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TRAINING FOR THE
INFANTRY FIGHTING VEHICLE-M2:
AN EVALUATION OF THE 11M10 COURSE

Developed By:

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&

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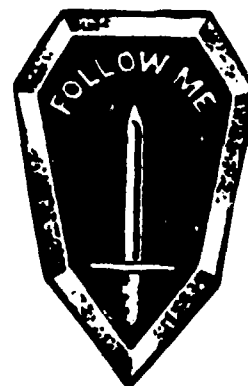
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The Infantry Fighting Vehicle-M2 is scheduled for introduction into the inventory during FY 1982. The U.S. Army Infantry School prepared a three week add on course to 11B OSUT to qualify IFV crewmen as 11M10. This course required validation prior to implementation. The validation method used involved on site observation involving Training Program Evaluation (TPE) of two course tryouts. Separate reviews of the Lesson Outlines and course tests were performed. The proposed course was found to meet the objectives of 11M (Cont'd.)		

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training but seven major recommendations for course improvement were made. Numerous observations and suggestions on conduct of training, Lesson Outlines and Testing are included.

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Training for the Infantry Fighting Vehicle-M2: An Evaluation of the IIMIO Course

by .

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October 1981

Prepared for:

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Fort Monroe, Virginia 23651**

The views, opinions, or findings contained in this report are the authors' and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other documentation.



PREFACE

This report contains the results of the effectiveness validation, observation and review of materials for the tryout of the course 11M10 - Infantry Fighting Vehicle Crewman, developed and conducted by the U.S. Army Infantry School (USAIS), Ft. Benning Georgia.

The work was performed by Roy C. Campbell and William C. Osborn of the Military Training Research Division (MTRD) of the Human Resources Research Organization (HumRRO). The work was performed under a Scientific Services Agreement administered through Battelle Columbus Laboratories, Durham Operations, Research Triangle Park, North Carolina, for the U.S. Army Training and Doctrine Command (TRADOC). Janet Lamb, U.S. Army Training Developments Institute, Ft. Monroe, Virginia was the Contracting Officer's Technical Representative.

The sponsor of the work was the Infantry Fighting Vehicle Task Force, USAIS, Ft. Benning, Georgia. Mr. Bob Agro served as IFV Task Force point of contact, but his role included that of confidant, coordinator, information source, and expeditor. It was through Mr. Agro's intelligent and responsive assistance that a great deal of work was accomplished in a short period of time.

Others involved in or associated with the program tryout and evaluation deserve mention. SFC Hagberg, who as the IFV Task Force representative co-observed most of the classes with the contractor, patiently explained the Infantry OSUT instructional process; his thoughtful input and his free exchange of training ideas contributed much to the contractor's insight into the 11M course. The cooperation, accommodation and professional assessments of the individual instructors contributed both to ease the contractor's task and to the quality of the evaluation. Deserving special mention are the OIC, CPT Harrington, and the NCOIC, SFC Reavis, who despite other constant demands, always took care to see that the contractor was fully informed and that his needs were met.

SUMMARY AND CONCLUSIONS

PROBLEM

The Infantry Fighting Vehicle-M2 is scheduled for introduction into the Army inventory during FY 1982. To facilitate its introduction and meet manning requirements a prototype course as an intended add-on to 11B OSUT was developed to train M2 crew members as 11M. That course must be validated before incorporation into OSUT.

APPROACH

An on-site evaluation of the instruction was conducted using a systematic observation method known as Training Program Evaluation (TPE). Where task tests were available performance on them was used as the criterion for validation. Untested class observations were presented. Separate reviews were made of the course Lesson Outlines and the existing course tests.

RESULTS

Overall, criterion test performance was good. Three task areas were reported where performance was considered marginal, and likely causes discussed. Numerous observations and comments on areas that need attention were made. The two main areas of concern center on instructor conduct of skill practice and the requirement for testing all tasks.

CONCLUSIONS

The 11M course needs some improvement prior to final implementation but neither redesign nor major alteration in method or content is required. Recommended areas for improvement are:

- . Attend to the three marginal areas of performance.
- . Strengthen the performance training practice model.
- . Develop tests for all tasks taught.
- . Increase emphasis on PMCS.
- . Expand the scope of the Driver Training Course and Firing Port Weapons Range Course.
- . Develop a driver's station mockup.
- . Review and reaffirmation of the content of five classes.

TABLE OF CONTENTS

	Page
PURPOSE AND SCOPE	1
METHOD	2
CONDUCT OF EVALUATION	4
FINDINGS	6
RECOMMENDATIONS	28
BIBLIOGRAPHY	30
APPENDICES	31
APPENDIX A: CLASS OBSERVATIONS	A-1
APPENDIX B: LESSON OUTLINE REVIEW	B-1
APPENDIX C: TEST REVIEW	C-1
APPENDIX D: ANALYSIS OF MARGINAL PERFORMANCE TEST RESULTS . . .	D-1

LIST OF TABLES

TABLE 1. NUMBER AND PERCENT OF 11M TRAINEES PASSING TASKS IN THE COMPREHENSIVE TEST	7
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TRAINING FOR THE INFANTRY FIGHTING VEHICLE-M2: AN EVALUATION OF THE 11M10 COURSE

The Infantry Fighting Vehicle-M2 (IFV) is currently scheduled for introduction into the Army inventory during FY82. The IFV brings with it a new approach to infantry tactics. The new approach means new tasks, and new tasks mean new training. Accordingly, a new instructional program, intended as an add-on to 11B OSUT, was developed to train M2 crewmen as 11M. That prototype instructional program requires trial and evaluation before it can be incorporated into OSUT on an operational basis.

PURPOSE AND SCOPE

The objectives of the work reported here were to conduct a training effectiveness evaluation of the existing Program of Instruction (POI) for the MOS 11M Infantry Fighting Vehicle (IFV) track of OSUT and an evaluation of the training provided.

The 11M IFV course is a three week add-on or track to 11B OSUT. Two trial classes were conducted. The first involved 13 students¹ and ran from 1 June - 20 June 1981. The second course ran from 24 June - 16 July 1981 and had a load of 15 students. Students were recent 11B/11C/11H graduates who had changed their enlistment contract for 11M. One student had prior service but with a foreign army. All instructors were from the USAIS IFV Task Force. There was one prototype M2 IFV available during the training.

Due to administrative delays in letting the contract, no pretraining evaluation of the POI was conducted; therefore no guidance was provided the IFV Task Force on sequencing, training aids, instructional content or methods based on a pre-instructional review of the materials. Likewise, though preliminary observations were discussed informally with IFV Task Force personnel, no effort was made to institute changes or revise instruction between the first and second tryouts.

This report presents the results of the evaluation. A description of the methods and conduct of the evaluation is followed by a discussion of the findings organized around responses to specific questions raised in the contract. This is followed by the major recommendations. Detailed results of the evaluation are contained in the Appendices. Appendix A contains the class observation results. Appendix B contains a review of the Lesson Outlines, Appendix C is a review of the existing course tests, and Appendix D contains specific discussion regarding classes with marginal validation results.

