The Navy–Marine Corps Team Needs Amateur Radio Operators

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September 2022

Proceedings

Vol. 148/9/1,435

Across the world, amateur radio operators, or "hams," remain ready and willing to coordinate emergency communications in peace and war. Within the continental United States, hams establish emergency communications in response to natural disasters dozens of times a year. They have provided military communications during America's wars and contingency communications to the National Command Authority. Highly proficient in the high-frequency (HF) band, they are not as vulnerable to the threats that nearly always challenge conventional communication architectures during times of crisis. And they cost the military next to nothing.

Surprisingly, amateur radio remains largely unknown and misunderstood even by military communications planners. This is despite the existence of the Military Auxiliary Radio System (MARS), a U.S. civilian auxiliary tasked to provide contingency communications to the military.[1] The Sea Services have a more acute issue. The Department of the Navy retired the Navy–Marine Corps MARS in 2015, stating that there were no service-unique requirements that could be filled by its MARS auxiliary.[2] Should the Navy and Marine Corps require MARS support, they must now rely on either Army or Air Force MARS.

The closure of Navy–Marine Corps MARS and the Navy Department's ignorance surrounding amateur radio capabilities must be addressed. By reactivating its MARS, routinely incorporating amateur radio and MARS capabilities into communication planning and building a culture of amateur radio expertise among naval communicators, the Navy and Marine Corps can ensure they will always have a way to exchange the right information at the right time, in competition, crisis, and conflict.

Amateur Radio at Home and Abroad

Amateur radio refers to the use of the radio frequency (RF) spectrum for personal, noncommercial purposes. Uses include experimentation, self-training, recreation, competition, and emergency communication. The Federal Communications Commission (FCC) distinguishes amateur radio from commercial, military, first responder, and other official uses of the RF spectrum.[3] Hams are licensed to use specific RF spectrum bands by the radio regulations of their countries. In the United States, the FCC issues ham licenses, generally through tests administered by the largest national body of hams, the Amateur Radio Relay League (ARRL). Most countries have ARRL equivalents, and nearly all are affiliated with the International Amateur Radio Union

(IARU). There are approximately 700,000 licensed U.S. ham operators and nearly 3,000,000 hams worldwide.[4]

A sizable portion of the ham community consists of current and former military communicators and first responders. In the United States and Canada, the Amateur Radio Emergency Service consists of hams who have registered their equipment and skills for public service during local contingencies and disasters, which usually involve the degradation of everyday communication infrastructure. Naturally, requirements for emergency communications do not stop with civilian infrastructure crises. They are required for military crises as well, which led to the creation of MARS.

Members of the Amateur Radio Emergency Service test HAM and Military Auxiliary Radio System equipment during Exercise Citadel Rumble 2019 at Navy Medical West in San Diego, California. U.S. Navy (John Pearl)

The Military's Most Cost-Effective Communication Service

Department of Defense (DoD) Instruction 4650.02, *Military Auxiliary Radio Service*, establishes roles, responsibilities, and status of MARS as a civilian auxiliary. Primarily, MARS is tasked to provide contingency communications to DoD, and each service secretary manages the MARS program of their own department.[5]

The Army and Air Force MARS programs regularly support exercises and experimentation, execute radio patching for airborne units, provide redundant communications paths for the National Command Authority, and remain available for any other DoD requirement MARS can meet. More than that, MARS operations are largely free—MARS members are volunteers who provide their own equipment, training, and licensing. The only cost is that which each service chooses to bear. The Army MARS, for example, has opted to establish a few paid positions to manage the program's administrative tasks. Beyond this, the largest cost is the time it takes to coordinate MARS participation in a military exercise or operation. In an age of fiscal austerity, why would the Department of the Navy, or any service, divest of a capability that costs next to nothing?

The apparent absence of a naval requirement for MARS was based on a perception of contingency communications as a primarily land-based service; having amateur radio stations operating at sea seemed impractical to a naval mission. Further, the decision came after years of a national security establishment focused on adversaries who are incapable of contesting the electromagnetic spectrum. Finally, before its retirement, the Navy–Marine Corps MARS was primarily used to support civil authorities within the continental United States.[6]

Yet the 2017 *National Security Strategy*, 2018 *National Defense Strategy*, and 2020 triservice maritime strategy, *Advantage at Sea*, all establish for the Sea Services a requirement for MARS. The Sea Services are compelled to operate against adversaries that can disrupt high-end communication architectures. Moreover, they will operate within contested littorals, areas rife with amateur radio operators. The 2021 *Interim National Security Strategic Guidance* reinforces this focus on competing against China and Russia within the global maritime commons and against gray-zone activities.[7] In these environments, amateur radio in general—and MARS in particular—offers opportunities to enhance naval communications in ways the Sea Services will require to fulfill their obligations to the nation.

