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Innovative Training Concepts for Use in Distributed Interactive Simulation Environments

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Armed Forces Research Unit
Training Systems Research Division

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13. ABSTRACT (Maximum 200 words)
This report describes innovative approaches for conducting training using emerging simulation technology. It is intended as a forward-looking reference for training developers and trainers interested in conducting specific types of training exercises using Distributed Interactive Simulation (DIS). The report presents five innovative training concepts that can be structured within a DIS environment for delivery of five types of training exercises, including (a) a Battle Staff Planning Exercise, (b) a Leader's Reconnaissance Exercise, (c) a Mission Rehearsal Exercise (Electronic Sandtable), (d) a Mission Execution Exercise (Electronic Sandbox), and (e) an Information Management Exercise. The report concludes with a description of the implementation of one of these five concepts, an Information Management Exercise (IMEX).

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Innovative Training Concepts for Use in Distributed Interactive Simulation Environments

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FOREWORD

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is charged with conducting basic and applied behavioral and social research that will contribute to the Army's capability to meet the soldier performance challenges of today and tomorrow. As part of ARI's training research program, the objective of the Future Battlefield Conditions team at Fort Knox is to enhance soldier preparedness by identifying future battlefield conditions and developing training methods that assure effective soldier performance under these conditions.

As the Army moves toward the greater use of simulation environments for training, particularly distributed interactive simulation (DIS) environments, innovative training concepts are needed to capitalize fully on the capabilities of simulation environments for training. This product presents five innovative training concepts for structuring simulation-based exercises and an Information Management Exercise. It is intended as a reference for training developers and trainers with an interest in using advanced simulation technologies for training.

ARI's research on training requirements and methods for future automated Command, Control, and Communications (C³) systems is supported by the Memorandum of Agreement (MOA) between ARI's Research Unit at Fort Knox (ARI-Knox) and the Tank Automotive Command (TACOM) on Combat Vehicle Command and Control (CVCC) dated March 1989 and the MOA between ARI-Knox and the U.S. Army Armor Center (USAARMC) at Fort Knox titled Research in Future Battlefield Conditions, 12 April 1989.

The results of this effort were briefed to the Commanding General, Fort Knox; the Director, Mounted Warfighting Battle Space Laboratory; Deputy Chief of Staff, U.S. Army Armor School; Commanding General, Training and Doctrine Command (TRADOC); and the Deputy Chief of Staff-Training, TRADOC.

EDGAR M. JOHNSON
Director

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In addition to the authors, the BDM Federal, Inc., research staff participating in the effort included Silver Campbell, Margaret Shay, and Timothy Voss.

Personnel of the onsite support contractor, Loral Training and Technical Services, supported simulation equipment. They included Jimmy Adams, David Clippinger, Michael Krages, Paul Monday, Rob Smith, and Diane York.

The Combat Vehicle Command and Control (CVCC) Innovative Training task yielded two research products. This product focuses on the development of simulation-based training concepts and the implementation of an Information Management Exercise (IMEX). The other product describes specific tools and products that may be of interest to training developers and trainers planning simulation-based training. Since the two documents grew out of the same research effort, they share a common background. As a result, the authors have relied on common descriptive narrative where appropriate. The approach reflects the full knowledge and agreement of all authors. It has been adopted to ensure clarity and consistency across the two products.

INNOVATIVE TRAINING CONCEPTS FOR USE IN DISTRIBUTED INTERACTIVE SIMULATION ENVIRONMENTS

CONTENTS

	Page
INTRODUCTION	1
Overview of the Research Product	1
Background	2
INNOVATIVE TRAINING CONCEPTS	7
Overview of Five Innovative Training Concepts	
Using DIS	7
A Battle Staff Planning Exercise	9
A Leader's Reconnaissance Exercise	12
A Mission Rehearsal Exercise (Electronic Sandtable)	14
A Mission Execution Exercise (Electronic Sandbox)	19
An Information Management Exercise (IMEX)	23
Implementation Decision	29
IMPLEMENTATION OF THE IMEX	30
IMEX Training Objectives	32
Training Approach for Prerequisite Skills	35
IMEX Training Delivery Software	36
IMEX Training Feedback Software	42
Development Phases and Iterative Improvements	50
FINDINGS AND RECOMMENDATIONS	56
IMEX Program	56
IMEX Software	60
Information Management SOPs	65
Innovative Training	65
REFERENCES	67
GLOSSARY	71
APPENDIX	
A. HARDWARE, SOFTWARE, AND TRAINING DEVELOPMENT CONSIDERATIONS FOR INNOVATIVE TRAINING CONCEPTS	A-1
B. TRAINING MATERIALS FOR PRACTICE VIGNETTE	B-1
C. TRAINING MATERIALS FOR TRAINING VIGNETTE 1	C-1

CONTENTS (Continued)

	Page
APPENDIX D. TRAINING MATERIALS FOR TRAINING VIGNETTE 2	D-1
E. TRAINING MATERIALS FOR TRAINING VIGNETTE 3	E-1
F. PRIVACY ACT STATEMENT, TRAINING EVALUATION QUESTIONNAIRE	F-1

LIST OF TABLES

Table 1. IMEX Training Objectives Linked to Tasks for Practice Vignette	34
2. IMEX Training Objectives Linked to Tasks for Vignette 1	34
3. IMEX Training Objectives Linked to Tasks for Vignette 2	35
4. IMEX Training Objectives Linked to Tasks for Vignette 3	35
5. IMEX CCD Self-paced Training Materials Training Objectives	37
6. C³ Capabilities of the CVCC CCD Configuration .	42
7. IMEX Operating Guidelines	43
8. IMEX Milestones	52
9. Software Functional Testing Form	53
10. Software Problem List	54
11. IMEX Materials	55
12. Student Ratings of IMEX CCD Training	57
13. Student Comments Regarding CCD Training . . .	57
14. Student Ratings of Exercise Materials	58
15. Student Comments Regarding Exercise Materials	59

CONTENTS (Continued)

	Page
Table 16. Situational Assessment Questionnaire Performance: Means and Standard Deviations	59
17. Student/SME Suggested Action Agreement Rate	61
18. Student Comments Regarding Software	62

LIST OF FIGURES

Figure 1. User needs to be met by Distributed Interactive Simulation (DIS)	4
2. The Distributed Interactive Simulation (DIS) architecture	5
3. Innovative training concepts for DIS	7
4. The IMEX hardware configuration	31
5. CCD display	32
6. Training schedule for participants	33
7. Coordinator's workstation	38
8. The two monitors used for IMEX exercise	41
9. Sign-in screen	44
10. OPORD/training objectives screen	45
11. ENDEX screen	46
12. Main menu screen	47
13. Message summary feedback screen	48
14. Exercise summary feedback screen	49
15. Situation report feedback screen	51

INNOVATIVE TRAINING CONCEPTS FOR USE IN DISTRIBUTED INTERACTIVE SIMULATION ENVIRONMENTS

Introduction

This research product describes innovative approaches for conducting training using emerging simulation technology. These concepts are innovative in two senses. First, they address training requirements that are presently being articulated within the Army community in response to current policy decisions, particularly the downsizing of the force, the fielding of increasingly sophisticated technological equipment and the shrinking budgets. Second, they use Distributed Interactive Simulation (DIS) as the environment within which training is delivered. Advanced simulation technologies such as DIS provide opportunities for unit and leader training that up until recently required expensive field training. DIS offers a cost-effective alternative by allowing soldiers to participate in training exercises through interactive combat vehicle simulators engaged in a simulated battlefield environment.

Overview of the Research Product

The purpose of this research product is two-fold. The first is to present five innovative training concepts that can be structured within a DIS environment for delivery of five types of training exercises. The second is to describe the implementation and tryout of one of these five concepts, an Information Management Exercise (IMEX).

The primary audience for this product is training developers and trainers with an interest in the use of simulation environments for delivering leader and collective training. Training developers may wish to consult this document as they update and extend training doctrine, such as Army Training and Evaluation Plans (ARTEPs) and Army Mission Training Plans (AMTPs), to incorporate emerging training requirements and to include simulation based exercises. Trainers within institutional and unit settings may wish to examine this document for concepts and materials that can be incorporated into their Program of Instruction (POI) or training plans, particularly as their access to DIS environments (such as the Army's Close Combat Tactical Trainer [CCTT]) increases.

This research product is organized into four major sections and series of appendices. The remainder of this section describes the background for the Army Research Institute's (ARI) program of research on innovative training. The second section presents five concepts for addressing emerging training requirements within a DIS environment. (Additional information on hardware, software and training development considerations can

be found in Appendix A.) The last two sections focus on the implementation and tryout of one specific concept, the IMEX. Appendixes B-F include all of the materials used to deliver and evaluate the IMEX. Training developers and trainers may find these materials particularly helpful as they design or structure their own exercises focused on information management skills.

Background

ARI's Field Unit at Fort Knox (ARI-Knox) provides research and development support to the Armor community. One of the research teams within the unit, the Future Battlefield Conditions (FBC) Team is charged with conducting research to forecast conditions on the future battlefield and to develop training methods to prepare soldiers to perform effectively under these conditions. The FBC Team has used the Army's DIS facility at Fort Knox, the Mounted Warfare Test Bed (MWTB), as a focal point for this research. The present effort aimed at the development and tryout of innovative training concepts grew out of this research program. The following discussion is intended to provide a short synopsis of the larger training research program and to describe the architecture and components of the DIS environment in which it was conducted.

The ARI-Knox Training Research Program. The FBC Team has been engaged in an ongoing program of research and development aimed at supporting the Army's requirements for future Command, Control, and Communications (C³) systems. A major thrust of this work has focused on future Combat Vehicle Command and Control (CVCC) prototypes. As part of the CVCC program as well as a program of ARI-sponsored research, ARI-Knox has been conducting simulation-based research on future C³ prototype configurations and the training requirements associated with these configurations.

The research program has included a series of simulation-based, soldier-in-the-loop evaluations of future tank systems and their associated training requirements. With one exception, these studies have been conducted in the DIS environment. They have proceeded in a bottom-up fashion from assessments of crew and platoon performance using a digitized position navigation (POSNAV) system (DuBois & Smith, 1989) and an automated C³ prototype similar in capability to the to the Intervehicular Information System (IVIS) for the tank commander (DuBois & Smith, 1991). A subsequent investigation conducted using the Unit Conduct of Fire Trainer (UCOFT) examined the integration of an IVIS-like prototype and POSNAV with the Commander's Independent Thermal Viewer (CITV), a digitized target acquisition tool for tank commanders (Quinkert, 1990). These efforts were followed by a series of investigations of company performance including: a company level evaluation of the operational effectiveness of

companies equipped with CVCC prototypes including integrated POSNAV, CITV, and an automated Command and Control Display (CCD) capabilities (Leibrecht, Kerins, Ainslie, Sawyer, Childs & Doherty, 1992); an examination of the training requirements associated with the integrated prototype (Atwood, Quinkert, Campbell, Lameier, Leibrecht & Doherty, 1991); and research on soldier-machine interface (SMI) issues associated with the design of CVCC user interfaces and controls (Ainslie, Leibrecht & Atwood, 1991).

More recent evaluations are focusing on the extension of future C³ capabilities to the battalion level. These efforts include an evaluation of automated workstations to support a battalion Tactical Operations Center (TOC) (O'Brien, Wigginton, Morey, Leibrecht, Ainslie, & Sawyer, 1992) and an evaluation of battalion level performance. Preliminary findings from the battalion level evaluation have been described (Leibrecht, Wunsch, Ford, Sawyer, Meade, Ainslie, Smith, Sever & Doherty, 1993), with a report of final findings anticipated in late 1993.

The impetus for the innovative training concepts described here lay in the increased understanding of training requirements projected for the future battlefield and of the powerful role that simulation environments can play in training derived from the FBC research program. These concepts were formulated to capitalize on the capabilities of the DIS environment which are described below.

The DIS Environment. The Army, along with the other military services, is currently engaged in the design of a DIS architecture. The DIS architecture is intended to provide a blueprint to guide the development of a general purpose simulation system which will meet the needs of a wide range of users, as shown in Figure 1 (from Beaver, Brasch, Burdick, Butler, Downes-Martin, Eller, Ferguson, Gotuby, Huber, Katz, Miler, Morrison, Sherman, Stanley & Yelowitz, 1992). (These types of simulation-based environments sometimes are referred to popularly as "virtual" environments.)

The DIS architecture is being structured to satisfy a large set of user objectives. Most notable here are "Training Development" and "Training & Readiness." In implementing an architecture to address such diverse needs, the most pervasive and general principle is to implement a man-in-the-loop simulation which simulates battlefield interaction between multiple warfighters at levels of fidelity that are sufficient to invoke realistic decision making behavior by the participants.

DIS is a direct descendent of simulation networking (SIMNET) technology. SIMNET was initiated in 1983 as a project on large-scale simulator networking by the Defense Advanced Research

Projects Agency (DARPA). It was a proof-of-principle technology demonstration of interactive networking for real-time, person-in-the-loop battle engagement simulation and wargaming suitable for a broad range of applications (Alluisi, 1991).

The FBC team initiated its CVCC research and development program in what was then the SIMNET-Developmental (SIMNET-D) facility established at Fort Knox in May, 1986. This facility contains developmental simulators designed to serve as reconfigurable weapon systems in which selected system characteristics can be modified to emulate conceptual weapon system configurations and their associated soldier-machine interfaces. This facility was subsequently renamed and is now known as the MWTB. The MWTB focuses primarily on armor-oriented environments as might be expected given its location at Fort Knox. (It should be noted, however, that the DIS program itself is larger in scope including other branches within the Army and other services within the Armed Forces.)

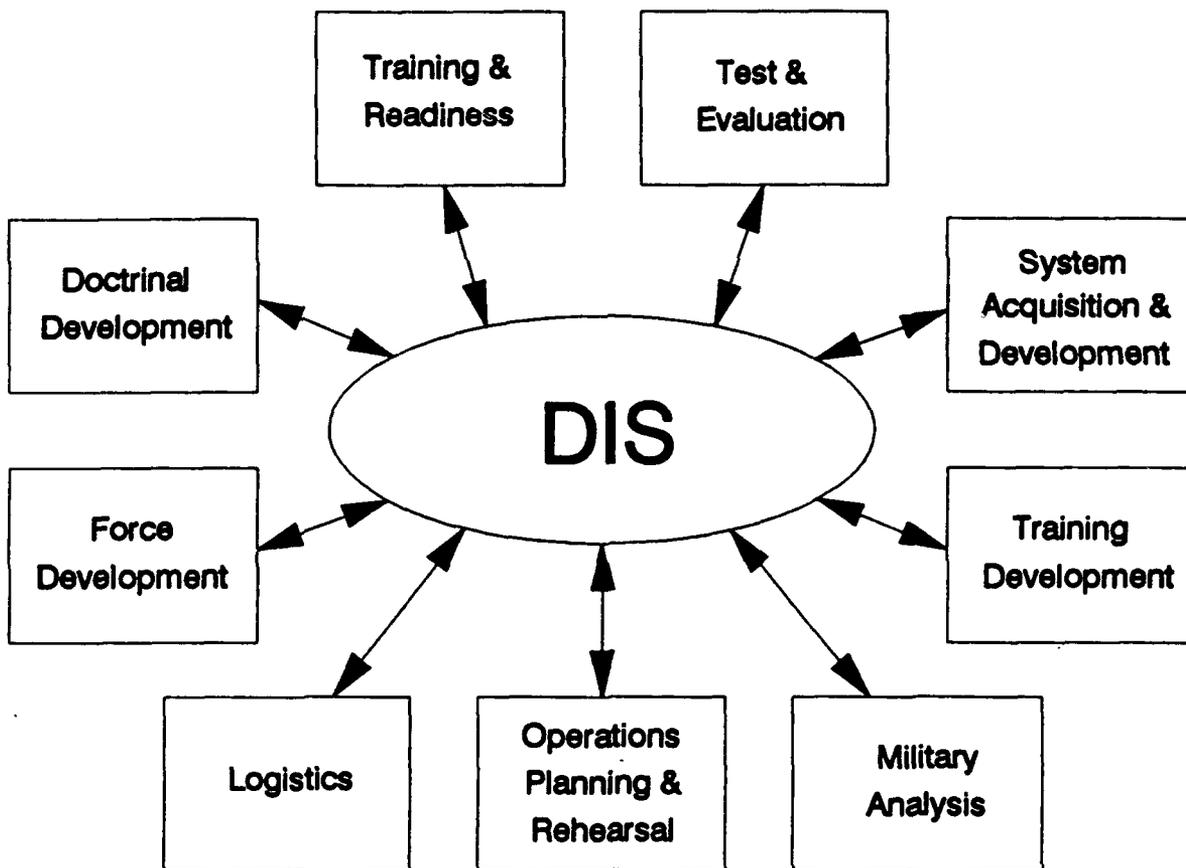


Figure 1. User needs to be met by Distributed Interactive Simulation (DIS) (from Beaver et al., 1992)

Figure 2 illustrates the networked simulation architecture which has supported the ARI program. These components provide the environment within which the training concepts described in this Research Product are intended to be implemented and evaluated.

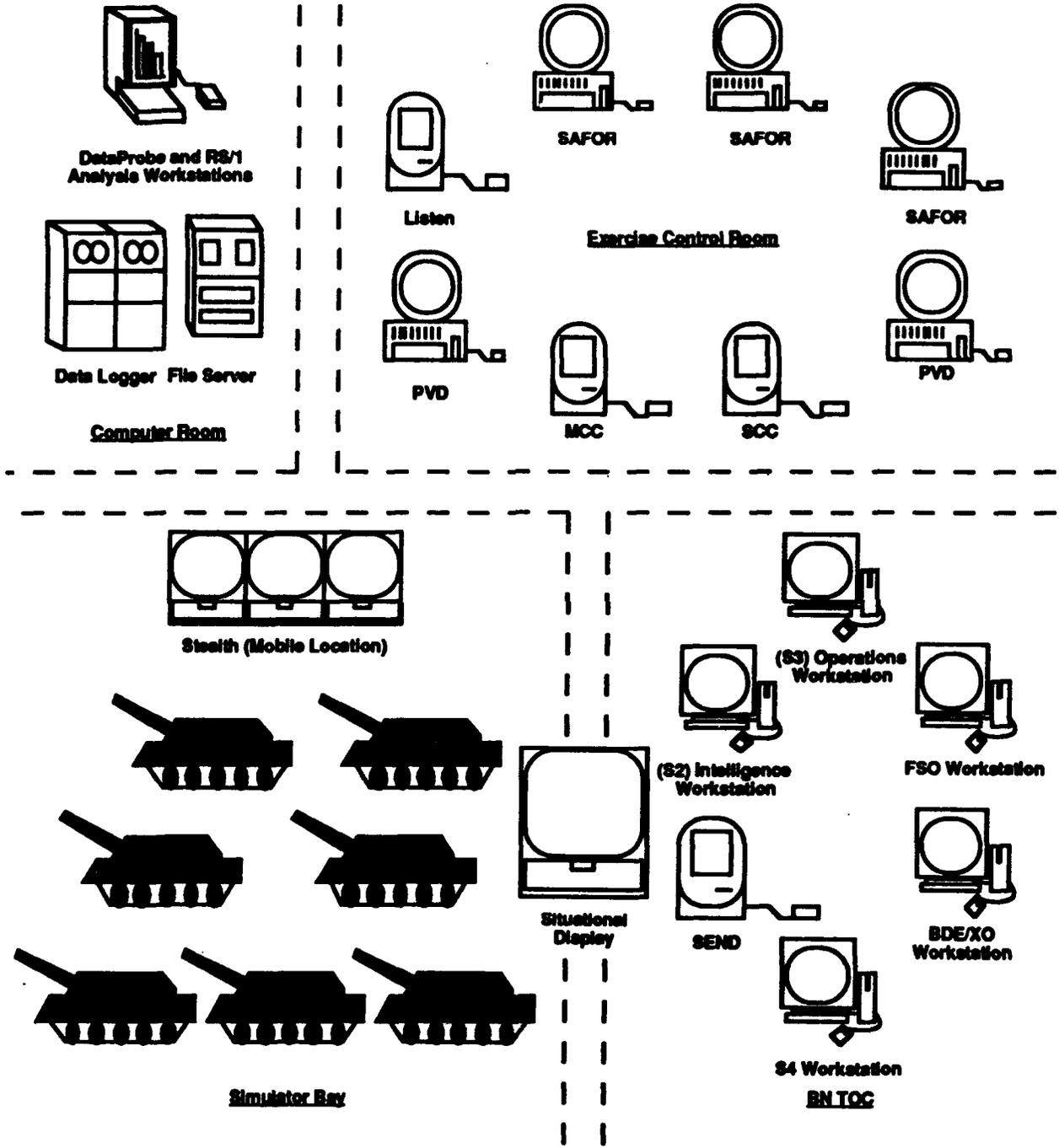


Figure 2. The Distributed Interactive Simulation (DIS) architecture

The architecture includes five major classes of components. The first class includes the simulators themselves shown in the simulator bay. These M1 simulators are built to be reconfigurable so that components can be utilized as required for a particular training or testing exercise. Thus, a particular component such as POSNAV or the CCD may be added to simulators to support a particular training or testing requirement. (The only exception to this modularity is the CITV which is integrated into the simulator simulation software.) For the most recent ARI-Knox research effort, simulators were configured to operate with CVCC prototype systems (including an integrated POSNAV, CCD, CITV capability) or as standard baseline M1 simulators. The second class includes the automated Tactical Operations Center which includes workstations for battalion staff including an Intelligence Workstation (S2), Operations Workstation (S3), a Fire Support Workstation (FSO), a workstation which can be used as a Brigade or an Executive Officer Workstation (CDR/XO), a Combat Service Support (S4) workstation, and a large screen Situation Display. (A SEND utility for transmitting automated messages is currently housed on the S4 workstation.)

A third major component identified in Figure 2 and located in the simulator bay is the STEALTH. The STEALTH is a phantom vehicle which can be used to traverse the battlefield without detection by battlefield participants. The STEALTH has been used for a wide variety of purposes including terrain analysis, reconnaissance, and After Action Reviews (AARs).

A fourth class of components reside in or adjacent to the Exercise Control Room. They include:

- (1) A Management, Command and Control (MCC) system for controlling and monitoring manned simulators and implementing fire support;
- (2) A SIMNET Control Console (SCC) for initializing an exercise and setting battlefield parameters;
- (3) Semi-Automated (SAFOR) stations for creating and controlling unmanned vehicles and aircraft, both friendly (BLUEFOR) and enemy (OPFOR);
- (4) A Plan View Display (PVD) for providing a "birds eye view" of the battlefield which can be used to monitor exercises and flag key events;
- (5) A LISTEN station to record digital messages; and
- (6) Radio nets for monitoring simulated Single Channel Ground Airborne Radio System (SINCGARS) radio traffic and communicating between control stations and manned simulators.

Finally, the computer room contains a set of components for use in data recording and analysis including: (a) a file server, (b) a Data Collection and Analysis System (DCA) for on-line recording of automated data and exercise playbacks (DataLogger), and (c) off-line reduction and analysis (DataProbe and RS/1 Analysis Workstations). (DataLogger, DataProbe, and RS/1 are registered trademarks of the BBN Software Products Corporation.) At present, all of these DCA components are only available at test-oriented DIS facilities such as the MWTB at Fort Knox. Currently, training-oriented DIS sites have the file server and DataLogger systems to allow for recording of all automated data and subsequent exercise replay.

Taken together, the components forming this architecture provides the structure within which the innovative training exercises described here are intended to be implemented and evaluated. It provides the larger picture for interpreting how the specific exercises described in subsequent sections can be delivered within a DIS environment.

Innovative Training Concepts

Overview of Five Innovative Training Concepts Using DIS

Our primary focus in this section is on describing five innovative training concepts which are capable of implementation within a DIS environment. These concepts were specifically formulated to address training requirements which are growing in prominence within the Army community as the nature of the future battlefield is projected. They were also conceptualized for delivery within a simulation training environment in light of current trends toward the increased use of simulation for training, reduced budgets and areas for field training, and the capability to simulate emerging technology to be fielded (such as automated command and control devices) within this type of environment.

Figure 3 provides an overview of the five training concepts formulated. As shown in the figure, the five training concepts (or exercises) span the stages of a tactical mission: planning, preparation, and execution.

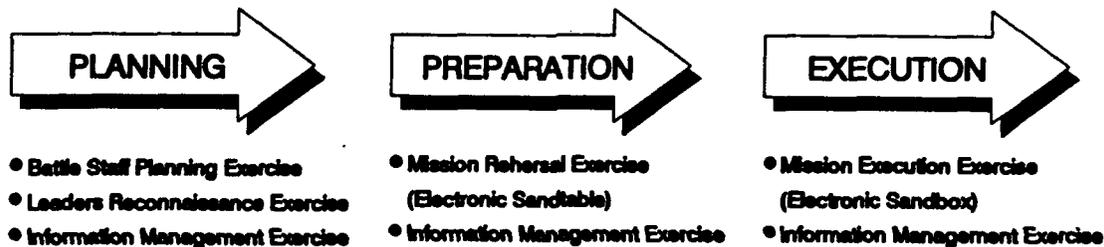


Figure 3. Innovative training concepts for DIS

Two exercises focused on mission planning: a Battle Staff Planning Exercise and a Leader's Reconnaissance Exercise. The remaining two exercises focused on mission preparation and mission execution: a Mission Rehearsal Exercise (Electronic Sandtable) and a Mission Execution Exercise (Electronic Sandbox). The IMEX could be adapted for use in all three stages of a tactical mission. As reported in this research product, this particular training concept was implemented in the mission execution stage.

The following sections present descriptions of each of the training concepts identified above. They are intended to provide training developers and trainers with possible approaches to consider as they plan and implement simulation-based training. They also provided a framework of options for the FBC Team at ARI-Knox to select from in identifying a candidate exercise for subsequent development, implementation and tryout.

However, before introducing these concepts in more depth, we wish to highlight the design principles used in formulating these concepts. These principles guided the substance and format of the concepts. Some of these principles are embedded in the Army's capstone training doctrine manual, FM 25-100 (Department of the Army[DA], 1988); others emerged from discussions with members of the Army community as particularly important considerations in future training design. In brief, our training design principles included:

- (1) design performance-oriented training;
- (2) set the training concept in the appropriate institutional and/or unit training setting;
- (3) provide a foundation for developing standardized, replicable training events;
- (4) build in hands-on experience to the extent possible;
- (5) allow multiple opportunities for practice;
- (6) make the training concept as realistic as possible, with particular attention to features that influence performance;
- (7) formulate a strategy for capturing objective performance data;
- (8) plan for incorporating feedback to trainees into the exercise through a structured AAR; and
- (9) explicitly identify the resources required to develop the training concept including existing hardware and

software and development of training materials and training software.

More specifically, descriptions of the five training concepts which follow are organized into four parts. These parts address: the training need addressed by the exercise, the training audience for the exercise, the operational concept for training delivery and feedback, and recommendations for implementation and tryout. Requirements for hardware, software, and software modifications needed to support each exercise can be found in Appendix A.

Since one of these concepts, the IMEX, was subsequently implemented and tried out requirements for hardware and software configuration and for software modifications were subsequently implemented. Hence, these requirements are presented in this section for the IMEX rather than in Appendix A.

A Battle Staff Planning Exercise

This Planning Exercise is aimed at training planning skills of battalion staff members and providing them the opportunity to work together in an integrated manner. Students would be provided a Brigade Operations Order and directed to work together in accordance with their Tactical Standard Operating Procedures (SOP) to develop their Battalion Operations Order and graphics, as well as the interim products. Each battalion staff member would be provided a workstation with appropriate software to use in the exercise. Students would receive feedback in the form of annotated solutions and doctrinally correct examples.

Training Need. The vital role of command and staff planning at the battalion level has long been recognized in Army doctrine (e.g., Command and General Staff College, 1991). The importance of effective staff planning as an key contributor to combat success has been underscored by lessons learned from the National Training Center (NTC) as early as 1985 (Center for Army Lessons Learned[CALL], 1985). The planning process is also receiving heightened attention with recent projections of the highly paced, rapidly changing future battlefield which highlight the need for faster planning cycles (U.S. Army Armor Center, 1992).

The need for increased training emphasis on the planning process was stressed by members of the Combined Arms training community at Fort Leavenworth in recent interviews (Atwood, Wunsch, Quinkert & Heiden, 1994). Respondents held strong views that the fundamentals as currently outlined in doctrine must be proficiently mastered. Further, they stressed needs for explicit and focused training on the planning process and effective coordination among battalion staff. The Battle Staff Planning Exercise was designed to address these needs.

Training Audience. The recommended training audience for this exercise is the Battalion Command Group and Staff. Four positions are recommended for inclusion: the Battalion Commander, the Battalion Executive Officer (XO), the S3 and the S2. Students enrolled in institutional training in preparation for these positions would be appropriate candidates. These individuals could all be drawn from the Armor Officer Advanced Course (AOAC). The Battalion Commander could be drawn from the Armor Pre-Command Course (PCC) and participate with AOAC students as command group and staff members. Members of Battalion Command groups and staff in Active Components (AC) would also be an appropriate training audience given access to a DIS facility.

Operational Concept for Training Delivery and Feedback. In the institutional training context, students from AOAC would participate in the exercise in small groups up to four (although pairs or individuals could be accommodated). Each student would be assigned the duty position of Battalion Commander, Battalion XO, Battalion S3 or Battalion S2 and a workstation. Alternatively, the Battalion Commander for this exercise could be drawn from PCC with other duty positions filled by AOAC students. In the unit training context, the Battalion Command group and staff (Battalion Commander, XO, S3 and S2) would participate in the exercise. Students would review training materials and the job aid on workstation operations and familiarize themselves with the workstation. Students would also be provided with a TOC SOP for their review and use in the exercise.

A Brigade Operations Order and associated graphics (with Intelligence Annex and associated overlay) would be provided to the Battalion Commander for his review and study. These materials would be provided in hardcopy and entered into the workstation for his use. (In the latter case, the Brigade Operations Order would be sent to the workstation using an existing software program, the SEND utility. Graphics would be entered into the workstation beforehand.) The Battalion Commander would be directed to prepare to brief the mission and issue his planning guidance to his staff. After an appropriate amount of time, the XO, S2 and S3 would convene with the Battalion Commander to receive his mission briefing and planning guidance. The Battalion Commander may use the workstation to brief his mission as he deems appropriate.

The task of the students operating as Battalion Command Group and Staff would be to work together in accordance with the TOC SOP to prepare:

- (1) Commander's planning guidance;
- (2) a Warning Order;

- (3) Intelligence Preparation of the Battlefield (IPB) templates and overlays;
- (4) an operations estimate;
- (5) a tentative plan;
- (6) a leader's reconnaissance;
- (7) an updated plan;
- (8) the Battalion Operations Order and graphics.

Trainees would be expected to operate as a normally functioning TOC during the planning phases of a mission using the provided SOP. However, in addition to voice communication, they would receive and send information using their workstations.

