risk may be necessary for maneuver operations. Overcoming the range disadvantage for U.S. Army Field Artillery will require proactive planning and execution. The near-peer threat will

have a significant numerical advantage when comparing indirect fire assets, which will make reducing that threat nearly impossible when engaging single elements. Therefore, targeting key nodes of systems will be a force multiplier. Indirect fires assets require command and control and detection through ISR platforms or target acquisition radars to deliver timely and accurate fires. Destroying or neutralizing command posts, radars, and ISR launch points will reduce the enemy's indirect fire capabilities. Missions against these soft elements can be executed by U.S. Field Artillery, even with current capabilities, but require special coordination. The concept of artillery raids gives Commanders the ability to leverage indirect fire assets near or behind the Enemy Forward Line of Own Troops and engage Deep Area Targets. Special PAAs need to be planned ahead of time and cleared before flying in artillery assets for extremely quick fire missions. These raids rely on the element of surprise, requiring coordination at all levels to execute and once that surprise is blown as missions are fired, even quicker exfiltration is required to remove all equipment and personnel from the area. If executed correctly, the range disadvantage is eliminated, creating an extra dilemma for the enemy to overcome. Constantly applying disruptive pressure on the enemy, using artillery once deemed inferior, will give Commanders the crucial control they would need to reduce the overwhelming enemy artillery threat.

Conclusion

No longer is the U.S. Army considered significantly superior against emerging near-peer threats. The strongest of these threats, Russia and China, have improved their indirect fires capabilities considerably over the last couple of decades while the United States has focused on counter-insurgency threats. These nations also boast a significant amount of artillery overall, utilizing these assets at higher echelons within the ranks to devastate opponents. The U.S. Army needs to

modernize its Field Artillery assets through more capable munitions and weapon systems to bridge the range gap. Even this may not be enough against a peer, which then may require further advancement of clever tactics and planning to establish an element of surprise and gain leverage over a potentially colossal threat.

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WO1 Conor McCarrell enlisted in the Colorado ARNG in 2009 as a Fire Support Specialist (13F). In 2012, WO1 McCarrell became a Forward Observer for 1-157th INF COARNG and then deployed with the 169th Field Artillery Brigade in 2017 as a Targeting NCO. During the deployment, he was assigned to the Special Operations Joint Task Force (SOJTF) J2 Targeting Cell, assisting in the discovery and development of ISIS targets in support of Operation Inherent Resolve. After the deployment in 2018, WO1 McCarrell went through the COARNG Warrant Officer Candidate School program and graduated from the WOBC in June 2020 as a 131A. He is currently the Brigade Counterfire Officer for COARNG's 169th FA BDE. He also recently graduated from Colorado State University with Bachelors of Science in Mechanical Engineering and Engineering Science.

References

Brown, D. (2017, September 05). Russia claims this new Howitzer shoots farther than any NATO gun. <https://www.businessinsider.com/russia-howitzer-shoots-farther-than-any-nato-gun-2017-9>

Chan, M. (2019, December 7). China's 'mystery' missile launcher casts shadow over Taiwan Strait. <https://www.scmp.com/news/china/military/article/3041007/chinas-new-pcl191-multiple-launch-rocket-system-casts-shadow>

Freedberg, S. (2020, March 7). New Army Cannon Doubles Range; Ramjet Ammo May Be Next. <https://breakingdefense.com/2020/03/new-army-cannon-doubles-range/>

Gordon, J., Mikolic-Torreira, I., Barnett, D. S., Best, K. L., Boston, S., Madden, D. Wilcox, J. (2020). Army Fires Capabilities For 2025 And Beyond. S.I.: RAND CORPORATION.

Gould, J., & Judson, J. (2018, October 4). From Paladin upgrades to a 1,000-mile cannon, Army artillery aims higher, farther. <https://www.defensenews.com/digi-tal-show-dailies/ausa/2018/10/07/from-paladin-upgrades-to-a-1000-mile-can-non-army-artillery-aims-higher-farther/>

Gouré, D. (2019, November 8). Why the Precision Strike Missile Is a Must Have for the Army. https://www.realcleardefense.com/articles/2019/11/08/why_the_precision_strike_missile_is_a_must_have_for_the_army_114839.html

Peck, M. (2018, July 8). Why Russia's Most Deadly Rocket Launcher Could Soon Be a Threat to U.S. Troops. <https://nationalinterest.org/blog/buzz/why-russias-most-deadly-rocket-launcher-could-soon-be-threat-us-troops-25212>

Pike, J. M109A6 Paladin Self Propelled Howitzer. <https://www.globalsecurity.org/military/systems/ground/m109a6-specs.htm>

Pike, J. M777 Lightweight 155mm howitzer (LW155). <https://www.globalsecurity.org/military/systems/ground/lw155.htm>

Prenatt, J., & Hook, A. (2016). Katyusha - Russian Multiple Rocket Launchers 1941-present. Bloomsbury Publishing Plc.

Suciu, P. (2020, April 29). China's Army Has a New Multiple Launch Rocket System. Here's What We Know. <https://nationalinterest.org/blog/buzz/chinas-army-has-new-multiple-launch-rocket-system-heres-what-we-know-149181>

U.S. Department of the Army. Field Manual 3-09.22, Field Artillery Tactics and Techniques, Ch.3. (Mar. 2001)

U.S. Department of Defense. Worldwide Equipment Guide: Volume 2: Ground Systems, Ch. 6 (Dec. 2015)

Welcome to the 55th Commandant of the US Army Field Artillery School



BG Andrew D. Preston
Incoming USAFAS Commandant
Fort Sill, OK

This month we will say farewell to BG Phil Brooks as he heads to Europe for his next assignment and welcome the 55th Commandant, and new Chief of the Field Artillery, BG Andy Preston. BG Preston is returning to Fort Sill from his most recent assignment, USARPAC Chief of Staff at Fort Shafter, HI.

A native of Edmond Oklahoma, he commissioned as a Field Artillery Officer through Officer Candidate School in 1992 after serving for two years as an enlisted soldier. Starting his Army officer career at Fort Bragg within the 82nd Airborne and quickly moving up to complete two Battery commands with the 214th Field Artillery Brigade at Fort Sill. Preston served with the 25th ID as Commander of the 2nd Battalion, 11th Field Artillery at Schofield Barracks, HI. He then assumed command of the 214th Fires Brigade and 4th Division Artillery before returning back to Schofield Barracks to the 25th ID as Chief of Staff. BG Preston served as the Director for the Chief of Staff of the Army's Coordination Group before holding his latest position.

BG Preston has deployed in support of Operation Enduring Freedom, Operation Iraqi Freedom and New Dawn.

Preston's education includes a Bachelor of Science degree from the University of Oklahoma, a Master of Public Administration degree from Harvard University, and a Master of Military Arts and Sciences degree from the United States Army Command and General Staff College. He also attended a Senior Service College Fellowship at the Scowcroft Institute, Texas A&M University.

Look for more from BG Preston in future issues of the FA Journal.



M777A1 lightweight 155mm towed howitzer. (Photo: Courtesy Marine Corps Systems Command.)

The Case Against Composite Rocket/Artillery Battalions

Maintaining Core Cannon Capabilities

By Col Christopher A. Tavuchis

**Originally Published in the April Marine Corps Gazette*

In 2019, Gen David Berger issued his visionary Commandant's Planning Guidance (CPG) outlining the sweeping changes the Marine Corps needs to make to meet the principal challenges facing the Nation as outlined in the National Defense Strategy (NDS) (MCG, Jun20). In the CPG, as outlined in the March 2020 Force Design 2030 (FD30) report, the CMC outlines as part of the organizational transformation of force design the argument of divesting towed cannon artillery in favor of increased investment in rocket and missile batteries and their associated capabilities. The document proposes a mix of 5 cannon artillery batteries (divestment of 16 batteries) and 21 rocket batteries (an increase of 14 batteries) with a proposed "composite" battalion comprised of 4 rocket and 1 cannon batteries. This formation is envisioned to possess the requisite headquarters battery organization to provide tactical fire direction, planning, consolidate supply, and maintenance support and envisions "enough depth to provide deploy-

able detachments to support the organic artillery batteries." The construct was ostensibly conceived in an attempt to preserve structure while maintaining a token cannon capability during the critical transition from cannons to rockets/mis-

siles. In his most recent Gazette article, our CMC asserts that the concepts and concepts of employment being planned in Quantico are "well supported by the wargaming, analysis, and experimentation ... done to date." It can be logically argued that the concept and employment behind a composite has not been fully analyzed and a composite battalion concept is flawed and fails to acknowledge obvious tactical, operational, and fiscal challenges already experienced with similar units since the fielding of a HIMARS to the active duty (and reserve forces) and, more recently, from 2016 to the present in 3/12 Marines. No experimentation of a composite rocket/cannon formation is required to inform us that the construct has been operationally cumbersome,

ly under resourced, fiscally uneconomical, and presents serious operational risk to maneuver forces. Alternatively, the bifurcation of the rockets and cannons in both 11th and 14th Marines presents a proven and successful model that works today and will work for the objective force. Finally, and most importantly, the composite battalion fails to account for the current and near-term operational risk to FMF maneuver units during the high-risk transition period from the current force (2021) to the objective force (2030). At a minimum, we owe the CMC a clear-eyed economical and operationally viable alternative to a composite unit characterized by distinctly different capabilities requiring distinctly difference command, control, and support requirements to make it viable.

It is now well known that several constraints were imposed on the planners during the wargaming leading up to the CMC's publication of his planning guidance. The constraints included (but were not limited to) force structure, elimi-

nating legacy capabilities perceived as “too heavy” for expedition-ary advanced base operations or littoral operations in a contested environment. The elimination of all towed cannon artillery was discussed during several forums, and planners were eventually walked back from total elimination in favor of a more modest preservation of a basic capability (ostensibly for global force management purposes)—since the “gap” (real or perceived) between infantry indirect fire systems (mortars) and medium cannon artillery was too great to discount out of hand, at least in the near term (ten years). More to the point, the arrival at five batteries still remains an analytical mystery and, in and of itself, mandates further analysis. As we have done in the past, the Marine Corps runs the risk of eliminating a capability without fully understanding the second and third order implications to the FMF and our basic warfighting capabilities.

Even with the emergence of loitering munitions, long-range precision fires, and evolving/emerging groundbased fire support systems that present a lighter footprint better suited for littoral operations characterized by smaller units, smaller ships, and dispersed forces, a valid need remains to ensure current and evolving formations have the necessary all-weather, persistent, economical fire support capabilities to support maneuver forces as we evolve towards the objective force.

One solution to bridging the gap between the current force and the objective force is to maintain a cannon pure battalion in each artillery regiment consisting of four batteries of eight cannons (four per platoon). While unpalatable to some, the maintenance of this capability will provide the following benefits:

- Provide a necessary capability while the Marine Corps continues to experiment with the emerging HIMARS MLRS Family of Munitions, establishment of a new HMARS formation in (5/10 Mar) and the Ground Based Anti-Ship Missile (GBASM) (po-

tentially Naval Strike Missile paired with ROGUE-Fires) and the Ground Launched Cruise Missile battery in Fiscal Year 2023.

- Provide the necessary cohesion, training, readiness and capability to provide close supporting fires in one of three echelons: battalion, battery and detachments, as required by operational need.
- Ensure the Marine Corps maintains a grade-appropriate cadre of cannon expertise in the event we need to rapidly expand the capability with more formations.
- Avoid the inevitable costs of fielding composite battalions that create cumbersome units,

complex tactical, operational, and fiscal challenges that we have already experienced with such units. Despite the best of intentions and due to fiscal and manpower constraints, we will fail to achieve the right support MOS mix, and we will, yet again, field dissimilar capabilities to a unit with the hope of addressing two separate and distinct functions through the guise of expediency, innovation, or brute determination.

While the notion of presenting an alternative to the five-cannon battery construct has not been warmly invited nor received by the original planners and those engaged in the race to solve the manning solution in the upcoming Fiscal Year



Ground Based Anti-Ship Missile (Naval Strike Missile) mounted on the Joint Light Tactical Vehicle. (Photo: Courtesy Marine Corps Systems Command.)



M142 High Mobility Artillery Rocket System. (Photo: Courtesy Marine Corps Systems Command.)

2023 Assigned Staffing Report, the level of analysis assessed in a potentially flawed hybrid solution presented in the CPG and the supporting documents issued (and currently in the works) demands a rational response. The concept of a composite artillery formation represents a half-measure or compromise solution that fails to address the operational and tactical realities already demonstrated and further fails to address the necessity for a bridging fire support capability while we field and evaluate objective force fire support units.

To some, the argument against a composite unit and for the maintenance of a core cannon capability appears to be desperate act to preserve one of our legacy systems. For anyone that has read the CPG and the supporting documents to comprehend the intent and vision and who has been in the institution during times of profound change, the writing is emblazoned on the wall, and our Corps is moving forward in support of integration and alignment with the Navy and CMC's vision. The fact remains, our CMC has spoken, and we will step off smartly to see his vision through. To be absolutely clear, however, the argument to maintain a cohesive cannon capability—which may certainly devolve into something lighter and more desirable to the CPG or, equally as likely, no cannons at all—is fundamentally a temporary and necessary hedge to preserve maneuver space for the CMC as we work through the inevitable and very real technical, operational, fiscal, and institutional risks that are utterly natural to realizing such a revolutionary and—some may say—radical change in direction.

About the Author:

Colonel C.A. Tavuchis is a life-long Artillery Officer. He is the CO of the Marine Artillery Detachment, Fort Sill, OK, and the former CO of the 11th Marine Regiment (The Cannon Cockers).

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<ul style="list-style-type: none"> • BN ROC Drill • Technical Fires RXL • LFX 	<ul style="list-style-type: none"> • LFX • Scenario-based tactical operations 	<ul style="list-style-type: none"> • Scenario-based tactical operations • Midpoint AAR/SOBE 	<ul style="list-style-type: none"> • Issue LFX FRAGO • Scenario-based tactical operations • BN ROC Drill 	<ul style="list-style-type: none"> • LFX • Scenario-based tactical operations 	<ul style="list-style-type: none"> • Change of Mission • Day Zero Recovery 	

Figure 2. Operation BLUE MAX Schedule of Events. (Courtesy information)

based on semi-annual qualification requirements.

Operation BLUE MAX

The 2nd Battalion, 20th Field Artillery Regiment (MLRS) returned to Fort Sill from a nine-month rotation to Camp Casey, Korea, in November of 2018 and transitioned to Focused Ready Unit (FRU) responsibilities. As an FRU, 2-20 FA learned that they must maintain high levels of personnel and equipment readiness to be prepared to deploy in support of LSCO. As part of these FRU responsibilities, the Battalion needed to train differently than the 'Fight Tonight' mission required. Leaders up and down the chain of command needed to understand the unique challenges of arriving to a battlefield months after the first rounds were fired, or even occupying unfamiliar locations just before hostilities commencing. Operation BLUE MAX, a seven-day Field Training Exercise (FTX), was created as a means to train the Batteries and the Battalion Staff how to shoot, move, and communicate in an offensive manner where the sequence of events was almost entirely conditions-based.

Creating the proper training conditions for a Battalion FTX/LFX requires a viable scenario, abundant training land to include live firing points, an apportionment of live rockets from the annual ammunition allocation (STRAC), and an agile Exercise Control (EX-CON) that can massage the scenario to maintain believability. The scenario for BLUE MAX forced the frequent movements that an MLRS unit is expected to make as it follows in

support of maneuver forces on the offense. A very large proportion of the Fort Sill training space, 34 of 78 training areas, were utilized to provide freedom of movement according to the tactical situation. A heavy emphasis was placed on keeping the whole exercise as tactical as possible, such as scripting mandatory LFX roadblocks as traffic control points for the notional Division Headquarters, and by placing all administrative requirements in the hands of the EXCON. This resulted in one Lieutenant checking in to 20+ training areas at a time to allow the Batteries to move from one training area to another without administrative requirements interrupting the scenario.

Operation BLUE MAX incorporated two live-fire events into the scenario. A total of 48 rockets were available due to the management of the qualification cycles. Through the intentional spacing of qualifications over the course of the year, in April and September, 2-20 FA only required two Artillery Table (AT) VI qualifications in FY19. This qualification cycle is sustainable as long as crew turbulence does not force an additional qualification outside of a planned Battalion LFX. A few section qualifications can be built into the scenario but the number and level of qualifications, according to the Fires Gated Training Strategy, needs to be identified as a training objective so that the specific mission requirements do not disrupt the realism of the training event.

The training objectives selected for BLUE MAX were to conduct tactical assembly area operations, conduct Reconnaissance, Selection, and

Occupation of a Position (RSOP), manage ammunition at the Battalion level, and demonstrate Platoon lethality. Surprisingly, very few Leaders in the Battalion had experience with these tasks and had never tried to incorporate all of them into a single training event. The education process for managing ammunition began months before the exercise and was the focus of the Leader Development Program in the weeks preceding the exercise. The other tasks were doctrinally studied but executed at speed with a steep learning curve and heavy coaching from the most senior Battalion Leaders.

Training objectives that are absent from this list, but are normally included in an exercise designed to prepare units for Korea, relate to CBRN decontamination and managing mass casualty events. While these are important skills, it was determined that they consume a large portion of training time and potentially detract from achieving the other training objectives. Instead, these events need to be treated as conditions under which the unit must continue to deliver rockets and missiles in support of maneuver forces. It is a mindset shift at the tactical level because the lessons of recent combat dictate that catastrophic events are a reason to pause operations. Units can no longer treat enemy actions as discreet events not connected to the larger combat operation and the scenario needs to drive that point home.

Operation BLUE MAX broke from traditional field preparation with a deliberate but notional deployment process that occurred the week be-

fore the Battalion began tactical operations (See Figure 2. Operation BLUE MAX Schedule of Events). This week of preparation before the actual exercise is where Reception, Staging, Onward Movement, and Integration (RSOI) of personnel and equipment was initiated in an attempt to replicate how the Battalion would deploy from Fort Sill to a global contingency operation.

The Battalion began Onward Movement by falling in on equipment at a notional port and moving to a Tactical Assembly Area (TAA). RSOI continued with the publication of a fragmentary order to begin operations in support of a Division attack. Inside the TAA the Battalion built combat power through priorities of work and conducted TLPs down to the section level. The activities and rehearsals in the TAA set conditions for rapid execution of future FRAGORDs during the remainder of the exercise.

Breaking away from the normal qualification practice of MLRS sections firing multiple missions from a static point, Operation BLUE MAX attempted to replicate the tactics necessary to survive in LSCO. The launchers loaded up live M28A1 Reduced Range Practice Rockets (RRPR) in the TAA, moved to the firing points to conduct RSOP, and proceeded to deliver rockets on target. The sections received their fire missions while in their hide sites, then remained concealed as long as possible before fire mission execution. This proved very uncomfortable to launcher chiefs who only knew static live fires throughout their careers.

The Support Platoons conducted tactical movements to secure and establish a doctrinal reload point in preparation for the firing Platoon movements. Upon the completion of the live fire, the Firing Platoons would reload their brain pods and move to their next assigned training area while the Support Platoon returned to the TAA with the live pods to give the next Platoon the same training experience. The very deliberate tracking of the live pods by a single element, the Battery Support Platoon, mitigated the

risk associated with the transition between live and dry firing.

Directing movements in this manner also allowed the Batteries to exercise a hot and cold Platoon, as well as maintain one Platoon in position ready to fire while the other moved, all while immersed in the tactical scenario. The RSOP process needed to be executed multiple times over the course of the exercise to allow for Platoon AARs to occur, enabling improved performance with every repetition. Eventually, section chiefs made appropriate tactical decisions, freeing up Platoon Leadership to concentrate on fire direction, forecasting logistical requirements, and planning Soldier and equipment maintenance periods. The Platoon Leadership struggled at first to fully grasp the concepts and the level of autonomy afforded to the section chiefs, but throughout the FTX the RSOP procedures became standard across the formation.

Ammunition Management

Ammunition management was the most involved of all of the training objectives for the field exercise. This training objective directly involved the Battalion ammunition officer, support Platoon Leaders, the forward support company, and the Fire Direction Centers. To accomplish the task, while maintaining a level of tactical realism,

60 additional expended pods came from an adjacent Battalion to meet the total Battalion haul capacity. These expended pods were aligned with chit cards filled with administrative data so launcher chiefs and Support Platoons were held accountable and unable to continue firing after their ammunition was depleted. It also caused the Platoons to manage the number and type of rounds available on the launchers and at the reload points.

Despite the successes, there are ways to improve upon ammunition management and make the training even more realistic. Coordination with the Brigade Support Battalion would allow Support Platoons to drop expended pods in consolidated points across the installation to be left for the transportation company to pick up at a later date. This would facilitate a better segregation of ammunition and allow a pod to only be 'fired' once, as opposed to a process of reconstitution once an expended pod was retrieved by the Organic Distribution Platoon.

Demonstrate Platoon Lethality

Operation BLUE MAX was not an Artillery Table XII live fire with external evaluators to certify Platoons. However, it did demonstrate Platoon-level lethality in a tactical scenario by empowering junior leaders to showcase capabilities outside of a scripted list of fire mis-

MISSION ESSENTIAL TASK	Training Objectives	T.A.
Control Field Artillery Operations (06-BN-1021) 06-BN-1036 Prepare the Field Artillery Operations Estimate 06-BN-1038 Control a Field Artillery Unit Move 06-BN-1110 Conduct Field Artillery Liaison 06-SEC-6030 Establish an Ammunition Holding Area MLRS/HIMARS 06-SEC-6032 Provide Battalion Ammunition Support 71-BN-5100 Conduct the Mission Command Operations Process for Battalions 71-BN-5122 Perform a Rehearsal for Battalion	<ul style="list-style-type: none"> D-Day: TAA OPS, Ammunition Management <ul style="list-style-type: none"> - Deploy to TAA - Issue ammunition - Issue BN OPORD - Conduct BN ROC Drill D+3: TAA OPS <ul style="list-style-type: none"> - Issue BN OPORD - Conduct BTRY ROC Drill 	T
Conduct Battalion Fire Missions (06-BN-6001) 06-BN-1023 Coordinate a Field Artillery Raid 06-BN-1079 Conduct Battle Tracking 06-BN-2011 Request Battle Damage Assessment 06-BN-5424 Process Fire Missions 06-BN-6055 Process a Precision Fire Mission 71-BN-5100 Conduct the Mission Command Operations Process for Battalions	<ul style="list-style-type: none"> D+1/D+2: Demonstrate PLT Lethality, Ammunition Management, RSOP <ul style="list-style-type: none"> - Occupy TAs - LFX D+3: Demo PLT Lethality, RSOP <ul style="list-style-type: none"> - Execute TLWS - Occupy TAs D+5: Demo PLT Lethality, RSOP <ul style="list-style-type: none"> - Execute Artillery Raid LFX 	T
Conduct Expeditionary Deployment Operations at the Battalion Level (55-BN-4800) 12-BN-0004 Prepare Personnel for Deployment (Battalion) 55-BN-4802 Conduct Home Station Mobilization Activities at the Battalion Level 55-BN-4804 Conduct Deployment Activities at the Battalion Level 55-BN-4850 Direct Deployment Alert and Recall at the Battalion Level 55-BN-4873 Plan Deployment at the Battalion Level 55-EAC-4055 Coordinate Family Readiness Group Support (Battalion Echelons Above Corps) 71-BN-5100 Conduct the Mission Command Operations Process for Battalions	<ul style="list-style-type: none"> D-5: Telephonic Alert D-4: SRP D-3: Motor Pool Operations Validate Maintenance Posture <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Training Objectives <ul style="list-style-type: none"> • Exercise TAA OPs • RSOP • Ammo Management • Demonstrate PLT Lethality • Validate maintenance posture </div>	T-

Figure 3. MLRS BN METs aligned with Operation BLUE MAX Training Objectives. (Courtesy illustration)

sions. Platoons conducted their deliberate RSOP, fully utilizing multiple firing points and hide sites across the training areas, to provide those Leaders the forum to learn and grow. During the LFX events the Platoons were only afforded one four-hour window of meteorological data to conduct RSOP and shoot their rockets or else they had to drop their remaining live pods for another Platoon to shoot. This rule added a level of competitiveness, rewarded a strong maintenance posture, and created a sense of urgency to complete the tasks with violence of action. Nobody, from Battery Commander to launcher driver, wanted to let someone else shoot the rockets originally allocated to them.