Reestablish Navy–Marine Corps MARS

The Department of the Navy should reestablish its Navy–Marine Corps MARS auxiliary. With miniscule investment, MARS stations can be established in every location in which the Navy–Marine Corps team operates now and in the future. Yokosuka and Okinawa, Japan; South Korea; Guam; Bahrain; and other key places will certainly benefit from contingency communications.

Moreover, the Department of the Navy also can use MARS stations as hubs to tap into the amateur radio networks employed by local nationals. MARS operators will be best equipped to reconcile how to tap into such networks through MARS's familiarity with the IARU, the global representative of amateur radio matters. This will provide a trove of real-time, local intelligence. Whether determining how to best flow supplies for a humanitarian mission, or monitoring adversary activity in a manner like that of World War II coast watchers, the MARS program has specific Navy–Marine Corps missions.[8]

With a MARS program reestablished, Navy and Marine Corps communication planners must make integration with MARS a cultural norm. Even within the Army and Air Force, where MARS programs continue to operate, consideration of MARS in planning is rare. One would be challenged to find a reference to MARS in Annex K, or the communications annex, of any operations order. Notably, in those instances in which MARS supported real-world contingencies, the integration of MARS stations into the joint communications infrastructure was a happy accident.[9] Using MARS successfully during operations must be a skillful and deliberate choice, and not something left to chance.

Capitalize on MARS Expertise in the HF Band

While all radio bands have pros and cons, hams skillfully operate in the band most suited to communications in a contested spectrum—the HF band, which is the largest component of "shortwave" radio. Many of the military's transmission systems operate in easy-to-establish bands that can provide the high-data throughput desired by data-hungry command posts. These bands are also the easiest to detect, disrupt, exploit, and target.[10] A combination of range, flexibility, directionality, and concealment makes HF the band of choice to support the littoral operations in a contested environment that will characterize naval operations during great power competition.[11] The low-probability-of-detection techniques that hams can perform in the HF band are the same techniques called for in the Marine Corps' *Tentative Manual for Expeditionary Advanced Base Operations*.[12]

While naval communicators train and operate in the HF band, HF proficiency remains substandard. The demand for HF services has waned as technological capabilities have grown; command posts prefer more convenient and data-rich communication systems that more closely resemble services available at home and in the commercial sector. This has deprioritized HF training. However, while HF communication is not the simplest form to use, it is far more science than art and remains bound by predictable principles that can be applied with ease if the operator understands how to use them.[13]

Meanwhile, the HF band is one of the primary bands in which hams are licensed to operate.[14] Their skills are such that radiosport, or competitions using radio frequencies, are conducted regularly in the HF band.[15] Recognizing the HF skills gap between military and amateur radio operators, the Army has explicitly tasked its MARS to serve as a repository for HF skills and provide HF training to military units and HF support during deployments.[16] Integrating MARS into communication plans and exercises provides another natural avenue to capitalize on the HF expertise of MARS operators and refine the HF acumen of naval communicators.

A Mission for MARS

Finally, integrating MARS and ham radio into naval communications will allow the full range of ham capabilities to be used. The most common use of ham is push-to-talk voice communications. The perception that ham is little more than the Citizen's Band radio used by truck drivers has contributed to its neglect within military circles. But today, hams can offer many of the same services that tactical radios provide, including chat, file exchange, email services, and video transmission.[17] The enemy cannot deny the U.S. military many transmission paths for ham radio, including the ionosphere and moon-bounce communications. This presents immediate and relevant applications when command and control is denied or degraded, as these networks do not rely on the satellites or cyber infrastructure so easily contested by peer adversaries.

If the Department of the Navy chooses to do so, it can activate a ready and waiting global network of contingency communicators at little to no cost. Amateur radio operators exist in every clime and place and are communication and local intelligence-gathering assets in support

of naval missions. The Sea Services will continue to be challenged by fiscal austerity in the years to come. Naval communications and local intelligence gathering can score a much-needed windfall by reactivating Navy–Marine Corps MARS, integrating MARS into communication plans and exercises, capitalizing on HF expertise within the ham community, and leveraging the full range of ham capabilities. In this way, naval commanders will cheaply and easily gain a critical advantage in competition and conflict.

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