¹Sixteen students started the first course. One was recycled early the first week for administrative reasons. Two more left the course (for non-course related reasons) toward the end of training and were not recycled.

METHOD

The approach used in the evaluation was based on a method termed Training Program Evaluation (TPE) developed under contract by Harless Performance Guild, Inc. for the U.S. Army Research Institute for the Behavioral and Social Sciences, Fort Knox Field Unit.¹ This program, with refinements and expansions by Kristiansen² and by Witmer³ is designed for courses in which specific task performance is the goal. Initially designed for evaluation of M60-M1 tank transition training, it has since been applied to a number of different courses in several TRADOC schools. The major characteristics of TPE are:

- a. A task test performance criterion (in terms of percent of first time GO) is selected for the course. This criterion, which may vary by task, is generally based on the judgment of knowledgeable people connected with the course. With a new course, where no experience factor exists, an 80% first time pass rate for tests is recommended.
- b. A trained observer attends the instruction and completes a comprehensive Observation Data Sheet (see Annex to Appendix A), recording what was observed in all areas of instruction. Although some observer evaluations are judgmental they are based on recorded observations.
- c. Test results are obtained. Any task for which the passing criterion (say, 80%) was not met is designated as deficient.
- d. Probable causes of performance deficiencies are determined by an analysis of the observation data.

This method was selected partially because of the evaluator's familiarity with the procedure, but primarily because of the short lead time for the IFV evaluation. Only five working days were available to plan for the evaluation before the start of the first class and a method was required which, while effective, could be quickly adapted to the purpose at hand. There was no time for the training of data collectors from the IFV Task Force and evaluation results had to be made available promptly after trial course completion to allow the IFV Task Force to complete revisions in a timely manner before the course is formally instituted. These reasons precluded using some existing evaluation methods such as the ISD Internal and External Evaluation Phases.

¹Harliss, J.H. Guidelines for Conducting a Training Program Evaluation. Working Paper FKFU 80-1, USARI Ft. Knox Field Unit, Ft. Knox, Kentucky, November 1979.

²Kristiansen, D.M. Training Program Evaluation: A Job Aid for Modifying Ineffective or Inefficient Training. Research Product 81-17, USARI Ft. Knox Field Unit, Ft. Knox, Kentucky (Draft).

³Witmer, B. Job Aid for Conducting an Evaluation of XM1 Transition Training. Working Paper FKFU 80-10, USARI Ft. Knox Field Unit, Ft. Knox, Kentucky, September 1980.

The TPE has some distinct advantages and some disadvantages. Among the advantages are:

- a. The TPE orients on performance. Since this is (or should be) the bottom line in any training, it places the emphasis of evaluation on what counts most.
- b. The TPE does not rely on complex statistical analysis. Although the greater the number of students who are tested the more confidence one has in the results, it does not mandate a certain sample size to establish statistical reliability. More importantly, the results of the evaluation are virtually universally readable, not limited only to those who possess a statistical background or knowledge of a particular methodology.
- c. The TPE has a certain amount of flexibility. The results of the systematic observation of classes are available for the reviewer whether or not performance was deficient on that task (or even whether or not the task was tested). A training improvement can be suggested even though the observed shortcoming may not have been so extensive as to produce a training deficiency.
- d. TPE concentrates on specifics as causes of problems thus making it easier to support specific fixes.
- e. The method is relatively simple in its application and it can be applied on a selected basis to whatever task training the evaluator is interested in. Hence, assuming some training in the materials, the method can be applied by the IFV Task Force to evaluate revised classes when they are instituted.

The apparent disadvantages of TPE are:

- a. It requires on-site and complete attendance at the classes by the observer. Further, the observer must be knowledgeable in the application of performance aids used in the observation. The observer must also prepare himself for the class by ensuring familiarity with the materials and subject being taught. General subject matter knowledge in the tasks is helpful but specific subject matter expertise is not a requirement. More importantly, the observer must be totally familiar with the principles and nuances of performance oriented training. Thus personnel demands and time requirements are high.
- b. TPE is a new (although not untried) evaluation method. Hence there may be some resistance on the part of those who are familiar with the more statistically oriented evaluation methods.
- c. TPE assumes the existence of reliable and valid criterion tests to fully use the method. Tests of such quality are seldom available, especially in the early stages of training program development and evaluation.

CONDUCT OF EVALUATION

There were additional areas of concern in the evaluation of the IIM course which are not specifically covered in TPE but which were done at the request of the sponsor.

The first area was a review of the draft lesson plans (or Lesson Outlines as they are referred to in USAIS terminology). TPE pretty much assumes that subject guidance given instructors is adequate and looks for consistency between Lesson Outline and lesson delivery. Because the IIM Lesson Outlines were drafts prepared at different times by different people on a new item of equipment, the adequacy of the Lesson Outlines could not be assumed. Hence a separate review of Lesson Outlines was performed. The results of that review are contained in Appendix B.

As mentioned earlier, TPE also assumes the existence of valid, reliable criterion test data but requires no separate review of the tests (although it does provide for the evaluation of their application). The tests in the IFV course were also prototypes and had been subjected to a technical review only. Therefore a separate review of the existing IIM tests was conducted to identify any apparent threats to validity and reliability. The results of this review are contained in Appendix C.

The major problem regarding the tests was that there were only 11 tests covering 17 tasks; roughly half of the tasks taught were not formally tested.¹ This fact, coupled with the unproven reliability and validity issue meant that the findings would be indications, not necessarily solid conclusions. Thus in task areas not tested, the training observations are believed to be valid but their impact--the extent to which they lead to deficient performance--is unknown. Where test results are available, the conclusions are probable--with the caveat that the results could also be caused by deficient tests. In neither case are the observations affected--only the impact that may have on performance. It was with this preknowledge that the evaluation proceeded.

¹The exact number of tasks in the course depends on how one defines a task. If the number of behaviors that are called "tasks" in the Training Objectives of the Lesson Outlines are counted, the total number of tasks in the course is approximately 60. However, this number is probably inflated. There are three areas (AN/VVS-2, Equipment Stowage, Evacuating Personnel) in which required performances are listed as tasks when, more properly, they are probably subtasks or even steps. If adjusted for this, the number of "tasks" taught in the course is probably closer to 40. Additionally there was at least one task (Operate IFV in Water) that was specified in the Lesson Outline but not taught due to vehicular limitations. Some other tasks (Range Estimation, Respond to TC Commands, Communicate Targets to TC, Identify OPFOR Vehicles, Tow IFV, Extinguish a Fire on an IFV) although definitely tasks, tended to be "buried" in other instruction or were presented in conjunction with driving and firing ranges, mostly as concurrent training. This does not mean that these tasks are not important, but the context of their training may have led developers to downplay their importance when testing decisions were considered.

