

EABO Communications Training

Items the Marine Corps communication unit must focus on
by CWO3 Patrick Fahey

The Marine Corps must focus on training in bandwidth restricted environments as well as signature management. Training within a bandwidth restricted environment will force leaders at all levels to become more comfortable making rapid decisions with limited information. This will be key in future amphibious operations due the nature of expeditionary advanced base operations (EABO). In an EABO construct, the distributed forces will not have access to the high bandwidth fiber connections that have become commonly used in training exercises throughout the United States and the Pacific. The Marine Corps must break this habit of relying on technology that cannot be guaranteed in EABO environments. Forcing all units to rely on tactical satellite and radio communications during training exercises will present gaps in our capabilities and drive change in standard operating procedures. This will better prepare the Marine Corps for how command and control will be conducted during future operations.

Signature Management

The Marine Corps must invest in equipment, training, and education in regard to managing physical and radio frequency (RF) signature management, especially in the communications field. Communication units must become accustomed to utilizing radar transparent camouflage netting to cover satellite ground terminals. Using this type of netting allows RF to pass through

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while masking the physical and infrared signature of the satellite terminals. The Marine Corps must also invest in more RF direction-finding equipment and training. Items like the Rohde & Schwarz PR-200 enable users to identify rouge RF signals within an area,

set lines of bearing, and triangulate the location of the signal via an imbedded mapping program; this is shown in Figure 1. This capability currently resides in limited quantity at the MEF and radio battalion level. With the given threats of a near-peer competitor, ensuring that items like the PR-200 are located at least at the communication battalion, squadron, and company level will enable more communications Marines to locate rouge signals that may be interfering with Marines Corps communication links. That information could then be passed to the next higher or adjacent unit that can facilitate

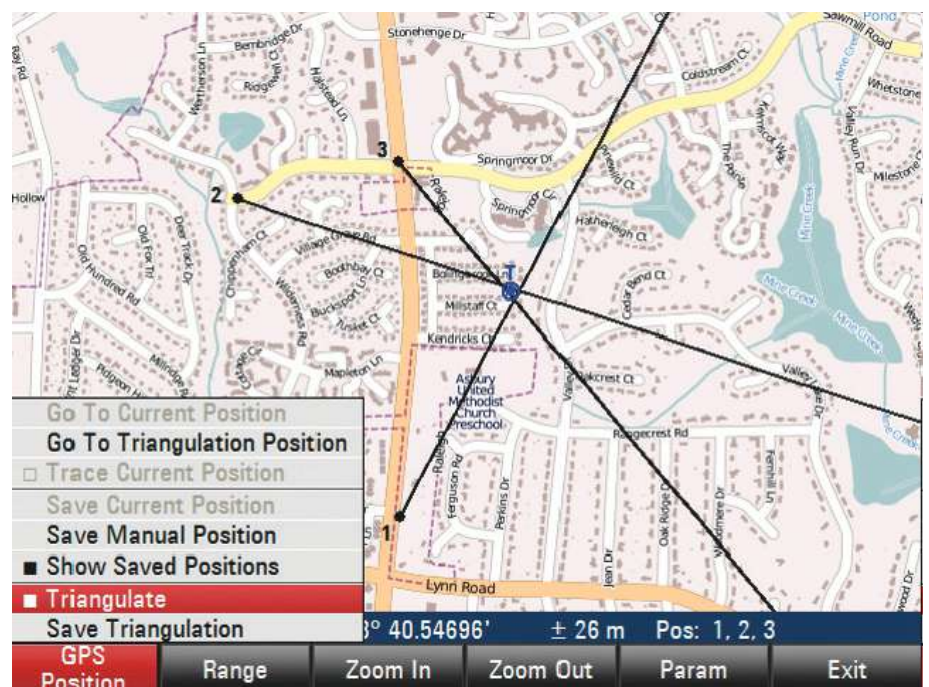


Figure 1. PR-200 Lines of Bearing and Triangulation. (Seidel, 2018.)

