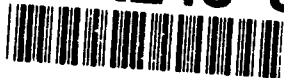AD-A243 592

Evaluation of the Reserve Component Armor Junior Leader Tactical Training Program

Donald R. Jones, M. Cathy Bullock, Kerm Henriksen, and Sharon Tkacz

CAE-Link Corporation

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November 1991

91-17692

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United States Army
Research Institute for the Behavioral and Social Sciences

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FOR THE BEHAVIORAL AND SOCIAL SCIENCES

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Availability Codes

| Dist | Avail and/or Special |
| A-1 | |

NOTICES

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
Unclassified	--

2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT
--	Approved for public release;
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	distribution is unlimited.
--	

4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
--	ARI Research Note 92-07

6a. NAME OF PERFORMING ORGANIZATION	6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
CAE-Link Corporation	--	U.S. Army Research Institute Boise Element

6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code)
209 Madison Street Alexandria, VA 22314	1910 University Drive Boise, ID 83725-1140

8a. NAME OF FUNDING/SPONSORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences	8b. OFFICE SYMBOL (If applicable) PERI-I	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER OPM Contract 87-9002

8c. ADDRESS (City, State, and ZIP Code)

5001 Eisenhower Avenue
Alexandria, VA 22333-5600

10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
63007A	795	3308	C3

11. TITLE (Include Security Classification)

Evaluation of the Reserve Component Armor Junior Leader Tactical Training Program

12. PERSONAL AUTHOR(S)
Jones, Donald R.; Bullock, M. Cathy; Henriksen, Kerm; and Tkacz, Sharon

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 91/01 TO 91/06	1991, November	91

16. SUPPLEMENTARY NOTATION

Contracting Officer's Representative, Joseph D. Hagman

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Reserve component (RC) Computer-based training (CBT)
05	06		Electronic information Formative evaluation
19	06		delivery system (EIDS) Interactive videodisc (IVD)

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This report presents the results of a user-based evaluation of a prototype Electronic Information Delivery System (EIDS)-based simulation called the Reserve Component (RC) Armor Junior Leader Tactical Training Program. The simulation was developed to support individualized tactical training of RC armor platoon leaders and sergeants. The evaluation was conducted to (a) determine how well target users can perform the tactical skills required by the program; (b) examine the program's level of user acceptance; and (c) identify program areas in need of improvement.

Four platoon leaders and four platoon sergeants from the 116th Armored Cavalry Brigade of the Idaho Army National Guard participated in the evaluation. Each soldier worked through the program's 14 hours of practical-exercise-based training modules and rated the program on aspects related to user acceptance, i.e., adequacy of training, ease of use, functional fidelity, appropriateness of performance standards, and suitability of media usage. In addition, soldiers indicated possibilities for program improvement.

(Continued)

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
Joseph D. Hagman	(208) 334-9390	PERI-IKD

ARI Research Note 92-07

19. ABSTRACT (Continued)

The program was found to be challenging in that soldier performance was in most cases below the established proficiency standards. Performance did vary considerably, however, with better scores found for fundamental tactical skills typically trained in the unit.

Despite low performance, soldiers rated the program high on user acceptance. They judged it to be: (a) adequate in its coverage of tactical skills specified in module training objectives; (b) a representative simulation of the decision-making environment in which platoon leaders/sergeants must operate; (c) reasonable in the standards set for proficient performance, and (d) easy to use. Several areas were also identified for program improvement.

Results suggest that, after minor modification, the present EIDS-based program will help RC platoon leaders/sergeants improve their individual tactical skills and achieve maximum payoff from the limited training time available.

EVALUATION OF THE RESERVE COMPONENT ARMOR JUNIOR LEADER TACTICAL TRAINING PROGRAM

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JUNIOR LEADER TACTICAL TRAINING PROGRAM

Introduction

A microcomputer-based interactive videodisc (IVD) simulation
called the Reserve Component (RC) Armor Junior Leader Tactical
Training Program has been developed to support individualized tactical
training of RC armor platoon leaders and sergeants. The present
report documents the results of a user-based evaluation of this
program. The evaluation was conducted to (a) determine how well RC
armor platoon leaders/sergeants can perform the tactical tasks
required by the program, (b) examine the program's level of user
acceptance, and (c) identify program areas in need of improvement.

This section of the report identifies the tactical skills
required of the armor platoon leader/sergeant, the current environment
in which these skills are trained, the potential for microcomputer-
based IVD technology to enhance this training, and the current program
developed to explore this potential.

Tactical Training

The platoon leader is the officer with the least amount of time
in service. Yet, he has the greatest amount of contact with the
enemy. Although his tactical decision-making is narrow in scope
(focused only on the company team's zone of action), it is highly time-
sensitive and vulnerable to an immediate enemy response. The
consequences of a delayed or wrong decision can be fatal for the
platoon.

The tactical skills required of this young officer are
formidable. In the offense, for example, the platoon leader must have
the technical skills required to control and maneuver an armor
platoon. He must know the capabilities of the enemy's anti-tank
weapon systems, the organization of its anti-tank-capable units, how
they organize their defenses, and how they fight. Before battle, he
must apply this knowledge to a specific zone of action and, using the
company commander's input, work through a series of analyses to
identify avenues of approach, enemy force deployment, and kill zones.
Next, he must estimate enemy force actions and plan counters to reduce
potential enemy fires. To do this, he must plan routes, movement and
fire control measures, and indirect fire targets. He also must
develop a fire support plan that will minimize the enemy's
opportunities for surveillance and fires.

During initial contact, the platoon leader must respond with
actions to protect platoon elements, assess the contact, and provide
accurate reports to the company commander. As the contact develops,
he must continually process information to establish an accurate
mental picture of the enemy arrayed against him and recognize whether
his assets are sufficient to defeat the enemy. The platoon leader,
working with the company commander, must respond effectively to the
enemy's counters and decide on the correct tactical option required to
defeat the enemy while preserving the platoon and the company's
integrity.

The above tasks are complex. To carry them out successfully, the
platoon leader must have extensive collective training in a variety of

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tactical situations experienced under realistic battlefield
conditions.

Current Training Environment

The road map for this collective training is outlined in the
Mission Training Plan (MTP) for the Tank Platoon (Department of the
Army, 1988). This MTP is written for force-on-force situational
exercises. Force-on-force implies the use of the Multiple Integrated
Laser Engagement Simulation (MILES) to supply weapons effects and an
intelligent adversary.

The logistical and administrative requirements associated with
MILES-based training, however, limit the frequency of its use. Thus,
the platoon leader is precluded from receiving the experience required
to plan effectively and conduct tactical operations against an active
enemy. His ability to neutralize the enemy, before the enemy can
destroy his combat force, therefore, normally is not exercised.

In addition, the Army Training Evaluation Program (ARTEP) which
is used to evaluate a unit's combat readiness, while written for the
inclusion of an active opposing force, can be conducted without the
use of MILES and the play of an active enemy. Thus, it is possible
for a platoon leader and his tank platoon to pass an ARTEP without
having to defeat an enemy in simulated combat.

The first time platoon leaders have an opportunity to experience
fully the complex conditions of combat is during a battalion rotation
to the National Training Center (NTC). The free-play, two-sided
nature of combat is incorporated at NTC as is the critical element of
testing one's skills against an intelligent and determined opposing
force. For many battalions, the force-on-force engagements at NTC are
an eye-opener. Many units experience high attrition rates and do not
accomplish their tactical missions. The after-action reviews
following tactical operations (Jones & Henriksen, 1985), as well as
publications by the Center for Army Lessons Learned (1988), reveal
that mistakes are made throughout the battalion command structure,
from the battalion commander and his staff to the company commanders
and platoon leaders.

Thus, platoon leaders need an effective and efficient way to
practice their tactical skills on an individual basis prior to going
to the field. This need is acute for RC platoon leaders. Not only do
they have the same training limitations as their Active Component (AC)
counterparts, but they also face an additional constraint on training
time (i.e., only 16 hrs per month for individual, crew, and unit
training).

Potential of IVD/Microcomputer Technology

The potential exists for microcomputer/IVD-based technology to
supply this needed individual tactical training capability. In
theory, it is possible for this technology to provide platoon leaders
with the chance to practice the kind of cognitive skills required in
battle without the need for a large scale investment in instrumented
ranges or weapon systems simulation.

This potential was first demonstrated by Morrison, Drucker, Kern,
and Foster (1989) when the Armor Tactical Concepts Tutor (ARTAC) was
shown to be successful in training selected tasks from the Armor
Officer Basic Course (AOBC). Based on this finding, the present

courseware development effort was begun at the request of the U.S. Army National Guard (ARNG) to enhance the tactical training of its junior leaders.

Description of Prototype Program

The prototype training program developed in response to this need is called the RC Armor Junior Leader Tactical Training Program. It consists of practical exercise-based courseware designed for delivery on the Electronic Information Delivery System (EIDS) configured with a hard disk drive, keyboard, mouse, and printer. The program covers offensive operations (i.e., the ARNG's primary wartime mission) and is organized along three sequential and progressive modules which require the platoon leader to maneuver the platoon, recognize Soviet defensive tactics, and plan a movement-to-contact operation. The opposing force is a Soviet Motorized Rifle Regiment (MRR) - BTR equipped. The program is closely tied to the armor platoon leader's primary reference manual, FM 17-15 The Tank Platoon (Department of the Army, 1987) and the control document for training and evaluating a tank platoon, the Mission Training Plan for the Tank Platoon (Department of the Army, 1988).

Digitized voice provides instructions for interacting with the courseware and feedback on all performance tasks. Feedback sessions synchronize graphic overlays and multiple video images with digitized voice to analyze platoon leader performance and to reinforce important instructional points. A printout of soldier performance is available after each exercise as part of the program's computer-managed instructional (CMI) system. The program also contains suggested performance standards to give the platoon leader a benchmark for assessing his performance, and for linking performance to success in combat.

Description of Training Modules

The training program contains a video introduction, a program conventions exercise, and three practical exercise-based training modules: Platoon Drills, Soviet Weapons and Tactics, and Tactical Planning. The video introduction serves to focus the platoon leader on the importance of tactical skills, while the program conventions exercise contains information on program construction, soldier response procedures, and use of the mouse.

Module 1, Platoon Drills. The first training module contains one lesson with two exercises. The first exercise covers basic platoon formations and associated hand and arm signals. The second exercise allows the platoon leader to maneuver the platoon in response to different tactical situations occurring in a movement-to-contact operation.