During preparation of the Validation Plan it was proposed that questionnaire data be obtained from both students and instructors. The purpose of this was to supplement the observations.¹ Questionnaires were tried for some classes the first few days and then dropped for the following reasons:

- a. The questionnaires were not pre-tested due to inadequate lead time. Particularly the trainee questionnaire was not fully understood by the respondents.
- b. The administrative requirements of issuing, completing and returning questionnaires was more of a burden than anticipated.
- c. The observer was present at more of the classes than anticipated. In fact, virtually all of the course was observed. (One of the intended uses of the questionnaires was to fill in gaps caused by the observer's absence from some classes.)
- d. The observer obtained trainee reaction in informal discussions with trainees (trainees tended to be more expressive vocally than in writing). The observer-instructor interaction was particularly good. Therefore the same information was obtained--while not as systematically, perhaps more accurately--on an informal basis.
- e. The primary reason was lack of usable information obtained through the questionnaires. The questionnaires relied heavily on narrative descriptions or expressions of problem areas. These were simply left blank, particularly from trainees, on those initially obtained. Because the observer was collecting, with difficulty, a lot of pieces of paper with no information on them, the effort was dropped and informal interview situations relied on to gather trainee and instructor reaction.

Otherwise data collection proceeded smoothly with the observer (the senior author) noting and recording information called for on the Observation Data Sheets (Annex to Appendix A). The delivery of all but two classes² over the two course iterations--more than 90% of the instruction--was observed.

¹TPE is somewhat non-directive on the collection of trainee or instructor opinion data: "The relative importance of trainee (instructor) reactions/opinions is somewhat controversial in the evaluation field. Trainee (instructor) opinions are the only data collected by some evaluators. Other evaluators give it so little weight that they do not collect it at all. The authors of your guidelines take a 'middle road' position on the issue. We suggest that trainee (instructor) opinions about the training be collected, if possible, but use the data as only one of the factors in evaluating the training. Of equal or greater importance in our approach are the data gathered during direct observations of the Input-training sessions and the practice/test events." Harliss, J.H., *op. cit.*, pg. 3-40.

²These were Close Combat Team (Dismount and Mount IFV) (4 hours) and Break and Join Track (4 hours).

FINDINGS

Student performance in the eleven task areas measured on the Comprehensive Test was quite good (Table 1), falling below the 80% standard in two areas only: Load/Unload 25mm Ready Boxes (71% pass) and Install/Remove M231 FPW (79% pass). If the standard were to be tightened some to allow for sampling fluctuation associated with the small number of students (~28),¹ performance in one other task area, Prepare DA Form 2404 (82% pass) might be considered marginal. A discussion of probable causes of low performance in these three task areas is organized in terms of observational data from the relevant classes and presented in Appendix D.

The remaining results of the evaluation, rather than being discussed by task or instructional block, are organized under 14 topics: 10 representing the evaluation target areas designated in the contract² and 4 from questions asked by IFV Task Force sponsors. Some of these are also addressed under specific instructional areas or tasks in the appendices, but they are covered collectively below.

1. Is the Training Properly Sequenced?

a. No problems were found regarding the order in which the classes were presented. In most of the classes or tasks, nothing inherent in the subject itself requires a set sequence; that is, in the sense of prerequisite skill or knowledge. There are exceptions, of course, and two events in the course serve as focal points for much of the training: IFV driving and weapons firing. Since these are primarily application phases, it must be assumed that tasks which are to be applied will be taught earlier. Most tasks that require use of other tasks are self evident and this should not be a problem with normal scheduling. However, when training schedules must be altered because of schedule interruptions, equipment nonavailability, and training site conflicts,

¹Given that a 90% confidence band on the 80% passing standard is, for a sample of 28 examinees,

$$\pm 1.645 \sqrt{\frac{.8(.2)}{28}} = \pm .124$$

it might be argued that any pass rate in the range 68% - 92% is marginal. In this formal statistical sense, an observed pass rate must exceed 92% for it to be considered reliably (no more than a 5% chance of being wrong) greater than the 80% standard; similarly, an observed rate must be less than 68% for it to be considered reliably below the standard. No benefit was seen in applying this kind of formal statistical analysis here.

²Under the original contract guidance these areas, for the most part, were to be addressed based on POI review prior to start of the instruction. This was not possible due to the short lead time. The discussions in this report therefore are based on both the POI (Lesson Outlines) review and the class observations.

TABLE 1
NUMBER AND PERCENT OF 11M TRAINEES
PASSING TASKS IN THE COMPREHENSIVE TEST

TEST (TASKS)	TRAINEES TESTED	FIRST TIME GO	
		Number	Percent
1. Prepare DA Form 2404, Equipment Daily Log (Use IFV Operator's Automotive Publications) (Perform Operator Maintenance on the IFV)	28	23	82
2. Load/Unload 25mm Ready Boxes (Load 25mm Ready Boxes) (Identify the Ammunition of the M2 IFV) (Perform Operator's Maintenance on Ammunition of the M2 IFV)	28	20	71
3. Slave Start the IFV (Slave Start IFV)	29	26	90
4. Perform Operator Maintenance on the M231 Firing Port Weapon (Perform Operator Maintenance on the M231 Firing Port Weapon)	28	25	89
5. Load/Unload TOW Launcher System (Load, Unload and Reload TOW Launcher System) (Remove a Misfired TOW Missile)	28	27	96
6. Install/Remove M231 FPW (Install and Remove the M231 FPW) (Load, Unload and Clear the M231 FPW) (Reduce a Stoppage in an M231 FPW)	28	22	79
7. NBC Decontamination of the IFV (Decontaminate IFV Interior Using ABC Mil)	28	28	100
8. Preventive Maintenance Checks and Services (Perform PMCS to Include Lubricating and Troubleshooting)	28	25	89
9. Drive, Steer and Stop the IFV (Drive an IFV)	29	28	97
10. Install and Assemble the AN/VRC 160 (Prepare Radio Set AN/VRC 64 for a Mounted Operation)	28	26	93
11. Hand and Arm Signals (Communicate Using Visual Signalling Technique)	28	28	100

the rescheduling must be done by a person who is familiar with the overall course requirements. This is no more a problem with the 11M course than with any OSUT training.

b. Only one area was found in the Lesson Outlines where the instruction seemed to be out of sequence. This was where PMCS training is called for before instruction on the DA Form 2404. In the actual course, the sequence was correctly reversed.

c. Scheduling instructions in "blocks" (e.g., weapons, commo, maintenance) appeals to some, in that the subjects are functionally related even though not directly dependent on each other. The opposite thought is that variety will enhance interest and attention, and returning periodically to related areas allows an opportunity for review. From a learning standpoint, training literature does not strongly support one approach or the other. So it becomes primarily a matter of administrative convenience.

d. Only one final scheduling concern should be noted: The morning following the Night Driving should be designated administrative time if possible. This is especially important in the summer months when driving cannot start until late. Tired soldiers are not good learners for the next morning's instruction.