Whether firing live RPR rounds or executing dry fire missions, the Platoon's actions remained driven by the same tactical scenario. Work and rest cycles had to be enforced to sustain personnel throughout the seven days while balancing dry fire missions and a live opposing force (OPFOR) element. The OPFOR was coordinated from an adjacent Battalion and given the resources to keep the Platoons active and engaged. Blank rounds, artillery simulators, and smoke grenades were all used to control the tempo of the fight and exercise systems throughout the organization. Real defense plans were required, SALUTE reports pushed up the chain of command, notional casualties treated, and CBRN capabilities tested. Although the Firing Platoons did

not receive an AT XII qualification, the introduction of an expeditionary LSCO scenario with tactical requirements tested the experience level of Platoon Leaders and Battery Commanders and simultaneously challenged assumptions for a population of NCOs that spend a career in the Korea - Fort Sill - Korea duty station loop. **Conclusion**

Operation BLUE MAX was a deliberate departure from traditional home station training exercises to prepare for the rigors of Large-Scale Combat Operations. The planners went into the exercise design process with the lessons learned from a nine-month rotation to Korea and a strong desire to have the MLRS battalion fight in a similar way to a cannon unit. The emphasis on shoot, move and communicate pushed the battalion to conduct operations in a way that was unfamiliar for many Leaders. It is important to note that the length of the exercise helped shape what the unit learned. By day four the organization was tired because Leaders drove themselves hard and were both frustrated by the steepness of the learning curve. By day six or seven the organization implemented some of the tough lessons learned during initial operations and ended on an upward performance trajectory.

Training events such as Operation BLUE MAX, with scenario-driven LFX incorporated into Battalion exercises, are not currently the norm within the M270A1 MLRS community. Variations of this exercise

should be adopted to increase the lethality of rocket and missile formations. There are some challenges in resourcing a complicated training event internally. A Battalion struggles to source an EXCON while including the full Battalion staff in a continuous scenario. Also, to keep the Battalion staff in the training audience the exercise needs to have multiple firing batteries to train current operations, making it incredibly difficult to internally resource Artillery Table XII evaluators. Finally, a true Higher Control could increase the rigor of the exercise by increasing or decreasing the pace of fire missions pushed down to the Battalion Fire Direction Center. Even without these additions, a Battalion can conduct challenging and budget-friendly home-station training that forges an understanding of LSCO requirements for M270A1 MLRS units.

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LTC Andrew J. Knight is a student at the Army War College and the former commander of 2nd Battalion, 20th Field Artillery Regiment (MLRS) at Fort Sill, Oklahoma. His previous service includes a variety of combat arms assignments with multiple combat deployments and a rotational deployment to the Republic of Korea commanding 2-20 FA. LTC Knight holds a B.S. from the United States Military Academy, an MPA from John Jay College of Criminal Justice, and an M.M.S. from Marine Corps University.

May 2020 MLRS training exercise - Camp Casey, Korea. U.S. Army Photo by Pfc. Mario Hernandez Lopez



Radar Survivability in an Electronic Warfare Contested Environment

By CW2 Jerrad Rader

As the Army shifts focus from counterinsurgency (COIN) to large-scale combat operations, it is imperative that the Army relooks how it employs Radars in an Electronic Warfare (EW) contested environment. As the United States Army has become more reliant upon the electromagnetic spectrum (ES), Russia has been developing, refining, and perfecting their TTP's using ES to target their adversaries. During the Russo-Ukrainian war, Ukrainian commanders complained about taking indirect fire (IDF) seconds after making a radio transmission.¹ Due to the Field Artillery and Target Acquisition community's inability to evolve with the ever-changing EW threat, new ways need to be identified in which the Target Acquisition Platoon (TAP), and its Radars, can survive in this type of an environment.



Figure 1

In June of 2020, 2nd Battalion 32nd Field Artillery TAP began running tests with Brigade EW platforms to determine ways to increase survivability (Figure 1). These tests were conducted with both AN/TPQ-50 and AN/TPQ-53 Radars at a distance of 4 Kilometers from Brigade EW platforms. Both of these Radars were positioned with an initial downward slope of 200-300 meters in front of the Radar then a sharp rise to a screening crest, which is considered an optimum site for a Radar.² The training encompassed various scenarios including:

- AN/TPQ-50, EW inside Radars max range; continuous cueing

- AN/TPQ-53, EW inside Radars max range; 360-degree mode continuous cueing
- AN/TPQ-53, EW inside Radars max range 90-degree mode; 30 seconds on 30 seconds off

None of these scenarios, or the use of an optimum site, prevented the Radar from being detected. In fact, the Radar was detected in less than a second each time it began radiating.



Figure 2

The TAP conducted additional training in July of 2020 (Figure 2) with both Brigade EW and Division Cyber-Electromagnetic Activities. This training included multiple scenarios at greater distances between the Radars and EW Platforms. The training included an AN/TPQ-50 and AN/TPQ-53 at a distance of 8.5 Kilometers and at a distance of 16 Kilometers. Each Radar was in a position to maximize screening crest (Figure 3) and tunneling (Figure 4). The TAP ran through multiple scenarios which included:

- AN/TPQ-50, EW outside Radars max range; continuous cueing
- AN/TPQ-50, EW inside Radars max range; continuous cueing
- AN/TPQ-53, EW inside Radars max range 90-degree mode; continuous cueing
- AN/TPQ-53, EW inside Radars max range 90-degree mode; 30 seconds on 30 seconds off
- AN/TPQ-53, EW inside Radars max range 360-degree mode; continuous cueing
- AN/TPQ-53, EW inside Radars max range 360-degree mode; 30 seconds on 30 seconds off



Figure 3

The exact Radar operating frequencies were not provided to increase the validity of results. The ranges of 1215 to 1390MHz and 3.1 to 3.5 GHz were used. These frequency ranges were selected because they are found via open source. Due to the positioning of the Radars, with both tunneling and screening crests, there was some success to prevent detection. However, by simply moving the EW platforms a couple of hundred meters, the Radars were easily identified. In an environment in which we face adversaries utilizing a networked direction-finding system, detection from one sensor may be avoided, but ultimately will not avoid detection of all sensors. During each of these scenarios, when the Radars were found, their signatures were located within one second from the onset of radiating. There is a misconception across the Field Artillery community that multiple seconds will lapse before a signature is detected. As evidenced by conducting testing, factual data confirms Radars can be detected immediately upon radiation without dwell time.



Figure 4

System	Screening crest	Tunneling	Electronic warfare threat	Position has screening crest and tunneling	Position has screening crest only	Position has neither screening crest and tunneling
AN/TPQ-36/37 AN/TPQ-53 in 90 degree modes	Less than 1 kilometer of the position in friendly territory 15-30 mils.	The use of foliage, berm, or buildings to reduce side lobe radiation	Counterfire officer provides the current electronic warfare status for their area of operations.	>15 minutes of accumulation	>15 minutes of accumulation	>8 minutes of accumulation
AN/TPQ-50 AN/TPQ-53 in 360 degree mode	Mask angle not greater than 100 mils.	Any building or vehicle less than 20 meters distance may degrade operation of or damage equipment	Continuous radiation time should not exceed two minutes when the enemy has electronic detection capabilities	Never position in a deep depression or valley between hills. The performance will be severely degraded.		

Figure 5

Documented reference from the Russo-Ukrainian War in which indirect fire followed radio transmission within seconds³ has led the TAP to question the validity and relevance of the survivability matrix in ATP 3-09.12, Field Artillery Target Acquisition (Figure 5).

As stated in ATP 3-09.12, and depicted in the survivability matrix, is that continuous radiation time should not exceed two minutes when the enemy has electronic detection capabilities.⁴ The issue with the survivability matrix is that it keeps the Radar in position for an extended period of time, ultimately increasing the risk of being targeted. In a high EW environment, it is common practice to radiate for 30 seconds on and 30 seconds off to avoid detection, or a similar combination, not to exceed the two minute timeline outlined in ATP 3-09.12. Once the Radar meets the 15 minutes of accumulated radiation, they then conduct a survivability move. As previously stated, this causes the Radar to be at extreme risk. Operators radiating for 30 seconds on and 30 seconds off, remain in position for 30 minutes before 15 minutes of accumulated radiation is complete. Training and research conducted confirms Radar signature is detected immediately upon radiation. Ultimately, this allows an adversary 29 minutes and 59 seconds to target the Radar. In September of 2014, east of Mariupol, a Russian drone flew over a Ukrainian position and 15 minutes later a BM-21 multiple launch rocket system (MLRS) destroyed that position.⁵ An argument can be made that an EW platform could find a target faster than a

drone, ultimately reducing the sensor-to-shooter time. Continuing to use operational standards outlined in ATP 3-09.12 leave the Radars at risk for both detection and destruction.

The Field Artillery community can fight their Radars in an EW constrained environment using the proposed matrix (Figure 6). All radiation times are to be carried out consecutively, without breaks. This will increase the probability of tracking enemy IDF, as well as decrease the amount of time spent at one location. Each column from the matrix is explained in subsequent paragraphs.

The proposition includes the use of emission control (EMCON) which is the selective and controlled use of electromagnetic, acoustic, or other emitters to optimize command and control capabilities while minimizing the following:

- a. detection by enemy sensors
- b. mutual interference among friendly systems
- c. enemy interference with the ability to execute a military deception plan.⁶

JP 3-13.3 outlines how EMCON is important to operational security as well as essential to preventing the adversary from distinguishing deception activities from the main effort.⁷ These EMCON levels should be assessed by the Field Artillery Battalion and deliberately elevated or lowered based on the criteria outlined in figure 7.⁸

Before discussing EMCON levels 1-5, clarification must be made regarding definitions and practices of Radar cueing. Situational cueing ties cueing to events or triggers

that are determined during IPB and the planning process. For example, during the execution of offensive tasks, an event or trigger may be breaching or air-assault operation.⁹

When the proposed survivability matrix discusses situational cueing, it is not referring to a cueing schedule where operators begin radiating at a designated time of the day. Rather the operators will begin radiating based on triggers. These triggers may include decisive points of the operation, during Airborne operations, or following a friendly Field Artillery volley in anticipation of enemy counterfire. At no time should the Radar operator begin radiating because it is a certain time, but rather only when a trigger has been met. Once that trigger has been met, cueing agents will contact operators, and inform them to begin radiating.

When discussing demand cueing, the survivability matrix is referring to the doctrinal definition of the activation of the weapon locating Radar once the enemy is known to have begun firing.⁹ For purpose of discussion, I have provided two examples in which demand cueing will be effective. On July 11, 2014, in the town of Zelenopillya, Ukraine, a combined Russian MLRS strike destroyed two Ukrainian Mechanized Battalions and lasted no more than three minutes.¹⁰ The significance behind this attack is not the destruction of the mechanized battalion, but rather the three minutes of firing. In a situation in which demand cueing would be implemented, three minutes is more than enough time for a cueing agent to inform a Radar to begin radiating. Additionally, a common Russian TTP is to perform anti-fire maneuver. During this TTP, artillery should begin moving within its area at a distance of up to 500 meters, followed by firing 7-10 rounds of each weapon.¹¹ Based on the rate of fire of a 2S19, the firing of 7-10 rounds will last 1-2 minutes, which would once again be plenty of time for a cueing agent to inform a Radar to begin radiating.

The first EMCON level, level 5 (Figure 8), is best described by how

EMCON Status	Protocol to enforce	Radio Power Transmission	Radar Cueing	Radar guidance	Example Authorized Reports
5	N/A	Power amp authorized, Re-trans as needed to conduct operations	N/A	Neither screening crest nor tunneling required	Any
4	Ensure comms are encrypted and black keys loaded	Power amp authorized, Re-trans as needed to conduct operations	Any cueing combination authorized, survivability moves conducted upon 15 minutes of radiation	Screening Crest Required	All Acquisitions, SPOT, SALUTE, PERSTAT, LOGSTAT, MEDEVAC, Equipment Slant
3	Evaluate EW threat to determine frequency range of ENY EW Assets. Minimize use of RADAR's operating in the frequency range of ENY EW Assets	Power amp authorized no closer than 10K from the FLOT, power amp not advised	Combination of both situational and demand cueing authorized, radiate for no longer than 8 minutes. Monitor previous locations and add time to cumulative radiation based on EW analysis	Screening crest and tunneling required	All Acquisitions, SPOT, SALUTE, PERSTAT, LOGSTAT, MEDEVAC, Equipment Slant
2	Cease all non-essential transmissions, turn off JBCP's, switch Radios to high	Power amp not authorized, decentralize RADAR's to units that can receive acquisitions with radios on high	Demand cueing preferred, situational cueing during decisive points. Radiate no longer than 8 minutes and conduct survivability move	Screening crest and tunneling required	All Acquisitions, SPOT, SALUTE, MEDEVAC
1	COMMS Silence	COMMS Silence	Demand cueing only, radiate no longer than 8 minutes and conduct survivability move	Screening crest and tunneling required	All Acquisitions, MEDEVAC

Figure 6

*Total radiation time will be consecutive without breaks to maximize RADAR coverage

EMCON Status	Description
5	Describes a situation where there is no apparent hostile activity against friendly emitter operations. Operational performance of all electromagnetic spectrum (EMS) dependent systems is monitored, and password/encryption enabled systems are used as a layer of protection
4	Describes an increased risk of attack after detection. Increased monitoring of all EMS activities is mandated, and all Department of Defense end users must make sure their systems are secure, encrypted, power levels monitored, and transmissions limited. EMS usage may be restricted to certain emitters, and rehearsals for elevated EMCON is ideal.
3	Describes when a risk has been identified. Counter ECM (encryption/Freq hop/directional antennas) on important systems is a priority, and the EWOs alertness is increased. All unencrypted systems are disconnected.
2	Describes when an attack has taken place but the EMCON system is not at its highest alertness. Non-essential emitters may be taken offline, alternate methods of communication may be implemented, and modifications are made to standard lower EMCON configurations (id power levels and antenna types).
1	Describes when attacks are taking place based off the use of the EMS. The most restrictive methods of EP are enforced. Any compromised systems are isolated from the rest of the network.

Figure 7¹

Radars are currently operating in the COIN environment. There is no protocol to enforce as there is no threat of an EW attack. The Radars are free to operate as many hours a day as necessary to support their current objectives. This is the most permissive EMCON level.

EMCON level 4 (Figure 9) is active when suspected enemy EW assets are in the area of operations (AO). Any combination of situational or demand cueing is authorized, not to exceed 15 minutes of continuous radiation. The timeline is based on the event that was previously discussed, in Mariupol, where a unit was destroyed within 15 minutes of being detected.¹²

EMCON level 3 (Figure 10) is active when there is confirmation of an enemy EW threat in the AO. At this particular level, the FA Battalion S2 must determine the frequency range in which the enemy EW asset is capable of operating. If a Radar is operating outside of the determined frequency range, every effort should be made to maximize the use of that Radar. While operating at EMCON level 3, the use of a power amp is authorized, however, it is not advised. By switching from power amp to medium power it will reduce the signature that the Radar is producing while transmitting acquisitions. Figure 11 depicts a single SINCGARS on power amp while fig-

ure 12 depicts it on medium. Once again, a combination of both situational and demand cueing is authorized, however the amount of time has been reduced to eight minutes of consecutive radiation before displacing. Once displaced, the previous location is monitored for IDF or intelligence, surveillance, and reconnaissance assets. If there is no evidence of an EW threat, the eight minutes can be increased to a longer duration.

EMCON level 2 (Figure 13) is active when there is a confirmed attack based on the use of EMS. During this time the Radar operators must cease all nonessential radio transmissions. When EMCON level 2 is active, authorized radio transmissions include sending acquisitions, and radio transmissions necessary for mission accomplishment. The use of a radio's power amp is not authorized throughout EMCON level 2. The command support relationships may require adjustment, or the counterfire fight may transition to a decentralized fight to reduce emissions if the counterfire headquarters cannot be reached using the radio on high. Demand cueing is preferred, however situational

5 <i>Figure 8</i>	N/A	Power amp authorized, Re-trans as needed to conduct operations	N/A	Neither screening crest nor tunneling required	Any
4 <i>Figure 9</i>	Ensure comms are encrypted and black keys loaded	Power amp authorized, Re-trans as needed to conduct operations	Any cueing combination authorized, survivability moves conducted upon 15 minutes of radiation	Screening Crest Required	All Acquisitions, SPOT, SALUTE, PERSTAT, LOGSTAT, MEDEVAC, Equipment Slant
3 <i>Figure 10</i>	Evaluate EW threat to determine frequency range of ENY EW Assets. Minimize use of RADAR's operating in the frequency range of ENY EW Assets	Power amp authorized no closer than 10K from the FLOT, power amp not advised	Combination of both situational and demand cueing authorized, radiate for no longer than 8 minutes. Monitor previous locations and add time to cumulative radiation based on EW analysis	Screening crest and tunneling required	All Acquisitions, SPOT, SALUTE, PERSTAT, LOGSTAT, MEDEVAC, Equipment Slant

cueing continues to be authorized during decisive points. Again, the Radar should radiate until it has reached eight minutes of continuous radiation and then displace.

EMCON level 1 (Figure 14) is active when attacks are continuously occurring through the use of EMS. This is the most restrictive EMCON level and will limit the Radar operator to complete communication silence. Demand cueing is the only authorized method of cueing during this level and no additional radio communications should occur apart from acquisitions or medical evacuation.

During times in which there is greater significance placed on improving EW systems, it is imperative that doctrine changes to increase the survivability of our Radars. With information collected via these training events, it has shown that the current Radar survivability matrix is not sufficient for an EW contested environment. Due to the Field Artillery and Target Acquisition community's inability to evolve with the ever-changing EW threat, new ways need to be identified in which the TAP, and its Radars can survive in this type of environment. Through the use of emissions



Figure 11



Figure 12

control and the survivability matrix provided, I believe 2-32 FA's Radars would survive in this type of environment.

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References

- 1 Scales, R. H. (2016, August 15). Robert H. Scales: While the U.S. chased political correctness, Russia chased the edge on the battlefield.
- 2 Field Artillery Target Acquisition ATP 3-09.12, 24 July 2020 p.28
- 3 Scales, R. H. (2016, August 15). Robert H. Scales: While the U.S. chased political correctness, Russia chased the edge on the battlefield.
- 4 Field Artillery Target Acquisition ATP 3-09.12, 24 July 2020 p.29
- 5 Karber, Dr. Phillip A. 2015. Lessons Learned from the Russo-Ukrainian War. Personal Observations, Washington D.C.: Johns Hopkins Applied Physics Laboratory
- 6, 7 Joint Publication 3-13, 3 Information Operations, 20 November 2014 p. 109, p. 54
- 8 Flanagan, William. Electromagnetic Spectrum Footprint and Emissions Control
- 9 Field Artillery Target Acquisition ATP 3-09.12, 24 July 2020 p.49
- 10 Karber, Dr. Phillip A. 2015. Lessons Learned from the Russo-Ukrainian War. Personal Observations, Washington D.C.: Johns Hopkins Applied Physics Laboratory p. 18 11 Army collection Journal of the Ministry of Defense of the Russian Federation

2 <i>Figure 13</i>	Cease all non-essential transmissions, turn off JBCP's, switch Radios to high	Power amp not authorized, decentralize RADAR's to units that can receive acquisitions with radios on high	Demand cueing preferred, situational cueing during decisive points. Radiate no longer than 8 minutes and conduct survivability move	Screening crest and tunneling required	All Acquisitions, SPOT, SALUTE, MEDEVAC
1 <i>Figure 14</i>	COMMS Silence	COMMS Silence	Demand cueing only, radiate no longer than 8 minutes and conduct survivability move	Screening crest and tunneling required	All Acquisitions, MEDEVAC

Developing and Implementing a RADAR Cueing Schedule

By SFC Todd-Geoffrey P. White and SFC Theodis Scott Jr.

Alone on a hilltop, an AN/TPQ-53 Radio Detection and Ranging (RADAR) system is occupied, ready to radiate, and take on the mission assigned. That mission is to provide effective and timely counterfire acquisitions to the organic Brigade and Division. As they stand ready, observing the assigned azimuth of search, prepared to acquire enemy indirect fire weapon systems, something occurs of which they were not expecting. The RADAR has received a jamming signal indicating the detection of a probable enemy electronic warfare system. The section reports time, frequency, and azimuth to the Counterfire Cell at Brigade and continues their mission. Moments later, they receive another jamming signal on the same azimuth and frequency. Shortly thereafter, they hear the distinct buzzing of an aerial drone of unknown type. As the RADAR section reports the contact to the Counterfire Cell, the section begins acquiring enemy indirect fire acquisitions, followed by accurate enemy indirect fire on the RADAR site. This indirect fire results in the destruction of the Sustainment Operations Group and the wounding of one crewmember. In an effort to save the RADAR, the section executes an immediate displacement and survivability movement of the Mission Essential Group (MEG). This scenario, while fictional, is a feasible scenario that could play out during large-scale combat operations. To avoid the scenario, the question that we must answer is, how do we integrate the development and implementation of RADAR cueing schedules into training, to increase overall proficiency, effectiveness, and survivability? Many factors can lead to a situation such as this to come to fruition. One main factor, not developing a

cueing schedule at the counterfire level, along with some other contributing factors may include: changing the cueing guidance without properly delineating to the RADAR sections, not planning for survivability movement once saturation time has been met, and failing to take into account the enemy electronic warfare threat in the area of operations. Furthermore, a lack of tracking radiate on and off cycling at the operator level, as well as, total saturation time can also contribute to the cueing schedules' ultimate success or failure.

Creation and implementation of a well-planned cueing schedule is one of the tasks that has degraded Army-wide, as trends at the Joint Multinational Readiness Center show. To begin to understand the problem, we must first understand the different types of cueing, advantages and disadvantages, and employment situations for each form of cueing. According to ATP 3-09.12, para 4-28, Field Artillery Target Acquisition, 24 July 2015, "Cueing is the process designed to prompt or notify the RADAR to begin radiating and acquire indirect fire. The cueing agent is a command and control element that has the authority to direct the RADARs search area and search time." There are two types of cueing that the RADAR systems execute - situational cueing and demand cueing.

"Situational cueing is the preferred technique for cueing Weapon Locating RADARs and is the most responsive. This method ties cueing to events or triggers that are determined during IPB and the planning process," ATP 3-09.12, para 4-32. There are many scenarios and missions related to situational cueing. For example, offensive operation triggers for the RADAR to begin cueing include but are not limited

to, the beginning of an air assault mission, artillery raid, breach, or wet gap crossing. Thus, ensuring target acquisition coverage during those operations. During defensive operations, cueing triggers may be associated more with the enemy operational phases of fire as depicted on a decision support template.

"Demand cueing is the activation of weapon locating RADAR once the enemy is known to have begun firing. For demand cueing to be effective, cueing agents must be designated and a responsive communication system between the cueing agents and RADAR established," ATP 3-09.12, para 4-33. Prioritization and standardization are crucial before utilizing demand cueing. Specifying cueing agents and triggers allow for effective RADAR coverage while limiting unnecessary radiating, resulting in less probability of detection by the enemy. Cueing agents may include, but are not limited to, forward observer teams, aerial intelligence surveillance and reconnaissance assets, electronic warfare assets, Brigade Fire Support Officers, and the Counterfire Cell. Agents, as well as triggers, vary based on the situation and which agent is best placed to direct cueing. For example, standard operating procedure for the brigade may be for the Counterfire Cell to retain all cueing authority; however, the enemy scheme of maneuver and friendly forces course of action may identify the forward observers in the forward most BN the best position to identify enemy indirect fire equipment. Therefore, delegating cueing responsibility as mission dictates to the forward most unit, may prove most relevant. Demand cueing relies heavily on every possible cueing agent understanding their role, having clear communications with the target acquisition

assets, and integration of those assets into unit training to execute the cueing guidance.

