

M1A2 Update:

Training and Doctrine Observations From Saudi Arabian NET Training on the M1A2

by Major Kevin D. Poling



RSLF units spend four weeks on the range during Phase II of New Equipment Training. Using a round-robin approach, units rotate through prime training, concurrent training, and maintenance/range support.

Fort Hood is not alone in fielding the M1A2 main battle tank. Since October of 1994, selected units of the Royal Saudi Land Forces (RSLF) Armor Corps have fielded the M1A2 tank and executed New Equipment Training (NET). Observations from this effort and lessons learned from NET offer some valuable insights for *our* army into the warfighting capabilities of the M1A2. My general intent is to share these observations in hopes that a comparison of these findings with the Fort Hood effort will produce a synthesis of ideas, not only to enrich the NET process in both locations, but also to enhance post-NET training. In addition, I will offer some viewpoints on the larger issues of training, doctrine, and digitization as it affects the U.S. Army, predicated upon my training observations.

Articles in *ARMOR* throughout 1995 have also addressed the issues of digitization and the capabilities of the M1A2, much to the authors' credit. My specific purpose, however, is to focus on the tank's warfighting capability as it affects the individual crewmembers, especially the tank commander. I believe this type of analysis is prudent because of the increased demands placed upon the M1A2 tank commander (TC) in comparison to his responsibilities in earlier tanks. Learning to use the M1A2's Intervehicular Information System (IVIS) is just one of the increased tasks the TC must learn to fight and win with his tank. How the individual tank commander optimizes the gunnery capabilities of the M1A2 will go far in allowing him to take advantage of the IVIS. One thing has not changed with the advent of the M1A2: effective gunnery is still a must. It does

no good to be situationally aware of your battlespace if you cannot employ your tank effectively by putting "steel on target." The two must go hand-in-hand, but fighting the vehicle must not be lost in the maze of networks and downlinks. We must be fully aware of the demands digitization places on the tank commander (and the unit leader), vis-a-vis his ability to fight his individual vehicle (and unit).

RSLF New Equipment Training

Let me briefly explain the four-phase NET process for RSLF armor units. Phase I is taught at the Armor Institute here in Tabuk, where an individual officer or soldier, totally unfamiliar with the M1A2, is taught the basics of the tank. Individual instruction is taught in four courses, which are essentially a cross between AIT and the tank certification courses at Fort Knox. Officer, Tank Commander, Gunner/Loader, and Driver constitute the four courses, ranging in length from twelve weeks for the driver's course to nineteen weeks for the officer's. Tank commanders and officers receive driving, gunnery, and tactics instruction, while the gunner/loaders and drivers receive instruction only in their respective positions. Cross-training for the latter individuals occurs in units. All students, except drivers, fire six rounds for familiarization fire prior to graduating to the next phase. In addition, a host of training devices supports the instruction, with students utilizing the improved-VIGS (Video Disk Gunnery Simulator), the Crew-Station Trainer (CST), and the Tank Driver Trainer (TDT). The M1A2 PCOFT is also on

hand for training, both in UCOFT and PCOFT modes.¹

Once a series of courses is complete, the students from all four courses form a company-sized unit within the tank battalion structure in order to execute Phase II. Prior to the start of instruction, the newly formed crews fall in on and inventory their tanks and corresponding equipment. During ten weeks, instructors re-evaluate these crews on the TCGST, and the crews methodically proceed from Combat Table I through Combat Table VIIA/B, in accordance with ST 17-12-1-A2, "M1A2 Tank Gunnery." During all tables, crews receive feedback from tank crew evaluators (TCEs) and AARs in order to gauge their progress. In addition, "jump" radios are used for both dry- and live-fire exercises. The unit conducts a weekly maintenance day, where the unit chain of command highlights both PMCS execution and training. Results from Phase II are extremely promising, with RSLF crews demonstrating their abilities to consistently hit targets. If properly prepared, the M1A2 will not miss.

