

Thinking Outside the Maneuver Box

by Captain Michael R. Evans

There is no teacher but the enemy.

No one but the enemy will ever tell you what the enemy is going to do.

No one but the enemy will ever teach you how to destroy and conquer.

Only the enemy shows you where you are weak.

Only the enemy tells you where he is strong.

*And the only rules of the game are what you can do to him
and what you can stop him from doing.¹*

Orson Scott Card hits on an important point in his 1977 science fiction short story: there are no rules in war, everything is fair, and nothing is off limits. There is not an end of exercise, no after action review (AAR), no demarcated maneuver box, and battles do not occur in predetermined time limits that allow restarts. The scope of the exercise is infinite, and everything is fair game. The potential for complacent routine that can lead to tactical disaster is enormous. Training is key to ensuring that an enemy does not teach the most costly lessons.

U.S. Army Field Manual (FM) 25-101, *Battle Focused Training*, tells us what we have all heard and know: that training is the commander's first responsibility.² Today this is as true and as challenging as ever.

The challenge is to train with the greatest possible tactical realism and free-play, replicating the fast-changing and adaptive threat. We have made a good attempt toward this goal over the past 2 decades, the most noteworthy being the development of the three combat training centers (CTCs).³ These premier sites provide the most realistic training available today. They do so, however, with significant cost in time, space, environmental impact, and physical and fiscal resources. Training does not start and end in this classic realm of live training. After all, the Army trained for many years without the CTCs. Today's CTCs are merely the acme of the Army's live collective training methodology. The methodology has been with us for some time; today we have new technological tools to enhance that methodology. The same technology that has accelerated change in the threat envi-

ronment also offers new tools that can be used to prepare for that threat.

Our training tools are multiplying; they are generally divided, however, into three venues differentiated by the environments in which they operate.⁴ Each venue has its relative strengths and weaknesses. They are not ends unto themselves because simply throwing tools at a training objective fails to exploit the potential for synergy in combining those tools. The right tools from the right venues must be employed, but they must also be employed in such a way that their effect is not merely cumulative, but complementary. The challenge is to choose the correct combination, maximizing opportunities while minimizing limitations.

The CTCs best teach interaction with the complete combat arms and supporting team. This is best done in a multi-echelon environment that accurately replicates the interaction of higher, adjacent, and subordinate elements. This is not an idea unique to the CTCs. FM 25-101 states that, the commanders' responsibility is "...training one level down and evaluating two levels down; for example, battalion commanders train company commanders with their companies and evaluate platoon leaders with their platoons."⁵ This is an enormously complex process, much more so than it might seem; it is a three-dimensional process in which each component part affects other individual component parts, often in a nonlinear way. A unit interacts not only with its subordinate elements, but also with those of adjacent or higher units, and even with other units scattered throughout their battlespace. This interaction is an integral part of realistic training,

particularly in regard to team building and cohesion.⁶ The benefits of training in this way transcend individual levels of expertise, for they affect the collective skill and cohesion of the organization.⁷ Much of this collective benefit is lost to personnel turbulence, which merely highlights the importance of this relationship.⁸ The challenge is to expand the collective training benefit of the CTC experience. The CTCs are incredibly resource-intensive and capable of only a limited number of exercises. It is simply impossible to provide CTC training to all Army units at a rate that would compensate for the ongoing loss of collective skill to personnel turnover.⁹ Therefore, if the Army cannot get to the CTCs in sufficient iterations, then the CTC collective training experience should be brought, with greater frequency, to the Army.

Collective Training Techniques

The U.S. Army employs several techniques for collective training, as discussed in FM 25-101.¹⁰ Essentially, there are three types of collective training, with a fourth technique derived from one of the types:

Field Training Exercise (FTX). The FTX is a "high-cost, high-overhead exercise conducted under simulated combat conditions in the field."¹¹ This is the CTC experience. An FTX is intended to exercise all the battlefield operating systems (BOS) functions to their utmost, including all assigned and attached units functioning as combined arms teams.

Situational Training Exercise (STX). The STX is a "mission-related, limited exercise designed to train one collec-



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tive task, or a group of related tasks and drills, through practice.”¹² This experience is often the most detailed exercise that a unit can attempt at home station. STXs are flexible in nature, include drills, leader tasks, and soldier tasks, and can be modified by units to meet their needs.

Live Fire Exercise (LFX). The LFX is focused on “unit and weapons integration at the company-team level.”¹³ LFXs are intended to incorporate both maneuver and weapons systems using live ammunition. While these can be conducted at home stations, they are often conducted in isolation, partly for safety reasons, partly because of shortage of range space, and partly because their resource-intensive nature frequently limits the employment of supporting, adjacent, and higher elements to nontactical supporting roles, if at all.

