Opinion

A new mindset for the Army: silent running

By **Jan Kallberg** and **Col. Stephen Hamilton**

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The Virginia-class attack submarine Indiana departs Newport News Shipbuilding to conduct sea trials. The Indiana is one of the last of the Block III Virginias. The Army may want to consider following the idea of "silent running" that many submarines use to operate. (U.S. Navy by

Matt Hildreth)

In the past two decades, the U.S. Army has continually added new technology to the battlefield.

While this technology has enhanced the ability to fight, it has also greatly increased the ability for an adversary to detect and potentially interrupt and/or intercept operations.

The adversary in the future fight will have a more technologically advanced ability to sense activity on the battlefield – light, sound, movement, vibration, heat, electromagnetic transmissions, and other quantifiable metrics. This is a fundamental and accepted assumption. The future near-peer adversary will be able to sense our activity in an unprecedented way due to modern technologies. It is not only driven by technology but also by commoditization; sensors that cost thousands of dollars during the Cold War are available at a marginal cost today. In addition, software defined radio technology has larger bandwidth than traditional radios and can scan the entire spectrum several times a second, making it easier to detect new signals.

We turn to the thoughts of Bertrand Russell in his version of Occam's razor: "Whenever possible, substitute constructions out of known entities for inferences to unknown entities." Occam's razor is named after the medieval philosopher and friar William of Ockham, who stated that in uncertainty, the fewer assumptions, the better and preached pursuing simplicity by relying on the known until simplicity could be traded for a greater explanatory power.

So, by staying with the limited assumption that the future near-peer adversary will be able to sense our activity at an earlier unseen level, we will, unless we change our default modus operandi, be exposed to increased threats and risks. The adversary's acquired sensor data will be utilized for decision making, direction finding, and engaging friendly units with all the means that are available to the adversary.

The Army mindset must change to mirror the Navy's tactic of "silent running" used to evade adversarial threats. While there are recent advances in sensor counter-measure techniques, such as low probability of detection and low probability of intercept, silent running reduces the emissions altogether, thus reducing the risk of detection.

In the U.S. Navy submarine fleet, silent running is a stealth mode utilized over the last 100 years following the introduction of passive sonar in the latter part of the First World War. The concept is to avoid discovery by the adversary's passive sonar by seeking to eliminate all unnecessary noise. The ocean is an environment where hiding is difficult, similar to the Army's future emission-dense battlefield.

However, on the battlefield, emissions can be managed in order to reduce noise feeding into the adversary's sensors. A submarine in silent running mode will shut down non-mission essential systems. The crew moves silently and avoids creating any unnecessary sound, in combination with a reduction in speed to limit noise from shafts and propellers. The noise from the submarine no longer stands out. It is a sound among other natural and surrounding sounds which radically decreases the risk of detection.

From the Army's perspective, the adversary's primary objective when entering the fight is to disable command and control, elements of indirect fire, and enablers of joint warfighting. All of these units are highly active in the electromagnetic spectrum. So how can silent running be applied for a ground force?

If we transfer silent running to the Army, the same tactic can be as simple as not utilizing equipment just because it is fielded to the unit. If generators go offline when not needed, then sound, heat, and electromagnetic noise are

reduced. Radios that are not mission-essential are switched to specific transmission windows or turned off completely, which limits the risk of signal discovery and potential geolocation. In addition, radios are used at the lowest power that still provides acceptable communication as opposed to using unnecessarily high power which would increase the range of detection. The bottom line: a paradigm shift is needed where we seek to emit a minimum number of detectable signatures, emissions, and radiation.

The submarine becomes undetectable as its noise level diminishes to the level of natural background noise which enables it to hide within the environment. Ground forces will still be detectable in some form – the future density of sensors and increased adversarial ability over time would support that – but one goal is to make the adversary's situational picture blur and disable the ability to accurately assess the function, size, position, and activity of friendly units. The future fluid MDO (multi-domain operational) battlefield would also increase the challenge for the adversary compared to a more static battlefield with a clear separation between friend and foe.

As a preparation for a future near-peer fight, it is crucial to have an active mindset on avoiding unnecessary transmissions that could feed adversarial sensors with information that can guide their actions. This might require a paradigm shift, where we are migrating from an abundance of active systems to being minimalists in pursuit of stealth.

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