The primary approach to training feedback would be self-assessment by students. This self-assessment is anticipated to take two main forms. First, students would compare their products to annotated solutions and doctrinally correct examples. Second, students would be presented textual descriptions of key teaching points. One or both forms may be provided as the basis for self-assessment depending on the specific product.

For example, after a Warning Order is prepared, the student would use the mouse to indicate when he is finished. Then a doctrinally correct example would be presented and students would be directed to compare their product to the doctrinally based example. The doctrinally correct example would be presented as one acceptable approach, not the ONE right answer. When there are discrepancies, students would be directed to consider whether they would make a change and if so, how. If they would not make a change, they will be asked to formulate their rationale. On-line feedback would also include a message center containing explanatory text windows which would include major teaching principles.

For products requiring graphic overlays such as tentative or updated Operations Plans, on-line feedback would include sets of doctrinally correct graphic overlays which would be placed over the developed overlay. The doctrinally correct overlay would be in a different color such as green. This approach would allow students to compare their overlay with a doctrinally correct overlay to examine the correspondence between, for example, their sets of control measures.

Recommendations for Initial Implementation and Tryout of Option. Our recommendations for structuring the initial implementation of this option is to use a Defense in Sector mission so as not to complicate planning with tactical movement.

Duty positions would include: Battalion Commander, XO, S3, and S2.

We expect that workstation familiarization and completion of a planning exercise would take approximately two days.

Leader's Reconnaissance Exercise

This exercise can be used as an adjunct to the Battle Staff Planning Exercise described above. In the planning exercise, leader reconnaissance is conducted as a map reconnaissance on the workstation. In this companion exercise, a more detailed and realistic leader reconnaissance can be conducted at the STEALTH.

If used in conjunction with the Battle Staff Planning Exercise, the Battalion Commander would leave the TOC and go to the STEALTH to conduct his reconnaissance. After the reconnaissance, the quality of his reconnaissance would be examined through replay on the PVD and use of the intervisibility function. The Commander would then return to the TOC and use information gained during his reconnaissance as inputs for updating the tentative plan.

Training Need. Leader reconnaissance is an important activity within the mission planning and preparation process which has been receiving increasing attention as an area of training need. For example, the General Accounting Office (GAO) (1991) conducted an analysis of Army training needs as part of a larger study of the availability of land for Army field training. They conducted extensive interviews with members of the Army training community and analyzed lessons learned developed by the CALL from the Army's Combat Training Centers and other major exercises such as Reforger. Reconnaissance and counter reconnaissance in general, and leader reconnaissance in particular, emerged as important areas of training need.

The GAO view was shared by members of the Combined Arms training communities in recent interviews (Atwood et al., 1994). The commander's need to "see the battlefield" was viewed as an important precursor to effective mission execution--highlighting the critical role of leader reconnaissance in the planning and preparation process. The concept for the Leader Reconnaissance Exercise described here was developed to address training needs in this area.

Training Audience. The recommended training audience for this exercise is the Battalion Commander. Preferably, the Battalion Commander would be operating as the leader of the Battalion Command Group and Staff participating in the Planning Exercise (although this exercise could be used independently to train leader reconnaissance). As suggested for the planning exercise, in the institutional training context this individual

could be drawn from AOAC along with other students participating as members of the command group or staff. Or, he could be drawn from the PCC and participate with students from AOAC. In the unit training context, the Battalion Commander, along with key staff, would participate.

Operational Concept for Training Delivery and Feedback.

This exercise is intended to be used in conjunction with the Battle Staff Planning Exercise. It allows the Battalion Commander the opportunity to conduct a more in-depth leader's reconnaissance than is possible with the map reconnaissance built into the planning exercise.

After the tentative plan is derived in the planning exercise, the Battalion Commander would leave the TOC and go to the STEALTH. He may bring his battalion staff with him to observe his reconnaissance. First, he would be provided with familiarization training on the operation of the STEALTH and how to communicate with the SAFOR Operator who will actually accomplish the movement of the STEALTH vehicle in accordance with the Battalion Commander's guidance. Then, with the terrain database initialized to the appropriate terrain and his vehicle placed at the nominal physical location of the TOC, the Battalion Commander would be given an opportunity to conduct a leader's reconnaissance. He would accomplish the reconnaissance by directing the SAFOR operator to move to specified locations or in a specified direction. While the approach and procedures used to conduct the reconnaissance would be left up to the Battalion Commander, he would be reminded that the objectives of the leader's reconnaissance are to confirm the tentative plan and to examine the METT-T factors (Mission, Enemy Troops, Friendly Troops, Time, Terrain) which might influence the plan.

After completion of the reconnaissance, the Battalion Commander and his staff would return to the TOC to complete the planning exercise. His immediate task would be to make inputs for updating the tentative plan based on the information he acquired during his reconnaissance.

After completion of his reconnaissance, the Battalion Commander would go to the PVD to review and replay his reconnaissance. The other members of his battle staff participating in the planning exercise may also be invited to participate as observers in this activity. At key points, the intervisibility function will be invoked to examine the visibility of the commander's vehicle (as represented by the Stealth) to the enemy.

Using a similar format as in the Planning Exercise, a message center for feedback would also be displayed on the PVD screen. This message center would allow for the display of explanatory text windows conveying major teaching principles on

leader reconnaissance. These points would focus on the role of the leader reconnaissance in confirming a tentative plan and examining potential influences of METT-T factors. Particular attention would be paid to identification of avenues of approach, obstacles, enemy locations and positions, selection of the reconnaissance route, and key observation points.

Recommendations for Initial Implementation and Tryout of Exercise. Our recommendations are to use the same mission as the Planning Exercise, Defense in Sector, for initial implementation and tryout of this exercise. The primary duty position would be the Battalion Commander, although other members of the battle staff (e.g., XO, S2, S3) may participate in the debriefing session if desired.

A Mission Rehearsal Exercise (Electronic Sandtable)

This exercise capitalizes on the capabilities of the DIS environment to train unit leaders in the conduct of an effective rehearsal. Mission rehearsals are typically conducted as backbriefs or verbal "talk throughs" using a map or a sand table with movable objects to represent units, vehicles, obstacles, key features of the terrain, and control measures. The DIS environment offers the additional capability to conduct more realistic rehearsals using vehicle simulators placed on a digital battlefield. This "electronic sandtable" approach has two distinct advantages. First, it is more realistic than a conventional sandtable. Second, it is more cost effective and feasible than a field rehearsal (which is often difficult to conduct due to available time and/or tactical and logistical considerations). Rehearsals in a DIS environment may be conducted as full force or reduced force rehearsals and may be used in conjunction with other forms of rehearsal such as backbriefs.

Training Need. The contribution of mission rehearsals to effective combat performance was dramatically demonstrated in the recent Desert Storm conflict (e.g., Kolcum, 1991a and 1991b). The importance of mission rehearsals has also been amply demonstrated at the NTC to the point that the CALL recently devoted an entire bulletin to effective rehearsal techniques (CALL, 1991a).

Procedures for conducting effective rehearsals were also pinpointed as critical training needs in recent interviews with members of the Combined Arms training community (Atwood et al., 1994). Respondents emphasized the importance of using a variety of techniques and procedures to ensure that rehearsals yield a common understanding of the commander's intent and mission plan as well specific understandings of each element's role in the plan. The concept for a rehearsal exercise described here was formulated to address these training needs.

Training Audience. The ability to conduct effective mission rehearsals is an important skill at all echelon levels. Recent lessons learned from the Combat Training Centers (CTCs) and Operation JUST CAUSE in Panama (CALL, 1991b) suggest that, not only must leaders practice with their own units, but that multiechelon rehearsals are required to yield the synchronization necessary for an effective mission. Thus, the recommended training audience for this exercise includes leaders and key staff at battalion (the Battalion Commander, the XO, the S3, the S2, and the FSO at a minimum, along with respective vehicle crews or TOC assistants), at company (company commanders, XOs and their respective crews), and at platoon (platoon leaders, platoon sergeants, wingmen and their respective crews). In some cases, it may be appropriate to use the SAFOR capability within the DIS environment to represent selected BLUEFOR units to reduce personnel requirements for the exercise.

The Mission Rehearsal Exercise could be treated as a follow-on to the Battle Staff Planning Exercise described earlier by maintaining members of the Battalion Command and Staff group from that exercise and augmenting them with additional personnel at battalion, company, and platoon. This approach would have the advantage of providing an opportunity for battalion leaders to rehearse the mission which they have just planned. Alternatively, this exercise may be treated as a stand-alone exercise focused on rehearsal skills with a given set of operations orders as a starting point.

The training audience may appropriately be drawn from either an institutional training context or a unit training context assuming access to a DIS environment. For example, in the Armor institutional training context, the PCC would be appropriate for drawing prospective Battalion Commanders and the AOAC would be appropriate for drawing members of the Battalion Command Group (such as the XO), primary battalion staff members (such as the S2, S3 and the FSO), Company Commanders and their XOs. In the institutional training context, it would probably be appropriate to represent platoons using the SAFOR capability since the Armor Officer Basic (AOB) Course for platoon leaders has a broad and diverse POI with only minimal tactical training. Additional crew members for vehicles and assistants for the TOC could be filled on a rotating round-out basis with PCC and AOAC students since rotation through other positions has cross-training value as well as provides students the opportunity to acquire alternative perspectives on the battlefield. It might also be productive to include students from the Advanced Non-Commissioned Officers Course (ANCOC) as platoon sergeants and students from the Basic Non-Commissioned Officers Course (BNCOC) as tank commanders. This concept of "shared training" is receiving consideration from the Armor School.

In the unit training context, participants in this exercise may be drawn from battalion, company and platoon levels as appropriate and available. If necessary, the SAFOR capability within the DIS environment may be used to represent some units within the battalion to reduce the number of personnel required for the exercise.

Operational Concept for Training Delivery and Feedback. The Mission Rehearsal Exercise is structured into two main phases. The first is intended as a leader rehearsal and includes the Battalion Command and Staff (the Commander, XO, S3, S2, and FSO at a minimum, although other staff officers may be included as desired), Company Commanders and their XOs, and Platoon Leaders and their Platoon Sergeants (unless platoons are planned to be represented by SAFOR to reduce personnel requirements). In this phase, backbriefs and an electronic map rehearsal are the primary rehearsal techniques. The second is the "electronic sandtable" portion of the rehearsal which is conducted using the simulated TOC and the simulators in the DIS facility and may be conducted with a full or reduced force depending on training objectives and personnel availability.

The first phase of the exercise would begin in the simulated TOC with the Battalion Commander delivering his Battalion Operations Order (OPORD) to his XO, Battalion Staff, Company Commanders and their XOs. If trainees were participants in the Battle Staff Planning Exercise, the OPORD derived from this exercise may be used. If not, the OPORD for the mission would be provided to the Battalion Commander beforehand for review and study. In either case, the Commander would have access to a workstation displaying a terrain map with his Concept of Operations overlay for use in briefing his order. After the OPORD has been briefed, the Battalion Commander would conduct a backbrief and ask each individual to state their understanding of the mission, the commander's intent, the concept, and their role and timing in the mission. The workstation would be available for use in the backup process. A Training Coordinator would be available to monitor the briefing and backbriefing process and to make observations on performance.

After the backbrief, Company Commanders would have an opportunity to go to their simulators to conduct their own mission planning, to brief their platoon leaders (if they are participating in the exercise), and to rehearse among themselves. (Platoon leaders would be provided a similar opportunity if they are exercise participants.)

At this point, company commanders and their XOs would return to the TOC for a second backbrief and an electronic map rehearsal. In the backbrief, company commanders would tell the battalion commander how they are going to accomplish the mission -- again making use of the workstation with terrain map and

Concept of Operations overlay as needed. After the backbriefs, the Battalion Commander would direct a map rehearsal using a workstation located in the TOC. The workstation would display the mission terrain and his concept of operations overlay. (This display could be projected onto a large screen display if desired.) Using the electronic map, the battalion and company leaders would verbalize their elements' actions interactively as the concept of operation of the mission is walked through. The goal here is to synchronize the discussion to correspond to planned actions, not a "one at a time" discussion of each element's role.

At this point, the second phase, the "electronic sandbox", would begin. This phase would be conducted in the simulators with battalion staff (most likely the XO, Assistant S3, S2, and FSO) in the TOC and the Battalion Commander, the S3, companies and platoons in the simulators. This phase may be conducted as a full force or reduced force rehearsal depending on training objectives, personnel availability and simulation availability. In the reduced force mode, all tank commanders would require a crew which could be reduced below a four man crew depending on training objectives. However, some units within the battalion may be represented by SAFOR. In the full force mode, all vehicles within the battalion would be manned with a four man crew.

The Battalion Commander would direct the "electronic sandtable" rehearsal from his simulator using radio communications. After a ready signal, all elements of the battalion would initiate actions in accordance with their respective plans and timelines. The exercise would be monitored by a Training Coordinator who would monitor the radio nets, observe and flag key events using the Plan View Display, and formulate his own observations of the exercise.

At the end of the mission rehearsal, an AAR would be held to assess performance. If a requirement for adjusting mission planning is uncovered in the rehearsal or if performance does not meet established standards, the mission may be rehearsed again by "resetting" the "electronic sandtable" to the starting terrain for the mission and repeating the rehearsal. This iterative rehearsal capability is a major strength of the "electronic sandtable."

The first AAR would be for all leaders participating in the initial briefing and backbrief during the first phase. This AAR would be fairly informal and directed at eliciting from the training audience the strengths and weaknesses of the backbrief process as an effective rehearsal technique. The key elements of an effective backbrief and its distinguishing features from coordination would be stressed.

The second AAR would be conducted for the full or reduced force participating in the "electronic sandtable" phase of the training exercise. Here the training coordinator would lead the discussion to allow the battalion to assess the quality of their rehearsal. Inputs into this assessment would include replays of critical events occurring during the rehearsal identified by the Training Coordinator, clips of communications tapes as relevant, observations made by the Training Coordinator and quantitative measures drawn from the DIS automated data stream. In the latter case, these measures would be specified beforehand based on the training audience, mission objectives and the commander's intent. Since rehearsal is intended to mirror execution, many of these measures would likely be drawn from measures derived for the Mission Execution Exercise which examine the correspondence between unit actions and control measures.

The AAR discussion would focus on the correspondence between actions taken in the rehearsal and those called for in the planning process and whether any weaknesses in the plan were uncovered. In the former case, the training unit would have the opportunity to conduct another rehearsal to improve their performance if deemed desirable. In the latter, the S3 would be given an opportunity to update the Decision Support Template and the exercise could be rerun as a rehearsal for the adjusted mission.

Recommendations for Initial Implementation and Tryout. It is recommended that this exercise be developed using a Battalion Deliberate Attack mission. This strategy would yield two possible missions for use in the exercise. If used in conjunction with an earlier exercise, the Defense mission developed in conjunction with the Battle Staff Planning Exercise could be used. Alternatively, developing an offensive mission in addition would provide the opportunity for tactical movement as part of the rehearsal process and would yield a mission which would complement the defense mission derived in the Battle Staff Planning Exercise.

To keep personnel requirements manageable, we recommend a reduced force "electronic sandtable" exercise with selected units within the battalion represented by SAFOR. More specifically, in the first phase of the exercise, we suggest inclusion of six members of the battalion command and staff group (the Battalion Commander, the XO, the S3, the Assistant S3, the S2 and the FSO) along with three Company Commanders and their XOs. The fourth company in the battalion would be represented using the SAFOR. We also recommend using the SAFOR to represent the platoons within each of the four companies. These individuals would participate in the second phase of the exercise as well. All tank commanders (Battalion Commander, S3, Company Commanders and XOs) would also require crews for the "electronic sandtable".

We expect that prerequisite training on the TOC workstation and simulators and completion of the rehearsal exercise would take approximately two days. Multiple iterations of the "electronic sandtable" that are highly desirable from a training perspective would probably extend this period to three or four days.

A Mission Execution Exercise (Electronic Sandbox)

As the Army reconsiders its training strategy in light of reduced budgets, the use of simulation to train units in mission execution has been a focal point of attention. While networked simulators such as the CCTT are not expected to completely replace expensive field training exercises, they are expected to provide prerequisite training in command and control, synchronization, and tactical execution of combat missions. This simulation training will allow leaders and units to hone their skills so that their field exercises can be used for maximum training advantage. This mission execution exercise or "electronic sandbox" is one example of how the DIS environment can be used to provide a well structured exercise for leaders and units with systematic feedback on their performance. It may be used in conjunction with the Mission Rehearsal Exercise or may serve as a stand-alone exercise.

Training Need. Effective mission execution is the linchpin to mission success. Fighting effectively requires experience in engaging the enemy under similar circumstances and conditions as might be expected in actual combat. Distributed simulation plays a key role in this training arena by providing a "simulated electronic battlefield" that can be structured to reflect anticipated battlefield requirements and situations (Quinkert & Atwood, 1992).

The value of using DIS environments to training mission execution was attested to by members of the Armor and Combined Arms training communities in recent interviews (Atwood et al., 1994). Capabilities of the environment for this type of training viewed as particularly important included: carefully constructed scenarios with systematically varying conditions, standardization of training events and their sequence, and objective feedback through performance data and focused AARs. The concept for a mission execution exercise described here was designed to address these training needs and to capitalize on the strengths of the DIS environment for providing units with training on mission execution.

Training Audience. The flexible networking structure within the DIS environment allows networks to be configured that are appropriate for training at platoon, company and battalion level. The Mission Execution Exercise described here focuses on the battalion level. We have selected battalion since it represents

a more complex example than company or platoon and training developers could use the battalion example to derive lower echelon exercises if desired. Maintaining focus at the battalion level also provides an example of how the Mission Execution Exercise can be used in conjunction with the Mission Rehearsal Exercise.

The recommended training audience for this exercise includes leaders and key staff at battalion (the Battalion Commander, the XO, the S3, the S2, and the FSO at a minimum along with respective vehicle crews or TOC assistants), at company (company commanders, XOs and their respective crews), and at platoon (platoon leaders, platoon sergeants, wingmen and their respective crews). In some cases, it may be appropriate to use the SAFOR capability within the DIS environment to represent selected BLUEFOR units to reduce personnel requirements for the exercise.

As noted earlier, the Mission Execution Exercise could be treated as a follow-on to the Mission Rehearsal Exercise. This approach has the advantage of providing an opportunity for units to actually execute the mission which they have rehearsed. Furthermore, if the Mission Rehearsal Exercise is used in conjunction with the Battle Staff Planning Exercise, battalion leaders have the opportunity to perform all phases of a mission from planning to rehearsal to execution. However, as an alternative, the exercise may be treated as a stand-alone which focuses on mission execution with a given set of operations orders as a starting point.

As with the rehearsal exercise, the training audience may be drawn from either an institutional training context or a unit training context assuming access to a DIS environment. For example, in the Armor institutional training context, the PCC would be appropriate for drawing prospective Battalion Commanders and the AOAC would be appropriate for drawing members of the Battalion Command Group (such as the XO), primary battalion staff members (such as the S2, S3 and the FSO), Company Commanders and their XOs. In the institutional training context, it would probably be appropriate to represent platoons using the SAFOR capability since the AOB Course for platoon leaders has a broad and diverse POI with only minimal tactical training. (Further, the tactical training provided in AOB focuses largely on platoon tactics. Thus, if a DIS-based exercise were to be incorporated into AOB, it would more appropriately be a platoon exercise rather than incorporating platoons within the context of a battalion exercise as described here.) Additional crew members for vehicles and assistants for the TOC could be filled on a rotating round-out basis with PCC and AOAC students since rotation through other positions has cross-training value as well as provides students the opportunity to acquire alternative perspectives on the battlefield. As noted for the rehearsal exercise, the concept of "shared training" might also be

considered here with the inclusion of students from the ANCOG as platoon sergeants and, perhaps, students from the BNCOG as task commanders.

In the unit training context, participants in this exercise may be drawn from battalion, company and platoon levels as appropriate and available. If necessary, the SAFOR capability within the DIS environment may be used to represent some units within the battalion to reduce the number of personnel required for the exercise.

Operational Concept for Training Delivery and Feedback. The concept for delivery of the Mission Execution Exercise varies somewhat depending if the exercise is a follow-on to the Mission Rehearsal Exercise (and the Battle Staff Planning Exercise) or whether it is a stand-alone exercise. Two main differences are anticipated based on which of these situations is operable. They concern the amount of equipment training required and the amount of time required for planning prior to the initiation of the exercise.

In the former case, only refresher training on the TOC workstations and the simulators would be needed since the unit would have recently participated in the Mission Rehearsal Exercise. After this refresher training, the exercise would begin in the simulated TOC with the Battalion Commander delivering his Battalion OPORD to his XO, Battalion Staff, Company Commanders and their XOs. Since the battalion staff would have participated in the preparation of the OPORD in the Battalion Staff Planning Exercise and the unit would have participated in a rehearsal of the mission in the Mission Rehearsal Exercise, it can be assumed that the leaders and unit members are familiar with the mission and the OPORD. Thus, after the issuance of the order, the unit would disperse to the TOC or their vehicle simulators.

In the latter case where the exercise is a stand-alone, time would need to be built-in for both familiarization training on the TOC workstations and the simulators and for further study of the OPORD, planning and preparation. In either case, the Training Coordinator would be available to direct the equipment training process and to monitor the briefing and to make observations on performance.

After the briefing of the OPORD, Company Commanders would have an opportunity to go to their simulators, to go over their own mission planning (or to conduct the planning if it is a stand-alone exercise), and to brief their platoon leaders (if they are participating in the exercise). (Platoon leaders would be provided a similar opportunity if they are exercise participants.)

At this point, the "electronic sandbox", would begin. Battalion staff (most likely the XO, Assistant S3, S2, and FSO) would be located in the TOC and the Battalion Commander, the S3, companies and platoons would be located in the simulators. The exercise may be conducted with a full force or reduced force depending on training objectives and availability of personnel and simulators. In the reduced force mode, some units within the battalion may be represented by SAFOR. In the full force mode, all vehicles within the battalion would be manned with a four-man crew if sufficient networked simulators are available.

The mission would begin after a ready signal from the Battalion Commander. The Battalion Commander would command and control the execution of the mission from his simulator using radio communications. All elements of the battalion would initiate actions in accordance with their respective plans and timelines. The exercise would be monitored by a Training Coordinator and an assistant who would monitor the radio nets, observe and flag key events using the Plan View Display, and formulate their own observations of the exercise.

At the end of the mission, an AAR would be held to assess performance. This AAR would be led by the Training Coordinator and structured to encourage the unit to assess their strengths and weaknesses in executing the mission and to identify needs for improvement. Inputs into this assessment would include replays of critical events occurring during the exercise identified by the Training Coordinator, clips of communications tapes as relevant, observations made by the Training Coordinator, and quantitative measures drawn from the DIS automated data stream. In the latter case, these measures would be specified beforehand based on the training audience, mission objectives and the commander's intent.

The AAR discussion would focus on the correspondence between actions taken in the execution of the mission and those called for by the mission plan. The unit would be encouraged to identify the strengths and weaknesses of their execution and how they would improve upon their performance if they were to execute the mission again.

Recommendations for Initial Implementation and Tryout. It is recommended that this exercise be developed using either the Battalion Defense or the Battalion Deliberate Attack mission developed for earlier exercises.

To keep personnel requirements manageable, we recommend a reduced force "electronic sandbox" exercise with selected units within the battalion represented by SAFOR. More specifically, we suggest inclusion of six members of the battalion command and staff group (the Battalion Commander, the XO, the S3, the Assistant S3, the S2 and the FSO) along with three Company

Commanders and their XO's. The fourth company in the battalion would be represented using the SAFOR. We also recommend using the SAFOR to represent the platoons within each of the four companies. All tank commanders (Battalion Commander, S3, Company Commanders and XO's) would also require crews for the "electronic sandbox."

We expect that prerequisite training on the TOC workstation and simulators and completion of the Mission Execution Exercise would take approximately three to four days depending on whether the exercise is a follow-on to the Mission Rehearsal Exercise or a stand-alone.

An Information Management Exercise (IMEX)

The purpose of the IMEX is to train small unit leaders to manage incoming information efficiently and effectively. The exercise draws on a prototype automated Command, Control, and Communication C³ device to support receiving, processing and sending digital messages.

Training Need. The Army's Modernization Plan for C³ (DA, 1993) calls for the increasing use of technology and automated devices to enhance the capabilities of commanders and to counter the increasingly sophisticated C³ capabilities of threat forces. These technologies are exemplified by the IVIS to be fielded with the M1A2 tank but are expected to become even more powerful and capable with the incorporation of emerging technologies such as voice actuation.

The introduction of C³ automation brings needs for training, not only in the operation of the device itself, but also in skills for managing the increased information load produced by such devices. For example, in recent interviews with the Armor training community (Atwood et al., 1994), training in information management and the use of information management SOPs were identified as important emerging training requirements. Specific issues identified focused on when to use digital and when to use voice communications, how to filter incoming information, when to relay information and to whom, and how to divide attention between automated C³ devices such as the IVIS and vision blocks. The IMEX was developed to address training needs in information management resulting from the introduction of automated C³ devices.

Training Audience. The recommended training audience is Company Commanders, Platoon Leaders, Platoon Sergeants, and Tank Commanders. Given the Army's plans to field vehicle-based automated C³ devices in future tanks, leaders at the crew, platoon and company level will be directly affected and will need to learn to incorporate handling digital messages into their C³

procedures. Participating individuals may be presently serving in these positions or completing training in advance of such an assignment.

In the former case, where individuals are currently serving in targeted positions, the IMEX could be delivered as part of unit training. In the latter case where individuals are preparing for targeted assignments, the IMEX would most appropriately be delivered in an institutional training context. Four courses are likely to be most appropriate: (a) AOAC for prospective Company Commanders; (b) AOB Course for future platoon leaders; (c) ANCOC for prospective platoon sergeants; and (d) BNCOC for future tank commanders.

As noted above, the primary focus of this exercise is information management of automated digital communications. Currently, automated command and control devices are not included in the POIs for these courses. However, as such devices become fielded, it will be necessary to revise the POIs to include instruction on the use of automated digital communications. Thus, this exercise provides an example of one approach for addressing such training within the curriculum. If implemented at this time, this exercise would familiarize students with a prototype automated command and control device and provide initial training on information management skills for digital messages.

Operational Concept for Training Delivery and Feedback. The operational concept for this training exercise is drawn from Lickteig (1991). Lickteig used vignettes systematically varying in number of messages and relevance of messages to examine communications handling. This concept capitalizes on Lickteig's approach and extends it in two main ways by:

- (1) systematically increasing information load over sequence of training vignettes for a progressive increase in training difficulty; and
- (2) providing performance feedback to students and an AAR structure for feedback from a Training Coordinator and group discussion and exchange.

More specifically, students from AOAC, AOB, ANCOC, or BNCOC would participate in this exercise in small groups up to four in size. Each student would be assigned the position of Company Commander (AOAC students), Platoon Leader (AOB students), Platoon Sergeant (ANCOC students) or Tank Commander (BNCOC students).

Each student would be assigned a Student Workstation on which to complete the exercise. The workstation would be loaded with software for a prototype automated C³ device developed by

ARI-Knox -- the CCD. Each student would use the CCD to complete the exercise without any communication with other students or workstations. However, at the end of the exercise, students would participate in an AAR feedback discussion as a small group.

The exercise itself would be organized into two major parts. The first part would focus on familiarization with the operation of the CCD. Students would receive an introductory briefing, demonstration, training and practice on the use of the CCD software. This training is envisioned to include review of self-paced training materials and practice exercises including use of a job aid on CCD operations. This job aid would serve as a reference during the training session and be available to the student during the exercise as needed. The practice session would also include a simple practice vignette similar to the training vignettes followed by a small group question and answer session.

The second part of the exercise would be organized to provide students with three vignettes of progressive difficulty. Each vignette would begin with the provision of an extract of an OPORD, a paper map and graphic overlay to set the context. Students would be given time to familiarize themselves with these materials before moving to the workstations. The map display on each CCD would be initialized to correspond to the given OPORD. For a 10 minute segment, the student would be directed to manage his message traffic using the CCD. Messages, including Spot, Contact, and Intelligence reports, would be transmitted to the student at predetermined intervals. This transmission would be accomplished using an existing software program for transmitting messages developed by ARI-Knox, the SEND utility. Students would be directed to handle the message traffic appropriately given the tactical situation. These actions would include receiving messages, processing information contained in messages and taking appropriate action including posting information to his map display, deleting messages, relaying messages to higher or lower units, and taking no action. To conclude the vignette, each student would be asked to prepare a situation report (SITREP) identifying current location, degree and type of enemy activity, critical shortages, and a decision of whether to attack, defend or delay.

Each student would complete three vignettes of increasing difficulty which would be structured and sequenced to systematically increase the information load placed on the student. Load would be enhanced by increasing the number of messages transmitted to the student and reducing the interval between message transmissions.

The primary approach to training feedback envisioned would be self-assessment by students. This self-assessment would take two main forms. First, students would be provided a summary of

their individual performance and a "preferred" strategy (derived from Armor Subject Matter Experts [SMEs]). They would have an opportunity to compare their performance to the expert approach.

Second, students would participate in an AAR session after they have had an opportunity to review their feedback package and the expert package. The Training Coordinator would lead the discussion using a set of guiding questions. The AAR would focus on sharing self-assessments of message handling strategies and their relationship to the expert approach and on identifying improvements.

The AAR sessions would occur after each of the three vignettes. In addition to feedback to trainees on their performance, the AAR sessions would also focus on identifying additional improvements that could be made in handling digital communications. Finally, hard copy feedback packages would be prepared for students at the conclusion of the exercise so that they have a record of their performance for subsequent reference and study.

Recommendations for Initial Implementation and Tryout of Option. To facilitate training development, it is recommended that the initial implementation of this exercise be structured using one mission and duty position. More specifically, to simplify the tactical situation but yet provide enough complexity to make the exercise challenging, a defense mission aimed at the Company Commander is recommended. This would serve as a useful starting point for implementing and trying out the IMEX. If successful, the IMEX could then be extended to other types of missions and to other positions.

We expect that CCD familiarization, completion of the three vignettes, and conduct of the AAR sessions after each vignette would take approximately one and a half days. More specifically, we would anticipate devoting the first half-day to CCD familiarization and practice. The second day would be focused on the completion of the practice vignette, the three training vignettes and the associated AAR discussions.

Required Hardware/Software Configuration. Somewhat different equipment is required for IMEX exercise development and exercise delivery as outlined below. (Descriptions of each of these components can be found in the first section of this Research Product which describes the architecture of the DIS environment.)

To develop this training exercise, the following equipment is needed:

- (1) a MCC System;

- (2) a SPARCS Workstation with CCD software;
- (3) a SEND station;
- (4) a LISTEN station;
- (5) a PVD; and
- (6) a SINGARS radio.