Module 2, Soviet Weapons and Tactics. The second training module has two lessons with video introductions for both. The first lesson, Weapons and Organization, has four exercises that provide training on anti-tank weapons and mines and on anti-tank capable units in a Soviet MRR. The second lesson, Tactics of an MRR in the Hasty Defense, has one exercise and sets up the situation of a combat outpost positioned forward of an MRR with reconnaissance patrols screening forward of the first defense belt. For this exercise, the platoon leader is presented a movement-to-contact situation and is tasked with three major requirements. The first requirement is to cc..duct an initial ground/map reconnaissance and determine the key terrain and main

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avenue of approach in the zone of action. The second requirement is to estimate the probable location of reconnaissance patrols and their kill zones and the location of the combat outpost, its defensive scheme, and potential firesack. The third requirement is to determine the probable engagement sequence of enemy units, given actual enemy locations and a tank company team at different locations in the team's zone of action.

Module 3, Tactical Planning. This last training module has one lesson and one exercise. There are three major requirements placed on the platoon leader in the exercise. First, given a complete operations order, the platoon leader is checked on his knowledge of the company's mission and his platoon tasks. Second, given an 85% understanding of the operation, the platoon leader must plan a movement-to-contact operation, based initially only on a map reconnaissance. The planning process includes an analysis of the terrain, projection of enemy force locations and kill zones, identification of the platoon's movement route, direct and indirect fire targets, and a fire support plan for each segment of the movement route. And third, using video of the actual terrain, the platoon leader simulates the conduct of a ground reconnaissance. Using terrain visuals, he reviews his thinking, reevaluates his plan, and makes any necessary changes to elements of the plan.

In the present evaluation, a sample of users from the target RC population was asked to complete the training program. Performance scores were used to determine soldier proficiency on the tactical tasks called for in the program. Answers to survey questions were used to identify any problems with the program, as well as to determine the appropriateness of its content and ease of use. The next section of the report describes in more detail how the evaluation was conducted.

Method

Participants

Four officers and four non-commissioned officers (NCOs) from the 116th Armored Calvary Brigade of the Idaho ARNG participated in the training program evaluation. Each was either serving, or had recently served, as a platoon leader or platoon sergeant. Table 1 shows the number of months held in each duty position by each soldier. As a group, the soldiers had limited computer experience. None had a computer at home, and only two had previous experience using a mouse.

Procedure

Each soldier worked through the three training modules (i.e., Platoon Drills, Soviet Weapons and Tactics, and Tactical Planning) at his own pace, typically finishing one lesson per evening session. Upon completion of a lesson, soldiers responded in writing to evaluation questions designed specifically for that lesson. All three modules were evaluated over a 6 week period.

Table 1

Months in Duty Position.

SOLDIER	DUTY POSITION	
	PLATOON SERGEANT	PLATOON LEADER
A	—	52
B	—	24
C	—	36
D	—	18
E	34	—
F	7	—
G	84	—
H	60	—

Performance Standards

Performance standards were established on the basis of tank platoon doctrine described in FM17-15, The Tank Platoon and the MTP for the Tank Platoon. For example, the ARTEP collective standards for the task "Execute Actions on Contact" is that no more than one tank is lost to hostile fire. The suggested individual platoon leader standard for the Tactical Planning lesson includes a 75% reduction of fires for enemy reconnaissance patrols firing anti-tank guided missiles (ATGM). This equates to one launch with a 85% probability of hit on one tank. Use of this approach ensures that an individual platoon leader standard is consistent with the collective platoon standard.

Evaluation Measures

Performance was evaluated in terms of response accuracy (e.g., percentage correct) and time to completion. Accuracy scores were recorded automatically by the courseware, whereas time scores were recorded manually by the soldier at the end of each lesson. The types of responses required for each lesson and the associated methods of scoring are shown in Table 2.

Information on user acceptance was collected using a 5-point rating scale procedure. Separate acceptance evaluation booklets were developed for each module. Appendix A shows the questions and associated rating scales contained in each booklet. Questions and ratings were later grouped for analysis purposes under five categories: adequacy of training, ease of use, functional fidelity, acceptance of standards, and media presentation. Table 3 provides the definition of these categories, while Appendix B shows the questions grouped under each. In addition to ratings, soldiers were asked to provide written comments on aspects of the training program that they thought could be improved to enhance effectiveness or efficiency.

Table 2

Types of Responses and Measurement Methods

LESSON	RESPONSE	MEASUREMENT
Platoon Drills	Identification Multiple Choice Plotting Positions	Percentage correct
Soviet Weapons	Identification Multiple Choice Fill in the Blank	Percentage correct
Soviet Tactics	Plotting Positions Plotting Areas Multiple Choice in Sequence	Position accuracy Area accuracy Percentage correct
Tactical Planning	Plotting Positions Plotting Areas Determining Tactical Counters	Position accuracy Area accuracy Percentage reduction of possible enemy fires

Table 3

Definitions of user acceptance categories.

CATEGORY	DEFINITION
Adequacy of Training	How well the program covered those skills specified in the lesson training objective
Ease of Use	How well instructions and other design features facilitated soldier execution of the lesson
Functional Fidelity	Extent to which program required user to process the same information, make the same decisions, and be informed of the same consequences that would occur in combat
Acceptance of Standards	How reasonable the criteria were for satisfactory performance on given training objectives.
Media Presentation	How effective the video, digitized voice, graphics, and animation sequences were in supporting training objectives

Results

Data on performance, user acceptance, and suggested program improvements are reported and discussed in this section.

Performance

Performance data were collected to determine soldiers' level of tactical proficiency on the practical exercises included in the program and the length of time required for program completion. In general, soldier performance was low but varied considerably across lessons. As shown in Figure 1, performance was better on Platoon Drills and Soviet Weapons than it was on Soviet Tactics and Tactical Planning. This performance is broken out below by lesson and exercise, while Appendix C shows the average performance of individual soldiers on each lesson.
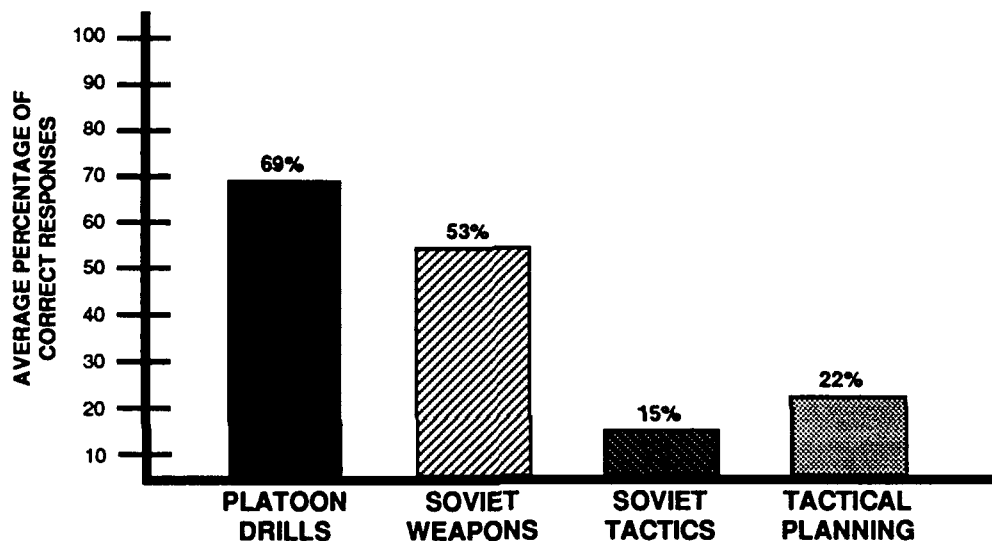
Figure 1. Overall performance on each lesson.

Platoon Drills. The lesson on Platoon Drills consisted of two exercises. Exercise 1 (Basic) contained 36 Go/NoGo scored items requiring the identification of hand and arm signals, construction of corresponding tank formations, and orientation of gun tubes to center sector overwatch. Exercise 2 (Advanced) contained 60 Go/NoGo scored items requiring the identification of appropriate formation and movement options to different tactical situations, platoon movements from one formation to another, and appropriate platoon control techniques. As shown in Figure 2, accuracy scores were slightly better on the Basic than on the Advanced exercise with more soldiers exceeding the performance standard of the Basic exercise.

Soviet Weapons and Organization. The lesson on Soviet Weapons and Organization consisted of four exercises that covered the anti-tank capabilities and the organization of anti-tank capable units of an MRR (BTR equipped), i.e., units most likely to be encountered during a movement-to-contact operation. These exercises contained multiple-choice and short fill-in items for questions on time-to-target (ATGM Exercise), maximum effective range (Tank/Anti-Tank Exercise), identification of mine laying vehicles (Mines Exercise), and number of AT-4 teams in a Weapons Platoon of a Soviet Motorized

