

# U.S. MARINE CORPS

## EXPLORES USING UNMANNED SURFACE VEHICLES TO ENHANCE LOGISTICS SUPPORT FOR EXPEDITIONARY FORCES

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### PERSPECTIVE

If my three tours in the U.S. Navy's amphibious forces – where I worked closely with embarked U.S. Marines in a large number of amphibious exercises – taught me anything, it is that while many functions are important in an amphibious assault, once the assault is underway and troops are on the beach, logistics is the critical factor in ensuring their success. U.S. Marines in the fight use enormous quantities of ammunition, fuel, food, and other material as they attempt to move off the beachhead and inland.

The importance of logistics goes back as far as recorded warfare. Over 2,500 years ago, Sun Tzu noted: "The line between disorder and order lies in logistics." Two hundred years later, Alexander the Great put it this way: "My logisticians are a humorless lot...they know if my campaign fails, they are the first ones I will slay." In the maritime domain, Captain Alfred Thayer Mahan said: "Logistics are as vital to military success as daily food is to daily work."

In the two decades after the September 11, 2001 attacks, the U.S. Marine Corps has been heavily engaged in Iraq and Afghanistan and not often embarked in the Navy's amphibious ships. Today, the Marines are back to sea and working with their Navy partners to ensure that the

nation's amphibious assault forces are, in the words of the Commandant of the Marine Corps, General David Berger: "Prepared for large-scale amphibious operations."

### A NEW EMPHASIS OF SHIP-TO-SHORE LOGISTICS

As the Marine Corps pivots from land wars to assaults from the sea, their logistics needs are changing dramatically. Now, the emphasis is on how to assault a heavily defended beach – and just as importantly – how to sustain Marines on the beachhead as they attempt to push inland. The mission will ultimately fail if the Marines are not able to have reliable and continuous sustainment in order to press the fight off the beaches and toward the objective area.

Here is how two researchers at a major think tank described the challenge of conducting any amphibious assault in the third decade of the 21st Century:

Amphibious assaults in the face of sophisticated anti-access/area denial (A2AD) capabilities threaten strategic reach and operational freedom of maneuver. The prospect of assaulting a hostile shore today is more daunting than ever. The capacity of Marines to push inland must depend on the security of their logistical support.



Devil Ray T38 (Courtesy of Jack Rowley)



Devil Ray T38 at sixty knots (Courtesy of Jack Rowley)



Devil Ray T38 (Courtesy of Jack Rowley)

While many naval professionals do acknowledge the importance of logistics, this vital function often gets shunted aside as a priority. Here is how one U.S. naval officer put it in the pages of the U.S. Naval Institute Proceedings in an article entitled “Improve Combat Logistics”:

Warfare is often viewed through the lens of iconic objects, such as a field of men wearing blue and gray uniforms, the M-4 Sherman tank, and the nuclear-powered aircraft carrier. What those images ignore are the forces that provide combat logistics—the sinews that link the resources to the warfighter.

Senior Marine Corps officers are emphasizing the importance of logistics to sustain effective expeditionary operations. The Commanding General of the First Marine Expeditionary Force, Lieutenant General George W. Smith, Jr., put it this way: “We are not putting enough emphasis on logistics...We can’t win without sustainment...The challenge for the Marine Corps is the last logistical mile.”

Other Marine Corps officers have emphasized the importance of seeking technology solutions for the Services’ needs, especially in the logistics arena, with the Commanding General, Marine Corps Combat Development Command, Lieutenant General Karsten Heckl, stating: “We need to get unmanned platforms into operators’ hands.”

## AN EMERGING LOGISTICS SOLUTION USING UNMANNED SURFACE VEHICLES

Recognizing their need to find an innovative solution to substantial logistics challenges encountered during an amphibious assault, the Navy and Marine Corps have been proactive in leveraging emerging technology – often commercial-off-the-shelf (COTS) technologies – in exercises, experiments, and demonstrations in order to explore potential logistics alternatives.

