Integration of Signals Intelligence, Electronic Warfare in Reconnaissance Troop: Seeing Where the Eye Cannot See

by CPT Doni Wong, 1LT Theodore Lipsky, CPT Brigid Calhoun and CW2 Pablo Cruz

In the ongoing debate of how to win against a near-peer adversary in a complex operating environment, senior Army leaders have posited several solutions to the question of tactical electronic warfare (EW) employment.

As the most proximate U.S. light infantry brigade combat team (IBCT) to Russia, 173rd IBCT (Airborne) tested an integrated EW and signals-intelligence (SIGINT) platoon to bridge the capabilities gap between the unit and its near-peer Russian adversary, whose armed forces demonstrated renewed EW capability in its 2014 conquest of Crimea.

The test was conducted in February 2018 when 173rd IBCT (Airborne) consolidated its EW and SIGINT Soldiers into a combat EW intelligence (CEWI) platoon within its military-intelligence company (MiCo). The brigade initially tested the concept with moderate success during Exercise Swift Response 17.2 at Hohenfels Training Area (HTA), Germany, in September 2017. To maximize the CEWI teams' collection reach, the brigade leadership task-organized them under Troop A (aka "Anvil Troop"), 1st Squadron, 91st Cavalry Regiment (Airborne). The concept was tested during 173rd IBCT's next two exercises at HTA in January and April 2018.

This article offers lessons-learned and recommendations from these three training exercises, specifically regarding the utility of habitually integrating the CEWI teams with the brigade's reconnaissance platoons. Although a nascent potential solution to the tactical EW question, the CEWI teams of 173rd IBCT (Airborne) met their brigade commander's initial intent by locating enemy emitters, succinctly communicating their locations across multiple spectrums to the commander and providing the commander with options for enemy signal disruption.

CEWI platoon established

COL James B. Bartholomees, commander of 173rd IBCT (Airborne), approved the consolidation in February 2018 of the brigade's EW and SIGINT Soldiers into a CEWI platoon in 54th Brigade Engineer Battalion's MiCo. The brigade initially tested the integrated-platoon concept with moderate success during two previous exercises at HTA in September 2017 and January 2018. However, the platoon's performance fell short of its full capability because of its inability to train as a single platoon ahead of the exercises.

After task-organization changes in February and March 2018, new-equipment training (NET) and new-equipment fielding (NEF) of the Versatile Radio Observation and Direction (VROD), VROD Modular Adaptive Transmit (VMAX), Saber Fury (a system that manages the electromagnetic environment while on the move without network connection) and Raven Claw (a system used with EW planning tools), the MiCo stood up the CEWI platoon according to the Army's ***Multi-Functional Intelligence and Electronic Warfare Concept of Operations***, Version 1.[1]

The brigade commander charged the platoon with three responsibilities that drove the train-up to the April 2018 Joint Warfighter Assessment (JWA) 18.1:

- Locate enemy signal emitters;
- Succinctly communicate their locations across multiple spectrums to the commander; and
- Provide the commander with options for enemy signal disruption.

Although the platoon and MiCo leadership acknowledged the long-term need for advanced fieldcraft and call-for-fire capability, plus training on the Raven unmanned aerial system (UAS) and/or Puma (small, battery-powered, hand-launched UAS), the leadership prioritized system cross-training, reporting and communication-platform proficiency between January and April 2018.

The CEWI platoon's relationship with Anvil Troop began during Exercise Bayonet Guard (see related article, this edition) in January 2018, a month before the consolidation directive. The MiCo leadership decided to attach the platoon to a maneuver unit during the force-on-force exercise to optimize the teams' ability to conduct continuous

24-hour operations. The platoon operated below modified table of organization and equipment strength during Bayonet Guard because only four of eight EW Soldiers were released by their parent battalions to participate. The undermanned teams struggled to simultaneously execute collection operations while providing their own security. Therefore, Anvil Troop provided perimeter security, logistics support and a troop headquarters for mission command, enabling the CEWI teams to focus solely on survey and collection activities. This also leveraged the troop's organic Ravens and 120mm mortars to fix and finish actionable targets.