At the completion of NET gunnery, the unit enters Phase III for five weeks of platoon tactical instruction. The concentration centers upon introduction of the four-tank platoon concept, with associated formations and drills, as well as use of the IVIS capability.² Platoons execute both day and night training exercises, with the AAR concept heavily emphasized. At the end of Phase III, the company conducts a three-week semi-annual service, which serves to train crews, the chain of command, and organizational mechanics in the conduct of this important event.

The completion of Phase III marks the official end of NET, but then the battalion embarks upon an eighteen-month sustainment training phase in order to build upon the foundation of NET. The unit will conduct collective training exercises through battalion level, as well as two sustainment gunneries, the first culminating in CT VIII, while the second culminates in CT XII. There is also a heavy emphasis on staff training to support the battalion's ramp-up toward full combat readiness.

M1A2 Crew Commentary

This process reveals some interesting points about the M1A2 crew and the responsibilities of each member. In essence, the gunner, driver, and loader positions are *evolutionary* in nature with regards to their present capabilities. The M1A2 certainly provides these crewmembers with advantages and advances in technology that improve their abilities to perform individual and crew tasks better than any tank in the world. The driver possesses increased capabilities to monitor the tank's maintenance status through the Driver's Integrated Display (DID), while the POSNAV system allows the driver to both drive and navigate the tank simultaneously. The gunner enjoys similar advantages in engaging targets with a computerized fire-control system that has faster response times and improved ballistic sighting over previous M1-series tanks. The loader has increased responsibilities in assisting the tank commander with the communication system, to include IVIS. The bottom line, however, is that the gunner stills engages targets, the driver still drives the tank, and the loader still loads the rounds. From a theoretical standpoint, much has not changed, which leads me to label these crewmember positions as *evolutionary*.

The tank commander position, however, is another case altogether. The additional capabilities afforded by the M1A2, specifically the CITV and IVIS, truly make the M1A2 tank commander's position *revolutionary* in na-



During NET and in home station preparation for qualification gunnery, units use their local training areas extensively. In preparing to execute Tank Tables I-IV, target silhouettes, snake boards, and boresight panels are available.

ture. The tank commander can acquire and determine range to targets independently of the gunner, using the CITV, while dramatically reducing target hand-off times to the gunner by utilizing the target designate button on the Commander's Control Handle Assembly (CCHA). The TC can monitor his battlespace, receive orders, integrate force multipliers into the operation, and report his tank's status more rapidly than ever before possible because of the IVIS. This also applies to individuals who are both tank commanders and unit leaders. The combination of these two categories, improved gunnery capabilities, and digitization truly make the TC a more powerful warrior than has ever been seen at his level.

How the tank commander exploits the advantages of the CITV and the IVIS, while not degrading his ability to fight the tank, will go far in determining how he, as both vehicle commander and unit leader, can effectively dominate his battlespace. As observed during training on the range and in the M1A2 UCOFT, the TC can get so absorbed in one area (i.e., CITV and fighting the tank) that he loses focus on the other (i.e., IVIS), thus negating its advantages. We must learn to use both simultaneously in order to maximize their potential, given the particular battlefield situation. A vignette from DESERT STORM serves to illustrate my point. The situation occurred on 27 February 1991, with the 2nd Brigade, 1st Armored Division attacking just short of "Medina Ridge." The unit was equipped, of course, with the M1A1.

Sergeant First Class John Scaglione led D/I-35 AR to within 800 meters of the Iraqi

lines. His platoon leader had fallen back in the formation and Scaglione had taken over the point position. He reluctantly stopped while two other tanks in his platoon fell back to cross-level main-gun ammunition. While this 20-minute operation was going on, Iraqi artillery and mortars began to fall behind them in the wadi.

In spite of increasingly accurate fire, Scaglione refused to sink into his hatch and forfeit his all-around vision. His platoon was isolated...and he could not afford to miss anything. He stood in the turret keeping a steady watch through binoculars while his gunner continued to swing the turret and its thermal sights back and forth. Suddenly, Scaglione was just able to make out the gun-tube of a T-72 as it rose over the top of a berm...He slipped down onto his thermal sights and twisted his override hard left, slewing the turret around. He laid his cross hairs just right and below the muzzle of the T-72. His gunner fired almost instantly...blasted through a berm, and unerringly found the steel body of the T-72. Again Scaglione popped out of the turret and continued to scan. In quick succession, his crew discovered and killed three more threatening T-72s before any could get off a shot.³

How would SFC Scaglione have fought this engagement with an M1A2? Certainly, the CITV would have allowed him to scan a much wider sector than that of the gunner.

