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A Glimpse of the Digitized Battlefield at the National Training Center

by

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The 3rd Battalion, 8th Cavalry Regiment (3-8 Cav), 1st Cavalry Division recently got a glimpse of the digital battlefield during National Training Center (NTC) rotation 93-10. What made this a unique rotation for the task force was the introduction of 17 M1A2 Abrams tanks, six Intervehicular Information System (IVIS)-equipped Bradleys and an IVIS base station (an M113A3 armored personnel carrier with IVIS installed) located with the battalion tactical operations center (TOC). IVIS allows tank/Bradley crews to communicate their location, standard reports, and graphics on their radio nets with other IVIS-equipped vehicles using digital data-burst communications.

With this combination of M1A2s and IVIS Bradleys the task force (TF) equipped one armor-heavy and mechanized-heavy team with IVIS capability to platoon leader level. In addition to these two teams the company commanders of the other armor and mechanized teams had IVIS capability in their respective vehicles. The battalion commander, S-3 (operations officer), and TOC were also IVIS-equipped. In this configuration, TF 3-8 Cav could communicate using IVIS-digital data-burst communications from the TF command group down to each maneuver company commander and in two companies down to platoon leader level.

The use of IVIS during the NTC rotation presented challenges and opportunities for the task force leaders and soldiers. The purpose of this essay is to share these experiences in the hope of stimulating discussion and interest in this powerful new capability.

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Background

Soldiers from 3-8 Cav have been involved with the M1A2/IVIS since April 1992, when a platoon from A Company conducted the Customer Test (CT) using five prototype M1A2s. Training for the CT was conducted at both Fort Knox, Kentucky and Fort Hood, Texas, and culminated with the platoon's participation in NTC rotation 92-12. This initial experience provided information used to develop the tactics, techniques and procedures (TTP) for the M1A2, helped refine the field manuals for the M1A2, and provided useful insights into the future potential of IVIS.

In late March, the battalion received 18 M1A2 tanks to begin preparations for the Initial Operational Test and Evaluation (IOTE) to be conducted at Fort Hood, Texas, this fall. Fourteen of these tanks went to A Company and the others to the battalion headquarters, to the B Company commander, and for a maintenance float. All crews attended New Equipment Training (NET) conducted by the Fort Knox M1A2 NET Team in April.

Training

Over the 30-day NET, each tank crew member received instruction on all crew stations, conducted gunnery, and performed other related training. The performance of the platoons on tank gunnery — all were rated in the “distinguished” category — increased expectations of the new tank's potential. In addition to the tank crew NET, organizational and direct support maintenance personnel were trained in the maintenance of the M1A2 tank.

Upon completion of the M1A2 NET, the task force conducted collective training using the division's standard NTC preparation training plan. This was an intense three-week period in which leaders not only trained their personnel on the usual tactical skills required to win at the NTC but also learned, developed and taught the procedures for the digital flow of information within the companies and task force. Crews refined their M1A2 skills on platoon and company exercises, a battalion fire control exercise, numerous IVIS command post exercises, and a battalion movement exercise.

There was no structured NET for the IVIS-equipped Bradley crews. Six IVIS-equipped Bradleys were made available through the project manager community and sent directly to the NTC. The Bradley crews received instruction from Fort Knox NET personnel and hands-on training in Warren, Michigan, and trained on the M1A2 IVIS in the unit motorpool at Fort Hood. This was well worth the effort as the unit learned valuable lessons about using IVIS in the integration of combined arms.

The base station TOC personnel also did not have a structured NET program. Countless “mini-exercises” were conducted to develop procedures to handle the flow of information being sent and received through IVIS. Working with the subject matter experts from the project manager, Fort Knox, and General Dynamics Land Systems (GDLS), SOPs were worked out to integrate the other combat multipliers that supported the task force. Training for the NTC and trying to capture the full capabilities of the IVIS system drove the TF leaders to find applications quicker than might otherwise have been possible.

The NTC Rotation

At Fort Irwin, California, the TF received six IVIS-equipped Bradleys and for the first time had IVIS capability from TF through maneuver company commander level. During the rotation, the TF conducted day-and-night defenses in sector and a deliberate attack during live-fire operations; a movement to contact, a deliberate attack, and a defense in sector during force-on-force (FOF) operations; and, during brigade operations, two deliberate attacks.

