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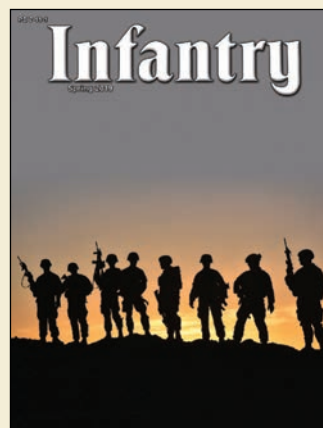
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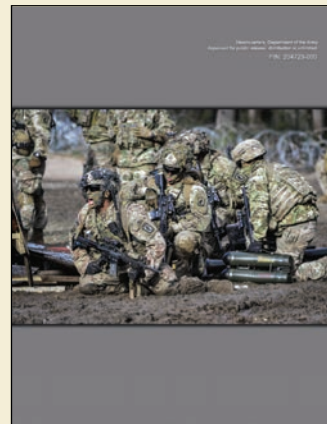


ON THE COVER:

Soldiers from Task Force Stalwart — which is comprised of Soldiers from 1st Battalion, 41st Infantry Regiment, 2nd Brigade Combat Team, 4th Infantry Division — pose for a group photo on 28 March 2018, in Afghanistan. (Photo by SFC Jasmine L. Flowers)

BACK COVER:

A U.S. Army paratrooper assigned to the 2nd Battalion, 503rd Infantry Regiment, 173rd Airborne Brigade, leads his squad into the fight during Exercise Rock Spring 19 at Grafenwoehr Training Area, Germany, on 6 March 2019. (Photo by SGT Henry Villarama)





Warfare in Megacities: *A New Frontier in Military Operations*

JOE LACDAN

In one city block, future Soldiers could find themselves in an intense gunfight with enemy militants. In another, Soldiers might crawl through debris to rescue trapped residents or deliver needed supplies. At the city's opposite end, U.S. troops could be attempting to quell a civilian riot.

As urban populations worldwide continue to rise, the probability of these scenarios increases. From the metropolitan sprawl of Tokyo with its 36 million inhabitants to the massive clutter of rush-hour traffic in Seoul, megacities present a jarringly daunting obstacle to the future of world combat operations, Army senior leaders said at the 2018 Land Forces Pacific (LANPAC) conference.

"The complexities that go on in this scale almost are unimaginable," said LTG (Retired) James Dubik, former

commander of the Multi-National Security Transition Command-Iraq.

Additionally, if current trends continue, two thirds of the world's population will reside in large-metropolitan areas, according to United Nations projections. Threats to megacities take increased importance in the Asia-Pacific region, where a majority of the world's megacities are concentrated.

Making matters worse, many of the cities sit inside the Ring of Fire, a 25,000-mile chain in the Pacific basin rampant with volcanic eruptions and unpredictable seismic activity. Some nations, such as Japan, sit on one of the most-active tectonic plates in the world. Densely populated cities like Bangkok and urban centers in Bangladesh are prone to natural disasters.

U.S. forces scarcely encountered operations in megacities in World War II or the Korean and Vietnam Wars.

"The challenge of megacities is unlike [anything] we've had to deal with in history," said Dr. Russell Glenn, G-2 director of Plans and Policy at U.S. Army Training and Doctrine Command (TRADOC).

With so much of a nation's population living in a compact, urban space, megacities pose a vastly different challenge from the deserts of the Middle East Soldiers have grown accustomed to.

U.S. Army Soldiers conduct actions on an objective during a training scenario at the Asymmetric Warfare Training Center on 23 February 2018 at Fort A.P. Hill, VA. The week-long training provides Soldiers with methods they can use to get through various obstacles on future objectives.

Photo by SGT Randis Monroe



“Every act you do in a city reverberates,” said GEN Stephen Townsend, TRADOC commander, who spoke via video teleconference at LANPAC.

Military units in rural areas, deserts, and small villages can contain the after effects of combat. In a large urban environment, skyscrapers, large structures, and traffic can cause a domino effect that spreads throughout a city.

Glenn added that smaller subsystems comprise a megacity that in turn is part of a much larger system that can extend worldwide.

A New Kind of War

To prepare for the complexities of urban warfare, TRADOC has created simulations for Soldiers to prepare for urban terrain. Weeks of coordination and planning must be implemented for a few hours of training, but Army leaders believe it will prepare Soldiers for future conflicts. Townsend said the Army has considered increasing the scale and size of their urban-simulated training centers. He added facilities can never match the scale needed to truly simulate warfighting in a megacity environment.

“Our simulations have not kept up with changes in our formations — changes in warfare,” Townsend said. “So we’ve got to advance our simulations.”

In March 2018, paratroopers from the 82nd Airborne Division spent about a month training for combat in underground tunnels and structures at Fort A.P. Hill, VA. They simulated chemical attacks. Soldiers learned to spontaneously alter current operating procedures to adapt to a city environment.

The Army has been working on a synthetic training environment to bolster its capabilities while also incorporating space and cyber capabilities more than before. Multi-domain operations will be crucial, commanders said.

Urban “Flow”

No amount of planning, study, or preparation can prepare a military unit for the unique rhythm of a major city or what Townsend labeled the “flow.” The city’s flow can’t be clearly defined, but its impact can never be understated, he said. It can be felt during rush-hour traffic or by careful observation over time.

A city’s social infrastructure carries more importance than its physical infrastructure, noted Glenn, but understanding how a megacity’s population moves and lives can provide valuable insight for learning a city’s unique intricacies.

To better understand a city’s flow, Townsend said the Army must consult with a city’s police force, fire department, and its citizens. Recently, the Army held a panel discussion in New York City to discuss logistics and how a force might handle the environment’s unique challenges through interagency cooperation. U.S. Army Pacific Commanding General GEN Robert Brown, Townsend, and New York City Police Commissioner James O’Neill joined the panel.

“The point that came through... more clearly emphasized more than any other was the need to understand our partnership,” Glenn said. “Take advantage of those military and civilian (relationships), only then can we fully understand the environment that we’re working in.”

Glenn said that if wartime conditions necessitate it, a military unit can impose or alter flow, so long as it benefits the friendly population and minimizes friction.

Mosul Opened the Door

The July 2017 recapture of Mosul from ISIS forces presented perhaps a blueprint for the future of urban warfare.

As the commander of the Combined Joint Task Force in Iraq, Townsend said he observed firsthand strategies the Iraqi army used to regain control of the city. Townsend believes potential adversaries noticed, too.

“I think the enemy has watched Mosul,” the general said. “I think they will deliberately go to the cities and dig in there to fight because they know it takes away a lot of our technological advantages... the range of our weapons is degraded — the effects of our weapons are degraded. So I think we’re going to see battle in megacities and there’s little way to avoid it.”

Townsend saw the difficulties of urban warfare in the northern Iraqi city which has a population of less than one million. His unit’s command and control (C2) systems lagged and struggled to keep pace with the conflict. He said digital maps and imagery were impacted.

“The urban landscape changes so rapidly,” Townsend said. “Our C2 systems, our targeting systems... became outdated quickly because the urban landscape was changing faster than we could update our imagery.”

Growing Threat

By 2030, the UN predicts the world’s 30 megacities will also double to 60. Large-scale cities will increase from 45 to 88. America’s potential enemies will take advantage of this trend.

“Wars are basically won or lost where the people are — where the population is,” Townsend said.

The Army’s solution: better training, preparation, and greater trust. At TRADOC, more Soldiers are receiving training in an urban environment. Soldiers must also learn to trust, not only first-responding agencies but accepting greater responsibility, Townsend said.

“As powerful as our mission command systems are, they are all challenged by the environment — the complex terrain that is a city... modern city,” Townsend said. “You can’t go more than one floor deep without losing [communication] with everybody who’s up on the surface. So this whole notion of conveying commanders’ intent, and empowering subordinates... to achieve that commanders’ intent, and trusting them to do that is exactly how we’ll have to fight in even small cities.”

Soldier Center Tests New Boots

RDECOM SOLDIER CENTER PUBLIC AFFAIRS

The U.S. Army Research, Development and Engineering Command (RDECOM) Soldier Center at Natick, MA, is testing new Army Combat Boot (ACB) prototypes at three different basic training and active duty installations over the next four months. The effort will gather Soldier feedback toward development of improved footwear.

The Army's current inventory of boots includes seven different styles designed for different environments and climates. The boots issued initially to recruits are the Hot Weather and Temperate Weather ACBs. Requirements for these are managed by the Army Uniform Board as part of the recruit "Clothing Bag." The Program Executive Office (PEO) Soldier's Project Manager Soldier Protection and Individual Equipment maintains and updates the specifications for both boots.

The current generation of ACBs has not undergone substantial technical or material changes since 2010. New material and technologies now exist that may improve physical performance and increase Soldier comfort.

"Great strides have been made recently in the Army's environment-specific footwear for jungle, mountain, or cold-weather locations, but there is substantial room for improvement in the general-purpose boots which are issued to new recruits," explains Anita Perkins, RDECOM Soldier Center footwear research engineer and technical lead for the ACB improvement effort. "Most components of these combat boots have not been updated in almost 30 years."

Surveys conducted by the Soldier Center report Soldier satisfaction with ACBs is lower than that with commercial-off-the-shelf (COTS) boots, leading many Soldiers to purchase and wear COTS boots.

"The survey of over 14,000 Soldiers worldwide discovered that almost 50 percent choose to wear COTS combat boots instead of Army-issued boots," Perkins said. "Many Soldiers reported choosing combat boots from the commercial market because the COTS boots are lighter, more flexible, require less break-in time, and feel more like athletic shoes than traditional combat boots or work boots. Unfortunately, these characteristics often come at the cost of durability and protection."

The Soldier Center's Footwear Performance Team believes new technologies can bridge the gap between the lightweight, comfortable, COTS boots and the durable, protective Army boots. Recent advancements in synthetic materials and rapid prototyping can produce a boot with potentially the same protection, support, and durability of current Army boots, but



Photo by MSG Matt Hecht

A U.S. Army Soldier from the 1st Battalion, 114th Infantry Regiment stands in the mud holding 7.62mm ammunition during M240 machine-gun training on Joint Base McGuire-Dix-Lakehurst, NJ, on 6 November 2018.

lighter and more comfortable out of the box. To reach this goal, the Soldier Center is evaluating new types of leather and even some man-made materials which are much more flexible than the heavy-duty, cattle-hide leather used in the current boots.

"Also included in the prototypes we are testing are new types of rubber and outsole designs, which are more than 30-percent lighter than the outsoles on the current boots," said Al Adams, team leader for the Soldier Clothing and Configuration Management Team at the Soldier Center.

The test boots will be fitted and fielded to 800 basic trainees at Fort Leonard Wood, MO, and Fort Jackson, SC, followed by 800 pairs going to Infantry Soldiers at Fort Bliss, TX. The Soldier Center team will be hand-fitting each pair of prototype boots throughout the month of January and then return in March and April to collect surveys and conduct focus groups to gather specific feedback.

"Soldiers live in their boots and many will tell you that there is no piece of equipment more important to their lethality and readiness," said Adams. "A bad pair of boots will ruin a Soldier's day and possibly result in injuries, so we really believe that each of these prototype boots [has] the potential to improve the lives of Soldiers."

Lab testing will also be conducted on the boots at the Soldier Center to quantify characteristics like flexibility, cushioning, cut/abrasion resistance, and breathability.

Read the complete article at: https://www.army.mil/article/215893/soldier_center_tests_new_army_combat_boot_prototypes.

Army Snipers Field Test More Accurate, Ergonomic Rifle

MAJ MICHAEL P. BRABNER

Eight snipers with the 2nd Infantry Brigade Combat Team (IBCT), 4th Infantry Division recently field tested an upgrade to the Army's sniper rifle in the shadows of the fabled Rocky Mountains at Fort Carson, CO.

Engineered as an upgrade to the M110 Semi-Automatic Sniper System, the Compact, Semi-Automatic Sniper Rifle (CSASS) was redesigned to enhance a Sniper's capability to perform missions with greater lethality and survivability, according to MAJ Mindy Brown, CSASS test officer with the U.S. Army Operational Test Command (OTC) at Fort Hood, TX.

Upgrades being tested include increased accuracy, plus other ergonomic features like reduced weight and operations with or without a suppressor. Brown said the purpose of the operational test is to collect performance data and Soldier feedback to inform the Army's procurement decision regarding the rifle.

"We do this by having the snipers employ the system in the manner and the environment they would in combat," Brown said. "In doing this, we achieve a twofold benefit for the Army as we test modernization efforts while simultaneously building unit — or in this case — sniper readiness."

She went on to explain how the 2nd IBCT snipers stressed the rifles as only operators can during the 10-day record test. The snipers fired 8,000 rounds from various positions while wearing individual protective and tactical equipment



Courtesy photos

A sniper team fires the M110E1 Compact, Semi-Automatic Sniper Rifle in mission-oriented protective posture (MOPP) gear.

as well as their Ghillie suits and cold-weather gear.

To also test how the CSASS allowed snipers to shoot, move, and communicate in a realistic combat environment, they also executed situational training exercise (STX) force-on-force missions in what they described as "the best sniper training they'd received since attending Sniper School at Fort Benning, GA."

The 2nd IBCT snipers really pushed each other, testing the CSASS in what evolved into a competitive environment on the ranges.

"Despite single-digit frigid temperatures, gusting winds, and wet snow, the snipers really impressed me with their levels of motivation and competitive drive to outshoot each other," said SFC Isidro Pardo, CSASS Test Team NCOIC with OTC's Maneuver Test Directorate.

While OTC celebrates its 50th Anniversary, 2nd IBCT snipers and OTC's CSASS Test Team are a testament to the importance of the half century relationship between the operational force and the test community.

"As we move into a period of focused modernization, now more than ever, that relationship is decisive to ensuring only the best materiel capability solutions make it into the hands of the men and women in uniform serving on the front lines around the world and at home," Brown said.



A test sniper engages targets identified by his spotter while wearing a Ghillie suit during the Compact, Semi-Automatic Sniper Rifle operational test at Fort Carson, CO.

10th Mountain Soldier Posthumously Receives MoH

SEAN KIMMONS

A 10th Mountain Division squad leader credited with saving the lives of three of his Soldiers by throwing himself atop a suicide bomber posthumously received the Medal of Honor on 27 March.

SSG Travis W. Atkins went above and beyond the call of duty on 1 June 2007 while his unit — Delta Company, 2nd Battalion, 14th Infantry Regiment, 2nd Brigade Combat Team — conducted route clearance southwest of Baghdad.

During the mission, Atkins, 31, of Bozeman, MT, heard a report over the radio of suspected insurgents crossing an intersection in the Iraqi town of Abu Samak.

As the truck commander in his Humvee, Atkins ordered the driver to pull the vehicle up to the intersection so they could interdict the suspected insurgents. Once stopped, Atkins exited the vehicle and approached one of the men to check him for weapons while another Soldier covered him.

When Atkins attempted to search him, the man resisted. Atkins then engaged in hand-to-hand combat with the insurgent, who was reaching for an explosive vest under his clothing, according to an award citation.

Atkins then grabbed the suicide bomber from behind with a bear hug and slammed him onto the ground, away from his Soldiers. As he pinned the insurgent to the ground, the bomb detonated.

Atkins was mortally wounded by the blast. With complete disregard for his own safety, he had used his own body as a shield to protect his fellow Soldiers from injury. They were only feet away. Soon after, another insurgent was fatally shot by one of Atkins' Soldiers before he could detonate another suicide vest.

For his actions, Atkins was initially given the Army's second-highest award, the Distinguished Service Cross. Now that award has been upgraded to a Medal of Honor.

Before he joined the Army, Atkins worked for concrete and painting contractors and as an engine mechanic in Montana. He enlisted into the Infantry in 2000, and less than three years



later he deployed to participate in the invasion of Iraq.

Atkins left the Army in late 2003, but he rejoined two years later and was assigned to the 10th Mountain Division. He deployed to Iraq again with the division in the summer of 2006 and became a staff sergeant in May 2007, a month before his death.

At Fort Drum, NY, the division honored Atkins by naming a fitness center after him in 2013. During the dedication ceremony, then-SGT Aaron Hall, who was Atkins' battle buddy, described the staff sergeant as a "quiet professional" who always had the respect of others.

"When my 4-year-old son Travis tells me his favorite superhero is Captain America and asks me who my favorite superhero is, my reply always has and will be Staff Sergeant Travis W. Atkins," Hall said.

According to his obituary, Atkins was also known to hunt, fish, camp, and ride snowmobiles. His first love, though, was his son, Trevor Oliver, who was 11 years old at the time of his father's death. Atkins was buried in his hometown of Bozeman in south-central Montana on 12 June 2007. He is also survived by his parents, Jack and Elaine Atkins.

Read more about Atkins at <https://www.army.mil/medalofhonor/atkins>.

Army Looking for Optionally Manned Fighting Vehicle

DEVON L. SUITS

A request for proposal for the Optionally Manned Fighting Vehicle (OMFV) went out to industry on 29 March, sent by the Next-Generation Combat Vehicle (NGCV) Cross-Functional Team (CFT).

The OMFV is considered to be a replacement for the Army's aging Bradley Fighting Vehicle.

"The next generation of combat vehicles will close the last tactical mile, giving our Soldiers a position of advantage," said BG Ross Coffman, NGCV CFT director.

"Our combat vehicles will have the ability to transition through those disruption zones with lethality and survivability ... [and] mobility, to be able to fight the enemy on our terms, and become victorious," Coffman said.

Lethality, survivability, and mobility continue to be at the forefront of the new OMFV program, Coffman said. However, the new system's requirements will be based on "attainable" technologies, rather than sinking countless amounts of money into an "unattainable" system.

Adding excessive features to the new OMFV program is something the CFT is trying to avoid, he said. Further, the Army seeks the option to pack two OMFVs in one C-17 aircraft.

OMFV proposals will be due this fall, Coffman said. The Army plans to down select to two candidates.

Experiments for Robotic Controlled Vehicles

In fiscal year (FY) 2020, the Army plans to start experimenting with a government-led Robotic Controlled Vehicles (RCV) program, Coffman said.