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Rifle Company (Organization Exercise). As shown in Figure 3, performance on these exercises was consistently below standard with only one soldier meeting the standard on one exercise.
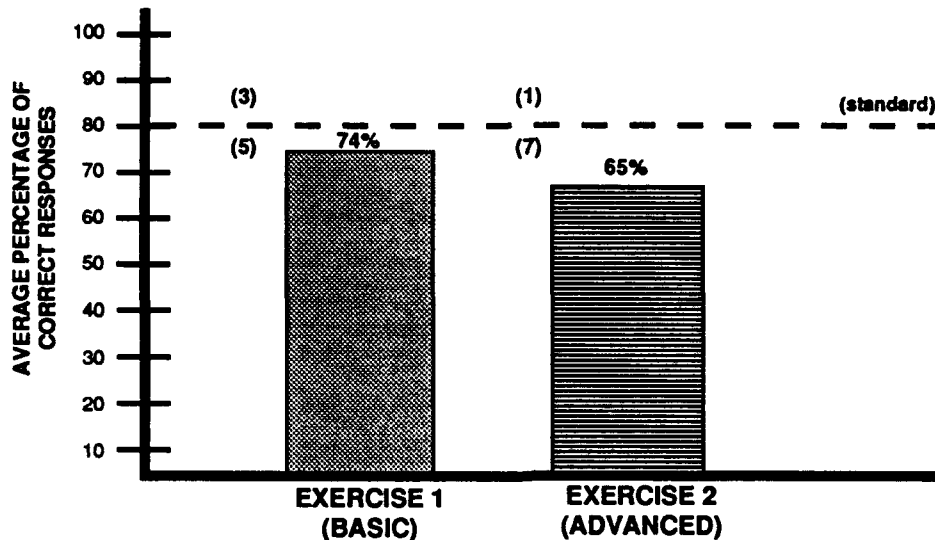
Figure 2.   Performance on Basic and Advanced Platoon Drills exercises (number of soldiers above/below standard is shown in parentheses).
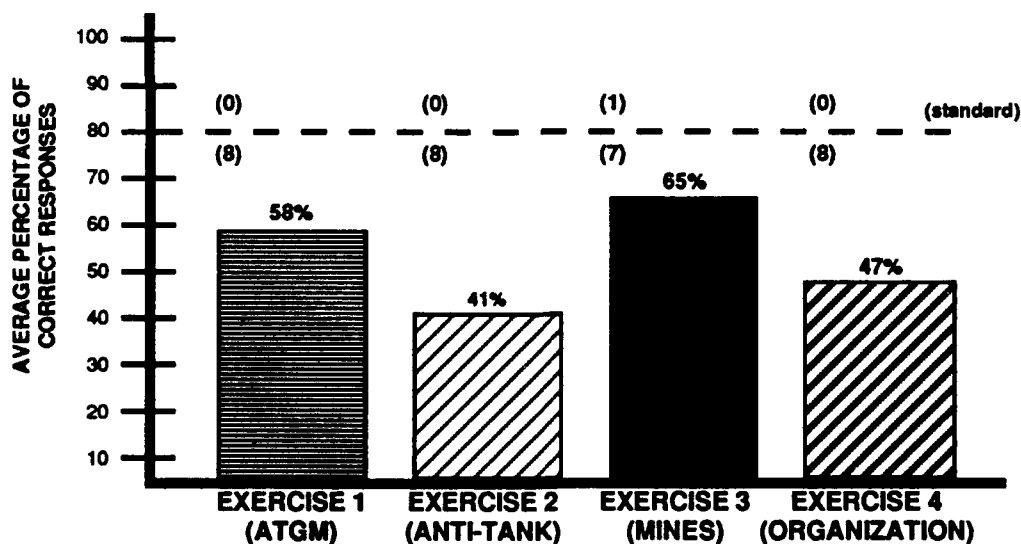
Figure 3 . Performance on Soviet Weapons exercises (number of soldiers above/below standard is shown in parentheses).

Soviet Tactics. The Soviet Tactics exercise put the soldier in a tactical situation where his mission was a movement-to-contact operation against a Soviet MRR (BTR equipped) in a hasty defense. The requirement was to determine enemy force locations and potential kill zones in the Company Team's zone of action. To make this determination, a platoon leader must analyze and apply intelligence information from the company commander to anticipate the type of enemy forces in the zone of action. This process involves map/terrain

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association for determining tactically significant terrain and the main avenue of approach as seen by the enemy. The leader must estimate the enemy's location and defensive use of this terrain, based on his knowledge of enemy defensive tactics.

These exercises were scored in terms of four different performance measures: (1) percentage of overlap of soldiers' estimates of key terrain and avenues of approach (soldiers encircled key terrain and outlined an avenue of approach on the video map) to that prescribed by the exercise, (2) percentage of correct soldier estimates of enemy recon patrol sectors of fire (soldiers placed recon patrol symbols on a video map and defined the left and right limits of each patrol's sectors of fire with the mouse), (3) percentage correct in terms of the placement of combat outpost symbols on the video map and the construction of sectors of fire with the mouse, and (4) percentage of correct estimates of enemy force engagement sequence (soldiers established sequence by using the mouse, symbol table, and video map to identify sequence number, type of weapon, individual weapon systems and their targets). As shown in Figure 4, accuracy percentages for the four measures were relatively low, with only one soldier scoring above standard for Recon Patrols.
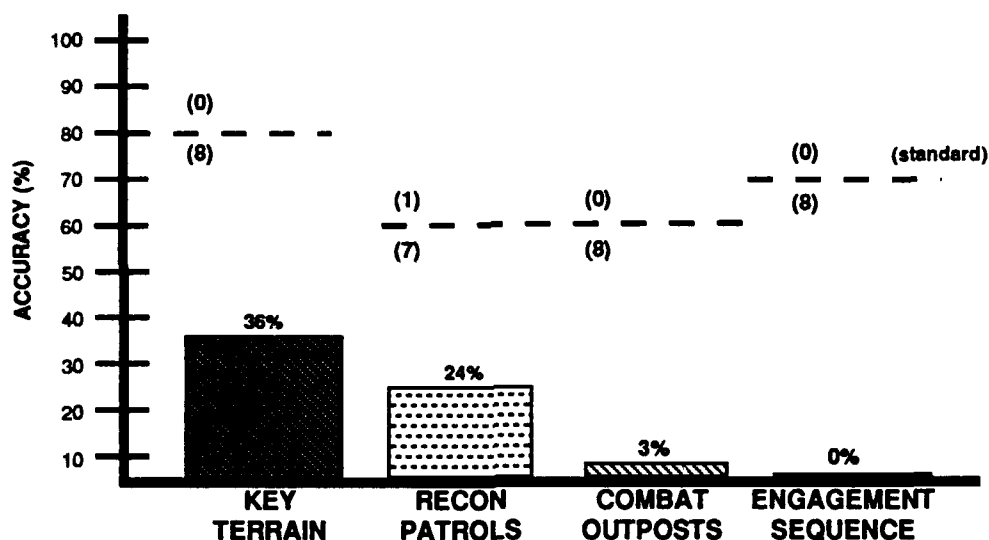
Figure 4. Performance on Soviet Tactics exercise (number of soldiers above/below standard is shown in parentheses).

Tactical Planning. This exercise built on the Soviet Tactics exercise and put the platoon leader in a tactical situation where he must first estimate enemy locations and kill zones, and then develop a tactical plan that substantially reduces the planned fires of the reconnaissance patrols and combat outpost. Software solutions determined if line of sight existed between enemy positions and the tank platoon, if the platoon was in the launch window, and if platoon direct or indirect fires suppressed enemy positions.

In accomplishing this tactical exercise, the platoon leader is required to perform his initial planning based on a map reconnaissance only. This planning process includes an analysis of the terrain, estimates of enemy force locations and kill zones, identification of the platoon's movement route, direct and indirect fire targets, and a

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fire support plan for each segment of the movement route. Once the initial plan is completed, the soldier, using video of the actual terrain, can review his thinking, and through this map and ground reconnaissance make any changes required to upgrade the effectiveness of the plan. For the most part, changes to the initial plan were not made. There were nine key analysis and planning elements for the eight soldiers, representing 72 potential changes. There was only a total of 13 changes or an 18% change rate in the tactical plans of all soldiers. Essentially, half of the tactical planning exercise was not used. Figure 5a shows the resulting performance scores. Overall, performance was consistently low with no soldiers attaining standard.

The reason(s) why soldiers made few changes to their plans is unknown. Perhaps they did not perceive the need to make a change because they failed to process information that was inconsistent with their initial plan. The results of an accumulating body of research suggest that individuals selectively discount or ignore information that is incompatible with readily available assessments of a situation (Freedman & Spears, 1965; Manning & Getty, 1981). Once they formulate an initial situation assessment, they are more likely to process information relevant to that situation in a biased fashion, e.g., falsely recognize cues to be consistent with that assessment (Arkes & Harkness, 1980). The current training program could be used to diagnose the extent of this cognitive bias and reduce its negative effect on tactical planning.

Soldiers' tactical plans also were generally ineffective in countering the planned fires of the simulated enemy units. With respect to the recon patrols, the standard was a 75% reduction of ATGM launches from these patrols. Soldiers had to stop four out of five launches to surpass the 75% standard. As shown in Figure 5b, soldiers were able to stop about 12% of these launches (5 launches out of 40). Three soldiers stopped one launch, one soldier stopped two launches, and the remaining four soldiers failed to stop any of the launches. At an 85% hit probability for the AT-5, these launch figures mean that four platoons would have lost either three or all of their tanks (12 to 16 tanks). Three platoons would have lost 3 tanks each and one platoon would have lost 2 tanks. Overall, eight platoons would have lost between 23 to 27 tanks out of 32.

The combat outpost contained three types of anti-tank weapons that had the potential for eight firings during initial contact, unless they were screened or suppressed. The standard was to reduce these firings by 50%. Overall, the eight soldiers were able to reduce 16% of the combat outpost firings (see Figure 5b). Individually, only one soldier was able to reduce combat outpost fires at or above the standard. The rest fell below the standard.

Time to Completion. The length of time taken by soldiers to complete the training program ranged from 11.3 to 19.9 hrs with an average time of 14.25 hrs. Table 4 shows the number of minutes each soldier spent on each lesson. For purposes of future scheduling, these times should be considered minimum times and probably are underestimates, because none of the soldiers reached criterion performance on all four lessons. Presumably, to do so would require additional time.
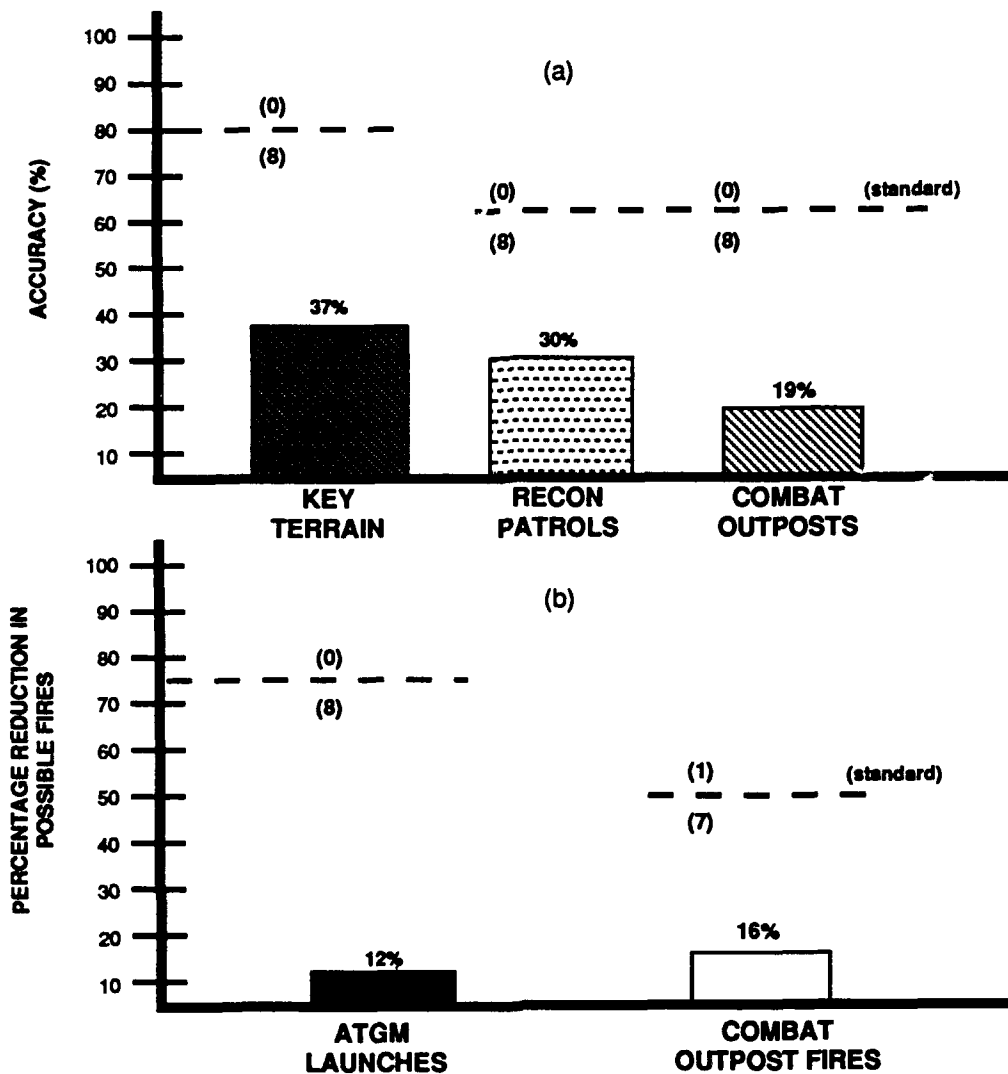
Figure 5. Performance on Tactical Planning exercise (number of soldiers above/below standard is shown in parentheses).