Building on this initial success, for JWA in April 2018, the brigade once again attached the CEWI platoon to Anvil Troop and placed the MiCo commander in the brigade tactical-operations center (TOC) to serve as the brigade's chief of reconnaissance. Because the brigade intelligence-support element (BISE) remained co-located with the brigade TOC, the MiCo commander could exercise mission command over the company while synchronizing the brigade's reconnaissance and collection efforts. Although the CEWI teams would be tactically controlled by Anvil Troop, they would also report to the cyber-EW activities (CEMA) cell in the BISE, which was comprised of the traditional SIGINT leadership of cryptological-support team (CST) and EW leadership formerly aligned under the brigade operations section.

JWA

Anvil Troop's mission during JWA was to conduct an advance guard east of the task force to protect it from direct fires, observed indirect fires and intelligence collection. The troop's plan divided the mission into five phases:

- During Phase I, the troop planned and prepared. Notably, this phase included deliberate coordination with the troop's attachments to develop a common operating picture and best integrate attachment capabilities into the overall plan.
- Phase II saw the beginning of tactical operations. During this phase, the troop entered the area of operations (AO) and established a screen along Phase Line (PL) Abrams. This screen protected the task force as it built combat power through the air-land sequence.
- Phase III encompassed the troop's movement eastward from PL Abrams to PL Daily. During this movement, Anvil Troop provided the advance guard for the task force as it moved to contact.
- Following this eastward advance guard, the troop transitioned to Phase IV, in which it screened along the task force's southern flank. This screen permitted the task force time and maneuver space to seize Objective Florida.
- During Phase V, the troop consolidated and reorganized. At the completion of Phase V, the troop stood ready to receive follow-on missions.
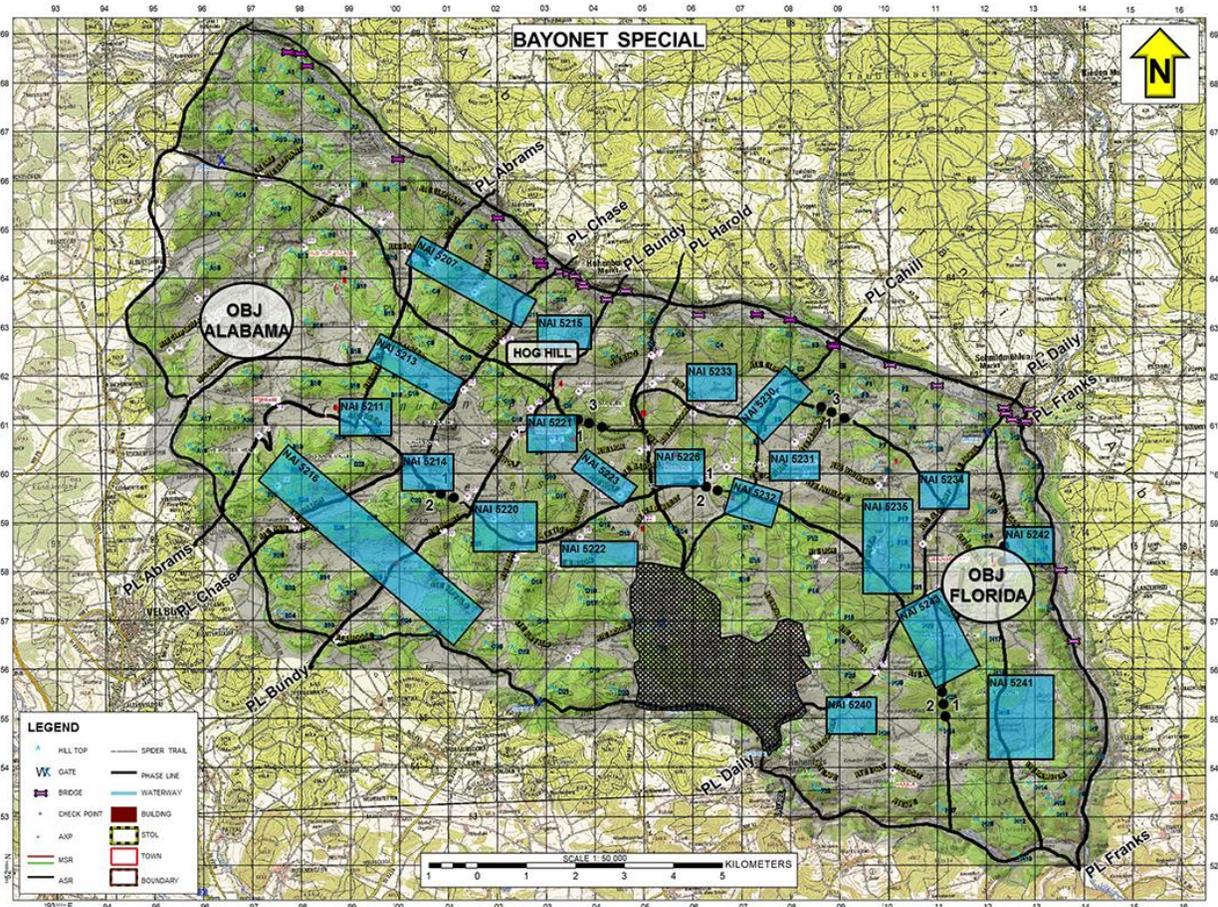
Figure 1. Map of HTA with the task force's phase lines, objectives, NAIs and Anvil Troop's platoon boundaries.
(Map by CPT Doni Wong)