Lanes Training Exercise (LTX). The LTX is a technique of the STX that is focused on training “company-size and smaller units on one or more collective tasks (and prerequisite soldier and leader individual tasks and battle drills) supporting a unit’s METL; however it usually focuses on one primary task.”¹⁴ Simply, the LTX is a mini-STX that focuses on fewer collective tasks to focus the training. This added focus is not without sacrifice. Significantly, the LTX has no free-play. Opposing force (OPFOR) organization and actions, and the friendly force mission and execution are scripted. The intent of the LTX is not to train for outcome, but drill the execution of the task-based process. The LTX is self-limited in both realism

and in the depth of the training that it imparts. The LTX trains what to think, rather than how to think.¹⁵

These training exercises have served the force well, providing a flexible and varied array of tools from which a commander can select depending on his resources, level of training, and objectives. The problem is that as the size, complexity, and expense of these exercises increase, commanders’ choices decrease because of resource limitations. The best training venue and the closest to war is the FTX, which is epitomized at the CTCs. More importantly, the FTX is the only exercise where the interaction of the complete system of higher, adjacent, and subordinate elements is exercised. But today, the FTX is often unfeasible at home stations due to the constraints that limit this type of training to well-funded, but limited rotations to the CTCs.

The resource limitations of home station training are not simply shortages of training land or physical and fiscal resources. Home station exercises also lack instrumented feedback, dedicated OPFOR, observer/controller (OC) support, and the detailed scenarios of the CTCs. The lack of these non-TOE components is felt in the tactical realism of the training — what benefit is derived from training without an impartial observer to provide feedback and experience-based mentoring? What benefit is derived from an enemy force who merely replicates U.S. military tactics or who simply acts as a passive target?¹⁶

In an attempt to overcome the limitations placed on live training, the Army has increasingly turned to technological tools, particularly for larger units. Large unit exercises conducted in the virtual venue however, such as a simulator-based STX, or in the constructive venue, such as a computer-mediated brigade-level FTX, are also limited. They either teach headquarters command and staff interaction; continue to focus on disjointed platoon exercises without interaction with higher, adjacent, or subordinate units; or they lack the essential realism that is inserted by getting soldiers out in the dirt and on the iron. The ironic thing is that we are still conducting multiechelon training — we have simply severed the links by conducting the various events in different locations or in different venues. It is not uncommon for battalions to conduct FTX staff exercises while their companies and platoons train in isolation.

This trend is replicated at all echelons. In an attempt to reduce overhead and limit costs, many units have historically substituted events such as training exercise without troops (TEWT) and use wheeled vehicles instead of expensive tracked vehicles. Recently, this has taken the form of simulations, such as simulation network (SIMNET) or computer mediated staff exercises, to replicate portions of or the entire battlefield. While the various substitutes are valuable tools, they often suffer from limitations inherent to the venue, but most significantly, the different technological tools have been employed separately, as isolated training events. In this way, many units train in isolated segments such as tank tactical tables, platoon STX or LTX, platoon and company TEWTs, and the occasional single-company or single-battalion STX or FTX. The most grievous inadequacy of training executed in these disjointed segments is the lack of interaction with both the full range of BOS elements and with the adjacent, higher, and lower echelons of the organization. There is no substitute for multiechelon training. In addition to learning the true complexities of maneuvering, the complete organization has the added benefits of cohesion and esprit that come from shared experiences and challenges that have been jointly overcome.

The changing scope of technology now offers us the chance to do more with these venues. Just as an FTX comprises many smaller events, these technological venue-based events collectively comprise a conceptually larger

event. The problem lies in the relatively artificial environment. To obtain a collective training benefit, the events must be linked the same way that various units are linked, both in echelons and across echelons. By linking simultaneous isolated events that are already trained in the live, virtual, and constructive venues, all echelons can train in the functional equivalent of an FTX. Connecting the live, virtual, and constructive venues is referred to as the synthetic theater of war (STOW). STOW is not a new way of training; rather, it merely links what we are already doing. In a STOW, a battalion could conduct simultaneous multiechelon training on platoon-maneuver in an LTX, on company-maneuver in a simulator-based STX, and in a computer-mediated battalion FTX staff exercise.

That we already do these things separately and without connection to each other is significant; STOW is not a new event, but a new way of conducting the events we already do. What is new about this is the conceptual framework. By connecting these exercises so that each element participates in the decisions, actions, and effects of the others, we construct a networked training exercise (NTX) that is greater than the sum of its parts. The NTX allows FTX-type training, with all its interaction, teamwork, and cohesion building while reducing overhead, resource demands, and time limits by maximizing available venues, which replicate a much larger environment.

