

Meet the Amphibious Vehicle Test Branch

The services this team provides

by Maj Justin D Davis

Few Marines and civilians understand the inner workings and significance of the Amphibious Vehicle Test Branch (AVTB).

Within Marine Corps Systems Command (MCSC), the AVTB is at the proverbial tip of the spear. Acquisition professionals conduct equipment testing and facilitate feedback to program managers to get the most capable equipment into the hands of the Operating Forces.

The AVTB is the only test and evaluation entity of vehicular ground combat equipment within the Marine Corps. The recent realignment of AVTB under the Marine Corps Tactical Systems Support Activity/MCSC expanded their ability to provide the test, engineering, and analysis feedback of a wider range of equipment.

The purpose of this article is to provide the Marine Corps and those within the DOD a better understanding of AVTB's ability to resource technology demonstrations, conduct developmental testing, and facilitate the formulation of viable weapons acquisition strategies for the warfighter.

Historical Perspective

AVTB traces its historic lineage to 1943 when Marines used tracked amphibian vehicles to support maneuver and logistics functions. As a sub-entity of the Schools Battalion, Marine Corps Base Camp Pendleton, CA (MCB CPEN), a small cadre of Marines and civilians were tasked to initiate the development of engineering enhancements to the Landing Vehicle Tracked (LVT) -1 through -4 as the island-hopping campaign commenced and further vehicular enhancements were sought.

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An Amphibious Combat Vehicle undergoes developmental testing at Vandenberg AFB, CA.
(Photo by Douglas Kenner.)

When the Tracked Vehicle School Battalion was separated from the MCB CPEN Schools Battalion in May 1948, so went the personnel supporting developmental testing.¹ Under the cognizance of the Tracked Vehicle School Battalion, the cadre continued their vehicular experimentations through the conclusion of the Korean War and the initial testing of the LVT-5 platform.

In 1958, the Commandant of the Marine Corps formally established the Marine Corps Tracked Vehicle Test and Experimentation Unit at MCB CPEN.²

With this formalization, the Experimentation Unit was operationally and administratively led by the CG, MCB CPEN; technically controlled by the Chief, Bureau of Ships, Department of the Navy; and received funding directly from the Commandant's office.³

In 1964, the Marine Corps re-designated the Experimental Unit to the West Coast Branch of the Landing Forces Development Center, and the unit was re-designated to the Amphibious Vehicle Test Branch in 1973. The Commandant, in conjunction with fel-



An AAVP-7A1 undergoing reserve buoyancy testing. (Photo by Bruce Lane.)

low Service chiefs, signed a Memorandum of Agreement in 1987, affording all Services the opportunity to employ AVTB for experimental and developmental testing at no cost to the respective Service.⁴

More recently, AVTB played a critical role in the sustainment, enhancement, and modification of the AAV while concurrently conducting developmental testing of the Expeditionary Fighting Vehicle. Furthermore, AVTB extensively tested numerous Marine Corps and joint Service ground combat vehicles.

quarters from Marine Corps Tactical Systems Support Activity (MCTSSA)/MCSC to Systems Engineering, Interoperability, Architectures and Technology/MCSC to Program Manager (PM)—Advanced Amphibious Assault-Program Executive Officer—Land Systems to MCTSSA, where it resides today.

Today

The current mission of AVTB is “to conduct test and evaluation of expeditionary combat vehicle systems and equipment in order to enable informed acquisition decisions.” The branch cur-

and maintainability; and communication and weapons testing.

Additionally, subject matter expertise pertaining to command, control, communications, and computers testing can be leveraged by the use of the AVTBs higher headquarters, MCTSSA. Marines can conduct the evaluation and analysis testing in day or night conditions and under all-weather and surf or sea state parameters at the request of the customer. The branch can conduct full-scale mission profiles—similar to what equipment would be utilized by Marine Operating Forces—to include ship-to-objective maneuver.

The current workforce at AVTB represents a highly trained and diverse skill set that crosses multiple competencies and disciplines. Its permanent organizational structure currently consists of 46 uniformed personnel and government civilians. The uniformed personnel predominantly comprise assault amphibian operators and maintainers. While they are assault amphibian by name, these personnel have vast experience operating and maintaining other platforms through formal and informal training opportunities.

