

By DON Innovation

(QUANTICO, VA) In late September, the Marine Corps Base Quantico co-sponsored the Modern Day Marine 2016 Exposition. Attendees of the annual event were able to view some of the newest ideas currently being developed by Marine Corps Systems Command (MARCORSYSCOM); Marine Corps Warfighting Lab (MCWL); Marine Corps Installations and Logistics (I&L); Marine Corps Energy; Naval Surface Warfare Center (NSWC), Carderock; Naval Air Systems Command (NAVAIR); Office of Naval Research (ONR); and Naval Surface Warfare Center, Indian Head Explosive Ordnance Disposal Technology Division (NSWC IHEODTD).

Marine Corps Warfighting Lab (MCWL) was out in force, providing information for a wide array of their projects as well as displays of their key initiatives. Some of the innovative exhibits included the Network On The Move – Internal Transportable Vehicle (NOTM-ITV), the Modular Advanced Armed Robotic System (MAARS), and the Robotic Vehicle Modular (RV-M). They also showcased an interactive TV screen, which presented a deep dive into videos of Marines using the groundbreaking new equipment coming out of MCWL.



Marine Corps Installations and Logistics (I&L) exhibited several projects that are being developed with industry and academic partners. Two of the projects involved using adaptive QR codes to input information directly into a handheld tablet. One of these projects focused on quantifying the delivery of fuel at different fuel distribution points. The QR code with the initial measurement was photographed at the beginning and again at the end. The application interface allows the fuel distribution specialist to quickly enter the amount of fuel distributed and the unit that was receiving the fuel. The system intuitively adjusted the algorithm based upon the weather and temperature. The second project used an adaptive QR code display that was integrated into the dashboard of a Medium Tactical Vehicle Replacement (MTVR). The handheld tablet “read” the QR code through the tablet’s camera, allowing for the transmission of various data points with important information to the device for inclusion in the vehicle’s record jacket (i.e., miles driven, speed driven, hours idle, temperature readings). This type of technology allows for a more measured approach to preventative and corrective maintenance, creating costs savings with parts and labor.



Another project displayed at the I&L booth was a case study on 3D printing an Unmanned Aerial Vehicle (UAV). While this project is still in its initial stages, the Government and academic team has conducted research into creating the best features for printing UAVs. Part of the focus has been on the design of the wings. Building too much structure makes the wings too heavy, reducing the payload, while building too little structure makes the wings too weak to support the payload. The ongoing research seeks to answer the issue of whether the wings will be constituted of a specific structure of printed material or of a filler substance that adds strength but little weight. The research will continue until the best answer is found.

Naval Surface Warfare Center, Indian Head Explosive Ordnance Disposal Technology Division (NSWC IHEODTD) displayed several



new tools that have been developed using Additive Manufacturing (AM) and other AM techniques. One notable piece of equipment was the Lodged Projectile Removal Tool (LPRT), which significantly reduces the amount of explosives required to remove projectiles lodged inside artillery barrels. In addition to reducing the amount of materials, this new technique reduces risk of damage to the artillery pieces, as well as risk of injury to Explosive Ordnance Disposal (EOD) personnel.



Naval Air Systems Command (NAVAIR) brought 3D printers and demonstrated some of their 3D manufacturing capabilities. This past summer, they used the same techniques to create a titanium 3D printed link and fitting assembly for the engine nacelle of an MV-22 Osprey. (Read more about the test flight [here](#)). For over 20 years, Naval aviation has utilized additive manufacturing as a prototyping tool and this test flight demonstrated the ability to expand this capability into the creation of in-flight parts and supporting tools.