"We're doing these experiments to test a series of hypotheses," he said. "I always emphasize it is an experiment. While I am an advocate, probably the No. 1 champion, that [believes] robots will change the way that we will fight combat in the future — we owe it to the Army, taxpayers, and everyone to make sure that this is a prudent step forward."

Currently, the Army is testing the RCV concept through the Synthetic Training Environment. These virtual experiments will

inform the final vehicle requirements, Coffman said.

This fall, the CFT is slated to house a "robot rodeo," Coffman said. The team is asking industry partners to bring their robots so that the Army can determine "what is in the realm of the possible."

Looking ahead to FY 2020, the Army's first experiment will focus on platoon-level operations, he said. During the scenario, Soldiers operating out of "two surrogate vehicles" will control a set of robots that bear a resemblance to the M113 armored personnel carrier.

"The two surrogate vehicles will have four Soldiers in the back... and there'll be two Soldiers controlling one robot. One will be driving [the RCV] and the other will be controlling [the vehicle's] payload."

"We're going to test cognitive load on the Soldiers... and at what operational distances we are able to conduct operations. [The Army is focused on] the tactics, techniques, and procedures, and what we want to use moving forward," he added.

Read more at: https://www.army.mil/article/219383/army_looking_for_optionally_manned_fighting_vehicle.



Photo by SGT Jamar Marcel Pugh

A Soldier guides a M2A3 Bradley Fighting Vehicle during an exercise in Bulgaria on 23 August 2018. The Next-Generation Combat Vehicle Cross-Functional Team recently released a request for proposal for the Optionally Manned Fighting Vehicle.



Enable the Fight:

HHC's Role in Supporting SbT and CWMD Operations

CPT MATT HEPINSTALL

The Korean Theater of Operations (KTO) offers a unique and challenging mission set that conventional forces rarely train on: subterranean (SbT) operations. While this concept is nothing new to the armed forces throughout the ages, the Democratic People's Republic of Korea (DPRK) adds a near-peer military threat to the equation. The DPRK has spent the last 70 years building and improving its military-grade underground facilities capable of housing men, weapons (to include weapons of mass destruction [WMD]), and equipment on a national scale.

Over the past nine months, the 2nd Battalion, 7th Infantry Regiment executed various validation exercises focused on SbT and countering weapons of mass destruction (CWMD) operations. The battalion developed a series of tactics, techniques, and procedures (TTPs) and standard operating procedures (SOPs) that are specific to SbT operations. The headquarters and headquarters company (HHC) is the command and control node for all enablers and battalion assets staged on the surface objective in a SbT operation. The HHC must shift its focus from the traditional combat trains command post (CTCP) in the rear to support battalion operations in the

front and near the portal entrance of the underground facility (UGF). This would allow the UGF commander, who is in charge with the clearance of the UGF, to focus on the environmental and enemy threats within the UGF and not become distracted with managing the various enablers staged on the surface objective. This article will discuss three key tasks the HHC and its commander fulfill during SbT operations.

Key Task #1: Understand the Commander's Intent and the Maneuver Plan

The first task of the HHC commander is to understand the commander's intent and the maneuver plan. A clear understanding of the two allows the HHC commander to anticipate potential friction points and provide real-time enabler support to minimize any kinetic enemy or environmental threats. For any given CWMD task force mission, the battalion could be task organized as such:

- X Company (SO1) is responsible for establishing the outer

Soldiers from the 1st Armored Brigade Combat Team, 3rd Infantry Division complete subterranean operations training in Korea. The Raider Brigade deployed to Korea as part of a regularly scheduled rotation of forces supporting the 2nd Infantry Division.

Photo by MAJ Pete Bogart



cordon and isolating the objective;

- Y Company (SO2) is responsible for clearing the surface objective and securing any portals; and
- Z Company (DO) is responsible for clearing the UGF.

SbT operations are executed in phases, with each company needing to accomplish its mission to allow the underground clearance force (Z Company) the freedom of maneuver. Once the HHC commander has a firm understanding of the battalion mission, the next step is to set the conditions on the surface objective.

Key Task #2: Setting the Conditions on the Surface Objective

SbT operations often require a massive amount of enabler support, personnel, and equipment. This requirement can cause the surface objective to get extremely congested if the HHC commander is not present to set the conditions. To set the conditions on the surface objective, the HHC command node (think of a modified light CTCP) will align itself with the tactical command post (TAC). The HHC command node and TAC will occupy the surface objective once Company Y clears it. Co-locating the HHC command node and TAC will allow the HHC commander to manage the enablers on the surface objective and free the TAC to battle track the operation and conduct combined command post (CP) operations with any Republic of Korea (ROK) forces. Once the HHC establishes its command node, the HHC commander must ensure the enablers attached to the battalion are in a position on the surface objective where they will be most useful to support the clearance operation.

Enablers can consist of but are not limited to: hazardous assessment platoon (HAP), chemical response team (CRT), troop decontamination assets, Military Police for detainee collection and interrogation, human intelligence (HUMINT) team, signal intelligence (SIGINT) team, low-level voice intercept (LLVI) team, host nation military personnel, and main aid station (MAS)/forward aid station (FAS) operations. It is imperative that the HHC command team set the conditions by deconflicting time and space with all assets during the setup of the surface objective. All deconfliction of enabler placement on the surface objective needs to be completed before the breaching of the UGF.

Key Task #3: Enabler Management

The next step for the HHC commander is enabler management on the surface objective. At this point in the operation, the HHC commander owns all the enablers on the surface objective. He is responsible for pushing the enablers to the UGF commander as well as coordinating for the movement of combatant and noncombatant detainees from the UGF to holding facilities. HUMINT and SIGINT teams will need to have space to interrogate the detainees, and all intelligence must be passed to the combined CP in a timely manner. All classes of supplies will need to be brought to the portal entrance. Nuclear, biological, chemical (NBC) equipment will need to be swapped out every 24-48 hours. CRT and HAP personnel must be kept

aware of the SbT clearance progress to allow enough time to turn on and test their equipment before entering the UGF for assessment and exploitation. It is important to remember that personnel moving to and from the UGF will potentially need to be decontaminated if there is a chemical, biological, radiological, nuclear, and explosives (CBRNE) threat. With all these moving pieces, the role of the HHC commander is to take care of all of the surface operations to allow the UGF commander to remain focused on the underground fight.

The most complicated part of enabler management is the medical support. Casualty collection and transportation are extremely difficult in a SbT operation, and the HHC first sergeant (1SG) plays a critical role in facilitating evacuation to the Role 1. The UGF company will only have enough resources to move casualties to the portal entrance; therefore, casualty evacuation (CASEVAC) from the portal entrance to Role 1 is the responsibility of HHC, which requires coordination. If CBRNE exposure occurs, then patient decontamination must be established along the route. This is a massive undertaking requiring five stations, 25-plus Soldiers, and 10-plus medics — all in full mission-oriented protective posture (MOPP) gear — stretched over a 300-meter area. The decontamination lane can facilitate up to five Soldiers at once and can take 30 minutes per person to complete on average. It is imperative that the HHC 1SG manages the patient flow from UGF to surface casualty collection point to Role 1 to allow the UGF 1SG to focus on his duties in the UGF.

Conclusion

The HHC provides an integral role in SbT operations. From receipt of the mission, the HHC commander must be able to fully understand the commander's intent and the maneuver plan to anticipate friction points and deploy the enablers when and where they are most needed. Once the surface objective is cleared, the HHC commander must set the conditions by establishing all enabler support positions. The HHC commander must take control of all enablers on the surface objective and stage them in an area that is most advantageous to the underground fight. Finally, the HHC commander must manage all enabler movements on the surface objective throughout the operation. Having the HHC commander accomplish these key tasks will allow the SbT commander to focus on the kinetic and environmental threats within the UGF and the battalion to concentrate on battle tracking the fight rather than fighting the enablers.

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Transitioning from Mechanized to Light Infantry in Support of SbT CWMD Operations

CPT BERNARD WHEELER

As the 2nd Infantry Division's Countering Weapons of Mass Destruction (CWMD) Task Force (TF), the 2nd Battalion, 7th Infantry Regiment received a unique mission set while deployed to the Republic of Korea as part of the Regionally Aligned Forces (RAF). The battalion was tasked to maintain its mechanized capabilities but also be able to fight as a light infantry battalion that is air assault capable. During the nine-month deployment, the battalion went through a series of changes within its formation to meet this mission requirement and conducted various validation exercises under different unit configurations. At the end of the deployment, 2-7 IN proved itself as an effective CWMD TF capable of deploying in various configurations to conduct subterranean (SbT) operations under chemical, biological, radiological, nuclear, and explosives (CBRNE) threats. This article will discuss three unique challenges that the battalion encountered throughout the transformation as a CWMD TF in task organization, equipment, and training.

Task Organization

The battalion arrived on the peninsula as a lethal

mechanized force capable of mounted maneuvers. The mission set, however, called for the battalion to also be able to fight as a light infantry battalion. Within the mechanized companies, Bradley fighting vehicle (BFV) crews were reassigned to create an additional weapons squad that consisted of three-Soldier 240B weapon teams (gunner, assistant gunner, and ammunition bearer). Additional Soldiers from the mounted crews were made into a fire team. NCOs from the mounted crews were assigned as the weapon squad leader and team leaders. At the end of the force realignment, each of the two mechanized companies had two configurations: a light infantry configuration which consisted of three rifle platoons and the mechanized configuration of 14 BFVs with dismounts.

Equipment

To be able to deploy as a light or mechanized force was not enough to meet the mission requirement as the CWMD TF. The mission required each of the infantry companies within the battalion to be able to traverse the complex terrain in the Korean Theater of Operations (KTO), endure the harsh Korean weather (extreme heat and cold conditions), and conduct SbT



Photo by CPT Bernard Wheeler

Soldiers in the 2nd Battalion, 7th Infantry Regiment complete subterranean operations training in Korea.

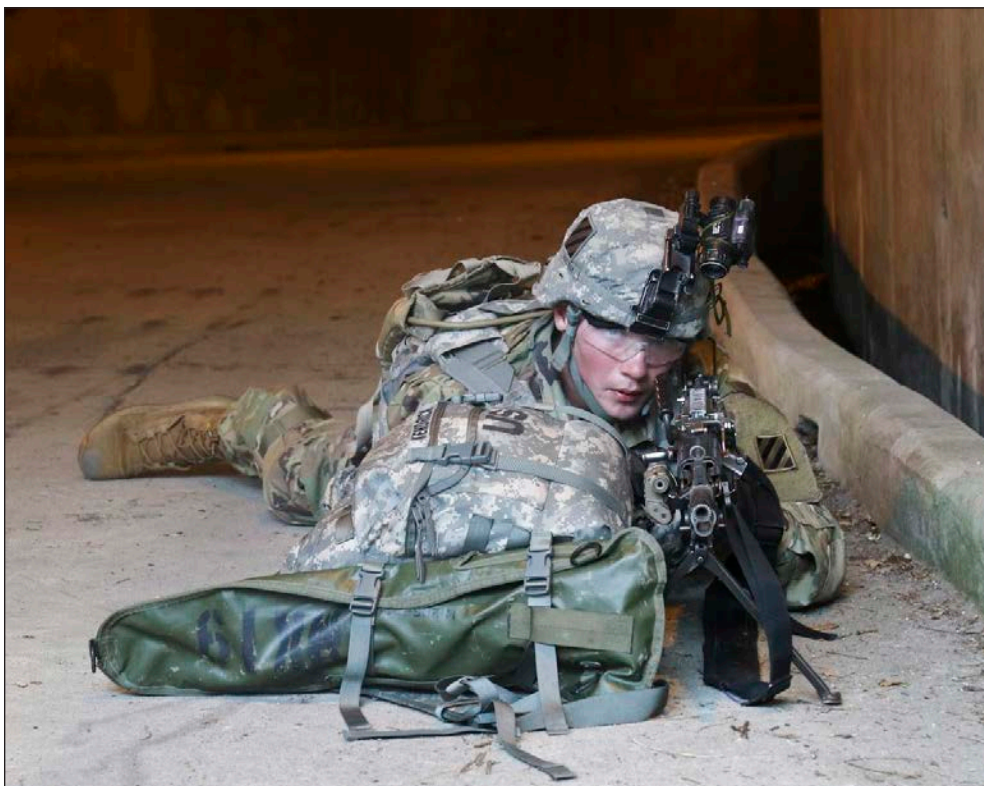


Photo by MAJ Pete Bogart

An Infantryman with the 2nd Battalion, 7th Infantry Regiment, 1st Armored Brigade Combat Team, 3rd Infantry Division, pulls security during urban operations training in Korea.

operations in mission-oriented protective posture (MOPP) gear with CBRNE threats. Throughout the various training events and validation exercises, the companies identified a list of useful equipment best suited for SbT operations as well as some capability gaps. We found that mesh network radios such as the MPU5s are more effective in SbT operations to counter the restrictive line of sight (LOS) in an underground facility (UGF). Weapon lasers and lights such as the Modular Advanced Weapon Laser (MAWL) are ergonomic, easy to operate, and extremely effective under limited visibility or no-light situations.

Every ounce counts in SbT operations under MOPP conditions. The longer Soldiers can sustain themselves in MOPP 4, the quicker they can move, and the wider the range of motion they have will help them survive and stay effective in SbT CWMD operations. We found that the medium-framed rucksack is more effective than the large rucksack or the assault pack. Plate carrier is more effective than body armor such as the Improved Outer Tactical Vest (IOTV). To retain organic indirect firing capabilities, we found that 60mm mortars are more effective than the modified table of organization and equipment (MTOE) 120mm mortars because of the need to limit the damage to the UGF with organic indirect firing assets, especially with the presence of WMD material on site.

Training

As a mechanized infantry battalion in an armored brigade

combat team (ABCT), the companies were trained to close with and destroy the enemy as a mounted force with dismounted infantry support with extreme aggressiveness. Leaders and Soldiers are ingrained with the concept of mass: overwhelming the enemy with fire and maneuver. We soon realized that this same approach could not be applied to SbT CWMD operations. There needed to be a mentality change to the way we approached UGFs, and Soldiers and leaders had to train on this new approach. It all begins with the mindset, complemented by training on the various specialty equipment unique to SbT CWMD operations. Clearing a UGF is an extremely deliberate operation. We found that making enemy contact with the smallest element possible is the best approach. This is because our forces are contested by two enemies: the kinetic force defending the facility and the environment itself. Contact is made as soon as our Soldiers enter the UGF, and our leaders and Soldiers

must be trained to understand this invisible enemy. We were trained on various detection devices and robots, which enabled the lead element to access the environment before entering the UGF. Leaders were trained to exercise tactical patience; continually assess the environment and enemy presence; protect Soldiers against enemy forces, the environment, or the CWMD material; and accurately and rapidly report to echelon in supporting assets as they advance into the UGF.

The 2-7IN was presented with a unique challenge during our nine-month deployment as a CWMD TF in Korea. We maintained our proficiency in mounted maneuvers as a mechanized force, task-organized into a light infantry battalion capable of air assaulting anywhere on the peninsula, and trained for additional capabilities as a CWMD TF capable of SbT operations. The battalion overcame challenges in task organization and became a robust force on the battlefield. We tested various equipment for SbT operations and identified capability gaps. Lastly, leaders and Soldiers executed an aggressive training glide path which changed the way we view and approach the SbT CWMD problem set.

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Organizing an Infantry Company for a SbT CWMD Environment... A Way

CPT CHARLIE FULTON

The Korean Theater of Operations (KTO) is a wildly complex operating environment. Organizing for combat in the KTO requires a different approach than conventional infantry tactics. Close quarters battle is a complex and strenuous environment to operate in on its own. Layer on CBRNE (chemical, biological, radiological, nuclear, and explosives) threats, poor air quality, loss of line-of-sight (LOS) communications, and zero ambient light, and you start to realize just how challenging the subterranean (SbT) environment can be. It forces leaders and Soldiers to be versed on much more than just tactics.

Fighting underground necessitates that units find a battle rhythm and are well rehearsed so that decision making can focus on environmental factors. To have that level of expertise within our formations is much easier said than done. Asking the 20-year-old specialist who is carrying a rifle, a shotgun, a chemical detector, protective mask, mission-oriented protective posture (MOPP) gear, marking equipment, medical equipment, ammunition, and body armor to also be able to operate a robot, know how to map a facility, conduct immediate decontamination, and understand/identify indicators of weapons of mass destruction (WMD) and CBRNE threats under night vision is just too much to ask of our "trigger pullers." To truly enable our personnel to build expertise, we have to limit how much we ask them to do. Assigning a team with one additional task to master is much more practical. This is the reason for the creation of company-level countering weapons of mass destruction (CWMD) standard operating procedures (SOP).

It is an effort to rapidly get to a proficient level in something that doctrine has not been able to keep up with. Units rotating to the KTO are expected to "fight tonight," but without building on a previous rotation's experience, this is not possible and undoubtedly degrades readiness. Our way of organizing an infantry company for combat in the SbT CWMD environment



Photos by CPT Bernard Wheeler

Soldiers in the 2nd Battalion, 7th Infantry Regiment complete subterranean operations training.

offers a starting point to increase task force lethality and proficiencies in the KTO by providing a specific set of tasks distributed among a specialty platoon and two assault platoons. In this article, we will explore each specific platoon's responsibilities when organizing for SbT operations.

In a SbT CWMD environment, there are many critical skills required — more than we can expect our Soldiers to master. A few examples include CBRNE detection and assessment, air quality assessment, mapping, breach, and decontamination. Typically, we like to build redundancy in our formations for teams that are required to complete key tasks on an objective (for example, enemy prisoner of war [EPW], aid and litter, etc.). This redundancy provides commanders and subordinate leaders flexibility by ensuring there are multiple people capable of providing a specific capability or performing a specific task. In the KTO, we must be able to fight both the CBRNE environment and enemy combatant forces. Expecting our Infantrymen to execute all this to any level of proficiency is unrealistic within such a short period of time as expected with rotational forces. After all, that is why there are military occupations specialized to handle such jobs. In order to protect ourselves and make sure

we can maintain the initiative no matter the environment, we must train our Soldiers on the specific equipment that is unique to SbT operations and CWMD hazards. To enable Soldiers to acquire such technical skills in a short period of time, on top of their primary duties, we found success in standardizing all the special teams across a company by habitually tasking platoons with the same mission to generate subject matter experts across a CWMD task force (TF).

