CONDUCTING NONSTANDARD AERIAL SUPPORT & COLLECTION

by First Lieutenant Cassandra Mundekis

Introduction

The Full On-the-Move (OTM) and At-the-Halt (ATH) Manpack Collection and Geolocation Solution (HPack) and the Versatile Radio Observation and Direction (VROD) are organic electromagnetic warfare (EW) and signals intelligence (SIGINT) direction finding (DF) systems operated across the battlefield. These two systems use the electromagnetic signature from the enemy to provide early detection and warning. In July 2021, 25th Infantry Division Soldiers from 2nd Infantry Brigade Combat Team and 3rd Infantry Brigade Combat Team evaluated the effectiveness of these organic EW and SIGINT assets when operated from an aerial platform. The purpose of this training was to validate the division's concepts for integrating EW and SIGINT on the battlefield, to create new training plans for EW and SIGINT operators, and to explore new capabilities for 25th Infantry Division to employ in a spectrum-contested environment.

Background

Low-level voice intercept (LLVI) and DF teams use information networks and triangulation to fix enemy targets on the battlefield. The EW and SIGINT teams operate together in constant communication to provide ground force commanders with accurate and timely information, both OTM and ATH. The HPack and VROD are the organic assets available at the brigade level to acquire advanced collection throughout the electromagnetic spectrum. Current tactics, techniques, and procedures (TTP) employ these assets through the ground force, using dismounted movement on foot or from a mounted vehicle. Given the steep terrain and dense vegetation of environments within the Indo-Pacific area of responsibility, utilization of these assets from an aerial platform would add to the division's capability to find, fix, and engage targets in rough terrain, archipelagos, and jungle environments.

Data and Findings

The collection team conducted the training with the 25th Infantry Division Combat Aviation Brigade on 27 July 2021. They operated from a UH-60 Blackhawk helicopter flying in an aircraft traffic pattern around Wheeler Army Airfield, Hawaii. Rabbits (the targets) operating Baofeng radios posed as opposing forces during the training, providing constant radio signals and LLVI for the operators. During the approximately 48-minute flight, operators recorded 28 lines of bearing from the signals provided by the rabbits, 5 of which were accurate within 100 meters of the targets. The system proved moderately successful in giving a general direction of the targeted emitter's location. During the next training event, operator skills, training on the aerial platform, and a signals environment with less electromagnetic or radio frequency interference will be necessary to produce a refined answer about the accuracy the system can provide while mounted on the aerial platform.

Capabilities and Limitations

Designed for ground collection, the HPack and VROD displayed specific challenges and limitations when performing collection from an aerial asset. Normally carried in a medium ruck with the DF antenna protruding from the top, the HPack and VROD need to be secured by the five-point AmSafe restraint system in the seat closest to the doors of the UH-60. When conducting collection from the aerial platform, a minimum of two operators and the system itself require seats on the manifest, which reduces the number of personnel the aircraft can carry. However, the HPack is secured in such a way that Soldiers can easily emplace the HPack system within minutes of arriving at the aircraft. This allows operators to use the system for air assault missions or collection during movement to or from an objective without creating a time burden on the unit.

The SIGINT collection asset outperformed the VROD when used from the UH-60. The VROD's Global Positioning System (GPS) software updates the location of the system every 5 seconds, while the HPack GPS can provide almost real-time GPS data. The speed of the aircraft created a lag in GPS that inhibited the VROD from gaining a GPS lock on any of the targets. The HPack locked in and gained fixes on the targets from a considerable distance.

The altitude of the helicopter increased the line-of-sight capability of the HPack system. The system performed best when the platform was perpendicular to the target. Although many relatively accurate line-of-bearing readings were produced, the collection environment proved difficult for the operators, and some readings were erroneous because of wind, roll, and pitching of the aircraft.

Beyond DF, the LLVI capability was present but severely degraded because of the loud conditions of the aircraft. Further testing using different signal strengths, headphones, and settings of the system is necessary to examine the LLVI capabilities from an aerial platform.

Intelligence Collection

Collection from an aerial asset will increase on-the-ground situational awareness and will directly increase mission success rate. Whether this system is used in direct support of air assault operations or for collection on priority intelligence requirements, the capability to gain a wider area of collection provides a better early warning capability for ground force commanders looking to clear through or occupy an area.

Further training from this platform leading to TTP for operation during flight would greatly increase the DF capability of this system on the aerial platform. Using a team in both a lead and a trail helicopter with HPacks oriented in opposite directions would provide the best coverage of the area of interest. The first test-run placed both systems in the same helicopter with both doors open, creating a wind tunnel in the platform. These conditions affected the operators' ability to use the system and efficiently communicate the results. The second test-run used one collection team with one of the UH-60 doors open. Minimizing the wind tunnel in the helicopter created a better collection environment for the operators.

SIGINT personnel can use the HPack from the aircraft alone or in conjunction with the ground-based, vehicle-mounted program of record-B system and other available collection assets. Each collection method provides its own advantages and disadvantages; however, a combination of collection methods would increase the overall ability to provide commanders with accurate and timely information.

Way Forward

Using the HPack from an aerial platform provides a short-term answer for aerial collection throughout the electromagnetic spectrum. Acquiring an unmanned aerial vehicle with the capability of DF (such as the EW pods) would increase precision and accuracy as an aerial collection asset. While less accurate, the HPack is more versatile in mounted or dismounted collection and can provide similar results as an asset for an organic brigade combat team's military intelligence company. Performing collection on this aerial platform immensely increases the competency of the operators and provides division-level capabilities and intelligence to maneuver commanders at echelon.

1LT Cassandra Mundekis serves in Delta Company, 29th Brigade Engineer Battalion, 3rd Brigade Combat Team, 25th Infantry Division, as the signals intelligence platoon leader. She previously served in 3rd Battalion, 7th Field Artillery Regiment, as the assistant S-2. She holds a bachelor of science in English from the United States Military Academy at West Point.

A Cyber Electronic Warfare Officer assigned to the 37th Infantry Brigade Combat Team, monitors Versatile Radio Observation and Direction (VROD) equipment during a training mission, similar to the mission discussed in this article, at Camp Grayling, MI, August 14, 2022. (U.S. Army photo)