These Marines are capable of operating test vehicles and can create uniformed end-user feedback early in the development process. This uniformed capability is uncommon in comparison with other DOD test facilities that typically rely upon contractual support to operate test articles.

The government civilian personnel predominantly include engineers, electronics technicians, and analysts. These permanent personnel are further augmented by additional uniformed personnel who support equipment-specific testing and may be sourced from a particular MOS for a specific period of time.

Additionally, AVTB draws heavily upon contracted personnel to meet the requirements and functions of daily support activities. The vast preponderance of equipment within the branch—including the employment of military equipment and a fleet of water craft—is operated by contractual support.

AVTB maintains a quantity of atypical equipment used in support of testing

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Most recently, AVTB conducted developmental testing of the AAVP-7A2/Survivability Upgrade, the amphibious combat vehicle, the Light Armored Reconnaissance Vehicle—Obsolescence Program, and the joint light tactical vehicle.

Since the late-1980s, AVTB has continually shifted between higher head-

quently supports a multitude of PMs from within MCSC/PEO-LS as well as other institutions within the Department of the Navy and the DOD. The branch specializes in the execution of water and land mobility performance; automotive performance; shock and vibration evaluation; equipment transportability; human factors; reliability, availability,

not found elsewhere within the Service. Consequently, there is no MOS to support and operate much of this equipment, resulting in the requirement to leverage contractual support for testing. Collectively, these personnel constitute today's workforce, manage a multi-million dollar consolidated memorandum receipt, and ensure appropriate customer interface.

AVTB supported a variety of tests this year that speak to the utility of the branch. Amphibious combat vehicle testing in support of PM-AAA is ongoing, with an upcoming low rate initial production assessment set to take place. The branch simultaneously hosts a logistics demonstration for the platform to verify the accuracy of technical manuals and supporting equipment prior to fielding.

Furthermore, AVTB is supporting Naval Surface Warfare Center–Pacific and Panama City with their efforts to automate the AAV platform with the incorporation of the MK-154 Linear Mine Clearance Kit, a mine plow, and a lane marking system to create a truly autonomous, amphibious breaching capability.

The branch has also contributed to the JLTV program, supporting the testing of systems integration into the platform prior low rate initial production. Outside of vehicles, the branch has supported PM Infantry Weapons in their quest for a squad common optic to replace the various weapon optics typically found within the Marine infantry squad today.

Finally, support has been forthright to Naval Information Warfare Center–Pacific (formerly SPAWAR) in their testing of multiple communications systems to be employed aboard naval shipping. The diversity of ongoing tests by the branch supports the adage that AVTB has many capabilities to support equipment managers across the DOD in their test and evaluation process.

Metrology Laboratory

The Metrology Laboratory, as its name implies, is used to execute the scientific study of measurement. The laboratory contains a vast wealth of



A LAV-AT undergoing testing. (Photo by Douglas Kenner.)

digital and analog instrumentation that is used to gather and record data for analysis by engineering personnel.

Laboratory personnel are responsible for installing, monitoring, and uninstalling instrumentation specified by test requirements. The equipment typically used in ascertaining scientific measurements for vehicular equipment includes: GPS instruments, pressure transducers, accelerometers, controller area network instruments, weight devices, and motion video systems.

While supporting testing, environmental monitoring systems are frequently used with supporting data sourced from thermometers, hygrometers, wave buoys, and wave height measuring devices. These devices and systems provide raw data into software programs that are then organized by a data analyst before being given to engineering personnel for interpretation and further analysis.

Engineering

The engineering staff includes multiple engineering disciplines and a mathematician. Engineering personnel typically work closely with customers to identify test requirements, which subsequently are transitioned to laboratory personnel to ensure feasibility and supportability.

Engineer personnel provide technical expertise in test design, execution,

collection, analysis, and reporting. In meeting customer requirements, engineers develop detailed test plans and reports with input from other AVTB sections to ensure all attributes and milestones are appropriately tested, customer satisfaction is achieved, and all requirements are met or exceeded.