2. Are the Selected Media and Methods of Instruction Appropriate?

a. Instructor mediated performance training is the predominant approach to instruction, and appropriately so. The hands-on procedural nature of most of the tasks in the 11M course is such that no major benefit is to be derived from introducing film or video mediated lessons. Such tasks are best demonstrated by a live demonstrator at the training site who gears his demonstration to the trainees and their reactions, repeating portions where necessary. Too, the efficiency of the AI who can coach the trainee during practice, providing guidance and feedback as needed, is difficult to replace in some other media-method configuration without an exorbitant front-end expense. The same may be said for the testing phase.

b. The above should not be construed as a blanket rejection of AV media. It is very possible, for instance, that in the IFV Gunners Course and IFV Commanders Course (both currently under development) there will be areas where audio-visual or other media should be explored. Even within the basic 11M course, TEC-type lessons paralleling the tasks instructed could be of benefit to those trainees who want to review a lesson, and should be available to soldiers after normal OSUT training hours (whether the voluntary use of such lessons would be sufficient to warrant their development is another matter).

c. While no current requirement for AV materials is identified, if the decision is made in the future to develop audio-visual modules to support the 11M course, caution is urged. Such training packages are expensive to produce, and once produced not easily changed. With new

equipment and new doctrine, care must be taken to insure that what is recorded will remain accurate and current for a long time. Before any future development of AV materials is undertaken, the initial step must be to identify what precise need those materials will fulfill. Currently no need is apparent from the tryout experiences.

d. The quality of implementing the instructional method that was used--performance oriented training--is another matter. The performance training model was followed throughout the course in form. In substance there were some weaknesses. Generally the orientation was correctly performance based, not subject-matter based, and the Demonstration phase of tasks both in the Lesson Outlines and in training was generally good. However, the conduct and extent of the Practice and Testing Phases need improvement. Practice tends to be uncontrolled, and testing (where it exists) is generally treated as a separate event rather than as a direct extension of the practice. Both points are discussed in detail in the appendices.

3. Are Training Aids/Devices Adequate?

a. Training aids used in the course consist primarily of flip chart GTAs. There is a tendency to over-use GTA, particularly if the requirements called for in the draft Lesson Outlines are followed. For example:

<u>Class</u>	<u>Number GTA Specified</u>	<u>Class Time</u>
Visual Signals	32	50 min.
Break and Join Track	20	30 min.
IFV Commo	69	80 min.
Stow Equipment	49	50 min.

Most GTA are not needed. For example, in the Visual Signals (Arm and Hand Signals) the GTA are used in addition to the live demonstration. The demonstration is better. Having both at the same time only makes it difficult for the trainee to direct his attention. Some principles of GTA use:

- (1) GTA should not substitute for equipment.
- (2) GTA should not detract from or compete with the demonstration.
- (3) GTA should supplement the demonstration only where there is something that is not visible on the actual equipment to the trainee during the demonstration.

- (4) Don't have a GTA just because it "fits."
Insure that it serves a purpose that cannot
be achieved by displaying or demonstrating
on actual equipment.

b. In the actual classes, the use of GTA was not as extensive as indicated in the Lesson Outlines. Still, in most cases, their use was more than required by the situation. There was a tendency by instructors to present the GTA and then ignore it until it was time to go to the next GTA. If a GTA is required it should be used, not just presented (i.e., the instruction should then center on the GTA).

c. In several cases (Visual Signals, TC Fire Commands, NBC Operations) there were a few GTA that were wrong. When this occurs the instructor has two choices: Either do not use that GTA at all or ignore the error. What should not occur is to call attention to the error. More than likely, the student will only remember the error.

d. In the Visual Signals class, flash cards were used for student practice. Although in this instance their use was not fully exploited, the idea of their use is excellent and should be retained.

e. Student handouts were generally sparse but, with one exception, were adequate where they were used. The exception was the "Inspection Guide for M231 FPW" in which the drawings showing good and bad components were of poor quality. Student handouts should probably continue to be used sparingly--if the student collects several sheets of paper as a matter of course in each class he will soon ignore what he has collected, if only because of sheer volume. This relates to another problem--that of note taking. Some students took continuous and apparently copious notes during demonstrations and appeared to be trying to write down everything that appeared on the GTA. Others never took notes and didn't even have note pads. For the most part, instructors ignored both the note taking and the fact that most were not taking notes. The USAIS OSUT policy in this regard is not known, but normally note taking should be discouraged. Trainees generally cannot both concentrate on the presentation or demonstration and take meaningful notes. But if there is something that would ordinarily require note taking, then a student handout should be used.

f. Training devices. There were three primary training devices used during the course:

- (1) 25mm ready box mockup (to scale)
- (2) Firing port weapon "box"
- (3) Dummy ammunition (25mm, TOW, smoke grenades)

The primary advantage of the first two devices is that of convenience in demonstration. Also they facilitate instructor observation during practice. But both devices lacked the realism of the actual equipment.

Therefore their role should be somewhat limited. The 25mm ammo box mockup serves well for a group demonstration and some phases of early practice but the students should be transferred to real equipment as soon as possible. The firing port weapon box facilitates learning initial FPW control while minimizing equipment wear, but its role should be limited to its intended purpose and, again, the transfer made to the actual equipment as soon as possible.

- (1) The 25mm ready box mockup was used almost exclusively for all practice and testing. The box is "turned around" to simulate which side (AP or HE) ammo box is being loaded. This may have confused some soldiers. The mockup is handy for having students practice hanging the correct number of rounds but for the total task it does not elicit the physical posture the soldier must assume inside the IFV nor represent the space and movement restrictions. Additionally, the actual ready box has a job performance aid decal affixed to prompt the soldier during loading. This should also be used on the mockup. Since there was one mockup available (and one IFV which was not used during this training) it was not clear what was gained (outside of accessibility) by exclusive use of the mockup. (In the second class tryout most students did get one practice loading on the actual boxes in the IFV. They appeared to have more difficulty than they did with the mockup.)
- (2) The firing port weapon box consists of an actual weapon port and periscope mounted in a plywood box open only in the back with a plywood pedestal seat affixed to the floor. The box was designed to facilitate trainee practice of the hand and eye coordination necessary to manipulate the aim of the M231 as it protrudes through the side of the IFV while the head and eye of the firer are on a different plane. However, the box was used extensively in all firing port weapon training and CBR testing (decontamination); also two of the boxes were mounted on a flatbed truck and comprised the entire application phase of the FPW Range firing. The use of the box should be limited to its design purpose; i.e., the training on weapon-hand-eye-tracer coordination. As an inclosure it does not simulate very well the interior of the IFV (nor does it need to if used only in its design role) and with closed sides the instructor has actually less access to the trainee during FPW installation and FPW immediate action training than he would inside the IFV.

The main advantages of the box on the FPW range (beyond initial FPW manipulation training) is that it allows the instructor more freedom of movement than he would have in the IFV and it reduces wear and tear on the actual equipment. But the box lacks intercom and is not a good substitute for the totality of the firing experience practice under actual IFV conditions. Used in the decontamination test it shows only that a soldier can decontaminate a plywood box-- not that he can decontaminate an IFV. The conclusion is that this device should be limited to its intended use and not be made a substitute for the IFV in training when it is not suitable. As an initial training device during stationary firing practice the device fulfills its purpose quite well but as a substitute for the IFV in other areas of training and testing it has very little advantage and many disadvantages compared with the actual equipment.