One U.S. Navy-Marine Corps exercise, Joint Exercise Valiant Shield, overseen by Commander Marine Forces Pacific (MARFORPAC), and conducted on the Marianas Island Range Complex as well as on the island of Guam, focused specifically on the logistics function, something of critical importance to Marine Corps warfighters. Valiant Shield demonstrated the ability of COTS technologies – in this case, unmanned surface vehicles – to perform the vital logistics function.

The expeditionary force commander used a catamaran-style hull 12-foot MANTAS USV to provide rapid ship-to-shore logistics resupply. While this small, autonomously operated, USV carried only one hundred and twenty pounds of cargo, the proof-of-concept worked and successfully demonstrated that unmanned surface vehicles could safely and effectively resupply troops ashore.



Side View of the Devil Ray T38 (Courtesy of Jack Rowley)

Using unmanned vehicles could be a game-changer for expeditionary assault forces. Beyond taking operators out of harm's way, using USVs for this task frees manned craft for other missions. Having a continuous, preprogrammed, logistics resupply process to perform one of the "dull, dirty and dangerous" functions important in an amphibious assault gives the commander one less thing to worry about in the chaotic environment of an amphibious operation.

### FROM EXPERIMENT TO ACTUALIZATION

While Joint Exercise Valiant Shield validated the concept of using COTS USVs to resupply Marines on the beach, delivering supplies in 120-pound increments is not a game changer. For this reason, the Navy and Marine Corps are now exploring the viability of using larger COTS USVs to provide logistics support to Marines on the beach.

For this reason, the maker of the MANTAS family of USVs (Maritime Tactical Systems, Inc.) has been challenged by the Navy and Marine Corps to "scale-up" the 12-foot MANTAS USV and develop larger proof-of-concept unmanned surface vehicles for this mission. Larger MARTAC unmanned surface vehicles, ranging from 24-foot to 50-foot long, have been designed and are now being fielded in a number of Navy and Marine Corps exercises, experiments and demonstrations.

Every amphibious ship I served on was stuffed to the gills with necessary gear for the Marines. But those mountains of equipment are no use to Marines if they are not delivered to the beach quickly, continuously, and reliably. That is difficult to do if every supply mission from ship-to-shore causes the amphibious assault commander to worry about putting humans in harm's way.

The basic specifications of the "Expeditionary Class" USV

provide an indication of the ability of these craft to deliver a steady, continuous stream of logistics support to Marines on the beach. The T38 Devil Ray travels at cruise speed of 25 knots and has the ability to carry a payload up to 4,500 pounds. The larger T50 Devil Ray travels at cruise speed of 25 knots and can carry a payload of 10,000 pounds.

### THE FUTURE OF EXPEDITIONARY LOGISTICS SUPPORT

As a former operator who is intrigued with new technology, I did some back-of-the-envelope math to understand what an expeditionary strike group equipped with a number of T38s and T50s could do to resupply troops on the beach. Having observed any number of amphibious exercises during my time in uniform, I am mindful that an amphibious formation typically stands no more than 15-25 nautical miles off the beach being assaulted.

Using a notional stand-off distance of 20 nautical miles, an amphibious formation equipped with four T38s traveling at their cruise speed of 25 knots could deliver 18,000 pounds of material from the ships to the beach per hour. Multiply that by twenty-four hours and you get a buildup of well-over 400,000 pounds of vital material per day, enough to support a substantial force of troops ashore. Using four T50s in a similar manner, the amount of material delivered approaches one million pounds a day.

The Navy and Marine Corps are planning an ambitious schedule of exercises, experiments, and demonstrations in the years ahead. Based on the promising performance of small, unmanned surface vehicles in exercises designed to demonstrate how USVs can support expeditionary assault forces, the Navy and Marine Corps would be well-served to experiment further with larger USVs to perform this vital logistics sustainment mission.