Operations

The operations staff contains the personnel who execute testing. Comprised of uniformed assault amphibian and communications personnel, they are the subject matter experts for planning and executing tests.

Additionally, the staff is composed of contractors who are responsible for the employment and maintenance of test support equipment. When unique test execution requirements are identified during planning, operations personnel conduct research, develop options, and facilitate the implementation of alternatives.

These may range in scope from conducting testing at a more appropriate DOD facility to conducting feasibility of support requests within Marine Forces Pacific for a particularly qualified individual or piece of equipment. They might also turn to the civilian sector to appropriately source whatever may be required.

Operations personnel are responsible for coordinating maneuver areas, firing

ranges, and waterway usage to include notices to mariners. They typically work with both engineers and laboratory personnel during execution to ensure the appropriate data points are met from the instrumentation so the engineer staff has the appropriate data to prepare a detailed test report.

Logistics

The logistics staff handles a vast swath of requirements pertaining to customer desires and the needs of the sections within the branch. Logistics personnel interface with the customer to ensure test articles are transported to and from MCB CPEN while ensuring all of the respective supporting equipment corresponding to the test article is handled appropriately.

The purchasing requirements for test support are atypical of what is usually purchased through the government; thus, the civilian sector is typically leveraged to procure supporting equipment. The logistics purchasing agent conducts market research and ensures compliance requirements are met before purchasing test support apparatuses as required.

In addition, a hazardous material section supports the shipping, receiving, and subsequent usage of petroleum, oils, and lubricants as required by test articles. Working with engineer and operations personnel, the logistics staff ensures all logistical parameters are met for successful test support.

Maintenance

The maintenance staff consists of a highly experienced workforce comprising assault-amphibian-repair Marines who are frequently cross-qualified in other vehicular equipment and can lend insight into diesel engine and transmission repair.

Additionally, the branch maintains welders and machinists for fabrication and repair. These personnel facilitate steel and aluminum welding and fabrication while working with laboratory, engineering, and operations personnel to create components as they are required for instrumentation or safety.

When conducting testing, maintenance personnel are also responsible

for recovery and salvage procedures. As the preponderance of vehicular testing generally involves equipment for which no recovery or salvage procedures exist, they are typically called upon to create them.

Finally, they work with operations personnel on rescue procedures and

Corps and the Department of the Navy, and it is working to significantly increase that number. Through perseverance, AVTB aims to be the pinnacle test center for vehicular equipment within the DOD.

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facilitate equipment, personnel, and procedures as required. These standardized test procedures pertaining to safety work in conjunction to significantly reduce risk when conducting testing.

Financial Management

Financial management personnel are not only responsible for managing a multi-million dollar research and development budget, they are also responsible for the financial interface between AVTB and its customers.

Internal to finance, the department can be divided into two sections: budget and execution. Pertinent responsibilities to budget management include spending plan development, budget submissions, the creation of funding documents, and approval for internal purchase requests. Execution responsibilities include the validation and submission of funding documents, correction of erroneous transactions, oversight of contractual invoicing, and facilitation of source documentation for all taskers regarding Marines Corps audits.

The Future

The future outlook for AVTB appears bright as it continually works to improve customer interface, widen the aperture of developmental testing capabilities, enhance technology commensurate with data collection assets, and provide test support to a wider clientele.

The branch currently has interface with 26 clients from across the Marine

establishment, testing, and sustainment of a Service-defining capability by informing acquisition decisions through rigorous test and evaluation. As the Marine Corps reorients to its amphibious roots and invests in upgraded and next-generation expeditionary vehicle capabilities, AVTB will again be relied upon to support the acquisition process—just as it has been since the dawn of the Service’s tracked vehicle, amphibious capability.

Notes

1. Headquarters Marine Corps, *CMC letter MC-1044473*, (Washington, DC: September 1948).
2. Headquarters Marine Corps, *Letter, Marine Corps Tracked Vehicle Test and Experimental Unit*, (Washington, DC: June 1958).
3. Ibid.
4. Department of the Navy, Naval Air Systems Command, *Memoranda of Agreement/Multi-Service Test Investment Review Committee on Unique Test Facilities*, (Washington, DC: March 1987).

