Training Notes

The UAS Training Imperative:

How to Implement C-UAS Training at the Company Level

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> "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.

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.

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

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

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

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.

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