The Specialty Platoon - Breach

The first platoon in the SbT company is the specialty platoon. They have three specified tasks. First, they conduct a breach on the exposed portal (identified by the surface force) either with organic equipment or with the support from attached enablers. After the breach, this platoon is tasked with gaining the initial foothold on the SbT objective. If there is a known or suspected CBRNE threat, the platoon must be prepared to conduct an assessment of the environment. This task requires experts capable of operating Joint Chemical Agent Detectors (JCADs), UDR and VDR radiac detectors, oxygen monitors, and even robotic equipment while wearing the appropriate MOPP gear. This platoon is further broken down so that specific teams are responsible for one type of detector, not all. One team is tasked with radiological and the other with chemical. The last specified task for this platoon is to provide security to the TF enablers as they are attached to the company. The platoon conducts



Soldiers in the 2nd Battalion, 7th Infantry Regiment move down a tunnel during subterranean operations training.

initial link up and provides an element to escort enablers on the objective as well as to and from the different platoons. Standardizing these tasks so that the platoon conducts them during every operation allows the Soldiers the repetition and experience needed to provide feedback on the SOP/tactics, techniques, and procedures (TTPs).

The Assault Platoon – Initial Clear

Second and third platoons are both assault forces tasked to clear. They conduct a forward passage of lines with the lead element and begin or continue the clearance of the facility. Clearance of an underground facility is more complicated than clearance of a surface objective. It is much more deliberate due to the likeliness of CBRNE hazards. There is more emphasis on the environmental threats, not just the kinetic enemy threat(s). The pace of clearance has to be sustainable so that the assault force can close with and destroy the enemy, all while being careful not to outrun its detection equipment. Special equipment like robots helps maintain the appropriate pace and provide early warning against both the enemy and environmental factors if fitted with the proper detectors. Much like the specialty platoon, each team within the assault platoon is dedicated to either chemical, radiological, or explosive detection using a variety of specialized equipment. While they must have a base knowledge of detector functionality, the real expertise for the clearing force resides with the clear understanding of the indicators associated with each threat that Soldiers could encounter. Specifically, if there are any CBRNE production, weaponization, storage materials, or other indicators, the TF would need to request a CBRNE enabler (such as a hazard assessment platoon or chemical response team) to further exploit. There are limited numbers of these specialized enabler teams. Therefore, understanding threat indicators on an objective and having the ability to accurately report are primary tasks of every element within the CWMD TF.

Headquarters – Mission Command

The primary role of the HQ is to provide command and



Soldiers in the 2nd Battalion, 7th Infantry Regiment enter a room during subterranean operations training.



SbT Lessons Learned by 2-7 IN in the KTO

control (C2) and liaise to higher headquarters for coordination of enablers. Leader placement is therefore essential due to the communication challenges the SbT environment presents to LOS radios. Company headquarters elements have more flexibility for leader placement and how to provide C2 on SbT objectives. Since the kinetic fight in SbT operations centers at the squad level, the company commander and the headquarters can move to the point of friction to provide C2 for the entire objective rather than maneuvering platoons.

Attached enablers frequently exceed the reasonable span of control of the maneuver unit during SbT operations. This task requires someone's full attention. Assigning the executive officer or fire support officer as the chief of enablers is a useful technique to maintain an appropriate span of control within the company. This is necessary for cross-coordination between the surface and sub-surface companies. Ultimately, leader placement and span of control are the most critical decisions to effective C2 of the objective.

In closing, the terrain in the KTO is wide-ranging and includes everything from restrictive mountains to dense urban areas to SbT facilities. These are all arduous challenges for military operations on their own, but in Korea what makes it even more challenging is layering these with the presence of CWMD threats. During the Raider Brigade's rotation to Korea,

we identified the vast amount of technical knowledge required of Soldiers to conduct the CWMD mission and SbT operations later than we care to admit. We learned the hard way that a task force must be able to close with and destroy the enemy as well as detect CBRNE threats, conduct initial CBRNE assessments and decontamination, operate with zero ambient light, communicate where LOS equipment does not work, map facilities, and escort enablers. We developed a specific task organization for a company to execute these operations underground, which distributed tasks all the way down to the fire-team level. Soldiers not only need to be prepared to fight the enemy tonight, but they must also operate in complex environments where CBRNE threats are just as dangerous as the enemy combatants. These skills are not frequently focused on during collective training cycles by conventional mechanized units, yet they are critical to allowing RAF units to "fight tonight" on the Korean peninsula.

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Photo by MAJ Pete Bogart

Soldiers from the 1st Armored Brigade Combat Team, 3rd Infantry Division complete subterranean operations training in the Republic of Korea. The Raider Brigade deployed to Korea as part of a regularly scheduled rotation of forces supporting the 2nd Infantry Division.



Training for the Right Fight

CPT JUSTIN D. LANE

The mission of the U.S. Army is to “fight and win the nation’s wars through prompt and sustained land combat, as part of the joint force.”¹ Maneuver leaders do this by “training Army forces for prompt and sustained combat incident to operations on land.”² The doctrine, techniques, and procedures which are used to train maneuver warfighters, then, must be sufficient to prepare them to achieve the Army’s mission to fight and win wars. Laser-like focus on maneuver live-fire training and Combat Training Center (CTC) rotations prevent Infantrymen from mastering fundamental skills. This ultimately reduces the light fighter’s capacity to fight and win wars. The Army cannot fight and win in a complex world unless the development of experts is made a priority in unit training plans designed to prepare units for their specific missions.

To illustrate the challenges associated with current practices allow me to describe a traditional combined arms live-fire exercise (CALFEX) progression. Soldiers employing the M4 Carbine must complete:

Table I: Preliminary Marksmanship Instruction;

Table II: Pre-Live-Fire Simulations;

Table III: Drills (Pre-Combat Checks, Load, Carry Positions,

Fight Down, Fight Up, Go to Prone, Reload, Clear Malfunction, Unload/Show Clear);

Table IV: Zero;

Table V: Practice (engagements simulating record fire qualification); and

Table VI: Qualification (Day/Night).³

When Soldiers achieve sufficient marksmanship proficiency, evidenced by their completion of the aforementioned progression, they begin maneuver live-fire exercises — another progression of training that looks something like the following:

- Additional “**Stage 1**” training to include familiarization with the hand grenade, M203/M320, and other organic weapon systems;⁴

- **Stage 2** — crew qualifications and rehearsals;

- **Stage 3** — buddy team live-fire exercise (LFX);

- **Stage 4** — fire team LFX;

Soldiers from 1st Battalion, 41st Infantry Regiment, 2nd Brigade Combat Team, 4th Infantry Division, pose for a group photo while deployed to Helmand, Afghanistan, on 28 March 2018.

Photo by SFC Jasmine L. Flowers



- **Stage 5** — squad LFX;
- **Stage 6** — platoon LFX; and
- **Stage 7** — company CALFEX.⁵

Each stage requires the execution of the eight-step training model, deliberate use of training areas, forecast and consumption of ammunition, and that priceless commodity — time. Live fires require rehearsals, blank, and live-fire iterations during both day and night. This force generation effort habitually consumes an entire training cycle and culminates with a rotation to a CTC and then deployment. It produces a CALFEX-certified and CTC-validated brigade combat team, but does completion of a CALFEX and a CTC rotation produce a force best prepared to defeat a near peer? To secure infrastructure in Afghanistan, Iraq, Kuwait, Korea, or Djibouti? To train, advise, assist, and accompany security forces in non-permissive environments?

This question is further complicated by the introduction of the Sustainable Readiness Model (SRM) and Objective-T (OBJ-T) generators and assessors of readiness that quickly reveal themselves to be at odds with one another. SRM seeks to provide combatant commanders with a perpetually ready and deployable force. It achieves this by reducing “the readiness ‘peaks and valleys’ we have witnessed for the past decade and enhance the Army’s ability to preserve the readiness of the force and balance the Army’s steady state missions and contingency response requirements.”⁶

The Army’s Objective Assessment of Training Proficiency, informally referred to as the OBJ-T initiative, assesses readiness by measuring individual, crew, and platform proficiency; mission essential task (MET) proficiency; and collective live-fire task proficiency.⁷

SRM requires that Soldiers are moved between units and installations frequently to increase personnel readiness across the force rather than filling units preparing to deploy. This means Soldiers will arrive to and depart from units during collective training and deployments. OBJ-T, though, requires continuity of personnel and units, as the introduction of new Soldiers during a collective live-fire progression would prevent their addition to crews, platforms, and fire teams that have progressed through Stage 1, listed in Training Circular (TC) 7-9, *Infantry Live Fire Training*, and referenced above.

OBJ-T ensures units arrive to CTCs with a highly trained team that is prepared for certification and validation. SRM ensures that upon completion of the CTC rotation, the newly validated and certified team is deprived of key leaders whom are moved to new assignments prior to and during the operational deployment that follows. SRM and OBJ-T pull the force in different directions — towards two definitions of readiness. They leave little room for mastery of the fundamentals.

In a February 2018 announcement of the formation of the Close Combat Lethality Task Force (CCLTF), then Secretary of Defense James Mattis acknowledged that combat formations like the ones described in this article “have historically accounted for almost 90 percent of our casualties and yet our personnel policies, advances in training methods, and

On a recent deployment to Afghanistan, the 1st Battalion, 41st Infantry Regiment, 2nd Infantry Brigade Combat Team, 4th Infantry Division, overcame the challenges associated with a traditional live-fire progression by deliberately scaling the culminating collective training event of the deployment and making mastery of the fundamentals a prerequisite for its execution.

equipment have not kept pace with changes in available technology, human factors science, and talent management best practices.”⁸ The Army’s own Asymmetric Warfare Group (AWG) recommended that “the service needs to increase training ammunition allocation for units to allow them to conduct more CQB [close quarters battle] training with small arms, especially carbine and pistol.”⁹

Army Doctrine Publication (ADP) 7-0, *Training*, confirms these assertions:

*“The goal in training is achieving task mastery, not just proficiency. Task mastery means Soldiers and units can perform a task to standard repeatedly under increasingly challenging, stressful, and varying conditions. Soldiers and units rarely achieve task standards on the first attempt or even after a few initial attempts. Leaders continually vary task conditions and conduct multiple iterations of task execution to make achieving standards more challenging. This technique builds Soldiers’ confidence that they can perform tasks under the most demanding conditions.”*¹⁰

The intent of the CCLTF, the concerns of AWG, and the mandate of Army doctrine are not satisfied under the competing requirements of OBJ-T, SRM, and the CALFEX as the capstone achievement of a collective training evolution.

The current model forces rapid progression through a series of increasingly complex training events, but it prevents and discourages mastery of marksmanship. It requires the training of qualifiers, not shooters — CALFEX participators, not warfighters. Simply put, Soldiers are not required to replicate, in sufficient quantity, the type of direct-fire engagements they must perform in combat.

On a recent deployment to Afghanistan, the 1st Battalion, 41st Infantry Regiment, 2nd Infantry Brigade Combat Team, 4th Infantry Division, overcame the challenges associated with a traditional live-fire progression by deliberately scaling the culminating collective training event of the deployment and making mastery of the fundamentals a prerequisite for its execution. The conditions for such an experiment were ideal — operational tempo that supported the effort, platoon leadership empowered to lead high-quality marksmanship training, abundant resources, and time. The progression deliberately ended with a fire team live fire to prevent impacts on operations



Photo by 1LT Dewey Ellison

A Soldier from Able Company, 1st Battalion, 41st Infantry Regiment, 2nd Brigade Combat Team, 4th Infantry Division, participates in a marksmanship competition at Contingency Location Dwyer in Helmand, Afghanistan, in June 2018.

and ensure sufficient training of the fundamentals. Companies designed a seven-week progression to get there. A traditional marksmanship certification program was first. Soldiers completed Tables I through VI on the M4 Carbine or equivalent for their primary weapon system.¹¹

The battalion's rifle companies designed and executed a marksmanship density program before progressing to maneuver LFXs. Bushmaster Company led a battalion leader professional development range day to ensure the requisite expertise existed at the company and platoon leadership levels. Commanders, first sergeants, platoon leaders, platoon sergeants, and staff performed magazine changes, close quarters engagements, and completed a close quarters drill (EI Presidente) in which a shooter engages each of three targets from left to right with a controlled pair at 10 meters, reloads, and engages the same targets from right to left — for time.

Drills such as these are common in competitive shooting circles and the Special Operations community because they create a more effective shooter — a master of the fundamentals. They are uncommon in the conventional force because time and resources are a scarce commodity, and CTC and CALFEX preparation must be prioritized over developing experts.

Able Company, 1-41 IN's marksmanship density resulted in the authoring of a standardized marksmanship program codified in the company's tactical standard operating procedures (TACSOP). The program "exists to standardize marksmanship training, progression, qualification, and certification across the company. It is also a tool that allows

leaders to select from a menu of drills to tailor training to the needs of their Soldiers."¹² Drills are categorized as common, close quarters, or complex engagements.¹³ There are 37 in total. Soldiers are required to earn the endorsement of their immediate supervisor and complete three drills in each category before advancing to the next series of engagements. Only after this requirement is met does a Soldier advance to a stress shoot and ultimately participate in a maneuver live fire.

The shooters' performance in the fire team live fire exceeded expectations. Their magazine changes were quick, their kit was assembled for function, their engagements were more accurate, and their confidence — earned through repetition of the fundamentals — resulted in faster and more aggressive fire teams. The scenario required a fire team to engage targets from 50-300 meters while maneuvering under live-fire conditions. The company achieved an average hit rate of 31.05 percent during daylight and 30.54 percent during limited visibility, revealing virtually zero degradation in marksmanship ability at night. The training methods used to achieve these results are not new or revolutionary, but they are rarely used to train Soldiers to master their craft. Units are unable to resource the time and ammunition required for such events while scrambling to achieve the requirements of a CALFEX progression constrained by OBJ-T.

Theoretical and practical solutions do exist and are achievable within the guidance of training doctrine. ADP 7-0 reminds us that "[e]ven when the unit trains to achieve mission-essential task (MET) proficiency, the underlying task proficiencies at the individual level are monitored and

constantly trained and retrained as necessary by unit NCOs. In units where Soldiers are incapable of performing individual tasks to standard, the unit cannot effectively execute collective tasks to standard.”¹⁴ The goal of training is achieving task mastery. “Task mastery means Soldiers and units can perform a task to standard repeatedly under increasingly challenging, stressful, and varying conditions.”¹⁵

Doctrine encourages commanders to employ the operations process to design a plan that will prepare the unit for operations in a specific operational environment against a specific enemy at a specific time. This process is designed to “allow commanders to focus time and resources in ways that mitigate constraints to maintain required levels of proficiency.”¹⁶ Yet time and again, units from across the force train in exactly the same way despite radically different missions and operational environments.

To achieve and sustain individual task mastery, units could periodically forgo CALFEX progressions in favor of a unit training plan focused on developing experts in their craft and the operational environment. Such a design would culminate with squad or team live fires rather than company or battalion events. The excess training days would be used to master the fundamentals. The risk to mission incurred by failing to exercise and train mission command functions at the company and battalion level could be mitigated by executing command post exercises, the warfighter exercise, or similar mission command simulations. An organization executing this model would deploy to a CTC but omit maneuver live fires

in favor of additional situational training exercises tailored to the operational environment and enemy identified in the unit training plan. A unit deploying to provide uplift to a security force assistance brigade or secure a forward operating base in Afghanistan would execute an aggressive battery of ranges designed to mimic likely engagements in the operational environment rather than a CALFEX designed to simulate a near peer.

The force is constrained by time and resources. If combat readiness is our ultimate priority, as it must be, our profession must acknowledge that readiness begins with the fundamentals of fighting. Soldiers master these fundamentals through repetition. Unit training plans designed for the mission, coupled with a deliberate focus on cultivating expertise, will provide that repetition.

Notes

¹ ADP 1, *The Army*, September 2012, 1-7.

² Ibid, 1-7.

³ Training Circular (TC) 3-20.40, *Training and Qualification, Individual Weapons* (Pre-Approval), 2018, 3-1 thru 3-17.

⁴ TC 7-9, *Infantry Live Fire Training*, September 1993, 1-5.

⁵ Ibid, 1-5 thru 1-6.

⁶ LTG James L. Huggins Jr., “2014 Green Book: Rebuilding and Sustaining Army Readiness,” accessed from https://www.army.mil/article/134893/2014_green_book_rebuilding_and_sustaining_army_readiness.

⁷ Headquarters, Department of the Army, *Leader’s Guide to Objective Assessment of Training Proficiency* (Washington, DC: U.S. Army, 2017).

⁸ Matthew Cox, “Mattis Wants Ground Combat Units to Be More Lethal in the Close Fight,” *Military.com*, 23 February 2018. Accessed from <https://www.military.com/daily-news/2018/02/23/mattis-wants-ground-combat-units-be-more-lethal-close-fight.html>.

⁹ Ibid.

¹⁰ ADP 7-0, *Training*, August 2012, 3-2.

¹¹ TC 3-20.40, 3-1 thru 3-17.

¹² A Company, 1st Battalion, 41st Infantry Regiment, 2nd Brigade Combat Team, 4th Infantry Division, *Able Marksmanship Program* (Helmand, Afghanistan: 2018), 4.

¹³ Ibid, 5.

¹⁴ ADP 7-0, 1-1.

¹⁵ Ibid, 3-2.

¹⁶ Ibid, 4-3.



Photo by 1LT Dewey Ellison

A Soldier from Able Company, 1st Battalion, 41st Infantry Regiment, participates in a marksmanship competition at Contingency Location Dwyer in Afghanistan in June 2018.

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Courtesy photo

Officers and NCOs discuss the challenges when strong-willed leaders clash in small units.