Integration of CEWI platoon

The two CEWI teams were each attached to an Anvil platoon: one in the northernmost part of the AO and one in the southernmost part of the AO. The plan split the CEWI platoon to take advantage of the elevation to the north and south, affording the SIGINT and EW systems the best possible lines of sight and lines of bearing.

While operating with the scout platoons, the teams received the autonomy to decide where to position their survey and collection assets, with the sole condition that they remain to the rear of the platoon's front-line trace and within supporting distance. This autonomy afforded the CEWI teams the flexibility to best emplace and leverage their systems while remaining nested in the scout platoons' security perimeter.

The CEWI teams maintained communications locally with their scout platoon using very-high-frequency (VHF) radios. The troop used Joint Capabilities Release (JCR) and satellite communications to communicate with the commander and the BISE. The CEWI-team leaders could send intelligence that required immediate attention over VHF radio while sending less urgent intelligence over JCR. The CEWI teams' employment of JCR ensured they did not burden tactical nets and could receive updated priority intelligence requirements and named areas of interest (NAIs) from the BISE. It also reduced the troop's overall electronic signature.

Also, the JCR enabled the CEWI teams to send thorough written reports to the troop commander and CEMA cell in the BISE. The CEMA cell contextualized these reports with collection from other intelligence disciplines and provided refined collection guidance to the CEWI teams.

CEWI enables recon

The mission demanded that the troop constantly transition from security tasks (such as screen) to reconnaissance tasks (such as area and route reconnaissance). The CEWI platoon overcame this high tempo by identifying and relaying changes to the enemy situation and potential targets of opportunity.

In one such instance, as the troop approached PL Bundy during route reconnaissance, the CEWI team attached to 3rd Platoon detected enemy positions near NAI 5215 (Hog Hill). This report confirmed the task force S-2's templated enemy observation post at the same position, and it drove the troop's decision to take an alternate route to bypass Hog Hill. Third Platoon subsequently conducted forward-passage-of-lines of a company team from Task Force Eagle, comprised of one tank platoon and two infantry platoons, along the secured route reconnoitered by the scouts. The company team then maneuvered to the target's location and destroyed the enemy while sustaining no casualties.