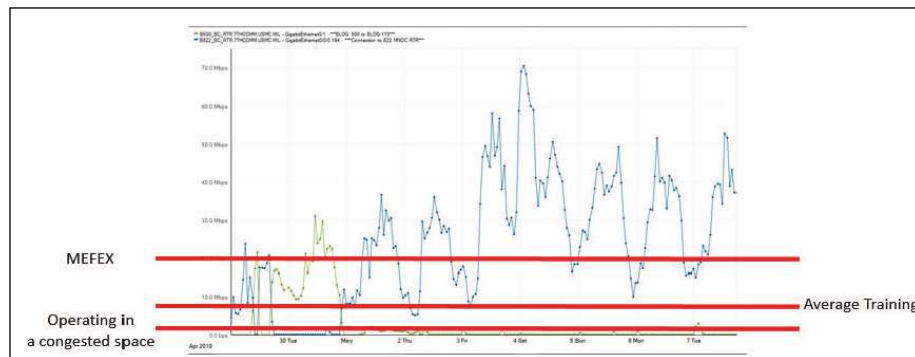


Figure 2. MEF-EX 2019 Bandwidth Usage. (Ramirez, 2019.)

further intelligence investigation or fire support coordination on the identified route signal location.

Bandwidth Restricted Environments

The Marine Corps current bandwidth appetite is far larger than its tactical assets can support. During exercises conducted by I MEF and III MEF from 2018–2020, the average bandwidth usage was upwards of 30–60Mbps. This bandwidth consumption is only possible with the inclusion of commercial fiber circuits to the Defense Information Systems Agency in order to facilitate wide area network or internet connectivity. The 30–70Mbps speed is more than 3–7 times higher than the average bandwidth speed to the Defense Information Systems Agency provided though tactical satellite communication links, normally 8Mbps and lower; this is illustrated in Figure 2. For future exercises the Marines Corps must actively avoid the use of commercial fiber circuits; this will quickly force change at the user level. This will also force the communication units to implement web restrictions on the tactical exercise network because there will not be enough bandwidth to support unrestricted web traffic. These types of web and bandwidth restrictions are already a regular part of Navy life aboard ships. Adopting similar control methods as the Navy will also put the Marine Corps units in a better position to adapt quickly to shipboard communication shortfalls.

SOP Updates

The Marine Corps must evolve the current SOP’s being implemented with the communication units to reflect the

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changes in enemy threat capabilities and EAB concept of operations. These updated SOPs must also be geared towards the inevitable denied degraded command and control environment that our Marines will likely face. Key concepts that need to be added to current

communication SOPs are listed below and were derived from the III Marine Information Group Employment of Signature Management SOP.

- Incorporating terrain masking, camouflage, cover, and concealment to shield emissions—as depicted in Figure 3.
- Utilize random communication windows and brevity codes.
- Record RF baselines during site surveys and record RF output during operations—as depicted in Figure 4.
- Using the minimum amount of power amperage in order to create a reliable RF link will assist in minimizing the overall emissions footprint.
- Use multiple frequency bands (high frequency, very high frequency, ultra-high frequency, super-high frequency, etc) for different methods of transmitting information.
- Communicate only when necessary.
- Remote antenna hills at least one kilometer away from the combat operations center.
- Use gun loops when possible.
- No cell phones. Use Iridium satellite phones with a secure sleeve as required.



Figure 3. VSAT-L Covered with Camouflage Netting. (Fahey, 2020.)

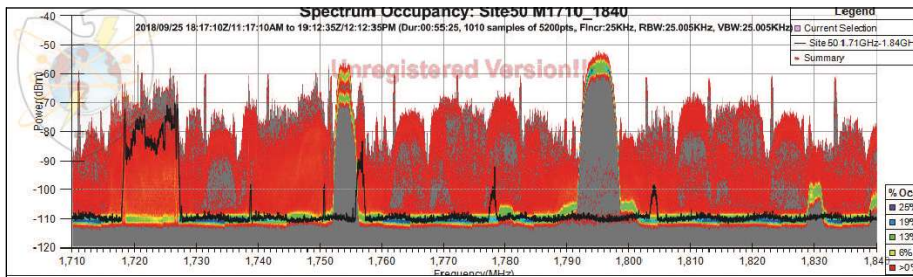


Figure 4. RF Baseline and RF output. (Vinson, 2019.)

