Mastery of the Fundamentals of Passive Counter-reconnaissance to Survive against a Hybrid Threat

by CPT Joshua T. Christian

The command post (CP) has just set in position, communications antennas have been erected and the first pot of coffee is beginning to drip when the situation reports from the troops crackle over the radios. This operation is conducted by a cavalry squadron partnered with a Polish cavalry troop executing joint, intergovernmental, interagency, multinational (JIIM) security operations at Grafenwohr, Germany, as part of the annual training exercises at the Joint Multinational Rotational Center (JMRC). For now, the situation is going just as the S-2 and S-3 predicted during their analysis; troops have occupied the screen and are deploying their troop unmanned aircraft system (UAS) to attempt to gain contact with the enemy forces.

Just 10 minutes after receiving situation reports from the subordinate units, the S-3 and S-2 are enjoying a cup of coffee and analyzing their information-collection plan for the upcoming 48 hours. Suddenly they hear incoming indirect fire. All the CP vehicles and individual Multiple Integrated Laser Engagement System gear begins going off, indicating that they have been killed. The observer/coach/trainer (O/C/T) informs them that the CP has been destroyed by indirect fire to the argument of the S-3 and S-2, who point out that this is impossible – not a single one of their troops had made contact with the enemy. In addition to the lack of enemy contact, the squadron had positioned the CP one terrain feature behind the main body, just as they had learned to do from doctrine.

In the after-action review (AAR), the O/C/T points out the lack of focus and attention that the unit gave to passive counter-reconnaissance. During the AAR, the opposing forces (opfor) described to the friendly unit how they had been able to use a common, off-the-shelf radio direction-finder (available at Radio Shack or ebay.com for $50 to $500) to identify a line of bearing to the unit's radio transmissions. The opfor then flew a UAS along the line of bearing until it identified the squadron's CP indicated by a series of tents, dress-right-dress vehicles and a line of port-a-potties. The opfor had identified the squadron CP as a high-payoff target during the planning phase and immediately massed its indirect-fire assets to destroy the squadron's headquarters.[1]

Field Manual (FM) 3-98 describes effective counter-reconnaissance operations as allowing the unit to retain freedom of maneuver by denying the enemy the ability to collect information and identify opportunities to seize, retain and/or exploit the initiative.[2] The counter-reconnaissance this rotational unit conducted was active in nature; it identified and defeated enemy reconnaissance forces in a named area of interest (NAI) or target area of interest.

So what is this passive counter-reconnaissance the O/C/T referred to – is it new? Had the unit missed an update to doctrine or to its individual and collective tasks outlined in the Combined Arms Training Strategy (CATS)?

Passive counter-reconnaissance is a unit's exercise of discipline when it comes to camouflaging and concealing their positions as well as exercising radio discipline and adhering to strict signal operating instructions (SOI) to reduce one's electronic signature. The squadron had not successfully employed protective measures of their CP such as digging in or camouflaging their positions. Also, the unit had not considered its electromagnetic signature and the vulnerabilities it presented to their security.

Protection: camouflage, concealment and deception

As units execute decisive-action training, they must account for the hybrid threat which will contain some near-peer capabilities such as UAS or even off-the-shelf (civilian-procured) UAS and radio direction-finding capability. In July 2015, a draft of Dr. P.A. Karber's "Lessons Learned from the Russo-Ukrainian War" circulated through U.S. Army Training and Doctrine Command. In this paper, Karber expresses his personal observations of the conflict and describes an environment proliferated with unmanned aerial vehicles, more than 14 different varieties of them, generally complemented with BM-21 Multiple Launch Rocket Systems, resulting in the ability to mass highly lethal indirect fires over extended ranges.[3]

For many years of stability operations, the United States and our allies have enjoyed complete supremacy over our enemies in every form of contact. As forces return to training for and fighting against a hybrid threat, that

supremacy over all forms of contact is not necessarily lost, but our training must bring back some of the lost disciplines and tasks.

Units at the combat training centers (CTCs) used to "dig-in" their CPs just as they did for their fuelers or mortar firing points. This doesn't assist in concealment, but it does increase overall survivability. Camouflage nets fully deployed also won't completely conceal the unit – a well-trained UAS operator will be able to identify something is there but will not be able to ascertain if it is a CP or not. Will the enemy decide to employ indirect fire if he cannot be certain it is a high-payoff target? Likely the enemy will deploy another form of reconnaissance to verify this information, buying the friendly unit time.

In addition to digging in and camouflaging positions, units need to plan that critical friendly zones are in place over their CPs susceptible to indirect fire. By planning critical friendly zones, units ensure that target-acquisition radar is within range and can identify a point of origin from incoming indirect fire to enable accurate and responsive counter-battery operations. The use of critical friendly zones and counter-battery will force the enemy to displace or destroy his indirect-fire assets, reducing his ability to continue to mass on friendly positions.