For delivery of the training exercise, requirements include:

- (1) Four (4) networked SPARCS workstations with CCD software, each operating in an ISOLATE mode to serve as Student Workstations;
- (2) a SPARCS workstation networked with the Student Workstations with the SEND utility to serve as the Training Coordinator Workstation;
- (3) a LISTEN station and printer;
- (4) a PVD;
- (5) SINGARS radios; and
- (6) a large screen display for use during the demonstration.

Training Materials Development Required. The following materials would need to be created. In some cases, these could be adapted from existing materials (1); in others, they would need to be developed (2) as shown below:

- (1) (1) Initial context setting materials for vignettes including OPORD extract, paper map and graphic overlay;
- (2) (1) Accompanying messages for each vignette structured to vary information load and organized into appropriate files for use by the SEND utility;
- (3) (1) Training materials for workstation familiarization;
- (4) (1) Performance measures and summary formats for use in feedback package;
- (5) (2) Introductory materials to introduce trainees to purpose of the exercise, training objectives, expectations for their behavior, and administrative/logistical issues;

- (6) (2) Exercises to be used in conjunction with Workstation job aid for training;
- (7) (2) Specification of doctrinal rules and teaching points associated with vignettes;
- (8) (2) Elicitation of "preferred" strategies for information handling by Armor SMEs for use in feedback package for each vignette;
- (9) (2) Guidelines for discussion leaders to be used in AAR sessions.

Software Modifications Required. Two types of software modifications would be required to support this exercise. The first type relates to exercise delivery, the second to training feedback.

First, delivery of this exercise is predicated on the use of four SPARCS workstations which are used by students operating individually. This configuration would require that:

- (1) Four (4) networked SPARCS workstations are capable of running CCD software, and receiving messages from the SEND station without rotation of the own-vehicle icon (since workstations are intended to represent stationary vehicles); and
- (2) the above workstations must be capable of operating in parallel in the ISOLATE mode so that the CCD software can be operated without affecting the presentation to another student.

Second, to support training feedback, the LISTEN station would require software modifications to provide students with feedback on their performance. More specifically, the station would be required to generate and print measures of performance by message as well as summary measures. These measures might include those identified below.

Individual Message Handling:

- (1) Report Identifiers
 - message source
 - message content
- (2) Actions Taken
 - nature of action taken (including post to map, delete, relay, no action)
 - direction of relay

(3) SME Recommended Actions

- recommended action
- accompanying rationale

Exercise Summary:

- (1) Student Actions by Type of Report
- (2) SME Recommended Actions by Type of Report
- (3) Discrepancy between Student and SME Actions with discrepant reports identified.

Situation Report Generation:

- (1) Student SITREP
- (2) SME SITREP
- (3) SME Rationale

It would be necessary for the software to identify and distinguish responses of individual students and prepare summaries of the above types of measures for each student. Ideally, a hard copy report would also be available 15 minutes after completion of the vignette. In addition to tabular summaries, it may be desirable to present some summaries in graphical format.

Implementation Decision

The preceding five training concepts are intended to illustrate how the DIS environment can be used to support new approaches to leader and unit training. They are intended to offer training developers and trainers ideas as they consider the role of simulation in training. To further explore such innovative training concepts, ARI elected to implement and try out one of these approaches, the IMEX. The remaining two sections of this Research Product describes the implementation of the IMEX and the results of the tryout. Exercise materials can be found in Appendices B-F.

Implementation of the IMEX

The IMEXs were designed to implement training techniques centered on simulation-based, networked technologies. The platform for this training program was a network of four double-screened workstations, providing individual training to soldiers on the receipt, processing, and dissemination of information using automated digital communications. These four workstations

were configured to communicate with a Coordinator's Workstation, but not with each other. A printer provided output of training feedback to each participant at the prompt of a signal from each of the four workstations or the Coordinator's workstation. The Situation Display (Sit Display) was used during training and AARs. Figure 4 shows the IMEX hardware configuration.

The left monitor of the four double-screened workstations was configured as a CCD while the right monitor was used to display IMEX feedback information. More discussion of the CCD and IMEX-specific software will be presented in a following section; however, an initial description of the CCD is included here to facilitate understanding of the IMEX implementation. Figure 5 shows a schematic drawing of the CCD display.

The CCD is a component designed to automate command, control, and communication functions. It has a computerized tactical map which can be tailored by the user to display terrain in different scales and with selected terrain features. The map can also be scrolled to show particular sections of terrain. Standardized digital mission overlays created by supporting Battalion TOC (Bn TOC) workstations can be transmitted to units with CCDs. These overlays can be shown on the map display and multiple overlays stored for future reference. The map display is integrated with POSNAV, which provides digital location and heading information, graphic routes on digital maps, an automated steer-to-device for drivers, display of own friendly vehicle locations (known as mutual POSNAV), and a tactical map on the battlefield in X-Y grid coordinates.

The CCD was used to present the "message handling" component of IMEX. This consisted of one practice and three training vignettes which progressed in difficulty. Within each vignette, students familiarized themselves with the training objectives, initial instruction materials, and an OPORD extract. After this familiarization phase, students began the information management phase of the vignette and managed their respective message traffic using the CCD. Messages included SPOT, CONTACT, and INTEL reports. Students were directed to handle their message traffic appropriately, given the tactical situation and guided by the initial instruction. Appropriate actions included receiving messages, processing information contained in the messages, and taking appropriate action including posting information to the map display, deleting messages, relaying messages to higher or lower, and taking no action.

At the end of the vignette, each student prepared a SITREP identifying current location, degree and type of enemy activity, critical shortages, and a decision to attack, defend, or delay. Students then completed and scored a situational awareness questionnaire developed specifically for each vignette. Next, students directed their attention to a second monitor which

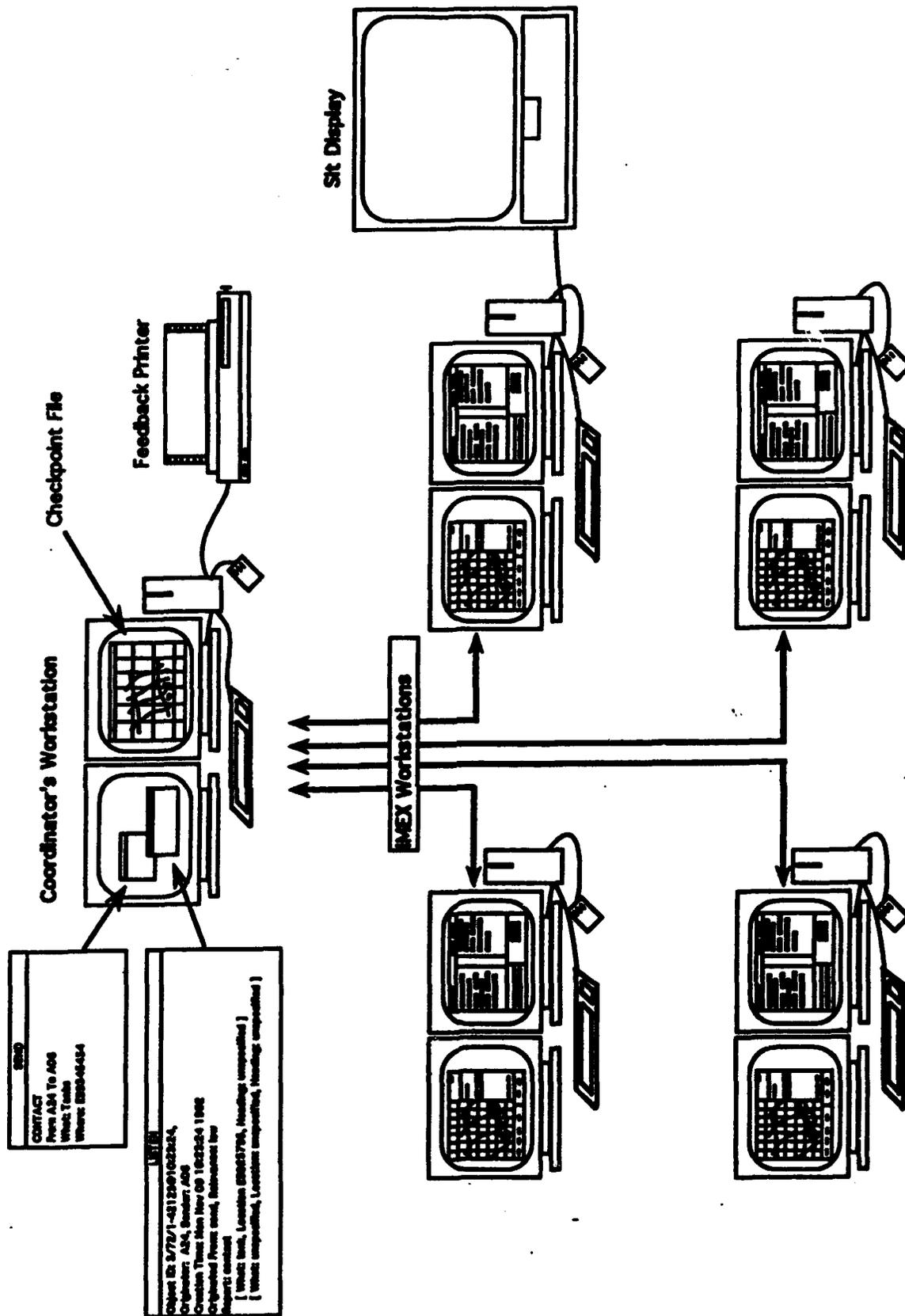


Figure 4. The IMEX hardware configuration

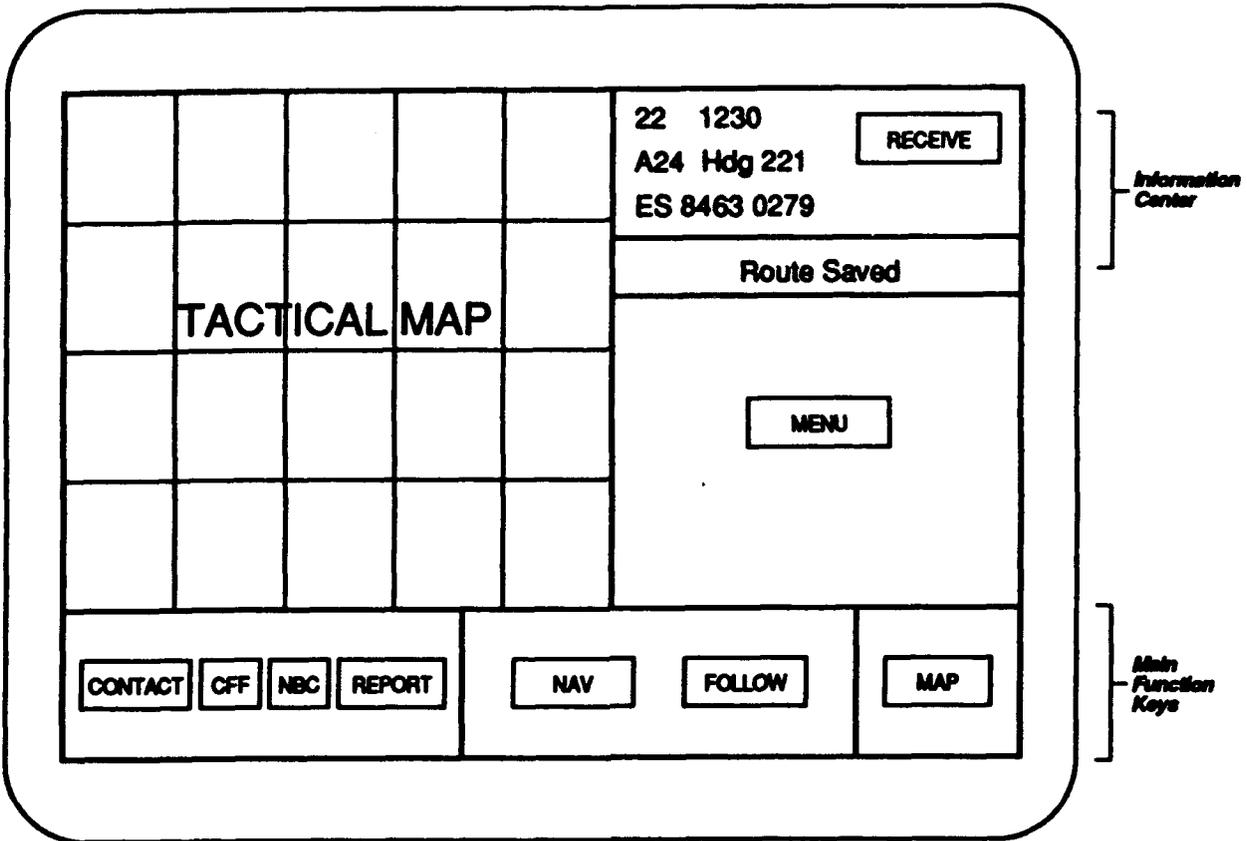


Figure 5. CCD display

presented the feedback component of the exercise. Finally, an AAR was conducted by an SME who reviewed the training objectives, tactical situation, and appropriate actions for particular reports. The platform conducting the AARs was the Sit Display shadowing that vignette's CCD with message icons posted. The AARs were conducted in a group format with each student having his workstation available for review of feedback materials. Students were given ample opportunity to ask questions about the suggested actions and provide input to future development of the exercises. Figure 6 shows the training schedule for participants.

IMEX Training Objectives

The IMEX training objectives resulted from an analysis of information management skills necessary for a Company Commander tasked with executing a planned defensive mission using automated message traffic from higher, lower, and adjacent units. Tasks were clustered within training objectives to ensure mastery of the CCD, efficient information management strategies, and an

EXERCISE SCHEDULE

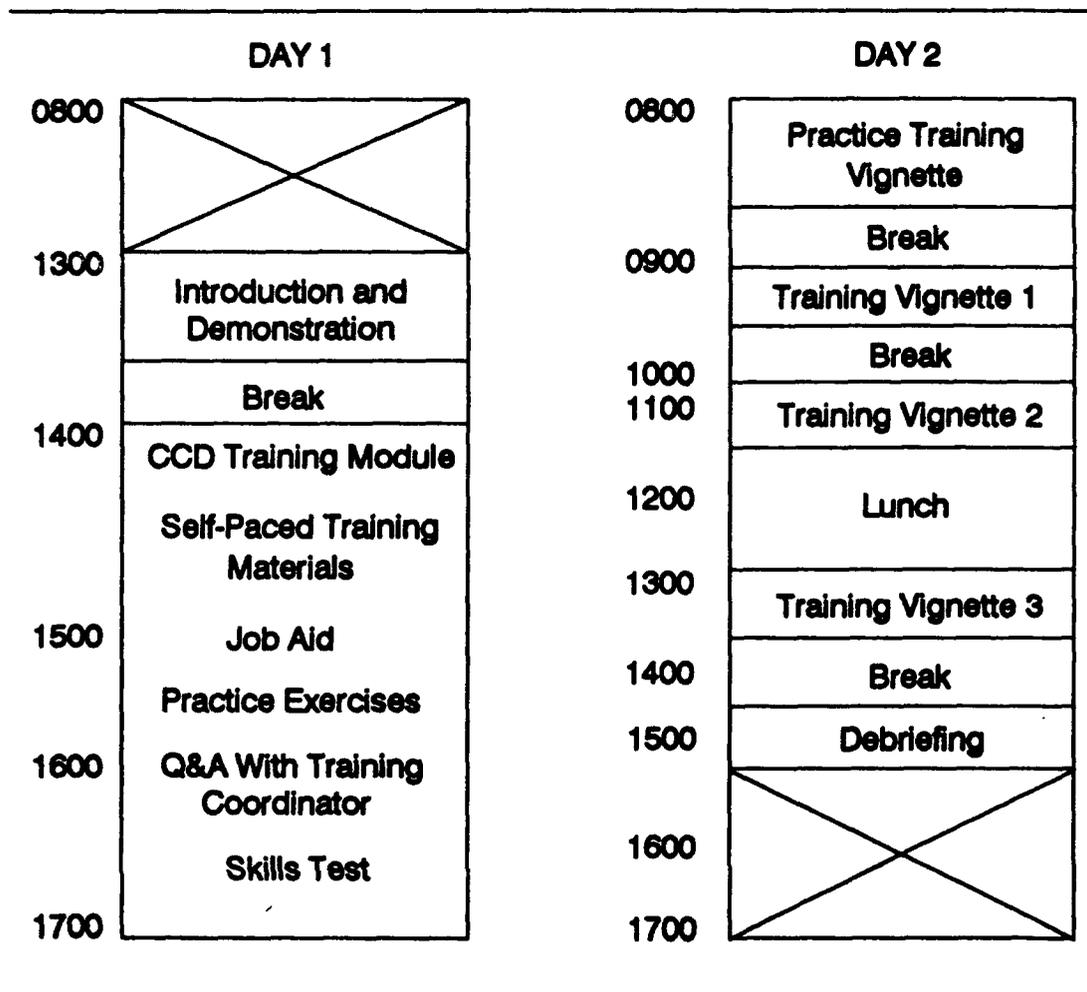


Figure 6. Training schedule for participants

increased ability to assess the battlefield situation. The training objectives served as the basis for the development of each vignette's tactical scenario and message sets. The overall training objective was presented to the students as follows:

Acting as a Company Commander, given a CCD and a paper map with an operations order extract, process information to support execution of the planned defensive mission.

The training objective for the practice vignette focused on CCD operation while giving each participant the opportunity to use the CCD in an IMEX-like session. Tasks aimed at map adjustment, viewing "old" messages, manipulating overlays, and accessing newly received messages comprised the practice vignette and are shown in Table 1. The training objective for vignette 1

(Table 2) focused on correctly directing message traffic by determining the relevance of each report to any potential recipients (higher, lower, or adjacent units). Tasks aimed at maintaining communications, determining a report's relevance, and correctly relaying reports are shown in Table 2. The training objective for vignette 2 focused on analyzing the content of messages in terms of urgency, redundancy, and accuracy. Tasks aimed at determining message priority, redundancy, and conflicting information are shown in Table 3. The training objective for vignette 3 focused on situational awareness. Tasks aimed at tactical map management, message filtering, and determining the enemy's scheme of maneuver are shown in Table 4.

Table 1

IMEX Training Objectives Linked to Tasks for Practice Vignette

VIGNETTE OBJECTIVE

Practice Manage the CCD to facilitate your ability to process information

TASKS

- Adjust CCD map to suit situation and preferences
 - Access previously received messages relevant to area of interest by examining the locations and types of message icons displayed
 - Open and post a CCD overlay to your map
 - Open and read newly received messages and take appropriate actions
-

Table 2

IMEX Training Objectives Linked to Tasks for Vignette 1

VIGNETTE OBJECTIVE

1 Keep higher, subordinates, and adjacent units informed of changes to the tactical situation.

TASKS

- Maintain communications with higher headquarters, subordinates, and adjacent units
 - Determine relevance of reported information to higher headquarters, subordinates, and adjacent units
 - Relay messages to higher headquarters, subordinates and adjacent units based on your evaluation
-

Table 3

IMEX Training Objectives Linked to Tasks for Vignette 2

VIGNETTE OBJECTIVE

- 2 Recognize and correctly process high priority messages, messages with redundant information, and messages with conflicting information.

TASKS

- When multiple messages are received, open and process high priority messages first
 - Recognize multiple sightings of the same element and relay one representative report of a sighting as appropriate, ignoring reports with redundant information
 - Recognize conflicting reports of sightings and relay most timely message as appropriate
-

Table 4

IMEX Training Objectives Linked to Tasks for Vignette 3

VIGNETTE OBJECTIVE

- 3 Maintain current status of enemy and friendly dispositions and determine enemy's order of battle.

TASKS

- Keep your tactical map current by posting new enemy sightings and friendly locations which are in or could soon be within your unit's area of interest
 - Delete message icons from your tactical map based on outdated information
 - Ignore messages not likely to influence your unit's area of interest
 - Determine the enemy's scheme of maneuver based on enemy sightings from higher headquarters, subordinates, and adjacent units
-

Training Approach for Prerequisite Skills

The primary prerequisite skill for participation in IMEX was CCD proficiency. Since the CCD is the prototype of an automated command and control device not currently fielded, it was necessary for students to complete a training program centered on CCD operation before the information management component of the

exercises was begun. Two approaches to CCD training were implemented. First, students were given an overview of the CCD during an Introductory Briefing, followed by a CCD Demonstration (Demo) that highlighted specific CCD functions to be used during the exercises (refer to Appendix A for the Introductory Briefing and CCD Demo). Both the CCD overview and Demo relied heavily on visual presentation of the system. For instance, the CCD Demo was conducted via the Sit Display (see Figure 2) which shadowed a CCD workstation, changing states as the result of various functions controlled by an operator as the Coordinator presented the Demo. Based on the "A picture is worth 1000 words" principle, the features of the CCD relevant to IMEX, especially those considered by trainers as most difficult to conceptualize were featured in the IMEX Demo. These features were explained and examples were presented on the following topics: map manipulation and scrolling; CCD icon identification and use; accessing reports, posting and unposting overlays; and SITREP creation. The CCD Demo ended with the operator sending messages across the network and the Coordinator providing suggested strategies on managing the incoming message traffic.

The second approach to CCD training permitted hands-on experience. Students were presented with a set of self-paced training materials and a CCD Job Aid to be used as a training supplement and reference once the self-paced training was completed. The self-paced training materials consisted of three units, each with its own set of objectives and exercises. These training objectives are shown in Table 5.

The self-paced training and CCD Job Aid familiarization took approximately 2.5 hours. Following the CCD training, students completed a CCD Skills Test and were given the opportunity to ask CCD-related questions and review functions. As a final rehearsal, a practice vignette provided a training objective centered on CCD skills. Students were closely observed by the Coordinator during this time and provided with any necessary remedial help.

IMEX Training Delivery Software

Coordinator's Workstation. The Coordinator's workstation (depicted in Figure 7) was a specially-configured Bn TOC workstation which allowed the Coordinator to use the left monitor for SEND and LISTEN activities while the right monitor was used to restart checkpoint files on each IMEX workstation. A printer was attached to the Coordinator's workstation which generated personalized hardcopies of the digital feedback information received by each student.

The SEND utility is a software tool for creating and sending digital messages to vehicle simulators and the battalion TOC workstations within the DIS environment. SEND was used to create

Table 5

IMEX CCD Self-paced Training Materials Training Objectives

Unit 1: Command & Control Display Introduction

Objectives:

- Demonstrate familiarity with requirements for the CCD
- Display knowledge of the capabilities of the CCD
- Use the mouse to manipulate the cursor
- Identify the locations of CCD functions
- Use the Information Center as a resource for information on the state of your vehicle and the current operations being performed by your CCD
- Use basic CCD command options
- Practice policing screen to keep CCD operating at maximum efficiency

Unit 2: Map-Related Functions

Objectives:

- Identify the characteristics of your own vehicle icon
- Demonstrate familiarity with the significance of friendly overlay icons
- Practice scaling and scrolling the CCD tactical map to see the terrain you want at the scale you want
- Customize your terrain features with the MAP Features function

Unit 3: Report Functions

Objectives:

- Identify CCD message icons using an icon reference sheet and know how to use their locations and types for help in report retrieval and report processing
 - Process newly received CCD-type messages and those found in the OLD files
 - Post and unpost CCD overlays to and from your map to allow you a current, standardized picture of the operation
 - Post message icons to your map and delete them from your map to keep your battlefield picture current
 - Use CCD hot icons to retrieve reports from the RECEIVE queue and the OLD files
 - Create a SITREP based on battlefield information
-

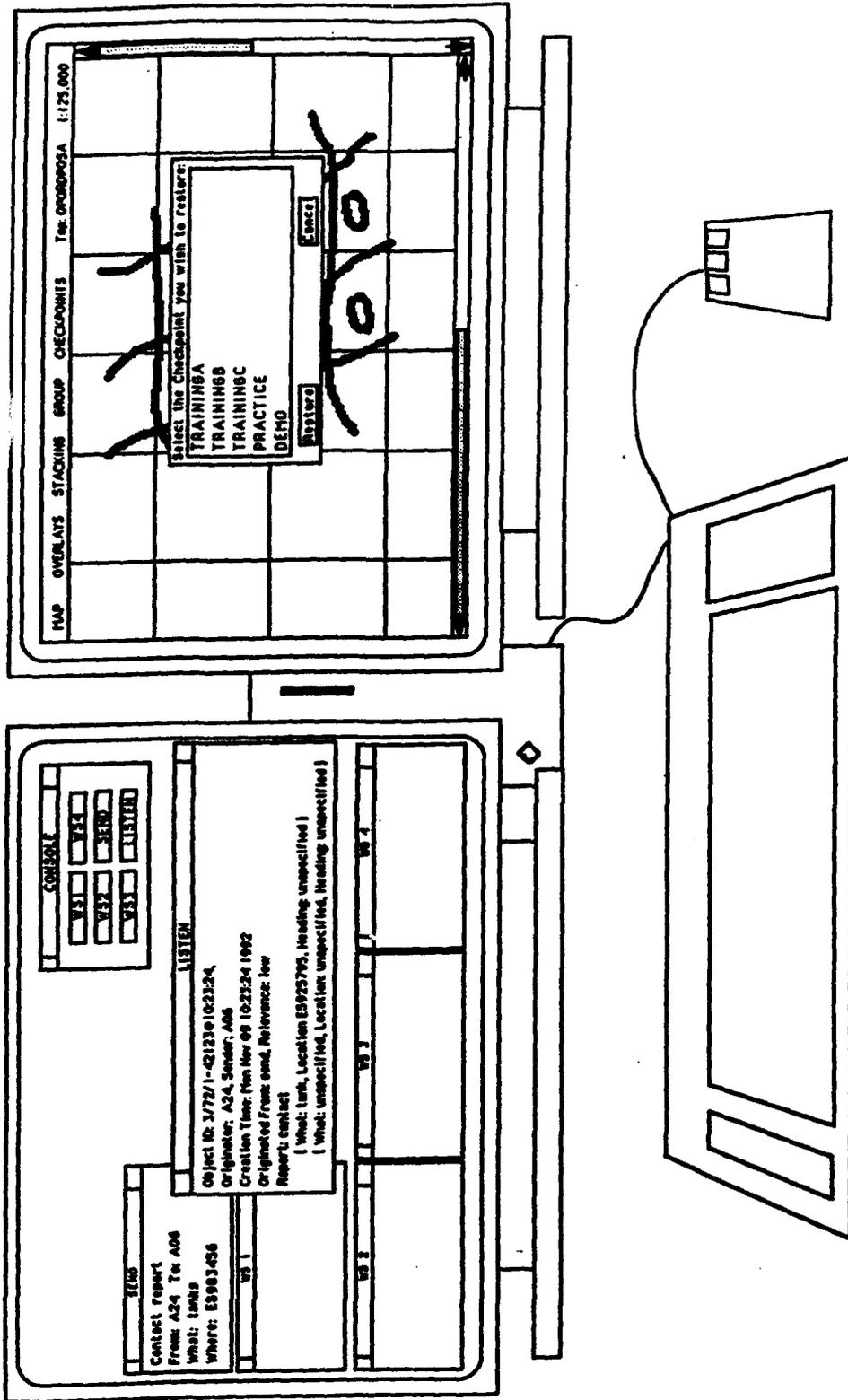


Figure 7. Coordinator's workstation.

and transmit files to the four workstations containing training materials, exercise control features, and digital reports. SEND was modified for IMEX to allow for report types unique to IMEX such as SME Rationales, OPORD extracts, training objectives, coordinator alerts, and coordinator messages. Each of these items, except coordinator alerts, were constructed prior to the exercises and loaded into the workstations using the Checkpoint utility discussed later. Coordinator alerts were not used during IMEX but are intended to allow the Coordinator to transmit a message online to a single student.

SEND was also utilized in IMEX to create and transmit digital sets of CONTACT, CFF, and INTEL reports to each student. Students received and processed two sets of SEND messages for each vignette. The first set of SEND messages was known to students as the "old files." The Coordinator's workstation was used to transmit these messages so that they were available to students at the beginning of each exercise. The old files were cast as being the last messages received by the previous Commander of Company A whom each student was replacing. Along with the OPORD extract, these messages helped to set the context for the present battlefield situation.

The second set of messages was sent to each student once he had reviewed the training objectives and OPORD extract for a particular vignette. To achieve a real-time effect, messages were set up in files for each vignette with 30-second intervals between each report, so that the Coordinator could send all messages in a single transmission without the messages arriving at the student's CCD simultaneously. Vignettes 1 - 3 contained 9, 15, and 21 reports, respectively. The practice vignette contained 15 reports. Reports for each vignette are shown in Appendices B - E.

LISTEN, a companion utility to SEND, was used by the Coordinator to monitor the transmission of reports by SEND, including student "Ready" signals and SITREPs. LISTEN was particularly useful for letting the Coordinator know when the last message of a vignette had been transmitted.

The Checkpointing utility was used to save the IMEX workstation's starting states for each vignette. This was accomplished by setting the workstations up in their initial states and taking an "electronic snapshot." Checkpointing was used to save files with the appropriate tactical map and own vehicle location for the CCD, as well as the OPORD extract and teaching objectives for Monitor 2. Once a Checkpointing file for each vignette was constructed, the Coordinator simply had to activate that file using the Restart function of the coordinator's Bn TOC workstation prior to the start of each exercise.

Dual Screen Student Workstation. Two monitors were used to execute IMEX. The left monitor housed a CCD while the right monitor was used to present the training materials. Figure 8 shows the two monitors used for the exercises.

The left monitor at each workstation displayed an automated CCD used by the student to manage tactical information. The CCD offers many functions that can be of significant assistance in planning, preparing, and executing missions. Table 6 shows a complete listing of the CCD functions used for current CVCC evaluations. Because IMEX was configured for an institutional training setting and the primary objective was to train information management skills, only a subset of CCD features was selected for IMEX. The CCD's features selected for inclusion with IMEX were as follows: the CCD's digital message capabilities which allow the user to prepare, transmit, and receive digital reports; the CCD's computer-based tactical map of the battlefield, designed to suit individual user's needs through scaling and scrolling and choice of terrain features displayed; and the CCD's standardized digital mission overlays function which allows for receipt of overlays from other units and multiple overlays to be displayed at one time on the map display. See O'Brien et al. (1992) for a description of the CCD used to support a recent CVCC Battalion TOC evaluation.

The right monitor was used for presenting instructional materials to students including training objectives, tactical information such as OPORD extracts, control messages, and feedback on performance. Students were given a set of guidelines on procedures to follow in dividing their attention between the two monitors, and these are shown in Table 7. Figure 9 shows the sign-in screen for Monitor 2. This was the first screen each student saw on Monitor 2. When the student entered his name and clicked on the "Okay" button, a new screen appeared displaying the OPORD extract and training objectives for the appropriate vignette (see Figure 10). Once the students had thoroughly reviewed the OPORD extract and training objectives, they clicked on the "Ready" button at the top of this screen. This caused Monitor 2 to go to a "shell" screen which served as an additional prompt to students to turn their attention to the CCD. Once students finished using the CCD to process all of their messages, they created and sent a SITREP to Battalion. This activated a new screen on Monitor 2. This screen, shown in Figure 11, remained active until the situational awareness questionnaire was completed and scored. At this point, the students were instructed to end the exercise by clicking on the "Okay" button below ENDEX. Following completion of this step, the feedback component of the exercise was begun.