Target hand-off would have been much easier with the target designate function, and the IVIS would have allowed him to not only report the situation, but also to initiate a call for fire. The situation seems to be very straight-forward. I believe the troubling aspect of the whole matter, however, centers around where SFC Scaglione actually fought the M1A1...out of the hatch. To take full advantage of the M1A2 capabilities, he would have had to be down inside on the CITV, which would forfeit his peripheral vision: a factor central to his success in actually acquiring the T-72s. Only SFC Scaglione knows if the CITV capability would have helped or delayed his efforts in acquiring the targets. In addition, if SFC Scaglione had been using the IVIS in our M1A2 scenario and not scanning, would the engagement have played out differently?

This vignette raises some important issues in regard to fighting the M1A2, especially on the offense. Does the TC fight out of the hatch or down inside, and how much time does he dedicate to IVIS (read digitization) in fighting the tank? Suggestions for a “heads-up” display or some other technological solution to the this problem should actively be pursued in order to make the M1A2 capabilities as user-friendly as possible. I contend, however, that there is also a training solution, both in units and during institutional education. At the tank commander and unit leader level, we should use the “applicatory method” of teaching, by which I mean these individuals should be continuously challenged with problem-solving exercises involving the M1A2 to develop their thought-process, rather than “school solutions” to be memorized. Given a particular situation, the TC might choose to fight out of the hatch, but in doing so, his thought-process and rationale must be scrutinized.⁴ In this way, we can further develop leaders who are situationally aware of both their battlespace and how best to fight the M1A2, given a particular circumstance. I believe, in general, that the decisions that optimize the use of the CITV and IVIS are the best solutions, but each individual TC and unit leader must make that call based upon the situation presented to him.⁵

M1A2 Training Observations

To fully dominate one’s battlespace in the way described above, the M1A2 tank commander must first acquire the

necessary technical skills to fight the tank; in essence, he must learn how to effectively acquire and engage targets.

I believe that the tank commander who cannot master the host of technical skills in Combat Table I of ST 17-12-1-A2, as basic and simple as that sounds, will fail miserably in his ability to fight the tank. In addition, without mastery of those skills as a foundation, the independent capability to use IVIS and digital technology is flawed at best.

Observations from the M1A2 UCOFT reveal rather quickly which tank commanders have mastered CT I skills and which ones have not. The first exercise of the UCOFT sustainment program is #932110, which in UCOFT language means: Target Acquisition (TA) Level 1, Reticle Aim (RA) Level 9, and System Management (SM) Level 3. In English, that means the following: day unlimited visibility; stationary own vehicle; short-range, multiple, stationary targets; and a fully operational system using the GPS. The multiple targets do not come in the standard five groups of two, like the M1A1 matrix (10 total per exercise), but come in five groups of two or three, at random, and with a minimum 13 targets per exercise.⁶ The crew will not meet the standards of this basic exercise without the TC’s mastery of the CITV in search mode and target designate function on the CCHA because the targets appear across a wide front. Trying to fight the tank and negotiate the matrix as he would with an M1A1 (i.e. TC staying on the GPS extension) is a recipe for failure. The tank commander must use the CITV, and he and the gunner must have the target hand-off procedures mastered in order to advance in the matrix. Successful execution of Combat Table I will give these two a solid foundation in which to excel, not only in the UCOFT, but also during progression through the gunnery tables.