User Acceptance

Under the heading of user acceptance, soldiers rated the training program on five categories: Adequacy of training, Ease of Use, Functional Fidelity, Acceptance of Standards, and Media Presentation. Table 5 shows the average individual and combined lesson ratings for each category. (See Appendix D for individual question ratings for each lesson, and Appendix E for average lesson ratings for each soldier.) Combined lesson ratings were above 4.0 for all of the categories. Individual lesson ratings were also uniformly high and are discussed in more detail below.

Adequacy of Training. Adequacy of Training ratings revealed how well soldiers thought that program lessons provided training on the skills specified in the training objectives. For example, evaluation items on Soviet Tactics asked soldiers to rate how effective the practice provided on estimating an enemy's engagement sequence was in developing the skills needed to anticipate an enemy's planned actions.

The response scale ranged from 5 (very effective) to 1 (very ineffective). As shown in Table 5, the average ratings were high and relatively uniform, indicating that soldiers perceived the practice to be effective.

Table 4

Number of minutes spent by soldiers on each lesson.

LESSON	SOLDIER								$\bar{x}$	SD
	A	B	C	D	E	F	G	H		
Platoon Drills	135	150	130	115	119	190	125	180	143.0	28.1
Soviet Weapons	58	134	65	73	69	97	110	129	91.9	29.9
Soviet Tactics	266	135	210	310	188	230	305	394	254.8	81.5
Tactical Planning	211	320	330	367	395	375	430	491	364.9	82.8
Σ	670	739	735	865	771	892	970	1194		
$\bar{x}$	168	185	184	216	193	223	242	298		
SD	91	90	114	144	143	116	153	172		

Ease of Use. Ease of Use ratings revealed how well soldiers thought that instructions and other design features enabled them to interact with the program lessons in an efficient manner. Ease of use was encouraged by several program design features. For example, a program conventions exercise was included to provide soldiers with practice on using the mouse before entering the lessons. Digital audio was used to provide instructions and could be repeated by touching the screen. A color scheme was used to define input boxes. And for responses considered to be especially difficult, the program guided soldiers through a practice example. As shown in Table 5, the average rating for all four lessons was around 4.0, indicating that soldiers felt that the training program was practicable as designed.

Functional Fidelity. Functional Fidelity ratings revealed how well soldiers thought that the program required them to process the same information, make the same decisions, and be informed of the same consequence that would occur in combat. As shown in Table 5, soldiers gave high functional fidelity ratings for the lessons on Platoon Drills, Soviet Tactics, and Tactical Planning. No ratings were required on Soviet Weapons because this lesson required knowledge-based responses performed outside the context of a tactical scenario.

Acceptance of Standards. Acceptance of Standards ratings revealed the extent to which soldiers thought that lesson performance standards were reasonable. Again, the ratings were uniformly high across all four lessons. This was surprising, given that most soldiers were unable to attain the standards set for any lesson. Presumably, soldiers felt that lack of knowledge, rather than unreasonably high performance standards, was the cause of their substandard performance on most program exercises.

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Table 5

Average ratings and standard deviations for each user acceptance category.

USER ACCEPTANCE CATEGORY	LESSONS									
	Platoon Drills		Soviet Weapons		Soviet Tactics		Tactical Planning		Combined	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Adequacy of Training	4.25	.68	4.32	.66	4.25	.64	4.60	.52	4.34	.62
Ease of Use	4.06	.94	4.00	.58	4.14	.63	3.98	.83	4.04	.74
Functional Fidelity	4.25	.82	—	—	4.12	.65	4.50	.61	4.29	.69
Acceptance of Standards	4.12	.35	4.25	.46	4.16	.50	4.12	.50	4.16	.45
Media Presentation	4.50	.50	4.24	.45	4.32	.53	4.44	.55	4.38	.51

Media Presentation. Questions regarding the quality and effectiveness of media usage to support program training objectives were asked for each lesson. Specialized use of media included running video, video stills, graphic overlays, digitized voice, and animated graphic sequences. For example, in providing an analysis of each engagement sequence in the Soviet Tactics lesson, the use of animated graphic overlays was combined with digitized audio to replay the tactical situation and explain the enemy's probable action. Table 5 shows that average Media Presentation ratings were high for each of the four lessons, ranging from 4.24 to 4.50.

Program Improvements

Soldiers' comments were used to identify areas in the current training program that needed immediate improvement before its distribution to the field. Comments were also used to identify areas needing future improvement should the program be expanded to include a greater variety of offensive exercises or complementary exercises on defensive tactics. The identified problem areas and their potential solutions are discussed below.

Immediate Improvements. Three program areas were judged to be in need of immediate improvement. First, an ease-of-use problem was noted by several soldiers in the second exercise of Platoon Drills, where lines had to be drawn to indicate tank movement into the next formation. The problem is with the narrow computation window (not visible on the map) within which the lines must lie for the software to compute the correct formation through pattern recognition. While developing the courseware, it was assumed that soldiers would place the lines at a distance appropriate to actual tank/ground distance, with each tank not more than 500 meters apart. However, they often placed the tanks as much as a kilometer apart. Consequently, the software algorithm would score the formation as incorrect. One potential solution to this problem is the addition of a text message

that stresses appropriate tank distance. A second approach would be to display a box graphic where the new formation must reside. Yet a third option would be a practice session with specific instructions in the program conventions exercise.

Second, a potential flaw appears to exist in the action drill procedures defined in FM 17-15. Action drills are designed to maneuver the tank platoon so that each tank's frontal armor is facing forward toward the enemy contact. The FM identifies four drills: Action Front, Action Left, Action Right, and Action Rear. The action drill practice exercise in Platoon Drills sets the enemy weapon system at an oblique angle, so when the soldiers executed an Action Drill Right, their formations were turned past the enemy weapon system. This gives the enemy a flank shot into the platoon; a situation incompatible with the intended effect of the drill. This apparent flaw in action drill procedures will be presented to the Platoon Tactics Committee, U.S. Armor School, Fort Knox for review and decision. The training program will then be modified accordingly to reflect this decision.

Third, the scoring procedure for estimation of the enemy's engagement sequence in the Soviet Tactics lesson needs to be changed. The current algorithm scores weapon-to-fire and sequence of firing as either correct or incorrect. Because this sequence is a best estimate, the scoring strategy should include a scheme for partial credit.

Future Improvements. Two areas were cited as needing improvement if the training program were to be expanded. The first problem area involves the quality of the video maps. These maps lacked the resolution required to make them easy to read, locate and place enemy symbols, and construct kill zones. The video stills of the tactical maps were produced from Army issued 1:50,000 topographical maps of the training area at Gowen Field, Idaho. These maps are produced from master-inked drawings using a silk screening process. The map contour lines that result from the process, while looking like solid lines to the naked eye, are a series of dots when viewed through a video camera. These dots do not have the solid line characteristic to maintain high resolution during the video production process. The solution is to transfer map images from master-inked mechanicals that have sufficient line weight to maintain good resolution of the contour lines during the video production process. Use of master-inked mechanicals and a state-of-the-art video production studio in any future courseware expansion efforts should eliminate this resolution problem.

A second problem was the excessive length of computer processing time required to save and score terrain/avenue of approach input, and to save, plot, and score ATGM kill zones. For example, it typically took 6 min to score key terrain, 3 min to score avenues of approach, and 5 min to score ATGM kill zones. The slowness of the scoring process can be partially attributed to the 8 mHz EIDS microprocessor, the slowest used in a 286 computer. There are several ways to speed up the scoring process. A small increase in speed could be obtained by recoding the save and score functions of the ATGM kill zones or by using an alternative method of coding the ATGM plotting process. Other solutions would require hardware modifications. Plugging in a numeric co-processor, for example, would reduce scoring times significantly. Or, one could remove the 8 mHz processor and replace it with a 12 mHz processor (i.e., replace one plug-in chip with another), thereby producing a 30% increase in processing time.

Adoption of one or more of these options is recommended should a decision be made to expand the current program.

Summary and Conclusions

Results of the training program evaluation revealed that soldier performance was low and, in most cases, below standards set for proficiency. Performance did vary considerably, however, across lessons. Soldiers scored better on exercises related to platoon drills than on those related to tactical planning. This was probably the case because tactical planning is more challenging. In addition, acknowledged RC time constraints force ARNG armor units to concentrate on the training of tank gunnery and fundamental tactical skills, leaving little time left over for training the complexities of U.S. or Soviet tactics. Use of the present EIDS-based program should help RC armor platoon leaders/sergeants to improve their tactical skills and achieve maximum payoff from the limited training time available.

Targeted RC users judged the program to be adequate in its coverage of the tactical skills specified in lesson training objectives, a representative simulation of the decision-making tactical environment in which the platoon leader must operate, reasonable in the standards set for proficient performance, and easy to use. The program, however, was found to have three specific problems areas in need of improvement. These included computation window too narrow for scoring the correctness of a platoon formation, apparent use of incorrect tactical procedures during an Action Drill Right, and the lack of a partial credit scheme for scoring firing sequence. Once these problems are corrected, the program will provide 14 hours or more of tactical training exercises to assist RC armor platoon leaders/ sergeants in the diagnosis and sustainment of their warfighting skills.

