

Low Signature Information Network

Bridging the gap between sensor and decisionmaker

by 1stLt Michael Donovan & Mr. Robert Hart

In anticipation of future conflict with China in the littorals, the Marine Corps is returning to its traditional mission of supporting naval campaigns.¹ Marines will act as the gatekeeper to the western Pacific by seizing and defending key maritime terrain. Expeditionary advanced bases will prevent Chinese forces from breaching the first island chain and provide a permissive environment for friendly naval and air forces. However, distributing small units across the Pacific is reckless if they cannot organically source mission-critical intelligence and conduct basic command and control (C2).

The Corps' current information systems are not designed with near-peer competition in mind. These overt conduits provide Marines with persistent C2 and access to intelligence but sacrifice survivability by revealing friendly positions. Additionally, evidence suggests that they are susceptible to intrusion and degradation from foreign actors.²

China's complementary kinetic and non-kinetic weapons will leverage Marines' vulnerabilities in the information domain against them. Unmanaged signatures will result in the identification and targeting of forward deployed forces. Non-kinetic fires will create gaps between sensors and decision makers, limiting Marines' ability to respond to kinetic fires, integrate into the joint digital kill chain, and access mission-critical intelligence. Marines operating expeditionary advanced bases will quickly find themselves in numerous complex "combined arms dilemmas" they are ill-equipped to handle.

While the latest *Marine Corps Operating Concept* takes a bold step toward

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confronting the emerging Chinese threat, it is difficult to support with information. An interlocking network of anti-access/area denial (A2/AD) can limit Chinese power projection. Howev-

er (LSIN). This network provides a resilient information conduit that connects sensors and decision makers through the access and dissemination of intelligence while minimizing signature

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er, this network is ineffective if its nodes cannot source targeting data, receive target engagement decisions, coordinate fires, and identify an impending attack. Additionally, if Marines cannot access or disseminate intelligence without exposing their position, the Service risks being defeated in detail in the western Pacific.

The Marines need a reliable, resilient, and clandestine method to access and disseminate intelligence and C2 to enable distributed operations in information contested environments. To address these challenges, the Marine Corps can integrate existing programs of record (POR) with government and commercial off-the-shelf technologies into a Low Signature Information Net-

work. While LSIN is not a panacea, it could prove an affordable and effective platform to support expeditionary operations.

Proposed Technology Solutions

In an information contested environment, the risk of attack is proportional to physical and electromagnetic emissions. Sophisticated collection systems will operationalize unmanaged signatures for targeting purposes. However, a highly optimized collection apparatus may be befuddled by unexpected spectrum usage, artful employment techniques, and redundant communications.

Chinese signals intelligence will use a priori knowledge to collect on U.S.

military frequencies. But, by operating outside of expected spectrum ranges, Marines can increase information conduit resiliency and expeditionary advanced base survivability. Imagery, measurement, and signature collection assets will scan the littorals for evidence of Marine presence—such as antenna hills, tent cities, and logistics nodes. However, a creative employment can increase the amount of time it takes for Chinese intelligence to process, identify, and target Marines. By applying these principles to information network design, Marines can mitigate the modern reality that “to be detected is to be targeted is to be killed.”

LSIN provides redundant means to access information and disseminate it to decision makers. In permissive environments, the LSIN can hitchhike on commercial communications networks to limit visibility. If communication networks are down, receive-only devices can access intelligence data without identifying users to Chinese collections. In any environment, boutique communications equipment can operate well outside standard military ranges, impairing Chinese signal collection efforts. Furthermore, the artful employment of LSIN can reduce the likelihood of physical signature identification. LSIN is composed of the following technologies.

I. Access: Depending on the level of communication degradation or the sophistication of adversary collection assets, Marines can use either the Mobile Broadband Kit (MBK) or the Embedded National Tactical Receiver (ENTR) to access information. These systems can provide indications of an impending attack, targeting data, and general battlespace awareness. The MBK and ENTR are proven technologies, POR, and meet the Commandant’s “affordable and plentiful” requirement.

a. Mobile Broadband Kit: The MBK is a communications system that allows users to leverage the world’s cellular carrier’s 4G/LTE networks to access Secret Internet Protocol Router services. The MBK masks user data transmission inside civilian traffic, thereby limiting Chinese

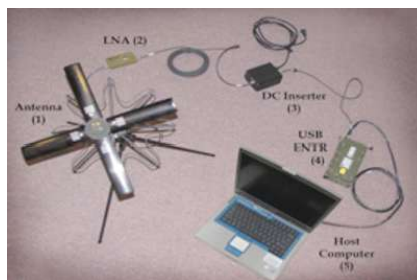
signal collection capabilities. This ruggedized system is lightweight and can be employed in various configurations, depending on the mission. The MBK costs roughly \$5,000.³
b. Embedded National Tactical Re-



The Mobile Broadband Kit provides global secure voice/data access. (Photo provided by author.)

Low-signature and resilient information conduits are a must for supporting forces operating well within the arc of our adversary’s weapons ...

ceiver: The ENTR is a receive-only, zero-emission device that gives Marines access to near realtime nationally derived sensor data from all over the world. It simultaneously receives, decrypts, and displays a persistent intelligence broadcast into a common operational picture (COP). It is



The Embedded National Tactical Receiver provides secure, realtime sensor data and intelligence that can be injected directly into a MAGTF’s Common Operation Picture, enhancing a commander’s situational awareness. (Photo by author.)

resistant to downlink jamming and will receive as long as the broadcast source is operational. While the ENTR COP is not as detailed as some SIPR capabilities, it is an effective alternative when communication networks are down. The ENTR can operate in a mobile configuration and has a small physical signature.