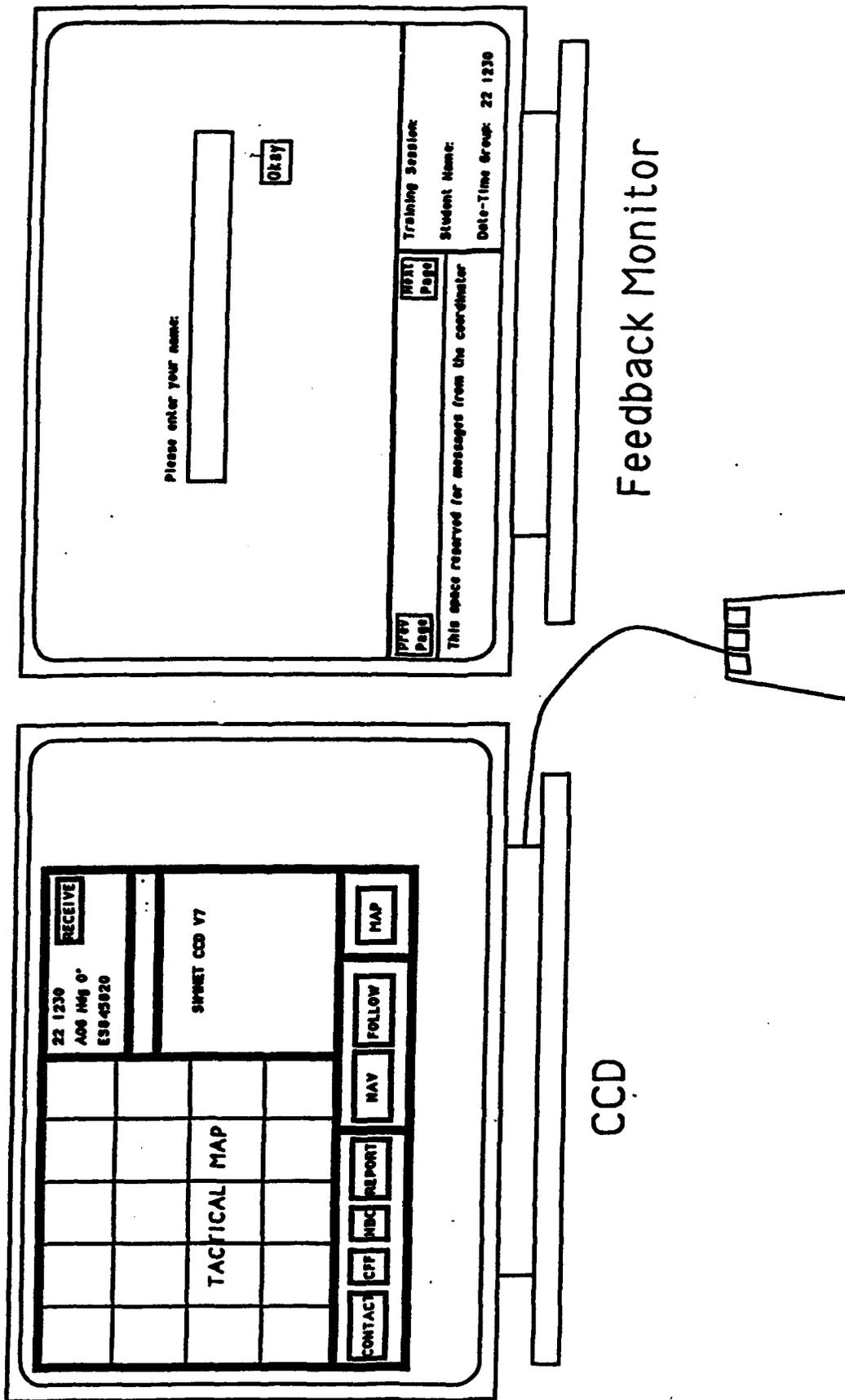


Figure 8. The two monitors used for IMEX exercise

Table 6

C³ Capabilities of the CVCC CCD Configuration

Navigation

Grid map
Terrain map
Graphic overlays
Own-vehicle icon (directional)
Friendly vehicle locations
Report-based icons
Route waypoints
Driver's steer-to display
Waypoint Autoadvance
Transmission of routes

Communications

Create/send/receive/relay reports (text)
Receive/relay graphics
Laser Range-Finder (LRF) input to reports
Report-based icons

General characteristics

Thumb control
Touchscreen control
Color display

IMEX Training Feedback Software

The feedback component of the exercise is housed on Monitor 2 and begins with the Main Menu screen shown in Figure 12. This menu allows the student to click on "Show" to review the OPORD Extract/Training Objectives, or choose one of three options to view the comparison of his performance to the SME preferred actions and rationales.

The first feedback option presented on the Main Menu is the Message Summary Option. The Message Summary Option screen is shown in Figure 13. Here, agreement between student message routing and SME recommendations for each report is characterized by a "GO" or "NO GO" in the status field. Complete agreement between student and SMEs was the requisite for "GO". Students were encouraged to review all reports for each feedback mechanism; however, students tended to focus more on "NO GOs" than "GOs". In the example shown in Figure 13, the student has selected a CFF report from A21 to review. That report is shown in the next section of the display. Adjacent is a listing of the

actual student actions performed on that report, followed by the SME preferred actions and rationale. Note that the first and last cells of the Message Summary display have pagination features allowing for multiple pages of information. When a report is selected on the Message Summary display, the CCD also shows the same report and highlights the report icon on the tactical map. Once all of the reports have been reviewed, the student selects "Exit" and returns to the Main Menu.

Table 7

IMEX Operating Guidelines

1. LOGIN:
 - Look at the right monitor
 - Click on the name box
 - Type in your last name
 - Click on "Okay" when done
 2. REVIEW OPORD AND TRAINING OBJECTIVE:
 - Read right screen
 3. POST OVERLAY:
 - Post overlay to CCD (left screen)
 4. REVIEW OLD MESSAGES:
 - Do not relay this information
 5. READY TO BEGIN EXERCISE:
 - Look at right screen
 - Click on "Ready"
 6. RECEIVE MESSAGES:
 - Look at the CCD
 - You will begin receiving messages shortly
 7. MESSAGE COMPLETION:
 - Once all messages have been processed, complete and send a SITREP to Battalion
-

The second feedback option was an Exercise Summary. This listing records the number of times the student and SME performed an action for a particular report type, along with the number of discrepancies between the student and SME. Figure 14 shows an Exercise Summary where there were a total of two discrepancies on CONTACT reports. These discrepancies occurred because the student posted two reports counter to the SMEs recommendation. Once all reports had been reviewed, the students selected "Exit" to return to the Main Menu.

Monitor 2

Please enter your name:

Okay

Prev
Page

Next
Page

This spot reserved
for messages from
coordinator.

Training Session: checkpoint file name

Student Name:

Date-Time Group:

Figure 9. Sign-in screen

Monitor 2

Training Objectives	Ready	OPORD Extract
<p data-bbox="285 523 360 591">Prev Page</p> <p data-bbox="695 519 769 587">Next Page</p> <p data-bbox="239 661 659 697">The purpose of this exercise...</p>		<p data-bbox="963 529 1037 597">Prev Page</p> <p data-bbox="1367 529 1442 597">Next Page</p> <p data-bbox="920 657 1319 693">These are operation orders...</p>
<p data-bbox="206 1319 264 1378">Prev Page</p> <p data-bbox="888 1319 946 1378">Next Page</p> <p data-bbox="434 1421 700 1523">This spot reserved for messages from coordinator.</p>		<p data-bbox="1015 1342 1504 1378">Training Session: checkpoint file name</p> <p data-bbox="1015 1417 1202 1453">Student Name:</p> <p data-bbox="1015 1485 1245 1521">Date-Time Group:</p>

Figure 10. OPORD/training objectives screen

Monitor 2

<h2>Endex</h2> <p>Okay</p>	
<p>Prev Page</p>	<p>Next Page</p>
<p>This spot reserved for messages from coordinator.</p>	
<p>Training Session: checkpoint file name</p> <p>Student Name:</p> <p>Date-Time Group:</p>	

Figure 11. ENDEX screen

Monitor 2

Main Menu		
◊	OPORD Extract/Training Obj	
◆	Message Summary	
◊	Exercise Summary	
◊	Sitrep Feedback	
<input type="button" value="Show"/>		
<input type="button" value="Prev Page"/>	<input type="button" value="Next Page"/>	Training Session: checkpoint file name
This spot reserved for messages from coordinator.		Student Name:
		Date-Time Group:

Figure 12. Main menu screen

Monitor 2

Message Summary

Prev Page	3-10/21	Next Page	
GO	A06	SPOT	2312
NOGO	B06	CONTACT	2312
GO	Y33	SHELL	2313
NOGO	A21	ADJUST	2314
NOGO	Y06	INTEL	2316
NOGO	Y02	INTEL	2317
NOGO	Y02	INTEL	2317

CFF Report

From: A21/A21 At 2314

What

Where

OTL

Prev Page	Next Page
<p>Student Actions: Inspect, Relay Up</p> <p>SME Actions: Inspect, Relay Up</p> <p>SME Rationale: Because of the close proximity of the enemy, the SME chose to inspect this report and relay it to the intelligence officer....</p>	

Prev Page	Next Page
<p>This spot reserved for messages from coordinator.</p>	
<p>Training Session: checkpoint file name</p> <p>Student Name:</p> <p>Date-Time Group:</p>	

Figure 13. Message summary feedback screen

Monitor 2

Exercise summary						
Prev Page			Next Page			
Contact Reports (7 total)						
	Student	SME	Discrepancy			
Reading	6	6	0			
Posting	4	3	2			
				B06	Contact	2312
				Y33	Contact	2322
Exit						
Prev Page		Next Page		Training Session: checkpoint file name		
This spot reserved for messages from coordinator.				Student Name:		
				Date-Time Group:		

Figure 14. Exercise summary feedback screen

The third feedback option presented the student SITREP along with the SME SITREP and rationale for that vignette. Figure 15 shows the feedback screen for this option. In this example, the SITREP would have been presented on the Message Summary Screen as a "NO GO" since there are discrepancies between the student and SMEs on the FLOT, Enemy, and Critical Shortage fields. When the student exited from this option, he returned to the Main Menu and was able to revisit any of the options listed on the menu.

As a supplement to the feedback provided via Monitor 2, a printout was provided to each student listing a tally of all reports and discrepancies, the Exercise Summary, and the SITREP comparison for each vignette. It was intended that these printouts would serve as the primary reference during the AARs; however, students preferred to rely on the information provided by Monitor 2 during the AARs and kept the printouts as take-home materials.

Developmental Phases and Iterative Improvements

The development of IMEX was a multi-stage, collaborative effort drawing from a number of resources in the Armor, Training, Research and Development, and Simulation communities. Table 8 shows the major milestones associated with designing the IMEX training program. Note that to facilitate their description, milestones are described in a linear fashion; however, it should not be assumed that all milestones were crossed sequentially.

Front End Analysis (FEA). As part of a FEA, structured interviews were conducted with Armor Training SMEs at Fort Knox, KY. and Combined Arms SMEs at Ft. Leavenworth, KS. The increased information load associated with automated C³ equipment was consistently identified as creating a future training requirement for information management skills.

The FEA provided the foundation for focusing our training efforts on information management skills. Further impetus was provided by the fact that C³ is a focal interest of the ARI-Knox FBC team. Finally, it was desirable to focus on a future training requirement which would capitalize on the DIS capabilities of the CCTB. Thus, it was decided that a training program aimed at honing information management skills would be developed. Once a concept paper directed at information management skills was written and approved, the next step was to begin coordination with software developers to ensure that the required software was available within a desirable timeframe.

Monitor 2

Situation Report Feedback		
Student's Report:	SME's Report:	SME Rationale:
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Situation Report</p> <p style="text-align: center;">From A06/A06 at 2330:02</p> <p>As of: 11 2330:15</p> <p>Flot: ES845945</p> <p style="margin-left: 20px;">ES832945</p> <p>Enemy: Light</p> <p style="margin-left: 20px;">Gnd Atk</p> <p>Crit Short: A</p> <p>Cdr Intent: Defend</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Situation Report</p> <p style="text-align: center;">SME's example</p> <p>As of: 11 2328:05</p> <p>Flot: ES843946</p> <p style="margin-left: 20px;">ES831945</p> <p>Enemy: Med</p> <p style="margin-left: 20px;">Gnd Atk</p> <p>Crit Short: FA</p> <p>Cdr Intent: Defend</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> Prev Page Next Page </div> <div style="border: 1px solid black; padding: 10px; min-height: 150px;"> <p style="text-align: center;">In this scenario, it was important to note...</p> </div> </div>
Exit		
Prev Page	Next Page	<p>Training Session: checkpoint file name</p> <p>Student Name:</p> <p>Date-Time Group:</p>
<p>This spot reserved for messages from coordinator.</p>		

Figure 15. Situation report feedback screen

Table 8

IMEX Milestones

- Conduct FEA
 - Select training method aimed at FEA results
 - Software development specification
 - Material development
 - Conduct pilot
 - Conduct tryout
 - Produce report
-

Software Development. New software was required to support the following desired IMEX capabilities: to allow the CCD to operate in a stand-alone capacity, to present the feedback component of IMEX, and to tailor SEND's messaging capabilities to support messages unique to IMEX (e.g., Coordinator messages). Specifically, development and/or modifications were identified to support a configuration of four networked stand-alone CCDs, one networked coordinating display for instructor use, one large-screen display for demonstrations, and one printer to provide paper copies of feedback information. Several working conversations with software developers occurred regarding the feasibility of specific software changes before a written functional specifications document was produced. This prevented staff from wasting time describing software modifications that were not feasible given the available resources. Once the practical limitations were understood, a functional specification document using text descriptions and storyboards was written detailing required software modifications. This document described all anticipated software development and modifications and was presented to the software developers to use as their primary reference.

Functional testing of the IMEX software was conducted in a cyclical fashion. Once a new version of the IMEX software was installed on the network, a cycle of functional testing began. Initial testing was conducted in phases which grew as software development progressed (e.g., CCD software only, CCD and feedback screen parameters only, etc.) culminating in a "full-up" test of the software's final version. Software Functional Testing forms were developed to assist the final software check of each workstation and were organized by functionalities for the Coordinator's workstation, the CCD and Feedback monitors (each menu level), and printer (Table 9 shows one form).

Table 9

Software Functional Testing Form

INNOVATIVE TRAINING REPORT/MESSAGE FORMAT CHECKLIST
MONITOR 1 & MONITOR 2

Research Asst: _____ Workstation: _____ Date: _____

#	STATUS Yes/No	ITEM	REMARKS
1.	_____	Verify User name screen appears.	_____
2.	_____	Verify students are able to enter name.	_____
3.	_____	Verify OPORD extract on Monitor 2 after student enters name.	_____
4.	_____	Verify Teaching Objectives appear on Monitor 2.	_____
5.	_____	Verify "ready" button is present on Monitor 2.	_____
6.	_____	Verify area for coordinator messages is present on Monitor 2.	_____
7.	_____	Clicking on "ready" button sends signal to coordinator's workstation via LISTEN.	_____
8.	_____	Verify Monitor 2 display closes down once "ready" is activated.	_____
9.	_____	Verify messages sent by CVCC-Send are received on Monitor 1.	_____
10.	_____	Verify message relays are seen by coordinator only	_____
10a.	_____	Relays to Bn	_____
10b.	_____	Relays to Co	_____
11.	_____	Verify correct relay default is shown on CCD for each message	_____

After Vignette is completed:

12.	_____	Verify "Endex" report box screen appears on Monitor 2 after student has sent SITREP.	_____
-----	-------	--	-------

Remarks: Use the space below to note additional problems encountered after initial checkout, or if additional space is needed.

With the completion of each software check, developers were presented with a "software problems" list used to document existing problems. Most software problems were assigned a priority to be used by developers in expending programming

resources. Since programming time and financial resources were of concern, problems with manageable work-arounds were assigned the lowest priority. Problems that were considered to be "show-stoppers" were given a high priority as well as problems requiring minimal effort to fix. Table 10 shows an example of a suitable format for describing software problems.

Table 10

Software Problem List

- Problem # 1 DESCRIPTION: Reliable communication between a Bn TOC workstation configured as a coordinator and 4 Stand-alone CCDs configured as A06 does not occur although, the software did appear to be stable on a 2 workstation setup. HIGH PRIORITY.
STATUS: Reported 4 Sept. 4 workstations tested 11 Sept. Software appeared stable.
- Problem # 2 DESCRIPTION: LISTEN does not pick up "ready" signal. LOW PRIORITY.
STATUS: Reported 12 Aug. Demonstrated to work 20 Aug.
- Problem # 4 DESCRIPTION: Nets can not be specified within SEND vignettes. This frequently results in inappropriate net defaults on the CCD. LOW PRIORITY, given work-around exists.
STATUS: BDM has developed a work-around.
- Problem # 5 DESCRIPTION: SEND does not tolerate "unseen" spaces following key words. LOW priority, given a work-around exists.
STATUS: BBN has offered a work-around.
-

Material Development. Many of the materials required an iterative development process and were not considered final until feedback from the pilot test was received. For example, since there were no standing SOPs for information management available for the Armor environment, the SME doctrinal solutions were developed in multiple stages. First the SMEs were given the message sets for each vignette and asked to independently produce a solution for each message. Second, the solutions were tallied and discrepancies in recommendations were recorded. Third, a SME Roundtable was held to resolve all discrepancies. This allowed each differing SME to presented an argument supporting his rationale, followed by group discussion until all SMEs agreed on a rationale. Finally, a few rationales were amended due to comments from pilot subjects where appropriate.

Table 11 shows a listing of all of the materials developed to support IMEX. Each of these items may be found in the appendices.

Table 11

IMEX Materials

IMEX Introductory Briefing
CCD Demo
CCD Self-Paced Training Program
CCD Job Aid
Tactical scenario materials
Initial instruction files
Teaching objective files
IMEX scenario message sets
SME doctrinal solutions and rationales
Situational Assessment Questionnaires
Training Evaluation Questionnaire
AAR guidelines

Pilot. A pilot test was scheduled to permit ample time for any necessary software or material revisions. Every attempt was made to duplicate the procedures planned for the actual IMEX tryout. However, due to scheduling constraints, some changes were necessary. For instance, an abbreviated Introductory Briefing was given, and participants were detained following the debrief to solicit discussion on any items of concern. Four pilot subjects with extensive Armor experience but no CCD training were chosen to participate. Results of the pilot indicated minimal need for material or software revisions. Most discussion focused on questions involving SME recommendations. Each question regarding the SME recommendations was discussed with the entire group of participants and an SME. If the majority of participants disagreed with the recommendation, it was generally agreed that the recommendation would be amended. However, in most cases, doubt in a specific recommendation was usually resolved through group discussion of the rationale. All changes were completed prior to the Tryout, with the exception of a requested software change to the "GO"/"NO GO" characterization of student performance. Unfortunately, programming resources did not permit such a change to the software. As a temporary alternative, this issue was thoroughly addressed during the Introductory Briefing for the Tryout and it was acknowledged that future implementations should adopt less sensitive performance labels. Participants' progress and positive reaction to the training materials were quite encouraging given that this was the first time that such an approach for the CCD had been attempted.

Tryout. An IMEX tryout with three recent AOAC graduates was conducted over a two-day period (see Figure 13 for the schedule).

The schedule was adhered to closely and permitted ample time to cover each event. Again, reaction to the self-paced training approach for the CCD was unanimously positive. Specific findings and recommendations are discussed below.

Findings and Recommendations

IMEX Program

Prerequisite Training. Since soldiers currently receive the majority of their CCD training via a demo and student/instructor lessons, one of the most notable aspects of the IMEX prerequisite training was the inclusion of self-paced training materials for the CCD. The reaction to this training approach was overwhelmingly positive. Students appreciated the opportunity to work directly with the equipment almost immediately. Another advantage noted by the students was that the self-paced approach allowed quicker learners to continue their progress while students needing help had the attention of the Coordinator. Several students commented that a smaller student/instructor ratio would be unnecessary, given the adequacy of the training materials.

A useful source of information for student assessment of IMEX is the Training Evaluation Questionnaire (contained in Appendix F). Students used this questionnaire to rate components of CCD training and the effectiveness of IMEX in training information management skills, and to provide comments on a range of related topics. Ratings and comments related to CCD training are presented in Tables 12 and 13. It is important to note that any data presented will reflect the opinions of only 3 students. More data collection is needed before any definitive conclusions regarding IMEX can be offered; however, these data do seem to indicate that IMEX has laid a firm foundation for teaching information management skills in an automated C³ environment.

For instance, Table 12 shows that students rated the CCD training component of IMEX very favorably. In fact 100% of the students rated the self-paced materials as excellent and 100% of the students believed the training program sufficiently taught the necessary prerequisite skills for successful use of the CCD for the tasks trained.

Table 13 presents student comments regarding the CCD training. The comments provided by students were overwhelming positive regarding the self-paced approach to CCD training. They also reinforce the high ratings presented in Table 12.

Table 12

Student Ratings of IMEX CCD Training

How adequate were the components of CCD training in preparing you to operate the CCD? ¹		
	Mean	Std. Dev.
CCD Demo	4.67	0.58
Self-paced CCD Training Materials	5.00	0.00
CCD Job Aid	4.33	0.58
CCD Skills Test	4.67	0.58
Overall Approach to Self-paced Training	5.00	0.00

Did the CCD training materials lack any components necessary to operate the CCD? **No 100%**

¹Rating scale ranged from 1 (Poor) to 5 (Excellent).

Table 13

Student Comments Regarding CCD Training

- Training materials were adequate for teaching CCD skills
- Self-paced materials are clear and convenient
- CCD was easy to operate
- Answers to CCD questions were easily found in the training materials
- 3:1 student/instructor ratio was effective

Exercise Materials. The exercise materials consisted primarily of each vignette's initial instructions and training objectives, message set, SME recommendations, situational assessment questionnaire and AAR. Students rated each of these items (except the situational assessment questionnaire discussed below) on the Training Evaluation Questionnaire. The ratings are shown in Table 14. As shown, the data indicate that exercise materials were rated very highly, with 100% of the students rating the initial instructions and training objectives, AARs, and IMEX overall as excellent. The lowest rating was given to the SME SITREP preferred solutions. Students commented that they needed more instruction on determining the enemy's level of

activity (low, medium, or high) for the SITREP. This was the most likely source of student/SME disagreement on the SITREPs and any future IMEX implementation should include a set of criteria for each student to use in making this determination. Student comments regarding the exercise materials are shown in Table 15 and again echo their ratings of the exercises. Students agreed unanimously that they would have liked more exercises to complete which continued to increase in difficulty and led to interaction with other students.

Table 14

Student Ratings of Exercise Materials

How adequate were the following components of the training program in helping you to improve your information management skills? ¹		
	Mean	Std. Dev.
Initial Instructions Linked to Training Objectives	5.00	0.00
IMEX Scenario Message Sets	4.67	0.58
IMEX SME Preferred Message Solutions	4.44	0.51
IMEX Message Summaries	4.67	0.58
IMEX Exercise Summaries	4.67	0.58
IMEX SME SITREP Preferred Solution	4.33	0.58
AARs	5.00	0.00
Overall rating of IMEX	5.00	0.00
Did the training meet the objectives? <u>Yes</u> 100%		

¹Rating scale ranged from 1 (Poor) to 5 (Excellent).

Table 15

Student Comments Regarding Exercise Materials

- Exercises should be repeated with a larger test bed of students
- Scenario materials and exercises were superior
- Increase the difficulty and number of exercises, building on what already exists
- Add an additional exercise on basic movement (offensive or withdrawal)
- Include Logistics reports
- Good match between training objectives and exercises
- Ability to develop picture of the battlefield provided by system is a must for current and future battlefield

The situational assessment questionnaires also are a useful source of information in evaluating the success of IMEX (the questionnaires are located in Appendices B - E). Since it was desirable to develop separate questionnaires for each vignette, comparisons between vignettes are difficult. However, students did improve across vignettes, both in confidence and response accuracy. As shown in Table 16, students showed an increase of almost one point on a five point scale on the average in confidence and a 14% increase in situational assessment accuracy when confidence ratings and performance for the practice Vignette are compared to Vignette 3. This may indicate a favorable training effect of IMEX for situational assessment; however, the small number of students (n = 3) and the fact that there were some common questions across vignettes, prevent any definitive conclusions at this point.

Table 16

Situational Assessment Questionnaire Performance: Means and Standard Deviations (in parentheses)

	Vignette			
	Practice	1	2	3
Confidence Ratings ¹	3.34 (0.67)	4.23 (0.50)	4.14 (0.90)	4.24 (0.45)
% Correct	67 (33.4)	75 (38.3)	76 (25.23)	81 (26.25)

¹Confidence ratings ranged from 1 (Not at all Confident) to 5 (Completely Confident).

A more objective source of data for evaluating the effectiveness of IMEX is provided by the student/SME agreement rate across vignettes. This information was obtained by retaining a copy of each student's feedback printout. Table 17 shows that student/SME agreement increased overall from the Practice Vignette to Vignette 3. The most striking change is the 22% increase in student/SME agreement regarding deletion of messages. Given that a cogent concern for automated command and control devices deals with the potential for information overload, the finding that IMEX may be able to teach soldiers how to effectively filter unneeded information is noteworthy. The fact that students showed a small negative trend in SME agreement for relaying reports down may be due to students becoming overly conservative in their report filtering. However, this is a small trend and more data are needed for a definitive explanation. No change was noted for SME/student agreement on report reading. It is recommended that report reading be dropped as a behavioral category since past research (see Lickteig, 1992) has shown that there is a strong tendency of soldiers to open all reports received. This also was the recommendation of the SMEs for each IMEX report.

IMEX Software

As described in the previous chapter, the software development for IMEX was a multi-stage, collaborative effort. The software adequately supported the objective of IMEX: training information management skills. However, there is much room for software modification. These are mostly in terms of refining parameters associated with the feedback materials and developing a more sophisticated Coordinator's workstation for training session execution. Modifications to SEND would also facilitate any future development of new and more complex IMEX vignettes. Student comments regarding software modifications are shown in Table 18. Comments not derived from student input reflect the observations and recommendations of the Coordinator.

The first comment regarding enemy icons stems from the belief of students that the current way the CCD displays enemy icons is not optimal. When there is more than one type of enemy specified in a report, the CCD displays an icon for the first vehicle specified in the report. For instance, if a report specifies 1 tank and 20 PCs, the CCD will display a tank icon with a 1 drawn beneath it. Students requested that both pieces of numerical information be listed with the icon.

The second comment deals with further IMEX development. Students wanted to progress from initial vignettes to exercises which allowed them to interactively manage traffic across different companies. The software currently does not support the capability to send messages from the Coordinator's workstation to different companies simultaneously. In addition, further

Table 17

Student/SME Suggested Action Agreement Rate

<u>Practice</u>					
	Reading	Posting	Relay Up	Relay Down	Delete
OK ¹	100%	77.78%	95.56%	82.22%	71.11%
IA ²		11.11%		15.56%	4.45%
MA ³		11.11%	4.44%	2.22%	24.44%
<u>Training 1</u>					
	Reading	Posting	Relay Up	Relay Down	Delete
OK	100%	85.19%	100%	77.78%	85.19%
IA		11.11%			3.70%
MA		3.70%		22.22%	11.11%
<u>Training 2</u>					
	Reading	Posting	Relay Up	Relay Down	Delete
OK	100%	82.22%	95.56%	84.44%	77.78%
IA		13.34%	15.56%		6.55%
MA		4.44%	4.44%		15.56%
<u>Training 3⁴</u>					
	Reading	Posting	Relay Up	Relay Down	Delete
OK	100%	85.71%	92.86%	90.48%	92.86%
IA		4.76%		4.76%	
MA		9.53%	7.14%	4.76%	7.14%
<u>% Change from Practice to Training 3</u>					
	Reading	Posting	Relay Up	Relay Down	Delete
	0.00%	+7.93%	-2.70%	+8.26%	+21.75%

¹OK = Student and SME are in agreement

²IA = Student took an Inappropriate Action

³MA = Student Missed an Action

⁴N=2, due to printer malfunction

Table 18

Student Comments Regarding Software

- Add an additional numerical identifier to track enemy icons
- Change software to support interactive training between students from different companies
- Develop mechanism to ensure critical information is not deleted
- Develop mechanism to filter redundant reports
- Change "Go/No Go" labeling on feedback screens

developmental work would be needed to provide feedback to students on reports generated online. The first step to accomplish this would be the development of information management SOPs which could be entered into a data base used to evaluate online behavior. This will be discussed further in a following section.

The third comment addresses the problem that one student experienced when he accidentally deleted an overlay from his overlay file. All of the students agreed that there should be a category of items which when selected for deletion, results in the user being issued a prompt asking for verification of his selection.

The fourth comment refers to the students' recommendation that a filtering mechanism be instrumented for duplicated reports. A filtering mechanism does exist which screens duplicate reports from the same originator; however, students desired a more sophisticated mechanism which could screen duplicate reports from different originators or reports which varied in only small degrees such as a slight difference in grid location.

The final comment reflects the students' sensitivity to the use of "Go/No Go" performance characterizations. These labels were unacceptable, especially since no information management SOPs currently exist to support such an "all or nothing" scoring strategy. It is recommended the software be modified to present student/SME agreement in terms of less sensitive labels such as "Agree/Disagree" rather than "Go/No Go". Additional changes to feedback parameters are discussed below.

Feedback Software. The feedback software was organized in terms of student/SME agreement on individual messages, overall exercises, and SITREPs. Additional software was written to provide students with a printout of their performance to use as a reference during AARs. Observations of the students as they completed the feedback component of each vignette yielded some

recommendations for software modifications. Two general interface suggestions are offered: (a) drop the pagination button and build in a scrolling feature for each screen and (b) highlight the bottom line of text to signal the user when there is additional information on a following page. Additional software modifications are suggested below.

(1) Message summary option: Students spent the greatest amount of time reviewing their performance using this option. Students took advantage of the handshaking ability of this option which activates a report's icon on the CCD's tactical map when that report was selected on the feedback screen. As mentioned, an easy and important software change to implement is changing the "Go/No Go" student performance labels to something less sensitive such as "Agree/Disagree". Another recommendation is to incorporate the SITREP feedback into this option. As it stands, the SITREP feedback does not require a separate option and lends itself well to this format.

(2) Exercise summary option: Students did not use this feedback option, probably because the message summary option provided sufficient feedback. This option could be eliminated or modified to match the format of data presented in Table 17.