In CATs, under Collective Task Number 07-3-9016, "establish an observation post (OP)," there are supporting collective tasks (07-2-6045, "employ deception techniques"; 05-2-3003, "employ camouflage, concealment and deception techniques"; and 05-3-3003, "camouflage equipment.") These tasks are rarely ever trained or enforced, particularly against the threat of aerial surveillance. Currently some formations across the Army do train in employing camouflage and concealment, but most often they evaluate the success of this compared to a direct frontal or flank observation and do not consider the threat of enemy UAS or how to counter it (actively or passively).

Old but still relevant to today's warfare is FM 5-20, **Camouflage, Basic Principles** (1944), which discusses the need for concealment and some of the difficulty achieving it. Even in 1944, the writers of this manual identified the differences in concealment from ground and aerial collection efforts and reduced aerial into visual and photographic.[4] The difference in visual and photographic then and now are the angle of observation based on the aircraft or collection platform.

Helicopters avoiding radar detection and air-defense threats generally fly low to the earth and therefore have a different observation angle than a UAS or satellite orbiting at a high altitude and generally looking directly down onto an area. During employment of camouflage and concealment, troops must consider what their locations look like from all these vantage points and choose appropriate terrain that will assist them. Conveniently troops have Ravens or other similar UAS that also need to fly to maintain proficiency and also ideally need practice in identifying enemy positions.

One way a troop commander could increase his troop's survivability and capability to conduct passive counter-reconnaissance is to challenge his platoons to conceal their OPs and at the same time challenge his UAS to identify them from the air.

Figure 1. Netherlands reconnaissance truck camouflaged with natural materials in a concealed posistion.

Figure 2. U.S. M109A6 Paladin artillery systems with no attempt at camouflage or concealment such as 'shoot and hide' techniques.

Students in the Army Reconnaissance Course (ARC) face enemy air threat from both AH-64E and UH-72 helicopters. AH-64E primarily rely on thermal imaging for observation, while the UH-72 relies on visual observation for conducting reconnaissance. ARC students employing concealment techniques are successful in remaining concealed (both mounted and dismounted) from these air threats for the duration of the aircraft's station time. ARC students have been so successful that cadre members narrowed the amount of terrain for the flight crews to reconnoiter to just one square kilometer, and the aircraft still could not identify the ARC OPs.

At the Cavalry Leader's Course (CLC), students are taught the importance of commander's reconnaissance guidance and commander's security guidance – specifically the importance of engagement, disengagement and displacement criteria and how they are affected by enemy air threats. Students at both ARC and CLC also learn about deliberate risk-mitigation and management techniques. Scouts today are armed with a large array of sensors ranging from a Long Range Advance Scout Surveillance System to a Lightweight Laser Designated Rangefinder and standard binoculars.

Scouts employ sensors that require batteries to operate; the commander therefore must deliberately mitigate the risk incurred of running a vehicle to charge batteries. In his synchronization, he can include run time (both the start time and shut-down time) for vehicles to mitigate the increase in thermal and exhaust signatures. The risk mitigation begins with understanding realistic enemy capabilities, and when things such as exhaust are most vulnerable to observation or how long a recently run vehicle will produce a strong thermal signature.

These are just a few examples of considerations the commander should evaluate when he develops his operations order, specifically his reconnaissance or security guidance.

Reducing unit's electromagnetic signature

Another form of discipline not new to the Army is the use of SOI. SOI should be high on unit commanders' training priorities, particularly those identified to conduct decisive operations in JIIM environments or as part of a regionally aligned force. What used to be a common skill and strictly enforced was the use of brevity codes and the constant evolution of frequencies, call signs and key sets to avoid or mitigate enemy eavesdropping; this has become lost after years of enjoying supremacy over our enemies. The "Five Eyes" nations comprised of Australia, Canada, New Zealand, United Kingdom and the United States maintain an agreed-upon SOI that includes brevity codes as well as transmission guidelines to ensure things are not lost in translation among member nations.[5]

SOI is more than just brevity codes, and staffs as well as commanders can assist scouts in reducing their communications signature through the planning process. Though fully compatible with joint services in frequency hopping (FH), Single-Channel Ground and Airborne Radio System (SINCGARS) are only partially compatible with multinational radios, requiring transmissions over single-channel (SC) non-secure mode to transmit to allies' very-high-frequency radios. In the vignette presented at the beginning of this article, to accommodate the Polish cavalry troop, the squadron maintained one SINCGARS channel on SC.