The ENTR costs just over \$30,000.⁴
I. Dissemination: Low Probability of Detection/Intercept (LPDI) devices are a family of communication technologies that are difficult for adversary collections to detect and non-kinetic weapons to jam. These devices are designed to be tamper-proof, low-cost, and can function in just about “any clime and place.” Their inconspicuous nature is perfect for covert action in the littorals where human intelligence sources abound, and operational security is a paramount concern. Marines can incorporate either the Enhanced Blue Force Tracker (EBFT) or the Unified Dot into their primary, alternate, and contingency communication plans to disseminate intelligence.

a. Enhanced Blue Force Tracker: The EBFT is an LPDI communication device that can disseminate critical, time-sensitive information when communication networks are down. Through the use of brevity matrices, Marines can encode and decode transmissions. Transmissions passed via the EBFT will populate on the ENTR COP. The EBFT is an affordable, risk-worthy system that cannot be compromised if captured. It is a G/COTS system and costs about \$5,000.
b. Unified Dot: The Unified Dot is a covert, zero-emission LPDI communication system. The system is





Enhanced Blue Force Tracker can ensure C2 in a denied, degraded, contested environment. (Photo by author.)

composed of an Android cell phone, decoder box, and x-band antenna. Its sleek design offers numerous employment methods, allowing Marines to receive intelligence data almost anywhere in the world inconspicuously.



The Unified Dot System can be issued to an individual Marine. (Photo by author.)

Bridging the Gap

The Pacific is replete with nationally tasked sensors that persistently collect on Chinese and friendly force activity. Whether they are identifying the launch of a theater ballistic missile or triangulating an enemy warship location, U.S. collection assets are always providing valuable information. In the hands of the right decision maker, this information translates to survival and success on the battlefield.

LSIN has something for everyone. It supports force protection by identifying incoming sea, air, and landbased missiles allowing tactical units to respond

quickly. It provides a secure blue force tracking capability. Groundbased kinetic fires platforms can use the network to achieve targeting solutions and queue secondary collection assets to increase targeting fidelity. C2 nodes can direct aviation platforms to locate, target, and destroy enemy forces. Logisticians can even identify over-the-horizon surface and air connectors and preposition assets to receive intra-theater sustainment. With LSIN, commanders at all levels will enhance the unity of their action through shared battlespace awareness.

Simultaneously, Chinese collection assets will struggle to identify Marine electromagnetic signatures inhibiting shooters' abilities to generate targeting solutions on covert, mobile Marine infrastructure. Even when the Chinese manage to attack, Marines will know in realtime and can move to safety.

Looking forward

While the ENTR, MBK, and LPDI are proven technologies, they were with interoperability in mind.⁵ This paradigm is endemic to the Corps' technology development and procurement. There are countless examples of systems in the Marine Corps inventory that do not work together but really should. By developing technologies that are not interoperable the United States cedes ground to adversaries who are striving to achieve technological parity. Technology sourcing, development, and procurement must involve relevant stakeholders to increase the breadth of a technology's utility and prevent unnecessary waste. It must also prioritize interoperability and multifunctionality. Additionally, a mechanism must be developed to fast track the fielding of existing PORs of demonstrated utility (i.e., MBK and ENTR) to tactical units of employment. Planners developing the table of organization and equipment for *Force Design 2030* must recognize these realities and provide appropriate resources to units.

LSIN is a short-term solution to a long-term problem. As our adversary's capabilities increase, the need for access to information will increase exponentially. Low-signature and resilient information conduits are a must for

supporting forces operating well within the arc of our adversary's weapons engagement zone. These information conduits should include many disparate technologies to bedevil calibrated Chinese collection assets and targeters searching for high-value targets to destroy. Emissions must "hide in the noise" of commercial traffic or present such insignificant signatures that Chinese shooters either ignore or miss them entirely.

Presently, Marines are in the horns of a dilemma. Without the ability to C2 and access mission-critical intelligence, there is little hope that disbursed Marine infrastructure can fight as a cohesive whole. The Marine Corps does not currently have any platforms capable of providing clandestine information outside of the special operations community. By integrating an LSIN-like solution into current information networks, the Marine Corps can provide an essential capability—clandestine information in contested terrain—at the level necessary to support expeditionary advanced bases.

Notes

1. Gen David H. Berger, *38th Commandant's Planning Guidance*, (Washington, DC: July 2019).
2. Jed Pressgrove, "DOD Agency Suffers Data Breach, Potentially Compromising SSNs," *Military.com*, (February 2020), available at <https://www.military.com>.
3. Staff, "Mobile Broadband Kits (MBK)," *4K Solutions*, (June 2020), available at <https://4ksolutions.com>.
4. Staff Concepts & Programs Home, "U.S. Marine Corps Concepts & Programs," (n.d.), available at <https://www.candp.marines.mil>.
5. *VALIANT WORKHORSE 20 After Action Report*; and *NOBLE FURY 20 After Action Report*.

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