The UAS Training Imperative: *How to Implement C-UAS Training at the Company Level*

CPT SEAN M. MINTON

*"Attack your enemy where he is unprepared,
appear where you are not expected."*

— Sun Tzu, *The Art of War*

Background: The "So What?"

In the May-June 2008 *Foreign Affairs* article "Age of Nonpolarity," Richard Haas describes the end of the international order dominated solely by United States as power that has diffused to "dozens of actors possessing and exercising various kinds of power." The use of unmanned aircraft systems (UAS), more commonly known as drones, is one such kind of power that state and non-state actors are using as a military means in today's conflicts. The main state actors, China and Russia, are adopting UAS into their military strategies and have begun training their militaries to fight them.¹⁻² Non-state actors such as the Houthis in Yemen, Islamic extremists in Nigeria, and ISIS in Iraq are also beginning to use drones for conducting surveillance or delivering explosives remotely on the battlefield.³⁻⁵ The U.S. Army as a whole acknowledged this, and counter-UAS (C-UAS) training as an initiative was codified in Army Techniques Publication (ATP) 3-01.81, *C-UAS Techniques*. Therefore, with the ongoing UAS existential threats and the advent of U.S. Army C-UAS doctrine, it is vital Army units begin to utilize UAS at every opportunity during field training.

In April 2018, Delta Company, 2nd Battalion, 58th Infantry Regiment, 198th Infantry Brigade, which conducts Infantry One Station Unit Training (OSUT), began implementing UAS training during the Advanced Individual Training (AIT) portion's culminating field training exercise (FTX) over three successive 14-week training cycles. The purpose of this article is to provide a brief overview of the experimentation phase, lessons learned, and proposed methods to begin institutionalizing UAS training for the new generation of Soldiers at the company level.

Experimentation Phase: How Do We Relate to the Z Generation aka iGen?

In his Summer 2017 *Forbes* magazine article "How Generation Z is Shaping the Change in Education," Sieva Kozinsky states that those in this up-and-coming generation, known informally as iGen, are all about "embracing social



Photos courtesy of author

Instructors from the Small Unmanned Aerial Systems Master Trainer Course (3rd Squadron, 16th Cavalry Regiment) familiarize Infantry One Station Unit trainees with UAS models in the U.S. Army arsenal.



Instructors from the 3rd Squadron, 16th Cavalry Regiment train SUAS-MT students on UAS operations while simultaneously providing intelligence to Infantry OSUT trainee platoons which were completing their culminating field training exercise.

learning environments, where they can be hands-on and directly involved in the learning environment.” The struggle in any instructional environment for the new generation is finding ways to make it hands-on. This was and continues to be the challenge for implementing proper UAS instruction for these new recruits.

According to guidelines listed in Appendix A of ATP 3-01.81, C-UAS training should be taught “during initial training to familiarize Soldiers with UAS threats and how to identify signs of enemy activity associated with the threat.” With this in mind, C-UAS was initially the focus when a “UAS Day” was integrated into Delta Company, 2-58 IN’s final FTX. However, this day of UAS training evolved from having a sole focus of learning how to react to enemy UAS to include hands-on missions where a UAS asset was used as a force multiplier for surveillance of an enemy objective during a platoon training mission.

The evolution over the three basic training cycles culminated with three of the trainee platoons running missions. Those in the fourth trainee platoon either acted as the opposing force (OPFOR) or observed the live feed from the UAS and provided real-time intelligence through FM radio to the other three trainee platoons conducting missions. This final method led to a proven hands-on experience that Generation Z trainees related to, as indicated from their feedback in after action reviews (AARs). It is worth noting

that each trial had its pros and cons, and lessons learned from each trial were used to inform the future implementation of UAS training at the company level; these will be discussed in the next sections.

Delta Company UAS Trial 1: How Do We Resource UAS in Our Training?

The Maneuver Center of Excellence (MCoE) at Fort Benning, GA, is home to the Small Unmanned Aerial Systems Master Trainer (SUAS-MT) Course, which is conducted by the 3rd Squadron, 16th Cavalry Regiment. After meeting and setting up communication with the unit points of contact, only follow-on coordination had to be made to have them present and ready for training. SUAS-MT instructors would use the opportunity to train their students while Delta Company would simultaneously use

the opportunity to train its trainees during friendly and enemy UAS-oriented missions.

In addition, further coordination had to be made with the Fort Benning Range Control office to reserve the air box that covered the training area. (Benning Range Control asks for the air requests 13 weeks before the date of training.) Advance requests for air box reservations are necessary for de-conflicting with commercial and military flight paths.

On 25 April 2018, Delta Company, 2-58 IN began its first trial run with the intent to expose trainees to the perils of enemy-controlled air and the advantages of friendly controlled air with surveillance assets. The SUAS-MT instructors and students began with an hour-long class on the different types



Trainees from Delta Company, 2nd Battalion, 58th Infantry Regiment, observe a live feed from friendly UAS assets and provide immediate feedback to units conducting missions.

Line	Information Example	Example
1	Unit call sign and frequency	Red 1, FHXXX
2	Unit location	6 to 8 digit grid location
3	Location of threat UAS	Grid or distance and direction from reporting unit location
4	Time threat UAS asset spotted/ detected	DTG: 091024ZMAR16
5	Estimated time on site	Was threat UAS asset approach observed or was it spotted overhead? How long might it have been there?
6	Flight characteristics	Is threat UAS loitering in one spot (possibly already spotted reporting unit), is it flying straight (enroute to loitering location), what is the direction of the flight, or is it flying randomly (searching)?
7	Estimated size, elevation, and physical description	Wingspan, height, color, tail configuration, other distinguishing markings
FH - frequency hop DTG - date, time, group UAS unmanned aircraft system		

Figure 1 — Recommended Threat UAS Reporting Format (Spot Report) from ATP 3-01.81

and specifications of UAS models in the U.S. Army arsenal, such as the Raven and the Puma, as well as a popular civilian model, illustrating the true extent of their accessibility to our enemies. After the formal portion of instruction, cadre launched three simultaneous missions where friendly air assets (Blue Air) would give intelligence to maneuvering elements. However, due to dense vegetation on the objective, the friendly UAS assets were unable to provide viable intelligence during those missions.

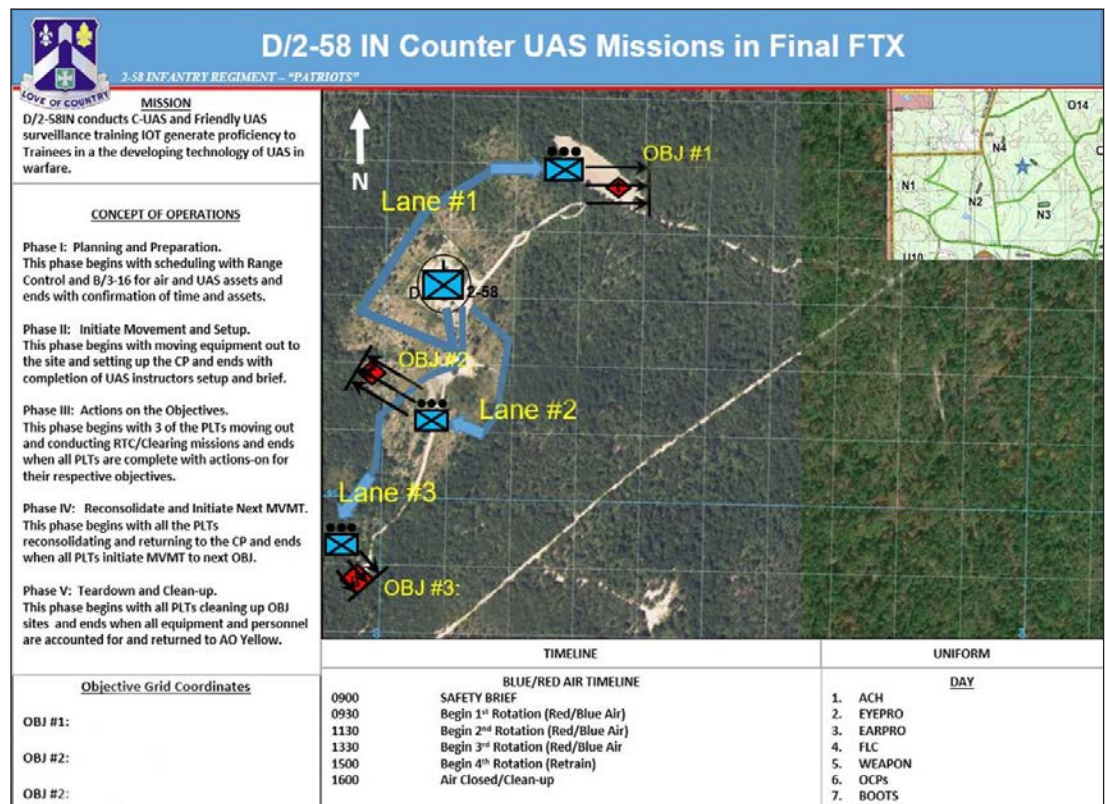
Once the Blue Air missions were complete, the missions with enemy UAS assets (Red Air) began. When trainees spotted enemy UAS, they had to use the seven-line spot report from ATP 3-01.81 to provide on-the-ground intelligence to the company command post (CP) (see Figure 1). Prior to the missions, the trainees were given instruction on how to react to enemy UAS consistent with the Asymmetric Warfare Group's Tactical Pocket Reference.⁶ The intent of the guidance is for friendly personnel to react appropriately when enemy UAS is spotted. By the end of the Red Air missions, the trainees had a firm grasp on how to execute a C-UAS battle drill.

Delta Company UAS Trial 2: How Do We Create Missions that are Meaningful?

Much of the feedback from UAS Trial 1 related to the need for creating a structured mission with clear visibility of the objective. It was also recommended that trainees conduct the FM radio communications in the company CP to enhance the training's effectiveness and the trainees' understanding of Blue Air missions. This change would make it more interactive with real-time changes of OPFOR movement on the enemy objective. Thus, a deliberate lane with clear visibility of the objective was created for use by the next Infantry OSUT training cycle during UAS Trial 2, which was conducted on 18 August 2018.

The training again kicked off with a formal hour block of instruction about the specifications and capabilities of the U.S. Army's UAS arsenal as well as a commercial-off-the-shelf (COTS) UAS example. Following the formal instruction, the trainees participated in Blue Air missions. The trainee platoon that was not engaged in missions conducted concurrent training, manned the company CP FM radio, and observed the live feed of the enemy objective. Trainees not only participated

Figure 2 — UAS Training Concept of Operations





During Trial 3, trainees get a closer look at a Raven UAS during formal instruction that occurred a week before their final field exercise.

in a mission where they experienced the benefits of friendly UAS, but they also watched the live feed of enemy movement on the objective and saw the effectiveness of Blue Air assets firsthand.

Trial 2 ended with trainees returning to their company defensive fighting positions with Red Air in effect. The opportunity allowed the trainees to solidify their react to C-UAS tactics, techniques, and procedures (TTPs) and report up to higher headquarters using the recommended seven-line spot report in the C-UAS ATP. The forcing mechanism of deliberate Red Air missions with enemy UAS assets was again effective in solidifying an understanding of C-UAS operations.

The big takeaway from Trial 2 was the need to engage more trainees and increase the UAS assets in order to add two more deliberate attack missions on an enemy objective. Trainees not engaged in a mission could serve as OPFOR and company CP FM radio operators. The remaining trainees who were not directly tasked could observe the UAS live feed and experience the value of Blue Air surveillance. In addition, the drill sergeants requested that the formal hour block of instruction occur prior to the day of training to allow for more rehearsals and preparation time in the morning before beginning the missions.

Delta Company UAS Trial 3: How Do We Get More Soldiers Involved?

Incorporating the feedback from the previous trial, trainees completed the formal block of instruction for Trial 3 in a classroom setting a week before the mission portion. In addition, cadre specifically designed three separate missions that had clear visibility of the objective from the air in order to provide accurate and credible intelligence on OPFOR movements. On 3 December 2018, the four platoons rotated through the three missions and OPFOR/radio operator tasking. This resulted in all four trainee platoons participating in two to three Blue Air missions in addition to a Red Air mission. According to feedback from the drill sergeants, this method of UAS training was the most productive and time efficient. However, there was some dilution in the quality of the lane during the Blue Air missions because the electronic setup could provide a live feed from only one UAS at a time. This diminished the level of intelligence the trainees could provide, but it kept more Soldiers immersed and engaged during the UAS missions. If the electronics can support more than one screen with simultaneous feeds from other UAS devices, this would be ideal. It would not only increase the quality of intelligence but also create a more conducive environment for the trainees to witness the effectiveness of friendly UAS.

Lessons Learned and Feedback

The primary lessons learned included:

- When the terrain allows, create multiple missions when there are multiple UAS devices and UAS operators available.
- Design missions with less vegetation at the objective (and along the movement routes if possible).
- Plan for a class where Soldiers can obtain hands-on experience with UAS devices, receive instruction on react to C-UAS and reporting procedures, and ask follow-on questions in a formal block of instruction.
- Allow Soldiers to see the live feed from the UAS — more than one live feed if possible — and see how the intelligence is reported to the ground units and the results that follow in real time. This is where much of the comprehension occurs with Soldiers who would normally not receive Blue Air asset intelligence because communications with higher headquarters is limited to the platoon leadership.
- During C-UAS operations, a military UAS device isn't needed to rehearse TTPs in the event of enemy UAS. Scripted enemy UAS possibilities could be used in place of actual UAS equipment to conduct this training.
- By focusing on technology to carry out missions, Soldiers witness the intelligence gathering and information distribution firsthand, which results in further understanding.

Proposed Methods to Implement Training: Recommended Path Forward

The world is moving towards UAS saturation with friend and foe alike having possession of UAS assets to conduct

reconnaissance and/or deliver explosives. The American Soldier must be comfortable in using friendly UAS assets while also being able to properly react to enemy UAS with rehearsed and well-prepared TTPs and battle drills. There are currently UAS trainers in every U.S. Army Forces Command (FORSCOM) brigade combat team (BCT). Today's company commander must find ways to plan and integrate UAS training into field training at every possible opportunity. Allowing Soldiers to conduct missions and observe the live feed creates the perfect blend of immersive, hands-on learning that iGen Soldiers internalize best. If we fail to properly find ways to integrate the emerging UAS threat with the dynamic learning style of up-and-coming Soldiers, then we risk facing the peril of Sun Tzu's principle of war — being attacked by enemy UAS where we are unprepared and unsuspecting.

Notes

¹ Kristin Huang, "The Drones That Have Become Part of China's Military Strategy," *South China Morning Post*, 25 August 2018, accessed from www.scmp.com/news/china/diplomacy-defence/article/2161354/drones-have-become-part-chinas-military-strategy.

² Patrick Tucker, "Russia Has Started to Train Its Entire Military to Fight Drones," *Defense One*, 16 November 2018, accessed from www.defenseone.com/technology/2018/11/russia-has-started-train-its-entire-military-fight-drones/152889/.

³ Ismaeel Naar, "Coalition: Houthis Attempting to Expand Use of Drones in Yemen," *Al Arabiya English*, 20 January 2019, accessed from english.alarabiya.net/en/News/gulf/2019/01/20/Coalition-Houthis-attempting-to-expand-use-of-drones-in-Yemen.html.

⁴ Cara Anna, "Islamic Extremists Are Now Using Drones in Nigeria, Leader Says," *Military Times*, 30 November 2018, accessed from www.militarytimes.com/news/your-military/2018/11/30/islamic-extremists-are-now-using-drones-in-nigeria-leader-says/.

⁵ Eugene K. Chow, "What Happens When America's Enemies Attack with Their Own Drones?" *The National Interest*, 11 March 2018, accessed from nationalinterest.org/blog/the-buzz/what-happens-when-americas-enemies-attack-their-own-drones-24805.

⁶ The Asymmetric Warfare Group's Tactical Pocket Reference (July 2015) can be found at <https://www.milsuite.mil/book/groups/asymmetric-warfare-group-knowledge-center> in the content section.



Trainees from Delta Company, 2nd Battalion, 58th Infantry Regiment, observe a live feed from friendly UAS assets and then provide immediate feedback to units conducting missions.

At the time this article was written, **CPT Sean M. Minton** was serving as the commander of D Company, 2nd Battalion, 58th Infantry Regiment, 198th Infantry Brigade (Infantry One Station Unit Training) at Fort Benning, GA. He is currently attending the Maneuver Captains Career Course at Fort Benning. His previous assignments include serving as a company executive officer and rifle platoon leader in the 1st Battalion, 32nd Infantry Regiment, 1st Brigade Combat Team, 10th Mountain Division, at Fort Drum, NY. CPT Minton is a 2013 U.S. Military Academy graduate and holds a bachelor's degree in American Politics, Policy, and Strategy (APPS) and the Russian language.

Train as You Fight:

Adding the Cost of Attrition to MILES Warfare

1LT JASON R. LALLY

It was the evening of X6, six days into rotation Combined Resolve X (CBR X) at Hohenfels Training Area in Germany, and the 15 Main Battle Tanks of Delta Company, 1st Battalion, 4th Infantry Regiment — U.S. Army Europe's opposing force (OPFOR) for training at the Joint Multinational Readiness Center — were postured in a hasty defense along two kilometers of rolling hills and dense forest. The plan was to delay and disrupt blue force's (BLUEFOR's) eastern advance, and then Delta Company would fall back east to establish a deliberate defense. My commander was composed and relaxed as he casually described his plan: Once Delta Company faced 30-percent attrition (a loss of four to five tanks), the company would retrograde. The commander ordered me to alert him when more than one tank was destroyed. Upon hearing my orders, I paused to reflect on the reality of this calmly spoken plan. Four or five tanks would be catastrophically destroyed, all crew members killed, before the remaining tanks would fall back and leave

those burning tanks and fallen Soldiers behind. Three tankers would be dead before the commander was even awakened. Had anyone actually thought about the reality of this imminent loss of human life?

Unfortunately, this indifference towards death is commonplace when waging war with the Multiple Integrated Laser Engagement System (MILES) where Soldiers shoot each other with harmless lasers in lieu of bullets. On a MILES battlefield, death is a mere temporary inconvenience; thus, the cost of human life is inherently undervalued.