(3) SME Sitrep feedback option: Since the SITREP is a report type, this option could be incorporated into the message summary feedback option. Also, the student scoring software should be modified to accept a range of values for the specified FLOTS. Currently, any deviation from the SME FLOTS results in a "No Go" for students. This was dealt with by including a textual explanation in the SME feedback explaining that values close to the SME FLOTS were considered "Gos". However, the optimal solution is a software modification to avoid unnecessary negative feedback.

(4) Feedback printouts: The printouts presented to each student prior to the commencement of a vignette's AAR were largely ignored. Students preferred to refer to their feedback screens for an accounting of their performance. In cases where the monitors would be available, this would be the preferred mode for all performance feedback. Further, "buffer jams" occurred when multiple students activated the printer at very close intervals. Given that the printouts were largely unused, it is recommended that they be presented in a take home package when a printer is available. Otherwise, the printouts could be eliminated with no negative training effect. Recommendations are offered below for developers who wish to continue using printouts as a source of feedback.

The first part of this feedback presents reports in terms of inappropriate actions (IA), missed actions (MA), and okays (OK) (see Table 17). For instance, a student receives an IA if they

posted a report counter to the SME's recommendation. However, if they failed to post a report that the SME recommended to post, they received an MA. This labeling scheme becomes cumbersome to interpret. An alternative way to present the data would be to replace IA and MA with easier to interpret symbols such as "+" and "-". A student would receive "+" if they committed an action not recommended by the SMEs and "-" if they omitted an SME recommended action.

A second recommendation is to eliminate the "Read" column of the feedback. As mentioned earlier, soldiers have a clear predisposition toward opening all received reports. This matched 100% with SME behavior; therefore, it appears that this category offers little potential for shaping information management strategies.

A second part of the feedback matches the format of the exercise summary option. Breaking the feedback down by report type is of little interest unless training objectives are directed at report type. This feedback could be eliminated without negative training effects.

The printouts were useful to the Coordinator in that they provided a permanent record of the training performance for each student. At a minimum, software should be written so that the information from the printouts is written to a disk. The preferred format for the data would allow for easy importing to data analysis software.

Coordinator's Workstation. Software for the Coordinator's workstation should be developed to provide the option of menu driven control of the exercises. Currently all exercise control is accomplished through manual input of sometimes extremely lengthy command lines for each workstation. Different commands require access to different directories, requiring some understanding of the UNIX system. While the coordinator would still require the ability to interact with each workstation individually, the workstation should have as a feature one window which controls all workstations and includes a menu with exercise control feature selections such as "Bring up IMEX student workstations," "Bring up IMEX Coordinator's Workstation," "Print innovative file," etc. The feature selection button for the start-up of the student workstations should also activate the appropriate checkpoint file and place each student's own vehicle icon in the correct location on the CCD's tactical map. Besides decreasing the probability of input errors, these modifications would make the workstation much easier for novice and short-term users.

SEND. SEND should be modified to allow bundling of messages from different echelons into one vignette file containing a radio net field for each report. Otherwise, the correct CCD default

route will not be presented to the user when he chooses to relay a report. This is a problem when a developer wants to place reports from different echelons into one vignette file and the interval of reports is a variable as well as the order in which the reports are transmitted. The work-around for this problem should not be considered a long-term option. It would seem that the software fix would be straightforward given that radio nets can be specified within session files. The work-around entails splitting the vignette file into separate files, one for each radio net (Company and Bn). Then, reports within each file are given intervals based on the order in which they should be transmitted (occasional timing problems still occur). These files are then bundled into one session file.

Another suggested modification of send deals with the creation of test files. Training objectives, direct instructions, OPORDs, and SME rationales were built using SEND. While it was desirable to keep text files brief, SEND has a limit of 1024 characters for a single text file. This greatly constrained the presentation of some training materials. This modification was beyond the scope of the current program's resources, but is recommended as a high priority change for future training development efforts.

Information Management SOPs

This tryout of IMEX has provided support for the SME recommendations offered to students. However, information management SOPs must be developed and validated before the IMEX program can be considered complete. As a start, it is recommended that additional tryouts be conducted to validate the SME recommendations and begin the development of information management SOPs. One approach to the development of SOPs would be to develop a data base of student performance, working toward a comprehensive source of information which could be used for the development of an expert system.

Innovative Training

The IMEX training program provides a sound basis for refining training technologies for the CVCC systems aimed at information management skills; however, several modifications to the program could enhance future training. First, future extensions of IMEX could require the capability for workstations to role-play Company Commanders of several companies, interacting with each other on a Battalion net and with subordinates on a Company net. Providing feedback aimed at reports generated online would require the development of an expert system based upon a valid set of information management SOPs. The development of scenarios and software supporting online student-to-student interaction would add increased complexity and realism to the

exercises. This was a consistent recommendation offered by the students.

Second, since all of the IMEX vignettes were defensive, additional scenarios could be developed based on offensive operations or more specialized situations such as a counterattack, attack, or delay missions. Related, the IMEX software currently does not allow for POSNAV or mutual POSNAV input to a student workstation. This would be a desirable change if students interacted with each other and/or scenarios requiring vehicle movement were developed.

Third, multiple levels of SME feedback could be made available to the user. For instance, "key terms" in a SME rationale could be presented in boldface. Students could have the capability to select any key term associated with a rationale. This selection would activate a second level of detail linking the key term to the SME rationale.

This trial implementation of IMEX has demonstrated the value of the DIS environment for innovative training uses and paved the way for future development that should be further pursued by the training and development community. While IMEX is focused on the CCD component of the CVCC program, other test and evaluation or training facilities concerned with training information management skills may tailor this approach to suit their needs. For instance, the Armor Combined Arms Training Strategy (CATS) contains explicit current and future guidance on collective training events, some of which combine simulation and C³ functions. The IMEX could positively impact the unit collective training events when automated C³ devices and equipment become available. IMEX could potentially enhance the critical synchronization activities in Staff Exercises, Logistics Exercises, and Movement Coordination Exercises.

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Glossary

AAR	After Action Review
AC	Active Component
ARI	Army Research Institute
ARI-Knox	Army Research Institute - Fort Knox Field Unit
AMTP	Army Mission Training Plan
ANCOC	Advanced Non-Commissioned Officers Course
AOAC	Armor Officer Advanced Course
AOB	Armor Officer Basic
ARTEP	Army Training and Evaluation Program
BLUFOR	Blue Forces (Friendly SAFOR Units)
BNCOC	Basic Non-Commissioned Officers Course
BnTOC	Battalion Tactical Operations Center
C ³	Command, Control, and Communication
CALL	Center for Army Lessons Learned
CATS	Combined Arms Training Strategy
CCD	Command and Control Display
CCTT	Close Combat Tactical Trainer
CDR	Commander
CITV	Commander's Independent Thermal Viewer
CTC	Combat Training Center
CVCC	Combat Vehicle Command and Control
DARPA	Defense Advanced Research Projects Agency
DCA	Data Collection and Analysis
DIS	Distributed Interactive Simulation
FBC	Future Battlefield Conditions
FEA	Front End Analysis
FSO	Fire Support Officer
GAO	General Accounting Office
IA	Inappropriate Action
IMEX	Information Management Exercise
IPB	Intelligence Preparation of the Battlefield
IVIS	Intervehicular Information System
MA	Missed Action
MCC	Management, Command, and Control
METT-T	Mission, Enemy Troops, Friendly Troops, Time, Terrain
MOA	Memorandum of Agreement
MWTFB	Mounted Warfare Test Bed
NTC	National Training Center
OPFOR	Opposing Forces (Unfriendly SAFOR Units)

OPORD Operations Order

 PCC Pre-Command Course
 POI Program of Instruction
 POSNAV . . . Position Navigation
 PVD Plan View Display

 S2 Intelligence Officer
 S3 Operations Officer
 S4 Logistics Officer
 SAFOR Semi-Automated Forces
 SCC SIMNET Control Console
 SIMNET . . . Simulation Networking
 SIMNET-D . . SIMNET-Developmental
 SITREP . . . Situation Report
 SME Subject Matter Expert
 SMI Soldier-Machine Interface
 SOP Standard Operating Procedure

 TACOM Tank Automotive Command
 TOC Tactical Operations Center
 TRADOC . . . Training and Doctrine Command

 UCFT Unit Conduct of Fire Trainer
 USAARMC . . . United States Army Armor Center

 XO Executive Officer

Appendix A

**Hardware, Software, and Training Development
Considerations for Innovative Training Concepts**

Battle Staff Planning Exercise

1. Required Hardware/Software Configuration. This training exercise would require:

- Four networked SPARCS workstations with Tactical Operations Center (TOC) software (previously developed under the auspices of ARI-Knox) and a terrain database;
- a networked (lesser capability) SPARCS workstation to operate the SEND utility; and
- a large screen for Situation Display.

2. Training Materials Development Required. The following materials would need to be (1) adapted from existing materials or (2) developed to implement this exercise:

- (1) Mission scenario including Brigade Operations Order (OPORD) and accompanying messages organized into appropriate files for use by the SEND utility;
- (1) Graphic overlay corresponding to Brigade OPORD entered into the workstations;
- (1) Intelligence Annex and overlay for Brigade OPORD containing Brigade inputs to the Battalion Intelligence Preparation of the Battlefield (IPB);
- (1) Specifications for terrain database corresponding to scenario;
- (1) Modifications to existing Battalion TOC Standard Operating Procedure (SOP) as needed;
- (1) Training materials for workstation familiarization;
- (2) Introductory materials to introduce trainees to purpose of exercise, training objectives, expectations for their behavior, and administrative/logistical issues;
- (2) Exercises to be used in conjunction with workstation job aid for training;
- (2) Specification of doctrinally correct overlays and associated teaching principles/rationale; and
- (2) Input for storyboards for message center feedback system to include text windows conveying teaching principles, explanatory rationales.

3. Software Modifications Required. Software modifications required to implement this exercise would be needed for training delivery and for training feedback.

For training delivery, three types of software modifications would be required:

- (1) To train the leader reconnaissance task, it would be desirable to add two functions to the workstation software. The first function is the capability to draw a profile of terrain between two selected points. This capability would allow the leader to examine the terrain in more depth as part of his reconnaissance. The second is an intervisibility function which would allow assessment of the map reconnaissance conducted on the work station as part of the Battalion Commander's leaders reconnaissance. Desired functions for the workstation represent current capabilities on the Plan View Display (PVD). (See initial section of this Research Product for a discussion of the components and capabilities within the Distributed Interactive Simulation (DIS) environment.)
- (2) Workstation modifications would also be necessary to add the graphics and symbology required to generate IPB templates and overlays.
- (3) Students would need to send and receive messages from other training participants who also are using the workstation. Workstation software must support communication among the Battalion Commander (CO), Executive Officer (XO), Intelligence Officer (S2), and Operations Officer (S3).

For training feedback, primary software modifications would implement routines for providing on-line feedback to students. Feedback would be specific to each of the products generated by students. Two types of feedback are anticipated. For products involving graphics, feedback is expected to include a set of overlays of doctrinally-correct graphics that can be laid on top of graphics developed by students. The doctrinally correct overlay would be in a different color (such as green) and would allow the students to assess key similarities and differences between their product and one doctrinally correct approach.

The second type of feedback is expected to include textual descriptions. For example, the workstation screen might be divided into three sections. The first section would provide participants with an on-screen format for a given product. When this product is completed, a second section of the screen would display a doctrinally correct product. A third section would list major teaching points associated with the product. A two-

level system for this third section is envisioned. At the first level, an overview of key teaching points is presented. Users have the capability of clicking on any point, which then displays a second explanatory screen containing more detailed information.

Specific requirements are anticipated for each product listed below. These generally include a specified format for the students to use while generating the product, a doctrinally correct example in the same format, and a list of key learning points at two levels of detail as outlined below.

Commander's Planning Guidance -

- (1) Restated mission.
- (2) Additional information/guidance to be considered by staff in planning process.

Warning Order - Format is variable and dependent on type of mission, but may include one or more of the following paragraphs:

- (1) Heading.
- (2) Situation.
- (3) Attachments/Detachments.
- (4) Earliest time of move.
- (5) Nature and time of the operation.
- (6) Time and place of orders group.
- (7) Administrative/logistical information.
- (8) Acknowledgment.

IPB Templates and Overlays - Templates and template manipulation tools to enable:

- (1) Battlefield area evaluation;
- (2) Terrain analysis;
- (3) Weather analysis;
- (4) Threat evaluation; and
- (5) Threat integration.

Operations Estimate - Format currently exists on workstations.

Tentative Plan - Current OPORD format with a section labeled "Assumptions" added.

Leader's Reconnaissance - Intervisibility function will provide mechanism for examining the quality of the map reconnaissance.

Updated Plan - Same format as tentative plan with capability to change the label and revise content.

Battalion Operations Order and Graphics - Currently exists as OPORD format on workstation. The following section describes required software modifications in more detail.

Functional Requirements for Software. This section outlines the functional software modifications to the Combat Vehicle Command and Control (CVCC) TOC workstation software to permit the use of CVCC SPARCS workstations in the training of Pre-Command Course (PCC) and Armor Officer Advanced Course (AOAC) students as a Battalion Commander, XO, S2, and S3.

The required hardware network configuration is shown in Figure A-1. The components of the network are: four networked SPARCS workstations for the student's use, one networked SPARC workstation capable of operating the SEND utility and the overlay module, and a large screen monitor for the situation display.

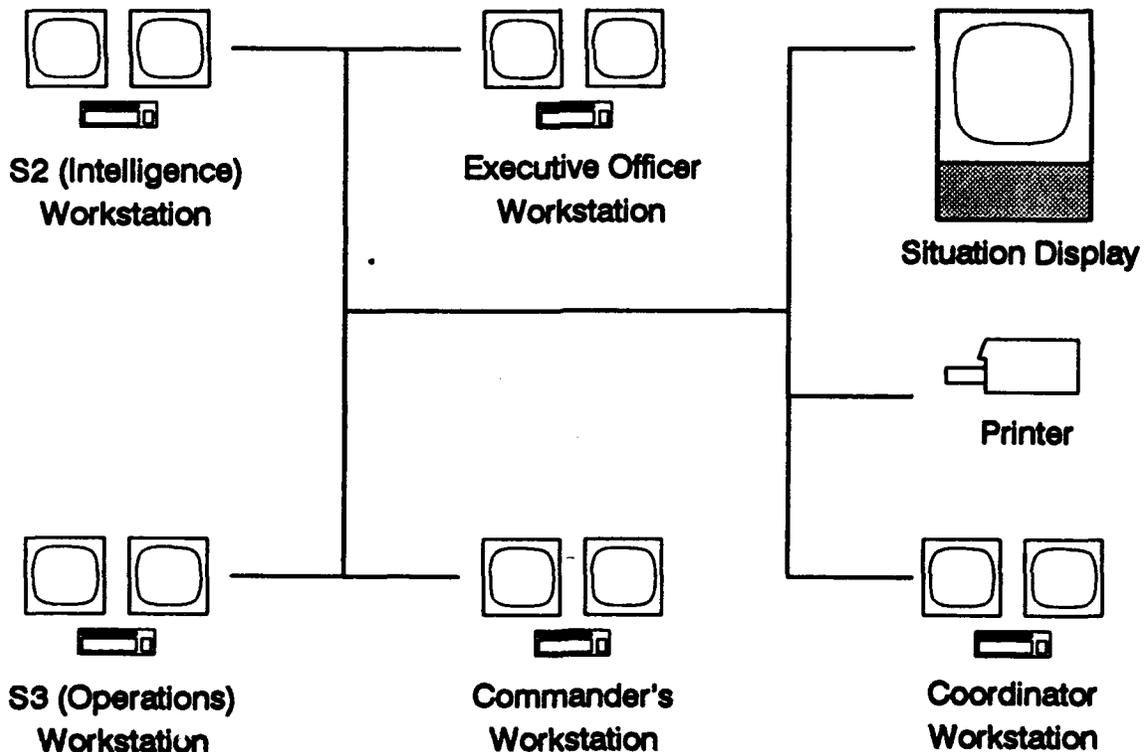


Figure A-1. The planning exercise network

In general, the intent is to build upon the software already available for the TOC workstations with changes/modifications held to the minimum required to support the training mission. CVCC software currently available will require some modification to permit its use in a workstation planning exercise. In the training network, both messages and overlays must be capable of being sent and received over the network and discrete destination addressing for message and overlays must be implemented. Currently, TOC workstations can "pull" files and overlays from other workstations. The specific modifications desired are discussed below.

In addition to the current capabilities, the TOC workstation must be capable of receiving and displaying brigade operation plans/orders including overlays and full page free text formats dispatched (sent) from the COORDINATOR workstation (The COORDINATOR station will emulate the Brigade Headquarters workstation). Overlays are a common part of Brigade Operations Plans/Orders. In addition, intelligence overlays are often forwarded to the battalion as a part of Intelligence Summaries (INTSUMS). As these overlays are received and displayed, the battalion task force staff WILL BE ALLOWED to edit the overlays (even though the battalion task force is not the originator). However, when edited, the overlay must be renamed. This will allow the staff to build upon the picture as it is seen by the higher headquarters and to add the additional symbology and information which is of concern to the battalion task force.

For the purposes of providing training feedback, two categories of Preferred Solution Examples (PSEs) will be utilized. These are: (a) individual PSEs, intended to provide feedback for products prepared by the individual student, and (b) collective PSEs intended to provide feedback for the product of collaborative efforts of the commander and staff.

Certain preferred solution overlays and formats will be dispatched from the COORDINATOR workstation for storage at the battalion task force workstations. These will be protected from display until the officer/student finishes preparing a required action (e.g. preparing warning order). With the mouse, the student will click on the "COMPLETE" button to indicate that he has completed the requirement. This action will release the corresponding PSE and its "POINTS" file which had been protected from display. The students can then compare their solution to the PSE. For an overlay, the preferred example may be displayed (in a contrasting color) over the student-prepared solution on the map display. For a text-based type requirement (e.g., a written intelligence annex), the PSE will be displayed beside the student's solution on the right-hand workstation screen. The preferred solutions presented will be "locked" with "read only" attributes to protect their contents from alteration.

In addition to the release of PSEs, discussed above, there are some staff actions which are group coordinated actions and can best be addressed as a collaborative PSE. In this case, as the commander and his staff complete each component of their collaborative solution, a screen will appear reminding them that the PSE will be presented upon completion of all the staff action components. The message will indicate that the students will gather as a group to review and discuss each component of the PSE. (The group review will be accomplished by projecting map and overlay data on a large-screen display with accompanying text data displayed at individual workstations.) A screen, like the one shown in Figure A-2, is prepared and input from the COORDINATOR workstation. (Each screen is unique for each requirement of a group solution.) As each component (POINTS) of the group solution is completed by the group, an indicator will appear in the parentheses. When all components of the collaborative solution are completed, the PSEs for all components of the collaborative solution will be released to the appropriate workstations for use in the small group review. If the student "clicks" on "NEXT" before the group solution is completed, a notice (as shown in Figure A-3) appears. This notice will be a standard screen that appears for group collaborative requirements.

P O I N T S (OPLAN)		
IPB Template	()
Intell Annex	()
Opns Estimate	()
Opns Overlay	()
OPLAN Draft	()
E X I T	B A C K	N E X T

Figure A-2. Points (OPLAN)

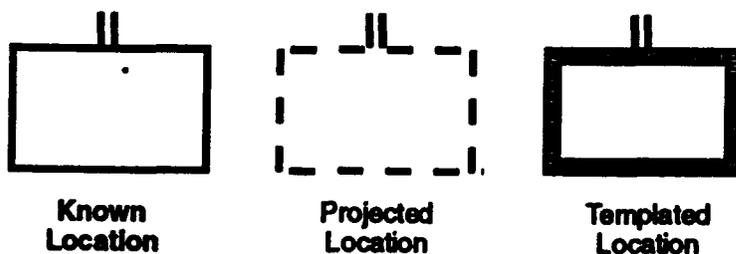
The S2 Workstation will use the current S2 workstation software with some additional capabilities. IPB using doctrinal templates is described in the workstation documentation (BBN, 1989) and in Chapters 4-7 of The Tank and Mechanized Infantry Battalion Task Force (FM 71-2). If time and resources permit, it is desired to implement a Template Module on the S2 Workstations. If resource or time constraints do not permit the implementation of the Template Module, a work-around using the ability to edit

incoming overlays from the COORDINATOR (Brigade) workstation can be used.

G P O U P R E V I E W (OPLAN)	
NOTICE: Upon completion of all components of the group collaborative effort, the Preferred Solution Examples for all portions of this requirement will be made available at each cmdr or staff officer's workstation.	
E X I T	B A C K

Figure A-3. Group review (OPLAN)

The work-around will require that the overlay tools allow symbols to be moved and rotated to any angle so that they can be incorporated into doctrinal templates as needed. In addition, the ability to prepare and place distinct opposing force (OPFOR) symbols in red color will be needed. It will be necessary to distinguish between OPFOR unit symbols and icons and between icons that are placed on the map as a template versus those that are placed on the map as a result of battlefield reports. This would require that the software support three distinct types of OPFOR symbols as shown in Figure A-4.



All symbols are in RED

Figure A-4. Required OPFOR symbols

The S3 Workstation will be configured with the normal S3 CVCC modules to include the Concept of Operations Module, a full page free text format, and the additional map tools described below.

The CO and the XO Workstations will be configured with the normal CO/XO workstation modules, with additional map tools to expedite the workstation use for map reconnaissance, and a full page free text format. The additional map tools will allow determination of battlefield intervisibility. These tools may function similarly to the intervisibility tools on the current PVD. Specifically, these tools must:

- (1) Display the status of intervisibility, using a color code, along a line of sight between two selected points on the battlefield. The first point selected will be the location of the observer with the second point selected representing the terminal point (target) being viewed;
- (2) Display the status of intervisibility, using a color code along rays extending from a point in a 360 circle (at 50 intervals) for a range of 3500 meters from the selected point; and
- (3) Display a profile of the terrain along a line of sight selected between two battlefield points.

The full page free text format will allow the CO/XO to prepare notes and guidance, restate his mission, and make other notations. This full page free text format will be used between the TOC workstations. There is difficulty in identifying free text messages in the incoming message queues at the present time. To facilitate identification of the message contents, the message queues functioning on all workstations could be changed to display the first few words of the text message, in addition to the current information.

The Coordinator Workstation (CW) is used by the instructor to input scenario information and to set the situation for the training exercise. The workstation also will have the tools required for the instructor to insert teaching "POINTS" down through the third-level text screens. In order to emulate several different brigade communication channels (i.e., Bde Cmd Net, Bde O & I Net, etc.), discrete addressing to the four other workstations on the net is required.

The following modules will be required on the coordinating display:

- (1) The SEND utility (front and or entire module);
- (2) The overlay module;
- (3) The format module (with full page free text format added);

- (4) The Map Module (including the intervisibility tools described above); and
- (5) A new module, the "SOLUTION" module, will be required to permit the entry of the preferred solutions and the "feedback" screens. Three levels of linked "feedback" screens will be planned for, although three levels may not be required in all cases.

The "Preferred Solution" is a doctrinally based solution which has been prepared by the training instructor using the modules available on the CW. It is the initial stage of feedback to the student and is revealed only after the student has indicated that he has finished an action required by the scenario and the staff interaction. The student indicates that the action (e.g., overlay or text format) is finished by "clicking" on a "COMPLETED" button. The "Preferred Solution" linked to that action is released and automatically displayed on the screen. At the same time, a "POINTS" menu specifically tailored and "linked" to the completed action is displayed. (This menu may be displayed on the same screen or on the opposite screen.)

The tools in the "SOLUTION" module will allow the instructor to enter a series of related screen menus which provide feedback and explanations to the student on demand. These screens provide three successive levels of specificity to the feedback.

The "SOLUTION" module must also be capable of preparing and storing certain "standard" explanatory screens similar to those shown in Figures A-2 and A-3. These will allow the instructor to prepare screens ahead of time for use in a variety of scenarios and will not require inputs from the keyboard each time they are needed.

As shown in Figure A-5, the first level of the SOLUTION module is the "POINTS" menu. This menu designates the key teaching points associated with the overlay or format prepared by the student (in accordance with the scenario used.) In the case of an action involving an overlay, the "preferred solution" overlay would automatically be placed over the student's overlay when the "COMPLETED" button has been activated. The "Preferred Solution" overlay would be in a contrasting color to assist the student in identifying differences between his solution and the "Preferred Solution." The "POINTS" menu would also be presented on the map display at a location which does not obscure the student's solution and the preferred solution. For a textually-based action, (e.g., prepared using the Format Module), the "Preferred Solution" would automatically be placed side-by-side with the student-prepared solution when the "COMPLETED" button has been activated. Again the "POINTS" menu would be displayed in a location which did not obscure the student's solution and the "Preferred Solution."

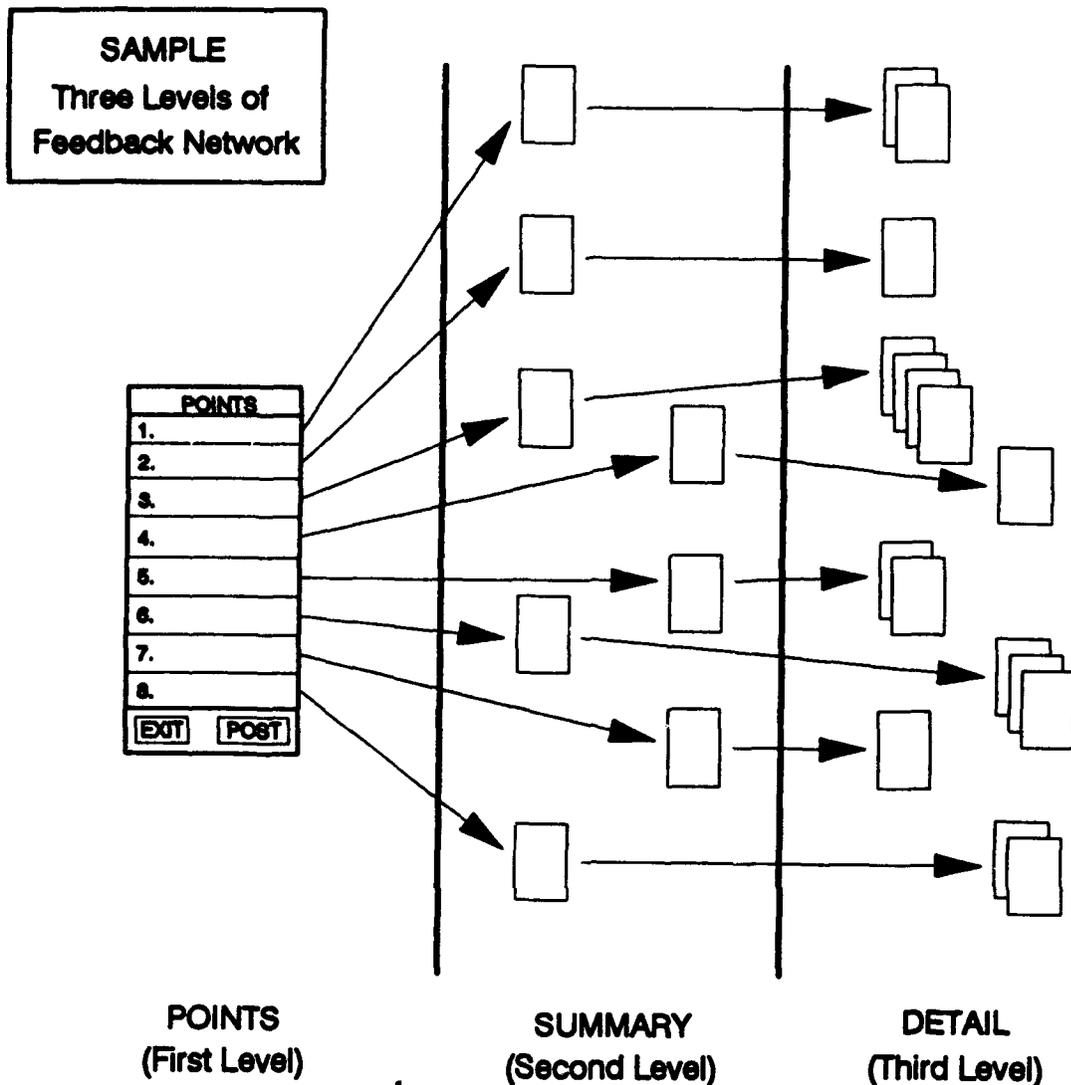


Figure A-5. The POINTS menu

As each "solution" is presented, a "POINTS" menu (presenting no more than eight "POINTS") will be revealed. The "POINTS" listed on the menu are word titles relating to key attributes of the overlay or text-based format. (The "POINTS" have been previously prepared by the instructor and entered from the CW.) Each POINT is an active button. When it is "clicked," it will call to the screen a short second-level text screen with a summary explanation of the "POINT" listed. The second-level screen will contain text which also has been prepared previously by the instructor. An example of the first-level "POINTS" menu is shown in Figure A-6.

Each "POINTS" menu is unique to the particular example displayed and are a part of the specific "preferred solution" file. Each of the words describing a "POINT" is an active button and, when "clicked," calls the corresponding Summary Screen to view. As an example, if the button labeled 3. BOUNDARIES is "clicked" on, the corresponding Summary Screen, headed "BOUNDARIES," would appear. If the student "clicks" on NEXT without selecting a numbered button, the Summary Screen labeled "TECHNIQUES" would appear. If the student is viewing the Summary Screen "BOUNDARIES" and clicks NEXT, then the Summary Screen for "PHASE LINES" (#4) would be called to view.

P O I N T S		
1. Techniques		
2. Scales		
3. Boundaries		
4. Phase Lines		
5. Battle Positions		
6. Routes		
7. Reserve		
8. Counterattack		
E X I T		N E X T

Figure A-6. Example of a first level POINTS menu

The second level is a summary of the individual points presented on the "POINTS" menu as shown in Figure A-7. It is a doctrinally-based textual explanation. Certain "keywords" in the textual explanation are highlighted and are sensitive (read "buttons") to being clicked on to "call" the third-level Detail screen, which provides more in-depth explanation of the "keyword." If the explanatory material exceeds one page in length, a scroll bar will be available on the right side of the screen.

The third feedback level (the Detail level) will be the final level displayed. It provides further detailed information on the linked highlighted "Keyword" selected from the second (Summary) feedback level. The third level is generally textually based with no highlighted words. It is a free text screen with a heading corresponding to the "Keyword" selected on the Summary

Screen. It has two action buttons at the bottom: BACK and EXIT. If the explanatory material exceeds one page, a scroll bar will be available on the right side of the screen.

As each "preferred solution" is prepared by the instructor and entered into the CW, the supporting feedback POINTS, Summary, and Detail screens will be segregated into separate files. When students are ready to compare their solution to the "preferred solution," they enter "COMPLETED." As the "preferred solution" is called-up, all of the supporting files with screens are ready to be called for display. When the requirement is an individual one, the three-level feedback system is immediately available, at the student's request, to provide further doctrinally-based explanations of the key teaching points associated with the particular overlay or format under consideration. "Preferred solution" files will be protected by "read only" attributes so they may not be inadvertently corrupted.