- (3) Dummy ammunition looks realistic, but has the distinct disadvantage of lacking weight. There is probably little that can be done about this. The 25mm is already training-aids produced and the TOW, which consists of an expended missile, would be difficult to realistically (and inexpensively) weight and balance. This does not detract from the teaching principles in handling/ loading these rounds but it does detract from the realism. When the soldier goes to handle his first live rounds he will at a minimum be taken aback momentarily by the unexpected differences and may well need extra learning trials. This is not necessarily a serious problem. The smoke grenades are instructor produced, OD painted, aluminum 16 oz. cans and instructors should be commended for finding a device that fits the launcher tubes and approximates the size (if not the weight) of the actual smoke grenade. But the disadvantage is that this device cannot "lock" into the launcher tube the way the actual grenade does. As a consequence, the necessary practice and "feel" for this step is not provided. A simulator that reproduces this practice is needed.

g. One training device that should be considered for development is a 1:1 mockup of the driving compartment. When using the actual vehicle, the instructor has virtually no access to the student except by leaning in through the driver's hatch, and even then his access and observability are limited. The 35mm transparencies used to illustrate the driver's controls are very high quality but they do not allow for practice nor illustrate precise control relationships. Such a simulator would be

useful not only in teaching Starting and Shutting Down but also in Driving, PMCS, Slave Starting, Tow Starting, and perhaps also in Swimming and use of the AN/VVS-2. While an ideal open-backed simulator would have power actuated dials and signal lights and a "responsive" starter, cost and technical considerations would probably limit the sophistication. But even a very simple non-dynamic device would facilitate driver controls orientation and practice.

4. Are the Content of the Instructional Blocks and the Time Allocation Perceived To Be Adequate to Achieve Course Objectives? Is the Appropriate Amount of Time Spent on Each Topic?

a. Shorn of rhetoric (commendable but unmeasurable) regarding discipline and motivation, the purpose of the course is to produce soldiers who can:

- (1) Drive the IFV.
- (2) Maintain the IFV (Operator Level).
- (3) Operate the IFV weapon systems within the limitations of the 10 level duty position.
- (4) Be rapidly assimilated as IFV drivers and squad crew into an operational IFV unit.

The last objective is the unquantifiable kicker. More so because there are currently no IFV units from which to draw commander expectations and requirements. Generally this requirement implies a knowledgeable, if not yet fully proficient, soldier in the preceding three areas. Soldiers apply and practice what they learn in the IFV course once they arrive at their unit. Primarily this unit practice is unstructured and occurs in the course of day to day operations. Additionally, the unit is responsible for further, more detailed training commensurate with unit priorities and missions. Usually this is at the crew/squad level and higher, but includes those individual tasks in support of that effort or that are unique to unit mission. This then is the context of 11M OSUT training and the planned content appears to meet these requirements. But the content and the resulting proficiency to meet this fourth objective must be reexamined at a later date when feedback from operational IFV units is available. Unfortunately, with many Army OSUT/AIT programs this feedback requirement is non-existent or ignored. The IFV program, through the Commander's Course that is planned, has an excellent opportunity to establish and maintain this vital feedback link. The link should be forged once IFV units become operational.

b. Questioning content of the course is dangerous ground for any outsider because content involves doctrinal decisions, not training or testing principles. But at the risk of second guessing more knowledgeable decision makers, there are four areas that should be looked at by the IFV Task Force if only to reaffirm original decisions:

- (1) Load/Stow Equipment on the IFV. This eight hour block instructs the student basically in how to follow a loading plan. It covers virtually everything that can be loaded on the IFV. The extent of the lesson and the time devoted to it are questioned. Students will not retain knowledge of where and how everything is stowed--indeed they are not supposed to. Most units will develop loading plans based on their own assignments and missions. Consideration should be given to reducing the scope of this class (perhaps to stowage of pioneer tools and weapons) and reducing the time. That loading plans exist and must be followed is a worthwhile objective of this class but loading of specific items should concentrate on only those items habitually carried and that present difficulties in stowing.
- (2) IFV Communications. This four hour block concentrates primarily on mounting and dismounting the radio. Some confusion seems to exist (between the Lesson Outline and the actual class) about whether the IFV will carry the AN/VRC-64 or the AN/GRC-160. In any case it is questioned whether the vehicular radio set will be removed routinely during tactical operations and put into a man-packed configuration (in the case of the AN/GRC-160), thus leaving the vehicle and any attendant crew member without voice communication. This is a purely doctrinal question but the situation appears unlikely. The requirement remains to remove the radio periodically for maintenance or routinely for storage in some units, but does not require the conversion to pack configuration and back. Moreover, who handles the radio is, in many units, a closely reserved prerogative of the Track Commander. Certainly the IFV crewmen must possess some knowledge and skills on the radio in his IFV. It is only recommended that the present instructions be reevaluated to determine if it matches in scope those knowledges and skills actually required.
- (3) Decontaminate the IFV. This part of NBC operations produced mixed reactions from the reviewer. The importance of the task cannot be denied but its application left feelings of dissatisfaction with the task. Much time seemed to be spent sloshing around soapy water on parts of the vehicle interior without emphasizing systematic decontamination of the entire interior and utilizing the full procedure of actions following chemical exposure including detection and use of other decontamination procedures. Although purposely limited to the IFV interior,

ignoring complete decontamination including the turret, driver's compartment and vehicle exterior is questioned. Part of the problem may lie in current application rather than in content, but this lesson should be reviewed with two options in mind. The first is deferring decontamination training (but not operation of the M11) to unit training. The second is expanding the scope of decontamination to include detection, the entire vehicle and use of other decontamination procedures and agents.

- (4) Identify OPFOR Vehicles and Range Determination. These classes are taught in conjunction with the FPW range. Their content is not questioned so much as whether they duplicate other OSUT training. OPFOR vehicle ID and Range Determination are certainly not unique (or at least shouldn't be) to 11M soldiers. The question for consideration is whether they must be taught or should be treated as a review. It makes a difference in the instructional approach. The decision is dependent on whether they are (or will be) part of the non-11M track of OSUT.

c. The course is currently designed for three weeks and no evidence was collected that would lead to recommending either lengthening or shortening it given the present content. The training schedules used in the two class tryouts contained provision for eight hours of review and four hours of make-up. Review time is actually instructional (practice) time if properly used. On the other hand delays and deviation in the tryout schedule were caused by outside demands on the vehicle for demonstrations and down time for maintenance. The result is that it is difficult to determine precisely if the full three weeks is required. It would seem that one or two days might be saved if there were a real need to. This would assume modification of some instruction as outlined in the preceding paragraph. However, the two course tryouts did not include actually swimming the vehicle. If and when this is included, probably an extra four to eight hours will be required. Hence the overall conclusion is that currently the three week block should be retained.

d. The time scheduled for the individual blocks was, in most cases, in excess of what was actually used. This excess time varied from 15 minutes to several hours in some cases. Again, it is difficult to state precisely how much excess time existed on specific blocks because there were many schedule interruptions due to the mentioned vehicle and instructor demands. No case, however, was noted when an instructor had to shorten his lesson solely because of inadequate time originally allotted. When it did occur, it was due to an extra curricular requirement (or in some cases to delays in unit furnished transportation) and not because of inadequate time allocated for the training. This does not mean that excess time exists in each block. If recommendations on the

extent of practice and inclusion of testing are followed, there should not be excess time. The point is that enough time does appear to exist in the current course plan to implement those recommendations.