Users should realize, however, that the current program contains only a limited number of exercises. The decision on whether or not to expand the programs, i.e., to include a greater variety of offensive exercises of complementary defensive exercises, has not been made. If expansion is desired, the current prototype and any additions to it should have better quality video maps and faster computer-based scoring times.

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APPENDIX A

Evaluation Booklets:

Platoon Drills
Soviet Weapons and Organization
Soviet Tactics
Tactical Planning

EVALUATION OF THE RC ARMOR
JUNIOR LEADER TACTICAL TRAINING PROGRAM
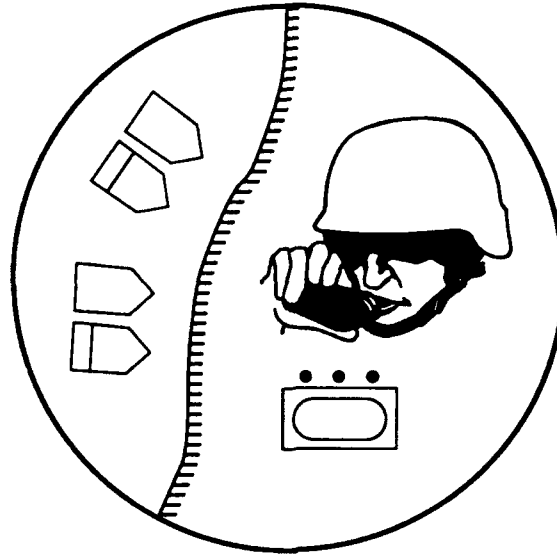
EVALUATION BOOKLET NO. 1
PLATOON DRILLS

INTRODUCTION

The Training Need

At present, armor platoon leaders do not have a readily available way of training their tactical decision making and warfighting skills. Additionally, under the current training structure, RC platoon leaders receive a very limited time (16 hours each month) to conduct training for their units and themselves. Despite these limitations, they are expected to obtain and sustain a level of combat readiness comparable to that of their Active component (AC) counterparts.

What is the Junior Leader Program?

The prototype Junior Leader Program represents a new approach for providing an extended opportunity for junior leaders to practice and develop their critical warfighting skills. The prototype program consists of approximately 30 hours of tactical and cognitive skill training that focuses on the offense and a movement to contact operation. The courseware presents several sequential and progressive exercises that enable the platoon leader to make tactical decisions required to out-think an enemy and execute counters to defeat him in combat. It is one of the first performance-based tactical training programs that incorporates video and microcomputer technology. It further demonstrates the type of training that can be delivered on the Electronic Information Delivery System (EIDS).

Purpose of this Evaluation

The purpose of this evaluation is to determine to what extent (a) the prototype program trains the tactical tasks it was designed to train and (b) to what extent it can be used effectively and efficiently by the target population. As RC soldiers, you will be the ultimate user of this program. Thus, your comments about it are valuable. The results of the evaluation will have a major impact on the use of desk-top tactical simulation in the Army National Guard.

Confidentiality
of Responses

The data collected with this booklet are to be used for research purposes only. They will not become a part of any individual's record and will not be used in whole or in part in making any determination about an individual.

The identifiers *(name or Social Security Number)* are to be used for administrative and statistical control purposes only. Full confidentiality of responses will be maintained in the processing of these data.

Your participation in this research is strictly voluntary. Individuals are encourage to provide complete and accurate information in the interests of the research, but there will be no effect on individuals not providing all or any part of the information.

This notice may be detached from the rest of this booklet and retained by the individual answering the questionnaire if so desired.

UNDERLYING ASSUMPTIONS

A Sustainment Training Prototype

The prototype training program is designed to sustain an officer's warfighting skills. The amount of courseware developed thus far *(approximately 30 hours)* is still quite limited. A fully developed program would contain a greater number of exercises on the planning and execution of tactical operations for both offensive and defensive missions.

Use of Mouse

The prototype program will require you to use a mouse as an input device. You will find some set-up and how-to-use instructions in the User's Guide. The first exercise on program conventions provides the opportunity to practice with the mouse as an input device.

Use of Topographical Map

In the tactical exercises, a topographical map is provided with the appropriate zone of action marked off. Use this map for study and analysis, and then use the mouse to show key terrain, force deployments, and other tactical information on the video map.

Setting of Preliminary Standards

The prototype training program includes performance standards to give an officer a benchmark to measure his abilities. The standards used in this program are preliminary or a "best guess" of what they might be.

GENERAL INSTRUCTIONS

How the Evaluation is Organized

The evaluation consists of four booklets: Booklet No. 1 — Platoon Drills, Booklet No. 2 — Soviet Weapons and Organization, Booklet No. 3 — Soviet Tactics, and Booklet No. 4 — Tactical Planning. Each booklet contains a number of questions that are grouped under the following headings: 1) adequacy of training *(your assessment of how well the training sustained the skills specified in the objectives)* and, 2) ease of use *(your assessment of the quality of the courseware and its ease of use)*.

Responding to the Questions

Each question is to be answered by circling the number representing the most appropriate description along a five-point scale. Also, at the end of each section there is space for adding comments. Your comments are important to us and will be considered carefully.

SPECIFIC INSTRUCTIONS

Before the Exercise

1) Fill out the personal data sheet.

2) Read the User's Guide.

3) Do not start until training manager instructs you to do so.

After the Exercise

1) Record the amount of time you spent on each exercise *(do not include break time).* Record this information on the lesson objective page.

2) Fill out the questions *upon completing each lesson.*

PERSONAL DATA

Name _____   Test No. ____-___-_____

Rank _____

Unit _____

Military Experience

Please fill in number of months assigned to each duty position for the units listed.

Unit	Plt. Ldr. Maneuver Plt.	Plt. Sgt. Maneuver Plt.	Master Gunner	Other -
Armor Company	_____	_____	_____	_____
Other _____	_____	_____	_____	_____
_____	_____	_____	_____	_____

LESSON OBJECTIVE STATEMENT
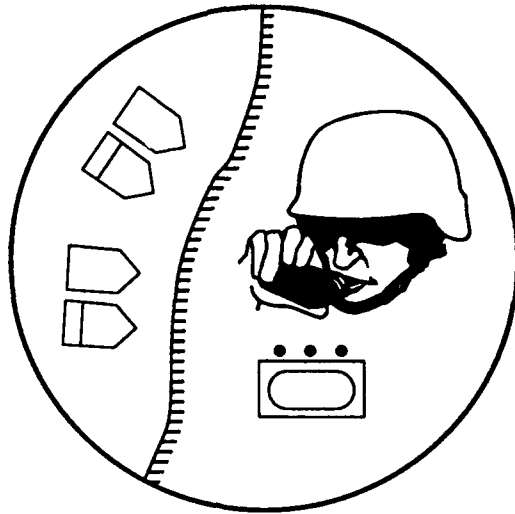
MODULE 1, LESSON 1
PLATOON DRILLS

Lesson Objective:

To sustain the skills required to control and maneuver an armor platoon.
This training supports ARTEP 17-237-10-MTP Maneuver Tasks 17-3-0201-17-3-0211 and Battle Drills 1 and 2.

Reference FM 17-15 Chapters 1, 2, and 3.

Time spent in minutes: Exercise 1 _____.

Exercise 2 _____.

Total Time _____.

PART 1: Adequacy of Training for Sustaining the Skills Specified in the Lesson Training Objective

EXERCISE 1: BASIC

1) The training objectives for the exercise were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

2) The requirement to identify hand and arm signals was _____ in sustaining my knowledge of these signals.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The requirement to construct tank formations was _____ in sustaining my knowledge of the primary tank formations.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

4) The requirement to orient gun tanks was _____ in maintaining my knowledge of primary gun tube orientation for each formation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

5) *Comments:*

_____

_____

_____

Exercise 2: Advanced

1) The training objectives for the exercise were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

2) The commander's concept of maneuver presentation and subsequent questions was _____ in sharpening my listening skills.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The diagraming of lines for movement from one formation to another was _____ in establishing the mental image of how tanks should move into that formation.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

4) The timed display of similar hand and arm signals and the requirement to discriminate the correct one was _____ in sharpening my knowledge of these signals.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

5) The check on gun tube orientation was _____ in reinforcing my knowledge of correct gun tube orientation *(center of observation sector)*.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

6) The creation of tactical events was _____ in providing an opportunity to determine the formation and movement technique appropriate to that situation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

7) The training provided in this lesson was _____ in helping me to maintain skills required to control and move an armor platoon.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

8) The standard of 80% was used as a preliminary standard for this skill area. A standard of 80% was _____.

5	4	3	2	1
very acceptable	acceptable	borderline	unaccept-able	very unaccept-able

9) *Comments:*

_____

_____

_____

PART 2: Ease of Use

EXERCISE 1: BEGINNING

1) The program conventions exercise was _____ for executing the performance requirements in Exercise 1.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

2) The use of video-motion for presentation of hand and arm signals was _____ in enabling recognition.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The steps to construct tank formations and orient gun tubes were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

4) The instructions for these steps to construct tank formations and to orient gun tubes were _____.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

5) The use of audio, video, and graphics to provide instructional feedback was a(n)
    _____ combination for presenting correct information.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

6) Color coding was _____ for indicating when certain functions (e.g., enter) were
    available.

5	4	3	2	1
extremely useful	of consider-able use	of use	not very useful	of no use

7) The item evaluation screen was _____ in providing an indication of strengths and
    weaknesses.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

8) The technique of deactivating the mouse during audio presentations and activating it
    when the audio is finished served as a(n) _____ cue for performing the steps.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

9) Did the training take place without the courseware malfunctioning?
Yes __ No __

If answered no, please comment:

_____

_____

_____

10) Did the training take place without the hardware system malfunctioning?
Yes __ No __

If answered no, please comment:

_____

_____

_____

11) Exercise 1 was _____ in providing a valuable foundation for recognition of signals and knowledge of formations.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

12) *Comments:*

_____

_____

_____

_____

_____

_____

_____

EXERCISE 2: ADVANCED

1) The program's convention exercise was _____ for executing the performance requirements in Exercise 2.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

2) The use of multimedia *(audio video and graphics)* was _____ in providing for a realistic training presentation.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

3) The steps required to draw lines for tank movement were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

4) The ability to use the repeat audio command to repeat a tactical event or instruction was _____.