The potential benefits exceed that of simply enhancing current training because the STOW can replicate a battlespace that dwarfs any live environment replicated battlespace. The benefits of linking the various tactical and operational echelons cannot be overstated. The modern battlefield makes it almost impossible to replicate doctrinal distances on most training areas, and the vastly increased battlespace of the interim brigade combat teams will multiply that problem. The NTX is a solution. Just as the FTX is a "high-cost, high-overhead exercise conducted under simulated combat conditions in the field." The NTX will exercise BOS functions, including all assigned and attached units functioning as combined arms teams, only without the associated space, high-cost, and high-overhead detriments. Further, by including a free-play and adaptive OPFOR and the honest-broker feedback of OCs in the NTX, we ensure that we are training as we fight. This way, the NTX al-



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lows all parts of a decentralized training scenario to train as if all the parts were present, even while some parts may be separated by large distances or may be present in virtual or simulated form only. The NTX expands the scope of isolated multiechelon exercises beyond that of mere battle drills.

The pieces of the NTX already exist. Virtual, constructive, and live venues are available. By adding OC support, it would be possible to create a CTC-like experience by networking multiechelon events into a virtual exercise extending over an enormous virtual battlespace. For example, the virtual training program (VTP) at the U.S. Army Armor Center at Fort Knox has operated in all three venues for several years.¹⁷

At Fort Knox, the virtual venue is provided by the SIMNET mounted warfare simulation trainer, which provides maneuver training to tank and mechanized forces from platoon to task force size. Running in the Unix operating system and employing the Modular Semi-Autonomous Forces application, SIMNET creates a virtual maneuver box in which tank and mechanized combined arms teams conduct mission essential task list exercises.

The Janus Mediated Staff Exercise (JMSE) system, a command and training venue primarily for battalion through brigade staffs, provides the Fort Knox constructive venue. Running on PCs, Janus is a highly flexible battle simulation that can run scenarios ranging from high-intensity conflict to disaster relief and peacekeeping operations. Creating a STOW by linking JMSE and SIM-

NET requires no new technology, simply new links and translation tools, a problem already solved by numerous commercial web-enabled systems.¹⁸ Employing the VTP staff, both SIMNET and Janus offer a turn-key environment for Armor School classes and visiting units — an experience that, by adding the Fort Knox OC team, replicates the CTC training experience complete with a challenging OPFOR and feedback from the experienced OC staff.

The Fort Knox live venue is unique in the Zussman Mounted Urban Combat Training Site (MUCTS). This is the only urban operations site in the Army that has been specifically designed and constructed for mounted warfare.¹⁹ By instrumenting the MUCTS with a system, such as the deployable force-on-force instrumented range system (DFIRST) or the deployable instrumented training system (DITS), the complex, already carefully networked for video and audio AARs, could be directly integrated into a virtual battle fought in battlespace represented simultaneously in the live, virtual, and constructive venues.²⁰ An alternate live venue would be a dry-fire instrumented LFX, in which a tank range, instrumented with DFIRST or DITS, serves as an assault, cordon, or attack by fire segment in support of a further live exercise in the MUCTS and a larger maneuver venue in the SIMNET/JMSE world.

A typical exercise might include a battalion task force with the mission to attack and seize a defended town. One company team (live) will attack the MUCTS at Fort Knox. The other two

company teams (virtual) will form a cordon around the town, denying enemy reinforcement or escape. One of these company teams is using simulators at home station; another is in the SIMNET at Fort Knox. The task force headquarters controls the battle in a JMSE from home station or Fort Knox. OCs participate at all levels, from platoon to task force. For the cost of moving two company teams of personnel, and only one company team of equipment, a complete CTC-like experience has been assembled.

Careful preparation, rehearsal, and a certain amount of imagination and initiative will be necessary to make it work. Conceptually, however, this is no harder than the precomputer days of staff exercises in which junior officers role-played from scripts according to the direction of external evaluator umpires for the benefit of battalion and brigade staffs with maps and grease pencils. For the troops in the virtual environment, all elements will be present and visible; the only loss is the absence of rain, mud, and the smell of cordite. For the staff at home station, the exercise will be perfectly realistic — reports coming over the digital link from the virtual and instrumented live exercises will be as real as those from a real battle, lacking only the ability to drive out and see for one's self. As for the troops in the live venue, while their adjacent units may be invisible, they still know that they are there behind those trees or perhaps on the other side of the hill.