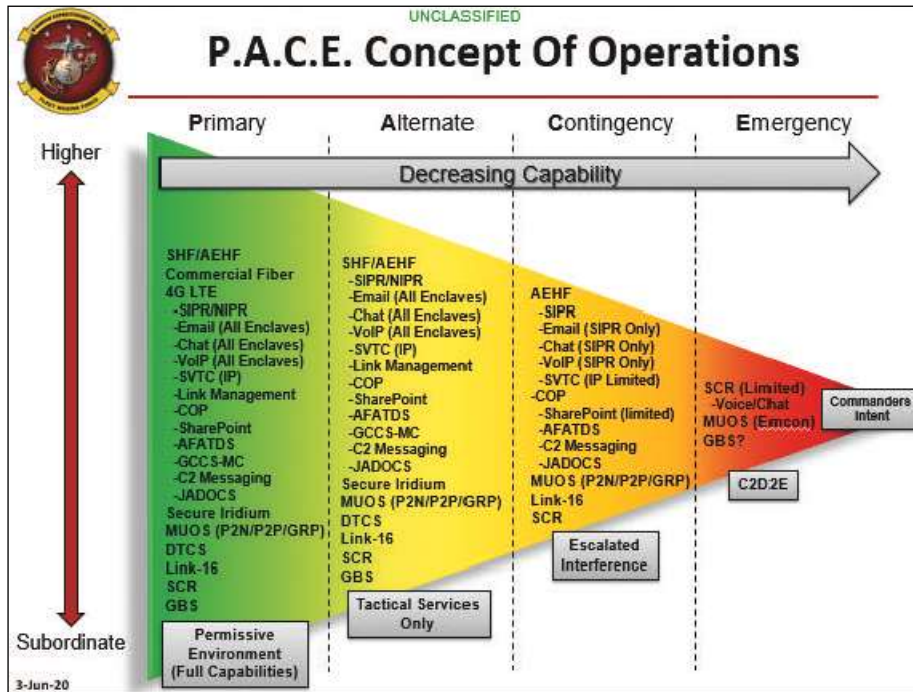


Figure 5. Missions Control primary, alternate, contingency, and emergency plan. (Bray, 2019.)

- Use decoy devices that emulate friendly signatures or emit false signals.
- Implementation of an emissions control primary, alternate, contingency, and emergency (PACE) plan; as shown in Figure 5.

Training

The Marine Corps communication units must begin training to setup essential radio and satellite links within a much shorter timeline than is currently expected. Most communication units move to the field two weeks prior to the execution of an exercise in support of ground and aviation users. This

is far more time than current EABO estimates give for units to setup, communicate, tear down, and repeat. An acceptable timeframe for single channel radio, AEHF, high-bandwidth line of sight, and ground satellite communication links that supports the EABO concept must be identified and adhered to. Communication Marines must get more experience and training with being jammed. This is currently very difficult to setup and requires coordination with applicable Air Force and Army units. The Marine Corps must conduct regular training sessions with those Air Force and Army units. This will ensure that communication Marines are exposed to and understand the effects of jamming on their equipment and services that they provide, as shown in Figure 6.

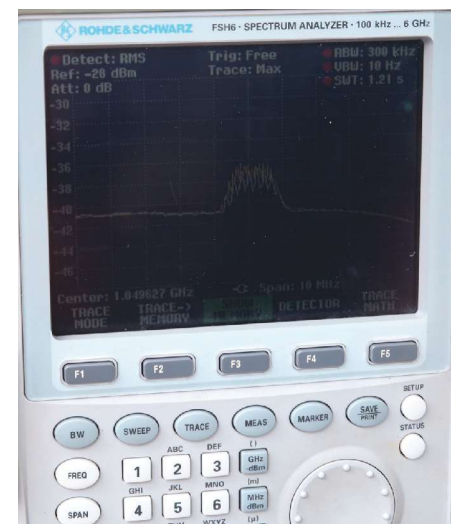


Figure 6. VSAT-L Spectrum Analyzer. (Belew, 2017.)

Conclusion

Implementing the changes described above will better posture the Marine Corps communication units for the future EAB and amphibious operations. All the suggested tools, standard operating procedures and training are geared towards generating a more flexible and agile communications unit; in order to prepare for the active threats and rapid movements that will shape the next great power conflict.

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