In another instance, while conducting a screen along PL Harold, the CEWI teams determined the location and time for an enemy resupply operation. The detection increased the range in which Anvil Troop could conduct its reconnaissance mission, as the identified location was beyond-line-of-sight. The troop used the report to process an indirect-fire mission that effectively disrupted and desynchronized the enemy's operations.
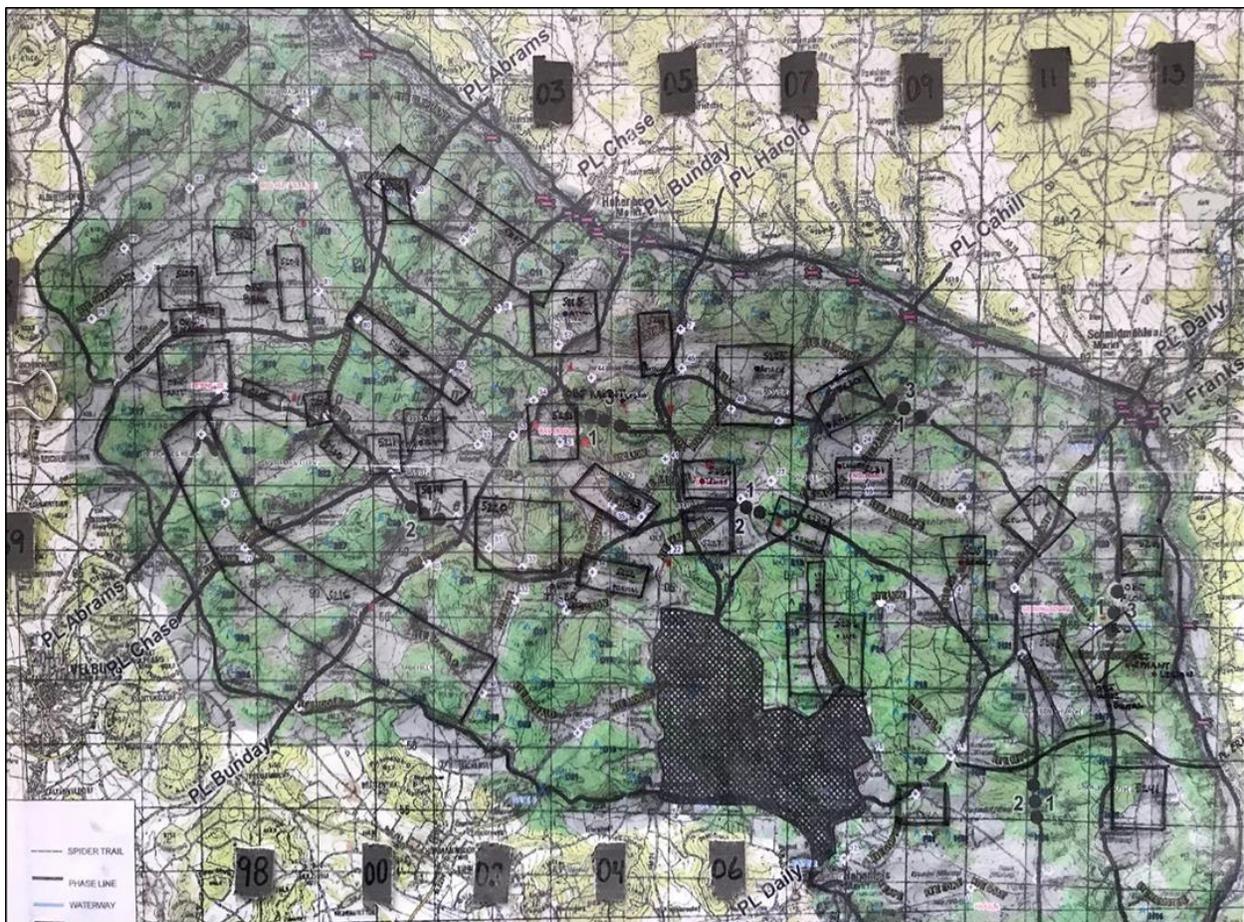

Figure 2. Map of HTA with the task forces' NAIs. *(Mapboard by CPT Doni Wong)*

Scouts enable CEWI

Just as the CEWI platoon enabled the troop's reconnaissance, the troop enabled CEWI operations in three ways: by providing coaching on camouflage and fieldcraft; by providing the security necessary for sustained CEWI operations; and by conducting the route reconnaissance necessary to confidently position CEWI platforms where they could best operate.

Anvil Troop learned the importance of camouflaging the CEWI teams during Exercise Bayonet Guard in January 2018. Though the CEWI teams employed their systems competently, they lacked expertise and experience with mounted movement and maneuver. This issue required immediate attention, as the mine-resistant ambush-protected all-terrain vehicles (M-ATVs) and their multiple antennae possess a unique physical signature and present a high-value target (HVT) for the enemy.

Anvil Troop coordinated with the CEWI platoon before beginning operations to adequately camouflage the M-ATVs and discuss tactically sound routes. The CEWI platoon, without hesitation, learned the Anvil Troop vehicle-camouflage standard operating procedure (SOP) and applied it to their M-ATVs. This early coordination ensured that the M-ATVs avoided detection at any point during the JWA.

Figure 3. A CEWI team's M-ATV conducts surveillance and collection missions while hidden near the forward-line-of-own-troops (FLoT). *(U.S. Army photo by CSM Paul Fedorisin)*

Figure 4. The CEWI team operates while remaining hidden from visual contact, often within 500 meters or less of enemy positions. *(U.S. Army photo by CSM Paul Fedorisin)*

As previously noted, during Bayonet Guard the undermanned CEWI platoon struggled to simultaneously conduct collection and security tasks. Therefore, Anvil Troop responded by adopting the practice of keeping its scouts near CEWI positions. The scouts assumed the responsibility of local security to best enable CEWI intelligence collection, which in turn helped drive the scouts' scheme of maneuver, including counter-reconnaissance. This symbiotic relationship explains much of Anvil Troop's success.