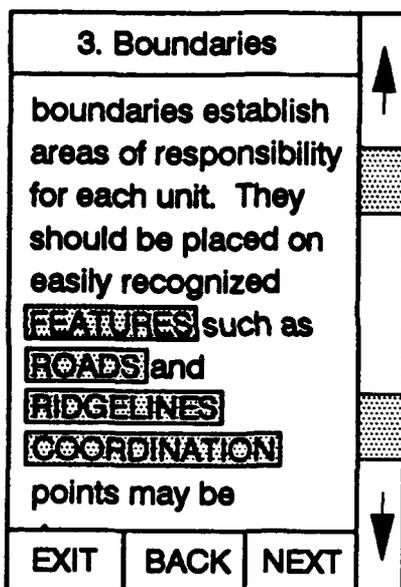


Figure A-7. Sample summary

The SEND utility is currently used to batch load files which set the situation on the simulation network. The necessity to preload files (i.e., the "preferred solution" files) require that they can be saved to floppy disks. Storing the files on floppy disks allows them to be archived and used for rapid loading into the workstation after it has been used for other purposes.

The situation display will be used for briefings by the staff officers and the commander as he announces his decision and explains his concept of operations. It also is used during the AAR to display overlays for discussion purposes. Each of the

networked workstations should be capable of posting to the situation display.

The printer is in the network to provide hard copies for discussion purposes and to provide students with copies of their work for future study. Print-outs of both the Map Screen and overlays (Left-hand Screen) as well as the Message and Format Screens (Right-hand Screen) are required.

Leader's Reconnaissance Exercise

1. Required Hardware/Software Configuration. This training exercise would require:

- A STEALTH operating as a ground vehicle;
- A Semi-Automated Forces (SAFOR) station;
- A terrain database initialized based on scenario used for planning exercise;
- A PVD; and
- A Data Logger.

2. Training Materials Development Required. The following materials would need to be (1) adapted from existing materials or (2) developed to implement this exercise:

- (1) Initialized terrain database with enemy and friendly vehicle placement as indicated by mission scenario;
- (2) Introductory materials to introduce trainees to purpose of exercise, training objectives, expectations for their behavior, and administrative/logistical issues;
- (2) Training materials and exercises to be used for familiarization training with the STEALTH and procedures for communicating with the SAFOR operator;
- (2) Specification of rules for invoking intervisibility function on PVD and associated teaching principles/rationale; and
- (2) Storyboards for message center feedback system to include text windows conveying teaching principles, explanatory rationales.

3. Software Modifications Required. The current software implemented in the DIS environment allows delivery of the training exercise as described. The only restriction is that the STEALTH must be tethered to a SAFOR vehicle during the reconnaissance. This allows the reconnaissance to be displayed and replayed later on the PVD. The STEALTH, when untethered, currently does not send data packets over the network, thus requiring this restriction.

However, software modifications would be required to implement the training feedback portion of this exercise. More specifically, these software modifications center on implementing routines for providing on-line, timely feedback to trainees at the PVD. Two types of feedback are anticipated. The first capitalizes on the intervisibility analysis capability of the PVD. The student will be provided with cues at predetermined points to invoke the intervisibility function and make a self-assessment based on this information.

The second type of feedback is expected to include textual descriptions listing major teaching points associated with leader reconnaissance. A two-level system is envisioned, with a first level overview of key teaching points and a capability to click on any point to bring-up a second explanatory screen with more detailed information.

Mission Rehearsal Exercise (Electronic Sandtable)

1. Required Hardware/Software Configuration. This training exercise would require:

- Networked SPARCS workstations with TOC software for all TOC participants (most likely, the XO, Assistant S3, S2 and Fire Support Officer (FSO)) and a terrain database housed in a simulated TOC;
- A large screen display for projecting the electronic map for use in map reconnaissance and initial AAR;
- Simulators for each tank crew participating in the "Electronic Sandtable" phase of the exercise (number will vary depending on use of SAFOR to represent units within the battalion);
- At least one (and possibly two) SAFOR stations for monitoring and controlling units within the battalion represented by SAFOR;
- Networked radios in simulators, TOC and exercise control room;
- A PVD housed in the exercise control room;

- MCC and SCC systems in the exercise control room for simulator setup, monitoring and control; and
- A Data Logger to capture automated data packets and a Data Probe/RS/1 Workstation for data reduction and analysis.

2. Training Materials Development Required. The following materials would need to be (1) adapted from existing materials or (2) developed:

- (1) Mission scenario including Battalion OPORD and accompanying graphics;
- (1) Specifications for terrain database corresponding to scenario;
- (1) Modifications to existing Battalion TOC SOP to include a Rehearsal Annex;
- (2) Introductory materials to introduce trainees to purpose of exercise, training objectives, expectations for their behavior, and administrative/logistical issues;
- (1) Familiarization training on simulators and workstations;
- (2) exercise guidelines for Training Coordinator and SAFOR operator(s);
- (2) specifications for automated measures to be derived from Data Logger;
- (2) observational formats for Training Coordinator; and
- (2) guidelines for AARs.

3. Software Modifications Required. The current software supports the delivery of the Mission Rehearsal Exercise. However, there are two modifications that are required to enhance the delivery of training feedback.

The first modification involves speeding the turn-around on the capture of data packets from Data Logger so the data can be entered quickly into an analysis program such as Data Probe/RS/1 for summary. To incorporate automated data into the AAR discussion, data summaries must be available no later than 30 minutes after the end of the exercise. Perhaps adjustments could be made to speed the Data Logger system or another system such as the Unit Performance Assessment System (UPAS) (currently under development by ARI) could be incorporated.

The second modification concerns the capability to access quickly and clip segments of communication tapes for replay in the AAR. For such segments to serve as inputs to the AAR, a process must be in place which would allow flagging of segments, preferably by time, and access of designated segments within a 30 minute period.

Mission Execution Exercise (Electronic Sandbox)

1. Required Hardware/Software Configuration. This training exercise would require:

- Networked SPARCS workstations with TOC software for all TOC participants (most likely, the XO, Assistant S3, S2 and FSO) and a terrain database housed in a simulated TOC;
- A large screen display for use in the AAR;
- Simulators for each tank crew participating in the "Electronic Sandbox" phase of the exercise (number will vary depending on use of SAFOR to represent units within the battalion);
- At least two (and possibly three) SAFOR stations for monitoring and controlling units within the battalion represented by SAFOR and controlling the OPFOR;
- Networked radios in simulators, TOC and exercise control room;
- A PVD housed in the exercise control room;
- MCC and SCC systems in the exercise control room for simulator setup, monitoring and control; and
- A Data Logger to capture automated data packets and a Data Probe/RS/1 Workstation for data reduction and analysis.

2. Training Materials Development Required. The following materials would need to be (1) adapted from existing materials or (2) developed:

- (1) Mission scenario including Battalion OPORD and accompanying graphics;
- (1) Specifications for terrain database corresponding to scenario;
- (2) Introductory materials to introduce trainees to purpose of exercise, training objectives, expectations

for their behavior, and administrative/logistical issues;

- (1) Familiarization training on simulators and workstations;
- (2) Exercise guidelines for Training Coordinator and SAFOR operator(s);
- (2) Specifications for automated measures to be derived from Data Logger;
- (2) Observational formats for Training Coordinator; and
- (2) Guidelines for AARs.

3. Software Modifications Required. The current software supports the delivery of the Mission Execution Exercise. However, there are two modifications that are required to enhance the delivery of training feedback.

The first modification involves speeding the turn-around on the capture of data packets from Data Logger so the data can be entered quickly into an analysis program such as Data Probe/RS/1 for summary. To incorporate automated data into the AAR discussion, data summaries must be available no later than 30 minutes after the end of the exercise. Perhaps adjustments could be made to speed the Data Logger system or another system such as the UPAS could be incorporated.

The second modification concerns the capability to quickly access and clip segments of communication tapes for replay in the AAR. For such segments to serve as inputs to the AAR, a process must be in place which would allow flagging of segments, preferably by time, and access of designated segments within a 30 minute period.

In summary, the Mission Execution Exercise offers an opportunity for leaders and units to train on the execution of specific missions in a simulation environment prior to the expenditure of resources for field training exercises. This strategy offers the advantages of providing an opportunity for units and leaders in institutional training settings to hone their skills before going to the field and to train in a setting that can provide objective and quantitative feedback on their performance.

Appendix B

Training Materials for Practice Vignettes

- 1. Initial Student Instruction**
- 2. Tactical Scenario Materials**
- 3. IMEX Message Sets and SME Rationales**
- 4. Additional Feedback Materials**

Innovative Training and Initial Instruction

IMEX PRACTICE OBJECTIVES: OPERATE THE CCD TO FACILITATE YOUR ABILITY TO PROCESS INCOMING INFORMATION AS APPROPRIATE

- I. Task 1: Open and post a CCD overlay to your map.
- II. Task 2: Adjust your CCD map to your situation and preferences using:
 - A. Map scale
 - B. Map features
- III. Task 3: Determine if previously received messages are relevant to your area of interest by examining:
 - A. Location
 - B. Originator
 - C. Report Time
 - D. Report Type
 - E. Mission Impact
 - F. Enemy Order of Battle
 - G. Disposition of Friendly Forces
- IV. Task 4: Open and read newly received messages and take any of the following appropriate actions
 - A. Read Report
 - B. Post to Your Map
 - C. Relay Report
 - D. Delete Report

Op Ord Extract: Practice Vignette

SIT: The A Co. Cdr was killed last night in a vehicle accident. The Bn Cdr has designated you to be the new Co Cdr. He has directed you to execute the previous Cdr's plan.

STARTING SYNOPSIS: The Co has been in its defensive position for 36 hours preparing positions. All PLTs are 100%. Last night the Bn engaged recon elements. The A Co had no contact, but B & D did. Bn Cdr has directed that only CCDs should be used for comms during this operation.

EN SIT: The enemy appears to be preparing to attack. Intel has been unable to determine if we will face the main or supporting attack. They expect the enemy to be in a MTC formation with a reinforced MRB forward in the Adv. Guard role.

FR SIT: B Co (left flank): Defend BP22. O/O defend BP23.

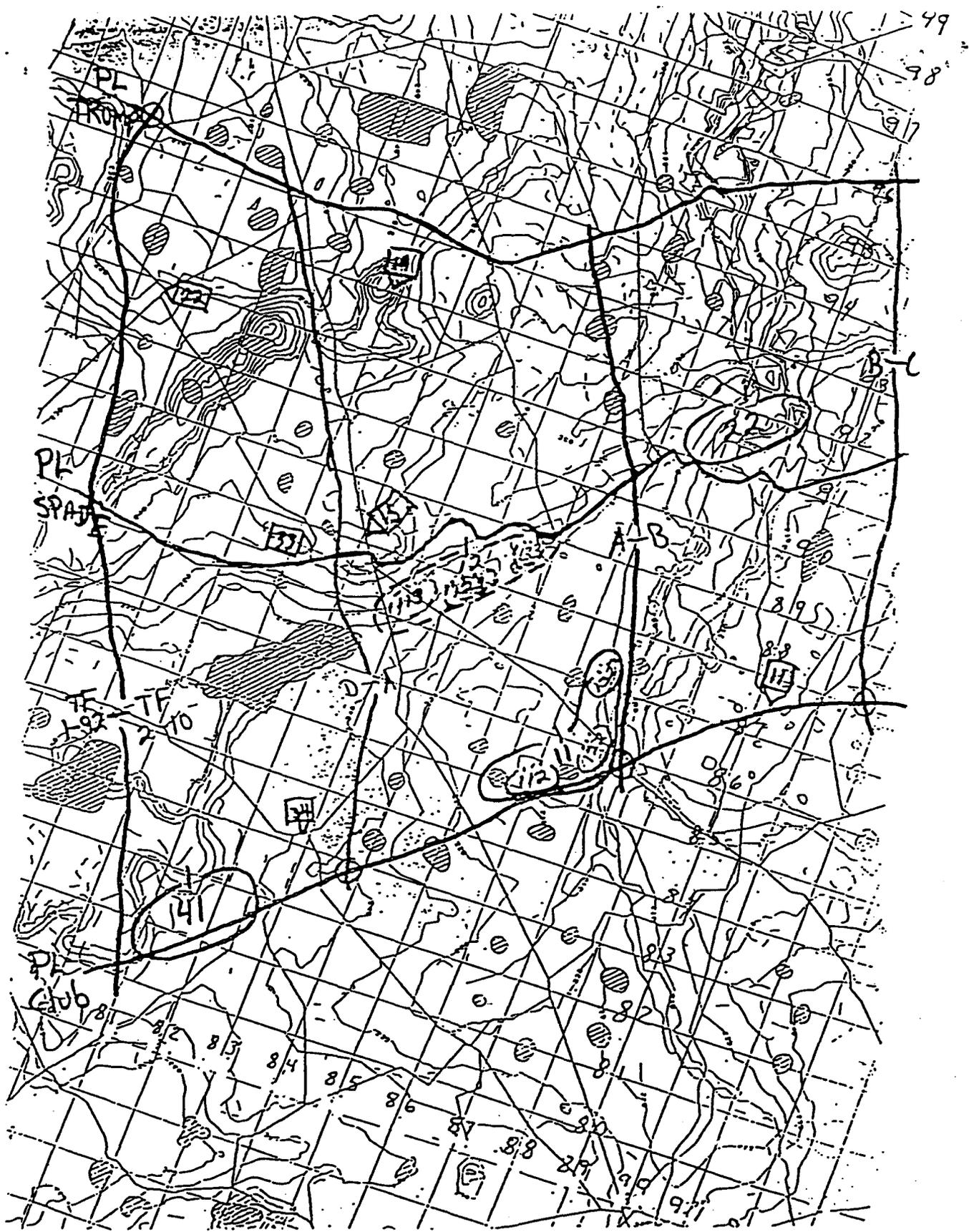
D Co (right flank): Defend BP41. O/O defend BP42.

MISSION: A Co defends BP11. O/O defend BP12.

CONCEPT OF OPERATION: 1st Plt: Defend BP112. O/O defend BP113.

2nd Plt: Defend BP122. O/O defend BP123.

3rd Plt: Defend BP132. O/O defend BP133.



Old messages for Practice Vignette

oldprac1

13:42:04 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:42:04, Originator: D06, Sender: D06

Creation Time: Mon Oct 26 13:42:04 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 1

Damaged: unspecified, Destroyed: 1]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES832798, Enemy Heading: 330, Enemy Activity: recon

Own Activity: defend, As Of: 13:42:04

oldprac2

13:42:34 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:42:34, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:42:34 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: unspecified

Activity: unspecified, Location: ES839793, Heading: 350

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:42:34

oldprac3

13:43:04 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:43:04, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:43:04 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: unspecified

Activity: unspecified, Location: ES915843, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:43:04

oldprac4

13:43:34 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:43:34, Originator: B06, Sender: B06

Creation Time: Mon Oct 26 13:43:34 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES890860, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

oldprac5

13:44:04 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:44:04, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:44:04 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: troops, Number: unspecified

Activity: recon, Location: ES905895, Heading: unspecified

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:44:04

Practice Vignette

13:11:59 Exercise 12

Innovative Training Message of type Start Collection

P11

13:12:00 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:12:01, Originator: Y03, Sender: Y03

Creation Time: Mon Oct 26 13:12:01 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mine-field, Number: 1

Activity: defend, Location: ES878852, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:12:01

SMEP11

13:12:00 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:12:01, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Minefield is on your flank boundary. Post the icon to your map and inform Lower.

P12

13:12:31 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-0@13:12:31, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:12:31 1992

Originated From: send, Relevance: low

Report: spot

[What: truck, Observed: 1

Damaged: unspecified, Destroyed: unspecified]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES901789, Enemy Heading: 90, Enemy Activity: unspecified

Own Activity: recon, As Of: 12:52:31

SMEP12

13:12:31 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:12:31, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Delete report because location is out of your sector. Mission is defend in sector. Attention should be devoted to information relevant to your sector.

P13

13:13:00 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:13:01, Originator: Y21, Sender: Y21

Creation Time: Mon Oct 26 13:13:01 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mortar, Number: 6

Activity: defend, Location: ES784901, Heading: 160

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:08:01

SMEP13

13:13:00 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:13:01, SME Actions:

inspect, post

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Information provided in this report is not relevant to your subordinates at this time because the mortars are out of range. To effectively handle this report, post it to your map for later reference but do not relay it lower.

P14

13:13:30 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:13:31, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:13:31 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: pc, Number: 3

Activity: recon, Location: ES946805, Heading: 350

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:13:31

SMEP14

13:13:30 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:13:31, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Send to lower because if enemy changes direction to the West there is potential of an enemy advance in A Sector. Mission is defend in sector and this report provides important information about enemy movement into the Bn sector that would be important to pass lower.

P15

13:14:01 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:14:01, Originator: Y21, Sender: Y21

Creation Time: Mon Oct 26 13:14:01 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: arty, Number: 3

Activity: defend, Location: ES820882, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:04:01

SMEP15

13:14:01 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:14:01, SME Actions:

inspect, post

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Send to lower only if you start a maneuver back to BP12. Friendly Arty at this location is not critical information to pass on to lower at this time.

P16

13:14:30 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:14:31, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:14:31 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: pc, Number: 3

Activity: recon, Location: ES804782, Heading: 345

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:14:31

SMEP16

13:14:30 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:14:31, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Relaying this report is not necessary since PCs are too far away and moving away from you. These PCs are not likely to pose an immediate threat to your subordinates. Messages that have tactical significance to your mission should be relayed.

P17

13:15:01 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:15:01, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:15:01 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: scout, Number: 2

Activity: recon, Location: LS879821, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:15:01

SMEP17

13:15:01 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:15:01, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Risk of fratricide decreases by informing subordinates of scout location. Situational Awareness decreases the risk of fratricide.

P18

13:15:30 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:15:31, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:15:31 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: pc, Number: 3

Activity: recon, Location: ES940876, Heading: 340

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:15:31

SMEP18

13:15:30 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:15:31, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: These PCs are moving towards C Co. As long as they continue in that direction, they will not affect your company's tactical situation. If the PCs change their direction, they will have to travel through B Co before reaching A Co's sector.

P19

13:15:59 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:16:00, Originator: A05, Sender: A05

Creation Time: Mon Oct 26 13:16:00 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mortar, Number: 6

Activity: defend, Location: ES837878, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:16:00

SMEP19

13:15:59 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:16:00, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Report should be relayed higher because it provides information on mortars located in the company's subsequent BP. Since this report was sent from AO5, it has already been passed to lower to protect subordinate elements from fratricide should withdrawal from primary BP be required.

P110

13:16:30 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-0@13:16:30, Originator: A11, Sender: A11

Creation Time: Mon Oct 26 13:16:30 1992

Originated From: send, Relevance: high

Report: spot

[What: arty, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES876819, Enemy Heading: unspecified, Enemy Activity: unspecified

Own Activity: unspecified, As Of: 13:16:30

SMEP110

13:16:30 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:16:30, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: The enemy Arty referenced in this report indicates a possible intention to attack. Post this report and send it to Higher since a change in the tactical situation is indicated. Arty may reflect progression of the forces referenced in an earlier report to you from Y21. When considered together, these two reports may contain information representing a significant change in the tactical situation.

P111

13:17:00 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:17:01, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:17:01 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: helo, Number: unspecified

Activity: recon, Location: ES915955, Heading: 360

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:17:01

SMEP111

13:17:00 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:17:01, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Read and delete this report from the display map and message queue. The helo specified in this report is in C Co's sector and moving north away from you. Avoid cluttering the map and message queue, delete this report.

P112

13:17:29 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:17:30, Originator: A21, Sender: A21

Creation Time: Mon Oct 26 13:17:30 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES891852, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMEP112

13:17:29 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:17:30, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Post report to the map and send higher. Message reports enemy contact by your unit in the EA.

P113

13:18:00 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-0@13:18:01, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:18:01 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 3

Damaged: unspecified, Destroyed: unspecified]

[What: pc, Observed: 6

Damaged: unspecified, Destroyed: unspecified]

Location: ES882811, Enemy Heading: 300, Enemy Activity: unspecified

Own Activity: unspecified, As Of: 13:18:01

SMEP113

13:18:00 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:18:01, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Post report and send lower. This report from the Scouts identifies tanks and PCs which could be the FSE moving towards your EA. Notify subordinates to be prepared for possible enemy contact.

P114

13:18:30 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:18:31, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:18:31 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: pc, Number: 20

Activity: ground-attack, Location: ES975780, Heading: 350

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:18:31

SMEP114

13:18:30 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:18:31, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: Post report and send lower. This report of 20 PCs could be the Advance Guard Main Body moving toward your EA. Inform subordinates to be prepared for possible enemy contact.

P115

13:19:01 Exercise 12

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@13:19:01, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:19:01 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: pc, Number: 3

Activity: recon, Location: ES935931, Heading: 10

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:19:01

SMEP115

13:19:01 Exercise 12

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@13:19:01, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Process incoming message traffic as appropriate.

EXPLANATION: This report indicates enemy forces moving in C Co. sector away from your element. Delete the report to avoid cluttering the map display and message queue.

SMESITPRAC

13:19:06 Exercise 12

Innovative Training Message of type SME Situation Report and Rationale

SME's Situation Report:

FLOT: ES860879-ES851848

Enemy Activity: ground-attack, Level: light

Shortage: { }, Own Intent: defend

As Of: 13:19:06

Rationale: If your FLOT is close to the grids given above, your answer is correct.

The level of enemy activity is light, your unit has only had contact with recon elements. The enemy is conducting a ground attack based upon the INTEL reports by Y02. The TF is conducting a defense.

SITUATIONAL ASSESSMENT QUESTIONNAIRE - Practice

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
----- ----- ----- -----				
Not at all	Somewhat	Moderately	Very	Completely
Confident	Confident	Confident	Confident	Confident

Confidence
Rating

- _____ 1. What type enemy organization is your Bn facing?
Type enemy organization: _____
- _____ 2. What type enemy organization is your Co facing?
Type enemy organization: _____
- _____ 3. Approximately how far away from EA Stone
(in kilometers) is the enemy main attack force?
Distance away: _____
- _____ 4. Record the grid location and type of any obstacle(s)
which could affect your company's forward or
rearward movement:
Grid location(s): _____
Type obstacle: _____
- _____ 5. Record the grid location and type of any enemy fire
support elements or observed fires which are
relevant to your Co's current situation:
Grid location(s): _____
Type fire support: _____
- _____ 6. In whose sector were the mortars initially located?
Sector: _____
- _____ 7. What was the last reported location of the mortars?
Grid locations(s): _____

SITUATIONAL ASSESSMENT QUESTIONNAIRE - Practice (Cont'd)

_____ 8. Are there any artillery assets in your sector?

Yes/No (Circle One)

If yes, grid location(s): _____

_____ 9. What was the last reported location of the Bn scouts in front of your position?

Grid location(s): _____

SITUATIONAL ASSESSMENT QUESTIONNAIRE - Practice
Answer Sheet

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
----- ----- ----- -----				
Not at all	Somewhat	Moderately	Very	Completely
Confident	Confident	Confident	Confident	Confident

Confidence
Rating

- _____ 1. What type enemy organization is your Bn facing?
Type enemy organization: **MRB**
- _____ 2. What type enemy organization is your Co facing?
Type enemy organization: **MRC**
- _____ 3. Approximately how far away from EA Stone
(in kilometers) is the enemy main attack force?
Distance away: **10-12 km (rough est.)**
- _____ 4. Record the grid location and type of any obstacle(s)
which could affect your Co's forward or
rearward movement:
Grid location(s): **ES878852**
Type obstacle: **Minefield**
- _____ 5. Record the grid location and type of any enemy fire
support elements or observed fires which are
relevant to your Co's current situation:
Grid location(s): **ES876819**
Type fire support: **Artillery**
- _____ 6. In whose sector were the mortars initially located?
Sector: **D06**
- _____ 7. What was the last reported location of the mortars?
Grid location(s): **BP12 ES837878**

SITUATIONAL ASSESSMENT QUESTIONNAIRE - Practice (Cont'd)
Answer Sheet

_____ 8. Are there any artillery assets in your sector?

YES, grid location: ES820882

_____ 9. What was the last reported location of the Bn
scouts in front of your position?

Grid location(s): ES879821

AFTER ACTION REVIEW PRACTICE VIGNETTE

AAR AGENDA

REVIEW TRAINING OBJECTIVE: AAR Leader

Manage the CCD to facilitate your ability to process information as appropriate:

TASKS:

1. Open and post a CCD overlay to your map.
2. Adjust your CCD map to your situation and preferences using:
 - A. Map scale.
 - B. Map features.
3. Determine if previously received messages are relevant to your area of interest by examining:
 - A. Location.
 - B. Map features.
 - C. Report Time.
 - D. Report Type.
 - E. Mission Impact.
 - F. Enemy Order of Battle.
 - G. Disposition of Friendly Forces.
4. Open and read newly received messages and take any of the following appropriate actions:
 - A. Read Report.
 - B. Post to Your Map.
 - C. Relay Report.
 - D. Delete Report.

REVIEW OPFOR PLAN: AAR Leader

The mission of the OPFOR MRB commander was to conduct a movement to contact and determine the enemy disposition. To find gaps in the defense or between the defensive units which would allow the MRRs to penetrate and seize river crossing sites on the Ohio River. The MRB was reinforced with a tank company from the Independent Tank Battalion of the Regiment. The Battalion commander adopted the typical advance guard model with a CRP consisting of 3BMPs checking out the information relayed by the divisional and regimental reconnaissance elements which had moved through the area previously. The CRP was followed by the FSE, which consisted of 3Tanks and 7BMPs. This was followed by the remainder of the battalion consisting of 7Tanks and 21BMPs.

REVIEW FRIENDLY OPLAN: AAR Leader

Company A defends BP11 with 1st platoon in BP112, 2nd platoon in BP122, and 3rd Platoon in BP132. On order the company will withdraw and defend BP12, with 1st platoon on BP113, 2nd platoon on BP123, and 3rd platoon on BP133.

PREVIOUSLY REPORTED EVENTS: Company Commanders

Have the company commanders state what actions they took to review and assess the previous reports in the queue.

Questions to stimulate and guide discussion:

What information were you able to gather from these reports?

What tactical assessment of the enemy were you able to make?

Based upon the reports what size enemy force was reported?

Based upon the previous reports what sized enemy force did you expect to engage next?

REACTIONS TO RECEIVED REPORTS: Company Commanders

Have the company commanders discuss any concerns they had with the reports they received. Have the commanders refer to their printout.

Questions to stimulate and guide discussion:

What picture of the battlefield were you able to put together from the reports?

How did you handle the volume of messages?

What happened when you fell behind in processing messages?

What difficulties did you have in determining what to do with the messages?

What information concerning the enemy were you able to obtain from the reports?

What problems did you have making up the sitrep at the end?

Did the situational assessment fit with the tactical situation presented in the reports?

What areas of the situational assessment gave you the most problems?

RESULTS: All

Go over with the students their situational assessment and other pertinent results of their training.

CORRECTIVE ACTION: All

Ask students how they could improve their performance on the information management tasks and situational assessment.

SUMMARY: AAR Leader

Summarize the training objective and the overall training session. Remind students that the results of this training should be discussed at the next unit training meeting.

Appendix C

Training Materials for Training Vignette 1

- 1. Initial Student Instruction**
- 2. Tactical Scenario Materials**
- 3. IMEX Message Sets and SME Rationales**
- 4. Additional Feedback Materials**

Innovative Training and Initial Instruction

IMEX LESSON1 TRAINING OBJECTIVES: INFORM HIGHER, SUBORDINATE, AND ADJACENT UNITS OF CHANGES TO THE TACTICAL SITUATION AS APPROPRIATE

- I. Task 1: Maintain communications with higher headquarters, subordinates, and adjacent units
 - A. Monitor reports as received
 - B. Send Sitrep to Higher when last report is processed
- II. Task 2: Determine relevance of reported information to higher headquarters, subordinates, and adjacent units considering:
 - A. Location
 - B. Originator
 - C. Report Type
 - D. Mission Impact
 - E. Enemy Order of Battle
 - F. Disposition of Friendly Forces
 - G. METT-T where appropriate
- III. Task 3: Post and Relay relevant messages.
 - A. Post to your map
 - B. Relay Higher/Adjacent
 - C. Relay Lower
 - D. No Action
 - E. Delete Report

Op Ord Extract: Training Vignette 1

SIT: You are the A Co Cdr. The Bn has just destroyed the 1st echelon of a MRR in a supporting attack. Your Co was heavily engaged during the battle. Your vehicle was bent and was inoperable for the last hour. It has just been repaired and you have moved back to your fighting position.

STARTING SYNOPSIS: The Co sustained no losses. All Plt's are at 100% and ready to continue the mission. The Bn Cdr wants to continue to use the CCDs for the rest of the mission.

EN SIT: The enemy is preparing to attack within 24 hours. The S2 thinks that we will face a supporting attack in our sector. He expects a MRR to conduct the supporting attack with 2 MRB's up and 1 back as the 2nd echelon of the regiment.

FR SIT: B Co (left flank): Defend BP20. O/O defend BP21.

D Co (right flank): Defend BP40. O/O defend BP41.

MISSION: A Co defend BP10. O/O defend BP11.

CONCEPT OF OPERATION: 1st Plt: defend BP111. O/O defend BP112.

2nd Plt defend BP121. O/O defend BP122.

3rd Plt defend BP131. O/O defend BP132.