Development of the brigade RADAR cueing schedule begins with the creation of the Target Acquisition Standard Operating Procedure. When including cueing schedules in the brigade TA SOP the Platoon Leader, Platoon Sergeant, Senior Field Artillery Targeting NCO, and Counterfire Officer make determinations on base-level guidance for each type of cueing. Development of a robust cueing guidance in the TA SOP provides the RADAR section a basis for operations that can then be refined and trained upon to ensure the sections have a clear understanding of cueing of their target acquisition systems. Baseline cueing guidance will also lay the groundwork for interoperable training events such as Mortar Evaluation Programs, Artillery Tables, and Counterfire Cell certification. This groundwork training will aid in the communication process, especially during demand cueing, as the RADAR sections often are not coordinated with possible cueing agents before large-scale combat operations. Once a Standard Operating Procedure is established, adjustment of the TA SOP occurs to align with Commander's guidance, Operational Environment variables, and mission analysis outputs, before development of the TA Tab of the BDE OPORD.

Every step of the Military Decision-Making Process is an opportunity to adapt and refine the brigade cueing schedule. From mission analysis to OPORD development, taking into account facts and assumptions that could affect the RADARs' capability to acquire targets and evade Electronic Warfare systems. The Intelligence Officer's assessments during Mission Analysis and Intelligence Preparation of the Battlefield are critical steps that the Counterfire Cell and Target Acquisition Platoon leadership should be most aware of, as these steps will provide the best facts and assumptions from which to plan. As an example, did we assume that the electronic warfare threat assessed

at full strength in phase one, and therefore poses a high risk to our radio frequency-producing devices? What have we determined the RADAR cueing schedule to be throughout phase one? How will our cueing schedules continue to adapt as the mission progresses? Thorough analysis and development during the Military Decision-Making Process is crucial to answering the questions as the process continues, resulting in a refined plan for cueing during as many phases as possible, and refined as necessary.

Now that we have developed cueing guidance in our SOP, and have practiced the performance measures of our tasks, we can continue to develop our tactical planning for the employment of our RADAR systems at the BCT level in this often over looked aspect of Target Acquisition planning. Effective cueing will ultimately come down to the RADAR section's understanding of the importance of cueing and ownership of the RADARs cueing at their level. Therefore, a best practice is to integrate cueing into all training events, from RADAR Artillery Tables to Battalion and above Artillery Training events. A concerted effort to having the systems in play and conducting their role as normal is critical to gaining and maintaining proficiency in this area. All too often, utilization of the RADAR section is in an "administrative" role, wherein they are only at the training event to provide secondary means of observation. They will generally emplace the system and not move for the entirety of the Live-fire Exercise. While this practice is not inherently wrong, it fails to provide the section the requisite training conditions to practice realistic technical and tactical performance measures. A holistic gated training strategy must include cueing of the RADAR during training events and certifications. Some ways to do this include aligning the RADAR table VI in line with the Field Artillery qualification tables for Howitzers or Rockets. Integrating the Counterfire Cell into the Brigade Fires Support Element during Artillery qualification tables,

to provide real-world situations and orders for the sections. With additional planning and support, the Target Acquisition assets will be more involved and proficient in the systems and processes of an effective counterfire fight. No matter how the cueing plan is integrated, all levels must have the discipline to continue training in this area to ensure cueing does not become a skill that we allow to atrophy.

We can mitigate the problem sets of RADAR coverage and survivability against EW threats with proper development, implementation, and training of both the RADARs and Counterfire Cells. This often overlooked and undertrained aspect of system operations is complex but manageable with the proper systems and processes in place. However, once in place it will result in a trained and knowledgeable Weapon Locating RADAR System platoon and Counterfire Cell and mission accomplishment of the Target Acquisition assets. Enabling brigade, division artillery, and division commanders to achieve success in counterfire battles in any operational environment.

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Digital Calls for Fire Processing

By LTC James Nemec and COL Thomas Caldwell

Introduction-

The deliberate and dynamic use of Fires in support of Maneuver remains the hallmark of combining arms during Large Scale Combat Operations (LSCO). The speed and offensive audacity of Armored and Stryker Brigade Combat Teams on today's battlefield requires Fire Support of the same character. Providing timely, accurate, and effective "digital" Fires in consort to consistently meet or exceed the Commander's Intent for Fires by organic and/ or Echelon Above Brigade (EAB) fire support means remains a methodical enterprise. The purpose of this paper is to provide context and solutions from both active duty and National Guard units' efforts during National Training Center (NTC) Decisive Action Training Environment (DATE) rotations to provide Fires digitally via current doctrinal, training, and material means. The context and solutions will be provided in the aspects of defining our digital fire support capabilities, digital sustainment training, maintenance, tactical employment, and leadership / unit culture.

Defining Digital Fire Support Capabilities-

During the Civil War, Sergeant Milton Humphrey proved by ordering a Soldier to a nearby hilltop to achieve indirect cannon fires, that reliable communications between observers (sensors) and the guns (shooters) was key. A century and a half later the expectations for communications between the two entities has significantly changed based on the 21st century character of warfare and significant advancements in technology. Today's U.S Army Fire Support enterprise has a myriad of systems to digitally target, transmit, tactically / technically process, and deliver calls for fire. Despite a comprehensive suite of digital systems, rotational units at NTC are challenged with establishing and maintaining reliable digital communications between Observation Posts (OP) and the firing unit and immediately default to utilizing conventional voice communications. The use of Frequency Modulated (FM) digital communication and Upper Tactical Internet (UTI) to send fire missions from an OP through the requisite Fire Sup-

port Elements (FSEs) at echelon to a firing unit can provide the optimal speed, efficiency, and accuracy to achieve and exceed the desired effects. The equipment currently fielded to FOs in active duty and National Guard units enable them to pull a target grid from a digital map and send a digital call for fire via text that is received and processed instantly through echelons of Advanced Field Artillery Tactical Data Systems' (AFATDS) intervention points, Fire Support Coordination Measures (FSCMs) protocols, and gunnery computations, resulting as a fire order on the guns. Forward Observer Software (FOS) comprised of the Remote Handheld Terminal Unit-mounted (RHTU) and the SCU-2 (Stand Alone Computer Unit) is the most prevalent suite of gear utilized at NTC. FOS is a multi-mode, user configurable Fire Support software application with two modes: Forward Observer/ Fire Support Team mode for processing fire missions and Fire Support Officer/ Commander Mode for planning and controlling fires and fire support operations. In support of dismounted operations, the Pre-

Desired takeaways from the defined aspects-

1. There is a divergent understanding of what Digital Fires is comprised of and the responsibilities of the combined arms community from simple 10 level tasks and collective relative application into unit operating procedures.
2. There is no substitute for regimented, disciplined, enforced, comprehensive and rigorous Digital Sustainment Training (DST).
3. Maintenance to include incorporation of high usage parts into the unit Shop Stock List (SSL). Leaders must track the maintenance statuses of both primary and complimentary Fire Support Equipment to properly maintain the sensor to shooter link to meet expectations.
4. Tactical employment of RETRANS, Fire Support sensor equipment, radars, and properly "trained" personnel must be a deliberate process to fundamentally be at the right location, with the right systems (optics, entry device, communications), and shared understanding.
5. Leaders at all echelons and warfighting functions must understand how they enable the complexity of digital Fires by setting conditions through accountability and unit culture. Honest dialogue of issues and opportunities within the Sensor to Shooter network at echelon both vertically and horizontally is key to meet or exceed expectations.

cision Fires-Dismounted (PF-D) is replacing the Pocket Forward Entry Device (PFED) and acts as a fires planning tool while also sending digital calls for fire, Close Air Support (CAS) requests, and is compatible with all dismounted targeting devices. These call for fire systems both mounted and dismounted require a reliable network.

Digital Sustainment Training-

At NTC, Fire Supporters at echelon routinely lack the ability to properly employ and troubleshoot assigned equipment. This observation is confirmed by the omission of leaders during each final NTC Fire Support After Action Review (AAR) being a result of not executing salient digital sustainment training (DST) and Fire Support Team (FiST) certifications. All commanders at echelon should systematically invest in quality DST and certifications of all digital call for fire systems, by deliberately scheduling and executing training in accordance with TC 3-09.8 Fire Support and Field Artillery Certification and Qualification and the 8 Step Training Model. Ensuring an accountable quality of training builds operator confidence and mitigates friction prior to and after crossing any line of departure. While at home station, DST is most effective as a weekly battle rhythm event properly de-conflicted with other competing demands. DST is best achieved when it begins on the same day as command maintenance to set conditions but is exclusively executed on another day of the week or throughout the week. DST should be a Brigade level event led by the Brigade Fire Support Coordinator (FSCOORD) or Fire Support Officer (FSO) along with the Brigade FSNCO and Brigade Digital Master Gunner who are the proponents for the training using the Brigade's Digital Standard Operating Procedure (DIGSOP) as a guide. The most effective DIGSOPs inform how the Brigade communicates digitally, codifying the Brigade's order of precedence for communication: Primary, Alternate, Contingency, and Emergency (P.A.C.E) plans, and provides standard troubleshooting methods. Like all SOPs, the DIGSOP

should be reviewed and updated on a routinely, especially following any applicable major training event.

A six-week progression that includes the Brigade FSEs, all Battalion FSEs, the Field Artillery Battalion's Fire Direction Centers (FDC) and guns provides the most efficient means to an effective enterprise. As early as possible, DST should incorporate Call for Fire Trainers (CFFT), to collectively train forward observer proficiency to enforce Fire Support systems employment and proficiency. DST requires daily incorporation of Preventive Maintenance Checks and Services (PMCS) on equipment to address maintenance issues, install parts that have arrived, and properly practice cross leveling of equipment or controlled substitution of parts. The first week of DST begins with everyone in the motorpool focusing on the digital linkage between platoons, companies, and Battalion FSEs. The second week focuses on the routing of digital calls for fire from the observers to the gunline and the observers to the Brigade FSE. The third week incorporates the Brigade's P.A.C.E (Primary, Alternate, Contingency, Emergency), and the routing of digital calls for fire from the observer to the Brigade FSE and the observer to the guns. For the fourth week, Battalion and platoon Fire Direction Centers (FDCs) should move 6-10 kilometers away from the motorpool to train digital capabilities at distance. The fifth week, observers move out of the motorpool and occupy OPs or the CFFT, testing their P.A.C.E plan at distance. For the sixth week, all elements of the digital chain should move out of the motorpool and test their ability to send digital missions from platoon observer to brigade, FDCs, and the gunline with each platform in the PACE plan. A successful Brigade DST progression includes realistic scenarios complimenting concurrent training including Brigade RETRANS, radars, and other enablers. DST is an important factor in improving the effectiveness of digital call for fire systems but is only effective if the equipment is maintained properly.

Maintenance-

Commanders must emphasize in their maintenance and command and supply discipline programs to place special emphasis on maintaining digital call for fire equipment due to it uniquely spanning multiple Army programs of record, Brigade staff sections, and subordinate Battalions. For example, M7 Bradley Fire Support Team (BFIST) are tracked as Fully Mission Capable (FMC) if their chassis meet all operational readiness requirements, but their FS3 and SCU2's are Not Mission Capable (NMC). As a result, regulatory reporting such as Unit Status Reports (USR) do not account for digital systems NMC therefore the requisite command emphasis is not placed on the proper maintenance and sustainment of these systems. Units preparing for NTC must identify NMC Fire Support equipment and operationalize a plan to repair or replace. Battalion and Brigade maintenance, S4, and S6 shops assist with digital call by understanding the required logistics and prioritization necessary to maintain the network. Unit Shop Stock List (SSL) and apportionment of the limited Fire Support systems in accordance with mission priorities of effort should be incorporated in staff processes. The FSNCO at BN and BDE levels are key in providing the FSCOORD, FSO, S4' and S6's with information from running estimates from a comprehensive and managed Fire Support platform, sub-systems, and complementary equipment tracker. Information provided by the tracker will provide the necessary information to inform maintenance efforts and capabilities management/cross leveling based on defined on equipment essential to digital fires.

Tactical Employment-

Proper tactical employment of digital call for fire systems at NTC begins during the Military Decision-Making Process (MDMP). The BN and BDE S6 is responsible for the planning and application of cogent line of sight analysis through SPEED software to ensure the best employment of RETRANS teams and OPs. Line of sight analysis uses

a variety of variables including terrain elevation, antennae height and distances to provide Brigades with data to properly synchronize RETRANS and OP placement especially during rehearsals. During RSOI (Reception, Staging, Onward movement, and Integration) units conduct a Digital Validation Exercise (DVE) to test their digital equipment at distance. Successful units use every aspect of the DVE to troubleshoot faulty connections and address friction points in their digital communication plan. Successful units leverage the experience of their Observer, Coach, Trainers to improve their digital communications and are willing to listen and adapt their plan if necessary. Often times, units assume they are testing their FM digital link but forget to turn off their tactical LAN (local area network) to ensure their AF-ATDS is functional on the FM digital network. In order to ensure proper FM digital connection and troubleshooting, RETRANS teams must be trained in testing the FM Digital network. RETRANS must know how to set up radios correctly, otherwise the digital network is not going to function properly during distributed operations. Prior to operations, Brigades should plan and rehearse primary and alternate OPs as well as primary and alternate digital communications. At the Intelligence Collection/ Fires Rehearsal, units should rehearse each target from sensor to shooter, including primary and alternate observers and communication systems. The Brigade S6 should attend and participate in the IC/ Fires Rehearsal to explain the communications plan and how he/she will respond to points of friction. Once operations begin, units often rely too much on upper TI, including JCR, to send fire missions. This becomes problematic because JCR is not a primary platform for fire missions and are easily convoluted within the receipt and transmission of multiple messages. Brigades should anticipate and plan for friction with digital communication during OP occupation, TOC/ TAC jumps, and transitions. The more informed and

trained units are at home station on digital communications from sensor to shooter, the better position they will be upon arrival at the NTC. The more thorough a unit plans and the more discipline it executes, accounting for friction prior to operations and nullifying issues as they arise, the better they will perform during the rotation.

Leadership / Unit Culture-

Many issues relating to digital call for fire systems stem from the old maxim: A Soldier must first master his/her assigned equipment before they can trust it will work. Soldiers attending Advanced Individual Training (AIT) as Joint Fire Support Specialists are taught to plot targets and call for fire using a map, protractor, binoculars, a compass, and a radio. Throughout AIT, Soldiers are introduced to digital systems and are trained to resort back to analog systems when digital systems are down. Without leader presence and accountability there is a natural reluctance to make the digital equipment work properly through routine maintenance and informed troubleshooting. The observed trend is that operators will resort to FM voice especially during high intensity and time constrained situations. If allowed to prematurely resort to FM voice, Soldiers never properly familiarize with their equipment, let alone master it, and assume it does not work. The success of any unit endeavor is based on command emphasis and support.

Conclusion-

The purpose of this paper was to review current digital call for fire systems and provide recommendations for increasing the effectiveness of these systems through defining our digital fire support capabilities, digital sustainment training, maintenance, tactical employment, and leadership / unit culture. Units at home station conducting quality weekly DST and maintenance build confidence in their digital call for fire systems and are best prepared to tactically employ these systems once at the NTC. In the event the digital system goes down, units provided with the right points of

contact and the knowledge to troubleshoot will quickly remedy the issue and continue the fight. Soldiers and leaders at all levels should possess a common understanding of where to go for assistance with digital call for fire systems. The Army Capability Manager (ACM) - Fires Cell at Fort Sill (580) 442-5719 has 13F subject matter experts tasked with assisting units with their digital call for fires systems. These seasoned Non-Commissioned Officers and Civilians are knowledgeable resources, prepared to assist with training, troubleshooting, component acquisition, and can reach out the right people to find the answers to tough questions. They also serve as a conduit of best practices, linked in with the Combat Training Centers (CTCs) to follow trends and capability gaps for the force.

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References

ADP 7-0 Training, July 2019
FM 3-09 Fire Support and Field Artillery Operations, April 2020
TC 3-09.8 Fire Support and Field Artillery Certification and Qualification March 2020
FY 18, 19, and 20 National Training Center Fires Support Division Training Analysis and Feedback Team



TRIGGER MATH

By Major George L. Cass

FSO/FSNCOs synchronize fires with maneuver. They do this through triggers.

You need to convert tactical triggers to technical triggers. Many of us going through Combat Training Center (CTC) rotations have heard our OC/Ts say that to us; but what does it mean? This article will prepare Fire Support Officers/Non-Commissioned Officers (FSO/FSNCO) at Company, Battalion, and Brigade level to provide different methods to solicit tactical triggers from Maneuver Commanders and planners to convert it to a technical trigger. Effective trigger planning is how we truly synchronize fires with maneuver and support the concept of operations.

Does doctrine effectively cover this subject and the method to do this for all scenarios? Army Training Publication (ATP) 3-09.30, Observed Fires provides the framework for planning triggers for moving targets. Many smart books and Tactical Standard Operating Procedures (TACSOPs) throughout the Fire Support community try to address this, but none give a step action drill that simplifies the process. Field Artillery Basic Officer Leader Course (FA BOLC) provides a trigger planning worksheet that assists, but still falls short of addressing the multitude of ways to plan triggers. This article will address the many ways that FSO/FSNCOs and Commanders at the company and battalion level can determine triggers to initiate fires against moving targets or to synchronize with friendly maneuver.

Reflections of a Stryker Company Fire Support Officer (FSO)

So, there I was... Training day six of our rotation at the National Training Center. The sun had just come up, it was eight o'clock in the morning and already hot. How could it be so hot this early? We were in a hasty defense after we had seized Brigade Hill the night before. A radio call over command

net alerted the formation to Suspension of Battlefield Effects (SOBE). I was relieved the fight was over. Finally, my company would get a break after not getting any sleep the night before. Some of us had been averaging only 2-4 hours over the previous week. I couldn't remember the last time I ate because I was so busy with Troop Leading Procedures. (TLPs) I constantly was engaged in cross talking with the Forward Observers and Platoon Leaders on the plan prior to LD. Then I was consumed with battle tracking and monitoring multiple radio nets during the operation. Now it was time to get some chow and enjoy the relief. However, that sense of relief only lasted for a few minutes.

Anxiety started to rush through me when I thought about the previous evening's operation and the After Action Review (AAR) that would follow. I thought about what would be discussed by my Observer Coach Trainer (OC/T). I knew the OC/T would talk about my multiple failures to properly synchronize fires in the previous days, but last night showed no improvement. For a second time, I did not synchronize fires properly. The trigger to initiate suppression and obscuration in support of my company seizing Brigade Hill was off. 1st Platoon was in the Support by Fire (SBF) position with M2s, Mk19s, and Javelins suppressing enemy battle positions and 2nd Platoon had dismounted and begun movement from the assault position toward the objective. As they crested the last covered position, I gave the call to fire target group A2E.

I anxiously waited for the call "SPLASH" to come over the net and observe the simultaneous impact of company 60mm, 120mm mortars, battalion 120mm mortars, and 155mm cannon artillery. We were echeloning fires in true form to doctrine. Death would rain down

from the sky upon the enemy. However, I waited and waited.

My commander kept yelling at me on the command net, "where are my fires?" Troop 60s and 120s were effectively suppressing the planned targets, but where were the battalion 120s and cannon artillery? 2nd Platoon began taking significant direct fire contact and now were in the prone still three kilometers away from the objective with little cover between them and the enemy. They needed supporting fires.

Finally, battalion mortars started coming in, but no artillery. The artillery was needed because it was going to provide a Battery 6 rounds HE to suppress and then a 500 meter smoke screen for 30 minutes to obscure the enemy battle positions from placing effective direct fire on 2nd Platoon. At this point 2nd Platoon was taking casualties and performing care at the point of injury. There was no ability for them to evacuate their wounded to the casualty collection point (CCP), because they were still in contact. Still no artillery coming in. It has been 5 minutes since I had called fire on target A2E. Where is the artillery? Over command net 2nd Platoon Leader relayed that a Stryker was destroyed by an Anti-tank Guided Missile. (ATGM) He had three wounded. Still no artillery. Now 1st Platoon called up and was taking direct fire contact resulting in five wounded. The situation was getting worse. Seven minutes had passed and still waiting for artillery. 2nd Platoon took more ATGM fire resulting in two more Strykers destroyed, and 5 more wounded. 2nd Platoon was combat ineffective.

The Company Commander was faced with the dilemma of ordering 3rd Platoon to assume the role as assault element under the same direct fire contact that destroyed 2nd Platoon or have 3rd Platoon establish another SBF and break contact. It had been 15 minutes and now the

artillery rounds started coming in. Smoke was billowing and suppression was effective. I called repeat on the Troop and Battalion mortars and had finally gotten A2E in full to provide effects. The Company Commander ordered 3rd Platoon to assume assault, 2nd Platoon to break contact and evacuate casualties and in a matter of 30 minutes our objective was seized and casualties were enroute to the aid station. However, I was left with the guilt of failing to synchronize fires resulting in the loss of a platoon of combat power. What happened? What did I do wrong?

General Explanation of Tactical and Technical Triggers

Like most things fire support, planning tactical and technical triggers is a combination of art and science. The art is the Maneuver Commander providing the tactical trigger by describing to the Fire Support planner the desired effect in time and space. The science is the FSO doing the math to establish the technical trigger. The purpose of the technical trigger is to account for all the variables that add time to a target being serviced. Once the call to fire a planned target is given from the observer it has several intermediaries before it gets to the delivery asset. For example: Platoon Forward Observer (FO) -> Company FSO -> Battalion FSE -> Brigade FSE -> FA Battalion FDC -> Platoon FDC -> Howitzer Section. Ideally this would take 10 seconds across each intermediary to transmit data. This adds up very quickly. Once on the Howitzer Section it could take 45 seconds at best to get shot.

There are three main considerations you base a trigger on; enemy movement, friendly movement, and cease loading for friendly forces. There are also many ways for a Commander to describe when and where they want an effect. The following will give the most common techniques used.

Tactical Triggers

Who is Responsible for Tactical Triggers

Maneuver Commanders are

responsible for articulating tactical triggers. FSOs must recommend and solicit feedback from the Commander to determine the tactical trigger for planned targets. Once the tactical trigger is identified, the FSO can plan the technical trigger. The tactical trigger should be based on enemy or friendly movement or actions. In the offense, it is most common to plan triggers based on friendly movement.

Who is Responsible for Technical Triggers?

Technical triggers are the responsibility of the FSO/FSNCO. They have the understanding of gathering the information needed for the math problem to determine where the trigger will be placed. The FSO/FSNCO will determine the technical trigger to consider transmission time, mission processing time, time of flight, build time for effect, and rate of march.

ATP 3-09.30 defines this as the intercept point which is where the enemy will be when the rounds are impacting. The formula to determine the distance from trigger point to intercept point is (Transmission time + Mission Processing Time + Time of Flight + effect build time) x Rate of March in meters/second (m/s) = Distance. This is the basic formula to determine triggers based on moving enemy or friendly units. However, this can be modified based on how the tactical trigger is specified by the Commander. Some of the factors can be removed.

- Mission processing time is length of time it takes for the element that is shooting to process data and shoot the first round.
- Time of flight is how long the munition will take once shot to impact on the target.
- Build time for effect is the amount of time it takes for a smoke screen to build or an effect such as suppression to be achieved. You cannot assume that first round will suppress an enemy that is dug in.
- Rate of march is the speed the friendly or enemy element is moving in which the trigger based.
- Distance is the distance from the intercept point to the where the trigger point will be on the route or the enemy or friendly unit is taking.