What makes Combat Table I, a very basic and simple sounding exercise, so important to the tank commander and crew proficiency? The reason involves the very complex skills that a TC must master in order to successfully fight the M1A2 and the different nature of those skills in building and sustaining crew proficiency. CT I still has the basic tracking and manipulation exercises using a snake-board for the gunner and TC to negotiate, with the TC now having two sights — the GPSE and the CITV. Gun-laying is still a part of this

table and the TC must master this skill as before, even with the addition of the target designate function on the M1A2. This separate gun-laying skill is still necessary and required because the TC will at times need to fight the tank in CITV/GPS Gun Line-of-Sight (LOS) mode, meaning the CITV does not operate independent of the main gun and the CCHA acts as a normal TC override. In addition to these tasks, the TC must sustain his normal range determination skills and then learn to use the stadia reticle capability of the CITV. Most importantly, CT I challenges the tank commander on a variety of target designate, target hand-off to the gunner, and switchology exercises designed to take full advantage of the M1A2’s capabilities. These skills constitute the heart of the tank commander’s technical skills in fighting the M1A2, and provide that solid crew foundation for success in the UCOFT and on CT VIII, as well as taking advantage of the digitization capabilities of the tank. Of course, the CT I tasks must also be performed under closed hatch and NBC conditions as well.

I have already described the importance of these skills to success in the UCOFT, but there exists a great benefit to qualification on CT VIII as well. Six of the ten engagements on CT VIII involve at least three targets, and one of these six actually has four targets.⁷ Also, the total number of CT VIII targets increases from 18 to 25, progressing from the M1A1 to the M1A2. A tank commander who cannot effectively employ the CITV and target designate functions of the M1A2 will not qualify. In addition, because of the tank commander’s need to search for other targets, he can no longer afford the time necessary to check the gunner’s lay or sense target effect from the GPSE. These functions will rest squarely on the shoulders of the gunner, and increase the importance of both the target hand-off and engagement termination drills between the gunner and TC. Switchology remains a significant element of this mix also, because four of those latter six engagements on CT VIII involve both main gun and troop targets. Successful crew execution of the UCOFT and CT VIII must be grounded in the basics of CT I, which constitutes one of the least resource-intensive training events available to units. I want to also reemphasize my central premise here: tank commanders and unit leaders will not be able to optimize the advantages of

digitization if they do not possess the skills required to effectively fight the M1A2. Even though it is a simple concept, unit leaders avoid executing Combat Table I to standard at their own peril.

Before analyzing some larger issues of digitization as they concern the M1A2 and the U.S. Army, I want to relate one additional training observation drawn from the RSLF NET experience. This area concerns tank fighting positions and the ability to use the target designate function. Currently, RSLF units are using a temporary range for firing. It includes full, dug-in fighting positions and offers the tank the three standard modes of positioning: hide, turret-down, and hull-down. When the tank is in the turret-down position, the TC can only target designate to targets within the limits of the fighting position walls before moving to a hull-down to engage. If the target falls outside this sector, the TC cannot target designate for fear of putting the gun-tube into the wall of the battle position. In this situation, the tank must first come to a hull-down position before the TC can target designate for the gunner.

This sequencing is important because of the contrasting manner in which the crew would normally train and execute a target engagement drill. Both in the UCOFT and on standard main-gun ranges, the tank commander can target designate in the turret-down position without fear of gun-tube interference. This capability gives the crew an additional few seconds in which to acquire the target and start their engagement drill before exposing their tank to the enemy. Units should train accordingly in preparation for any training event where dug-in fighting positions will be the norm. If using the standard fighting position, the front should face as close as possible to the tank's primary sector of fire so the target designate function can be used in the turret-down position. Sounds simplistic, but experience here has shown that the crew must be prepared to handle this type of situation in order to minimize exposure to the enemy. The Armor Center should study whether an alternate fighting position design is warranted, given this stated limitation.

Doctrinal Considerations

Having examined some of the complexities of the tank commander's job

in actually fighting his tank, and by extension, a platoon or company if he is also a leader, I want to propose some ideas involving the overlap of digitization upon these fighting requirements. The tank commander is faced, undoubtedly, with an immense challenge to integrate the IVIS capability with the normal modes of fighting the tank. 1LT Robert S. Krenzel, Jr., offered some extremely valuable insights into this process in his *ARMOR* article entitled, "The Armor Lieutenant and the M1A2."⁸ He also recognized the enormous workload placed upon the TC, and offered his credible solutions to these challenges. One solution 1LT Krenzel proposed in order to reduce the reporting load via IVIS for the company chain of command, especially in the offense, involved the company XO playing a much larger role in the company's use of digitization and reporting information to higher headquarters. Although a bold proposal, I feel this particular solution places too much burden on the XO, relying on him to have an almost picture-perfect view of the battlefield, and also takes a gun tube out of the fight. This solution also leans toward a best-case scenario, one which a unit SOP should generally avoid. Although the XO possesses the increased capabilities of the M1A2 as an individual TC, there exists another answer.