Old Messages for Training Vignette 1

OLDTNG1-1

13:44:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:44:47, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:44:47 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: 11

Activity: ground-attack, Location: ES956758, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:44:47

OLDTNG1-2

13:45:17 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:45:17, Originator: B06, Sender: B06

Creation Time: Mon Oct 26 13:45:17 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES923780, Heading: unspecified]

[What: tank, Location: ES925779, Heading: unspecified]

OLDTNG1-3

13:45:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:45:47, Originator: B06, Sender: B06

Creation Time: Mon Oct 26 13:45:47 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 4

Damaged: unspecified, Destroyed: 4]

[What: pc, Observed: 11

Damaged: unspecified, Destroyed: 11]

Location: ES925785, Enemy Heading: 315, Enemy Activity: ground-attack

Own Activity: defend, As Of: 13:45:47

OLDTNG1-4

13:46:17 Exercise 8
Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn
Message Type: object, Priority: high, Object Type: report
Object ID: 3/74/1-0@13:46:17, Originator: S11, Sender: S11
Creation Time: Mon Oct 26 13:46:17 1992
Originated From: send, Relevance: high
Report: intel
ENEMY: What: pc, Number: 11
Activity: ground-attack, Location: ES926740, Heading: 315
FRIENDLY: What: unspecified, Number: unspecified
Activity: unspecified, Location: unspecified, Heading: unspecified
OBSTACLE: What: unspecified, unspecified-unspecified
As Of: 13:46:17

OLDTNG1-5

13:46:47 Exercise 8
Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn
Message Type: object, Priority: high, Object Type: report
Object ID: 3/74/1-0@13:46:47, Originator: A21, Sender: A21
Creation Time: Mon Oct 26 13:46:47 1992
Originated From: send, Relevance: high
Report: contact
[What: pc, Location: ES890770, Heading: unspecified]
[What: tank, Location: ES891775, Heading: unspecified]

OLDTNG1-6

13:47:17 Exercise 8
Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn
Message Type: object, Priority: low, Object Type: report
Object ID: 3/74/1-0@13:47:17, Originator: A14, Sender: A14
Creation Time: Mon Oct 26 13:47:17 1992
Originated From: send, Relevance: high
Report: spot
[What: tank, Observed: 3
Damaged: unspecified, Destroyed: 3]
[What: pc, Observed: 10
Damaged: unspecified, Destroyed: 10]
Location: ES889789, Enemy Heading: 330, Enemy Activity: ground-attack
Own Activity: defend, As Of: 13:47:17

OLDTNG1-7

13:47:47 Exercise 8
Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn
Message Type: object, Priority: low, Object Type: report
Object ID: 3/74/1-0@13:47:47, Originator: S11, Sender: S11
Creation Time: Mon Oct 26 13:47:47 1992
Originated From: send, Relevance: high
Report: spot
[What: tank, Observed: 3
Damaged: unspecified, Destroyed: 3]
[What: pc, Observed: 10
Damaged: unspecified, Destroyed: 10]
Location: ES830720, Enemy Heading: 20, Enemy Activity: ground-attack
Own Activity: defend, As Of: 13:47:47

OLDTNG1-8

13:48:17 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:48:17, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:48:17 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 3

Damaged: unspecified, Destroyed: 3]

[What: pc, Observed: 10

Damaged: unspecified, Destroyed: 10]

Location: ES921700, Enemy Heading: 340, Enemy Activity: ground-attack

Own Activity: defend, As Of: 13:48:17

Training Vignette 1

10:15:05 Exercise 8

Innovative Training Message of type Start Collection

T11

10:15:06 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-42201@10:15:06, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:15:06 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: 10

Activity: ground-attack, Location: ES900730, Heading: 300

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:00:06

SMET11

10:15:06 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42201@10:15:06, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation as appropriate.

EXPLANATION: This report is highly relevant to your company since it indicates a major force headed your direction. Changes in the tactical situation warrant posting the report to your map and informing your company.

T12

10:15:35 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-42123@10:15:36, Originator: B06, Sender: B06

Creation Time: Mon Oct 26 10:15:36 1992

Originated From: send, Relevance: low

Report: contact

[What: pc, Location: ES925795, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET12

10:15:35 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42123@10:15:36, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation.

EXPLANATION: This report is relevant to your company since it indicates a flank unit in contact. Post the report to your map and relay to subordinates. Even though the enemy force is in B Co's sector, it is important to keep your subordinates informed of adjacent unit contact which could spill over into your area.

T13

10:16:05 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-42327@10:16:06, Originator: C06, Sender: C06

Creation Time: Mon Oct 26 10:16:06 1992

Originated From: send, Relevance: low

Report: spot

[What: pc, Observed: 5

Damaged: unspecified, Destroyed: 5]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES962798, Enemy Heading: 350, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:16:06

SMET13

10:16:05 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42327@10:16:06, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation.

EXPLANATION: This report describes PCs out of your sector and destroyed by C Co. It is not necessary to post or relay the message, but only to delete it. Note the report for possible reference, but devote your efforts to maintaining communications with all elements. Direct your attention to reports of higher relevance that may affect your unit's area of interest.

T14

10:16:35 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-42206@10:16:36, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:16:36 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: scout, Number: 2

Activity: recon, Location: ES912765, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:01:36

SMET14

10:16:35 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42206@10:16:36, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation.

EXPLANATION: Post this report to your map and relay lower to avoid possible fratricide. In evaluating how to handle this report, you should consider that the two friendly scouts were in danger of being mistaken for enemy forces unless your people were informed of their presence.

T15

10:17:04 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-41303@10:17:05, Originator: A21, Sender: A21

Creation Time: Mon Oct 26 10:17:05 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 9

Damaged: unspecified, Destroyed: 7]

[What: tank, Observed: 4

Damaged: unspecified, Destroyed: 3]

Location: ES892781, Enemy Heading: 340, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:17:05

SMET15

10:17:04 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-41303@10:17:05, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Inform Higher of changes to the tactical situation.

EXPLANATION: Post report to the map and relay higher so that the S2 at TF level can determine the enemy's order of battle.

T16

10:17:35 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-41302@10:17:35, Originator: A34, Sender: A34

Creation Time: Mon Oct 26 10:17:35 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 10

Damaged: unspecified, Destroyed: 2]

[What: tank, Observed: 9

Damaged: unspecified, Destroyed: 5]

Location: ES892785, Enemy Heading: 45, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:17:35

SMET16

10:17:35 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-41302@10:17:35, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Inform Higher of changes to the tactical situation.

EXPLANATION: Post report to the map and relay higher. The TF S2 needs to know the enemy's rate of attrition to determine the enemy's order of battle.

T17

10:18:05 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-42124@10:18:06, Originator: D06, Sender: D06

Creation Time: Mon Oct 26 10:18:06 1992

Originated From: send, Relevance: low

Report: contact

[What: pc, Location: ES855750, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET17

10:18:05 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42124@10:18:06, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation

EXPLANATION: Post report and relay to lower. Report indicates D Co has contact in their EA with PCs. Report is relevant to your unit since it indicates a flank unit in contact. Keep your subordinates informed of adjacent unit contact which could spill over into your area.

T18

10:18:35 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-42218@10:18:36, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:18:36 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: tank, Number: 10

Activity: ground-attack, Location: ES910750, Heading: 310

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:18:36

SMET18

10:18:35 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42218@10:18:36, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation.

EXPLANATION: Post and relay lower since the number of tanks and the heading specified in this report indicate a major force headed your way. Subordinates need this information so they may prepare for enemy contact. Number of tanks specified in report indicates a company size element from the independent tank battalion of the regiment.

T19

10:19:05 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-42213@10:19:06, Originator: Y21, Sender: Y21

Creation Time: Mon Oct 26 10:19:06 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mortar, Number: 2

Activity: defend, Location: ES865796, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:04:06

SMET19

10:19:05 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-42213@10:19:06, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Inform subordinates of changes to the tactical situation.

EXPLANATION: Post report to the map display and relay lower. Report is relevant to your company because the mortars are in your sector and could affect displacement routes. This information will decrease the risk of fratricide as your subordinates withdraw.

SMESIT1

10:19:10 Exercise 8

Innovative Training Message of type SME Situation Report and Rationale

SME's Situation Report:

FLOT: ES888798-ES867783

Enemy Activity: ground-attack, Level: heavy

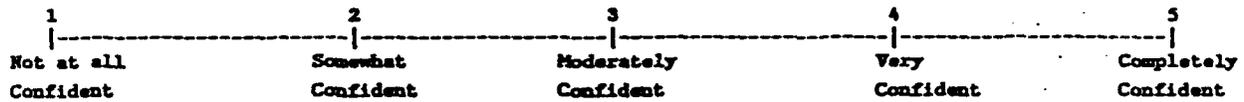
Shortage: { }, Own Intent: defend

As Of: 10:19:11

Rationale: If your FLOT is close to the grids given above, consider yourself correct. Because your unit has engaged part of the 2nd Echelon Battalion of the MRR, level of enemy activity is heavy. Enemy is conducting a ground attack against your defending TF.

SITUATIONAL ASSESSMENT QUESTIONNAIRE-Training Vignette 1

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.



Confidence
Rating

- _____ 1. What type enemy organization is your Bn facing?
Type enemy organization: _____
- _____ 2. What type enemy organization is your Co facing?
Type enemy organization: _____
- _____ 3. Has D Co been in contact with the enemy?
Yes/No (Circle one)
- _____ 4. How many enemy did your Co destroy?
Number of enemy destroyed: _____
- _____ 5. How many of the enemy vehicles are in your EA?
Number of enemy vehicles in the EA: _____
- _____ 6. How many enemy tanks did your unit observe and destroy? Observed: _____ Destroyed: _____
- _____ 7. What was the last reported location of the Bn scouts in front of your BP?
Grid location(s): _____

SITUATIONAL ASSESSMENT QUESTIONNAIRE--Training Vignette 1
Answer Sheet

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
-----	-----	-----	-----	-----
Not at all Confident	Somewhat Confident	Moderately Confident	Very Confident	Completely Confident

Confidence
Rating

- _____ 1. What type enemy organization is your Bn facing?
 Type enemy organization: **MRR**
- _____ 2. What type enemy organization is your Co facing?
 Type enemy organization: **MRB & MTB**
- _____ 3. Has D Co been in contact with the enemy?
 Yes
- _____ 4. How many enemy did your Co destroy?
 Number of enemy destroyed: **17**
- _____ 5. How many enemy vehicles are in the engagement area?
 Number of enemy vehicles in the engagement area: **32**
- _____ 6. How many enemy tanks did your unit observe and
 destroy? **Observed: 13 Destroyed: 8**
- _____ 7. What was the last reported location of the Bn
 scouts in front of your BP?
 Grid location(s): **ES912765**

PT 5933

**AFTER ACTION REVIEW
TRAINING SESSION 1**

AAR AGENDA

REVIEW TRAINING OBJECTIVE: AAR Leader

Keep higher, subordinate and adjacent units informed of changes to the tactical situation as appropriate.

TASKS:

1. Maintain communications with higher headquarters, subordinates and adjacent units.
 - A. Monitor reports as received
 - B. Send Sitrep to Higher when last report is processed.
2. Determine relevance of reported information to higher headquarters, subordinates, and adjacent units considering:
 - A. Location.
 - B. Originator.
 - C. Report Type.
 - D. Mission Impact.
 - E. Enemy Order of Battle.
 - F. Disposition of Friendly Forces.
3. Post and Relay relevant messages.
 - A. Post to your map.
 - B. Relay Higher/Adjacent.
 - C. Relay Lower.
 - D. No Action.
 - E. Delete Report.

REVIEW OPFOR PLAN: AAR Leader

The mission of the OPFOR 2nd Echelon MRB commander was to conduct a penetration and exploitation through the gap in the defensive made by the 1st echelon two MRBs. Continue the attack toward the Ohio river and secure crossing sites. Since the 1st echelon did not have any success in creating a gap in the defense, the regimental commander ordered the MRB commander to attack. He ordered him to attack behind the 1st MRB on the left, and to seize the road junction vicinity ES823877 and the dominant terrain vicinity ES790900.

REVIEW FRIENDLY OPLAN: AAR Leader

Company A defends BP10 with 1st platoon in BP111, 2nd platoon in BP121, and 3rd Platoon in BP131. On order the company will withdraw and defend BP11, with 1st platoon on BP112, 2nd platoon on BP122, and 3rd platoon on BP132.

PREVIOUSLY REPORTED EVENTS: Company Commanders

Have the company commanders state what actions they took to review and assess the previous reports in the queue.

Questions to stimulate and guide discussion:

What information were you able to gather from these reports?

What tactical assessment of the enemy were you able to make?

REACTIONS TO RECEIVED REPORTS: Company Commanders

Have the company commanders discuss any concerns they had with the reports they received. Have the commanders refer to their printout.

Questions to stimulate and guide discussion:

What picture of the battlefield were you able to put together from the reports?

How did you handle the volume of messages?

What happened when you fell behind in processing messages?

What difficulties did you have in determining what to do with the messages?

What information concerning the enemy were you able to obtain from the reports?

What problems did you have making up the sitrep at the end?

Did the situational assessment fit with the tactical situation presented in the reports?

What areas of the situational assessment gave you the most problems?

RESULTS: All

Go over with the students their situational assessment and other pertinent results of their training.

CORRECTIVE ACTION: All

Ask students how they could improve their performance on the information management tasks and situational assessment.

SUMMARY: AAR Leader

Summarize the training objective and the overall training session. Remind students that the results of this training should be discussed at the next unit training meeting.

Appendix D

Training Materials for Training Vignette 2

- 1. Initial Student Instruction**
- 2. Tactical Scenario Materials**
- 3. IMEX Message Sets and SME Rationales**
- 4. Additional Feedback Materials**

Innovative Training and Initial Instruction

IMEX LESSON 2 TRAINING OBJECTIVES: RECOGNIZE AND CORRECTLY PROCESS HIGH PRIORITY MESSAGES, MESSAGES WITH REDUNDANT INFORMATION, AND MESSAGES WITH CONFLICTING INFORMATION.

I. Task 1: Relay and post high priority messages that indicate:

- A. A risk of fratricide**
- B. Sudden enemy contact**
- C. A change in the enemy's order of battle**
- D. Immediate importance over other reports**
- E. Important obstacle information**

II. Task 2: Relay and post one representative report of multiple sightings of the same element. Delete reports with redundant information. Watch for:

- A. Multiple reports with identical information**
- B. Multiple reports with extremely close grid locations**

III. Task 3: Relay and post the most timely version of conflicting reports.

Watch for reports that:

- A. Follow duplicates and do not add up**
- B. Indicate unlikely locations**
- C. Indicate unlikely forces**

Op Ord Extract: Training Vignette 2

SIT: The A Co Cdr was evacuated for medical reasons. The Bn Cdr has directed you to assume temporary command of the Co and execute the planned mission.

STARTING SYNOPSIS: The Bn has just defeated the Adv. Guard of the Div and is preparing to take on the main body. The Co saw little action since the battle was to the east of its positions. All PLT's are 100%. The Bn Cdr has directed that only CCDs be used for comms during this operation.

EN SIT: The enemy appears ready to launch offensive operations in your sector. It is believed that they will attack from the march. The S2 thinks that the Div main attack will be in your sector. Ahead of the main body will be a reinforced MRB in an Adv. Guard role.

FR SIT: B Co (left flank): Defend BP22. O/O defend BP23.

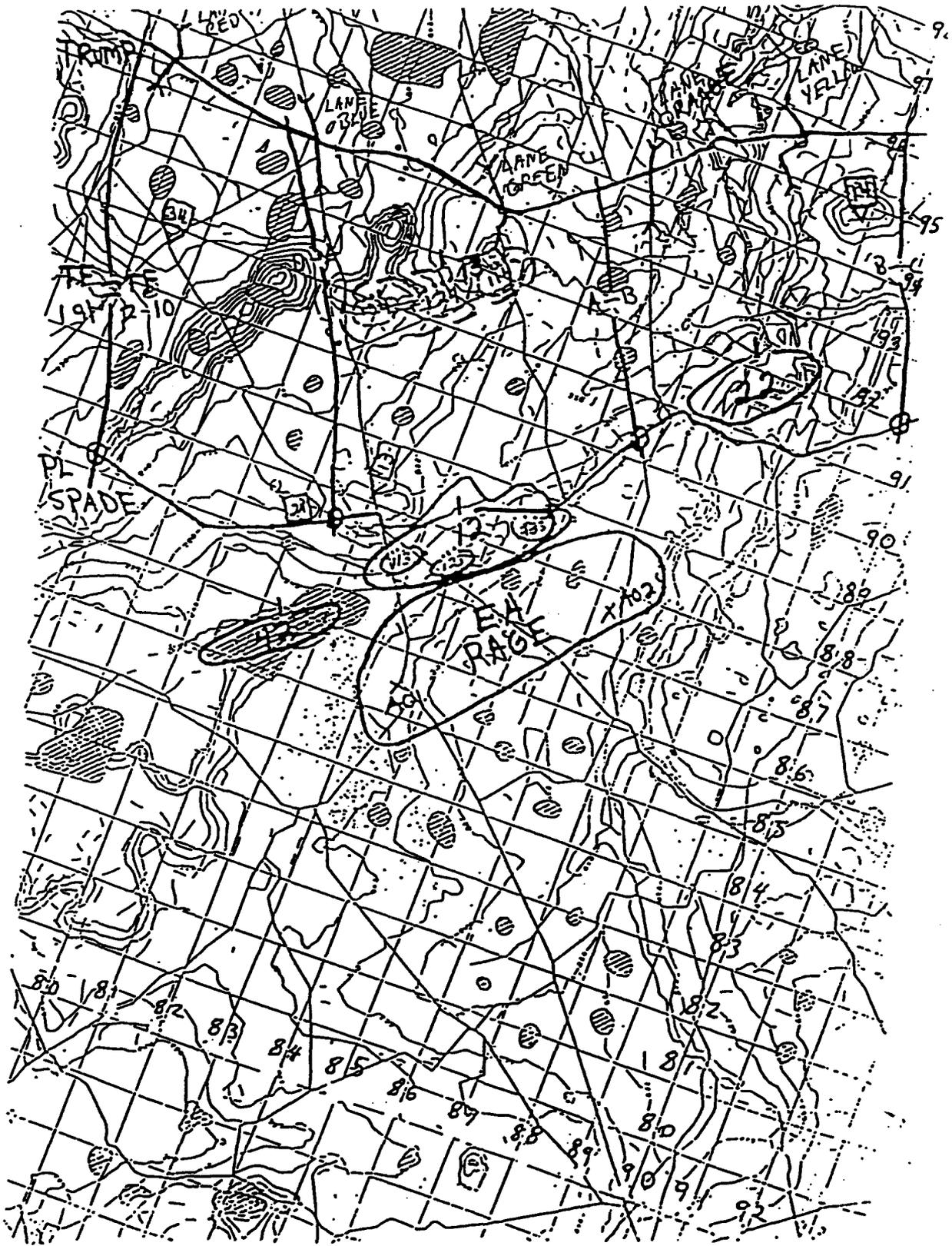
D Co (right flank): Defend BP42. O/O defend BP43.

MISSION: A Co defend BP12. O/O defend BP13.

CONCEPT OF OPERATIONS: 1st Plt: Defend BP113 O/O defend BP114.

2nd Plt: Defend BP123 O/O defend BP124.

3rd Plt: Defend BP133 O/O defend BP134.



Old Messages for Training Vignette 2

OLDTNG2-1

13:48:55 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:48:55, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:48:55 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: unspecified

Activity: ground-attack, Location: ES882810, Heading: 330

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:48:55

OLDTNG2-2

13:49:26 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:49:25, Originator: A21, Sender: A21

Creation Time: Mon Oct 26 13:49:25 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES843849, Heading: unspecified]

[What: tank, Location: ES841851, Heading: unspecified]

OLDTNG2-3

13:49:55 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:49:55, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:49:55 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 3

Damaged: unspecified, Destroyed: 3]

[What: pc, Observed: 10

Damaged: unspecified, Destroyed: 10]

Location: ES845790, Enemy Heading: 350, Enemy Activity: ground-attack

Own Activity: defend, As Of: 13:49:55

OLDTNG2-4

13:50:25 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:50:25, Originator: D06, Sender: D06

Creation Time: Mon Oct 26 13:50:25 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES825822, Heading: unspecified]

[What: tank, Location: ES825831, Heading: unspecified]

OLDTNG2-5

13:50:56 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:50:55, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 13:50:55 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: 11

Activity: unspecified, Location: ES909863, Heading: 330

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 13:50:55

OLDTNG2-6

13:51:25 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/74/1-0@13:51:25, Originator: B06, Sender: B06

Creation Time: Mon Oct 26 13:51:25 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES882890, Heading: unspecified]

[What: tank, Location: ES881905, Heading: unspecified]

OLDTNG2-7

13:51:55 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:51:55, Originator: B06, Sender: B06

Creation Time: Mon Oct 26 13:51:55 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 4

Damaged: unspecified, Destroyed: 4]

[What: pc, Observed: 10

Damaged: unspecified, Destroyed: 10]

Location: ES875910, Enemy Heading: 330, Enemy Activity: ground-attack

Own Activity: defend, As Of: 13:51:55

OLDTNG2-8

13:52:26 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:52:25, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:52:25 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 3

Damaged: unspecified, Destroyed: 3]

[What: pc, Observed: 10

Damaged: unspecified, Destroyed: 10]

Location: ES925750, Enemy Heading: 330, Enemy Activity: ground-attack

Own Activity: defend, As Of: 13:52:25

Training Vignette 2

10:08:17 Exercise 8

Innovative Training Message of type Start Collection

T21

10:08:18 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32209@10:08:19, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:08:19 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

ACTIVITY: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: scout, Number: 2

Activity: recon, Location: ES836841, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:53:19

SMET21

10:08:18 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32209@10:08:19, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: Post report to map and relay to subordinates. Keep subordinates informed of friendly activity to avoid fratricide.

T22

10:08:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32722@10:08:48, Originator: A21, Sender: A21

Creation Time: Mon Oct 26 10:08:48 1992

Originated From: send, Relevance: high

Report: contact

[What: tank, Location: ES851864, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET22

10:08:47 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32722@10:08:48, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: Post report to your map and relay higher because message indicates enemy contact by the 2nd PLT. Higher needs this information to properly track enemy activities to determine the enemy order of battle.

T23

10:09:18 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32204@10:09:19, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:09:19 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: pc, Number: 10

Activity: ground-attack, Location: ES839825, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:54:19

SMET23

10:09:18 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32204@10:09:19, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: Report indicates a company size element moving in your direction. Post report to your map and relay lower. Subordinates need to prepare for possible enemy contact.

T24

10:09:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32724@10:09:48, Originator: A34, Sender: A34

Creation Time: Mon Oct 26 10:09:48 1992

Originated From: send, Relevance: high

Report: contact

[What: tank, Location: ES850875, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET24

10:09:47 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32724@10:09:48, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: Post and relay higher since report describes enemy contact by the 3rd PLT. Higher needs to track all enemy contacts in order to determine the enemy's order of battle.

T25

10:10:19 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32208@10:10:19, Originator: Y21, Sender: Y21

Creation Time: Mon Oct 26 10:10:19 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mortar, Number: 4

Activity: defend, Location: ES850911, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:55:19

SMET25

10:10:19 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32208@10:10:19, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: Report indicates friendly mortars have moved into your unit's sector. Post report to your map since these mortars could affect your maneuver within the sector and routes of withdrawal. Relay to subordinates to avoid possible fratricide.

T26

10:10:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32211@10:10:48, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:10:48 1992

Originated From: send, Relevance: low

Report: intel

ENEMY: What: troops, Number: 2

Activity: recon, Location: ES785938, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:10:48

SMET26

10:10:47 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32211@10:10:48, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority reports.

EXPLANATION: This report indicates two enemy soldiers outside of your unit's sector, moving north away from your location. Read and delete the report to avoid cluttering the map display and message queue. You should have received this message and the next SPOT report from A34 at the same time. This message should be processed after the SPOT report from A34. The location of the icon for this INTEL report is out of your sector. Therefore, it was important to process the SPOT report first.

T27

10:10:48 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-31313@10:10:49, Originator: A34, Sender: A34

Creation Time: Mon Oct 26 10:10:49 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 6

Damaged: unspecified, Destroyed: 2]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES850881, Enemy Heading: unspecified, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:10:49

SMET27

10:10:48 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-31313@10:10:49, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: Since this report reflects enemy contact with the 3rd PLT, post it to your map and relay higher. Two of the observed vehicles were destroyed. The TF S2 needs this information to determine the enemy's order of battle. You should have received this and the last INTEL report from YO2 at the same time. The icon location for YO2's report was out of your sector. Therefore, it was important to process this report first.

T28

10:11:17 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32214@10:11:18, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:11:18 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: tank, Number: 21

Activity: ground-attack, Location: ES871836, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:11:18

SMET28

10:11:17 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32214@10:11:18, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: The number of tanks specified in this report indicates the remainder of the independent tank battalion of the MRR moving towards your EA. Post report to the map and relay to subordinates so they may prepare to engage the enemy tank force.

T29

10:11:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32215@10:11:48, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 10:11:48 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: pc, Number: 10

Activity: ground-attack, Location: ES839826, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:56:48

SMET29

10:11:47 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32215@10:11:48, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Recognize and correctly process messages with redundant information.

EXPLANATION: Delete reports with redundant information. Send one representative report since the grid locations reported in an earlier report from Y02 and this report are the same. If you relayed the earlier report, you would not want to distract your subordinates with redundant information or risk unnecessary confusion by sending them this report.

T210

10:12:18 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32216@10:12:19, Originator: A05, Sender: A05

Creation Time: Mon Oct 26 10:12:19 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mine-field, Number: unspecified

Activity: unspecified, Location: ES850869, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:57:19

SMET210

10:12:18 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32216@10:12:19, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: This report indicates engineers have completed a minefield in your EA. A05 sent the report and your subordinates have all received the same message. Post report to your map and relay higher. Higher need information on obstacles in the TF area because of their impact on future planning considerations.

T211

10:12:48 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@10:12:48, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:12:48 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: 20

Activity: unspecified, Location: ES839825, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:12:48

SMET211

10:12:48 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@10:12:48, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Recognize and correctly process messages with conflicting information.

EXPLANATION: Previous reports from S11 and Y02 indicate only 10 PCs at the location. This report conflicts since it indicates 20 PCs at the location. Read and delete the report since it is in conflict with the two previous reports.

T212

10:13:17 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32221@10:13:18, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 10:13:18 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: tank, Number: 21

Activity: ground-attack, Location: ES871835, Heading: 315

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:13:18

SMET212

10:13:17 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32221@10:13:18, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Recognize and correctly process messages with redundant information.

EXPLANATION: Delete reports with redundant information. Send one representative report since the grid locations reported in an earlier report from Y02 are only 100 meters from this report. Relaying this and the earlier report would distract your subordinates with redundant information and risk unnecessary confusion.

T213

10:13:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32223@10:13:48, Originator: B06 , Sender: B06

Creation Time: Mon Oct 26 10:13:48 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mine-field, Number: unspecified

Activity: unspecified, Location: ES885905, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:58:48

SMET213

10:13:47 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32223@10:13:48, SME Actions:

inspect, post

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: This report indicates a minefield in B Co's sector. Post report to your map. Do not relay to subordinates. This information could be important for your unit in the event you are required to maneuver forward of your location. Posting it to your map will alert you to the potential danger of maneuvering in that area. Relaying this information to subordinates at this time would only clutter their map display.

T214

10:14:16 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-32224@10:14:17, Originator: Y33, Sender: Y33

Creation Time: Mon Oct 26 10:14:17 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: arty, Number: 8

Activity: attack, Location: ES858798, Heading: unspecified

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:59:17

SMET214

10:14:16 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-32224@10:14:17, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: 8 Arty guns have been identified within range of your location. Post report to your map and relay lower so that subordinates can prepared for possible artillery rounds impacting in their area.

T215

10:14:18 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-31326@10:14:19, Originator: A11, Sender: A11

Creation Time: Mon Oct 26 10:14:19 1992

Originated From: send, Relevance: medium

Report: spot

[What: tank, Observed: 3

Damaged: unspecified, Destroyed: 1]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES832862, Enemy Heading: unspecified, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:14:19

SMET215

10:14:18 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-31326@10:14:19, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Recognize and correctly process high priority messages.

EXPLANATION: This report indicates enemy forces observed and engaged by the 1st PLT. Post report to your map and relay higher. Notify Higher of all enemy contacts to determine the enemy's order of battle.

SMESIT2

10:14:23 Exercise 8

Innovative Training Message of type SME Situation Report and Rationale

SME's Situation Report:

FLOT: ES851889-ES824870

Enemy Activity: ground-attack, Level: light

Shortage: { }, Own Intent: defend

As Of: 10:14:24

Rationale: If your FLOT is close to the grids given, consider yourself correct. Since your unit has engaged portions of the 1st echelon of the MRR, level of enemy activity is light. The enemy is conducting a ground attack against your defending TF.

SITUATIONAL ASSESSMENT QUESTIONNAIRE--Training Vignette 2

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
----- ----- ----- -----				
Not at all	Somewhat	Moderately	Very	Completely
Confident	Confident	Confident	Confident	Confident

Confidence Rating

_____ 1. What type enemy organization is your bn facing?

Type enemy force: _____

_____ 2. What type enemy organization is your Co facing?

Type enemy force: _____

_____ 3. How many enemy vehicles did your Co destroy?

Number of enemy destroyed: _____

_____ 4. Are there any friendly obstacles to avoid in the case of a counter-attack through EA Rage?

Yes/No (Circle one). If yes, give location _____

_____ 5. What organization did the 21 tanks reported by Y02 come from? _____

_____ 6. What was the last reported location of the mortars?

Grid location(s): _____

_____ 7. How far away from your battle position are the enemy artillery guns reported by Y33? _____

October 28, 1992

SITUATIONAL ASSESSMENT QUESTIONNAIRE--Training Vignette 2
Answer Sheet

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
-----	-----	-----	-----	-----
Not at all	Somewhat	Moderately	Very	Completely
Confident	Confident	Confident	Confident	Confident

Confidence
Rating

- _____ 1. What type enemy organization is your Bn facing?
Type enemy force: MRR
- _____ 2. What type enemy organization is your Co facing?
Type enemy force: MRB & MTB
- _____ 3. How many enemy did your Co destroy?
Number of enemy destroyed: 3
- _____ 4. Are there any friendly obstacles to avoid in the case of a counter-attack through EA Rage?
Yes, grid location. ES850869
- _____ 5. What organization did the 21 tanks reported by Y02 come from? Independent Tank Bn of the MRR
- _____ 6. What was the last reported location of the mortars?
Grid location: ES850911
- _____ 7. How far away from your battle position are the enemy artillery guns reported by Y33? Approx 7.5 Kilometers

**AFTER ACTION REVIEW
TRAINING SESSION 2**

AAR AGENDA

REVIEW TRAINING OBJECTIVE: AAR Leader

Process messages to ensure that high priority messages are handled first, more timely messages receive priority over more dated messages, and relay of messages with redundant information is minimized.

TASKS:

1. Give high priority to messages that indicate:
 - A. A risk of fratricide.
 - B. Sudden enemy contact.
 - C. A change in the enemy's order of battle.
 - D. Immediate importance over other reports.
 - E. Important obstacle information.
2. Relay one representative report of multiple sightings of the same element. Ignore reports with redundant information. Watch for:
 - A. Multiple reports with identical information.
 - B. Multiple reports with extremely close grid locations.
3. Recognize conflicting reports of sightings and relay most the timely message as appropriate. Watch for reports that:
 - A. Follow duplicates and do not add up.
 - B. Indicate unlikely locations.
 - C. Indicate unlikely forces.

REVIEW OPFOR PLAN: AAR Leader

The Regimental Commander decided to attack with a reinforced MRB forward in the Advance Guard role. He reinforced it with a tank company from the Independent Tank Battalion. Behind the Advance Guard he had the other 2MRBs attacking on line with the remainder of the Independent Tank Battalion poised to exploit any penetration in the defense. He planned to have the 2MRBs shape a penetration to allow the tanks to pass through and seize the high ground vicinity ES820880.

REVIEW FRIENDLY OPLAN: AAR Leader

Company A defends BP12 with 1st platoon in BP113, 2nd platoon in BP123, and 3rd Platoon in BP133. On order the company will withdraw and defend BP13, with 1st platoon on BP114, 2nd platoon on BP124, and 3rd platoon on BP134.