5	4	3	2	1
extremely useful	of considerable use	of use	not very useful	of no use

5) The use of voice and graphics to provide feedback was _____.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

6) The item evaluation screens were _____ in providing an indication of strengths and weaknesses.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

7) In Exercise 2, the combined use of video, audio and graphics to create the mental image or perception of operating in a movement-to-contact operation was _____.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

8) Upon receipt of a "Go" criterion in this lesson, my ability to control the platoon, utilize correct formations, and employ movement techniques can be best described as _____.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

9) **Comments:**

_____

_____

_____

_____

_____

_____

_____

_____

FORMATIVE EVALUATION OF THE RC ARMOR JUNIOR LEADER TACTICAL TRAINING PROGRAM
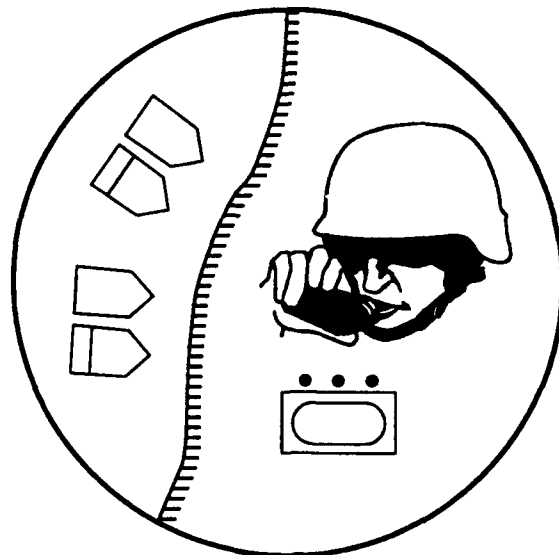
EVALUATION BOOKLET NO. 2
SOVIET WEAPONS AND ORGANIZATION

LESSON OBJECTIVE STATEMENT
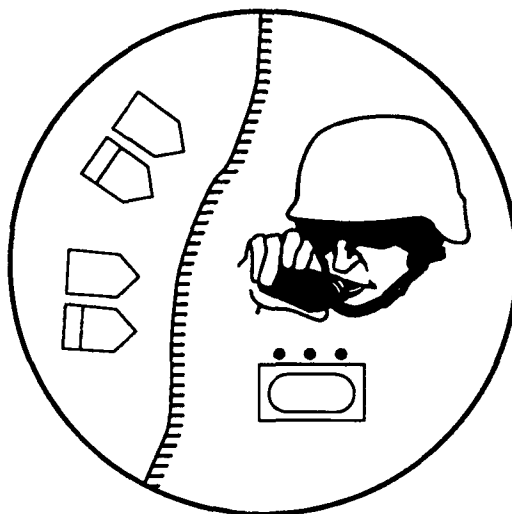
MODULE 2, LESSON 1
SOVIET WEAPONS AND ORGANIZATION
(BTR) MOTORIZED RIFLE REGIMENT

Lesson Objective:

To develop a detailed knowledge of the capabilities of this potential enemy's anti-tank weapon systems and the units that employ these weapons. This training supports ARTEP 17-237-10-MTP Command and Control Task 173-0100.

Time spent in minutes: Exercise 1 _____.

                                  Exercise 2 _____.

                                  Exercise 3 _____.

                                  Exercise 4 _____.

                                  Total Time _____.

PART 1: Adequacy of Training for Sustaining the Skills Specified in the Lesson Training Objective

1) The training objectives for the four exercises were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

2) The array of questions on the AT-4 and AT-5 anti-tank guided missiles were _____ in increasing my knowledge about the capabilities of these weapons.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The questions on the T-80 main battle tank deployed in the defense were _____ in increasing my knowledge about the capabilities of this tank.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

4) The questions on the SPG-9 anti-tank gun and RPG-16 anti-tank rocket were _____ in increasing my knowledge about the capabilities of these weapons.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

5) The questions on anti-tank mines, mine laying vehicles, and mine fields were _____ in increasing my knowledge about the capability for using this weapon.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

6) The questions on organization of MRR anti-tank capable unites and the distribution of anti-tank weapons for these units were _____ in increasing my knowledge about the anti-tank capability of each type of unit.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

7) The training provided in this lesson was _____ for learning the anti-tank capability of a potential enemy.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

8) The standard of 80% successful completion of training objectives was used as a preliminary standard for this skill area. A standard of 80% was _____.

5	4	3	2	1
very acceptable	acceptable	borderline	unaccept-able	very unaccept-able

9) The lesson was _____ in providing a valuable foundation for knowing the capability of a potential enemy for destroying armor.

5	4	3	2	1
more than adequate	adequate	borderline	inadequate	very inadequate

10) The lesson was _____ in challenging my knowledge with respect to the anti-tank capability of a Soviet *(BTR)* Motorized Rifle Regiment.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

11) Upon receipt of a "Go" criterion in this lesson, my knowledge of a potential enemy's anti-tank capability can be best described as _____.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

12) *Comments:*

_____

_____

_____

_____

_____

_____

_____

_____

_____

PART 2: Ease of Use

1) The use of video stills *(pictures and graphics)* to visually represent each capability question was _____ for learning about that particular weapon.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

2) The combination of audio and visual images *(video, graphics, changing color of text)* for providing the correct answers was _____.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

3) The steps to selecting appropriate choice boxes and entering data were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

4) The item evaluation screens were _____ in providing an indication of strengths and weaknesses.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

5) Did the training take place without the courseware malfunctioning? Yes __   No __

   If answered no, please comment:

   _____

   _____

   _____

   _____

6) Did the training take place without the hardware malfunctioning? Yes __   No __

   If answered no, please comment:

   _____

   _____

   _____

   _____

7) *Comments:*

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

EVALUATION OF THE RC ARMOR
JUNIOR LEADER TACTICAL TRAINING PROGRAM
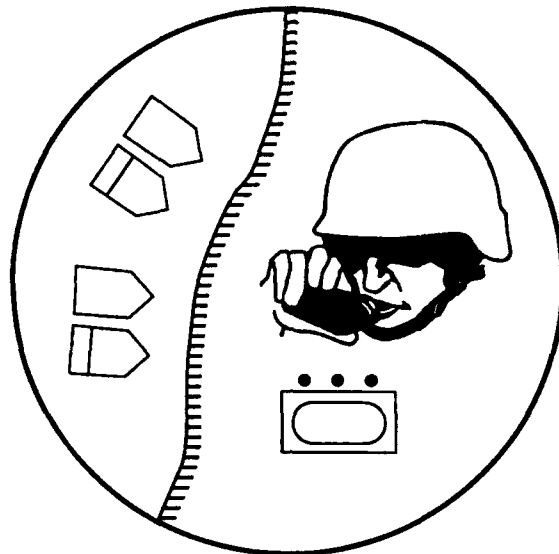
EVALUATION BOOKLET NO. 3
SOVIET TACTICS

LESSON OBJECTIVE STATEMENT
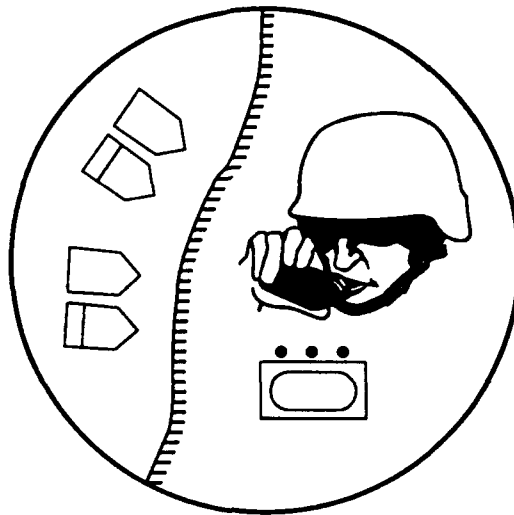
MODULE 2, LESSON 2
SOVIET TACTICS

Lesson Objective:

To develop the ability to "See the Battlefield" *(that is, the ability to (a) identify key terrain and avenues of approach, and (b) anticipate how a potential enemy will use this terrain)* so that good estimates of enemy positions and kill zones can be made. This training supports ARTEP17-237-10-MTP Command and Control Task 17-3-0100.

Time spent in Minutes for:

Practical exercise through key terrain instructions _____.

Practical exercise for Key Terrain and Avenue of Approach section _____.

Practical exercise for Reconnaissance Patrol section _____.

Practical exercise for Combat Outpost section _____.

Practical exercise Review section _____.

Practical exercise for Estimate of Engagement Sequence _____.

Total Time _____.

A-29

PART 1: Adequacy of Training for Sustaining the Skills Specified in the Lesson Training Objective

1) The training objectives for this exercise were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

2) The requirement to identify the key terrain and main avenue of approach using a map/ground reconnaissance was _____ in making me use the same mental analyses that I would use in an actual leader's recon given the same mission.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The type of practice provided in this exercise to identify key terrain and avenues of approach was _____ for developing terrain analysis skills.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

4) The standard of 80% was used as a preliminary standard for this skill area. A 80% standard is _____.

5	4	3	2	1
very acceptable	acceptable	borderline	unacceptable	very unacceptable

5) The requirement to identify the locations of the reconnaissance patrols in their primary and alternate positions and their corresponding sections of fire was _____ in making me work through the same mental analyses that I would use in an actual leader's recon given the same mission.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

6) The type of practice provided in the exercise was _____ for developing the skills needed to plot reconnaissance patrols and their ATGM kill zones.

5	4	3	2	1
very adequate	adequate	borderline	inadequate	very inadequate

7) The standard of 60% was used as a preliminary standard for this skill area. A 60% standard is _____.

5	4	3	2	1
very acceptable	acceptable	borderline	unacceptable	very unacceptable

8) The technical questions on the launch windows for the AT-5 were _____ in increasing my knowledge about the range at which the platoon is most vulnerable to a launch.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

9) The requirement to identify the location of the combat outpost and estimate its defensive fire plan and potential firesack was _____ in making me analyze the enemy's plan at the level of detail needed to move against an actual forward outpost.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

10) The standard of 60% was used as a preliminary standard for this skill area. A 60% standard is _____.