Third, Anvil Troop reconnoitered routes ahead of the CEWI attachments, mitigating the M-ATV's cumbersome mobility and lack of stealth. It also aided the CEWI teams' ability to position themselves on advantageous terrain. Finally, it allowed the platoon and troop to maintain momentum instead of slowing down for a mired M-ATV or turning around at a dead end.

Acting on CEWI intel

Throughout JWA, the troop had to decide how it would act on the intelligence its CEWI assets provided. The troop's chosen courses of action (CoA) fell into four categories: continue to monitor, employ indirect fires, conduct electronic attack and conduct a direct ground attack.

The first CoA was to continue gathering intelligence through the vulnerability exploited to acquire a higher payoff target without the risk of the enemy detecting the Blue Force's (BLUFOR) collection efforts. For example, ahead of the final assault onto Objective Florida, Anvil Troop recommended no direct action be taken on intelligence that indicated a meeting location between two leaders. As a result, this decision enabled the CEWI team to continue its collection mission; the CEWI team learned where the opposing force's daily resupply would occur.

The second CoA leveraged indirect fires in an effort to neutralize the target or disrupt the enemy's operations. This was best accomplished using a UAS asset as a primary observer for clearance of fires against static positions such as a battle position or a logistical or mission-command node. Defensive positions are preferred targets because indirect fires will not have to chase a moving target, and they provide a high payoff by disrupting the enemy's defenses or supporting efforts without unmasking BLUFOR ground forces.

In the third CoA, the CEWI teams conducted an electronic attack to desynchronize enemy maneuvers and/or deny their ability to report on BLUFOR actions to adjacent or higher units. This was best implemented during enemy offensive operations or right before a BLUFOR attack. The ground commander assumed risk with this CoA because the CEWI team conducting the electronic attack radiated a strong, constant signal and became vulnerable to enemy collection and countermeasures.

The fourth and final CoA available to the maneuvering unit upon receipt of CEWI intelligence was to conduct a direct ground attack. This was particularly prudent when the destruction of an HVT was a priority or when indirect fires were not practical or available. Anvil Troop achieved decisive action when acting upon this fourth option during the JWA. While screening on PL Daily prior to the task force's seizure of Objective Florida, the CEWI platoon

detected the enemy's assembly area location, scheme of maneuver and execution timeline. After reporting this intelligence to the task force, the troop identified that the target location was located between the FLoT and the main body, posing a serious threat to the task force and eliminating indirect fire as a feasible CoA.

The troop instead maneuvered two platoons to attack the assembly area. One platoon conducted the assault, and the second one provided support by fire. Owing to rapid collection of and action on the intelligence, the troop conducted the attack while the enemy maintained minimal security in its assembly area conducting priorities of work, so the enemy could not muster a counterattack on the task force. This action was a prime example of dynamic targeting using the "find, fix, track, target, engage and assess" methodology at the troop level while maintaining situational awareness for the task force.

Current limitations

Currently, the three main limitations are the size of the M-ATV and its mobility, its large target signature and its dependency on external security.

The CEWI platoon's current vehicle configuration employs M-ATVs. While the M-ATV provides the crew with some protection and mobility, when maneuvering off-road or through the woods, the platform becomes restricted. At times during the JWA, the M-ATVs could not follow the scouts to which they were attached because humvees could traverse terrain inaccessible to M-ATVs. To adapt, the scouts conducted route reconnaissance ahead of their attached CEWI teams and then pulled the teams forward on known passable routes.

To decrease the CEWI's vehicle signature, the scouts assisted the CEWI teams in camouflaging their vehicles. The scouts also shared their SOPs and lessons-learned on vehicle emplacement into hide sites.

Figure 5. The 1-91 Cavalry camouflage SOP requires all lights and reflectors to be taped, burlap to be placed over the headlights and foliage applied to break up the geometric outline of the vehicle. *(Photo by CSM Paul Fedorisin)*

In addition to the M-ATV's size, SIGINT and EW activities that the CEWI teams conducted broadcast a significant signature over the electromagnetic spectrum. This makes the teams susceptible to enemy collection efforts. Therefore it's critical for the team and the command it supports to understand the risk they assume when the CEWI team executes different SIGINT and EW tasks.

