

Soldier-Centric Design and Combat Vehicle Modernization

by COL Warren Sponsler

The Army's modernization effort for ground combat vehicles is moving forward, providing opportunity unparalleled since the development of the "Big 5" nearly a half century ago.

Due to the Army's continued commitment to modernization through Army Futures Command (AFC) and the dedicated focus on the "31+4" signature modernization efforts, the next 10 years and beyond will undoubtedly bring many new tactical capabilities not only to maneuver formations but for our Army as a whole. Survivability, lethality, speed, range – all will be increased in the near-term, enabling a transformation in how our units and Soldiers fight and win decisively on the future battlefield.

These efforts are made possible only by bringing together Soldiers, leaders, engineers, scientists, specialists and technicians from key partner organizations from both within the Army – such as the Maneuver Center of Excellence and Program Executive Office Ground Combat Systems – as well as those from industry, academia and across the Department of Defense. The Next-Generation Combat Vehicles Cross-Functional Team (NGCV-CFT) provides unity of effort to the professionals from across the Army's modernization enterprise.



Figure 1. Soldiers participate in a virtual experiment to help determine the way forward for the next generation of combat vehicles. (U.S. Army photo)

The NGCV-CFT introduced the Army's priority armored-vehicle development efforts in the Spring 2020 edition of **ARMOR**. In just the year since, the Army has made major steps forward in bringing these much-needed capabilities to our Soldiers.

Following is brief overview.

Optionally Manned Fighting Vehicle

In mid-Summer 2021, the Army will select five industry partners to create a detailed digital design for the Optimally Manned Fighting Vehicle (OMFV), which will not only replace the Bradley Fighting Vehicle in our formations but also has the potential to transform how our mechanized-infantry fight, capitalizing on advanced,

mature technologies and innovation. OMFV is being designed using a new approach to enable the mounted force to maneuver Soldiers on the battlefield to retain and maintain decisive overmatch long into the future.

Rather than providing our industry partners with top-driven, rigid requirements early in the process, the Army provided industry partners with a description of how the OMFV will fight and nine broad “characteristics of need” to be included in initial OMFV concept designs, leaving the door open for innovation. The characteristics are, in order: survivability, mobility, growth, lethality, weight, logistics, transportability, manning and training.

The Army will then analyze each design using modeling and simulation tools to refine future system requirements and capabilities as the Army moves to the next phase of the program.

Robotic Combat Vehicle

Robotic Combat Vehicles (RCVs) have been getting a tremendous amount of attention as the Army continues the campaign of learning for integrating unmanned combat systems into maneuver formations. RCVs may increase commanders’ ability to develop actions before and on contact, improve situational awareness, reduce risk to manned platforms and enable faster decision-making on the future hyper-lethal battlefield.

Last year’s Soldier Operational Experiment (SOE) with Soldiers from 3rd Brigade, 4th Infantry Division, at Fort Carson, CO, clearly demonstrated the practical utility of robots in a combat role. As the program transitions to the next phase, over the past few months the Army took delivery of purpose-built prototypes of the light (under seven tons) and medium (under 12 tons) RCV variants in preparation for the Army’s second SOE with Soldiers from 1st Cavalry Division, Fort Hood, TX, in Summer 2022.



Figure 2. A Soldier is trained to operate an RCV in a simulator during the RCV Phase I SOE at Fort Carson, CO, in August 2020. (U.S. Army photo)

The team is also examining opportunities to integrate RCV prototypes and surrogate platforms with Soldiers in other operating force units and at the combat-training centers. These live experiments, coupled with multiple virtual experiments over the past year, continue to develop new understanding of how best to employ robots in our combat formations, what the necessary capabilities of each platform are, how to train at the unit level and what the organizational structures are to support them.

Mobile protected firepower

Following prototype development and build over the past year, mobile protected firepower (MPF) prototypes are in the midst of a Soldier Vehicle Assessment (SVA) with Soldiers from 82nd Airborne Division and at the Army Test

and Evaluation Command. The two unique MPF designs are being put through their paces in crew and collective training at the brigade-combat-team (BCT) level and below.

MPF provides infantry BCTs' (IBCT) dismounted infantry with an organic lethal, deployable and survivable platform to fight through the enemy's security zone, defeat strongpoints and light armored vehicles, and eliminate heavily defended positions.

Following the SVA, the Army is poised to conduct a limited user test (LUT), again with 82nd Airborne, to make a critical decision in Summer 2022 on which of the designs the Army takes to production. The current MPF rapid prototyping phase provides the Army with an opportunity for Soldier-centric design, leading to a much-needed capability for supporting the maneuver of the Army's IBCTs on the future battlefield.

Armored Multi-Purpose Vehicle

Production of the Armored Multi-Purpose Vehicle (AMPV) is in full swing following the earlier LUT with 1st Cavalry Division at Fort Hood and after subsequent pre-production refinements based on Soldier feedback. Nothing fancy here – just one tough vehicle to provide the survivability, mobility and growth potential for the future battlefield.

AMPVs replace all five variants of M113-based vehicles currently in the Army's armored BCTs with capabilities to ensure they will remain relevant long into the future.

The Soldiers of 3rd Infantry Division, Fort Stewart, GA, are scheduled to receive the first operational brigade set of AMPVs within the next year.

Next-generation main battle tank

While not currently one of the Army's priority "31+4" modernization efforts due to the exceptional capability of the M1A2 System Enhancement Package (SEP) v3 and M1A2SEPV4, NGCV-CFT is collaborating with partners on what comes next. Today the Army has the opportunity to capitalize on advanced and rapidly maturing technologies that enhance the lethality, survivability and mobility – as well as overall effectiveness – of the main battle tank beyond the current Abrams form. To this end, the team is continuing a series of Soldier innovation workshops, virtual experiments and Soldier touchpoints to inform future Army decisions.

