

# Is the HF Radio Dead?

by 1stLt Dustin J. Canestorp

*'Communications dominate war.'*

—ADM Alfred Thayer Mahan

Has the advent of tactical satellite communications (TSC) replaced the “tried and true” long-range capabilities offered by high-frequency communications (HFC)? The purpose of this article is to show that current Marine Corps doctrine on TSC no longer applies and needs to be updated. I will point out the need for organic tactical satellite radios at the infantry battalion level and the requirement to update the infantry battalion’s communications electronic operating instructions (CEOI) to reflect the gain in this new asset.

“Communications dominate war; broadly considered, they are the most important single element in strategy, political or military.”<sup>1</sup> Even though ADM Mahan was talking circa 1900, his statement rings with veracity today. As recently shown during Operation ENDURING FREEDOM in Afghanistan, effective command and control played a key role in the defeat of Taliban and Al Qaeda’s will to fight.

On 14 December 2001, Battalion Landing Team 3/6 (BLT 3/6) secured Kandahar International Airport in Afghanistan enabling the 26th Marine Expeditionary Unit (Special Operations Capable) to establish a forward operating base (FOB). From this FOB the BLT subsequently launched raids, security reinforcement, and humanitarian missions to tactical distances in excess of 100 miles. The BLT’s communications architecture had to stretch to meet the real requirement to simultaneously reach company-sized units spread throughout the theater of operations at operational distances in excess of 900 miles from

the USS *Bataan* amphibious ready group. That is analogous to the BLT being deployed between New York City and Charleston, SC. With that kind of dispersion it is hard to run wire. Connecting this wide dispersion pattern of tactical units was TSC, and it became the “voice of command.” The BLT did attempt to use its onhand HFC assets, but they proved to be unreliable. HFC is not as reliable as TSC, especially when dealing with the distances and terrain that was encountered by the BLT during the execution of Operation ENDURING FREEDOM in Afghanistan.

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Communicators use a program called SPEED (systems planning engineering evaluation device) to help locate the perfect type of antenna, frequency, and power output to use in order to communicate effectively with HF radios. Marines are not allowed to use any frequency they choose; they are supposed to use only the frequencies that are assigned to them by the frequency manager. This is one of the many flaws associated with HFC. The problem here is that the best frequencies are already taken or in use. Additionally, sunspots, solar storms, and weather severely affect HFC and at times completely eliminate any possibility of its use.<sup>2</sup>

HFC is reliable but only after extensive coordination. When BLT 3/6

deployed to Twentynine Palms last year, participating in Combined Arms Exercise 3-01, we set up an HFC shot back to our regimental headquarters in Camp Lejeune. We were finally successful after many hours of SPEED analysis and using the telephone to coordinate with our regiment. In addition, we talked in the clear and did not use a KY-99 to talk secure. In a tactical situation, commanders always want to talk secure, and a communicator will not have the luxury of a telephone for coordination.

Lima Company, BLT 3/6 conducted a 9-day clear-in-zone mission in support of coalition and special operations forces (SOF). They were operating in the mountainous region of Khost, located over 100 miles northwest of Kandahar near the Pakistan border, where the elevation gets up to 12,000 feet. The extreme terrain, coupled with the elevation,

made using vehicle-mounted HFC impossible. (Terrain, logistics, and mission will determine when you can deploy vehicles. Additionally, the BLT was limited to the number of vehicles that it could bring in country.) The company moved exclusively by foot or helicopter. There were many times when our Marines were used in a supporting role for SOF and coalition forces. In the above case, Lima Company had to totally rely on SOF for TSC support. SOF uses TSC exclusively (satellite radios and telephones), and they don’t use any form of HFC.