The use of SC has also allowed the squadron to increase the width of their screen due to the extended range it offers over FH. However, the use of SC is very susceptible to radio direction-finding, a weakness the opfor was able to exploit in the vignette. If units are going to use SC to communicate with allies, they must strictly adhere to SOI and ensure that communications are as brief as possible.
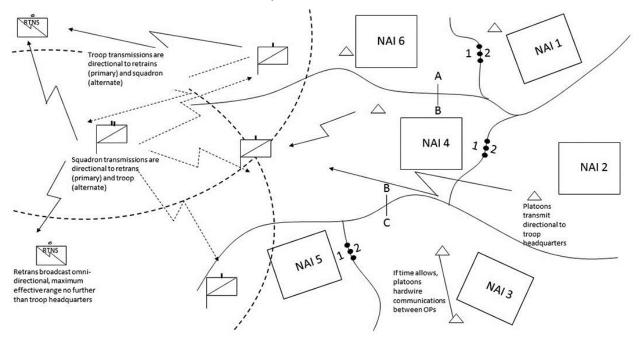

Figure 3. Example network diagram to reduce electromagnetic signature.

By refining priority intelligence requirements down to the yes, no or number indicator for the scout on the ground, the staff and commander can reduce the overall amount of radio traffic. Scouts do not need to send up routine reports; a well-trained scout will inform his command when he identifies an indicator he was tasked with collecting or when he makes contact. The gaps in between those two times should be acceptable radio-silence times, particularly in a Joint Capabilities Release-capable unit. Going forward against a hybrid threat, strict adherence to smart SOI will not only increase a unit's survivability against an enemy trying to direction-find them, but it will also ensure that units are interoperable with our multinational partners.

Another technique to increase survivability of cavalry formations against hybrid threats while still relying on Single-Channel Plain Text to talk to multinational partners is to rely on directional antennas such as the half-rhombic antenna instead of omnidirectional antennas like the common OE-254 and COM 201B.[6] Using a directional antenna aimed at the person you are talking to, coupled with the use of SOI brevity codes, significantly reduces the overall communications signature you are emitting. The S-6 and S-3 should evaluate the signal plan; it is more than just a

list of frequencies, call signs and succession of command. Units could use directional antennas with retrans in-depth to reduce the overall electronic signature traveling forward toward the enemy.

SINCGARS operates on three variable power settings – designed to allow a user to control the electromagnetic signature given off by the radio transmission – and can be as little as 200 meters or as large as 40 kilometers (terrain dependent).[7] Units can dictate to the troops which phases of an operation it's acceptable to operate on "high power"; when they need to operate their radios on "low power"; and when they need to operate in radio silence/listening only. The goal is to reduce the overall electromagnetic signature emitted, so it is advised that CPs only use the lowest-possible power setting to maintain reliable communication.[8]

If time is available, units should rely on hard-wire communications run between positions. To hardwire between OPs, units used to rely on TA312 wire, but that has been turned in and removed from most unit's modified table of organization and equipment. Either a new solution is required to fill the gap, or the Army must re-issue the wire and phones to units to counter this threat.

Conclusion

Unit commanders plan training, and in doing so, "they must understand their expected operational environment … [and] replicate the conditions as closely as possible in training."[9] Also, Army Doctrinal Reference Publication (ADRP) 7-0 points out that troop, company and battery commanders are responsible for tackling the fundamentals first, focusing on individual and small-unit skills.

Since the Army is currently focused on Europe, the Pacific and Central and Southeast Asia, unit commanders must understand that adversaries in these regions possess near-peer or similar capabilities and incorporate those threats into unit training plans. Failing to acknowledge the operational environment of adversaries and incorporating it into training environments is impacting the overall mission readiness of Army forces capable of deploying to protect U.S. interests. The CTCs have acknowledged it and include it in their rotations; now the rotational units must ensure it is trained at home station through repetition after repetition until units regain competencies lost due to years of persistent conflict with an inferior enemy.

Finally, by removing units from their comfort zones of large "Base-X"-style CPs, not only do units train to increase their survivability against a hybrid threat, but they also build resiliency into their systems and increase the adaptiveness of their leaders.

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Notes

[1] The vignette presented is fictional but was created based on trends presented by JMRC in the Cavalry Council hosted by 3-16 Cavalry Jan. 27, 2016.

[2] FM 3-98, **Reconnaissance and Security Operations**, July 2015.

[3] Dr. P.A. Karber, "Lessons Learned from the Russo-Ukrainian War" (draft), The Potomac Foundation, 2015.

[4] FM 5-20, **Camouflage, Basic Principles**, 1944.

[5] Allied Communications Publication 131(F), **Communications Instructions – Operating Signals**, April 2009.

[6] For more information on types of antennas and how they can assist in reducing a unit's susceptibility to enemy intercept and interference, units should refer to Chapter 10 of Army Technical Publication (ATP) 6-02.53 (2016).

[7] ATP 6-02.53, **Techniques for Tactical Radio Operations**, January 2016.

[8] Ibid.

[9] ADRP 7-0, **Training Units and Developing Leaders**, August 2012.