- Transmission time is the amount of time it takes for a unit to transmit over digital or voice Frequency Modulation radio to get the targeting data to the element that is shooting.

- Effect build time is the amount of time it takes for an effect to be achieved after initial round impacts. It is most commonly used for smoke missions to account for the time it takes for the smoke to billow and create a full smoke screen that will achieve screening or obscuration. It can also be used to estimate how long it will take for suppression to occur. Initial rounds impacting on an enemy battle position that has good defilade and armor vehicles, might not be considered suppressed until after one minute of rounds impacting in that location. However, for softer targets, initial rounds might be considered good to achieve effect and it is not necessary to incorporate this factor into the math problem.

Types of Triggers

Good trigger planning in the field starts with having tools that make it easier to do when you are sleep deprived and short on time. Figure 1 is an example of a smart sheet that has a step action drill that walks the fire support planner through what they need to plan triggers and who has the information for planning assumptions. In the absence of having the information provided by someone, the tables with data are used as planning assumptions. We will use this smart sheet as we go through the types of triggers.

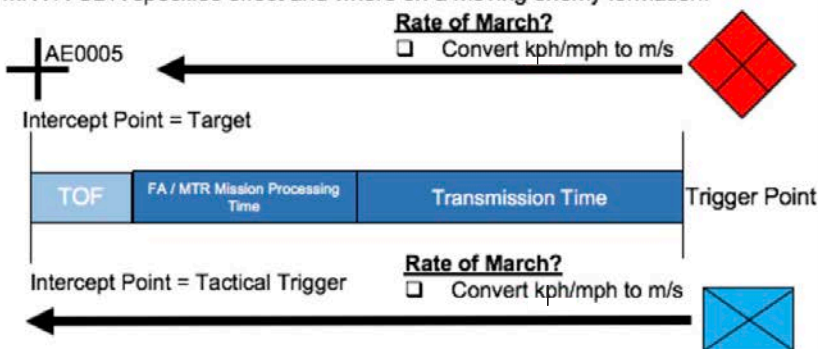
Moving Target

The most common technical trigger among fire supporters is planning to engage a moving target. This is ill-advised because it is extremely difficult to hit a moving target and have good effects. However, it is still feasible to disrupt enemy formations and slow movement. Fire support planners frequently plan fires on moving targets in the defense for targets that are moving toward Engagement Areas (EA) to slow formations, cause them to button up, and force them to transition from movement to maneuver. The most significant consideration

FIGURE 1

Tactical to Technical Trigger (EN/FR MVMT)

Enemy Movement: MNVR CDR specifies effect and where on a moving enemy formation.



Friendly Movement: MNVR CDR specifies effect on stationary Enemy formation synchronized with Friendly movement/maneuver.

$$\text{Rate of march in m/s} \times (\text{TOF} + \text{FA / MTR Mission Processing Time} + \text{Transmission Time}) = \text{Distance between Intercept point and Trigger Point in meters}$$

Rate of March Conversion			
MPH*	KPH	m/s*	Notes
3	5	1	Dismount Walking
6	10	3	Dismount Running
9	15	4	Vehicle Maneuver
12	20	6	
16	25	7	Vehicle Movement
19	30	8	
22	35	10	
25	40	11	
28	45	13	
31	50	14	

TOF Estimates	
RG from PAA to Target	Times
4-5 km	20 sec
6-7 km	25 sec
8-9 km	30 sec
10-13 km	40 sec
14-16 km	50 sec
17-18 km	60 sec

FA / MTR Mission Processing Time		
Firing Unit	HE(D/V)	SMK(D/V)
Mortar Section	90	90
Mortar Platoon	90	90
FA Platoon	35 / 45	55 / 75
FA Battery	35 / 45	55 / 75
FA Squadron	35 / 35	35 / 35

Transmission Time		
Echelon	Digital	Voice
Observer to TRP	5 sec	10 sec
TRP to SQDN	5 sec	10 sec
SQDN to REGT	5 sec	10 sec
REGT to FA SQDN	5 sec	10 sec
FA SQDN to PLT FDC	5 sec	10 sec

Schoolhouse Standards	
Factors	Times
Smoke Build Time	60 sec

* Estimates based on M795 being fired with minimum charge for ranges. Observer should still request TOF from FDC.

Formulas

MPH x 1.609 = KPH

KPH x 0.278 = m/s

*Each number is rounded to the nearest whole number based on the conversion from KPH.

Step Action Drill

- Determine Tactical Trigger: Maneuver Commander or S3 determines effect on enemy and where it will occur.
- Plot target.
 - Intercept point = Target for Enemy MVMT
 - Intercept point = Tactical Trigger for Friendly MVMT
- Determine EN/FR rate of march with MNVR CDR/S3/S2 or estimate. (Refer to Time Distance Table)
- Determine TOF through TRP/SQDN MTRs or Firing BTRY or estimate. (Refer to TOF Estimates Table)
- Determine transmission time through TRP/SQDN mortars or FA SQDN FDC or estimate. Refine through FA Technical Rehearsal.
- Determine Mission Processing time
- If it is a Smoke Target, determine Smoke build time through TRP/SQDN Mortars or FA SQDN FDC or estimate. (Refer to Schoolhouse Standards)
- Calculate trigger math to determine distance between Intercept Point and Trigger Point.
- Determine trigger w/ Phase Line, Easting/Northing, or TRP. (Draw new phase line if needed)
- Annotate trigger on FSTW (TTLODAC)
- Can the Primary and Alternate observer see the trigger point?

Enemy Movement: MNVR CDR specifies effect and where on a moving enemy formation.

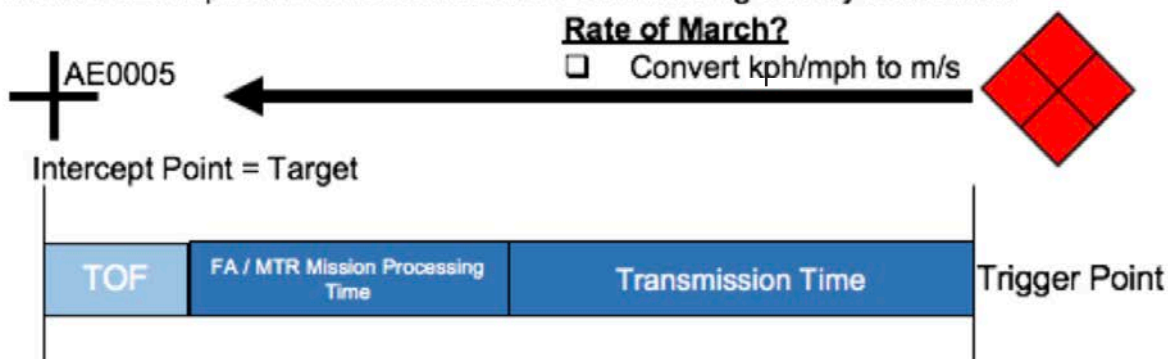
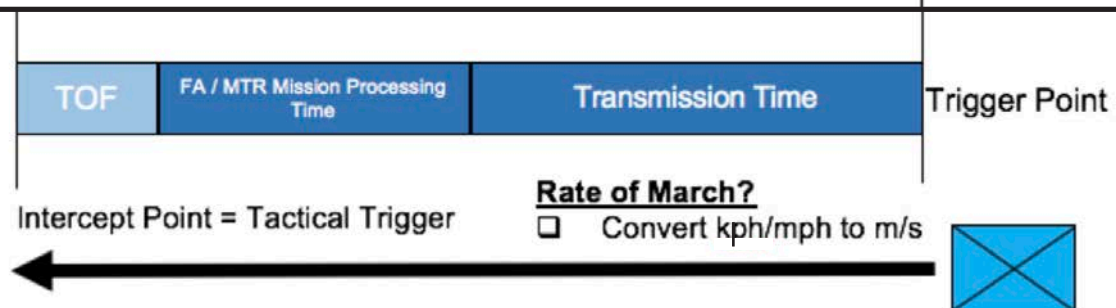


FIGURE 2

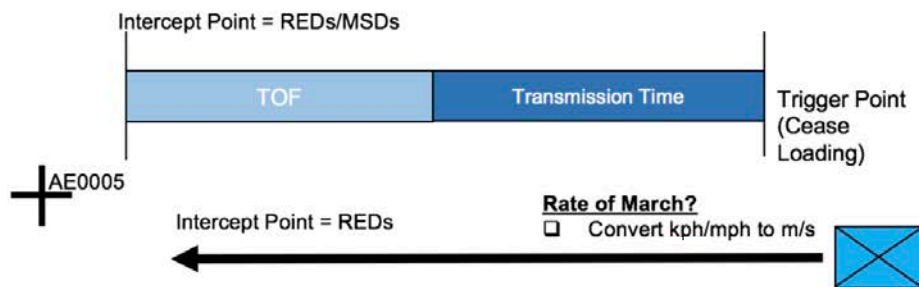


Friendly Movement: MNVR CDR specifies effect on stationary Enemy formation synchronized with Friendly movement/maneuver.

FIGURE 3

FIGURE 4

Technical Trigger for Cease Loading Prior to REDs



Friendly Movement: FSO determines point on ground when Friendly troops are within REDs.

$$\text{Rate of march in m/s} \times (\text{TOF} + \text{FA / MTR Mission Processing Time} + \text{Transmission Time}) = \text{Distance between Intercept point and Trigger Point in meters}$$

Rate of March Conversion				TOF Estimates		FA / MTR Mission Processing Time		
MPH*	KPH	m/s*	Notes	RG from PAA to Target	Times	Firing Unit	HE(D/M)	SMK(D/M)
3	5	1	Dismount Walking	4-5 km	20 sec	Mortar Section	90	90
6	10	3	Dismount Running	6-7 km	25 sec	Mortar Platoon	90	90
9	15	4	Vehicle Maneuver	8-9 km	30 sec	FA Platoon	35 / 45	55 / 75
12	20	6	Vehicle Movement	10-13 km	40 sec	FA Battery	35 / 45	55 / 75
16	25	7		14-16 km	50 sec	FA Squadron	35 / 35	35 / 35
19	30	8		17-18 km	60 sec			
22	35	10						
25	40	11		* Estimates based on M795 being fired with minimum charge for ranges. Observer should still request TOF from FDC.				
28	45	13		Schoolhouse Standards				
31	50	14		Factors	Times			
				Smoke Build Time	60 sec			

Transmission Time		
Echelon	Digital	Voice
Observer to TRP	5 sec	10 sec
TRP to SQDN	5 sec	10 sec
SQDN to REGT	5 sec	10 sec
REGT to FA SQDN	5 sec	10 sec
FA SQDN to PLT FDC	5 sec	10 sec

Formulas
 MPH x 1.609 = KPH
 KPH x 0.278 = m/s
 *Each number is rounded to the nearest whole number based on the conversion from KPH.

Step Action Drill

- Determine REDs for munition used (Refer to JFIRE)
- Determine Friendly rate of march with MNVR CDR / S3 or estimate. (Refer to Rate of March Conversion Table)
- Determine TOF through TRP / SQDN MTRs of Firing BTRY of estimate. (Refer to TOF Estimates Table)
- Determine Transmission time through TRP / SQDN MTRs of FA SQDN FDC of estimate. (Refer to Transmission Time Table)
- Calculate trigger math to determine distance between Intercept Point and Trigger Point.
- Determine trigger with Phase Line, Easting / Northing, or TRP. (Draw new Phase Line of TRP if needed)
- Annotate trigger on FSEM (TTLODAC)
- Can the Primary and Alternate observer see the Trigger Point?

to planning for a moving target is determining where on the ground the Commander wants to effect the enemy.

• Tactical Trigger

For a moving target the Commander needs to articulate where along the enemy’s axis of advance he/she wants to achieve an effect. An example of this is, “I want fires to turn the disruption force into EA Jackson.” Another example is, “I want fires to disrupt the enemy at the 34 easting to cause the enemy to transition from formations that allow rapid movement to maneuver at a slower rate of march.” With this information, the fire support planner can plan a technical trigger.

• Technical Trigger

With this information, the fire support planner can use Figure 1 as a tool to plan out the technical trigger. The formula to determine the trigger point is (Transmission time + Mission Processing Time + Time of Flight) x Rate of March in m/s = Distance. When in doubt on rate of

march always lean toward the fastest. This gives the observer the fires earlier and while still achieving an effect rather than shooting too late and the enemy already bypassed the intercept point. In the example, the fire support planner would calculate the math problem and determine the distance from the 34 easting along the enemy axis of advance to where the trigger point is located. The fire support planner would need to confirm that observers could actually range with sensors to observe the trigger point. If ground observers will not be in range to observe trigger point, the fire support planner must inform the Commander.

Friendly Movement

The second trigger that is common is based on friendly movement. This is often used to time targets in the offense and is crucial for suppression and obscuration targets in support of a combined arms breach and facilitating the infil during seizure of an urban objective.

• Tactical Trigger

There are different techniques to do this. Both require the Commander determining the point on the ground where friendly elements will be when he/she wants the effect to be achieved. For instance the Commander can say “I want suppression and obscuration of the enemy Battle Position (BP) when the breach force comes within direct fire range of the BP.” The Commander could also say “I want suppression and obscuration on enemy BPs to be fired when SBF position is set and once smoke builds and BPs are suppressed, the Breach Force will move forward to reduce the obstacle.” Both can be effective but tempo must be considered in the different techniques.

• Technical Trigger

The FSO/FSNCO would go through the math steps similar to figure 3, but the distance determined is based on the location along the route of march that the Commander wants the effect achieved. With this example it is common to use the effect

build time to factor in time for smoke and suppression to build good effects.

Cease Loading

The third technical trigger commonly planned is a trigger to call cease loading during an echeloning of fires and during a combined arms breach when the assault force is moving through the obstacle belt. The formula for this is (Transmission time + Time of Flight) x Rate of March in m/s = distance between intercept point (REDs/MSDs) and trigger point.

• **Tactical Trigger**

For determining cease loading triggers, it is not necessary for the Commander to articulate the tactical trigger. The Risk Estimate Distances (REDs) or Minimum Safe Distances (MSDs; in training) should be used to determine the intercept point of the friendly movement.

• **Technical Trigger**

The FSO/FSNCO would go through the math steps similar in Figure 4 to determine where the trigger point is for the observer to call “cease loading” over the net. When in doubt, the fire support planner should predict a faster rate of march so fires are end sooner and do not impede tempo or put friendly forces at risk. This calculation should be discussed with the Commander to determine risk to mission/force when considering how close the fires should cease in proximity to movement.

Conclusion

Successful synchronization of Fires at Battalion and Company level requires clear tactical triggers articulated by Commanders and good technical triggers planned by Fire Supporters. These skills will solidify an effective Fires plan where targets are not just concepts drawn on an overlay, but planned with good technical triggers. The ability of Battalion and Company FSO/FSNCOs to incorporate technical triggers into planning can directly affect the accomplishment of Brigade operations.

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MM200708

Joint Fires Observer Training Within A Distributed Mission Operations Environment

By David D. Lindeman

Introduction

The battalion was spread across 5 kilometers along a line that was created by the river in front of them. Alpha company was on the west and Charlie Company was on the east. Bravo was in place in the center and all companies, platoons and individual positions had overlapping fields of fire. The unit had been assigned a Joint Terminal Attack Controller, but the Battalion Commander wanted him inside the TOC with him. Each Company Commander had one radio monitoring the Fires net, and could have artillery support as quickly as a radio call. That is exactly what happened when Alpha Company spotted a large column of T-80 tanks coming down the road. The battery of M777's came alive and 155 mm rounds were soon raining down on the lead elements. Just as quickly, Charlie Company came up on the Fires net requesting artillery support, only to be told Alpha was the priority at this time. Immediately, the 13F2L7 Joint Fires Observer attached to Charlie Company was on the net contacting his supporting JTAC. The young FIST NCO was well qualified for artillery coordination, but had only recently become familiar with Close Air Support communications, and the requirements to employ munitions from airframes. Providing his own position, a grid and elevation to the column of tanks, the pair coordinated a strike from a flight of F-15E Strike Eagles, and within five minutes, had precision guided munitions on the lead elements, turning the eastern most column of T-80's back, and preserving the defensive perimeter tasked to the battalion.

Large Scale Combat Operations (LSCO) will move quickly,

with dynamic targets against offensive, defensive and sustainment operations. Having the resources and knowledge on how to engage threats will be the difference between survival and destruction. Training Joint Fire Observers (JFO), and more importantly sustaining that knowledge, is more important now than ever before. However, in the current environment of doing more with less, how do commanders keep the skills of their people sharp? Using Air Force Distributed Mission Operations (DMO) is one option available to Field Artillery commanders for the completion of multiple annual and semi-annual sustainment tasks (United States Army), keeping readiness in the green.

Background

The JFO course at Fort Sill, Oklahoma is a 2 week course designed to train soldiers how to request, control and adjust surface fires and provide close air support (CAS) targeting information to a Joint Terminal Attack Controller (JTAC) or Forward Airborne Controller (FAC A). The JFO can talk directly to aircraft if authorized by the JTAC for autonomous Terminal Guidance Operations (TGO) as a means to convey visual, voice, mechanical or electronic measures of providing targeting information to pilots (Kenney).

The JFO becomes a second set of eyes for the JTAC, enabling quicker and more accurate fires in the defense of friendly personnel, or enabling offensive options for a commander executing operations within an LSCO. As the United States military transitions out of a Counter Insurgency Operation (COIN) and moves to LSCO, the JFO becomes a valuable asset and force multiplier.

However, once a JFO's training is complete, there must be a plan to sustain that training. This is where Air Force Distributed Mission Operations (DMO) can come into play.

Air Force DMO defined is "an event in which multiple war fighters operating in geographically separated simulators are brought together by a distributed mission network" (Lang). The Air National Guard initiative for DMO is the Distributed Training Operations Center (DTOC) and is located at the Des Moines Air National Guard Base, Des Moines, Iowa. The DTOC is the home of the Air Reserve Component Network (ARCNet) suite of networks. The ARCNet is a Wide Area Network (WAN) set up with encryption and decryption on both ends and using either commercial internet lines, or Defense Information Systems Agency connections. A suite of five different networks handles specific platforms and security classifications. Additionally, there are seven other Air Force and Joint network or cloud based data transfers that connect to the DTOC to provide a broad base of customer support. The DTOC consists of over 70 Active Guard and Reserve (AGR), Military technicians, GS Civilians and contractors, and traditional Guardsmen. These individuals operate the Network Operations Center (NOC) for the ARCNet suite, as well as write and role play scenario based training vignettes designed to meet specific Desired Learning Objectives (DLO's) based on the needs of the customers. Customers include multiple attack, fighter and bomber platforms, both conventional and special purpose, as well as command and control elements and mobility assets of the United States Air Force. For "Ground Op-

erations”, Air Support Operations Squadrons and Air Support Operation Centers are key customers and are the homes of the JTAC’s. The DTOC uses a scheduling system to provide six to eight periods throughout a day for customer units to “buy” to meet their training needs (Purviance, Jamie).

Albert Bandura developed the social cognitive theory, whereby learning occurs through the combination of the experience of the individual, how others act and react to the situation, and the environmental factors within the situation (Bandura). An individual learns through doing, but doing so in specific situations with others acting and reacting to the individuals actions. By observing the environment and other’s reactions to what happens after an action, individual knowledge changes and adapts to develop skills to be used later in similar situations. Learning is processed information originating in the effects of a person’s actions and the outcomes form concepts of appropriate behavior. Scenario based training forms an appropriate medium for this type of learning.

The United States Air Force (USAF) has developed currency guidelines for all of their Air Force Specialty Codes (AFSC). Adapted into the Ready Aircrew Programs (RAP) for each specific platform. Air Force Instruction 13-112V1 (United States Air Force), covers the Ready JTAC Program and outlines annual and semi-annual requirements for currency. These are listed in Table 1.

These requirements include identification of acceptable training via the simulator platform. In the case of the JTAC’s, the platform is the Joint Terminal Control Training and Rehearsal System (JTC TRS). The JTC TRS is an immersive trainer that forms a dome over the JTAC and uses Modern Air Combat Environment (MACE) as an environment generator, and MetaVR© Virtual Reality Scene Generator (VRSG) as an image generator. These provide a realistic, immersive atmosphere for the JTAC to use the same tools that are used in a live environment.

JFO’s have a similar set of re-

AFI 13-112V1 Table A5.1. JTAC 6-Month Minimum Qualification Requirements

Terminal Attack Control	Minimum Required	Condition
Type 1 (Note 5)	1	Live-fly and 1 can be Simulated annually
Type 2 (Note 5)	1	Live-Fly or Simulated
Type 3 (Note 5)	1	Live-Fly or Simulated
BOT	1	Live-Fly Only
BOC (Note 5)	1	Live-Fly or Simulator
FW CAS Aircraft (Note 5)	2	Live-fly and 1 can be Simulated per 6 Months
RW CAS Aircraft (Note 5)	1	Live-Fly or Simulator
Laser control (Note 4, 5)	1	Live-fly and 1 can be Simulated annually
IR Pointer (Note 3,5)	1	Live-Fly and 1 can be Simulated annually
Remote Observe (Note 5)	1	Live-Fly or Simulator
Video Downlink (VDL) (Note 5)	1	Live-Fly or Simulator
Live (Note 1)	1	Live-Fly Only
9-Line Attack Brief (Note 2)	1	Live-Fly Only
Day	1	Live-Fly Only
Night (Note 5)	1	Live-fly and 1 can be Simulated annually

1. Live Munitions include: Forward firing gun, rockets, bombs (including inert/practice) or missiles.
2. Must use a complete nine line attack brief; IP-to-Target attack (Lines 1-3) may not be abbreviated, not applicable (N/A) or from the overhead
3. IR pointer shall be utilized to mark a target for a NVG equipped aircrew. The intent is to demonstrate correct use of IR equipment and IR terminology
4. Laser shall be utilized to mark/designate a target for any FW aircraft (laser spot tracker recommended). The intent is to demonstrate correct use of laser equipment and laser terminology.
5. Only JFS ESC accredited dome simulators may be used.

Table 1 – Ready JTAC Program Requirements

AIR-TO-SURFACE FIRES EVENTS

EVENTS	FREQUENCY REQUIRED
1 x with a qualified JTAC/FAC(A) or PTAC	ANNUALY
1 x with JFO passing targeting data directly to aircraft as authorized by JTAC/FAC(A) or supervising JFO-I/E	SEMI-ANNUALY
1 x targeting data for BOC MOA	SEMI-ANNUALY
1 x (maximum of 2 events) JFO conducting CAS w/o a JTAC IAW JP 3-09.3	SEMI-ANNUALY
1 x LTD integration for target acquisition or weapons guidance	SEMI-ANNUALY
1 x Night Target Marking w/ IR Pointer	SEMI-ANNUALY
1 X GRG Event in an Urban Environment	SEMI-ANNUALY

NOTE 1: Events may contain multiple sub-tasks

NOTE 2: A maximum of two AA/SOF CFF events may replace two events for this requirement

NOTE 3: Simulated LTDs must accurately replicate a Signatories’ fielded LTD in emulation or form / fit / function

NOTE 4: Emulation may only be utilized if the unit does not have an operating SME LTD meeting form / fit / function

Table 2 JFO Currency Requirements

quirements, as identified in Training Circular (TC) 3-09.8, and shown in Table 2.

PROCESS

The 1st Battalion 194th Field Artillery (1-194 FA), Iowa Army National Guard (IA ARNG), contacted the DTOC about the ability to assist in training their JFO's, focusing on JFO sustainment and currency requirements, individual preparation for attendance at the JFO Course, and the practicality of conducting training locally.