5. Is the Instructor-Student Ratio Per Block of Instruction Perceived To Be Adequate? What About the Quality of Instruction and Any Presentation Problems?

a. No significant problems were encountered with instructor-student ratios and none are anticipated based on Lesson Outlines. For simultaneous individual practice (which occurs infrequently, FPM Maintenance and Vehicle Publications being examples) a ratio of 1:3 or 1:4 would be recommended. For most practices on the IFV the planned ratio of 1:6 is adequate. Most problems will be encountered with equipment-student, not instructor-student, ratios.

b. While some suggestions and comments on instructor techniques are included in Appendix A, we tried to steer clear of instructor personalities in the observations. While it is often difficult to separate the instructor from the presentation, if this is not done a good delivery can mask a poor class. And because the instructors observed will not be permanent OSUT instructors, shortcomings in manner identified during the tryout do not have much significance. Nonetheless, the quality of instruction observed was in most reports high, with a notable exception being in the conduct of practices which may be attributable more to the lack of a clear-cut practice model than to instructor deficiencies. While it was expected that the instructors would be subject matter knowledgeable, it was gratifying to note that they were definitely trainee and training oriented. This was true regardless of rank or experience of the instructor. (Even PFC and SP4 AI were notable in this regard.) To a man, the instructors epitomize professionalism and if a like quality of instructor is assured after transfer of the course to ITG there will be no cause for concern in this regard. Instructors did make mistakes and occasionally violated suggested training principles, but there was no instructor or AI who did not approach his task with enthusiasm, a positive attitude, and a dedication to the trainee and his performance.

c. One aspect of instructor quality that is important for implementation of the course is the attention that must be paid to the qualifications and preparation of the AIs. If practice sessions are carried out correctly, the real instructional burden falls on the AIs' shoulders. Indeed the quality that is most needed in a PI is not his presentation or lecture skills but his ability to train, utilize and supervise his AIs. The role of the AI is paramount in IFV instruction because of the decentralized nature of the practices. They must receive maximum attention during future implementation of the course and the qualifications, preparation and training of AI should be every bit as rigorous as they are for the Primary Instructor.

6. Are Lesson Plans (Lesson Outlines) Designed for Target Audience and Ease of Presentation?

a. With one exception the Lesson Outlines are sufficiently geared toward the trainee audience. The exception is Communicate Within the IFV where, if the "script" of the Lesson Outline is followed, the extensive use of communication equipment nomenclature will overwhelm the trainee.

b. The appropriateness of most of the Lesson Outlines for the instructor is a different matter. Most Lesson Outlines orient on the introduction and demonstration phases of instruction and give little attention to the application and practice. They seem to orient on instructing the instructor how to do the task--not the student. The instructors tend to be critical of the Lesson Outlines, but their criticisms are not specific. Most Lesson Outlines are too wordy and appear cumbersome to follow during presentation. This is a controversial area, as Task Force development must follow USAIS guidance on format and content of Lesson Outlines. Lesson Outlines are discussed in some detail in Appendix B.

7. Does the Driving Course and Firing Port Weapons Range Compliment Classroom/Hands-On Instruction?

a. Both the driving course and the FPW range are focal points for instruction which put into practice combined application of a number of individual blocks of instruction. The driving course appears to achieve this better than the FPW range.

b. The driving course (although not completely finished at the time of the tryouts) is an outstanding physical facility and has the potential to be the best learning and practice driving course of the four or five track and wheeled courses the observer has seen at other installations. It should serve not only to provide excellent driving practice but has the potential of producing real driving skill and driver confidence. This is seldom achieved in most OSU level driving training. What is needed is more individual driving on the course than was available during the tryouts. Two one-hour practice sessions separated in time is considered the minimal requirement. Night driving should also be moved to this course and extended minimally to two 30-minute sessions. Since one of the three main course objectives is to produce drivers, the actual application deserves more time. This perhaps will be possible when more IFV are available for training.

c. The major shortcoming of the FPW range, as conducted during the tryouts, was lack of full and complete realistic training because the IFV itself was not used. Objectives of individual techniques of fire and loading, unloading, and clearing of the FPW were achieved. Nominally, fire commands, reporting targets, coordination of fires were also practiced, but realistically not much was achieved in these task areas. Here again, the tryout was faced with equipment restrictions that may be eliminated or avoided in future training. There are no apparent problems with how the range was used in carrying out the lesson. However, the

range itself (Malone III) is not ideal since only right angle movement to the targets (straight back and forth) is allowed. Individual stationary fire should be conducted only to the extent necessary to familiarize the trainee with weapon characteristics and target engagement techniques. The majority of emphasis should be on firing on the move. An ideal course would employ a MISPYC concept (mounted infantry squad proficiency course) over varied terrain employing pop-up targets and allowing 360° firing capability. This could be dry run for target identification and reporting and/or wet run for engagement. Site availability and construction costs probably preclude immediate development of such a course, but long range plans should consider it. As one of the two high-points of the IIM course, the range firing should employ the maximum capabilities of the vehicle. Given the range and vehicle limitations, the range, as currently run, achieves its training objectives but does not produce the enthusiasm and total integration of activities that is possible.

8. Are Soldiers Manual Skill Level 1 IFV Specific Tasks Taught During the MOS IIM OSUT Track?

a. The draft Soldier's Manual FM 11M10 has 79 tasks listed. Of these, 22 tasks are unique to the IFV; other tasks share commonality with other CMF 11 series MOS. All 22 tasks are covered in the IFV course. Four other tasks that are listed in the draft SM are also taught in the course, although two of them, Move as a Member of a Close Combat Team and Use Visual Signals (control movement), have different content in the course than are evident in the SM. The remaining 53 SM tasks are basic OSUT tasks (First Aid, Security and Intelligence, M16, M60 Machinegun, Land Navigation, etc.). While there appears to be no problem in this regard, two possible cautions:

- (1) Tasks that are currently in the IIM track (Use M11, CVC and Intercom, Respond to Fire Commands, Report Targets, IFV Publications and Forms, Stow Equipment on IFV) but are not included in the IIM SM should be added to the SM.
- (2) When the IFV track "breaks off" from OSUT, the list of tasks in the SM must be reviewed to insure that none previously taught in OSUT are "lost" during the transfer.