Experience with the M1A2 at NTC confirms that it is far more advanced than the M1A1. The IVIS improved our situational awareness at critical junctures: the M1A2's position/navigation (POSNAV) system improved maneuver precision; the Commander's Independent Thermal Viewer (CITV) improved target acquisition; and the laser far-target designate capability (only during live-fire) significantly enhanced the ability to obtain accurate enemy locations. The tank's embedded diagnostic capabilities simplified sustaining and supporting.

The added capabilities of the M1A2 and the IVIS-equipped Bradley encouraged specializing the fully IVIS-equipped companies for the most difficult missions. The M1A2/IVIS mechanized team (D/1-9 CAV) was the advanced guard company and the base company for movement. The M1A2/IVIS tank team (A/3-8 CAV) was the counterreconnaissance and reserve company in the defense and the assault company during TF breaching operations.

The M1A2 and IVIS Bradley gave the TF exceptional situational awareness, better command and control, and greater lethality. While the TF did not win every battle against the opposing force (OPFOR) or the "plywood" regiment — making mistakes and learning from them as all TFs do — some things were done that, frankly, would not have been possible for an M1A1-equipped unit.

Live-Fire Deliberate Attack

The capabilities of IVIS were tested in a live-fire training exercise conducted by TF 3-8 CAV. The TF mission was to attack to seize an objective where an enemy motorized rifle company (reinforced) was defending from prepared defensive positions. The capabilities of the M1A2 and IVIS-equipped Bradleys greatly assisted in the planning, preparation and execution of this mission.

During the planning process, the TF scouts conducted a detailed reconnaissance identifying mines, concertina wire and tank ditches across the entire objective area. This obstacle belt, as well as the templated enemy positions, was placed in IVIS at the TOC early and sent to commanders to aid their planning. During preparation, the TF continued to receive intelligence from brigade which allowed IVIS overlays to be updated with the latest enemy positions. Normal FM voice was used to supplement these updates for non-IVIS leaders such as engineers, scouts and air defense. As the operation began, commanders at all levels were comfortable that they shared the same picture of the battlefield.

The intent was to move rapidly. Maneuver graphics were translated into a series of waypoints to aid the drivers using their Driver's Integrated Display (DID). Aided by the position navigation (POSNAV) system, the TF massed into an attack position on the move from team assembly areas. The TF, composed of two mechanized teams, two tank teams, and engineers, maneuvered along an axis of advance as planned. The TF moved quickly through a friendly minefield that was emplaced in the previous defense. At this point, the TF executed a planned turn to avoid templated engagement areas and fireboxes. (The observer-controllers commented that the TF had moved with more precision than they thought possible.)

As the TF approached the objective, the mechanized teams used POSNAV to quickly occupy support-by-fire (SBF) positions to provide security and suppressive fires. There were problems getting smoke and the TF had to conduct the breach without the benefit of obscuration. The CIVT and IVIS screens helped to maintain the orientation and situational awareness of key leaders. A TF combat team (B/3-8CAV) and the engineers moved forward to breach, forcing two lanes through the obstacle belt at the precise point that had been planned.

The TOC monitored the penetration on IVIS and informed the TF of the exact location of the lanes. Using POSNAV and the waypoints received from the TOC over IVIS, A Team (A/3-8 CAV) moved quickly through the obstacle belt and set up far side security to eliminate an enemy platoon. Attacking teams forced the enemy from their dug-in positions. Mechanized teams dismounted their infantry and engineers to clear routes as the enemy withdrew. Over the rugged compartmentalized terrain at the mouth of the passes that made FM voice communications difficult, the TF was able to maintain situational awareness across the TF largely because of the "retransmission" feature in IVIS which allowed position updates and reports to continue when FM voice wasn't reliable.

In all, a difficult mission was made substantially easier because of IVIS and the capabilities of the M1A2.

Planning and Preparation

During the planning phases of each new mission, the TF found that IVIS and POSNAV enabled it to move teams quickly and accurately into new positions to begin preparation for the next mission. The TOC sent movement instructions via IVIS and monitored movement progress on the IVIS display panel. Once the concept of operations for the mission was firm and staff coordination in progress, the base station operator would input operational graphics into IVIS and send them to the company commanders and command group tanks. The graphics input process was somewhat time-consuming and had to be reduced to essential symbols to avoid screen clutter, but it still enabled the TF to get the critical information to commanders substantially faster than the "FM-acetate" method. The TF did continue to produce normal overlays with operation orders (OPORDs) for the non IVIS-equipped combat multipliers.