JFO's need to have a JTAC or FAC (A) for their training, as they can only provide targeting data to the aircraft and JTAC, but the JTAC/FAC (A) is the member of the kill chain that can authorize ordnance release on a target. For this reason, anytime JFOs need currency, sustainment or preparation for attending the JFO course, they need to coordinate with a supporting ASOS. In the case of the 194th, the supporting ASOS and range was the 284th ASOS out of Salina, Kansas, where Smokey Hill Air National Guard Range is located. The unit has to coordinate multiple members traveling over 400 miles one-way and expend multiple days per diem at around \$330 per traveler.

Typically, the unit will send five to eight individuals to Kansas for a 4-5 day training period, elevating the total cost to \$1,647 - \$2,636. This also does not take into account the cost and coordination for live aircraft (over \$7,700 per hour for single A-10) to support the training, which could be delayed or cancelled due to weather.

When possible, it is desirable to maintain the alignment relationship between JFO's and ASOC's. This would require all ASOS to be fully connected and operating in the Distributed arena. At this time, the 284th does not have an active connection to the ARCNet due to simulator authorization on the network. Therefore, the 14th ASOS out of Fort Bragg, North Carolina, a frequent DTOC participant, agreed to assist in the trial.

The DTOC uses the same MACE and VRSG platforms as the JTC TRS, but on desktop computers. Cre-

ation of a joystick configuration for MACE allowed the JFO to "attach" to a MACE US Soldier entity, look, and move around the virtual battle space. This allowed the JFO to be in a separate Event Control Center (ECC - the naming configuration the DTOC uses for the rooms that run the scenario) from the white force during execution of training without an inside peek at the scenario. Rules regarding movement around the constructive battlefield will have to be established. As of now, there are no controls to keep the JFO into or out of a specific space.

A week prior to execution of training, we tested with the 14th ASOS and the DTOC training configuration (2 ECC's and MACE Pilot Workstations). This established a set of best practices for moving forward.

EXECUTION

The DTOC and 14th ASOS identified four scenarios for use with JFOs. During the week, the conduct of an additional scenario, due to scenario variety and DTOC resource availability, was added. The scenarios were:

Stormfront II - LSCO involving 2 battle spaces in an armor on armor event in the Korean Peninsula.

Stormfront III - LSCO involving 3 battle spaces in an armor on armor event in the Korean Peninsula.

Shabow Khyel Shura - COIN meeting with elders to discuss establishment of COP within the region.

Table 3:

	Time (CST)	Scenario
8-Dec	07:45 - 08:45	Stormfront II
	10:45 - 11:45	Stormfront II
9-Dec	9:15 - 10:15	Ajo Air Assault
	10:45 - 11:45	Ajo Mountain Patrol
	12:45 - 14:00	Stormfront II
10-Dec	9:15 - 10:15	Stormfront II
	10:45 - 11:45	Stormfront II
	12:45 - 14:00	Stormfront III
11-Dec	07:15 - 08:30	Shabow Khyel Shura
	10:45 - 11:45	Shabow Khyel Shura

Ajo Air Assault - COIN involving an air assault into a terrorist training camp with split US forces.

Ajo Mountain Patrol - COIN foot patrol to find smuggling routes by threat insurgents (add on).

Training was conducted at the following times and utilizing the scenarios in Table 3.

Three JFO's participated in the trial. All three were current in their requirements, receiving the training to maintain currency. The breakdown is as follows:

	Years Service	Years MOS Qualified	Years JFO Qualified	Last Worked with JTAC
JFO 1	17	16	10	2018
JFO 2	8	3	1.5	2018
JFO 3	12	12	7	2019

Expectations by the JFOs were the ability to do Close Air Support with and without a JTAC in the loop, and to establish a working relationship with the DTOC and the 14th ASOS JTACs.

During each of the events, the JFOs worked as a team. All three had access to computer systems that allowed them to see the battlefield. MACE was configured as a Blue Force Tracker, showing only known locations of friendly forces. Each scenario incorporated the following from TC 3-09.8:

CAS event with a qualified JTAC JFO passing targeting data directly to aircraft as authorized by JTAC/FAC (A)

Conduct of CAS w/o JTAC

The scenario Shabow Khyel Shura, includes use of a Gridded Reference Graphic (GRG).

Nine JTAC's participated with one JTAC /I acting as a source for continuity.

	Years Service	Years MOS Qualified	Years JTAC Qualified	Last Worked with JFO
JTAC 1	3	2	1	2020
JTAC 2	3	2	1.5	2020
JTAC 3	14	12	6	UNK
JTAC 4	3	2	1	2020
JTAC 5	3	2	1	2020
JTAC 6	3	2	1	NEVER
JTAC 7	5	2	.25	NEVER
JTAC 8	3	.25	.5	NEVER
JTAC/I	16	13	13	2020

The JTAC's have a range of three to sixteen years of service, for an average of a little under 6 years of service. Their qualification range is from one to thirteen years and averaging just over four years as qualified. Half of them have worked with a JFO before, but have not employed CAS in a combat situation with a JFO.

Three main expectations came out of pre execution interviews:

1. How to work with and integrate JFO's into CAS situations
2. Learning what TTP's JFOs use
3. Other personal improvement goals for their own professional development

RESULTS

The results of the initial run were positive for all parties involved. The JFO's received training at a decreased cost to the unit and as indicated by their survey responses, was of a quality they had not fully anticipated.

Quantifiably, the results are significant in showing the value of the training to the participants. It shows the training scenarios are complex yet relatable and realistic in setting. With the exception of Audio Clues and to a lesser extent the Visual Clues, all mean rankings are above the median range. The issue with these clues is the setting that the JFO's participated in within the DTOC. The Event Coordination Centers are not designed to substitute as any kind of a simulation center so the audio cues are stimulated by the white force and not a part of the interactions by the JFO's. The JTC TRS DT-100 in a separate setting would provide the additional audio stimuli to help mitigate that issue.

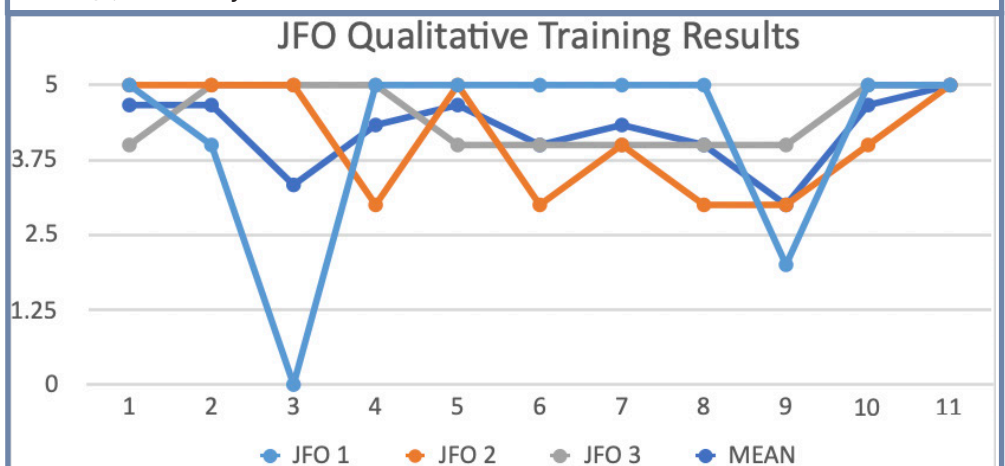
The JTAC's being geographically removed from the DTOC made it difficult to gather a full complement of detailed data like we did with the JFO's. However, the lead liaison from the 14th ASOS has provided a general overview captured from the participants.

From the JTAC view, the training shows a comparative decrease on the quantifiable scale by 15 points. Viewing it strictly in this mode, it shows a possible distraction to the training of the JTAC's.

	JFO 1	JFO 2	JFO 3	Total	MEAN
Was the length (time) of the scenario adequate for the training exercise	5	5	4	14	4.67
Was the scenario realistic enough for you to feel immersed in the exercise	4	5	5	14	4.67
Was the scenario complex enough to challenge you	0	5	5	10	3.33
Were the terrain, landscape and buildings realistic enough not to cause distraction to training	5	3	5	13	4.33
Were audio cues distinct enough to replicate patterns of life	5	5	4	14	4.67
Were the visual cues distinct enough to replicate patterns of life	5	3	4	12	4.00
Were the visual clues distinct enough to discriminate non-combatants	5	4	4	13	4.33
Were the visual clues distinct enough to identify key individuals	5	3	4	12	4.00
Were the audio cues distinct enough to identify location of enemy forces	2	3	4	9	3.00
Were the visual cues distinct enough to identify the location of enemy forces	5	4	5	14	4.67
Was the opposing force ration sufficient to evaluate the unit?	5	5	5	15	5.00
	46	45	49	140	46.67

1 = Not at all adequate, 2 = Generally NOT adequate, 3 = Neither adequate nor inadequate, 4 = Generally Adequate, 5 = Very Adequate

Table 5 JFO Survey



	JTAC Consolidated
Was the length (time) of the scenario adequate for the training exercise	4
Was the scenario realistic enough for you to feel immersed in the exercise	5
Was the scenario complex enough to challenge you	4
Were the terrain, landscape and buildings realistic enough not to cause distraction to training	5
Were audio cues distinct enough to replicate patterns of life	5
Were the visual cues distinct enough to replicate patterns of life	3
Were the visual clues distinct enough to discriminate non-combatants	NA
Were the visual clues distinct enough to identify key individuals	NA
Were the audio cues distinct enough to identify location of enemy forces	3
Were the visual cues distinct enough to identify the location of enemy forces	3
Was the opposing force ration sufficient to evaluate the unit?	4
	31
JTAC Consolidated review	



The ability to gather better data from the JTACs may show a difference in this, and therefore, this data is skewed, and I am unable to show if there is a significant result. When looking at the comments, and applying an additional qualitative analysis, the view is different.

There were several after action comments regarding how to conduct the scenarios, focusing on better planning and execution along with white force actions. These included how to operate in a JTAC and JFO event, teaming of JTAC's and JFO's for familiarity, and monitoring and mentoring when either a JTAC or JFO is overcome by events and pausing the scenario to show case teaching points and provide instruction.

Sustainment comments identify the value of this training for the JTAC's.

"The simulator integration with the JFO's and Pilots overall has been a success. Good comms across the board and all entities on the screen seemed to match up. Having actual pilots tied in to the simulator is beneficial over having a "simulated" pilot because it adds a sense of realism."

"This was a great initial go for this kind of JFO/JTAC integration and can't wait to see how much this will evolve."

Follow on telephone conversations were also positive in nature and both the JTAC's and JFO's have expressed a desire to continue and

improve the training.

RECOMMENDATIONS

The common theme among participants is that this was good training for all involved. The JTAC's had an opportunity to work with Army JFO's and vice versa. The model of the DTOC includes individual subject matter experts that have been qualified, and in some cases still current, with the platforms they replicate in the virtual world. Because of this, the training audience gets a chance to work with, hear, and respond to inputs from experienced individuals. The feel of the events is a training feel, but with stimuli from live role players that react and respond as they would in a live situation. Both training audiences responded with appreciation at the setting they were in, and recommend continuing this type of training.

An area found lacking was the planning time involved. Pre-mission briefs and coordination between the JFO and JTAC, as would be conducted at a Brigade or Battalion Headquarters prior to mission execution, was not conducted until minutes before event execution,

and then quickly to not interfere with the event. Moving forward, the JTAC and JFO need to conduct, well in advance, coordination with "ground commander" and staff. The 14th ASOS has included pre mission calls to the DTOC to gain a lot of the information they will need for conduct of the event. These calls typically occur a day in advance of execution, but with this type of event, it is recommended a longer time between coordination and execution. Personnel training will need to build out their personal products and possibly share with other participants. Once this training coordination is completed, establishment of clearly stated arrival, start and end times will aid in management of participant expectations. This will also provide time for identification of specific Techniques, Tactics and Procedures for use during execution. The DTOC model is to enter an event and conduct last minute coordination between players, run the scenario, and finally, to have an informal after action review to discuss what just happened. Having the same JTAC and JFO on multiple events will allow immediate

"The simulator integration with the JFO's and Pilots overall has been a success. Good comms across the board and all entities on the screen seemed to match up. Having actual pilots tied in to the simulator is beneficial over having a "simulated" pilot because it adds a sense of realism."

"This was a great initial go for this kind of JFO/JTAC integration and can't wait to see how much this will evolve."

implementation of lessons learned. JTAC's and JFO's will be able to work together again and have continuity of learning. The recommendation comes from the JTACs, reinforced by the JFOs and White Force that individuals training have the opportunity to do back-to-back events, which would allow for implementation of lessons learned.

The current training of the Tactical Air Control Party (TACP) Team of JTAC, JFO and Aircraft is to operate in a COIN environment. However, that is changing to add emphasis to a LSCO. With scenarios set in both situations, it is easy to make comparisons of TTP's. The reality is the individuals training most likely do not know TTP's used in LSCO. Bringing in Multi Domain Operations (MDO) will add a new element that will most likely become the driving factor for LSCO planning and operation. That planning will be for future missions and operations that are in line with US doctrine and National Security policy.

SUMMARY

The ability for all players to speak to each other in training, JTAC to JFO and both to an actual pilot creates an environment that is ripe for learning. The first time you hear a check in from a pilot, it can be a bit overwhelming if you do not know what to expect. One reaction over heard in the past is "I didn't understand a word of that check in so I just went with a B-1".

Conversations post scenario run included how much the JFO had learned and how much the JFO still had to learn when conducting operations with a JTAC. Similar comments from the JTAC community were voiced, and both communities identified the value of having a pilot as opposed to someone that role-plays a pilot.

From a white force standpoint, there was also a lot to learn, as we have been used to driving scenarios towards specific learning objectives through verbal injections. Set up and execution will be different from what we have experienced and will need to adapt.

There are developments in the ability to connect the 194th FA to the ARCNet for the purposes of training. The DTOC and 194th FA are both Iowa National Guard assets and this lends itself to some more opportunities regarding establishing a distributed site away from the DTOC and with a system, such as the JTC TRS DT-100, that is better designed to facilitate training. We are also in discussions with the 194th FA to provide a DMO Subject Matter Expert that can assist in the planning and execution of the training and act as a key point of contact for the JTAC's.

The 194th Field Artillery approached us about conducting training and the DTOC was able to provide it with the help from the 14th ASOS. All sides agree that there will be a lot of trial and error before we get it right, but we have shown that it is possible. We are already planning follow on training opportunities for the spring of 2021 and beyond. While the methods of op-


eration will continue to evolve, we have shown it is possible to conduct this training with significant results and aid in better understanding of the roles each of the warfighters conduct and embrace to survive a complicated modern battlefield.

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References

- Bandura, Albert. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Upper Saddle River, New Jersey: Prentice Hall, 1986.
- Kenney, Caitlin. www.army.mil/article/88014/joint_fire_observers_make_battlefield_impact. 27 September 2012. <https://www.army.mil/article/88014/joint_fires_observers_make_battlefield_impact>.
- Lang, Major Nichole M. *Distributed Mission Operations: Training Today's Warfighters For Tomorrow's Conflicts*. Maxwell Air Force Base, Alabama: United States Air Force, 2016.
- Purviance, Jamie. "Air National Guard Distributed Training Center, Des Moines, IA." Des Moines, 22 September 2015.
- Tirpak, John A. www.airforcemag.com/article/0405mission. 1 April 2005. <<https://www.airforcemag.com/article/0405mission/>>.
- United States Air Force. "Joint Terminal Attack Controller (JTAC) Training Program." Washington: United States Air Force, 29 September 2017.
- United States Army. "Fire Support and Field Artillery Certification and Qualification." Washington: United States Army Publishing Directorate, 30 March 2020.



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THE RED RUSE

A Look at Near Peer Deception Tactics for a Large-Scale Combat Operation (LSCO) Fight.

By CPT Mark Chapman

This article seeks to provide a brief qualitative analysis of some of the deception tactics employed by our potential adversaries and propose a solution for countering them. All of the evidence used in this article is open-source, meaning that the Russians and the Chinese are no longer (if they were ever) hiding these methods for tactical deception.

As early as 2010, the Russian Military unveiled a series of inflatable military vehicles that many outside the Kremlin found laughable. Western media sources touted these inflatables as negligent spending as Vladimir Putin poured billions of rubles into rebuilding his military. Nearly four years later, the Russians launched an incursion into the Crimea and since have launched a formidable array of forces into Syria. And at the forefront of both these incursions have been the use of the Russian tactic of Maskirovka. Maskirovka, or masking, is the Russian form of deception widely used at both the tactical and strategic levels. At the strategic level, Maskirovka can be as complex as a military exercise in the Baltic Sea that draws worldwide press releases. While at the same time, large quantities of weapons are quietly shipped to a dictator in Latin America. Conversely, tactical Maskirovka can be as simple as a map with incorrect graphics that is left to “fall in enemy hands” and sow confusion. The New York Times gave the following insight “The idea behind maskoveria is to keep the enemy guessing, never admitting your true intentions, always denying your activities and using all means political and military to maintain an edge of surprise for your soldiers.” (Kramer, 2016)

An integral part of Putin’s plan to rebuild the military is a revitalization of deception tactics. As part of this plan, the Kremlin has contracted Rusbal, a toy company, to begin making an extensive array of

inflatable military vehicles. From MiG 31 fighter jets and T-80 main battle tanks to radar stations and Surface to Air batteries, the toy company makes 1:1 scale inflatable look-alike copies of its most important vehicles and systems.

At the price of roughly \$496,000 and with a setup time of only about two hours, the Russians can emplace a battalion of tanks at a strategic location, such as over watching an obstacle belt, a critical intersection, or on an enemy’s flank. (Mizokami, 2016) This battalion-sized element positioned at a crucial juncture is meant to propagate confusion and chaos by clogging the enemy’s decision making progress by forcing them to react to a new threat while causing the intelligence section to respond to additional information. Thus from the platoon level where a lieutenant is reporting the tanks, to the Brigade level where the staff is trying to react to and decide what, if any, assets can be diverted to deal with the threat, the plans process and the operational tempo is slowed if not ground to a complete halt. This gives the Russians a window of opportunity to react to or counteract their enemy’s plan. Done at a critical location such as a piece of terrain or an obstacle belt, even a company-sized armored formation (especially in a light IBCT fight) could cause the enemy to alter their entire plan.

Furthermore, many of these same vehicles and systems are also found on a Brigade or Division Commander’s High Payoff Target List (HPTL). The HPTL is a ranked order of systems and or vehicles whose destruction the commander has deemed necessary for him to accomplish their mission. Inflatable versions of weapon systems such as the S-300 surface-to-air missile battery, the Tochka, Short-range tactical ballistic missile system, and even radars are being deployed by the Russians. These are the same systems that commanders at the

tactical level rank as the most important to destroy: radar, air defense, and armor. At the tactical level, the Kremlin uses maskoveria to clog their enemy’s information collection systems and divert the use of precious resources like fixed-wing air assets or rocket and cannon artillery to destroy a threat only to find that they were deceived. Worse, tactical Maskirovka diverts critical assets and exposes them to counter fire, bringing critical enemy assets out of the fight. An example of how a threat like this can be convincing can be seen in Syria. In 2017, As US and Iraqi forces continued to drive ISIS West back into Syria. The Russians mobilized as well, deploying forces to the region to back President Bashar al-Assad. One of the key weapon systems that was deployed was the newest version of the S-300. The S-300 is a long-range surface to air missile system designed to intercept both fixed-wing aircraft and ballistic missiles. Because of this potential threat, the United States quickly curtailed its use of critical airpower in specific locations over the Syrian border. Were all, if any, of the S-300s real? Or were they inflatable versions of the weapon system, produced by Rusbal, meant to deter American intervention in the region? We may never know, but the introduction of that threat, real or perceived, was enough to divert important air assets from the area.

Conversely, on the strategic scale, in an age dominated by instantiable access to information via social media, merely having the appearance of a few battalion-sized elements of tanks along an international boundary can have global implications. Facebook, Twitter, and a myriad of other outlets can relay information in real-time, spreading chaos and fear in civilian and military circles. And while the media propagates the story, the Kremlin is quietly and methodically maneuvering, in the



Inflatable tanks like the examples above are being developed by the Russian military as part of an elaborate deception tactic known as Maskirovka. Source: UK Daily Mail

shadows, to reach its real objectives. Thus, the appearance of a few battalions of Rusbal's inflatable vehicles have the legitimate possibility of shifting entire national strategies and playing right into Putin's hand.

Likewise, the Chinese have followed a very similar suit with their deception tactics. Citing Sun Tzu, who said, "All warfare is based upon deception. Therefore, when capable, feign incapacity; when active inactivity. When near, make it appear that you are far away; when far away, that you are to lure him; feign disorder and strike him. When he concentrates, prepare against him. Anger his general and confuse him. Pretend inferiority and encourage his arrogance." (Tzu) To enable these tenants of warfare on the modern battlefield, the People's Liberation Army (PLA) is incorporating deception tactics into their large scale combat strategy.

In keeping with President Xi's vision of turning China into a world-class fighting force by 2030, one that can compete with Western armies, the Chinese military is actively seeking ways to bridge the gap. They are doing this, in part, by flooding the battlefield with specific decoys that are designed to mimic targets on the HPTL, much like the Russians. However, unlike the Russians, the Chinese will seek to have a 1 to 1 ratio of fake formations to real ones, effectively making their own force seem twice as large. (Jensen, 2020) This should be alarming decoys that are to western military leaders because these tactics will spread fear and chaos through our formations. All the while, the PLA

will be masking their true intentions and capabilities behind a well-constructed wall of deception.

Like their Russian counterparts, these decoys will mimic the real vehicles. They will also be camouflaged and concealed under radar scattering nets. However, the Chinese go further still, adding another layer to the ruse by providing soldiers to operate them and maintain security in fighting positions around them as if they were a real fighting formation. Furthermore, to confuse adversaries, some of these decoys have been built to give off a heat signature by pumping hot water through them (Jensen, 2020). Thus, even with thermal optics, adversaries may not be able to differentiate between a real threat and a decoy.

Furthermore, the PLA has also begun incorporating solid metal decoys that "maintain nearly the exact shape of the impersonated vehicle." (Jensen, 2020) The PLA boasts the reality of their decoys, which they claim are "difficult to distinguish from real equipment from a distance of 100 meters." (Jensen, 2020) This tactic's intent is clear; by placing large numbers of decoys on the battlefield, the Chinese seek to impede the enemy's decision-making process and sow confusion at the tactical level. Capitalizing on the disorder, The PLA will employ tenants of Sun Tzu's military treatise.

Yet, another aspect of these deceptive tactics ought to be particularly concerning to the Fires community. As Ph.D. candidate Aaron Jensen notes in his article Deception is key

to Military Strategies: "used effectively, decoys can draw enemy surveillance and attacks from high-value targets and deceive the enemy about the number and location of friendly weapons, troops, and equipment. Decoys can also increase friendly firepower by making it easier to locate and target enemy forces once they have revealed their position by attacking the decoy." (Jensen, 2020) Placing large formations of decoys at critical junctures or that match key, specific targets on the maneuver commander's HPTL, both the PLA and the Russians seek to trick their enemy into committing their artillery to the fight. If they can cause their enemy to commit their artillery to the fight early and expose their locations, it makes them very susceptible to counter fire. The destruction of artillery by the PLA or the Russians would prove devastating to their adversary as it negates a powerful combat multiplier. However, equally important, the destruction of the enemy indirect fire weapon system also allows the PLA or Russians indirect fires without fear of counter fire.

Thus far, this piece has examined a series of short articles that must be not be viewed as independent, instead of as a chain of linked items as if they were puzzle pieces. Combined, these puzzle pieces form a grim picture of an adversarial capability that is very, very real. It is a threat that must be taken seriously. To prepare ourselves for a confrontation where we will face deceptive tactics, we must actively train against it. In addition to training

against it at the Combat Training Centers (CTCs) like the Joint Military Readiness Center or the National Training Center, we must revitalize the Long-range Reconnaissance and Surveillance (LRS) teams and actively collect intelligence on the enemy at those critical junctures or extended periods of time.