PREVIOUSLY REPORTED EVENTS: Company Commanders

Have the company commanders state what actions they took to review and assess the previous reports in the queue.

Questions to stimulate and guide discussion:

What information were you able to gather from these reports?

What tactical assessment of the enemy were you able to make?

REACTIONS TO RECEIVED REPORTS: Company Commanders

Have the company commanders discuss any concerns they had with the reports they received. Have the commanders refer to their printout.

Questions to stimulate and guide discussion:

What picture of the battlefield were you able to put together from the reports?

How did you handle the volume of messages?

What happened when you fell behind in processing messages?

What difficulties did you have in determining what to do with the messages?

How were you able to determine if the report was redundant?

How did you resolve discrepancies between similar reports?

What information concerning the enemy were you able to obtain from the reports?

What problems did you have making up the sitrep at the end?

Did the situational assessment fit with the tactical situation presented in the reports?

What areas of the situational assessment gave you the most problems?

RESULTS: All

Go over with the students their situational assessment and other pertinent results of their training.

CORRECTIVE ACTION: All

Ask students how they could improve their performance on the information management tasks and situational assessment.

SUMMARY: AAR Leader

Summarize the training objective and the overall training session. Remind students that the results of this training should be discussed at the next unit training meeting.

Appendix E

Training Materials for Training Vignette 3

- 1. Initial Student Instruction**
- 2. Tactical Scenario Materials**
- 3. IMEX Message Sets and SME Rationales**
- 4. Additional Feedback Materials**

Innovative Training and Initial Instruction

IMEX LESSON3 TRAINING OBJECTIVES: MAINTAIN CURRENT STATUS OF ENEMY AND FRIENDLY DISPOSITIONS. DETERMINE THE ENEMY'S ORDER OF BATTLE FROM THE ENEMY SIGHTINGS REPORTED BY ALL SOURCES.

I. Task 1: Keep your tactical map current by posting new enemy sightings and friendly locations which are in or could soon be within your unit's area of interest. Watch for:

- A. Enemy and Friendly Locations**
- B. Enemy Forces Info**
- C. Flank Info**
- D. Obstacle Info**

II. Task 2: Delete outdated reports. Watch for:

- A. Enemy movement**
- B. SPOT reports that update CONTACT reports**

III. Task 3: Delete messages not likely to influence your unit. Watch for:

- A. Out of sector locations**
- B. Reports from distant companies**
- C. Enemy vehicles moving away from you**

IV. Task 4: Determine the enemy's scheme of maneuver. Watch for:

- A. CONTACT, SPOT, and INTEL reports of enemy sightings**
- B. Reports that help build a picture of the battlefield**

Op Ord Extract: Training Vignette 3

SIT: The A Co Cdr was killed last night in an accident. The Bn Cdr has made you the new Co Cdr. He has directed you to execute the previous cdr's plan.

STARTING SYNOPSIS: The Co has been in its defensive position for 72 hours preparing positions. All PLTs are 100%. The Bn has not had any contact. Last night, the Sct PLT Ldr reported hearing vehicular movement, but no contact. It is believed that these vehicles were recon elements. The Bn Cdr has directed that only CCDs should be used for commo.

EN SIT: The enemy appears to be preparing to attack. Intel has been unable to determine if we will face the main or supporting attack. They expect the enemy to be in a MTC formation with a MRB forward in the Adv. Guard role.

FR SIT: B Co (left flank): Defend BP20 O/O defend BP21.

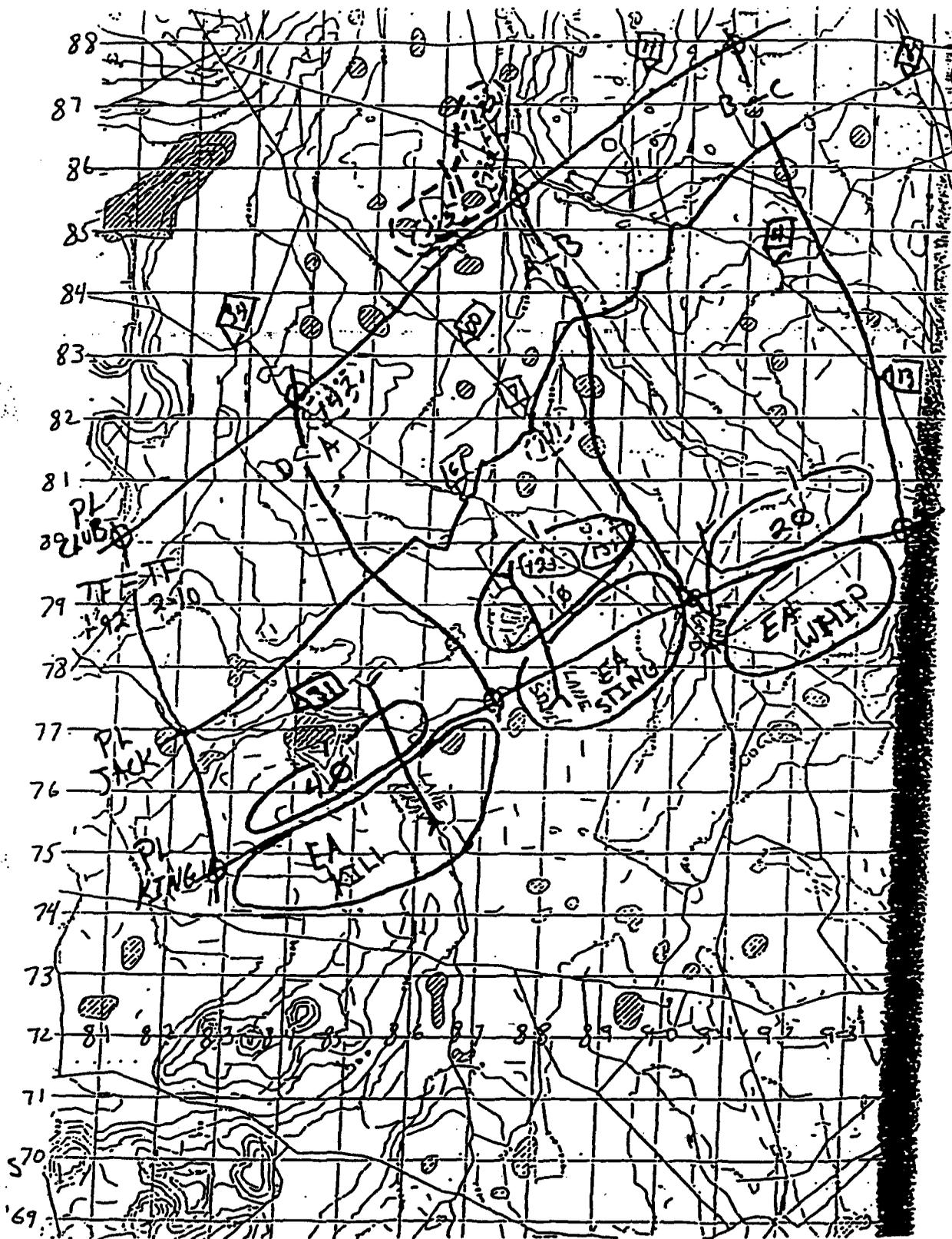
D Co (right flank): Defend BP40 O/O defend BP41.

MISSION: A Co defend BP10 O/O defend BP11.

CONCEPT OF OPERATION: 1st PLT: Defend BP111 O/O defend BP112.

2nd Plt: Defend BP121 O/O defend BP122.

3rd Plt: Defend BP131 O/O defend BP132.



Old Messages for Training Vignette 3

OLDTNG3-1

13:53:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:53:47, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:53:47 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 2

Damaged: unspecified, Destroyed: unspecified]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES801783, Enemy Heading: 335, Enemy Activity: recon

Own Activity: defend, As Of: 13:53:47

OLDTNG3-2

13:54:18 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:54:17, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:54:17 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 3

Damaged: unspecified, Destroyed: unspecified]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES878727, Enemy Heading: 135, Enemy Activity: recon

Own Activity: defend, As Of: 13:54:17

OLDTNG3-3

13:54:47 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:54:47, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:54:47 1992

Originated From: send, Relevance: high

Report: spot

[What: truck, Observed: 3

Damaged: unspecified, Destroyed: unspecified]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES899728, Enemy Heading: 90, Enemy Activity: recon

Own Activity: defend, As Of: 13:54:47

OLDTNG3-4

13:55:17 Exercise 8

Ivis Broadcast PDU by Vehicle 3/74/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/74/1-0@13:55:17, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 13:55:17 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 3

Damaged: unspecified, Destroyed: unspecified]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES965785, Enemy Heading: 130, Enemy Activity: recon

Own Activity: defend, As Of: 13:55:17

Training Vignette 3

09:57:11 Exercise 8

Innovative Training Message of type Start Collection

T31

09:57:12 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-61701@09:57:13, Originator: A05, Sender: A05

Creation Time: Mon Oct 26 09:57:13 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mine-field, Number: unspecified

Activity: unspecified, Location: ES864806, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:57:13

SMET31

09:57:12 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-61701@09:57:13, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Maintain current status of friendly dispositions.

EXPLANATION: Keep your tactical map current by posting new enemy sightings and friendly locations which are in your unit's area. Minefield is in the middle of your sector and could affect withdrawal to your subsequent battle position. Subordinates received this message since they are on the same net as the originator, A05. Notify Higher since the scheme of maneuver and withdrawal speed could be affected by the friendly minefield.

T32

09:57:41 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-61302@09:57:42, Originator: Y03, Sender: Y03

Creation Time: Mon Oct 26 09:57:42 1992

Originated From: send, Relevance: medium

Report: spot

[What: pc, Observed: 2

Damaged: unspecified, Destroyed: 2]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES932800, Enemy Heading: unspecified, Enemy Activity: unspecified

Own Activity: defend, As Of: 09:57:42

SMET32

09:57:41 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-61302@09:57:42, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions.

EXPLANATION: Delete messages not likely to affect your unit's area of interest. 2 PCs are dead and in B Co's sector. They can not influence any activity in your area of interest. Therefore, read the report but delete it to keep your map and message queue free of unnecessary information. From this report, you can determine that the enemy reconnaissance forces are moving into the TF sector.

T33

09:58:11 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62203@09:58:12, Originator: Y21, Sender: Y21

Creation Time: Mon Oct 26 09:58:12 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: mortar, Number: 4

Activity: defend, Location: ES864824, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:43:12

SMET33

09:58:11 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62203@09:58:12, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of friendly dispositions.

EXPLANATION: Keep your map current by posting friendly locations. Post report to your map since the location of these mortars could impact your scheme of maneuver within your sector and affect routes of withdrawal. Inform subordinates of friendly locations to decrease the risk of fratricide.

T34

09:58:41 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62204@09:58:42, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 09:58:42 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: 7

Activity: ground-attack, Location: ES904745, Heading: 0

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:58:42

SMET34

09:58:41 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62204@09:58:42, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Determine the enemy's order of battle and disposition from the enemy sightings reported by all sources.

EXPLANATION: New enemy sightings could soon be in your unit's area of interest. Use this information to determine the enemy's scheme of maneuver. Post report to your map because the forces could soon be in your EA. Subordinates need to be informed of the potential for enemy contact.

T35

09:59:12 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62212@09:59:12, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 09:59:12 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: scout, Number: 2

Activity: recon, Location: ES911765, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:44:12

SMET35

09:59:12 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62212@09:59:12, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of friendly dispositions.

EXPLANATION: Keep your tactical map current by posting friendly locations. Post scout locations to your map and send lower to avoid the risk of fratricide. Once you receive an updated INTEL report reflecting new scout locations, this report should be deleted to maintain current status of friendly forces.

Mon Oct 26 10:00:02 EST 1992

T36

09:59:42 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@09:59:43, Originator: A31, Sender: A31

Creation Time: Mon Oct 26 09:59:43 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES891780, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET36

09:59:42 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@09:59:43, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions.

EXPLANATION: Keep your tactical map current by posting new enemy sightings. Post report and send higher since it indicates your unit has contact with enemy forces. Posting the report to your map and keeping Higher informed of enemy sightings are necessary to maintain the current status of enemy dispositions.

T37

10:00:11 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-67107@10:00:12, Originator: C06, Sender: C06

Creation Time: Mon Oct 26 10:00:12 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES970792, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET37

10:00:11 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-67107@10:00:12, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions.

EXPLANATION; Delete messages not likely to influence your unit's area of interest. This message should be deleted because it reports contact in the middle of C Co's EA. Information is not within your unit's area of interest and should be deleted to keep your tactical map and message queue free of irrelevant information.

T38

10:00:41 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@10:00:42, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:00:42 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: pc, Number: 3

Activity: ground-attack, Location: ES930770, Heading: 310

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:00:42

SMET38

10:00:41 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@10:00:42, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions and enemy's order of battle.

EXPLANATION: These 3 PCs may be headed toward your EA. Maintain the current enemy status and enemy scheme of maneuver by posting the report to your map and informing your subordinates so that they may prepare for potential enemy contact.

T39

10:01:11 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62108@10:01:12, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 10:01:12 1992

Originated From: send, Relevance: high

Report: contact

[What: tank, Location: ES893766, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET39

10:01:11 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62108@10:01:12, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions and determine enemy's order of battle.

EXPLANATION: Keep your tactical map current by posting new enemy sightings and determine the enemy's scheme of maneuver. Post report to your map and send lower since it indicates that enemy tanks are moving into your engagement area. Subordinates should be informed so that they can prepare for enemy contact.

T310

10:01:41 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-61710@10:01:42, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:01:42 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: scout, Number: 2

Activity: recon, Location: ES907783, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:01:42

SMET310

10:01:41 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-61710@10:01:42, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of friendly dispositions.

EXPLANATION: Keep your tactical map current by posting friendly locations and delete outdated reports. Maintain the current status offriendly elements and avoid the risk of fratricide by posting and relaying this report lower. The previous report from Y02 about scouts is now outdated and should be deleted.

T311

10:02:13 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@10:02:13, Originator: A21, Sender: A21

Creation Time: Mon Oct 26 10:02:13 1992

Originated From: send, Relevance: high

Report: contact

[What: tank, Location: ES892782, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET311

10:02:13 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@10:02:13, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions.

EXPLANATION: Keep your tactical map current by posting new enemy sightings. This report should be posted and sent higher since it indicates your unit has contact with enemy forces. Posting the report to your map and keeping Higher informed of enemy sightings are necessary to maintain the current status of enemy dispositions.

T312

10:02:42 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-0@10:02:43, Originator: A11, Sender: A11

Creation Time: Mon Oct 26 10:02:43 1992

Originated From: send, Relevance: high

Report: contact

[What: pc, Location: ES870777, Heading: unspecified]

[What: unspecified, Location: unspecified, Heading: unspecified]

SMET312

10:02:42 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@10:02:43, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions.

EXPLANATION: Keep your tactical map current by posting new enemy sightings. Post report and relay higher since the report indicates your unit has contact with enemy forces. Posting the report to your map and keeping Higher informed of enemy sightings are necessary to maintain the current status of enemy dispositions.

T313

10:03:11 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62217@10:03:12, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:03:12 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: pc, Number: 21

Activity: ground-attack, Location: ES902771, Heading: 310

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:48:12

SMET313

10:03:11 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62217@10:03:12, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions and determine the enemy's order of battle.

EXPLANATION: Keep your tactical map current by posting new enemy sightings which could soon be within your unit's area of interest and determine the enemy's scheme of maneuver. Post ed and send lower because it indicates the Advance Guard Main Body is moving into your unit's EA.

T314

10:03:42 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-61714@10:03:42, Originator: S11, Sender: S11

Creation Time: Mon Oct 26 10:03:42 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: scout, Number: 2

Activity: recon, Location: ES907782, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 10:03:42

SMET314

10:03:42 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-61714@10:03:42, SME Actions:

inspect, delete

Rationale: TRAINING OBJECTIVE: Maintain current status of friendly dispositions.

EXPLANATION: Delete messages not likely to influence your unit's area of interest. This report contains the same information sent to you earlier by Y02. Delete this report to avoid unnecessary clutter on your map and message queue.

T315

10:04:11 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62219@10:04:11, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:04:11 1992

Originated From: send, Relevance: high

Report: intel

ENEMY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: blown-bridge, ES870826-unspecified

As Of: 09:49:12

SMET315

10:04:11 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62219@10:04:12, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVE: Maintain current status of friendly dispositions.

EXPLANATION: Keep your tactical map current by posting friendly activities within your unit's area. This blown bridge is in your unit's sector. Post report to your map and relay lower since the bridge could affect your unit's withdrawal in the sector.

T316

10:04:43 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-0@10:04:43, Originator: A11, Sender: A11

Creation Time: Mon Oct 26 10:04:43 1992

Originated From: send, Relevance: high

Report: spot

[What: tank, Observed: 3

Damaged: unspecified, Destroyed: 3]

[What: pc, Observed: 4

Damaged: unspecified, Destroyed: 4]

Location: ES871779, Enemy Heading: 335, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:04:43

SMET316

10:04:43 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@10:04:43, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions and determine the enemy's order of battle.

EXPLANATION: Keep your tactical map current by posting enemy sightings within your unit's area and determine the enemy's scheme of maneuver. Number of observed and destroyed vehicles indicates that part of the Advance Guard is in your EA. Posting this report and relaying it Higher is necessary for maintaining the current status of enemy forces and providing insight to the enemy's scheme of maneuver.

T317

10:05:12 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-0@10:05:13, Originator: A31, Sender: A31

Creation Time: Mon Oct 26 10:05:13 1992

Originated From: send, Relevance: high

Report: spot

[What: pc, Observed: 4

Damaged: unspecified, Destroyed: 3]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES886788, Enemy Heading: 350, Enemy Activity: ground-attack

Own Activity: defend, As Of: 10:05:13

SMET317

10:05:12 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-0@10:05:13, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions and determine the enemy's order of battle.

EXPLANATION: Keep your tactical map current by posting enemy sightings within your unit's area and determine the enemy's scheme of maneuver. The number of observed and destroyed vehicles in this report indicate part of the Advance Guard is in your EA. Posting this report and sending it to Higher is necessary for maintaining the current status of enemy forces and providing insight to the enemy's scheme of maneuver.

T318

10:05:41 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62224@10:05:42, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:05:42 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: tank, Number: 10

Activity: ground-attack, Location: ES913689, Heading: 300

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:50:42

SMET318

10:05:41 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62224@10:05:42, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions and determine enemy's order of battle.

EXPLANATION: Keep your tactical map current by posting new enemy sightings which could soon be in your area of interest and determine the enemy's scheme of maneuver. Number of tanks referenced in this report indicates a company-sized element from the Independent Tank Bn moving towards your EA. Notify your subordinates so that they may prepare for enemy engagement.

T319

10:06:12 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Br

Message Type: object, Priority: low, Object Type: report

Object ID: 3/72/1-61719@10:06:12, Originator: A21, Sender: A21

Creation Time: Mon Oct 26 10:06:12 1992

Originated From: send, Relevance: medium

Report: spot

[What: pc, Observed: 10

Damaged: unspecified, Destroyed: 7]

[What: unspecified, Observed: unspecified

Damaged: unspecified, Destroyed: unspecified]

Location: ES883788, Enemy Heading: 340, Enemy Activity: unspecified

Own Activity: unspecified, As Of: 10:06:12.

SMET319

10:06:12 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-61719@10:06:12, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions.

EXPLANATION: Keep your tactical map current by posting new enemy sightings. This report should be posted and sent higher since it indicates your unit has contact with enemy forces. Posting the report to your map and keeping higher informed of enemy sightings are necessary to maintain the current status of enemy dispositions.

T320

10:06:42 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/A

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-61125@10:06:43, Originator: A31, Sender: A31

Creation Time: Mon Oct 26 10:06:43 1992

Originated From: send, Relevance: high

Report: contact

[What: tank, Location: ES895781, Heading: unspecified]

[What: pc, Location: ES893773, Heading: unspecified]

SMET320

10:06:42 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-61125@10:06:43, SME Actions:

inspect, post, relay up

Rationale: TRAINING OBJECTIVE: Maintain current status of enemy dispositions.

EXPLANATION: Keep your tactical map current by posting new enemy sightings. Post report and send higher since the report indicates your unit has enemy contact. Posting the report to your map and keeping higher informed are necessary to maintain the current status of enemy dispositions. This sighting could represent remnants of the Advance Guard.

T321

10:07:12 Exercise 8

Ivis Broadcast PDU by Vehicle 3/72/1 on Network 1/Bn

Message Type: object, Priority: high, Object Type: report

Object ID: 3/72/1-62227@10:07:12, Originator: Y02, Sender: Y02

Creation Time: Mon Oct 26 10:07:12 1992

Originated From: send, Relevance: medium

Report: intel

ENEMY: What: pc, Number: 30

Activity: ground-attack, Location: ES920691, Heading: 10

FRIENDLY: What: unspecified, Number: unspecified

Activity: unspecified, Location: unspecified, Heading: unspecified

OBSTACLE: What: unspecified, unspecified-unspecified

As Of: 09:52:12

SMET321

10:07:12 Exercise 8

Innovative Training Message of type SME Actions and Rationale

Report ID: 3/72/1-62227@10:07:12, SME Actions:

inspect, post, relay down

Rationale: TRAINING OBJECTIVES: Maintain current status of enemy dispositions and determine enemy's order of battle.

EXPLANATION: Keep your tactical map current by posting new enemy sightings which could soon be in your area of interest and determine the enemy's scheme of maneuver. Number of PCs referenced in this report indicates a Bn-sized element from the lead regiment moving towards your EA. Notify your subordinates so that they can prepare for enemy contact.

SMESIT3

10:07:17 Exercise 8

Innovative Training Message of type SME Situation Report and Rationale

SME's Situation Report:

FLOT: ES893796-ES875777

Enemy Activity: ground-attack, Level: heavy

Shortage: { }, Own Intent: defend

As Of: 10:07:17

Rationale: If your FLOT is close to the grids given above, consider yourself correct. Because your unit has engaged the Advance Guard Battalion of the enemy force, level of enemy activity is heavy. The enemy is conducting a ground attack against your defending TF.

SITUATIONAL ASSESSMENT QUESTIONNAIRE--Training Vignette 3**Answer Sheet**

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
----- ----- ----- -----				
Not at all	Somewhat	Moderately	Very	Completely
Confident	Confident	Confident	Confident	Confident

Confidence
Rating

_____ 1. What size enemy unit is your Bn facing?

Size force: MRR

_____ 2. What size enemy unit is your Co facing?

Size force: MRB

_____ 3. How many enemy vehicles did your Co destroy?

Enemy destroyed: 17

_____ 4. Approximately how far away from BP 10 (in meters/kilometers) is the main body of the MRR, as reported by Y02?

Distance away: 10 km (approximate)

_____ 5. How soon (in minutes) would you expect to encounter the main body of the MRR if it enters your sector?

Minutes to encounter: 20-25 minutes at 25 km per hour

_____ 6. What is the location of the Advance Guard Bn Main Body?

Location: ES902771

_____ 7. What is the grid location and type of any obstacles which may impact on mobility within your Co sector?

Grid location

ES870826

ES864806

Obstacle type

Blown bridge

Minefield

SITUATIONAL ASSESSMENT QUESTIONNAIRE--Training Vignette 3

Please answer each question and rate your confidence in your answer using the scale below. Place the number from the scale in the space preceding each question.

1	2	3	4	5
----- ----- ----- -----				
Not at all	Somewhat	Moderately	Very	Completely
Confident	Confident	Confident	Confident	Confident

Confidence
Rating

- _____ 1. What type enemy organization is your Bn facing?
Type enemy organization: _____
- _____ 2. What type enemy organization is your Co facing?
Type enemy organization: _____
- _____ 3. How many enemy vehicles did your Co destroy?
Enemy destroyed: _____
- _____ 4. Approximately how far away from BP 10 (in meters/
kilometers) is the Main Body of the MRR
reported by Y02?
Distance away: _____
- _____ 5. How soon (in minutes) would you expect to encounter
the Main Body of the MRR if it enters your sector?
Minutes to encounter: _____
- _____ 6. What is the location of the Advanced Guard Bn
main body?
Grid location(s): _____
- _____ 7. What is the grid location and type of any obstacles
which may impact on mobility within your Co
sector?

Grid location Obstacle type

**AFTER ACTION REVIEW
TRAINING SESSION 3**

AAR AGENDA

REVIEW TRAINING OBJECTIVE: AAR Leader

Maintain current status of enemy and friendly dispositions. From the enemy sightings reported by all sources, determine the enemy's order of battle.

TASKS:

1. Keep your tactical map current by posting new enemy sightings and friendly locations which are in or could soon be within your unit's area of interest. Watch for:
 - A. Enemy and Friendly Locations.
 - B. Enemy Forces Info.
 - C. Flank Info.
 - D. Obstacle Info.
2. Delete outdated message icons. Watch for:
 - A. Enemy movement.
 - B. SPOT reports that update CONTACT reports.
3. Ignore messages not likely to influence your unit. Watch for:
 - A. Out of sector locations.
 - B. Reports from distant companies.
 - C. Enemy vehicles moving away from you.
4. Determine the enemy's scheme of maneuver. Watch for:
 - A. CONTACT, SPOT, and INTEL reports of enemy sightings.
 - B. Reports that help build a picture of the battlefield.

REVIEW OPFOR PLAN: AAR Leader

The mission of the OPFOR MRB commander was to conduct a movement to contact and determine the enemy disposition. To find gaps in the defense or between the defensive units which would allow the MRRs to penetrate and seize river crossing sites on the Ohio River. The MRB was reinforced with a tank company from the Independent Tank Battalion of the Regiment. The Battalion commander adopted the typical advance guard model with a CRP consisting of 3BMPs checking out the information relayed by the divisional and regimental reconnaissance elements which had moved through the area previously. The CRP was followed by the FSE, which consisted of 3Tanks and 7BMPs. This was followed by the remainder of the battalion consisting of 7Tanks and 21BMPs.

REVIEW FRIENDLY OPLAN: AAR Leader

Company A defends BP10 with 1st platoon in BP111, 2nd platoon in BP121, and 3rd Platoon in BP131. On order the company will withdraw and defend BP11, with 1st platoon on BP112, 2nd platoon on BP122, and 3rd platoon on BP132.

PREVIOUSLY REPORTED EVENTS: Company Commanders

Have the company commanders state what actions they took to review and assess the previous reports in the queue.

Questions to stimulate and guide discussion:

What information were you able to gather from these reports?

What tactical assessment of the enemy were you able to make?

REACTIONS TO RECEIVED REPORTS: Company Commanders

Have the company commanders discuss any concerns they had with the reports they received. Have the commanders refer to their printout.

Questions to stimulate and guide discussion:

What picture of the battlefield were you able to put together from the reports?

How did you handle the volume of messages?

What happened when you fell behind in processing messages?

What difficulties did you have in determining what to do with the messages?

How were you able to determine if the report was redundant?

What information concerning the enemy were you able to obtain from the reports?

What problems did you have making up the sitrep at the end?

Did the situational assessment fit with the tactical situation presented in the reports?

What areas of the situational assessment gave you the most problems?

RESULTS: All

Go over with the students their situational assessment and other pertinent results of their training.

CORRECTIVE ACTION: All

Ask students how they could improve their performance on the information management tasks and situational assessment.

SUMMARY: AAR Leader

Summarize the training objective and the overall training session. Remind students that the results of this training should be discussed at the next unit training meeting.

Appendix F
Privacy Act Statement
Training Evaluation Questionnaire

NAME _____

DATE _____

PRIVACY ACT STATEMENT

AUTHORITY: Title 10, USC, Sec 4503

PRINCIPLE PURPOSE: The data collected with this form are to be used for research purposes only.

ROUTINE USE: This is an experimental personnel data collection activity conducted by the U.S. Army Research Institute for the Behavioral and Social Sciences pursuant to its research mission as described in AR 70-1. Identifiers, names, social security numbers or videos of individual actions will be used for research purposes only. Full confidentiality of your responses or videotaping will be maintained in the processing of these data.

DISCLOSURE: Although your participation in this experiment is strictly voluntary, we encourage you to provide complete and accurate information in the interests of research. There will be no effect on you for not providing any or all part of the information.

One thing I want to stress is that all the data we collect will be used for research purposes only. The videotaping may be used for training or briefing purposes but your individual identification confidentiality will be maintained. Your participation will make a big difference to this experiment. It's very important that you do your best.

By signing below, I am indicating that I have been read the above privacy act statement and understand the privacy rights it guarantees me.

Date _____

Name: _____

IMEX TRAINING EVALUATION

We would like to get your opinion on the Information Management Exercise (IMEX). Your confidential responses will be used to improve future training programs.

- | | | | | |
|------|---------------|---------------------|---------------|-----------|
| 1 | 2 | 3 | 4 | 5 |
| Poor | Below Average | Average
Training | Above Average | Excellent |

Record a number from the scale in the space preceding each question.

1. How adequate were the components of CCD training in preparing you to operate the CCD?

- _____ 1a. CCD Demo
- _____ 1b. Self-paced CCD Training Materials
- _____ 1c. CCD Job Aid
- _____ 1d. CCD Skills Test

Please explain any "Poor" ratings. _____

2. Were there skills that you needed to operate the CCD that were not sufficiently covered in the CCD Training Materials listed above? Yes___ No___. Explain below:

3. Please rate the overall approach of using self-paced materials to train CCD skills. _____ Explain your rating below:

Revised 28 Oct '92

Date _____

Name: _____

IMEX TRAINING EVALUATION

1	2	3	4	5
Poor	Below Average	Average Training	Above Average	Excellent

Record a number from the scale in the space preceding each question.

4. How adequate were the following components of the training program in helping you to improve your information management skills?

- _____ 4a. Initial Instructions linked to Training Objectives
- _____ 4b. IMEX Scenario Message Sets
- _____ 4c. IMEX SME Preferred Message Solutions
- _____ 4d. IMEX Message Summaries
- _____ 4e. IMEX Exercise Summaries
- _____ 4f. IMEX SME Sitrep Preferred Solutions
- _____ 4g. AARs

Explain any "Poor" ratings _____

5. Did the training provided meet the objectives?
(Circle one) YES / NO. Please explain. _____

6. Give an overall rating of IMEX. _____

Explain your overall rating. _____

Revised 28 Oct '92

Date _____

Name: _____

IMEX TRAINING EVALUATION

7. If you could redesign the IMEX training program to help train information management skills, what 3 things would you change?

- 1. _____
- 2. _____
- 3. _____

8. If you could redesign the IMEX software interface to help train information management skills, what 3 things would you change?

- 1. _____
- 2. _____
- 3. _____

9. Please provide any other comments that would help us understand how you feel about the ability of this exercise to train information management skills (also include comments regarding equipment here).

10. Please describe any suggestions you may have for using innovative approaches to training CCD skills.