Although the profession of arms often prioritizes mission accomplishment over individual safety, Army leaders are still human and will innately consider the risk to their Soldiers' lives when making decisions. Arguably, fighting with MILES trains leaders to think with a mission-first mindset, as my commander did on the night of X6 in CBR X. Unfortunately, those leaders are also being conditioned to give orders with



Photo by SPC Dustin D. Biven

A Soldier assigned to 1st Battalion, 63rd Armor Regiment, 2nd Armored Brigade Combat Team, 1st Infantry Division, engages a member of the opposing force during exercise Combined Resolve X at Hohenfels Training Area, Germany, on 2 May 2018.

complete emotional and tactical disregard for attrition, which does not fairly replicate wartime decision making.

From the Soldier perspective, fighting with lasers similarly alters tactical decision making. After Delta Company's retrograde and subsequent defensive stronghold, the platoons conducted engagement area development. As the plan developed, I realized the southernmost platoon's defense hinged on a bait tactic, a fairly common strategy on the MILES battlefield. Two crews of Soldiers were excited to lure the attention of imminent BLUEFOR in order to allow a fellow tank section to engage from heavily concealed positions. The bait crews staged in the center of an open danger area, directly facing the BLUEFOR avenue of approach with only a slight intervisibility line offering trivial cover. It was a suicide mission — one that the crews accepted without hesitation. BLUEFOR took the bait and the plan was effective, though unsurprisingly at the cost of those tank crews' lives. Perhaps in dire circumstances amidst a losing battle, leaders and Soldiers would agree that a bait tactic is worth the sacrifice. However, in actual war, leaders would likely consider alternative plans before concluding to use Soldiers as bait, and after that conclusion would certainly take substantial measures to mitigate the increased risk. To clarify, brave Soldiers have undoubtedly made sacrifices on real battlefields similar to what these two crews replicated, but such sacrifices are rare displays of unparalleled selflessness. However, this level of courage is typical on the MILES battlefield, and both sides of training rotations capitalize on Soldiers' disregard for death. The result is an unrealistic battlefield, swarming with Soldiers of unwavering braveness and a reliance on excessively risking Soldiers' lives.

Training with MILES severely alters leader and Soldier tactical decision making by drastically reducing the cost of Soldier casualties. However, assuming that the U.S. Army will continue replicating warfare through MILES, rotational exercises ought to artificially add consequences to Soldier losses. Training exercise planners must tailor the tactical scenario and exercise rules to restore some of the costs induced by attrition. These costs are generally broken into two categories — emotional and tactical. The emotional cost of attrition can never be accurately portrayed outside of actual war, thus a stressful and continuous training event is the best option to simulate emotional tolls on leaders.

The tactical cost of attrition is where training stands to improve most. In current rotations, when a Soldier is killed, he or she remains in place and is typically "dead" for four to 24 hours depending on ongoing operations. The Soldier then rejoins his or her main element. This death and revival concept supports reusing terrain, the reinforcement of BLUEFOR, and the replication of a larger OPFOR. Soldiers cannot remain incapacitated on the battlefield for the entirety of a training rotation since it would diminish that Soldier's training value, clutter the confined training area, and reduce the OPFOR combat power too quickly to adequately oppose BLUEFOR. However, there is room to improve the attrition process in order to improve tactical decision-making simulation.

Army training events replicate contemporary warfare primarily through using MILES, which inherently removes the cost of death from war. Consequently, leaders and Soldiers alter their battlefield decision making during training given their disregard for personal harm or the effects of attrition on future operations.

Battles and engagements lasting longer than a few hours, spanning into multiple days, and fought with only remnants, would begin to add realism. By shifting the revival time beyond 24 hours and planning complex, multi-day engagements, leaders on the ground are forced to more heavily consider the impacts of Soldier casualties when devising a plan. Losing two tank crews in the first hour of a 48-hour battle will have a dramatic impact on the leader's subsequent tactics.

If revival was contingent on medical evacuation (MEDEVAC), leaders would face increased costs associated with losing Soldiers, which would further nudge their decision making towards reality.

A common rationale for reviving Soldiers rather quickly is that they replicate reinforcements. The departure from reality, however, is that the revived elements are organic to the unit and there is no reintegration process. If rotations require external reinforcements to bolster OPFOR or BLUEFOR combat power, then some additional augment units should be kept in reserve in order to reinforce an attrited front line. This reinforcement process adds complexity to leaders who now have to integrate new Soldiers into their ongoing mission rather than welcome back Soldiers who know the plan, have synchronized communications, and know their chain of command. This complexity translates into adding costs associated with Soldier attrition.

Army training events replicate contemporary warfare primarily through using MILES, which removes the cost of death from war. Consequently, leaders and Soldiers alter their battlefield decision making during training given their disregard for personal harm or the effects of attrition on future operations. While the concussing explosion of 120mm mortars or the painful grief of losing a platoon member will always be absent in force-on-force training, there are actionable steps leaders can take to improve training realism. Future training exercises should intentionally induce costs to replicate the effects of Soldier casualties. By having longer engagements with less revivals, conducting MEDEVACs, and reinforcing attrited units through external entities, training units will face greater costs associated with losing Soldiers; thus, decision making and behavior may closer imitate that of wartime.

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Tutorials for New DTMS Training and Readiness Dashboards Now Available

SARAH SCHWENNESEN

In January 2019, the Combined Arms Center-Training's (CAC-T's) Training Management Directorate (TMD) released the Digital Training Management System (DTMS) Training and Readiness Dashboards in support of the Secretary of the Army's vision to reduce requirements on echelons at brigade and below. Since then, TMD refined the dashboards' functionality and accompanying tutorials and published the first three of 11 new tutorials designed to support dashboard users.

MG Maria R. Gervais, the deputy commanding general for CAC-T, introduces the new tutorial series in the opening of the Training and Readiness Dashboard Overview.

When complete, the Army Training Network (ATN) DTMS Knowledge Base will host both audio/video self-paced and slide-based tutorials that walk users through the different elements of the dashboards. In order to get the tutorials to the field as quickly as possible, TMD will release them as they are completed. The first three audio/video tutorials posted to the DTMS Knowledge Base are: The Training and Readiness Dashboards Overview, the Mission Essential Task List (METL) Tool, and the Collective Live-Fire Tool tutorials.

Eight additional tutorials covering individual, crew-served, and platform weapons management are in the production

process and will be released shortly. The last two products for development and production are the recording of a Soldier Army Physical Fitness Test (APFT), height/weight, and body fat. These should be available on ATN by mid-April.

TMD will post all related tutorials to the DTMS Knowledge Base Training and Readiness Dashboards page: <https://atn.army.mil/DTMSDashboard>.

Visit TMD's Facebook page and milSuite Forum for updates on new content. ATN Facebook and milSuite Forum are found at: <https://www.facebook.com/ArmyTrainingManagementDirectorate/> and <https://www.milsuite.mil/book/groups/army-training-management-directorate-tmd/overview> respectively.

Additional web-hosted DTMS training can be found in the DTMS Knowledge Base, at [https://atn.army.mil/unit-training-management-\(utm\)/dtms-knowledge-base](https://atn.army.mil/unit-training-management-(utm)/dtms-knowledge-base). The TMD Help Desk is also available to provide support to unit leaders on DTMS related questions and issues the from 0500-2100 Central Standard Time (CST) Monday-Friday and from 0800-1700 CST Saturday and Sunday. Contact the TMD help desk at (913) 684-2700, DSN: 552-2700, or toll-free at (877) 241-0347 for assistance; email assistance is also available at: usarmy.leavenworth.cac.mbx.dtmsd@mail.mil.



U.S. Army graphic

The new DTMS Training and Readiness Dashboard Tutorials are available at <https://atn.army.mil/DTMSDashboard>.

Improving Soldier Lethality:

A Machine-Gun Training Outline for Small-Unit Leaders

CSM (RETIRED) JOHN DUDAS

The M240B machine gun is one of the most important weapons assigned to platoons and companies. The large caliber 7.62 ammunition and high rate of fire make it invaluable in supporting attacks and ambushes as well as protecting defensive areas and mounted patrols.

The purpose of this article is to provide the small-unit (team, squad, and section) leader a training outline that will help improve the knowledge, performance, and more importantly, the lethality of their machine-gun crews. One of the first things the reader may notice about this article is that it does not discuss the techniques of machine-gun live-fire training. Subjects such as fire commands, marksmanship, and range operations will not be covered. This training outline focuses primarily on machine-gun theory (explanation of terms) and employment practices (crew drill).

The training program is outlined in four instructional topic areas:

- Characteristics of Fire
- Classes of Fire
- Application of Fire
- Crew Drill

The aim of these topic areas is to provide the crew members with a basic understanding of machine-gun theory and to explain how machine-gun fire relates to the ground, target, and the weapon itself. The crew will also learn about the types of machine-gun targets and the methods used for successful engagement. An overview of the crew drill will be provided to give crew members an opportunity for “hands-on” learning and practical application of emplacing the machine gun into and out of action.



Photo by SGT Kimberly Lamb

Soldiers with the 37th Infantry Brigade Combat Team qualify on the M240B machine gun at Camp Mike Spann, Afghanistan, on 7 February 2012.

Characteristics of Fire

The purpose of this topic area is to provide and explain terminology that describes machine-gun fire. These terms are important for the crew to understand what happens to the 7.62 round(s) after the trigger is pulled. As shown in Table 1, there are five terms that crew members should know. Understanding these terms will set the foundation for the following modules that further discuss machine-gun theory.

The two most important terms in this topic area are **danger space** and **beaten zone**. These terms describe to the crew members how to make machine-gun fire lethal. Understanding how range can affect danger space and the beaten zone gives crew members useful knowledge, especially when selecting firing positions in tactical scenarios.

Term	Definition
Trajectory	Path of bullet in flight
Maximum Ordinate	Highest point of trajectory between barrel and the target
Danger Space	Space between the weapon and the target where the trajectory does not rise above 1.8 meters, including the beaten zone (1.8 meters is the height of average soldier)
Cone of Fire	Pattern formed by different trajectories in each burst of fire as they travel down range
Beaten Zone (BZ)	Pattern formed by rounds striking the target or ground. Range affects the BZ. Short engagement range: BZ is narrow and long Long engagement range: BZ is shorter and wider

Table 1 — Characteristics of Fire

Classes of Machine-Gun Fire

This subject explains to crew members how machine-gun fire is directly related to the ground (terrain), the target, and the machine gun itself. After discussing the previous subject, which only concerned the effect of rounds leaving the barrel, this topic area teaches the crew how machine-gun fire is inter-related between the weapon, target, and terrain. Understanding this relationship is vital when selecting firing positions for the machine gun. This relationship is outlined in Table 2.

The most important instructional points from this topic area

are for crew members to fully understand **grazing** and **enfilade fire**. Both are related as they make the maximum use of the beaten zone. It is critical to impress upon the crew that anytime they select a firing position, it should incorporate grazing fire and enfilade fire whenever possible.

Application of Fire

Continuing to expand on theory, this subject area covers methods of emplacing the machine gun to take advantage of the weapon's inherent superiority in range and rate of fire over

Table 2 — Classes of Machine-Gun Fire

Fire in Respect to the Ground	Fire in Respect to the Gun	Fire in Respect to the Target
<p>Grazing Fire: Cone of fire which does not rise more than one meter above the ground. Maximum range of 600 meters over level terrain.</p> <p>Plunging Fire: Occurs when the danger space is confined to the beaten zone.</p>	<p>Fixed Fire: Only one aim point is required for the beaten zone to cover this target. Used against a point target.</p> <p>Traversing Fire: Fire distributed in width by successive changes in direction. Used against a linear target.</p> <p>Searching Fire: Fire distributed in depth by successive changes in direction and elevation. Used against a deep target.</p> <p>Traversing & Searching Fire: Fire distributed in width and depth by successive changes in direction and elevation. Used against a linear target with depth.</p> <p>Swinging Traverse: Fire delivered from a tripod-mounted gun against targets too wide to cover with the traverse lever on the M192 ground mount. This type of engagement requires major changes in direction.</p> <p>Free Gun: Fire delivered from a tripod-mounted gun that cannot be applied with the traversing and elevating levers on the M192 ground mount. This type of engagement requires major changes in direction and elevation.</p>	<p>Frontal Fire: When the long axis of the beaten zone is delivered at a right angle to the front of the target.</p> <p>Flanking Fire: Fire that is delivered to the side of a target.</p> <p>Oblique Fire: When the long axis of the beaten zone is delivered to an angle other than a right angle to the front of a target.</p> <p>Enfilade Fire: When the long axis of the beaten zone coincides with the long axis of the target. Can be frontal or flanking. Makes the maximum use of the beaten zone.</p>

Type of Target	Description	Example
Point Target	Beaten zone adequately covers the entire target. Gunner uses fixed fire with a single aim point.	<ul style="list-style-type: none"> - Bunkers - Vehicles - Weapons emplacements - Concentration of dismounted troops
Area Target	Has width and depth. Exact enemy location may be unclear. Requires traverse and search methods to cover the entire target area.	<ul style="list-style-type: none"> - Linear targets - Deep targets - Targets that are linear with depth

Table 3a — Type of Machine-Gun Targets

Type	Range
Maximum Range	3,725 meters
Range of Suppression Fire	1,800 meters
Range of Grazing Fires	600 meters

Position	Type Target	Range
Bipod	Point Area	600 meters 800 meters
Tripod	Point Area	800 meters 1,100 meters

Table 3b — M240B Effective Ranges

Term	Purpose
Sustained Rate of Fire	Used to conserve ammunition. Used after enemy suppression is achieved. Fewer barrel changes.
Rapid Rate of Fire	Used in initial enemy contact to gain fire superiority. Achieves high volume of fire on enemy. Used to suppress enemy quickly. Frequent barrel changes.
Cyclic Rate of Fire	Constant trigger hold to rear — continuous burst. Used for aerial targets. Highest volume of fire for the machine gun. Barrel change required every minute.

Table 3c — M240 Rates of Fire Description

Rate of Fire (RoF)	Rounds per Minute (RPM)	Rounds per Burst	Barrel Change Frequency
Sustained RoF	100 RPM	6-9 round burst every 4-5 seconds	Every 10 minutes
Rapid RoF	200 RPM	10-12 round burst every 2-3 seconds	Every 2 minutes
Cyclic RoF	650-950 RPM	Continuous burst	Every 1 minute

Table 3d — M240 Rates of Fire

lesser weapons on the battlefield such as rifles, carbines, and grenade launchers.

Application of machine-gun fire describes the type of targets a machine gunner will engage on the battlefield along with the maximum effective ranges of the weapon system. Rates of fire and the timing of barrel changes are also discussed to ensure the target area is kept engaged with the correct amount of ammunition without damaging the machine gun's barrel or causing stoppages from an overheated gun.

To the left are four tables that describe in detail the type of machine-gun targets, maximum effective ranges for the M240B machine gun, and rates-of-fire data that apply to the weapon system (Tables 3a, 3b, 3c, and 3d).

The most important instructional point in this topic area is for crew members to know and understand the M240B's rates of fire. They should know that the rapid rate of fire is used when initiating or receiving contact with the enemy. This rate of fire allows the crew to gain fire superiority over the enemy — allowing movement and maneuver of friendly forces. Once fire superiority is achieved, the crew can begin using the sustained rate of fire to conserve ammunition while still keeping the enemy's head down. Knowing the scheduled times for changing the barrel is also important for ensuring the weapon system does not become damaged or overheated during the engagement. Instruction on changing the machine-gun barrels will be covered in the next topic area concerning the crew drill.

Crew Drill

Any training outline concerning machine-gun training would not be complete without discussing the crew drill. The crew drill is the most important method of training a machine-gun crew to employ the weapon system. For new machine-gun crews, the crew drill provides basics of emplacing the machine gun into and out of action. For the advanced crew, the crew drill can perfect the weapon's employment and coordination amongst the team. When training new crew members, actions should be instructed slowly but deliberately. The ultimate training goal is for the machine-gun team to execute each move of the crew drill rapidly but never at the cost of precision.

The crew drill can be conducted with a two-Soldier or three-Soldier machine-gun crew. For this article, the three-Soldier crew will be referenced. The three-Soldier machine-gun team is made up of:

1. Gunner (G) carrying the M240B machine gun.
2. Assistant gunner (AG) carrying the spare barrel and case with heat-protective mitt (HPM).

3. Ammunition bearer (AB) carrying the M192 ground mount (tripod).

Crew members execute actions on commands (cues) provided by a leader. The following tables discuss the commands given by the leader and the actions executed by the crew members during the machine-gun crew drill.

It should be mentioned that the manner of execution as

outlined in the tables above serve only as an introduction to the crew drill. Once a foundation of knowledge is gained by the crew members, the crew drill may be modified into tactical scenarios, only limited by the imagination of the leader and crew. The crew drill is a time-tested method of training machine-gun teams in the employment of the weapon system and should be incorporated in preliminary marksmanship instruction (PMI) plans and mission rehearsals.

Table 4a — Leader Command: Form for Crew Drill

Action by Gunner	Action by AG	Action by AB
Take a prone position five steps from and facing the leader.	Take a prone position five steps behind the G.	Take a prone position five steps behind the AG.
Upon receiving the command, all crew members move simultaneously. Once in their positions and starting from the rear, announce their duties: AB, AG, gunner.		

Table 4b — Leader Command: Inspect Equipment Before Firing, Bipod/Tripod

Action by Gunner	Action by AG	Action by AB
Gunner inspects the machine gun using checklist. (See TC 3-22.240 for complete checklist.)	AG inspects the spare barrel and case using checklist. (See TC 3-22.240 for complete checklist.)	AB inspects the M192 using checklist. (See TC 3-22.240 for complete checklist.)
Announces any deficiencies to the machine gun, AB and AG equipment or if none, "all correct."	Announces any deficiencies to spare barrel or if none, "AG correct."	Announces any deficiencies to M192 or if none, "AB correct."