There persists an attitude within the military that we will simply come across these decoys parked in a field somewhere or catch the PLA in the act of inflating them and merely bypass them. However, our days of fighting amateurs with outdated equipment are over. Both the PLA and the Russian military are commanded by professionals who are as good, if not better than, we are. Adversarial commanders will implement their decoys with additional assets designed to layer the deception and add credibility to the ruse. To complete their deception, the PLA and Russia will dedicate engineer assets to build defensive positions for their inflatable tanks, provide crews and nets for their inflatable radar systems, and possibly move their decoys as they would

their real systems around the battlefield.

In order to build familiarization with these tactics and the stress that they will induce on fighting formations in the field, the United States Military and its allies must actively incorporate them into their collective training. This should be done at all Battalion and Brigade level training events where there is an element is playing the role of a near peer opposing force. At the very least, the opposing forces at the CTCs should employ inflatable or hardened decoys to sow confusion and stress intelligence assets.

Having the ability for Company and Battalion Commanders to train against these deceptive tactics, build familiarization, and conduct After Action Reviews (AARs) as part of collective training will pay dividends when they fight against an adversary that employs deceptive tactics. It is not enough to simply annotate the use of decoys or the units which target them either. Both Commanders and the Observer Coach Trainers (OCT) at the CTCs must capture and share the lessons learned. By developing and pub-

lishing a set of best practices and tactics techniques and procedures, commanders and the OCTs can better teach the force and prepare it for a Large Scale fight where the enemy will use deceptive measures.

The other way that the United States Military must actively combat these tactics is to bring back the LRS concept for its Brigade and Division level fighting forces. In a peer fight, the United States and its allies must have a dedicated, long-range reconnaissance asset capable of collecting intelligence on specific named areas of interest (NAIs) for extended periods. In an environment where airspace and the electromagnetic spectrum will be contested, we cannot rely on the assets we have become used to in the counter-insurgency environment. Instead, we must deploy Soldiers forward of the forward line of troops (FLOT) to gain valuable data. When trained and equipped correctly, these troops can overwatch areas and ascertain whether or not formations of tanks are real or inflatable, if radar assets are cueing or not, and if Surface to Air threats are real or perceived. These LRS teams

Workers inflate a model of a Russian S-300 long range surface-to-air missile system at the compound of the RusBal balloon manufacturer outside Moscow. The small firm produces infrared and radar reflective inflatable dummy targets in 1:1 ratio that are designed for the Russian military and the international defence market. Source: UK Daily Mail



must be comfortable pushing out into contested areas and staying out there for up to 96 hours to accurately ascertain where the enemy formations are and what they are doing.

Until the need for LRS is realized, Reconnaissance Squadrons at the Brigade level must actively train their Troopers and attached fire supporters to be sensors. This is particularly true of the dismounted reconnaissance troops (DRT), which currently fill this critical gap as an intelligence collection asset for the Brigade combat team.

Unmanned Aerial Assets (UAS) cannot fill this gap alone with limited loiter time and an even smaller scope of view. We must have a dedicated human sensor on the ground, forward of the FLOT, to watch and report. Until there is a Division or Corps level force whose mission is reconnaissance with a dedicated targeting cell, the responsibility must rest upon the Cavalry Squadron. The Squadron Fire supporters must internalize this threat and must take the time to educate their reconnaissance brethren on Russian and PLA deception tactics.

It is not enough to realize this threat; it is incredibly imperative to actively train our forward observers and the Brigade's Reconnaissance Squadron against this threat. If we fail to do so, we risk losing our artillery to counter fire early in the fight, leaving the brigade without its most significant organic combat multiplier. Or, at the very least, we risk shooting the wrong target, wasting critical ammunition. At the same time, the real threat moves unhindered around the battlefield.

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Another Russian firm, Rusbal, created this dummy of a truck, designed to look like the real thing from the air Source: Rusdecoy.com



In conflicts of the future inflatable vehicles like the one above will be arrayed in defensive positions, under camouflage nets, and posted forward in critical points on the battlefield with the intent to disrupt the enemy's tempo. Source: Rusdecoy.com

Field Artillery Cannon Battalion Combat Configured Loads

A sustainment perspective and best practices from JRTC

By CPT Russell Vickers



Combat configured loads (CCL) can create a dramatically more linear sustainment effort of Class V for a Field Artillery (FA) cannon battalion. A CCL is a pre-designated allotment of ammunition that can be built and delivered by sustainment assets on a sustainment platform such as a container roll-on/off-platform (CROP). A CCL eliminates the need to list individual amounts of ammunition by replacing the extensive lists with a single name or identification for a set. By flattening the logistical request process it alleviates confusion created between the gun line needs versus supply chain capabilities. This flattening allows for earlier and more accurate feedback on what is available to supply a battery before a designated operation or fire mission. The accurate feedback and logistical readiness grants tactical commanders the ability to make decisions based on facts concerning ammunition availability rather than assumptions. The key to this benefit is creating the correct CCL for your organization.

One of the most frequent, and most avoidable, complications in the request and distribution of FA ammunition is the language barrier between fire supporters and logisticians in regards to Class V. The breakdown in understanding can come as easily as confusing the Department of Defense Identification Code (DODIC) which is used by logisticians for accountability and nomenclature which is used by fire supporters. A CCL must delineate the exact ammunition desired. A clear, shared understanding of what munitions are intended for each CCL must be provided to each echelon of support from the battery and forward support company (FSC) commanders, to the battalion S4, brigade support battalion (BSB) support operations officer (SPO) and supporting combat service support battalion (CSSB). By clearly establishing each CCL, a brigade combat team (BCT) can effectively leverage its resources and capabilities to succinctly move artillery munitions around the battlefield. This process begins with the CSSB moving

ammunition from the division support area (DSA) forward to the brigade support area (BSA). This laborious process can be shortened significantly with already built configured loads and by clearly defined anticipated configured loads. It will also prevent the prevalent receipt of incorrect munitions or munitions in quantities other than what was desired. Both mishaps can lead to the inability of a battery to conduct specified fire missions. Beyond the enigmatic language barriers during an operation a CCL must be designed to support both the FA battalion while remaining within the limitations of sustainment.

An effective CCL immediately invokes three of the eight principles of sustainment: simplicity, responsiveness and economy. Responsiveness begins with limiting alterations to designated CCLs. Whether a cannon battalion decides to create only a few, broad CCLs or a score of highly detailed CCLs, the configuration must be understood by all units involved. This starts with the aforementioned language disambiguation and continues to include committing to those designations to maintain responsiveness. The expectation of a battery or a cannon battalion to alter the predetermined configurations and force the slower moving sustainment warfighting function to alter its configuration eliminates responsiveness and is not sustainable in large scale combat operations. To prevent these alterations, a significant amount of planning and decision making must be made by a combination of the staff, primarily the fire direction officer (FDO), S4, and commanders within a cannon battalion. By understanding and planning for the fight and following pre-determined standard operating procedures (SOP) generated within the battalion, a commander can commit to the CCLs already established. This will ensure that responsiveness can be maintained with the desired ammunition. This planning must include the sustainment warfighting function to ensure the desired results from the chosen munitions. Part of the planning must involve

the haul capacity and capabilities of the FSC among many other considerations of the sustainment warfighting function to include compatibility, weight limits, convoy size and a myriad of other limiting factors. The limiting factors for the movement of ammunition must also include the capabilities at the battery level to move the received ammunition. To ensure requested CCLs are manageable for the battery, the battery commanders need to also be involved with the planning of the CCLs. It is the battery commanders who will ultimately use the ammunition supplied by the sustainment unit and therefore must be ready to receive, store, move and use that ammunition. Without key input from the battery commanders they will be unable to design the fight to meet the expected enemy strategy. These capabilities will drive what can be requested for an individual, or multiple, CCLs and revolves around the economic principle of sustainment.

As it relates to sustainment, economy is likely the primary outcome that a unit is striving to achieve when using CCLs. The economy of sustainment is the ability to provide the prioritized resources in an efficient manner to the greatest effect possible. The configuration of CCLs must help limit wasted movements, space and time. A proper CCL will help achieve these things as long as the unit adheres to three important planning considerations. These three considerations are ammunition compatibility requirements, weight restrictions, and perhaps most importantly, maximizing available CROP space. When space is maximized it prevents unnecessary movements which decreases time on the road and allows for smaller convoy sizes for the supporting logistical units. These limitation factors must be present in planning not only at the FA battalion level but also taking into consideration the capabilities and availability of BSB and CSSB assets. The availability of these assets can vary greatly depending on the priority of support and priority of the commodity established by the brigade and the

BSB. As the shape of the battle-field continues to grow increasingly complex, a driving force for successful operations, including the use of CCL, is the simplicity of its use.

Creating a shared understanding from the FA cannon battalion concerning the use of CCLs is the first step to ensure the use of CCLs is simplified to a reasonable extent. The relay of information concerning what exactly constitutes a CCL, how and when they will be used, and ensuring the information for the timelines of their use is vital to this step. In a protracted conflict no unit will ever have the time needed to build a sufficient quantity of CCLs before their push into the area of operation. This means the reliance for their construction will be placed on non-fires warfighting function personnel, namely sustainment personnel working in the DSA or the theater ammunition transfer and holding point. Simplistic CCLs need to be clearly explained and understood by these sustainers to be effective. CCLs have seen an increasing emphasis at the

Joint Readiness Training Center (JRTC) and their utilization creates a positive impact on the BCT in regards to artillery ammunition availability.

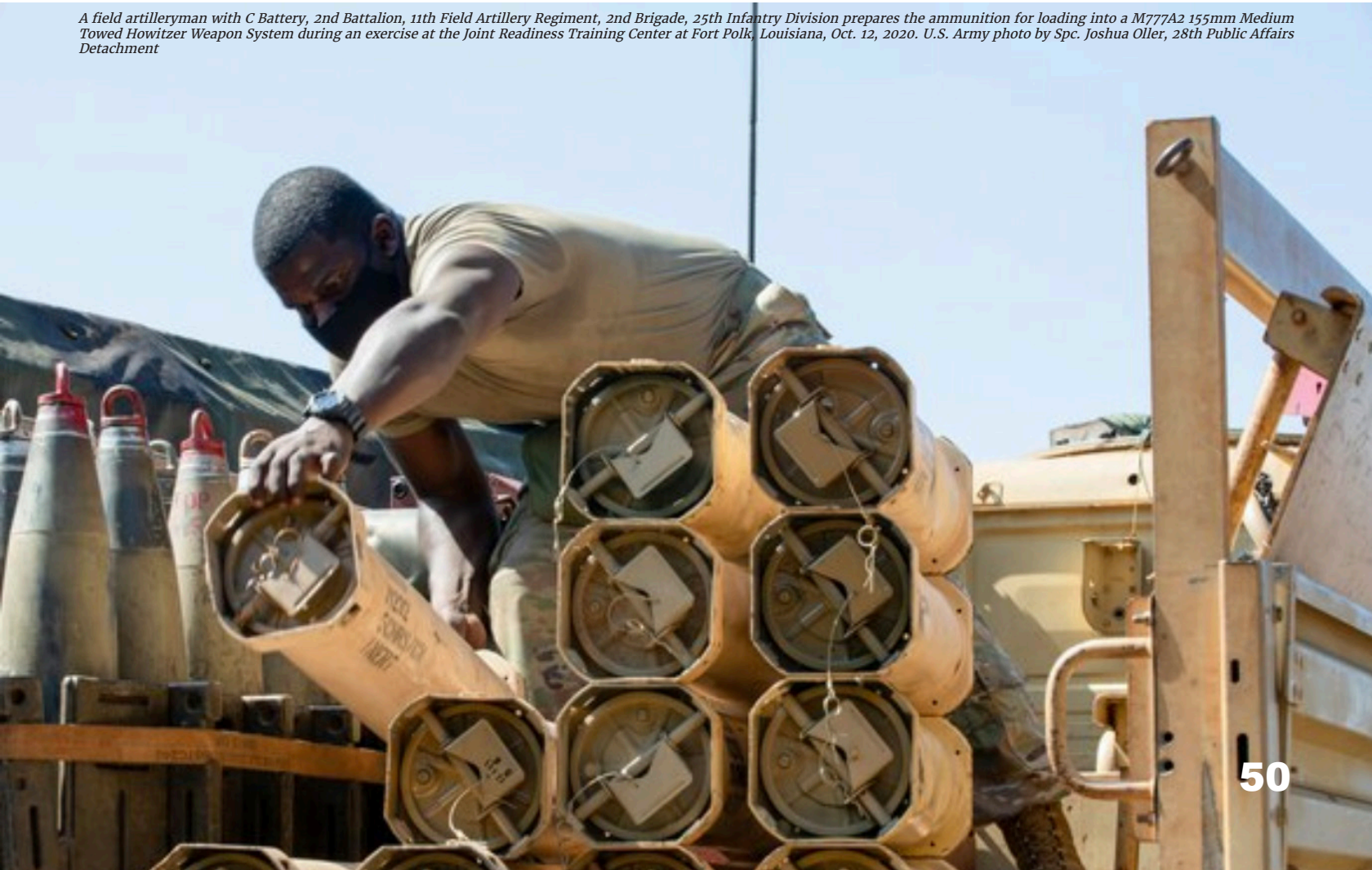
Best practices for the use of CCLs from the sustainment perspective begin well before stepping foot in the Class V yard. The most successful units start at home station by creating a simple spreadsheet or worksheet that identifies munitions based on DODIC, nomenclature, formal and informal names which helps disambiguate much of the language confusion created when Class V is requested. This sheet should also include the often neglected fuse, charge, and shell-fuse combination names, and uses. When this type of document is shared and used by the FSC, S4, FDO and made available to the BSB SPO and CSSB the increase in accuracy of requests and movement of munitions is incredible.

Like the worksheet for understanding each munition that can be used by an FA cannon battalion, the need to create a common document that describes each CCL is vital.

Version control and non-standardized naming conventions of CCLs leads to confusion and delay in requesting and moving ammunition. This is severe within the FA battalion but gets expounded when it reaches the BSB and the CSSB. A second level of relief from this trap is the use of 13 series MOS liaisons at the BSA and with the CSSB. When a fire supporter is available to clarify and provide feedback on requests it often clears up confusion created during the relay of requests from the gun line through the battalion, brigade and division assets like the CSSB.

The storage and movement of the CCL on wheeled sustainment platforms also requires practice, planning and training. Best practices to consider with the movement of ammunition from the FSC to the gun line include the physical placement of the ammunition on the CROP. It is not only the economy of the CCL that is important in the decision making but how the ammunition can be arranged to be most effective for the battery upon receipt. Consider what needs to be moved off

A field artilleryman with C Battery, 2nd Battalion, 11th Field Artillery Regiment, 2nd Brigade, 25th Infantry Division prepares the ammunition for loading into a M777A2 155mm Medium Towed Howitzer Weapon System during an exercise at the Joint Readiness Training Center at Fort Polk, Louisiana, Oct. 12, 2020. U.S. Army photo by Spc. Joshua Oller, 28th Public Affairs Detachment



the CROP first and arrange ammunition in the best possible configuration to have those rounds easily accessible. This skill depends on interaction, communication and joint training between the FSC distribution platoon and the battery gun line NCOs and Soldiers. The training should include standardization of what occurs at the logistics rally point site as well as practice working together to move the ammunition in a way that both units understand and can execute.

Once on the ground at JRTC a best practice for the creation of CCLs is the emphasis placed on them from the battalion command team. Allowing the FSC time to create as many pre-determined CCLs as possible for both the initial push into the box and for the initial CSSB resupply is a game-changer. A general rule of thumb used for JRTC is an FSC should take as much Class V into the box as possible and leave no CROP space empty. Likewise, available CROPs that are beyond the FSCs haul capacity should be used to create additional CCLs to alleviate the strain on the CSSB and for direct knowledge of the availability of ammunition once the fight begins. These CROPs can often be left in the Class V yard for easy pick-up by the CSSB. The FSC is typically in charge of this operation, but the battalion S4 and FDO must have an intimate understanding of what is happening and what is available once movement begins. Without the understanding of availability, requests are wasted and planning is ineffective when the plan involves ammunition that is no longer available due to usage. Simply marking CROPs with the designated name of the CCL also simplifies movements and prevents confusion during exchanges between sustainment units through the echelons of support.

The availability of CROPs becomes a unique training exercise in accountability, decision-making and prioritized movement. CROP spaces become a premium as an operation increases in length of time due to their versatility. This means that available CROP space within the battalion must be closely monitored



Soldiers from Alpha Battery, 1st Battalion, 82nd Field Artillery Regiment, 1st Armored Brigade Combat Team, 1st Cavalry Division, draw 155mm Base Burn Dual Purpose Improved Conventional Munition rounds, each weighing nearly 100 pounds, and carry into their vehicles during a load exercise directed by the 210th Field Artillery Brigade, 2nd Infantry Division. U.S. Army photo by 2nd Lt. Gabriel Jenko

to ensure that the movement of ammunition remains possible. Best practices for this include consistent movement of ammunition of CROPs at the battery and to the gun line and ammunition trucks. Dedicating CROP space to ammunition during the initial push as mentioned in the previous paragraph, but also the exchange of flat racks between sustainment units. Communication with the BSB must be clear and concise for the use of CROPs when Alpha Distribution Company becomes involved in the movement of Class V with throughput to resupply. The knowledge and tracking of available space at the FSC, BSB and CSSB is an important role for the battalion S4 in ensuring efficient use of CCLs. Knowing when to utilize an echelon of support other than the FSC is a tough learned lesson that results in increased efficiency for the FA cannon battalion.

Dedicated training, planning and utilization of CCLs flatten the logistical footprint of an organization. By using the principles of sustainment when considering a CCL, specifically simplicity, responsiveness and economy, a unit will greatly reduce confusion on Class V availability, movement, and opportunity for resupply. Effort in the administrative and physical creation of CCLs ahead

of an operation will pay great dividends on commanders' abilities to make informed decisions based on facts concerning Class V rather than assumptions.

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DIVARTY's Role in Combat from Korea to the Gulf

By MAJ Brennan Deveroux

The Army's resurgent emphasis on large-scale combat operations reintroduces a historical debate regarding division artillery's (DIVARTY) combat role. Contrary to its earlier design, the modern DIVARTY does not have organic firing units but instead receives them when required. Outside of National Guard units or a corps headquarters potentially allocating rocket artillery support to DIVARTY, the division's artillery is exclusively the cannon battalions assigned to the brigade combat teams. In this context, the Army, a brigade-centric organization shifting back to a division focus, faces a potential issue if DIVARTY intends to centralize control or re-allocate the assigned direct-support artillery from maneuver units to conduct shaping operations for the division. Maneuver commanders understand the advantages of dedicated artillery support to their respective missions and will thus be hesitant to give them up. As General Lloyd Austin explained after the 2003 Iraq invasion, "ask any infantryman if he has enough artillery, and he always will answer, 'No.'" This modern DIVARTY construct has yet to face the crucible of combat, but with the ramp-up for large-scale combat operations, the historical debate surrounding this vital organization's role must be examined. This article does not attempt to prescribe division-level organizational change or DIVARTY's future role; instead, it provides the historical context to facilitate such a discussion.

Post-Korean War: Adapting to a Nuclear Battlefield

The proliferation of tactical surface-to-surface nuclear weapons after the Korean War not only created a new capability for the United States, but it represented an emerging problem: the nuclear battlefield. The reorganization of forces into

what would become the "Pentomic Division" sparked a conversation about decentralizing indirect fire.

To fight in this nuclear environment, the Army needed to organizationally adapt to focus on small independent units, dispersion, and mobility. In 1954, Army Chief of Staff General Matthew Ridgway ordered an assessment of how to restructure Army divisions, specifically shrinking the formation's size and emphasizing mobility without sacrificing lethality. The nuclear battlefield threatened the idea of the large massed forces that had fought in WWII and the Korean War. Dispersion became the key to survival, which strained sustainment operations and forced units to become more autonomous. The Army created the Pentomic Division, an organization comprised of five platoons per company, five companies per battle group, and five battle groups in each division. The battle group design was built around a self-contained model and resembled a modern-day brigade combat team (BCT). The advent of the self-contained battle groups weakened the division artillery as it required the detachment of a firing

battery for each battlegroup to give it autonomy. A.J. Bacevich, a history professor at Boston University and a retired Army Colonel, notes that "while artillery formally remained a division asset, its organization into five separate units lent itself to semi-permanent distribution among each of the division's five battle groups."

This new relationship challenged division artillery's fundamental role, putting into question who had the authority to plan and execute indirect fires. Dr. Boyd Dastrop, the U.S. Army Field Artillery Command Historian, explains that many senior field artillery officers of the time opposed the detachment of field artillery batteries away from the division headquarters because it "violated two sacred artillery tenets—unity of command and massing fire." He outlines how Major General Edward Williams, the then-Commandant of the Artillery and Guided Missile School, for example, openly challenged the reorganization and argued against decentralizing the control of fires. The critiques of Brigadier General Donald Harriott, the 10th Infantry Division Artillery commander at



Atomic Annie was the first Nuclear Artillery on the Korean Peninsula. - Source National Security Archives

the time, provides another example. After a training exercise, he argued that the organizational adaptation limited the artillery's ability to mass fires and that indirect fires' ability to achieve unity of command was critical to supporting maneuver forces.

The Army transitioned in the 1960s from an organization created for the nuclear battlefield to a conventional military prepared to fight a modern war across various intensities and terrain. In 1961, the Secretary of the Army approved the Reorganization Objective Army Division (ROAD) concept, an organizational change that initially focused on creating infantry, armored, and mechanized divisions. The ROAD concept allowed the Army to operate at all levels of conflict, from a small engagement to a nuclear war. For artillery, this transition ended the Army's reliance on atomic weapons and reestablished division control of indirect fire, pairing platform types to specific divisions: self-propelled artillery was assigned to armored and mechanized divisions, and towed artillery to the infantry divisions.

Vietnam: Decentralizing out of Necessity

Vietnam provided combat experience for artillery operations that emphasized air mobility and other niche capabilities such as direct-fire operations. Successful integration of the helicopter was the key to successfully employing indirect fire in this unconventional conflict, allowing artillery units to be broken down into small elements and dispersed, supporting as much area as possible. These units were often left in static firebases for extended periods. McKenney, the author of *The Organizational History of Field Artillery 1775-2003*, argues that this "piecemeal, static application of artillery went completely against the usual American practice of massed battalion fires." The helicopter facilitated a new type of warfare by inserting artillery units deep into potential enemy territory severely restrictive to wheeled/tracked vehicles. Helicopters also provided resupply and support to tactical

artillery bases that remained forward with maneuver forces.

One unexpected consequence of the reliance on helicopter mobility and firebase operations in the Vietnam War was the reduction of DIVARTY's role on the battlefield. The maneuver commander on the ground built habitual relationships with the artillery that supported him, as had been envisioned by the Pentomic Division concept in the 1950s. On top of the DIVARTY losing its light artillery, the heavy artillery pieces rarely moved around the battlefield except to preposition for an operation. However, even with this relationship, the DIVARTY was still responsible for all of its artillery battalions during the war. Although the volume of fire was not at the same level as that of the Korean War, artillery missions still presented a logistical challenge. As McKenney explains, "with elements so widely dispersed, [the DIVARTY commander] saw his supply and maintenance responsibilities increase and his tactical ones decrease."