Project Convergence

Many of the new and developing technologies that help enable these vehicles are being demonstrated through Project Convergence (PC), the Army's premier technology experimentation and demonstration venue. This event, which includes our partners from across AFC and the Joint force – and will integrate operating-force units this year – is at the center of a campaign of learning focusing on linking sensors across the battlefield to geolocate and classify threats and determine which weapon system(s) to employ against the right target at the right time.

From NGCV-CFT's perspective, PC is all about supporting the ground maneuver commander in the effective application of combat power to take advantage of windows of opportunity as they arise. Instrumental to this end is the use of artificial-intelligence-enabled decision-support tools, backed by robust data, which aid the commander to make better and faster decisions, leading to tactical-decision dominance. PC also provides a fantastic opportunity to continue to push the envelope on developing technologies supporting a rapid transition to acquisition and fielding to operating-force units.

As noted in the preceding program descriptions, Soldier feedback is central to the Army's modernization efforts. NGCV-CFT and AFC are constantly looking for opportunities to get Soldiers and leaders from the field involved in modernization. Whether live exercises in the field, formal test events, virtual experimentation and simulations, or technology evaluations, trained, focused and well-led Soldiers provide unique perspectives through their experience that directly influence the trajectory of the Army's modernization programs.

If approached correctly, these touchpoints also provide units the opportunity to build readiness through reinforcement of basic tactical concepts and leader development in unique situations. Soldiers from the field are instrumental to the modernization process, and their input directly impacts how future generations of Soldiers will fight.



Figure 3. RCV (Light) was delivered to the Army in late 2020. (U.S. Army photo)



Figure 4. The RCV (Medium) prototype was delivered to the Army in early 2021. (U.S. Army photo)

Similar to the developmental relationship between the “Big 5” and AirLand Battle doctrine, today’s materiel and concept-modernization efforts present an opportunity to address the challenges of the future operating environment. Progress forward and innovative approaches on the OMFV, RCV, AMPV and MPF priority programs, as well as the Army’s other “31+4” modernization signature efforts – taken in conjunction with the development of the multi-domain operations and cross-domain maneuver concepts – provide the Army with the conditions to determine how maneuver formations will fight and win decisively against tomorrow’s adversaries.

The solutions to the future tactical, operational and strategic problems do not reside solely in the development of technology and materiel. Leaders who have the vision to see how to think through the hard problems, leverage developing capabilities and apply them to the doctrine, tactics and operating concepts will shape the future of our Army. Professional forums and publications such as **ARMOR** provide venues to socialize ideas and continue the dialogue that will shape how our Army and maneuver forces will fight and win in the future.

NGCV-CFT continues to drive the Army’s ground-combat-vehicle modernization priorities, providing unity of effort to the wider modernization enterprise. Innovative approaches to the development of combat system capabilities and requirements, Soldier-centric design and steadfast commitment to priority modernization objectives all are necessary to success. The Army’s focus on modernization is unwavering – each of us has the opportunity to be a part of these solutions and impact the Army of tomorrow.

COL Warren Sponsler is a U.S. Army Armor officer serving as chief of staff of NGCV-CFT, Detroit Arsenal, MI, part of Army Futures Command. Previous assignments include tank-platoon leader, scout-platoon leader, support-platoon leader and company executive officer, 2nd Battalion, 12th Cavalry Regiment, 2nd Brigade, 1st Cavalry Division, Fort Hood, TX; tank-company commander, headquarters and headquarters company commander and battalion S-4, 1st Battalion, 64th Armor Regiment, 2nd Brigade, 3rd Infantry Division, Fort Stewart, GA; battalion operations officer (S-3) and battalion executive officer, 1st Battalion, 8th Cavalry Regiment, 2nd Armored Brigade Combat Team (ABCT), 1st Cavalry Division, Fort Hood; brigade operations officer (S-3), 2/1 Cav (ABCT), Fort Hood; commander, 1st Battalion, 66th Armor Regiment, 4th Infantry Division, Fort Carson, CO, and in the Middle East supporting Operation Spartan Shield; senior BCT observer/controller/trainer at the National Training Center, Fort Irwin, CA; Armor Branch assignment manager, U.S. Army Human Resources Command, Alexandria, VA; and operations officer, U.S. Air Force Intelligence (A-2) Field Support Office, Kirtland Air Force Base, NM. During his time with 1st Cavalry Division, COL Sponsler deployed to Kuwait in support of Operation Intrinsic Action and to Bosnia in support of Operation Joint Forge. While in company command in 3rd Infantry Division, he deployed to Kuwait in support of Operations Desert Spring and Iraqi Freedom. Later with 1st Cavalry Division, he deployed to Kirkuk Province, Iraq, and again to northern Iraq in support of Operation New Dawn. COL Sponsler’s military schooling includes the Armor Officer Basic Course, Armor Officer Advanced Course and U.S. Marine Corps’ Command and General Staff College. COL Sponsler completed a U.S. Army War College Fellowship with the Massachusetts Institute of Technology Security Studies Program. His education includes a master’s degree in military science from Marine Corps University, Marine Command and General Staff College.

Acronym Quick-Scan

ABCT – armored brigade combat team

AFC – Army Futures Command

AMPV – Armored Multi-Purpose Vehicle

BCT – brigade combat team

IBCT – infantry brigade combat team

LUT – limited user test

MPF – mobile protected firepower

NGCV-CFT – Next-Generation Combat Vehicles Cross-Functional Team

OMFV – Optionally Manned Fighting Vehicle

PC – Project Convergence

RCV – Robotic Combat Vehicle

SEP – System Enhancement Package

SVA – Soldier Vehicle Assessment