Table 4c — Leader Command: Gun to be Mounted Here (Bipod), Front, Action

Action by Gunner	Action by AG	Action by AB
Gunner moves (first) to identified position and assumes prone position. Clears and loads machine gun.	AG moves (second) to position, assumes the prone to the left of the gunner. Removes spare barrel and the HPM from the case. Puts on the HPM. Aids gunner in loading machine gun upon arrival.	AB moves (last). Places M192 one step to the left of machine gun. Moves 10 steps to left of the AG and assumes a prone security position.
Announces "Up."	After gunner announces "Up," AG gives ready signal to the leader.	

Table 4d — Leader Command: Out of Action (Bipod)

Action by Gunner	Action by AG	Action by AB
Gunner moves (last) after the AB and AG has departed. Unloads and clears the machine gun. Moves five steps to the rear and assumes the prone position.	AG moves (second) after removing the HPM and placing it, along with the spare barrel, back into the case. Moves 10 steps behind the machine-gun position and assumes the prone position.	AB moves (first) to machine gun and retrieves the M192. Moves 15 steps to the rear of the machine-gun position and assumes the prone position.
Checks to make sure the AG and AB are in position and announces "Up."	After gunner announces "Up," AG gives ready signal to the leader.	

Table 4e — Leader Command: Gun to be Mounted Here (Tripod), Front, Action

Action by Gunner	Action by AG	Action by AB
Gunner moves (last) to the identified position. Assumes prone position and mounts the gun on the M192. Clears and loads machine gun.	AG moves (second) to position, assumes the prone one step to the left of the M192. Removes spare barrel and the HPM from the case. Puts on the HPM. Aids gunner in mounting the machine gun onto tripod and loading the machine gun upon arrival.	AB moves (first) to the identified position. Opens the M192 and places it on the ground, stomping the rear tripod shoes. Pulls the M192 traverse and elevation mechanism out for the gunner. Moves 10 steps to the left of the M192 and assumes a prone security position.
Once gun is ready to fire, announces "Up."	After gunner announces "Up," AG gives ready signal to the leader.	

Table 4f — Leader Command: Out of Action (Tripod)

Action by Gunner	Action by AG	Action by AB
Gunner moves (second) after unloading and clearing the machine gun. Removes the machine from the M192 and moves five steps to the rear of the position and assumes the prone position.	AG moves (first) after helping the gunner remove the machine gun from the M192. AG removes the HPM and places it, along with spare barrel, back into the case. Moves 10 steps behind the machine-gun position and assumes the prone position.	AB moves (last) to the machine gun and retrieves the M192. Moves 15 steps to the rear of the former machine-gun position and assumes the prone position.
Checks to make sure the AG and AB are in position and announces "Up."	After gunner announces "Up," AG gives ready signal to the leader.	

Table 4g — Leader Command: Fall Out Gunner

Action by Gunner	Action by AG	Action by AB
Gunner moves 10 steps to the rear, assumes the prone position, and becomes the AB.	AG moves five steps forward, assumes the prone position, and becomes the gunner.	AB moves five steps forward, assumes the prone position, and becomes the AG.
Upon receiving the command, all crew members move simultaneously. Once in their positions and starting from the rear, announce their duties: AB, AG, gunner.		

Table 4h — Leader Command: Change Barrels

Action by Gunner	Action by AG	Action by AB
Ensures bolt is to the rear by pulling the cocking handle to the rear with a palm-up grip. Places the weapon on safe and returns the handle forward. Indicates to AG that gun is ready for barrel change by announcing "Go."	Upon hearing "Go," using HPM, the AG pushes the barrel release button and removes the hot barrel from the machine gun with the handle. Places new barrel on the machine gun. Ensures it is secure by listening for 2-7 clicks when emplacing the new barrel on the receiver.	Remains in prone security position.
Once the new barrel is on, announces "Up."	Announces to gunner: "Barrel on." After gunner announces "Up," AG gives ready signal to the leader.	

Conclusion

This article has outlined a training program for small-unit leaders to improve the knowledge, performance, and lethality of their assigned machine-gun crews. Though the instruction on machine-gun theory can be delivered in a classroom setting, practical exercises will give machine-gun crews hands-on training. For example, by placing available items such as assault packs or rucksacks in a line, column, or tactical wedge formation, a machine-gun crew can practice methods of engaging point and area targets by using fixed, traversing, or searching fire. These exercises can be conducted in the unit area after a morning foot march.

Crew drill can be done almost anywhere and should be

incorporated during opportunity training at marksmanship ranges and situational training exercises (STX) while in the field.

The instruction presented is not intended to replace other techniques of machine-gun training. In fact, its purpose is to enhance and supplement other subjects used in instructing machine gunnery. For more information on machine-gun theory and practice, see Training Circular (TC) 3-22.240, *Medium Machine Gun* (April 2017).

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Meeting Our First Enemy in the Heat

LTC (RETIRED) CHARLES D. HENRY

Often on deployment we meet our first enemy when we first step off the plane. We sense the temperature is different and the dryness or humidity of the air. If we have been lucky, pre-deployment training made us aware of how different this environment would be compared to our home station, but we cannot truly understand the challenge until we actually feel it the first time.

We can be physically fit as well as optimally trained and supported for the tasks that we face, but our bodies cannot fully adapt to the new situation and attain maximal performance without whole body exposure and the days needed to physiologically respond to the environment's demands. Our bodies always adapt to meet the environment that it is in at that moment. Changing our environment means our bodies will have to go through its changes and sometimes that means, in the worst case, it may take literally weeks before our body's new stability is reached and our supportive behaviors become routine.

The patterns we are concerned with in this article are adapting to a hotter environment that is either dryer or wetter. There are two patterns of heat adaptation — one for desert and altitude dryness, the other for jungle humidity. Each has its special dangers. As tropical animals, it is simpler for us to adapt to excess heat than excess cold. These hotter environments are constantly sucking the water out of our bodies and threatening to overwhelm us with either dehydrating heat or a heat burden. Military operations almost always require that we perform outside our normal healthy body activity parameters, so we must constantly observe and manage the physical demands being imposed on us. The challenge is to learn how to lose heat and moisture to these environments in a manner that we can control and be able to forecast our rates of potential failure.

Any warfighter knows that during a deployment the possibility of having two weeks to allow the body to gently adapt to a new environment is usually pretty small. There are three

components to the body's adaptation: nerves, hormones, and behavior. Nerves begin to respond in seconds. Hormones begin to respond in minutes to hours. Behavior acts at several levels and is key to the warfighter's ability to perform. Behavior is based on what we know, how we have been trained, and the awareness and discipline we bring to the task.

Our Transitions to Heat Acclimatization

The difference in the dangers between dry and humid heat will show very quickly with the perceived heat burden on the body growing more rapidly in humidity. Humidity slows evaporation of sweat so that body heat quickly builds and becomes felt as a burden, while desert dryness speeds up evaporation making the body sense that it is cooling even though the total body's heat load is instead growing. This feeling of comfort can fool us into making potentially lethal errors.

According to a 1958 NASA report, people can live indefinitely in environments that range between roughly 40 and 95 degrees Fahrenheit (F), but only if the latter temperature occurs at no more than 50-percent relative humidity. The maximum temperature moves upward when it's less humid because the lower water content in the air makes it easier to sweat and thus keep cool — or at least seem to.

Sweat evaporation is the only mechanism the human body has to cool itself. Generally, sweating occurs when the ambient air temperature is above 80 degrees F. We also normally sweat where our bodies do not have a local airflow to help evaporation such as our armpits, neck line, waist line, groin, and feet.

Observations have shown that the body's very first physiological changes in response to heat take three days to complete. The body's changes can be complete in 10 days under optimal conditions of steady physical activity, food,

Soldiers from the 3rd Brigade Combat Team, 1st Armored Division wait for their turn to bound during a squad live-fire exercise on 3 November 2016 at Udari Range near Camp Buehring, Kuwait.

Photo by SGT Angela Lorden



rest, and fluids in a stable environment of moderately extreme conditions. For a complete response, the usual transition period is expected to be 14 days if the environment is stable and not too extreme.

On first exposure there is then at least a three-day window of real vulnerability where the body is initiating its responses to change where it might be possible for normally sub-lethal stress to seriously compromise the body's ability to adapt well enough and soon enough to protect itself.

Each one of the body's systems and adaptation processes needs time to change. Trying to force the changes by supplying excess dietary water and electrolytes does not speed the process of heat acclimatization. These attempts to hurry the processes actually confound our physiology and may make it worse by creating chemical imbalances that the body must then take additional time to correct. The Army treats about 10 to 20 hyponatremia (low body salt) cases each year where excess water has been consumed to the point of diluting the body's sodium and causing the nervous system to malfunction. At least one Army death has been reported with this cause.

Our sweat glands adapt differently during humid and dry heat exposures. Heat acclimatization performed in a hot-humid condition stimulates a greater sweat rate than heat acclimatization in a hot-dry environment. This reflects the lower efficiency of our sweat cooling ability in a humid environment.

Men and women acclimatize equally well. Different body sizes and weights will influence how warfighters respond to heat stresses. Training in a hot-humid environment is more stressful than training in hot-dry conditions because humidity slows heat loss while dry air speeds it up. The bigger and heavier Soldiers will suffer more with heat accumulation as the larger mass generates more heat and slows down its rate of loss. In all cases, heavy warfighters sweat faster than light ones and therefore require more water to erase their deficit of body water. Since our rates of sweating are nearly proportional to the two-thirds power of body weight, 200-pound warfighters sweat approximately 30-percent faster than their 130-pound companions.



Photo by Ashley Cross

A student in the Air Assault Course at Fort Benning, GA, drinks water after a run on 14 July 2013.

Though it accounts for only 20 percent of body heat loss at rest in low temperatures, more than 80 percent of our body heat loss is achieved by sweat evaporation when environmental temperatures exceed 68 degrees F. This ability to sweat is our one key mechanism to surviving in the heat.

If warfighters are performing heavy work in the heat, the critical environmental temperature level above which potentially lethal heatstroke is likely to occur may be as low as 85 to 90 degrees F.

Physical exercise can increase our whole body metabolism and its heat generation by as much as 15 to 20 times the resting rate in healthy young males. But because the body only uses 20 percent of its generated energy to provide useful work, the balance must be dissipated and given off as heat to the environment. If it is not, the core temperature will rise to high levels very early during any physical exertion. The heat that injures and kills warfighters is usually not from the sun but from the physical work they do.

When air and ground temperatures are below 92 degrees F, warfighters can lose heat by radiation to the cooler ground or by convection to the cooler air. In air above 92 degrees, the only way a warfighter can lose heat is by sweating. The human body only takes care of its heat exchanges by using water for evaporative cooling.

Exposure to an air temperature of 110 degrees F necessitates a 25-percent reduction in a warfighter's work output. A body water deficit of 2.5 percent (1.8 liters) requires the same reduction of work output by the average man. If both stresses are experienced at the same time, our productivity will be reduced by a total of 50 percent.

Early investigators found that troops in the desert lost 1 to 3 percent of their body weight before voluntarily beginning to drink and then drank less water than they were losing through sweat; the resulting water deficit was not reversed until after the evening meal. E. F. Adolph and associates named this condition "voluntary dehydration." Some researchers claim that the thirst drive does not kick in until 2 percent of the body weight is lost. The thirst drive appears to be good only for 65-70 percent replacement of the fluid lost (although some researchers claim it's only 50 percent). Measured decrements to mental and physical performance are generally first seen at a 2-percent loss. This can be offset to a certain extent by trained, disciplined, and focused effort, but it is no substitute for water replenishment.

The physiology of the thirst drive is too complex to discuss here, but it is important to note that humans do not rehydrate completely unless they have eaten, and those who drink deionized water also do not rehydrate completely. Some form of nutrients needs to be taken in for us to completely rehydrate.

It is now known that the intensity of exercise, rather than the level of dehydration, is the most important factor determining body temperature during exercise. This is because the generation of body heat can overwhelm the rate of heat loss possible with the volume of water-based plasma available.

Dehydration not only elevates our core temperature responses but also negates the thermoregulatory advantages conferred by high aerobic fitness and heat acclimatization. Heat acclimatization lowers core temperature responses when warfighters have all the water they need. However, when we are dehydrated, similar core temperature responses are observed for both unacclimatized and acclimatized states.

We need to know that when we are fit and acclimatized we can produce up to three liters of sweat in an hour of strenuous exercise under the worst of conditions, but our bodies can only absorb a little over one liter from fluid consumption. As is true with our calories and electrolytes, we cannot replenish fluids at the same rate we deplete them; our body simply cannot absorb as fast as it loses. Evaporative cooling can deplete fluids and electrolytes faster than the body can replenish them. This is why knowledge of these phenomena is essential so that we can set a sustainable operational pace and avoid unnecessary casualties by creating states of exhaustion.

Differences Between Jungle and Desert Stresses

Desert

First, we hope to know all the environmental factors that will impact us and our operations before a deployment. Then we hope to have the time for appropriate training. Finally, we look to the individual and chain of command. An article published

Water is the main weapon against heat injuries. It is essential to remember that the thirst drive is only good for about two-thirds of the water lost in sweat. This explains why fit troops will suddenly drop from heat exhaustion or heatstroke even though they have been able to quench their thirst at will.

in the November-December 2004 issue of *Infantry Magazine* provides an excellent example of how one unit — the 2nd Brigade Combat Team, 2nd Infantry Division — prepared for desert operations in Kuwait/Iraq in 2004.¹ The planning and preparations conducted in anticipation of the deployment ideally should be emulated by all deploying units. This article does not provide a cookie-cutter plan as every deployment is unique. What is absolutely required, however, is that a unit must understand its home-station environment and what the new environment requires to have the same degree of success on the ground. Only with that foreknowledge — and the discipline to follow through — can plans and procedures be adjusted to fit the deploying unit.

The heat load created by direct sunlight is significant. The desert sun imposes a thermal stress on man that is two to three times that imposed by the open tropical climate, where clouds often obscure the sun. This can be different than the sun exposure in the deep jungle. The physiological strain due to this stress appears to be proportionately greater in the desert. Warfighters will sweat approximately twice as much in the desert as they will in an open tropical environment because they can lose water more rapidly and have more exposure to the sun. Note also that this is different than warfighters acclimatized to the deep jungle who will generally sweat more than the desert acclimatized because of sweat's poorer cooling efficiency in the deep jungle.

Water is the main weapon against heat injuries. It is essential to remember that the thirst drive is only good for about two-thirds of the water lost through sweat. This explains why fit troops will suddenly drop from heat exhaustion or heatstroke even though they have been able to quench their thirst at will. In the early days at the National Training Center at Fort Irwin, CA, a three-part pattern was seen. First, after three days in garrison, those troops who quenched their thirst with beer and soda collapsed with heat injuries as those drinks dehydrate you and make you feel dull. Second, those troops in the field who drank only enough water to quench their thirst collapsed on the sixth night and seventh morning. Third, those garrison troops who drank only water and only to quench their thirst collapsed on the eighth night and ninth morning.² Once this pattern was recognized, an education program was created for the rotating units and the pattern all but disappeared. In addition, commanders saw their sick calls drop by 30 percent. Whenever a unit is exposed to heat stress, there must be command emphasis on an adequate supply and intake of water.

Commanders should consider that they and the rest of the leadership are also subject to heat stress and injuries. Heat and fatigue first affect our thought processes. Unit leaders must not let heat and fatigue reduce the effectiveness of the unit's command and control. All too often during exercises, those in leadership and staff positions are up and going around the clock in the first days until they are exhausted. This then leaves the unit without active and effective leadership and staff functions in the final days of the exercise. In combat, this will reduce the unit's ability to respond to and defeat the continuous activities of the opposing forces.

One of the few consistent markers in our body's decline from dehydration is that when we hit 8-percent dehydration we find ourselves unable to spit. I have found myself at this point several times while operating in the desert and realized that I was then perhaps two to three hours from becoming physically dysfunctional from the heat. Therefore, I had to end the mission and get to a source of water.

Remember, the need for a constant and plentiful water supply to provide a substrate for perspiration can be a great limitation for warfighters in dry heat.

Jungle

In the humid tropics, the problems associated with heat are quite different. Solar radiation is less of a problem and temperatures are often lower than in the desert. The major thermoregulatory problem is the high humidity which reduces the effectiveness of evaporative heat loss. Evaporation is not so effective in a hot-humid environment, but since water is usually easily available, prodigious sweating over the entire body surface can maximize possible evaporative cooling without necessarily leading to fatal dehydration.

It is usual for operational and medical records to be incomplete and not to coincide. So it is rare to see how operational facts can contribute to medical realities. One operation in history that clearly indicates the effect of jungle heat on unacclimatized warfighters' physical performance has been pieced together regarding the U.S. Marine experience during Operation Starlite on 18-19 August 1965 in Vietnam.

The daily temperatures in that region of Vietnam that time of year was usually between 105 and 110 degrees F. According to one source, it reached 112 degree-plus heat on 18 August. The battle was initiated by the 3rd Battalion, 3rd Marines and



Photo by SSG Brandon Ames

A U.S. Army Soldier scans the jungle while pulling security during Jungle Warfare School in Ghana on 4 August 2018.

2nd Battalion, 4th Marines, both having been in country and in combat some six weeks beforehand.

The Special Landing Force (SLF) — Battalion Landing Team (BLT) 3rd Battalion, 7th Marines which consisted of India, Mike, and Lima companies — was kept shipboard as the Pacific theater reserve. The BLT was alerted from the Philippines on 16 August to take part in Starlite. Each of the companies rostered six officers and 176 enlisted.

In late afternoon of the 18th, the SLF arrived offshore. Lima 3/7, which was on the USS Iwo Jima, was heli-lifted ashore, landing at 1543 on 18 August. Under the operational control of 3/3, it was then dispatched to help India 3/3. Lima 3/7 moved out to contact at 1730 and reached its objective area by 1845. The Marines were equipped with steel helmets, no flak jackets, M-14s and M-79s, two metal 1-quart canteens, and a light marching pack with no blanket roll.