Post-Vietnam: Preparing for the Soviet Union

After the Vietnam War ended, the threat of large-scale combat in Europe forced changes in equipment and munitions and how the Army would fight. The new concept, AirLand Battle, envisioned a partnership between the Army and the Air Force to attack the Soviet Union in depth. Although this transition did not restructure the artillery in the same way that the Pentomic Division or the ROAD concept had, it dramatically altered the role of indirect fire on the battlefield and once again placed DIVARTY in control. The Field Artillery School Department of Tactics, Combined Arms, and Doctrine outlined the challenges of the new way to fight in *The Artillery Journal* and explained that "the mission of the Field Artillery remains unchanged in the AirLand Battle." However, the department also noted that the mission had "become more complex in terms of execution due to the increase in requirements." In simplified terms, AirLand Battle was a plan to over-

come the numerical mismatch of mechanized vehicles with the Soviet Union by maximizing the number of friendly forces available for the close fight while limiting the number of enemy vehicles that could engage them. To support this transition back to large-scale combat operations, AirLand Battle required three unique indirect fire mission sets for the DIVARTY: close support, counterfire, and interdiction.

The AirLand Battle concept reintroduced the DIVARTY commander's importance, which had a reduced role in the Vietnam War. The DIVARTY commander's challenge was three-fold: determine where to position units to support all critical missions, decide what elements they could afford to allocate to a maneuver unit for direct support, and establish priorities among the three artillery mission sets. Contrary to the battlegroups in the Pentomic Divisions and indirect fire in the Vietnam War, the habitual relationships between artillery units and the maneuver forces they supported were no longer a priority. When it came to the allocation of artillery for the direct-support relationship as part of the AirLand Battle Concept, the Artillery School explained: "faced with the requirement to attack three distinct target sets concurrently, the division commander simply can't afford to farm away up to two-thirds of his field artillery for a single purpose." Thus, as large-scale combat operations grew in importance, so did that of the DIVARTY. However, this also meant a shift away from habitual relationships between maneuver and artillery units.

Success in The Gulf: The Importance of DIVARTY

The latter half of the Cold War had prepared the U.S. military to defeat a mechanized force. The 1991 Gulf War and the 2003 Iraq invasion provided opportunities for it to do so, and overall these combat experiences validated the role of DIVARTY. Additionally, this high-tempo warfare's rapidly changing tactical situation reinforced the challenges of planning and executing fires. These



Artillery in the 1st Gulf War - Source DOD

large-scale combat operations against a modern military required artillery assets to support distributed operations across large distances. Thus, central control of indirect-fire assets ensured mission prioritization for the overall operation.

The 1991 Gulf War was a one-sided conflict that favored the U.S. military. Unlike the Korean and Vietnam Wars, the Gulf War was not a stress test for American artillery. The 1st Armored Division was one of the main combat elements in the Gulf War, and in just a few days, the unit effectively applied a high volume of artillery rocket and cannon fire against the Iraqi Army. Colonel Vollney Corn Jr., the DIVARTY commander at the time, explains that “in the course of an 87-hour, 218-mile attack, the 1st Armored Division Force Artillery delivered 1,213 rockets and more than 9,500 rounds of cannon fire.”

The 2003 Iraq invasion is another example of DIVARTY succeeding in a large-scale combat operation. In an interview with *The Field Artillery Journal*, Brigadier General Lloyd Austin, the 3ID deputy commander during the 2003 invasion, detailed the 21-day mission in which the division traveled over 700 kilometers. In the short conflict, the division fired nearly 14,000 cannon rounds and 800 rockets, with Austin noting that despite the challenge of the massive dispersion of the units, “artillery support was

absolutely magnificent.” There was never much doubt that the U.S. artillery would outperform the Iraqi artillery. Major Robert Rooker, the assistant operations officer for 3rd ID DIVARTY in OIF, conducted a detailed battle damage assessment. He explained that the 3ID DIVARTY “destroyed 526 enemy tanks, trucks and artillery pieces; 67 buildings, OPs and bunkers; and 2,754 enemy soldiers without losing a single soldier or piece of equipment to enemy indirect fire—truly a one-sided artillery fight.”

Artillery was decisive in both these conflicts, demonstrating its function to the division commanders. Austin reinforced this sentiment, concluding that “when the division goes into a fight, the [DIVARTY] is a critical piece of it.” Shortly after the 2003 invasion, however, the role of DIVARTY and the conversation regarding decentralizing artillery hit a culminating point.

Modularity: The Dissolution and Reconstitution of DIVARTY

In late 2003, the Army began a reorganizational process known as “modularity.” Similar to the Battle Groups in the 1950s, it created autonomous units below the division level. The Rand Corporation describes the transition as a shift from a “division-based force into a brigade-based force,” with each BCT incorporating maneuver, artillery, and combat support forces. Under this structure, the Army assigned every BCT a direct support

field artillery battalion. Like the ROAD concept, the artillery weapon system varied by BCT: infantry, heavy, or Stryker.

Modularity did not simply restructure brigades; it reduced the necessity of the division headquarters in combat, a decision that had drastic consequences for the employment of indirect fire. On top of this organizational change, there was a dramatic reduction of nearly half the field artillery brigades—which often supported Corps level operations: 23 field artillery brigades in 2002 were reduced to only 13 by 2008. In an Army War College strategic research report, *Effect of Modularity on the Field Artillery Branch*, Colonel Noel Nicolle explains: “The reduction in the number of field artillery brigades and the total elimination of both the Corps Artillery Headquarters and [DIVARTYs] is devastating” to the U.S. military’s ability to employ indirect fire effectively.

The termination of DIVARTY eliminated a battlefield coordination and resource distribution element. Additionally, it removed a training organization designed to ensure all artillery units within the division were proficient in indirect fire employment. In a 2006 interview with *The Field Artillery Journal*, Major General William Caldwell IV, the 82nd Airborne Division Commander, optimistically explained that without a DIVARTY, the new artillery relationship put the onus of training and oversight on the BCT commanders. He argued: “Those are their jobs now. And they’ve got the Red Book as the non-negotiable standard.” However, this new role was not successful, and the primary mission of artillery units—the employment of indirect fire—degraded over the first few years of the transformation. As Nicolle argued in 2009—five years after the modularity concept began—the absence of DIVARTY created “a significant consequence that is only now becoming apparent.”

Not surprisingly, the degradation of indirect-fire proficiency was keenly felt on the battlefield. In 2007, three BCT commanders—

Colonels Sean MacFarland, Michael Shields, and Jeffrey Snow—published the influential white paper *The King and I: The Impending Crisis in Field Artillery's ability to provide Fire Support to Maneuver Commanders*. In the white paper, the commanders outlined long-term problems associated with synchronizing indirect fire with maneuver operations and the continued capability decay dangers. Contrary to Caldwell, these commanders argued that “modularization places responsibility for fire support training on maneuver commanders who are neither trained nor resourced to perform these tasks.”

The artillery white paper made clear the importance of indirect fire in future conflicts, and the commanders explained that artillery proficiency degradation was an Army-wide problem. MacFarland, Shields, and Snow concluded that it was “urgent that [the Army] take another look at the structure of this important combat arm.” These sentiments were echoed a couple of years later by Nicolle at the Army War College. After finishing his assessment of how modularity shaped indirect fire, Nicolle concluded that although the number of artillery battalions had increased in the six years since the Iraq invasion, the force was less capable. He warned that “if course corrections regarding the field artillery are not made in the immediate future, the

United States Army's reason for existence—the ability to win its nation's wars—is no longer a certain outcome.”

The dissolution of DIVARTY was in direct contrast to the lessons that the 3ID identified in the 2003 Iraq invasion. For example, the division noted the importance of the DIVARTY at coordinating artillery during the conflict and argued for the organization's continued development. Similar to the development of the Pentomic Divisions and the ROAD concept, the Army designed modularization to be successful in a new type of conflict. However, the significant difference was that modularization removed key organizations above the brigade level, which demonstrated a movement away from large-scale combat operations as a whole. The Army eventually heeded the warnings of senior military officers about artillery degradation. In fact, the U.S. Army Forces Command published a DIVARTY Implementation Order that outlined the headquarters' resurgence to begin in 2014, with full implementation across the force two years after that. Although the Army reconstituted numerous DIVARTYs, the organization's role varies drastically from its Gulf War predecessor. Additionally, because artillery battalions remain a part of BCTs, and DIVARTY has no organic artillery assets, the conversation of control continues today as the Army

once again prepares for large-scale combat operations. BCTs, and DIVARTY has no organic artillery assets, the conversation of control continues today as the Army once again prepares for large-scale combat operations.

Conclusion

The Army is transitioning back to a division-centric force as it moves away from counterinsurgency, and how the division will fight its artillery is a pressing concern. This article does not propose to know the DIVARTY's role in the next conflict but instead offers historical insight. Although tactical situations have forced habitual associations and the decentralization of fires, the Army has historically trained and fought with division controlling artillery. If the Army must adapt the BCT model for large-scale combat operations, the clarification of DIVARTY's role must come soon. Any change, particularly if it directly impacts the combat power of the current BCTs, must be worked out in training and experimentation, not on the next battlefield.

About the Author:

MAJ Brennan Deveraux is a student at the Command and General Staff College.

References

- Patrecia Hollis, “3d ID in OIF: Fires for the Distributed Battlefield—An Interview with Brigadier General Lloyd Austin III,” *Field Artillery: A Professional Bulletin for Redlegs*, September 2003
- Janice E. McKenney, *The Organizational History of Field Artillery 1775–2003, Army Lineage Series* (Washington D.C.: Center of Military History, 2007)
- A.J. Bacevich, *The Pentomic Era: The U.S. Army Between Korea and Vietnam* (Washington D.C., 1986)
- Boyd L. Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery, TRADOC Branch History Series 1* (Fort Monroe, Virginia: United States Training and Doctrine Command, 1992)
- Field Artillery School Department of Tactics, Combined Arms, and Doctrine, “Implementing the AirLand Battle,” *Field Artillery Journal* 49, no. 5 (September 1981)
- Vollney Corn and Richard Lacquemont, “Silver Bullets,” *Field Artillery: A Professional Bulletin for Redlegs* 91, no. 5 (October 1991)
- Robert Rooker, “Historical Recounting of Marne Thunder in OIF,” *Field Artillery: A Professional Bulletin for Redlegs*, September 2003
- Stuart Johnson et al., *A Review of the Army's Modular Force Structure* (Santa Monica, California: RAND Corporation, 2012). iii.
- Noel T. Nicolle, “Effect of Modularity on the Field Artillery Branch” (ARMY WAR COLL CARLISLE BARRACKS PA, March 2009), <https://apps.dtic.mil/docs/citations/ADA497749>.
- Patrecia Hollis, “Pentathletes in the 82nd Airborne Division—Developing Critical Capabilities for the Army: Interview with Major General William B. Caldwell IV,” *Field Artillery: A Joint Magazine for US Field Artillerymen*, July 2006
- Sean MacFarland, Michael Shields, and Jeffrey Snow, “The King and I: The Impending Crisis in Field Artillery's Ability to Provide Fire Support to Maneuver Commanders,” 2007
- United States Army Field Artillery School, “DIVARTY: A Force Multiplier for the BCT and Division,” *Redleg Update: The United States Army Field Artillery Branch's Newsletter* 04, no. 14 (April 2014)

Modern Artillery returns to DivArty Structure— Source Divds Photo by CPT Jermaine Branch





GULF WAR



Retrospect from a Veteran Part 1 Attack through Al Busayyah

By LTC (Ret) Alan Watts

Disclaimer: The following paper was mainly articulated based on memory, After Action Review (AAR) notes from four AARs in March and April, 1991, 1st Armored Division and 1st Armored DIVARTY briefing charts created during March and April, 1991, and a "2nd Battalion 1st Field Artillery 'Iron Deuce' Battle Summary Narrative," also created during March and April, 1991.

From 14 through 17 February 1991, 2nd Brigade (Iron Brigade), 1st Armored Division, as part of U.S. VII Corps, moved approximately 165 kilometers (KM) from Tactical Assembly Area (TAA) Thompson into Forward Assembly Area (FAA) Garcia in northern Saudi Arabia.¹ LTG Fred Franks, VII Corps Commander, used the move to rehearse an armored corps movement through desert terrain in preparation for an attack into Iraq.² During Theater and III Army planning, the 1st Armored Division was to cross the berm early morning on 25 February. On the morning of 24 February, the 1st Armored Division (1st AD) received orders to move the attack time up to 241500 Feb 91.

At approximately 241400 Feb 91, through a blinding, horrendous shamal (desert sandstorm), the Iron

Brigade with its supporting elements began moving out of FAA Garcia towards the Iraqi border, marked by a 12 ft defensive sand berm. Division engineers had cut paths through the berm, as well as cleared and marked lanes through minefields on the other side for the division to move into Iraq. The move was not without incidents, as a fire severely damaged a brigade tactical operations center (TOC) generator trailer, and a 50 cal round (probably from someone clearing a weapon somewhere) hit the Brigade S4's HUMMV door frame. To complicate matters further, the 1st AD Main TOC, attempting to move on routes through the same berm holes as the brigade, at the same time, became tangled with brigade vehicles, which took "a lot of time" to untangle in the storm.

However, LTG Franks had wisely planned and allowed his front-line divisions enough time for the combat forces to transverse the berm and minefields intact, then realign units and vehicles in battle formations before continuing the VII Corps movement into Iraq on 25 Feb.³

The 1st AD initial main objective was an enemy corps level supply

depot at the town of Al Busayyah⁴, about 144 KM from the Line of Departure (LD). After crossing the berm, the Iron Brigade moved into the left rear of the Division Wedge⁵ formation, behind the 1st Brigade (which actually was 3rd Brigade, 3rd Infantry Division redesignated 1st Brigade 1st AD during Desert Storm). The 1st AD organic 1st Bde remained in Germany undergoing major modernization upgrades and fieldings.

The Iron Brigade was the 1st AD "heavy brigade," consisting of four maneuver battalion / task force size elements: 1st Battalion 35th Armor (TF 1-35 Armor), 2nd Battalion 70th Armor (TF 2-70 Armor), 4th Battalion 70th Armor (TF 4-70 Armor), and 6th Battalion 6th Infantry (TF 6-6 Infantry). Task Force 6-6 Infantry was also a 3rd Infantry Division unit ordered to take the place of the Iron Brigade's organic 2nd Battalion 6th Infantry, which was left in Germany also due to major modernization activities.

The 3rd Brigade 1st AD (located in the Division Wedge, right rear behind 1st Brigade), was assigned intermediate objectives "Bull" and "Dog" in the northeast division zone. The 1st Brigade was assigned

an intermediate objective "Bear" beyond Bull and Dog in the division's northwest zone. Each 1st and 3rd brigades had estimated enemy battalion size forces (from the Iraqi 26th Infantry Division) on their objectives.⁶ The Iron Brigade was tasked to continue the attack through Al Busayyah as the 1st and 3rd brigades completed taking their immediate objectives. The 1st and 3rd brigades made their attacks the afternoon of 25 February. As the 1st AD forces began to engage, the Iraqis fired a few rounds, then began "doing the Iraqi Wave" (surrendering). The numerous enemy prisoners of war (PWs) were a hindrance throughout Desert Storm, especially if there were no Military Police available for hand-off. The situation soon became one of hurriedly making sure prisoners were disarmed, and then pointing to the rear (south) for the prisoners to continue walking. Those Iraqis that needed medical attention received it.

Approximately 252300 Feb 91 the Iron Brigade was continuing north, moving around 1st Brigade, when a TF 1-35 Armor tank commander requested permission to fire at a target, vicinity grid PU 815415. The Iron Brigade had instituted two field expedient friendly vehicle identification features. For the first expedient, soldiers mounted a camouflage pole section with a yellow revolving light ("whoopie light"), the light wrapped in "100-mile-an-hour" (duct) tape, on top of the vehicle. The tape-wrapped light did not give the vehicle away, but provided a heat source above the body of the vehicle so any friendly armored vehicle with its thermal sight could identify the vehicle's second heat source (the engine was the first heat source) above the vehicle body.

The second identification feature was a colored chem light mounted on each armored vehicle's backside. Each battalion in the Task Force had a specific color, so during periods of limited visibility vehicles behind the armored vehicles could keep aligned in their relative task force formation. The target at which

the TF 1-35 tank commander was requesting permission to shoot had neither friendly vehicle identification feature.

As the TF 1-35 tank commander requested permission to fire, I realized that both 1-1 CAV (the divisional cavalry squadron), as well as 1st Bde elements, were probably still in front of the Iron Brigade. Going thru the Division Fire Support Element (FSE) I contacted the 1st Bde Fire Support Officer (FSO) to see if there were any friendly forces of which he knew in the area. Phantom 50 (Hollywood Call Sign for 1st Bde FSO) said negative. Just about the same time he said "negative," all hell broke loose on the brigade and division radio nets. The tank commander had been given permission to fire, so he shot at the target, which turned out to be a friendly 1-1 CAV M88 Heavy Vehicle Wrecker towing a truck across the battlefield towards the rear.

The M88 has a characteristic rear engine (very large for towing up to M1 Tank-sized armored vehicles), that also generated a very intense heat signature. The TF 1-35 tanker apparently aimed just to the left in the heat spot exhaust, which caused his tank round to fly over the towbar pulling the truck. The M88 had a radio, on which the operator called for an immediate cease fire, which was immediately re-transmitted over the entire division's net structure. The Division Commander then had a "serious conversation" with the Iron Brigade Commander, which flowed down-hill rather quickly. The DIVARTY Commander, not to be outdone, reprimanded me on the DIVARTY command net as he thought I had "cleared maneuver fires." In hindsight, after hearing senior commanders themselves speaking rather harshly on the radio, I believe the unfortunate incident was actually God-given, as throughout the remainder of Desert Storm, extreme attention and effort was given at all levels in the division to prevent fratricide.

Finally, the 2nd Bde cleared 1st Bde and moved into positions to attack Al Busayyah the next morning. Throughout the remainder of the

night the DIVARTY and Iron Deuce (2-1 Field Artillery 155mm SP, in Direct Support of Iron Brigade) shot H & I (Harassment and Interdiction) targets in the logistical site area, followed by a 15-minute prep at 260615 Feb 91.⁷

Attack on Al Busayyah

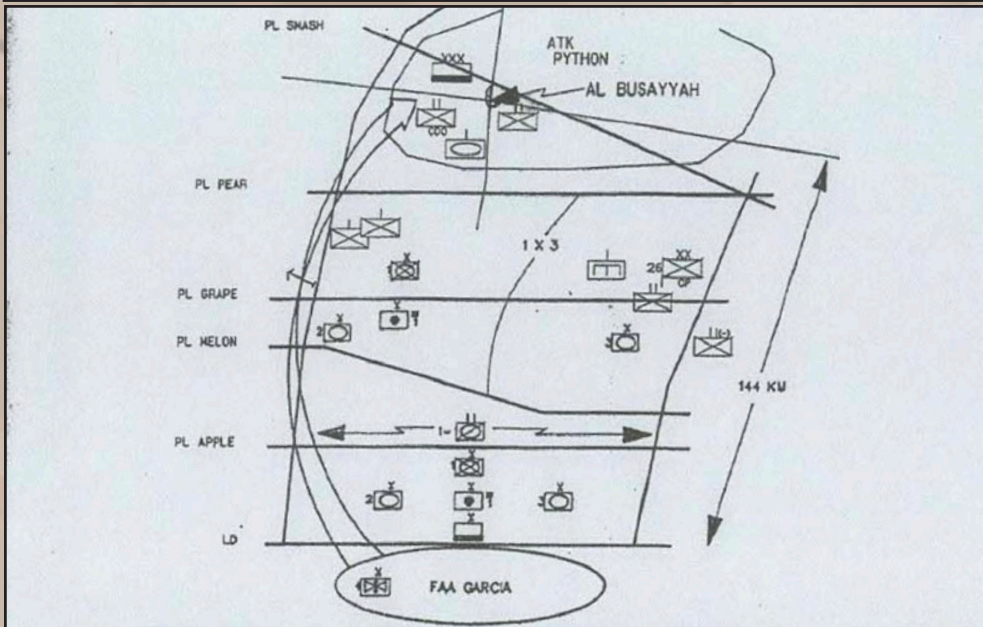
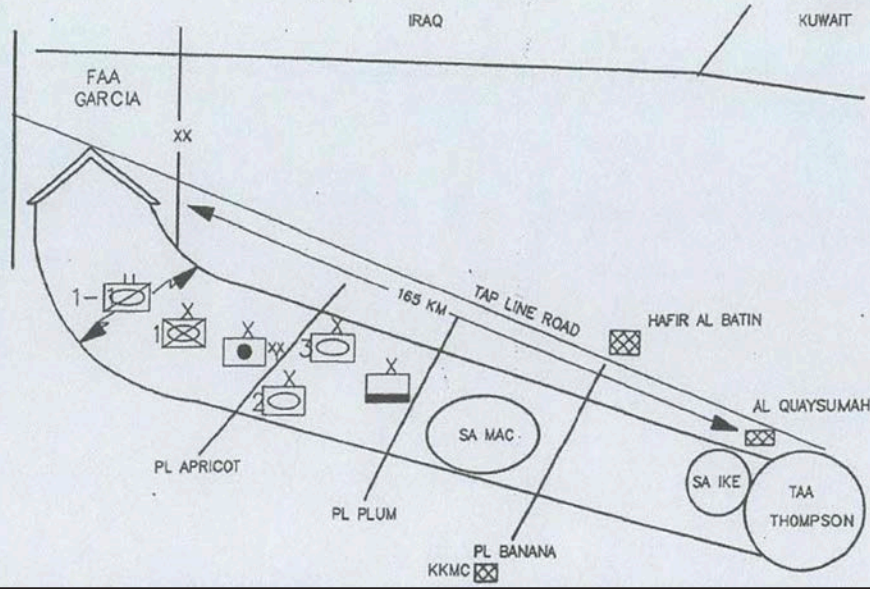
The enemy information we had on the Al Busayyah area was sketchy at best. Maybe a couple of leg-infantry battalions, and an armor company or two, probably equipped with T-55 or at best T-62 tanks.⁸ Turned out that was about all that was there.

At 260630 Feb 91 the Iron Brigade began the attack on Al Busayyah. From left to right, TF 4-70 Armor on line on the west, Task Force 6-6 Infantry in the center with the main mission to attack the town itself, and on the right slightly behind TF 6-6 Infantry was TF 2-70 Armor. Task Force 1-35 Armor was in reserve, following TF 6-6 Infantry, then following TF 2-70 Armor as TF 6-6 moved through the town.

Iron Deuce, after completing the prep and standing by for targets of opportunity, march-ordered at 0650 hours to follow the task forces. As TF 6-6 Infantry moved towards the town, it started receiving some small arms fire from some of the buildings. When discussing this incident after Desert Storm, both Deuce Six (2-1 FA Commander, LTC James Unterseher) and I surprisingly had the same feelings at the time: "What is that Iraqi infantry doing firing at us? They're supposed to be surrendering like what happened in the other brigade fights!" We stopped the Iron Deuce 155 mm artillery battalion, and shot six volleys (144 rounds) of high explosive (HE), quick and delay fused, into the town, destroying many of the buildings. The range was so short we shot charge three, green bag (about the least amount of powder put into an artillery howitzer breach to get a 96 lb projectile down-range). As this was the first time a number of our maneuver brethren witnessed artillery in close proximity, they thought we had fired a force artillery mission into

1ST ARMORED DIVISION

TAA THOMPSON TO FAA GARCIA
(14-17 FEB 91)



the town, including MLRS (Multiple Launch Rocket System, 227mm)! Al Busayyah was so close to the artillery battalion that the Iron Deuce gunners could watch their rounds impact across the desert, seeing the buildings collapse and crumble while firing the mission.

Task Force 6-6 Infantry continued through the town, meeting little resistance as their attached M728 CEV (Combat Engineer Vehicles) destroyed 10-12 bunkers. A CEV would receive small arms fire from a bunker, fire its 165 mm demolition gun into the bunker, and thus receive no more small arms fire. Task Force 6-6 Infantry reported killing 3 tanks, and 2 trucks.

Task Force 2-70 Armor moved to the east of the town, then back to the west on the other side, picking up the main movement north, from Task Force 6-6 Infantry, still in the town taking out bunkers. Task Force 2-70 Armor reported destroying "a few tanks, a number of trucks, and some bunkers" in the area." An RPG (Rocket Propelled Grenade) was fired at the TOC M577 track, but missed (no damage).