As stated before, the CEWI teams rely on an external security element, especially when positioned near the FLoT. At this point in the CEWI platoon's training glidepath, the MiCo commander and CEWI platoon leadership prioritized system cross-training and reporting over tactical combat skills. Because of this, the team relied on good visual camouflage, disciplined use of their EW equipment and a maneuver unit to provide security to maximize their capabilities and survivability.

Way ahead

The JWA validated the CEWI-platoon concept and the benefit of its early integration with ground reconnaissance units. The teams met the brigade commander's intent by locating enemy emitters, succinctly communicating their locations across multiple spectrums to the commander and providing the commander with options for enemy signal disruption. A sustained habitual relationship with 1-91 Cavalry Squadron, specifically with Anvil Troop, will only increase the brigade reconnaissance enterprise's efficiency and effectiveness over time.

When afforded time to train together, SIGINT and EW Soldiers grew as a team and gained trust in one another and their equipment. Future cross-training during the next 12-18 months may enable the brigade to field more teams. The complementary capabilities of the VROD, VMAX and PRD-13 dismounted systems underscore the utility of CEWI consolidation. The NET/NEF of the VROD and VMAX should be sustained, and units should send both military-occupation specialty 29-series and 35-series Soldiers to training.

The mounted EW systems, however, require further development and testing. The M-ATV platform should be replaced by a more mobile vehicle that has a similar visual signature to scout vehicles. The 173rd IBCT (Airborne) fielded two Razor vehicles in July 2018 equipped with more electronic-search and electronic-attack equipment. Future fielding of new CEWI equipment, however, must incorporate a unit testing phase before deployment to a major training exercise.

The brigade received the prototype Saber Fury and Raven Claw systems in late March 2018 and executed its JWA three weeks later. Unfortunately, the field-service representatives (FSR) attempted a software upgrade to both systems the day before the JWA's execution, resulting in more system complications. Thus, the systems' capabilities did not meet the unit's expectation. Also, the systems were fielded with laptop and Medusa cable shortages that prevented the BISE from pulling all the data collected by the forward teams. Abundant FSR support during the JWA mitigated several of the Saber Fury and Raven Claw issues, but a rapidly deployable unit will not always have the luxury of FSR support in a deployed environment.

The CEWI platoon is participating in the brigade combat-training-center rotation, Exercise Saber Junction 18, which started in September at HTA. The brigade once again attached the platoon to 1-91 Cav. The platoon's training priorities are focused on:

- Refined communications practices and reporting formats;
- Integrating the Puma UAS systems that were fielded in early April 2018; and
- Integrating the Razor vehicles.

The UAS systems elevate the CEWI platoon into a multi-sensor team concept, leveraging UAS to target and integrate fires. The long-term plan for the CEWI platoon will involve sending the platoon leadership and squad leaders to the Reconnaissance and Surveillance Leader's Course and all platoon members to the Low-Level Voice Intercept Operators' Course.

The CEWI platoon concept has progressed significantly since its first employment in October 2017, and with proper training and equipping, it will function as an optimal force multiplier within the brigade's reconnaissance enterprise.

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Notes

[1] U.S. Army Intelligence Center of Excellence, ***Integrated Intelligence and [CEMA] Operations at Echelons Corps and Below: Multi-Functional Intelligence and Electronic Warfare Concept of Operations***, Version 1.0, Dec. 21, 2017.

Acronym Quick-Scan

ABOLC – Armor Basic Officer Leader's Course
AO – area of operations
BISE – brigade intelligence-support element
BLUFOR – Blue Force
CEMA – cyberspace electromagnetic activities
CEWI – combat electronic warfare intelligence
CoA – course of action
CST – cryptologic support team
EW – electronic warfare
FLoT – forward-line-of-own-troops
FSR – field-service representative
HTA – Hohenfels Training Area
HVT – high-value target
IBCT – infantry brigade combat team
JCR – Joint Capability Release
JWA – joint warfighter assessment
M-ATV – mine-resistant ambush-protected all-terrain vehicle
MiCo – military-intelligence company
NAI – named area of interest
NEF – new-equipment fielding
NET – new-equipment training
OIC – officer in charge
PL – phase line
SIGINT – signals intelligence
SOP – standard operating procedure
TOC – tactical-operations center
UAS – unmanned aerial system
USMA – U.S. Military Academy
VHF – very high frequency
VMAX – VROD Modular Adaptive Transmit
VROD – Versatile Radio Observation and Direction