After moving into the attack, Lima 3/7 was ordered to a hilltop to meet up with India 3/3. At 1855, Lima 3/7 reported being delayed due to heat casualties, saying it was stalled in battle, could not move, and needed water. LtCol Joseph Muir of 3/3 Marines went out to Lima 3/7 to bring some order to the situation as Lima had numerous medical evacuations involving leadership (including the company commander). Lima 3/7 then needed assistance from India 3/3 as it was apparently unable to guide itself up to the hilltop position. Approximately 1.5 hours of battle in the sweltering jungle heat had emasculated the unit's functional leadership. The decision was made to return Lima 3/7 to the 3/3 perimeter during the night and place it in reserve; the Lima 3/7 Marines were then led down the hill, holding onto each other's belts in the darkness.

Lima 3/7 suffered four killed in action and 14 wounded in action on 18 August (18/182 = 9.9 percent). The heat casualties were not included in this total. The unit spent the next day sweeping the beach before going into its blocking position by 1500.

While Lima 3/7 was almost immediately in combat, India 3/7 arrived at the 3/3 command post at 1800 on 18 August and pulled security, with light fighting during battlefield clean up on 19 August. Mike 3/7 beach landed at approximately midnight on 19 August. It spent that day doing light fighting during the battlefield clean up as well. On 24 August, BLT 3/7 re-embarked as the SLF.

The extreme vulnerability of the human in the first days of acclimatization is graphically portrayed in this example. While 3/3 and 2/4 Marines had been living and operating in country for six weeks, the SLF had no recent exposure. Moving into battle in sweltering jungle heat less than two hours after hitting the beach left these Marines dazed, confused, and exhausted in less than another two hours. The operational demands in the prevalent environmental stresses would have immobilized any unacclimatized military unit.

Even being acclimatized is no guarantee of protection as temperature changes often cannot be forecast. On a jungle

reconnaissance, I suddenly became aware of heavy heat oppression and the onset of physical weakness as I began to stagger. I slowed my rate of movement and drank water until the feeling of body stress and weakness was moderated some. On returning to camp that evening, I was told the temperature had jumped 12 degrees that day for some reason to over 108 degrees F.

Relying on assumptions rather than hard facts can also contribute to operational chaos. I observed the rotation of a group of engineering troops from Florida and Alabama while assigned to a task force in Honduras. They said they came from a hot and humid home station so they already knew how to operate in the jungle. What they created was the worst unit record for heat illness/injury and heat stress-related vehicle accidents (collisions and equipment roll overs) of any unit that rotated through the task force that year. The Soldiers and their leadership simply lacked the discipline to listen and adopt the safe behaviors needed for that particular jungle environment.

Summary

Whenever we move out of the general range of 40 to 95 degrees F, we encounter the situation where we must always consider that the environment is always sucking moisture and energy constantly out of our bodies. Our bodies then become yet just another piece of equipment that we constantly have to monitor so that we can depend on it being capable of what we need it to do when we need it.

With awareness of how our warfighters' bodies work and what they need, along with proper planning and execution, we can move on our objectives and take control rather than only being capable of staggering to the objective and collapsing into an exhausted, vulnerable state.

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Lessons from the Past



The Battle of Monroe's Crossroads

CPT THOMAS DROWN

In sustainment operations, security is paramount. This is especially true as we consider the shift the Army is taking from counterinsurgency (COIN)-based operations back to unified land operations (ULO). In today's hybrid environment, linear warfare rear area threats can take the form of anything from enemy special operations forces elements to bypassed armored squadrons; none of which sustainment elements are traditionally prepared to defend against. As we look to modify doctrine, there are lessons that can be drawn from past conflicts.

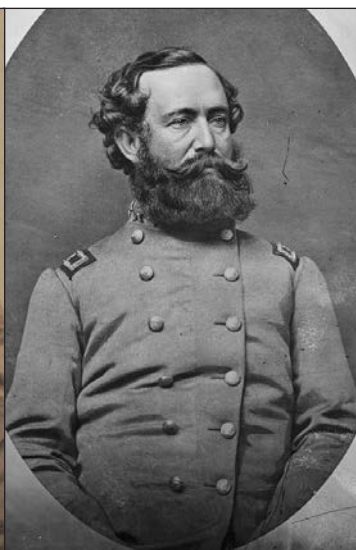
An excellent source of data on what a fluid ULO would look like would be the U.S Civil War. Many of the battles fought were tactically linear but operationally and strategically based around the fact that the forward line of troops (FLOT) was not rigidly defined. Of particular interest in that regard would be the little known Battle of Monroe's Crossroads. Occurring on 10 March 1865 on what is now Fort Bragg, NC, the battle was an attempt by Confederate cavalry to exploit the fog of war and fluid unit boundaries to destroy the Federal cavalry division under Brevet Major General Hugh J. Kilpatrick. While not particularly sustainment intensive, it illustrates the importance of two of the principles of sustainment: improvisation and survivability.

Background

After four long years of intense conflict, the American Civil War was finally coming to a close. In Northern Virginia, General Ulysses S. Grant had General Robert E. Lee's Army of Northern Virginia pinned at the Siege of Petersburg. In the South, General William T. Sherman's forces had just finished burning a fiery path across Georgia in Sherman's infamous March to the Sea. With the capture of the city of Savannah, Sherman received new orders. He and his army were to board vessels bound for Virginia in order to assist Grant in the final destruction of the Army of Northern Virginia. Sherman had other ideas, however, and requested that he be allowed to march



**Union Brevet Major General
Hugh J. Kilpatrick**



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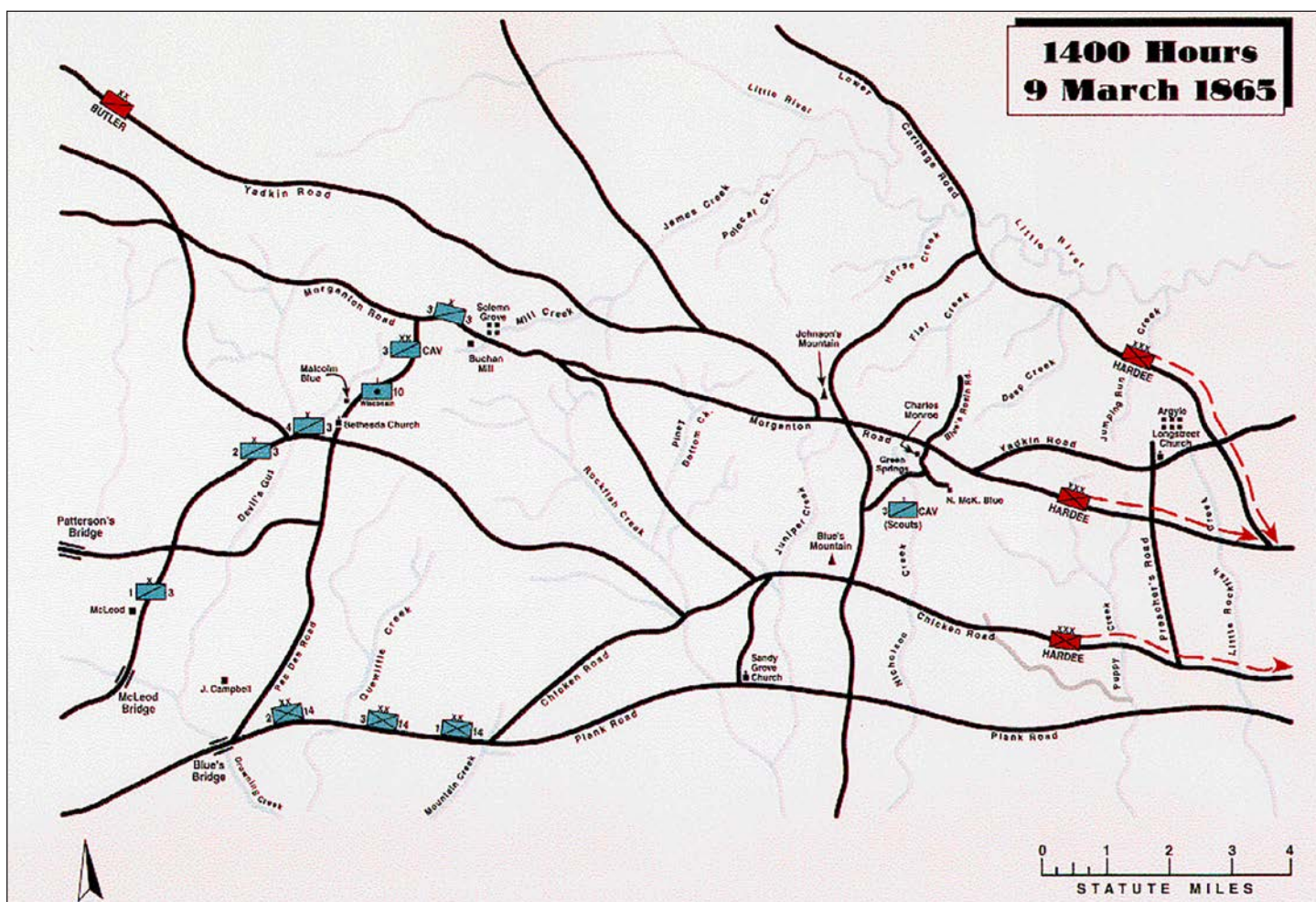
**Confederate Lieutenant
General Wade Hampton**

north through the Carolinas, thereby punishing the hotbed of secession that had started the bloody conflict. Grant acquiesced to Sherman's request, and on 19 January 1865 Federal forces plunged into the Carolinas.

Sherman's plan for the invasion of North Carolina was centered on the capture of Fayetteville. Possession of the city would allow for the resupply of his army via the Cape Fear River as well as allow him to link up with any potential inland thrusts from Federal forces on the coast. To accomplish this, Sherman would first feint

towards Charlotte before turning the main body of his troops towards Fayetteville. If the bridge at Fayetteville could be captured quickly, the Federals could trap Confederate General Joseph E. Johnston's army on the western side of the river. All told, Johnston could muster only 30,000 troops to face Sherman. His only chance for success would be to concentrate as much force as possible and attempt to overwhelm one of Sherman's wings as they became disjointed on their advance. To that end Johnston ordered Lieutenant General Joseph Wheeler's cavalry to delay the Federals as much as possible so he could concentrate his spread out forces.

On 8 March 1865, Confederate Major General William J. Hardee's 6,000-man infantry force began to filter into Fayetteville. Also on that day, a Confederate Cavalry Command was established. Under Lieutenant General Wade Hampton, this command united Wheeler's forces and Major General Matthew Butler's division. On the Federal side, Kilpatrick seemed unconcerned by what was happening as he spent his time in the carriage of a female companion, Marie Boozer, while his division struggled through the rain and mud towards Fayetteville. Forced to use parallel routes in order to not overtax the poor road systems, the Federals became disjointed and separated — a target that could easily be exploited. The only thing that kept the Federal cavalry brigades in supporting distance of one another was their excellent scouts.



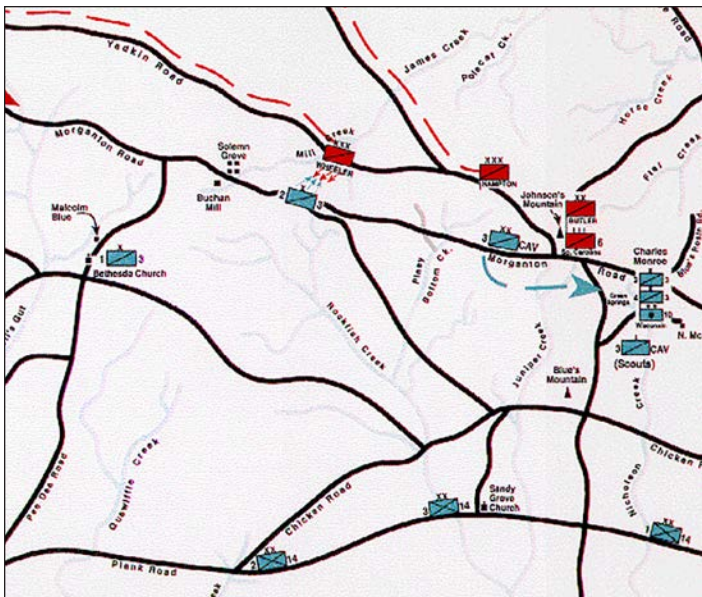
Map 1 — Situation as of 1400 on 9 March 1865

These same scouts, 8-10 miles in front of the majority of the division, reached the Monroe Crossroads at 1100 on 9 March. Behind Kilpatrick's scouts, the 3rd Brigade under Colonel George Spencer arrived at the village of Solemn Grove at around 1400. Spencer's men were exhausted. With the rest of the division considerably further behind them, Spencer decided to halt, rest, and set up defensive positions. His scouts that had been moving north and east along Morganton Road reported that a large body of infantry had recently passed through on its way to Fayetteville. They also reported that Confederate cavalry troops were riding as fast as possible westward in order to catch up. Kilpatrick's cavalry division was now between Hardee's infantry in Fayetteville and the Confederate cavalry under Hampton.

Kilpatrick was now at a decision point. He could continue to advance, a risky proposition with the Confederate cavalry in the area and his division strung out, or he could halt, divide his division to cover the three main roads, and attempt to prevent Hampton's cavalry from linking up with the Confederate infantry in Fayetteville. Kilpatrick chose the latter as he could select the ground on which he could fight the Confederates, thereby negating some of the risk of dividing his forces. The 1st Brigade under Brigadier General Thomas Jordan, the furthest back in

the column, was ordered to divert to cover Chicken Road. The 3rd and 4th Brigades with attached artillery would continue down Morganton Road beyond the junction with Yadkin Road and establish camp, thereby blocking Yadkin. The 2nd Brigade would follow and block Morganton Road.

The 3rd and 4th Brigades arrived at the bivouac site at the Monroe farmhouse around 2100 and began setting up camp. The 3rd Brigade turned parallel off of Morganton Road into the sloped open field surrounding the farmhouse while the 4th Brigade camped on the area across from the farmhouse opposite 3rd Brigade. The field was just barely large enough to squeeze all three of 3rd Brigade's regiments; the 1st Alabama Cavalry continued south and encamped on a small hillock overlooking the wooded swamp on the western side and the rest of the field where the 5th Ohio and 5th Kentucky Regiments were camped. Finally, the two cannons from the 10th Wisconsin were set up about 50 yards south of the farmhouse. The rain once again became torrential as soldiers set up shelters and unloaded wagons. The Monroe house was designated as division headquarters and was speedily occupied by the division staff that had not stayed with Kilpatrick. This included Boozer and her mother, who were allocated their own quarters within the house. Spencer, 3rd Brigade's commander, instructed



Map 2 — Situation as of 2100 on 9 March 1865

pickets to be put out towards Fayetteville, but in the torrential rain he was confused and pushed them a half mile south of Morganton Road.

Wheeler's Corps was moving parallel to Union Brigadier General Smith Atkins' 2nd Brigade on Morganton Road. The rain and darkness hindered visibility to such an extent that the two forces were often within a mile of each other, but neither was aware of the other. Moving southeast along Yadkin Road, Butler's advance guard struck Morganton Road and halted. Suddenly, they heard voices and saw riders on horseback. Butler ordered the riders to identify themselves and discovered they were Federal cavalry troopers from the 5th Kentucky Regiment. Quickly drawing his revolver, Butler demanded the Federals' surrender. As they were laying down their arms, a second group of riders appeared; upon seeing the situation, they scattered into the woods before the Confederates could capture them. It was not until much later that Butler would learn that he had almost captured Kilpatrick. In the interim, Butler sent his scouts to follow their tracks and that he would follow shortly with the division.

At around the same time Hampton was giving instructions for the attack, Kilpatrick finally stumbled into his camp at the Monroe farmhouse. Exhausted from his near capture, the general and his mistress turned in for the night, safe under the assumption that the 1st or 2nd Brigades would make first contact with any Confederate cavalry and thus alert the division headquarters at his location. He could not have been more wrong.

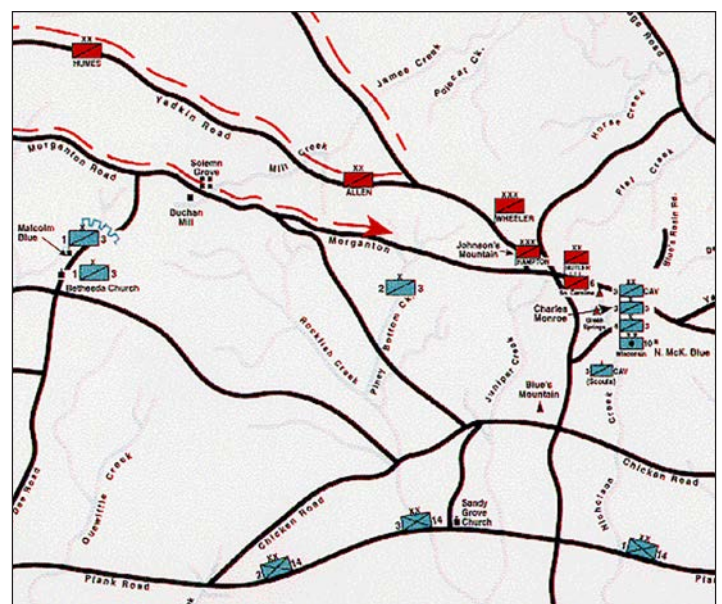
As the night continued, 2nd Brigade (under Atkins) continued to push towards Morganton Road. They had been rather roughly handled by Wheeler's flank guards earlier and so they advanced slowly with a skirmish line out in front. It was these skirmishers who reported seeing Confederate cavalrymen in ponchos encamped along the road. These were Butler's men who had no idea of the size of the Federal force to their rear as they were entirely fixated on the camp at the Monroe

Crossroads. At this critical juncture, a quick violent assault on Butler's unsuspecting command would seem an obvious choice for Atkins. However, with no idea of the size of the enemy force and realizing he was cut off from the rest of the division, Atkins ordered his brigade to countermarch. The road ahead was blocked, but he confident his men would find a way around to the southeast. He ordered them off the road so as to avoid any Confederates coming from the west. Moving off road in the pitch dark was about as appealing as it sounds, and 2nd Brigade promptly fell into a swamp. Horses and men foundered while wagons and cannons were mired to their axles in the deep mud. With Atkins' men busy trying to extract themselves, the first part of Kilpatrick's hazy security plan fell apart.