Task Force 1-35 Armor continued movement up on TF 2-70's right flank. After the fight for Al Busayyah the task force reported killing two tanks (T-55 and T-62) and two trucks, as well as taking seven PWs.

In the west, Task Force 4-70 Armor encountered a number of bunkers, with infantry firing small arms who were easily eliminated. A number of destroyed tanks were in its area, but the Task Force Commander (LTC Bill Feyk) did not know what killed them. (We suspected the Division 4th Brigade (Aviation) had engaged the enemy tanks with an Apache attack earlier.) As TF 4-70 Armor moved further into Iraq the unit encountered extremely difficult terrain, including horrendous wadis. To make matters worse for the task force, a herd of "camels, goats, and about three thousand sheep" disrupted its formation.

During its operations, TF 4-70 Armor requested more engineer support, but the only engineer platoon available had the sole mission

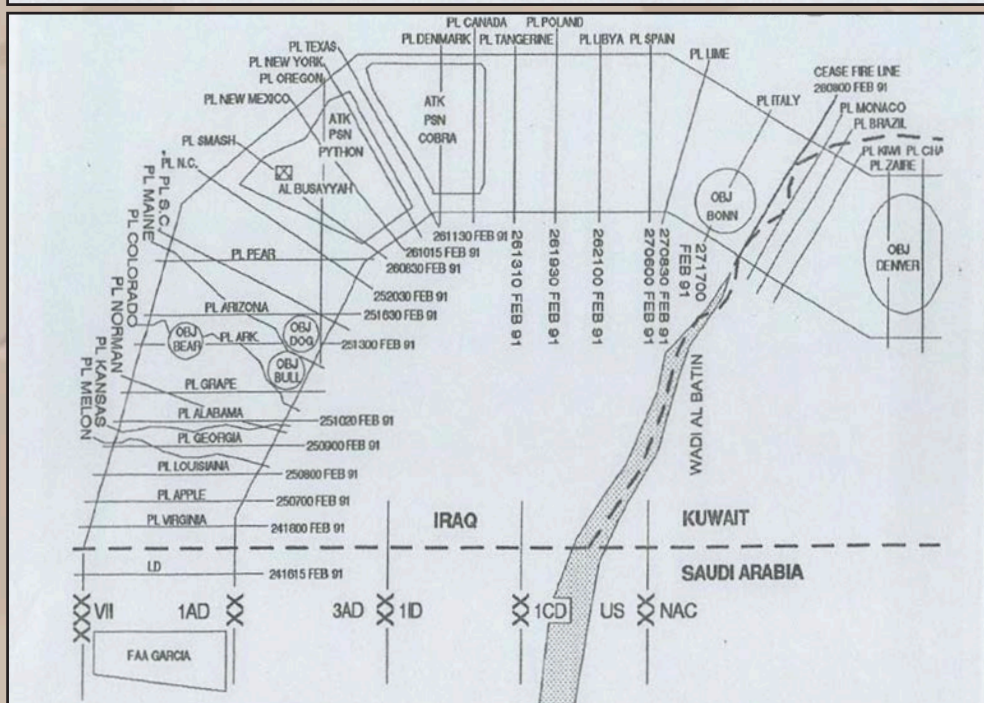
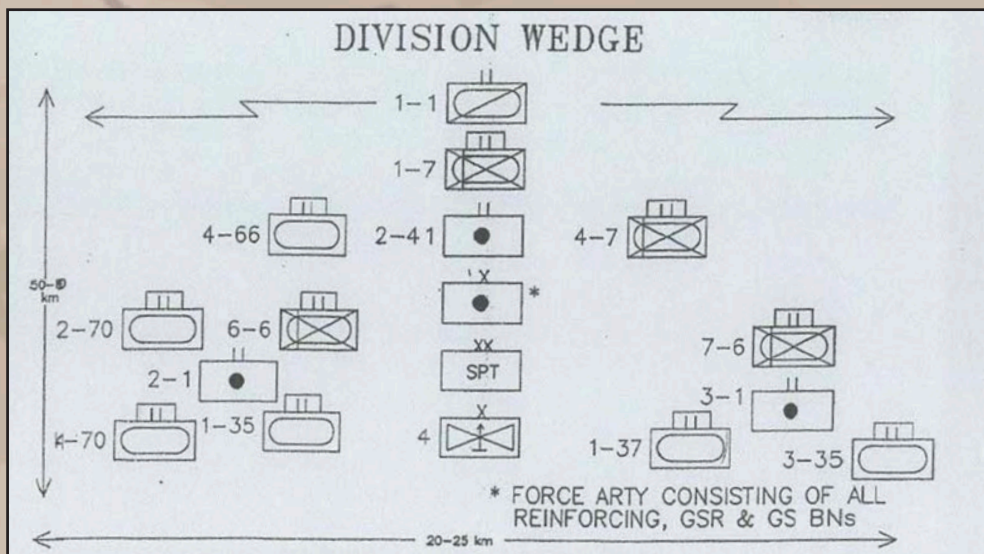


M109A2 Howitzer, Field Artillery Ammunition Supply Vehicle. Note the Battalion Operations Officer Hummer on the skyline with American flag. MAJ Doug Anderson (S-3) led the Iron Deuce battalion battle wedge throughout the war, sometimes through horrendous wadis, horrible weather, and Iraqi burning vehicles with ammunition still cooking off. Photo by Alan Watts

to establish a "log-line" going down the brigade's center axis of march. The log-line was a line of marked stakes in the desert, driven in the ground about every 200 meters, marking the brigade's route of march. Each stake's marking provided the azimuth and distance to the next stake. This marking of the brigade's movement turned out to be a critical lifeline for all the support elements trying to keep from getting lost in the vast, terrain-less desert, traveling much through rainstorms and sandstorms, and being able to find the brigade combat units. The lifeline was invaluable to even corps vehicles, such as tankers, speeding across the desert floor to catch up to the brigade's almost empty Abrams tanks on 26 Feb. When the Brigade Commander found out that the Brigade S-3 had re-tasked the Log-line Platoon to TF 4-70 Armor, he "hit the roof" and got the Log-Line Platoon back on mission. During AARs, much consternation was voiced about the "break" in the log-line.⁹

To the north of Al Busayyah, the Iron Brigade turned right (east) with TF 6-6 Infantry moving to TF 4-70 Armor's left flank, guarding the Division (and VII Corps) left boundary with XVIII Corps. Next in line north to south was TF 4-70 Armor with TF 2-70 Armor on its right boundary, then TF 1-35 Armor as the Iron Brigade's southern most task force. Task Force 4-66 Armor, 1st Brigade 1st AD, was on TF 1-35 Armor's right flank moving east. The entire division, without halting except for fuel stops, had made a 90-degree right turn, moved through Attack Position Python, crossed PL Smash, and continued the attack into the Iraqi Republican Guard Divisions.¹⁰

The Iron Brigade experienced no casualties or battle damage from enemy fire, except a bent Abrams tank fender from an RPG round in Task Force 4-70 Armor. The 54th Engineer Battalion supporting 2nd Brigade experienced a fratricide incident, when a 3rd Armored Cavalry Regiment (ACR) Bradley, with its 25 mm chain gun, fired-up the engineer unit clearing an airfield north of Al Busayyah. The fratricide oc-



A true "hero" of the war: 2-1 FA HEMTT loaded with artillery ammunition. When we started the attack the FA battalion carried three times the basic ammunition load. A few times a fully loaded HEMTT had to stop and tow a fully loaded howitzer or other broken down vehicle. Photo by Alan Watts

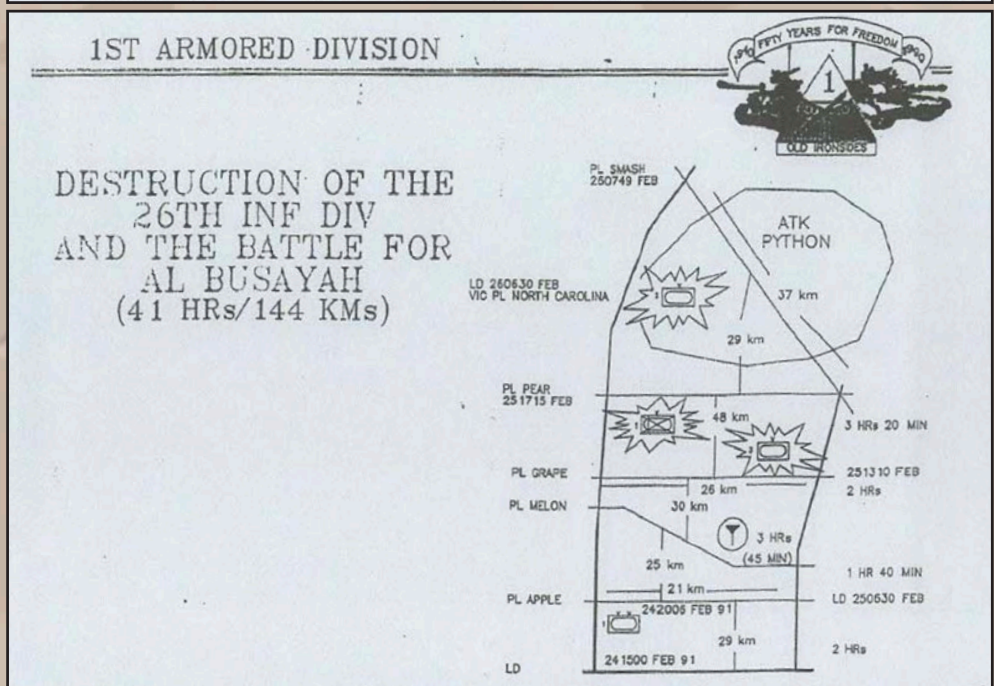
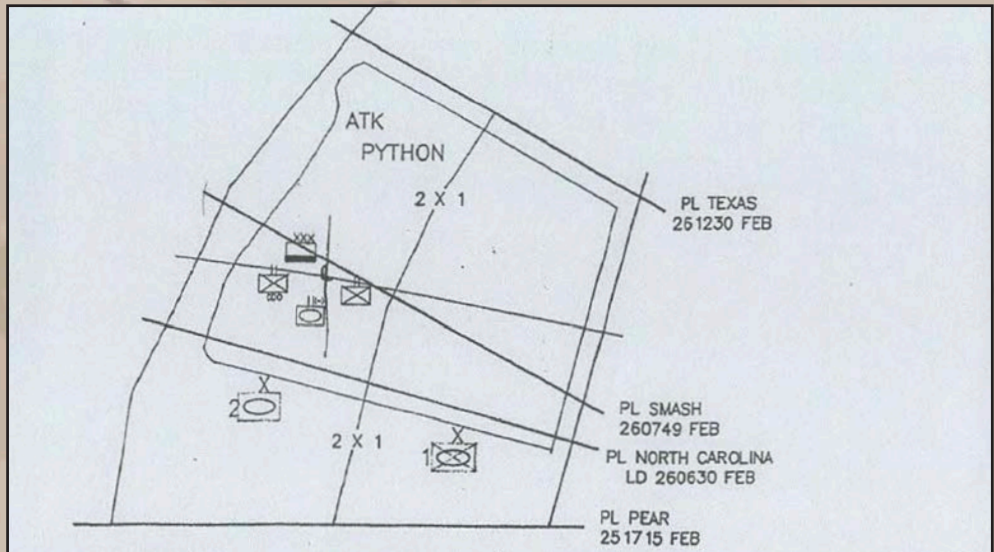
curred when the 3rd ACR unit erroneously crossed the corps boundary between VII Corps and XVIII Corps, understanding it had the mission to clear the airfield. The Iron Brigade was at least 30 KM in front of the 3rd ACR due to the change in battlefield geometry when 1st AD made its right turn, and XVIII Corps maintained a more north-easterly axis.

Early on 27 February the Brigade Commander had to order Task Force 6-6 Infantry to return to Al Busayyah to thoroughly clear the town and surrounding area. Apparently, the initial order to attack Al Busayyah did not contain the word, "clear." The town had to be cleared to ensure no residual forces were by-passed so follow-on, very vulnerable logistical forces were not attacked and critical supply lines disrupted. When arriving, Task Force 6-6 Infantry cleared a Iraqi Special Forces unit from the area, then raced to catch back up with the Iron Brigade continuing to move east.

In comparison with other Desert Storm reported engagements, little intense, heavy close fighting occurred during the Iron Brigade's Al Busayyah attack. The battle allowed the brigade to gain combat experience and refine skills, including conducting critical cross-talk between commanders, scout coordination to maintain contact with units right and left, keeping units on line to prevent fratricide, and fire discipline. The Iron Brigade's Battle of Al Busayyah was a solid army victory that instilled soldiers' encouragement, pride, and confidence that they would not only win Desert Storm, but crush the enemy.

About the Author:

LTC (Ret) Alan Watts was commissioned at LSU on 20 Dec 1974. After OBC, he joined 1-16 FA, 2nd AD, Ft. Hood, TX where he was an FO and FDO for C Battery, XO of A Battery, BN Ammo Officer, and BN Motor Officer (1975-1979). Following a short stint as an Aerial Observer at 2nd Armored DIVARTY, and the Advanced Course, he was assigned as the BN S-2, for 3-16 FA, 8th Inf Div, Baumholder, FRG. After be-



ing the HHB Commander for that battalion, CPT Watts extended in Baumholder to be the 8th DIVARTY Asst S-3, then extended again to go back to 3-16 FA as the S-3. Back to Ft. Sill in 1985 as a Gunnery Instructor, then TACFIRE School "Dean." MAJ Watts moved to Zirndorf, FRG in 1988 to be the 1st Armored DIVARTY Asst-S-3, then assignment as the 2nd Bde 1st AD FSO in Erlangen. As Desert Storm fighting ended, MAJ Watts assumed duties as the 2-1 FA XO to deactivate the battalion in 1991. LTC Watts' final assignment was as the Division Chief of the Automated Fire Support Systems Branch at the Field Artillery Board, retiring from the army in 1995. As a defense contractor, LTC (R) Watts fielded force protection systems to U.S.FOBs in Afghan

istan from 2008-2015, deploying twice in-country for over two years. He is now fully retired in north Alabama with his wife, Barbara, four children, five grand children, and four great grand children.

References

1. 1st Armored Division Desert Storm briefing slide, "TAA THOMPSON TO FAA GARCIA (14-17 FEB 91), Not dated, 1991.
2. Clancy, Tom and General Fred Franks, Jr. (Ret). Into the Storm, A Study in Command. New York: Berkley, 2004. Pg 177. (Original version / printing, 1996.)
3. Clancy, pp 311-312
4. 1st Armored Division Desert Storm briefing slide, "DESTRUCTION OF THE 26TH INF DIV AND THE BATTLE FOR AL BUSAYYAH", Not dated, 1991.
5. 1st Armored Division Desert Storm briefing slide, "DIVISION WEDGE" (14-17 FEB 91), Not dated, 1991.
6. 1st Armored Division Desert Storm briefing slide, untitled (last slide in briefing), depicting 1st AD timelines crossing Desert Storm Phase Lines, not dated.
7. Document, "2nd Battalion 1st Field Artillery 'Iron Deuce' BATTLE SUMMARY NARRATIVE". (Not dated). 1991.
8. 1st Armored Division Desert Storm briefing slide, "BATTLE FOR AL BASAYYAH (24-26 FEB 91), Not dated, 1991.
9. 2nd Bde 1st AD After Action Review (AAR), 5 March 1991
10. 1st Armored Division Desert Storm briefing slide, "DESTRUCTION OF THE 26TH INF DIV AND THE BATTLE FOR AL BUSAYYAH", Not dated, 1991.

TWO CENTURIANS AWARDED THE HONORABLE ORDER OF SAINT BARBARA FOR THEIR SERVICE IN WWII



Walter Sommers accepted the Honorable Order of Saint Barbara, patron saint of the field artillery, for his service as a corporal in the U.S. Army during the Second World War in the Pacific Theater.

"I want to thank you very much for honoring me," Sommers said, touching the medal and red ribbon resting on his chest. "I certainly appreciate it. I never expected anything like this."

Then, tapping a folder containing the Legend of Saint Barbara and the nomination letter that brought the award to him, Sommers said solemnly, "These were not the worst days of my life."

Born in Germany in 1920, Sommers came to America as a teenager to escape anti-Semitic persecution. "Fortunately, my parents had the wisdom to leave Germany and emigrate to the United States," Sommers said. "I was 17 years old, going on 18. And I had a job within three days paying me 25 cents an hour. It was a good beginning and I went from there." Even though he would endure being called "The Nazi" by his Army brethren, Sommers gladly served in the Pacific Theater of World War II. One of his jobs was calculating the trajectory for 155mm projectiles, so the officers could order an accurate

artillery strike. "I did the best I could do," Sommers said modestly. "But I want you to know, it was a trigonometry book from Germany that helped win the war. It was a lot better than the Army trigonometry book." He had his mother send him his old German textbook from high school so he could better make his calculations.

Sommers said his family history guided him into field artillery. He had a grandfather in the Prussian army and his father was also an artilleryman. "I told them in our family we only serve in field artillery," Sommers said of his enlistment. "But I was the first one to serve in the American Army."

His service took him from Hawaii to Guam, then to Leyte in the Philippines, then on to Okinawa and Japan. In the Philippines he became friendly with a local family who wanted him to marry their daughter and take over the coconut farm.

"I could have walked around in sandals and shorts all my life," he said, chuckling. "But I said no, I think I better go back home."

A new book about Sommers' life story is also planned for release around Memorial Day. "A Reluctant Hero: The Walter Sommers Story" is written by Rick Kelsheimer of Illinois, who was at the ceremony. Kelsheimer said Sommers had a kind of "Forrest Gump" life in the Army, meeting many well-known people such as journalist Ernie Pyle, while retaining his good-natured charm and love of life.

Excerpts from the original article "WWII artilleryman Walter Sommers gets his due, Terre Haute man directed field artillery in Pacific Theater" that appeared in the Tribune-Star on April 9th, 2021 written by Lisa Trigg

"I told them in our family we only serve in field artillery."

Mr. Walter Sommers



Above Left: Honorable Order of Saint Barbara Medal being placed around Walter Sommers Neck by SFC Lucas Worthington. Above: Walter Sommers telling stories from his time in service as a Field Artilleryman in the Pacific Theater during WWII with SFC Lucas Worthington from the IN ARNG. The Ceremony took place at the Terre Haute, Indiana retirement home where Sommers resides.

Mr. Wallace Bassett Gatrell, Field Artillery Lieutenant Colonel Retired, was honored with the Honorable Order of Saint Barbara on April 10, 2021 by the 65th FA BDE Utah Army National Guard for his service in WWII and Korea.

Mr. Gatrell joined the Utah Army National Guard as an enlisted member of Battery D, 2nd BN 145th Field Artillery Regiment on 02 June 1938. He served as a Battery and Battalion Supply Sergeant reaching the grade of E7 before accepting his Warrant in September 1942 and by the time of his initial separation from service in October 1945 he had reached the rank of Chief Warrant Officer in Service Battery 145th Field Artillery. The 145th Field Artillery was called into active federal service in March 1941, and Wallace served overseas during the next several years engaged in the Pacific. He also participated in the liberation of the Philippines.

After a break in service of less than six months Mr. Gatrell re-enlisted in the Army and served with the ROTC program first in Utah High Schools and then at the University of Utah. After two years he accepted a commission as a FA 2LT and joined active service with the Second Division Artillery, (Fort Lewis, WA.). In 1950 Wallace and his unit were called to the Korean peninsula where he served with distinction and was awarded the Silver Star for his singular role in saving a wounded Soldier. He was also awarded two Bronze Star medals with "V", and a purple heart for his contributions during the Korean War.



Above: LTC (R) Gatrell with Command Teams of the 145th FAR and 65th FA BDE Utah Army National Guard after receiving the Honorable Order of Saint Barbara.
Below Right: LTC (R) Gatrell with his sons, Garth and Quinn Gatrell, saluting the US Flag during the ceremony.

During his career Mr. Gatrell received several awards and decorations including Silver Star, Bronze Star, Purple Heart, Meritorious Service Medal, Good Conduct Medal, National Defense Medal, Armed Forces Reserve Medal, and other World War II and Korean campaign medals.

Mr. Gatrell served in many Field Artillery units including Second Division Artillery (Fort Lewis, WA), 148th FA (Camp Carson, CO.), 147th FA (Fort Richardson, AK.), First Cav Division Artillery (Japan), and Second Missile Command 32nd Artillery (Fort Carson, CO.). He transitioned to the Army Finance Corps while stationed at Fort Carson in

1961, and accepted a company command with the 38th Finance Disbursing Section in Germany shortly afterwards. Mr. Gatrell finished his career at the rank of Lieutenant Colonel as the Deputy Director, Financial Data Systems Directorate (Fort Eustis, VA.) in 1972.

Mr. Gatrell married Ruth Barton in 1945 and is the proud father of eight children. He received a Bachelor's Degree in accounting from the University of Utah in December 1960, and a Masters of Commerce Degree from University of Richmond in August 1968. After his military service Mr. Gatrell continued public service to the State of Utah until his retirement in 1997.

Mr. Gatrell celebrated his 100th birthday in January 2021.

Excerpts from the original article written by MAJ Chris Kroeber, UTARNG



"It's a rare opportunity to connect this generation of Soldiers with someone who represented their organization over 80 years ago. After being a part of this event, I think many of us will take an extra moment to reflect the next time we put on this uniform."

LTC Brett Anderson, Commander, 145th Battalion

Million Dollar View



A U.S. Marine Corps CH-53E Super Stallion with Marine Heavy Helicopter Squadron 464, 2nd Marine Aircraft Wing, sling loads a M777 Howitzer during an artillery raid as part of Exercise Rolling Thunder 21.2 at Camp Lejeune, N.C., April 28, 2021. This exercise is a 10th Marine Regiment-led live-fire artillery event that tests 10th Marines' abilities to operate in a simulated littoral environment against a peer threat in a dynamic and multi-domain scenario. U.S. Marine Corps photo by Lance Cpl. Brian Bolin Jr.

FA Journal Submission Guide

The Field Artillery Journal serves as the professional forum of the branch across all ranks, Marine, Army, and Civilian. We exist to inform on new developments in the Branch and winning ideas from the field. The FAJ is seeking articles and short features on past, present or future programs, equipment, tactics, techniques, procedures or other issues affecting our Branch. Approximately 40 percent of our readers are company-grade Field Artillery Soldiers and Marines. The other 60 percent is comprised of more senior-ranking Redlegs, servicemen from other branches and services, our Allies, corporate executives and politicians. We are a total-branch publication.

What to Submit:

Article submissions do not have to agree with current doctrine, official policy or approved techniques or procedures. Ask yourself how the topic is going to help the artillery community. Only unclassified information can be published in the FAJ. Articles must promote safe techniques and procedures. Be accurate, logical and complete in your writing. Submissions must be clearly written with an evident thesis, no more than 2500 words. Strive to educate, not impress. A message is most clear when written in simple language, An abundance of adjectives, adverbs and words that the reader will have to look-up detracts from the message. If possible please include graphics, charts or photographs to supplement your article.

Preferred Topics:

- Counter-fire at the DIV/Corps Level
- Targeting
- Training at homestation for LSCO
- Fires Support Issues within the EUCOM/PACOM AOR

All submissions must be emailed to director@fieldartillery.org with the subject line FAJ Article Submission. Please email submissions in an attached word doc format. DO NOT place images or graphics into the word document. Send them as attachments in jpeg, png, pdf, or eps files. Include footnotes where appropriate, though we may not publish them with the article. Also include a short biography, highlighting the experience that makes you credible as a author on that subject. Include your name, email address and phone number so that we may contact you with follow-up questions.

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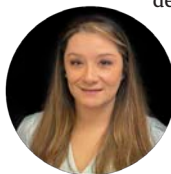
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