5	4	3	2	1
very acceptable	acceptable	borderline	unaccept-able	very unaccept-able

11) The practice of estimating the combat outpost and its fire plan and engagement area *(firesack)* was _____ for developing the skills needed to locate this forward defensive position and its kill zones.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

12) The questions on the mission of the combat outpost, the combat elements that make up the outpost, the artillery, and mine assets were _____ in increasing my knowledge about the extent of the combat outpost's anti-tank capability and potential actions.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

13) The post exercise review was designed to show how your estimates match the actual enemy force array and the key topography, and to provide you with an idea of your strengths and weakness. The post exercise review was _____.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

14) The requirement to estimate or project the enemy's engagement sequence was _____ in allowing me to practice the same cognitive processes that I would work through if I were planning to move against an actual enemy force.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

15) The standard of 70% was used as a preliminary standard for this skill area. A 70% standard is _____.

5	4	3	2	1
very acceptable	acceptable	borderline	unaccept-able	very unaccept-able

16) The type of practice provided for estimating an enemy's engagement sequence was _____ for developing the skills to anticipate an enemy's planned actions for this tactical situation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

17) What sort of problems, if any, did you have with the scoring for this part of the exercise?

Please comment:

_____

_____

_____

18) This exercise was _____ in providing a foundation for developing the skills needed to out-think a potential enemy.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

19) The exercise was _____ in challenging my decision making and analysis ability to "see the battlefield" *(to identify key terrain, plot enemy positions and kill zones).*

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

20) In the exercise, the various video images of the enemy and its anti-tank capability were _____ in heightening my awareness of this capability and in helping me to accurately project the enemy force arranged in a given zone of action.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

21) The skills practiced in this exercise for estimating the enemy situation are _____ for success in an actual movement-to-contact operation against a potential enemy.

5	4	3	2	1
highly critical	critical	borderline	non-critical	highly non-critical

PART 2: Ease of Use

1) The program conventions exercise was _____ in preparing for the performance requirements in this exercise.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

2) The video and graphics presentations for the introduction and statement of the training requirement were _____ in stimulating my interest to practice decision making skills required to "out-think" an enemy.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The use of video and audio presentation of the enemy situation was _____ in presenting the tactical problem.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

4) Practice on use of the terrain visual system was _____ for learning the steps necessary to perform a ground/map reconnaissance.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

5) The steps required to circle key terrain, draw the avenue of approach, and to move back and forth from the map to the terrain visuals were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

6) The instructions on how to perform these steps were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

7) The orientation dots on the close-up tactical maps were _____ for relating a terrain picture in the visual system to its location on the map.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

8) Did you have any difficulty using the actual topographical 1:50,000 map to study and locate the area of interest on the video map? Yes __ No __

If answered yes, please comment:

_____

_____

_____

9) The video introduction on reconnaissance patrols and their tactics was _____ for conveying the threat that they represent to armor as it moves into their security zone.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

10) The steps required to identify the three potential AT-5 launch areas for a recon patrol are _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

11) The use of audio feedback and graphics for describing the potential launch areas and the chances for detection were _____ for understanding the threat that the AT-5 system possesses at the stand-off range.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

12) The steps required to place patrols on the video map and show each patrol's sector of fire were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

13) The multimedia (*graphics, video, audio*) presentation for the combat outpost and the combat elements that make up this forward position were _____ in providing a mental image of an intelligent and capable adversary.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

14) The steps required to plot the positions and sectors of fire for the T-80s and AT-4 Spigot were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

15) The instructions on how to perform these steps were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

16) The technical information on the capability to support the outpost with substantial anti-tank mines and artillery was _____ in increasing my awareness of the extent of the anti-tank defense that would be met at this forward position.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

17) The steps required to plot the minefields and artillery concentrations were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

18) The instructions on how to perform these steps were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

19) The steps required to identify the combat outpost, a switch position and the firesack are similar to those for drawing key terrain. Did you have any problems in performing these steps?

If answered yes, please comment:

_____

_____

_____

20) In the post exercise review, the use of color graphics and audio was _____ in showing and discussing *my* estimate of terrain, enemy positions and kill zones as compared to the actual enemy situation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

21) The review solution feature was provided to let you view the total tactical picture as it is built piece-by-piece. Through this process, the intent was to make you keenly aware of enemy intentions, and for you to build a mental image of the zone of action with respect to the enemy's defensive plan. The feedback and review solution was _____ in providing me with these perceptions.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

22) During the post exercise review, what problems, if any, did you experience in the scoring?

Comments:

_____

_____

_____

23) The steps required to estimate or project the enemy's engagement sequence were ____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

24) The instructions on how to perform these steps were _____ .

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

25) The technique of displaying active boxes in red was _____ in working the exercise.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

26) The use of audio and graphics to replay the tactical situation and explain the enemy's probable action was _____ in providing for an analysis of each engagement sequence.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

27) *Comments:*

_____

_____

_____

_____

_____

_____

_____

_____

EVALUATION OF THE RC ARMOR
JUNIOR LEADER TACTICAL TRAINING PROGRAM
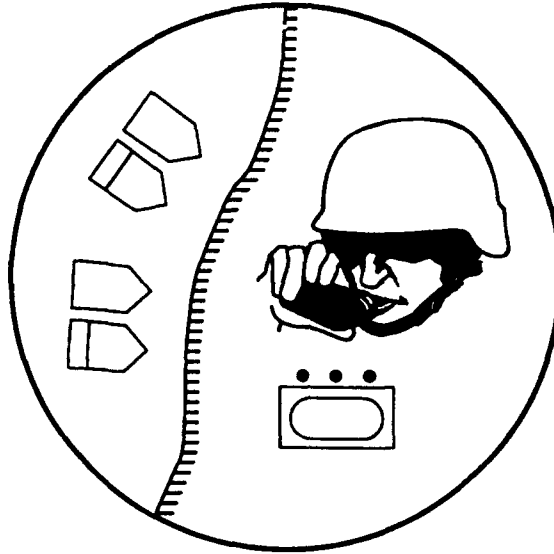
EVALUATION BOOKLET NO. 4
TACTIC PLANNING

LESSON OBJECTIVE STATEMENT
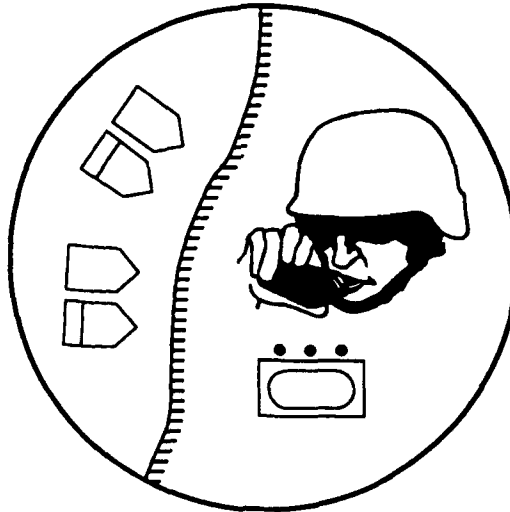
MODULE 3, LESSON 1
TACTIC PLANNING

Lesson Objective:

To develop, through practice, the junior leader's cognitive ability to accurately anticipate how a potential enemy will use the terrain and to effectively plan counters to reduce the enemy's planned fires. This training supports ARTEP 17-237-10 MTP Command and Control Task 17-3-0100.

Time spent in Minutes for:

Practical exercise through mission brief and subsequent questions _____.

Practical exercise for map reconnaissance of key terrain and avenue of approach _____.

Practical exercise for map reconnaissance estimate of the enemy situation *(recon patrols and combat outpost)* _____.

Practical exercise segment for developing tactical plan using map recon.

Tentative Route _____.
TRPs and Indirect Fire Targets _____.
Fire Support Plan _____.

Practical exercise segment for ground/map reconnaissance to confirm /change key terrain and avenue of approach _____.

Practical exercise segment to confirm/change estimate of enemy situation based on ground recon _____.

Confirmation/revision of tentative plan based on ground recon _____.

Route _____.

TRPs and Indirect Fire Targets _____.
Fire Support Plan _____.

Post exercise review _____.

Total Time _____.

PART 1: Adequacy of Training for Sustaining the Skills Specified in the Lesson Training Objective

1) The training objectives for the exercise were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

2) The operations order was _____ in requiring me to listen to and understand the same types of operational concepts and maneuver requirements as would be expected for an actual tactical situation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

3) The questions on the warning order and the commander's operation order were ____ in testing my knowledge and understanding of that order and the platoon's requirement.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

4) Often in a combat situation there will not be the time to physically see your zone of action prior to developing your plan. The requirement to estimate the enemy situation and develop a tactical plan using only a map reconnaissance was ____ in making me work through the same mental analyses that I would have to work through in an actual situation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

5) The practice of using a map reconnaissance was ____ for developing the cognitive skills required to translate the topographical map into a good mental picture of the enemy and to plan actions to counter him.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

6) The leader's recon provided you with a chance to view the zone of action. Based on this look at the terrain, did you make any changes to your estimate or plan?

Please circle yes or no:

Key Terrain	*Yes*	*No*
Avenue of Approach	*Yes*	*No*
Recon Patrols/Killzones	*Yes*	*No*
Combat Outpost	*Yes*	*No*
Defensive Scheme	*Yes*	*No*
Route	*Yes*	*No*
TRPs	*Yes*	*No*
Artillery Targets	*Yes*	*No*
Fire Support Plan	*Yes*	*No*

Comments:

_____

_____

_____

7) The effectiveness of your plan was evaluated with respect to reducing the number of the enemy's engagement opportunities. In this evaluation, a determination is made as to whether line of sight exists between the enemy positions and the tank platoon, whether the platoon is in range, and whether platoon planned direct or indirect fires suppress enemy positions. The simulation and graphics were _____ in showing the probable results of my plan's ability to reduce the enemy's planned fires?

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

8) The preliminary standard for the reduction of anti-tank guided missile launches is a 75% reduction in the planned fires. A 75% standard is ____.

5	4	3	2	1
very acceptable	acceptable	borderline	unaccept-able	very unaccept-able

9) The preliminary standard for the reduction of fires from the combat outpost is a 50% reduction in the planned fires. A 50% standard is ____.

5	4	3	2	1
very acceptable	acceptable	borderline	unaccept-able	very unaccept-able

10) The exercises like the one just taken were _____ in developing the skills needed to anticipate the locations and actions of a potential enemy and plan actions to counter him.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

11) The exercise was _____ in challenging my decision making and tactical ability to visualize the defensive scheme of this potential enemy and plan effective counters to reduce his fires.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

12) In the post-exercise review, the animation sequences of your platoon moving under your supporting fires and the various video images of the enemy either firing or unable to fire were _____ in reinforcing the criticality of reducing the enemy fires.

13) The skills practiced in this exercise for estimating the enemy situation and planning actions to counter him are _____ for success in an actual movement-to-contact operation.