I would offer an alternative solution, and one that maintains the XO's important role as battle captain, as well as offering the promise of increased influence in assisting the commander to fight the battle. I propose that the company XO be placed in an improved command and control vehicle (C2V), modeled after the role played by the ground cavalry troop XO, who currently rides in an M577. Placing the XO in this improved C2 vehicle offers several distinct advantages over him continuing to ride in a tank, both from the perspective of current digital reporting requirements and for an expansion of the company/team's mission profile on the future battlefield. I make a basic assumption in offering this alternative: a C2 vehicle is a better platform than the tank for the XO to optimize the advantages of current and future digital technology.

From the perspective of digital reporting, an XO operating from a C2 vehicle can efficiently send unit digital reports higher, while also possessing the capability to rapidly convert voice information from company traffic into a

digital format. Use of digital reporting could therefore be enhanced in this manner, both horizontally and vertically across the battalion/task force, regardless of how the individual platoons were reporting the information.⁹ Improvements to the digital protocols could enhance the unit XO's ability to share digital information with battalion and sister units (through their C2V-equipped XO), giving those units timely access to vital information while allowing the individual commanders to fight the battle as required. The same advantages apply to reports flowing to the company, where the XO can quickly disseminate this information. Current cavalry troop XOs function in this manner, reporting information and the situation both vertically and horizontally to keep other units informed, as well as receiving reports, freeing the commander to focus on the battle.

By using this approach, we allow the XO to better relieve that burden from his unit's leaders and permit them to focus on the battle. The XO can do this best from an improved C2 vehicle. Some will say this capability is unnecessary in tank companies or across the battalion because improvements in the digitization area will overshadow this solution. I am not positive this is entirely the case. In addition, the C2V-equipped XO can function as a force-multiplier for the company/team of the future, as the unit's mission-profile and battlespace expand. Recently, MG Maggart, the Chief of Armor, suggested that the Force XXI brigade would have to dominate the same battlespace as a Cold War division.¹⁰ It is then fairly logical to deduce that future battalions and companies would have to dominate the same battlespace as current brigades and battalions, respectively. If our companies operate over increased areas, the expansion of their command and control capabilities will be a must. The improved C2 vehicle at the company-level, with the XO on board, meets that need.

Colonel Christopher V. Cardine, the current Project Manager-Abrams, wrote a report entitled, "Digitization of the Battlefield," in which he foretold an expansion of the battlefield capabilities of a company-sized element due to digitization.¹¹ In Colonel Cardine's scenario, a small company/team is given the mission of destroying a company-sized defensive position 50 kms away in order to establish a brigade passage point and pass the brigade through.

This company/team is reinforced with the following assets: a scout section; mortar, engineer, and air defense squads; and a logistics package. In addition, an M109A6 Paladin platoon, a scout-weapons team with RAH-66 Comanche and AH-64D Apache helicopters, and two F-15E Strike Eagles are in direct support of the operation. All these elements are digitally linked, giving the commander at this level unprecedented access to combined arms capabilities in order to accomplish his mission. At the center of the team, capable of assisting the commander in integrating these various assets, stands an improved C2 vehicle.¹²

In Colonel Cardine's scenario, the company/team successfully accomplished its mission by integrating these various resources and utilizing the advantages of digitization. As he concludes, "...mass was accomplished by the synchronization and concentration of fires on the enemy. Decisive victory was achieved by both individual crews and commanders employing digitized systems to outpace the decision cycles of their respective opponents."¹³ The use of a C2 vehicle at the company-level was crucial to mission accomplishment, and seems a wise command and control investment if companies of the future are to operate successfully over greater distances and with expanded mission profiles.