9. Where, If Any, Should Reinforcement Training Be Required To Supplement Each Block of Instruction?

a. Reinforcement training--primarily in the form of practice--should take place primarily in the driving course and FPW range much as it does now. Several things could be added to the driving course such as starting the vehicle, visual signals (ground guide signals) and fording preparations. But the biggest need, the one that should be emphasized if all other reinforcement training were to be ignored, is to reinforce

systematically the conduct of PMCS using the operator's TM. Vehicular operator maintenance is an Army wide problem and if good habits are to be developed by the IFV operator they must start in OSUT. PMCS, though not difficult to perform, is time consuming to practice especially in a group. The trainee has no way of discovering the relative importance of OSUT topics (all subjects are important, he is told) except by the way the instructor treats them. Extra practice on PMCS would emphasize the importance of PMCS without reducing the importance of other topics. The extra emphasis must be more systematic than simply scheduling a random extra block of practice. One way to achieve it would be to have six men assigned to an IFV, and (after they learn PMCS) each morning and evening under supervision they must pull the before and after PMCS, rotating responsibilities and duties as directed. This may require an additional 30 minutes at each end of each day which may have to come out of training time, but the gain in learning should be worth it. Certainly the training value is as great as the current practice of sending trainees on police call at the start or end of each day. (Who is going to pick up the cigarette butts will not be addressed here.)

b. The other general area for reinforcement training is an obvious one--safety. But as obvious as it is, it is often not done. There is a great deal of difference between what is taught and what is actually done and enforced regarding some areas of safety on track vehicles. This does not mean that safety emphasis during ranges and driving or as taught during the safety orientation is deficient. It is the more mundane areas of safety such as smoking and movement on and around track vehicles that receives scant attention in practice. This is an Army wide combat arms condition and was no worse or better in the ILM course than observed elsewhere. The enforcement of safety in these areas is chiefly an instructor motivation problem. Some instructors do; most don't. It tends to peak with command emphasis, then slowly decline until there is renewed emphasis or an accident. As important as it is, it is an area with no easy answers. It may be that safety requirements regarding smoking, standing on the vehicle, and movement on and around the vehicle are too stringent to be effectively enforced. If so, instructions should be changed, but currently the trainee is initially told a safety requirement only to see it later ignored. The danger is he cannot discriminate these "lesser" restrictions from more important ones and it may lead to him ignoring everything he is told in the area of safety.

10. Did the Instructors Follow the Proposed Lesson Plans?

a. Compliance with the objectives of the lesson plans was generally good despite instructor expression of general dissatisfaction with the Lesson Outlines. The main exceptions are as follows:

- (1) Evacuation of injured personnel from the IFV was not taught. But this might have been due to the nonavailability of the IFV during this period of instruction.

- (2) Tow starting the IFV is demonstrated but not practiced. Again, this may be due to equipment availability.
- (3) Maintenance of the IFV radios was not taught. Nor were several other aspects of the Lesson Outline followed as written. But as discussed in Appendix B, this Lesson Outline has many problems and strict adherence to its requirements is probably not practical nor desirable.
- (4) The NBC Lesson Outlines requires that trainees be taught and practice loading the 25mm ready boxes while masked and wearing protective clothing. This was not done. But both the practicality and desirability from a training standpoint of including this task is questioned. Certainly it would serve to illustrate the difficulty of performing this task while under such conditions but it is not clear that the effort is a proper concentration of OSUT efforts. MOPP integrated training is usually a unit responsibility. Further, because of the extreme heat, inclusion of this task on the day the training was observed would have been risky.
- (5) The FPW range was not conducted exactly as outlined in the FPW Lesson Outline. The Lesson Outline calls for quite extensive concurrent training including Loading/Unloading Ready Boxes, Load/Unload TOW Launcher, Target ID Course Using Scale Range, Weapon Characteristics, and Target Identification and Acquisition Familiarization. The Lesson Outline foresees a series of stations with groups rotating between them. While the Lesson Outline was not followed completely, it appears to be overly ambitious considering the practical constraints on the conduct of the range as experienced in the tryouts.

b. Some of the Lesson Outlines contain extensive and detailed presentations for the introduction and closing statements, to include skits and display demonstrations. Most of these were not followed during the presentation and it is clear that many such requirements are cumbersome to present and impractical. Their inclusion is not necessarily advocated, but their rejection without tryout may not be an option.

11. Are the Training Locations Adequate?

a. Most training was conducted at three primary locations: 5105 bleachers, 4303 ramp and bay, and 4303 classroom. These sites were adequate with the following qualifications:

- (1) The bleacher site would not be adequate during inclement weather and possibly not during winter months. A roofed training structure is adjacent to the bleachers and is adequate for brief inclemency but is not suitable for prolonged instruction and practice during extended (day long) rains.
- (2) The 4303 classroom quickly becomes uncomfortable during hot weather. Fans are available but are noisy and interfere with hearing and concentration. Lighting is barely adequate. During hot weather (which appears to be most of the time at Ft. Benning), if no other more suitable site is available, instructors must be prepared to compensate for the inadequacies of 4303 classroom by rescheduling so that it is used early in the morning and by providing frequent breaks to offset the lethargy that the classroom conditions induce.

b. Most training should be located with the equipment--in short, the locations were fine. Resist the temptations to move "lecture" portions of instruction to a classroom no matter how comfortable the available facilities might be. The farther the students are from the equipment the more prolonged the introduction will become and the more instructors will try to substitute words for demonstration and practice. An exception to this is IFV Publications and Forms and possibly M231 maintenance. These should be done in a classroom-like setting with sufficient work space and lighting. This is to facilitate initial learning. Later, students can practice and apply what they have learned under more job-like conditions.

12. Is the Equipment Ratio Adequate?

a. A limitation on the tryout was that there would be only one IFV available for training. Thus the equipment ratio was essentially 15 to 1. In actuality, this was not as big a problem as originally anticipated. There was student "down time" during some periods of instruction when only a limited number could be on the IFV, but not to the point where it became alarming or student interest was seriously affected. Instructors generally tried to keep students involved in some activity. When questioned, students did not react adversely to the tryout ratio. This does not mean that equipment ratios did not cause notable problems and specific citations are contained in Appendix A. The biggest problem is that equipment limitations restrict the extent of practice but they

also contribute to instructor fatigue and inattention by extending the length of time an instructor must spend with a group of students. But despite the problems caused by restricted equipment availability, meaningful training can still take place as the tryouts evidenced.

b. The planned ratio of students to IFV is 6:1. This should be very conducive to full learning, participation and practice. However since vehicles for training always seem to take low priority (and invariably have higher maintenance nonavailability time), the course, when implemented, should have contingency plans for situations where the 6:1 ratio cannot be met. Experience on the tryouts shows that crews can double up (i.e., 12:1) and still train successfully although with some degradation. Exceeding that ratio, however (i.e., 3 crews to a vehicle), even for a very short time or in an emergency situation will likely require major schedule modification.

c. The one other equipment problem encountered involved copies of the operator TM for the IFV Publication class. Students had to double up to refer to the publication. This was not conducive to good learning and should not occur in the future when more TMs should be available.