5	4	3	2	1
highly critical	critical	borderline	non-critical	highly non-critical

14) Upon receipt of a "Go" criterion, my ability to estimate the potential enemy situation and plan actions to counter him can be best described as _____.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

15) *Comments:*

_____

_____

_____

_____

_____

_____

_____

_____

PART 2: Ease of Use

EXERCISE 1

1) The video and audio presentation of the commander's operation was _____ in presenting a realistic tactical problem.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

2) The steps required to answer the questions on the warning order and company operations order were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	different	very different

3) A variety of media *(video, audio, and graphic animation)* were used to provide correct feedback on the planning questions. The media were _____ for learning this information.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

4) The steps on how to develop the fire support plan through the check points were _____ to perform.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

5) The instructions for the fire support planning steps were _____.

5	4	3	2	1
very clear	clear	borderline	unclear	very unclear

6) To enable your planning process, a number of features were provided for varying the amounts of detail displayed on the tactical map. These features are the HIDE, FILL and TGT AREA commands. I found these features _____.

5	4	3	2	1
very helpful	helpful	borderline	unhelpful	very unhelpful

Comments:

_____

_____

_____

7) The instructions and demonstration on the use of these features were _____ to follow.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

8) The process of confirming or changing any aspect of your estimate of the enemy situation or tactical plan was designed to systematically allow you in turn to accept or change each element. I found this procedure _____ to use.

5	4	3	2	1
very easy	easy	borderline	difficult	very difficult

9) At the completion of your plan, audio and video stills were used to stress the criticality of reducing the enemy's ability to fire first. These media were _____ in conveying this message.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

10) In the post-exercise review, multimedia (video, graphic animation, and audio) were used to show the potential results of your planned counter against the enemy units arranged against you. This presentation was _____ in showing me the probable results of this confrontation.

5	4	3	2	1
very effective	effective	borderline	ineffective	very ineffective

11) During the post-exercise review, what problems , if any, did you experience with the scoring?

Comments:

_____

_____

_____

12) The summary of your performance for Tactical Planning includes all of the analysis elements for the enemy situation and the results of the effectiveness of your plan. Did you have any problems with these summary data?

Comments:

_____

_____

_____

13) Did the courseware run smoothly without malfunctioning? Yes __ No __

If answered no, please comment:

_____

_____

_____

14) Did the hardware run smoothly without malfunctioning? Yes __ No __

If answered no, please comment:

_____

_____

_____

15) What sort of problems, if any, did you have in executing the lesson requirements?

Comments:

_____

_____

_____

16) *Comments:*

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX B

User Acceptance Category by Question
Matrix for each Booklet:

Platoon Drills
Soviet Weapons and Organization
Soviet Tactics
Tactical Planning

Table B-1
User acceptance questions for booklet 1.

User Acceptance Category	Booklet 1 Platoon Drills			
	Part 1		Part 2	
	Basic	Advanced	Basic	Advanced
Adequacy of Training	1, 2, 3, 4	1, 2, 4, 5, 7	11	8
Ease of Use	—	—	1, 3, 4, 6, 8	1, 3, 4
Functional Fidelity	—	3, 6	—	—
Acceptance of Standards	—	8	—	—
Media Presentation	—	—	2, 5, 7	2, 5, 6, 7

Table B-2
User acceptance questions for booklet 2.

User Acceptance Category	Booklet 2 Soviet Weapons and Organization	
	Part 1	Part 2
Adequacy of Training	1, 2, 3, 4, 5, 6, 7, 9, 10, 11	—
Ease of Use	—	3
Functional Fidelity	—	—
Acceptance of Standards	8	—
Media Presentation	—	1, 2, 4

Table B-3
User acceptance questions for booklet 3.

| User Acceptance Category | Booklet 3 Soviet Tactics | |
	Part 1	Part 2
Adequacy of Training	1, 3, 6, 8, 11, 12, 13, 16, 18, 19	16
Ease of Use	—	1, 4, 5, 6, 7, 10, 12, 14, 15, 17, 18, 23, 24, 25
Functional Fidelity	2, 5, 9, 14, 21	—
Acceptance of Standards	4, 7, 10, 15	—
Media Presentation	20	2, 3, 9, 11, 13, 20, 21, 26

Table B-4
User acceptance questions for booklet 4.

User Acceptance Category	Booklet 4 Tactical Planning	
	Part 1	Part 2
Adequacy of Training	1, 3, 5, 10, 11, 14	—
Ease of Use	—	2, 4, 5, 6, 7, 8
Functional Fidelity	2, 4, 13	—
Acceptance of Standards	8, 9	—
Media Presentation	7, 12	1, 3, 9, 10

APPENDIX C

Individual Performance Data

Table C-1
Individual performance data.

Booklet		Soldier							
		A	B	C	D	E	F	G	H
Platoon	$\overline{x}$	59.0	64.5	67.0	64.5	68.0	77.5	81.5	74.0
Drills	s	2.8	10.6	19.8	6.4	5.7	13.4	0.7	5.7
Soviet	$\overline{x}$	51.5	40.8	58.5	29.0	63.0	51.5	72.2	56.2
Weapons	s	14.2	12.0	20.6	5.1	11.3	15.6	16.9	12.6
Soviet	$\overline{x}$	17.0	12.5	14.8	8.5	18.0	7.2	11.8	34.5
Tactics	s	17.9	18.4	16.5	17.0	18.8	8.8	13.9	37.0
Tactical	$\overline{x}$	19.6	13.8	22.4	18.8	41.6	28.0	23.4	10.8
Planning	s	19.9	19.1	15.1	21.3	15.7	5.9	10.1	21.5
Total	Σ	147.1	131.6	162.7	120.8	190.6	164.2	188.9	175.5
	$\overline{x}$	36.8	32.9	40.7	30.2	47.6	41.0	47.2	43.9
	s	21.6	24.8	25.9	24.4	22.8	30.3	34.7	27.3

APPENDIX D

User Acceptance Data for Each Booklet:

**Platoon Drills
Soviet Weapons and Organization
Soviet Tactics
Tactical Planning**

Table D-1
User acceptance ratings for each question in booklet 1.

Booklet 1 Platoon Drills					
Part 1 - Basic			Part 1 - Advanced		
Question #	$\overline{x}$	s	Question #	$\overline{x}$	s
1	4.12	.991	1	4.00	.926
2	4.75	.463	2	4.25	.707
3	3.88	.641	3	4.12	1.126
4	4.38	.744	4	4.38	.744
			5	4.50	.756
			6	4.38	.518
			7	4.25	.463
			8	4.12	.354
Part 2 - Basic			Part 2 - Advanced		
Question #	$\overline{x}$	s	Question #	$\overline{x}$	s
1	4.25	.707	1	4.25	.707
2	4.75	.463	2	4.88	.354
3	3.75	1.581	3	3.12	1.356
4	4.12	.834	4	4.38	.916
5	4.38	.518	5	4.62	.518
6	4.38	.744	6	3.88	.641
7	4.38	.518	7	4.62	.518
8	4.25	.707	8	3.50	.534
11	4.75	.463			

Table D-2
User acceptance ratings for each question in booklet 2.

| Booklet 2 Soviet Weapons and Organization | | | | | |
| Part 1 | | | Part 2 | | |
Question #	$\bar{x}$	s	Question #	$\bar{x}$	s
1	4.25	.463	1	4.14	.378
2	4.38	.744	2	4.29	.488
3	4.25	.707	3	4.00	.577
4	4.25	.707	4	4.29	.488
5	4.50	.534			
6	4.38	.518			
7	4.38	.744			
8	4.25	.463			
9	4.12	.834			
10	4.62	.744			
11	4.12	.641			

Table D-3
User acceptance ratings for each question in booklet 3.

Booklet 3 Soviet Tactics					
Part 1			Part 2		
Question #	$\overline{x}$	s	Question #	$\overline{x}$	s
1	4.12	.641	1	4.50	.534
2	3.62	.518	2	4.25	.463
3	3.62	.916	3	4.25	.463
4	4.00	.534	4	3.88	.641
5	4.38	.518	5	4.12	.641
6	4.50	.534	6	4.00	.534
7	4.12	.354	7	3.88	.641
8	4.38	.518	9	4.12	.641
9	3.88	.834	10	4.00	.534
10	4.12	.354	11	4.12	.354
11	4.12	.354	12	4.00	.534
12	4.50	.534	13	4.50	.534
13	4.38	.744	14	4.00	.756
14	4.62	.744	15	4.00	.756
15	4.38	.744	16	4.12	.641
16	4.25	.707	17	4.25	.707
18	4.38	.744	18	4.38	.518
19	4.38	.744	20	4.38	.518
20	4.25	.707	21	4.50	.534
21	4.50	.534	23	4.25	.707
			24	4.38	.518
			25	4.38	.744
			26	4.50	.534

Table D-4
User acceptance ratings for each question in booklet 4.

Booklet 4 Tactical Planning					
Part 1			Part 2		
Question #	$\overline{x}$	s	Question #	$\overline{x}$	s
1	4.38	.518	1	4.38	.744
2	4.50	.534	2	4.12	.641
3	4.75	.463	3	4.50	.534
4	4.50	.534	4	3.88	.834
5	4.50	.534	5	3.88	.991
7	4.38	.518	6	3.88	1.126
8	4.00	.534	7	4.12	.641
9	4.25	.463	8	4.00	.756
10	4.88	.354	9	4.25	.463
11	4.62	.518	10	4.50	.534
12	4.62	.518			
13	4.50	.756			
14	4.25	.707			

APPENDIX E

Individual User Acceptance Ratings

Table E-1
Individual user acceptance ratings.

Booklet		Soldier							
		A	B	C	D	E	F	G	H
Platoon Drills	$\bar{x}$	4.45	4.66	3.62	4.28	3.79	4.21	4.21	4.83
	s	.74	.48	.90	.84	.90	.49	.73	.54
Soviet Weapons	$\bar{x}$	4.60	4.33	3.93	3.73	4.53	4.27	4.33	4.63
	s	.51	.49	.46	.46	.64	.46	.49	.81
Soviet Tactics	$\bar{x}$	4.4S	4.42	3.56	3.81	4.47	4.07	4.00	4.91
	s	.55	.50	.50	.45	.50	.51	.38	.37
Tactical Planning	$\bar{x}$	4.65	4.43	3.91	3.96	4.70	4.04	3.96	5.00
	s	.49	.51	.60	.71	.47	.64	.64	.00
Total	$\bar{x}$	4.55	4.46	3.76	3.94	4.37	4.15	4.12	4.84