An area that required particular emphasis is the routing matrix that allows information to be passed through IVIS. For example, the current version of the software will only allow the battalion commander to send (not receive) operational graphics and does not have a position for the TOC or Combat Trains Command Post (CTCP). To work around this limitation, the TOC had to assume the role of the battalion commander on the IVIS to transmit graphics and receive reports, while the real battalion commander assumed the position of a company commander.

The TF also attempted to integrate IVIS events into wargaming and TF rehearsals but could never fully master this process. The critical events or times to use IVIS were established, but discussing these IVIS events at rehearsals tended to cause confusion among the non-IVIS equipped staff and leaders. The work around solution was to talk IVIS events briefly at the end of the TF rehearsal which was only partially successful.

In the preparation phase of each mission, the TF was able to pass vehicle locations, status reports, checkpoints, platoon and company firing sectors, routes and other essential information quickly among the TF leaders and the TOC. This greatly improved the situational awareness of all IVIS-equipped leaders and, using conventional methods, information was passed to the other staff and leaders as well.

Execution

In the execution phase of the missions, the capabilities of the M1A2 allowed the TF to move along any direction of attack, precisely occupy support or attack-by-fire positions and orient fires, and by-pass enemy positions or contaminated areas quickly and accurately. In several battles (such as the one discussed above), the TF maneuvered along its direction of attack to stay out of enemy engagement range and templates fire boxes, and conducted the obstacle breach at the precise location that had been planned. The precision of movement and situational awareness provided by the digital flow of information greatly enhanced TF combat capabilities. The TOC was able to monitor movement, report crossing of lines of departure and phase lines, and provide position updates to the brigade TOC without voice reports from the companies or command group. By using IVIS and the CITV, the battalion commander was able to control the movement of companies through heavily obscured breach sites while in chemical equipment and buttoned-up with minimal radio transmissions.

It should be noted that in the operations the TF was limited by the inability to laser accurately to enemy vehicle positions. The M1A2 does not possess an eyesafe laser range finder or filter that will permit reception of accurate eight-digit grid coordinates using the far-target designate capability in face-to-face operations.

The NTC training has provided a wealth of experience on the M1A2 and IVIS. Improvements like software upgrades to facilitate IVIS link-up procedures; changes to the routing matrices to allow the battalion commander, S-3, TOC and command post to send reports and operational graphics to company commanders and one another more easily; a free text capability to send messages; reducing the size of graphic symbology on the 1:50,000- and 1:100,000-scale grids on the IVIS display panel; and making the Global Positioning System (GPS) internal to the POSNAV/IVIS will make the M1A2 a better tank and hopefully bring the IVIS Bradley closer to reality.

The Digital Future

With the completion of the NTC rotation, the TF was able to look back on its "digital" experiences and look forward to the future. The addition of all battlefield operations systems into the

digital flow of information would greatly improve the ability to synchronize combat multipliers. The TF engineer talked of how each IVIS-equipped vehicle and leader could know the precise location of all emplaced minefields and breaches in the enemy's obstacles. The ability to instantly pass eight-digit grid locations from OH-58D scout helicopters to OPFOR T-80 tanks to the TF commander and to the field artillery, and for TF scouts to transmit located enemy positions throughout the TF and the brigade TOC, would significantly enhance agility and lethality.

For the TF commander, the situational awareness advantages provided by the digital flow of information also reduced decision-making time. The ability to display both friendly and enemy locations on the IVIS display panel allows for faster decisions, assists in synchronization, and helps mass combat power at the critical point on the battlefield. Although information overload is a potential hazard, detailed SOPs combined with effective training would reduce the data flow to the critical information leaders require.

With the speed of information comes an increase in tempo and action. Yet, the increased command and control afforded by digitization reduces the risk of fratricide and, combined with the increased lethality of the M1A2 tank, provides a decisive advantage over enemy forces not similarly equipped — the precise advantage contingency forces will require to fight outnumbered and win decisively.

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