At this time, 1st Brigade was busy fortifying itself at Bethesda Church about five miles southwest of Solemn Grove. Scouts reported enemy activity to the north, and Jordan was taking no chances on being surprised. Into the early morning of the 10th, he desperately attempted to contact Kilpatrick, Atkins, or even Spencer with the 4th Brigade. All of his runners returned with reports that the roads were blocked by Confederate troops passing eastward. Worried that the enemy forces reported in the north would strike southward, Jordan continued to fortify his position and brought his artillery forward to cover the road. He would wait until daylight and then reassess the situation. The timidity of 1st and 2nd Brigades had now set the stage for a potential failure of colossal scale.

On the Confederate side, events were moving far more aggressively. Butler personally reconnoitered the federal camp, and after conferring with Hampton and Wheeler, built a plan of attack. Butler would move out when Wheeler's troops reached his rear area and then position himself to fall on the Federal camp from the northwest while Wheeler's strung out divisions would strike the rear of the camp from the west. In effect, the Federal 3rd Brigade, 4th Brigade, divisional headquarters, and Kilpatrick would be caught in a pincer movement by Hampton's cavalrymen. Confident in their complete surprise and

Map 3 — Situation as of 0100 on 10 March 1865



superiority, Confederate leaders from company commanders to Hampton himself turned to planning how to take the real prize — Kilpatrick himself.

Satisfied with the reconnaissance, Wheeler returned down Morganton Road to his camp and ordered units into position. The Texas Brigade, the right wing under Brigadier General William Humes, would shift into the woods behind a low ridge. As they moved into position, stumbling through the darkness, they promptly ran into the swamp at the base of the ridge and began to shift right to get onto higher and drier ground. Unbeknownst to them, 200 yards of flooded swamp now stood between Humes' Texans and the Federal camp. More of Wheeler's units began arriving and shifting into positions so that by 0530 as much of Wheeler's command as possible was in position.

By that time, the rain that had incessantly battered both Federals and Confederates subsided and was replaced with a heavy fog that hung low over the swamp. The Confederate forces were finally in position. Wheeler with Brigadier General William Allen's division and Captain A.M. Shannon's scouts held positions along the ridge just south of Morganton Road, directly west of the camp. On his right, the aforementioned Texans under Humes held the far southern portion of the ridge. To the northwest, Butler's division held position on the opposite side of Morganton Road, having shifted parallel to the Federal camp during the night. At 0600, Wheeler gave the command "Forward!" and the Confederates began their attack.

At 0600, the Federals at Monroe Crossroads were just beginning to wake from their slumber. Men could be seen making coffee and reveille was minutes away. Still dressed in

his long white nightshirt, Kirkpatrick stepped outside to check on some horses. At that moment, Wheeler and his men burst from the wood line at full gallop with sabers drawn and guns blazing. The aforementioned Confederate prisoners were abandoned by their guards, and several were killed by their fellow Confederates in the pandemonium. Dumbstruck at the site of Wheeler's men running wild through the camp, Kilpatrick muttered, "Here is four years hard fighting for a major general's commission gone up with a surprise."

As if to reinforce that point, a young Confederate captain reined his horse and shouted, "Where is General Kilpatrick?" Kilpatrick, realizing he was unrecognizable in his night clothes, immediately pointed to one of his officers (who was attempting to mount up) and shouted, "There he goes on that horse!" The Federal officer lashed his mount into a gallop; thinking his quarry was escaping, the Confederate captain followed hot on his trail. Hiking up his night shirt, Kilpatrick leapt onto the ground and took off to the woods to follow his men and hopefully salvage the situation.

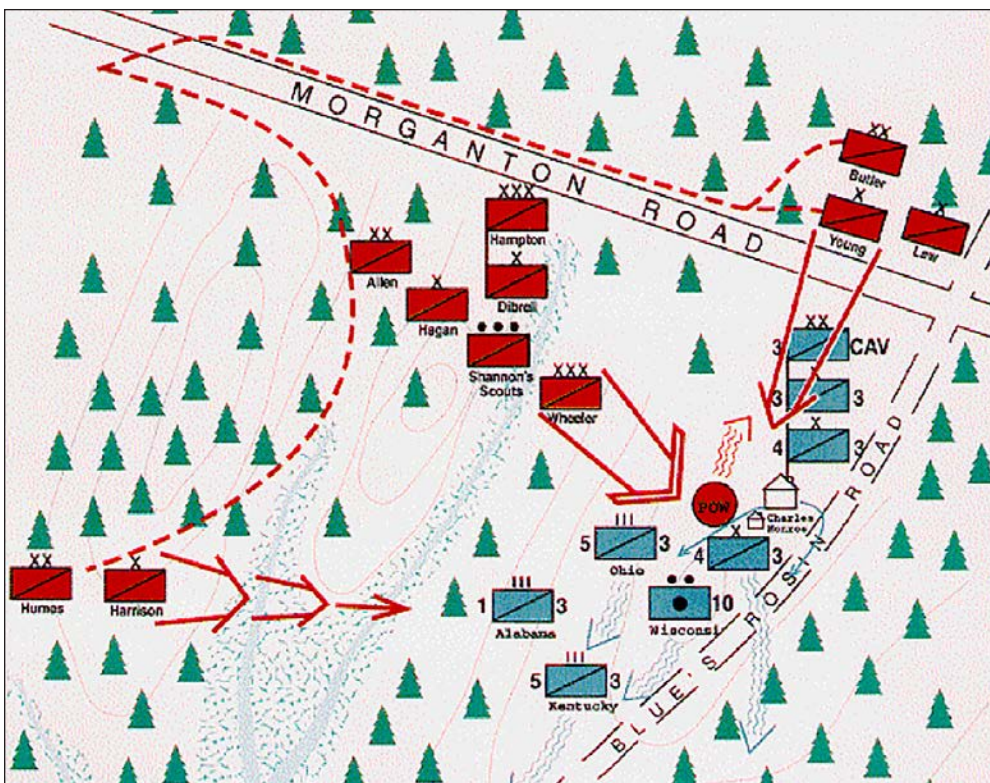
Being pushed from the north and east, the Federals who could get away fled south towards the swamp. Meanwhile, some of the Federal units attempted to form some kind of resistance to the inexorable grey tide. Protected from the initial onslaught by the Monroe house, 4th Brigade attempted to form into a firing line along the wood line. The machine-like precision of fixing bayonets drew the Confederates' attention, and murderous short-range fire rained down on 4th Brigade troops, swiftly cutting short their attempt to make a stand. Broken and joining in with their fleeing comrades, their one positive contribution was that their rifled muskets tricked the

Confederates into thinking they were an infantry column. That sobering image caused the Confederates' front rank to rein itself in, throwing the follow-on ranks into confusion.

On the Confederate right, things were not going well. When the bugle had sounded charge at 0600, the Texans had immediately launched themselves into the fog only to immediately slam into an impenetrable swamp. Men cursed as the follow-on regiments kept pushing, driving some of Texans neck deep into the muck and mire. After much confusion, the supporting regiments called a halt. Hume's Texans, however, were already committed, and so many of them continued to try and find a way across the swamp.

The Union's 1st Alabama Cavalry, which was immediately across from Hume's men, was already under duress, having been assaulted

Map 4 — Dawn Attack





Martin Pate painting, *Cavalry Clash in the Sandhills, The Battle of Monroe's Crossroads, North Carolina*

The Confederate cavalry charge unleashed chaos in the startled Union camp that was just beginning to stir awake.

during the initial Confederate sweep. The soldiers were not routed as they had sited their camp on a small hill further down the slope which overlooked the swamp. The Alabama troops now did a 90-degree shift and began blasting Hume's Texans with their breech-loading Burnside carbines, driving the Texans back into the neck-deep swamp.

As for the rest of the Federal Army, things were far less successful. The Confederates had driven most of the men who had been trapped in (or under) the Monroe farmhouse into the woods to the south. Those men, having finally been stopped by an impenetrable swamp, held on for the inevitable Confederate follow through. Most had grabbed their weapons when they fled and so now were determined to sell their lives dearly. As they continued to wait, officers began to bring order to the masses, and after minor discussion they decided to retake the camp. The Confederate ranks, on the other hand, had descended into chaos as they began to loot the Union camp. Wheeler attempted to bring order and ordered his men to limber up the Federal cannon and wagons for onward movement. At that moment, they heard gunfire coming from the swamp. The Federals had begun their counterattack.

As the Confederates dropped their loot and tried to find cover, a muddy, wet firing line advanced from the wood line. The 5th Ohio's rapid firing Spencer carbines generated a hailstorm of fire that drove the Confederates from the southern part of the camp. They were victims of their own success as the earlier charge was so swift and so successful that unit integrity had been utterly lost. The Confederates rapidly fell back to the north end of the camp and sporadically returned fire while

attempting to reform. Wheeler, hearing of the Texans' lack of success on his right, ordered them to reform and come to the fight from the north end of the camp. No longer pressured, the 1st Alabama troops swiftly fell back and joined their comrades advancing from the swamp.

Meanwhile, the Confederate reserve could not be located; thus, the only means of salvaging the day would be if Hume's Texans made it in time. The Federals, however, were not letting up; their concave firing line retook the southern portion of the camp and continued to put immense pressure on Wheeler's men. Crossing Nicholson Creek and

the Blue Rosin's Road ford, Captain T.F. Northrop's mounted scouts had found and then collected the 3rd and 4th Brigades, adding them to his 200 Soldiers. This mounted element launched a charge up the hill to retake the Monroe house; it was quickly halted, however, when it ran right into the reforming Confederate cavalry. The rest of the Federal force, encouraged by the reinforcements, surged up the hill and collided with the mounted Confederates.

In the ensuing confusion, First Lieutenant Ebenezer Stetson, who commanded a Union artillery section, retook one of his cannons, unlimbering it and placing a friction primer in the touch hole. With a swift jerk, the cannon fired, stunning everyone in the vicinity. Both sides turned their focus to the cannon. Stetson quickly assessed the situation and began reloading the gun while more of his crews appeared from hiding to assist him. The rebels, having recovered from their initial shock, attempted to take out the new hazard. Hume's Texans, having made the long journey around the swamp, were first into action against Stetson's guns. They, along with jumbled elements from the other Confederate cavalry brigades, attempted to charge the guns but were swiftly scythed down by canister fire. Realizing storming the guns was an expensive course of action, the Confederates focused accurate rifle fire that successfully eliminated the gun crews.

With the guns eliminated, Wheeler realized this was the last opportunity to retake the camp and defeat the Federals. He gathered up men and sounded the charge. The Federals were incensed at this audacious attempt to cheat them of their hard-won comeback and devastated the Confederate

In conclusion, from start to finish this battle was hindered by the fog of war. In the initial phases, thanks to the weather and darkness, Kilpatrick missed the chance to defeat Wheeler's strung out force in detail. Also, the lack of communications, thanks to the intermixed Confederate and Federal units, prevented Federal commanders from warning Kilpatrick about the Confederates to their rear. For the Confederates, confusion and the breakdown of discipline cost them the field as their forces failed to take and hold the camp. In addition, since reconnaissance didn't identify the poor terrain (thanks to the weather), the failure of Hume's brigade cost



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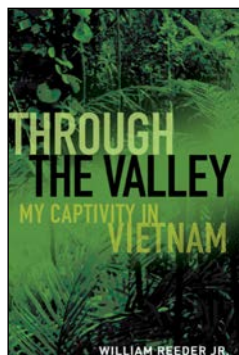
Book Reviews



Through the Valley: My Captivity in Vietnam

**By William Reeder Jr.
Annapolis, MD: Naval Institute Press, 2016, 238 pages**

Reviewed by LTC (Retired)
Rick Baillergeon



There are those rare books which engross you from the very beginning. For me personally, these volumes share two key characteristics. First, they center on subject material which I clearly have a great interest in. Second, the author articulates the subject in a highly conversant style which is extremely engaging and demands that you continue to read the next page. It is these two characteristics which clearly make William Reeder's *Through the Valley: My Captivity in Vietnam* one of those select books.

Within the pages, Reeder superbly details his harrowing experience in the waning months of the Vietnam War. It began on 9 May 1972 when then CPT Reeder was flying his Cobra gunship in support of South Vietnamese troops. During the mission, Reeder's helicopter was shot down in the Central Highlands of Vietnam. The crash killed his co-pilot and left Reeder with severe injuries which included a broken back. Despite his debilitating condition, he evaded capture from the North Vietnamese for three days.

Following his capture, Reeder was moved to a small jungle prison comprised almost entirely with South Vietnamese prisoners. Here we underwent his first of countless interrogations. After several weeks, Reeder and 25 other POWs were forced to travel by foot more than 200 miles along the Ho Chi Minh Trail into North Vietnam. Following this incredible ordeal in which seven POWs died, the group would eventually find imprisonment at the Hoa Lo Prison (better known as The Hanoi Hilton). Reeder spent months there until his eventual release on 27 March 1973. When released he was the last U.S. Army prisoner taken who survived. All others captured after him died.

Reeder superbly tells this story within the pages of *Through the Valley*. He achieves this in several ways. First, he writes in the aforementioned extremely conversant style. Second, the author does a superb job of articulating the vast emotional spectrum which highlighted his 10-month ordeal. Reeder does not shy away from addressing his thoughts and emotions with readers. His decision to share this makes this a very impactful book.

Within this discussion, one clear theme resonates throughout the volume. That is the power of faith and hope in assisting a person in meeting or simply surviving the challenges of life. Throughout the volume, Reeder reflects on the seemingly desperate situation he was in. Yet, you always sense that he felt he would ultimately make it through the ordeal. His optimism and ability to supplant the negativity of the environment he was placed is clearly inspirational. In fact, this is one of those volumes which can truly influence your way of thinking and the way you approach problems.

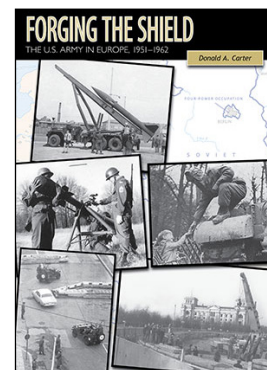
What makes this unique amongst other Vietnam POW books is that Reeder skillfully blends the interactions and relationships he had with others while a POW. This not only includes fellow U.S. POWs, but South Vietnamese POWs, guards and prison staff, and North Vietnamese soldiers. In particular, Reeder details his experiences with South Vietnamese POWs and the bond he developed with many. Reeder further expounds on many of these individuals in the volume's epilogue. In it, he further elaborates on his relationship with each and provides a synopsis on what happened to them after the war.

This is not just one of the best firsthand POW accounts I have read, but one of the best volumes I have read in many years. It unquestionably possesses the characteristics of a superb story and a story which is superbly told. *Through the Valley* is a book which will benefit and be remembered by readers of a wide variety of interests. William Reeder has a special story which must be read.

Forging the Shield: The U.S. Army in Europe, 1951-1962

**By Donald A. Carter
Washington, D.C.: Center of Military History, 2015,
513 pages**

Reviewed by Maj Timothy Heck,
U.S. Marine Corps Reserve



Donald Carter's *Forging the Shield: The U.S. Army in Europe, 1951-1962* is the Center for Military History's official account of Army presence in Western Europe from the return of U.S. combat forces in 1951 through the Berlin Crisis of 1961-62. The book is a dense academic work focusing on the

institution's doctrine, logistics, and manpower as the United States sought to reinforce its presence in Europe after the initial shock of the Korean War. Given recent discussions regarding America's role in European regional security, *Forging the Shield* deepens our understanding of how the Army went from a relatively small post-war garrison and occupation authority to a combat-ready force that remains stationed in Europe today.

As a result of rising tensions between the Soviet Union and the West in the late 1940s, American policy makers and strategists revised America's force posture throughout the world. The surprise of the Korean War and its initial American setbacks prompted changes to the American presence in Europe, where overt Soviet action was most expected. The 1st Infantry Division and the U.S. Constabulary, which were garrisoning West Germany, lacked sufficient or significant combat power required a radical shift in manpower and training in order to become a combat-capable force. In September 1950, just three months after the start of the Korean War, President Harry Truman called for reinforcements to be sent to Europe, demonstrating a willingness to forward deploy American troops in anticipation of conflict. The reinvigorated Army, Carter remarks, was a "down payment" for security in Western Europe in the event of a Soviet attack.

Carter's focus on the sinews and mechanisms required to expand American presence in Europe reveals the struggles commanders faced. Post-war drawdowns left equipment and training readiness at abysmal levels. Furthermore, doctrinal changes, especially with regards to atomic weapons,

represented another significant challenge. Carter deftly portrays the frequent changes in American plans for tactical nuclear weapons and the resultant shifts in DOTMLPF (doctrine, organization, training, materiel, leadership and education, personnel, and facilities) considerations. Throughout the 1950s, the U.S. Army in Europe conducted large-scale exercises and wargames in order to prepare for the atomic battlefield. These exercises helped American planners anticipate troop reactions, civilian concerns, and maturing NATO doctrine when preparing for World War III.

As Chief Historian Richard W. Stewart states in the book's foreword, the U.S. Army in Europe during this time was "a visible symbol to the world that America had placed its flag and its soldiers — its citizens-in-arms — in harm's way to reinforce its commitment to peace and freedom." Carter authoritatively tells that story from an organizational perspective. Drawing from official records and contemporary accounts in newspapers like *Stars & Stripes*, *Forging the Shield* is extensively researched and amply illustrated. That said, it is not for light or casual readers. The structural focus means the individual Soldiers and leaders who made up the Army are often lost in the narrative, leaving it somewhat sterile. While there are interesting asides on the birth of the Special Forces, intervention in Lebanon, post-war occupation politics, and simulated nuclear war in populated areas, the denseness of Carter's work limits its applicability to all but the dedicated student of history. Ultimately, *Forging the Shield* is a valuable work in the history of the Army and its organization though aimed at a niche audience.

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