For OCs, crosstalk and initiative will add to the experience. A certain amount of adjudication is necessary in any exercise — actual .50 cal. rounds will shoot through a building and any occupants, but MILES .50 cal. rounds are stopped by dust, smoke, and leaves. Just as an OC will make spot decisions to correct this situation, he can also correct virtual adjacent organizations. For example, an OC in the virtual venue observes that one of the cordon force teams allowed a virtual enemy platoon to infiltrate the town from the west. He quickly calls his counterpart at the MUCTS, who sends in a live OPFOR platoon from the west. The challenge is to the unit commanders and staff — will they notice the enemy movement and alert the team in the close fight? Only through multiechelon training is this sort of change, interaction, and adaptation possible in an environment that teaches the true cause-and-effect rules of the battlefield.

The Army trains for and fights wars. When training for war we must always remember that we are in the training business, not the technology business. Technology will change, but it is only the tool we use to an end, not the end itself. Just as a trained worker discovers new things he can accomplish by employing old and new tools in new ways and new combinations, so must we. Our society excels at rapid and competitive adaptation to new opportunities constantly created by fast developing information technology. By employing the STOW to conduct the NTX, we can continue to train with the detail and precision that we already apply to LTX and STX, while adding the interaction and team-building effects of larger scale exercises. NTXs will allow units to train in CTC-like environments, but at an acceptable cost and greatly increased tempo. It is time to think outside the maneuver box, and realize the benefits from taking existing tools and systems and combining them in new ways.

Notes

¹Orson Scott Card, *Ender's Game*, Tor Books, New York, January 1985.

²U.S. Army Field Manual (FM) 25-101, *Battle Focused Training*, U.S. Government Printing Office, Washington, DC, 30 September 1990.

³Historically, U.S. Army units tend to lose, or at least suffer disproportionate losses, during the first battle of major American wars, the most noteworthy recent occurrences being Kasserine Pass in World War II and Task Force Smith in the Korean War.

⁴From a philosophical standpoint, each venue may be regarded as a product of the age of human development that brought it about. See Alvin Toffler, *The Third Wave*, Random House, New York, February 1980.

⁵FM 25-101.

⁶This interaction is of crucial importance, and is overlooked in much of the Army's performance-based training environments.

⁷Trained soldiers do not make a trained platoon, nor do trained platoons make a trained company. To understand not only how the entire organization fights, but also how the organization's parts interact within it, there must be a common experience base to which the participants can refer in common.

⁸In a typical cycle, a brigade combat team trains intensively for a year to prepare for a CTC rotation. Included in this preparation is the "freezing" of normal personnel rotations so as to maintain the continuity and cohesion that is formed during this high-intensity training.

⁹Ideally, a unit would complete such training at a rate congruent with its turnover: a unit with 25 percent turnover per quarter, for example, should

completely retrain every year to maintain a mere average level of cohesion and collective training.

¹⁰FM 25-101.

¹¹FM 25-4, *How to Conduct Training Exercises*, Washington, DC, U.S. Government Printing Office, 10 September 1984, p. 53.

¹²FM 25-101, p. C7.

¹³*Ibid.*, p. C9.

¹⁴Training Circular 25-10, *A Leader's Guide to Lane Training*, Washington, DC, U.S. Government Printing Office, 26 August 1996, p. 9.

¹⁵This is an important point, for it touches on the nature of warfare as a complex adaptive system (CAS). In a CAS, actions beget adaptive reaction in continuous sequential trees. After only a few iterations of this cycle, the results become essentially unforeseeable. In this way, it is difficult, if possible at all, to predict the future actions of an enemy or the future nature of war beyond the first few action-reaction cycles.

¹⁶Ideally, an enemy force would be made up of tough, motivated, intelligent, and experienced soldiers told to fight to win, even at the expense of ignoring doctrine. There would be no rules governing their behavior, only the limitations of their ability and imagination.

¹⁷The VTP consists of a standing team of civilian exercise controllers and OCs who both operate and provide AAR services for SIMNET and Janus events, as well as the Fort Knox OC team, "The Warthogs," which provides OC support for platoon-company team size virtual and urban warfare exercises.

¹⁸Indeed, the OneSAF software of rehosted SIMNET eliminates the need for connecting hardware and software between the SIMNET and constructive computer-mediated systems such as Janus.

¹⁹Only the Fort Knox MUCTS has facilities and structures built to withstand live fire, demo, controlled pyrotechnic effects, and even the collision of tanks and fighting vehicles. Structures are built of 200 psi concrete with doubled rebar.

²⁰Both DFIRST and DITS are deployable, modular systems, MILES compatible, and allow instrumentation of remote training areas from a deployable package. Further, both systems offer a complete player tracking and playback-AAR capability.

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