As another example, digitization and remote sensors will give future commanders a much clearer picture of the enemy situation and their own battlespace, allowing them to effectively use the company/team in ways only now being realized. In similar fashion to the Cardine scenario, a company/team could be sent on a deep mission, not to engage enemy combat forces, but to bypass them in order to defeat the enemy through disruption of his command and control, artillery, and logistics elements.

The company raid could become an extremely viable mission in which to utilize the advantages of a digitized force and the company's ability to integrate various combined arms assets into the operation. Major O. T. Edwards spoke of new and different ways in which to utilize the digitized force.¹⁴ I believe the company raid and deep attack could become significant missions in the future mission profile of the company/team.

Conclusion

Digitization offers the Army the potential to integrate various combined arms capabilities at unit levels never before seriously considered. The M1A2 tank stands at the center of this capability. In designing upgrades to our digital forces and equipment, we must never forget the effects these improvements have on the individual soldier and his capacity for fighting on the battlefield. The M1A2 tank commander's job is certainly an example of the complexity faced by soldiers in integrating digital technology with the basics of fighting in his particular position. Observations from RSLF NET conclusively show that, in order for the tank commander to optimize the digital capability of his equipment, he must first master the fighting complexities of the tank. I believe this example serves as a model for other battlefield positions as we overlay the demands of digitization upon the already complex nature of warfighting. We should not forget this important concept as we train and equip our future army.

Notes

¹Instruction is currently performed by a combination of RSLF cadre and U.S. instructors from Mansour General Dynamics, Ltd. (MGDL). Future plans have the RSLF assuming primary instruction for both Phases I and II, with MGDL providing technical assistance.

²The RSLF is changing from the three-tank platoon, ten-tank company to the four-tank platoon, fourteen-tank company in its M1A2 battalions. Each battalion has three line companies and two HQ's tanks.

³BG Robert H. Scales, Jr., USA, *Certain Victory — The U.S. Army in the Gulf War*, (Washington, DC: Brassey's, Inc., 1994), p. 294.

⁴For an analysis of this teaching methodology, see Michael Duncan Wyly's article entitled, "Teaching Maneuver Warfare," *Maneuver Warfare — An Anthology*, Richard D. Hooker, Jr., Editor, (Novato, Calif: Presidio Press, 1993), pp. 248-269.

⁵ST 71-2-2 (Revised Draft), *Tactics and Techniques for the Digitized Task Force*, (Fort Knox, Ky.: U.S. Army Armor School, January 1995). See pp. 1-6 and 4-16 for digital limitations in the offense.

⁶Exercise #942210, which is fired at long-range targets and at night (TA-2, RA-10, SM-4), actually presents EIGHTEEN targets to the crew. They are broken down into two groups of three, and three groups of four, for eighteen total targets for this exercise.

⁷ST 17-12-1-A2 w/change 1, M1A2 Tank Gunnery, (Fort Knox, Ky.: U.S. Army Armor School, June 1995). See Chapter Two for a complete description of the combat tables. CT I starts on p. 2-5.

⁸1LT Robert S. Krenzel, Jr., "The Armor Lieutenant and the M1A2," *ARMOR*, July-August 1995, pp. 15-22.

⁹Tank commanders and platoon leaders must still decide when to use digital or voice reporting, based upon the situation. No matter what vehicle the XO rides in, the M1A2 company still must execute a solid and disciplined reporting SOP to facilitate internal command and control.

¹⁰Sean D. Naylor, "Three Options for Four Starts — Army Weighs Choices to Decide Direction of the Future Division," *Army Times*, October 16, 1995 (56th Year, No. 12), p. 12.

¹¹Colonel Christopher V. Cardine, "Digitization of the Battlefield," USAWC Strategic Research Report, (U.S. Army War College, Carlisle Barracks, Pa.: May 1994).

¹²*Ibid.*, p. 27.

¹³*Ibid.*, p. 35.

¹⁴Major O.T. Edwards III, "Digital Battlefield Training and Tactical Insights of a User," *ARMOR*, May-June 1995, p. 13.

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