I started comparing our TSC assets against our HFC assets and experimented with TSC on the move because we saw SOF doing it. BLT 3/6 executed up to five vehi-

ular patrols a day around Kandahar International Airport. I issued our HFC and TSC assets to the patrol commanders. As soon as the patrols exceeded the operational limits of their very high-frequency (VHF) radios, they would switch over to HFC for the duration of the patrol or until they reestablished VHF communications. Ultimately, this never happened. In this case, the answer was TSC on the move. If radios are not reliable and simple to use then Marines will not use them. Marines will use what does work, and for BLT 3/6, TSC was the “moneymaker.”

The AN/PSC-5 is the most common tactical satellite, man-pack radio in the Marine Corps inventory. Current Marine Corps doctrine states that TSC be used exclusively for deep reconnaissance or to support tactical echelons in the Marine air-ground task force outside of the infantry battalion. Before deploying as the communications officer for BLT 3/6, I was fortunate to get my hands on three AN/PSC-5s on a temporary basis for the duration of the deployment. Additionally, current doctrine does not show an infantry battalion having a TSC net. We overcame this deficiency by using a higher unit’s net, especially when the BLT commander was a mission commander. This was problematic at times since more than one unit was using the same net. The missions that BLT 3/6 conducted in Afghanistan demonstrate that current doctrine no longer applies and, therefore, needs to be updated.

Satellite communications is a lot more reliable in today’s proliferated battlespace. It complements *Marine Corps Strategy 21* as laid out by the Commandant of the Marine Corps, that states: “Our goal is to capitalize on innovation, experimentation, and technology to prepare Marine Forces to succeed in the 21st century.”<sup>3</sup> It also goes on to state that we must be innovative, experimental, change, and adapt to ensure that the Marine Corps is most ready when the Nation is least ready.

The infantry battalion has a requirement to have organic tactical satellite radios added to its table of equipment. We need to amend the infantry battalion CEOI to reflect having this new tactical satellite radio capability and give it two organic tactical satellite nets on which to operate. The infantry battalion needs to secure its fair share of tactical satel-

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lite bandwidth. We should use demand access multiple assigned channels for training only and dedicated channels with a minimum bandwidth of five megahertz for real-world operations. The Marine Corps needs to keep up with current technological advances and procure such technology as quickly as possible. We need to pursue a vehicle-mountable antenna like the X-Wing that the U.S. Special Forces used in Afghanistan and field the AN/PRC-117F to the infantry battalions.<sup>4</sup> This revolutionary radio can perform the same duties of three different radios currently in use (AN/PRC-113, AN/PRC-119, and AN/PSC-5).

HFC is more than just a science; it is an art. Communicators in the Marine Corps have spent a number of years honing the skills necessary to deal with this temperamental, black magic-like craft. However, when human lives are at stake, inconsistent communications is something that the Marine Corps cannot afford to use. This is especially true when technology has improved our options. By doing all of this, the Marine Corps will be able to remain America’s elite “9-1-1” force.

**Notes**

1. Heidl, Jr., Robert Debs, Col, USMCR, *Dictionary of Military and Naval*

*Quotations*, (United States Naval Institute, Annapolis, MD: 1966), p. 62. ADM A.T. Mahan was a U.S. naval officer and historian born in West Point, NY. A Union naval officer in the Civil War, he later lectured on naval history and strategy at the Naval War College, Newport, RI, of which he was president (1886–89, 1892–93).

2. For more information on HF radios, propagation theories, and the ionosphere, check out the book titled *Radio Communications in the Digital Age, Volume One: HF Technology*, (Harris Corporation, 1996), Chapter 2.

3. For more information on Marine Corps doctrine and *Marine Corps Strategy 21*, visit the Marine Corps Doctrine Division, Marine Corps Combat Development Command web site at <<http://www.dctrine.usmc.mil/>>.

4. For more information on the X-Wing antenna, contact the manufacturer at Trivec-Avent Corporation, FSCM 60188, Huntington Beach, CA 92647. For more information on the AN/PRC-117F, visit the Harris Corporation web site at <<http://www.harris.com/>>.



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