13. Is Practice Adequate?

a. Practice is the most critical phase of hands-on performance training. In the 11M course it was the most consistent deficiency with the greatest impact. It was not that practice did not take place--almost all tasks taught involved a phase that was called practice. But practice involves more than just turning the student loose on the equipment. It is the most subtle and demanding part of the instructor's job. And at the same time, it is boring for the instructor. Few instructors can do it properly without some training and lots of motivation.

b. A uniform but flexible model for practice needs to be established for instructors. Models exist in many training guidance publications and no doubt one probably exists and is taught to USAIS instructor personnel.¹ The following principles should be embodied in any practice model:

¹In 1974, under sponsorship of USAIS, HumRRO developed a 10 hour block of instruction designed to teach NCOs and junior officers how to manage and conduct performance-oriented training in their units. This instruction, called UTRAIN, was incorporated on a trial basis into Ft. Benning IOBC. Although designed for unit training, the principles embodied and the training approach used are applicable to the conduct of performance training in any setting. Despite the 7 year interval since its development, the principles contained in UTRAIN are virtually unchanged in their applicability to current performance training. The subsequent utilization of UTRAIN at USAIS is unknown but it would still serve as an excellent reference course. See also Osborn, W.C., *et al.* Instructions for Unit Trainers in How to Conduct Performance Training, Volume I, Volume II. AD-AO 17722, U.S. Army Research Institute, Arlington, Virginia, September 1975.

- (1) The practice actually starts with the demonstration. The emphasis must be on what the demonstrator is doing, not what the instructor is saying. Students' first learning takes place by imitating--not by digesting words. Insure the demonstration is observable; that it is from the trainee's viewpoint (how it will look to him when he performs it) and, if a lengthy task, that it is in short sequences. In some tasks where equipment is available (weapons maintenance, for example) each step in the demonstration is immediately followed by student initial performance on his own piece of equipment.
- (2) The demonstration is immediately followed by initial practice on the actual equipment. Some tasks require a walk-through where the AI performs a step while the student observes, then returns the equipment to the pre-step condition and the student performs it. Other tasks require only a talk-through--the instructor prompts with verbal cues. Talk-throughs are generally used when the task is long but the steps are not difficult. The instructor's verbal cues tell what to do next (sequence). How to do it is best shown by demonstration. Do not try to talk through a complicated step.
- (3) The next practice is with the student on his own, but the instructor stops mistakes from occurring, corrects them when they do occur (by returning the equipment to the pre-step condition and having the step repeated correctly) and by giving both visual cues and verbal cues as needed.
- (4) The practice continues until the student has enough practice. The minimum for "enough practice" is when the student can perform the entire task on his own. Some tasks will require more than one such mastery trial.
- (5) Ideally, a student practice is repeated after some time delay. Again he repeats the process until he does the task without assistance.
- (6) If time is a standard in the task the student learns to do the steps first without error and then practices speed. Practice is not successful until the time standard is met.
- (7) No practice is done without supervision by the AI, although supervision should be unobtrusive in the later mastery practice sessions.

- (8) When simultaneous practice is not possible, the model must be applied as necessary for each student. Often the first student in a consecutive practice situation gets excellent attention but by the time the last student arrives for his turn the AI is weary, bored, and inattentive. Rotate AIs frequently and provide them frequent breaks. Just as AIs monitor the students during practice, the PI must monitor the AIs.
- (9) The application of the model must be flexible. This means it must be adapted to the task and to the student. Some tasks and steps may not require repeats on the demonstration. To "force" a demonstration of a step in all cases wastes time, bores the student and tires the AI. On the other hand, just because nine students in a row had no problems with a step, don't assume the tenth won't. The AI must be prepared to drop back or jump ahead to any phase of the demonstration--walk-through--talk-through--repeat step--unobtrusive observation--process depending on the reactions of the student.

c. Because task practice is so important it deserves more attention in the Lesson Outlines. Currently some Lesson Outlines utilize an Instructor/Implementor Guidance that covers practice. Other Lesson Outlines specify practice in the Body. Still others do not directly mention practice. It deserves uniform and detailed treatment. The Lesson Outline should specify:

- (1) When practice is to take place (particularly important on lengthy or multiple tasks--don't wait until a series of tasks have been demonstrated and then go out to practice them for the first time an hour later).
- (2) Size of the groups for practice.
- (3) Activities of those not actively engaged in practice (in the case of consecutive practice).
- (4) Student roles to assign when interaction is required and guidance on how each trainee gets full practice.
- (5) How to handle situations where complete practice is not possible (e.g., Extinguish fire on an IFV, Reduce a stoppage on M231).
- (6) What actions or role the AI must fulfill (e.g., Load 25mm ammo boxes, Respond to fire commands from TC).

- (7) When enough practice has taken place (e.g., one unassisted performance, two or more, time standard).
- (8) Guidance on when a slow student's practice should be terminated because continuation is denying the rest of the trainees the opportunity to perform. Also, what to do with that student. (This is generally a remediation plan and need not be included in each Lesson Outline. But some tasks have particular implications in regards to when or how complete remediations must be effected.)

14. Is Testing Adequate?

a. The specific content of the tests that are currently used in the course are discussed in detail in Appendix C.

b. Currently 11 tests have been developed in the course that test about 17 of the roughly 40 tasks in the course. Tests must be developed for all remaining tasks and all testing integrated into each instructional block. This does not mean that current certification requirements for award of the 11M need be changed or made more stringent. Certification is a policy decision based on varied considerations but the inclusion of tests for all tasks taught is a training requirement. Testing is an extension of practice; it is the logical conclusion of instruction. Without testing there is no measure of the adequacy of instruction nor of the proficiency of the soldier. Training without testing is incomplete training. Every task taught must be tested.

c. The causes of inadequacies of the extent of the current testing program are fairly easy to trace but not always so easy to solve. Essentially there are three likely causes:

- (1) As noted in the footnote on page 4, some tasks were probably not included because the training content in which they were taught caused developers to downplay their importance when testing decisions were made. This must be rectified: Tasks that are important enough to be included in training must be tested. This does not mean that every topic covered in training need be tested. Common sense must prevail and testing is dependent on the isolation of clear-cut tasks in training. With the exceptions as noted on page 4, most of the 11M tasks are fairly well identified as bona fide tasks. These tasks should be the focus for testing. In final test development the complete task may not be testable but this is an acceptable limitation on current state of the art testing

and must be decided on a case basis. But testing on what is practiced is generally feasible.

- (2) Other tasks fall into a more difficult testing category. Tasks such as Combat Formations, Prepare IFV for Fording/Swimming, Break and Join Track, TOW Misfire Procedure, Evacuate the IFV and Operate a Boresight Kit all involve interactive or other form of joint activities. This may have caused developers to consider that the tasks were not testable and certainly they require a differing approach in test development. But some tasks (such as Boresighting and Break and Join Track) can use the "standardized other" approach to testing with specified actions being performed by the scorer or an AI (much as the practice is currently conducted in Boresighting). Or some tasks may be reduced to part-testing where conditions are manipulated to allow part of the task to be tested on an individual basis. Hopefully, analysis will allow selection of "critical" portions of the task and these will be the ones where individual testing is feasible. Finally, for some tasks, paired or group testing may be the only solution and nothing in test philosophy precludes this approach. These tests are constructed, administered and scored almost exactly like individual tests. However, because of attendant or perceived threats to "fairness," these tests are often not included in the requirements for certification but used primarily to evaluate training and learning.
- (3) The third cause of the current limited test scope was likely the limited time available as solely dedicated to testing. The current "Comprehensive Test" takes the better part of a day and it is not feasible to include many more tasks in that time period. But the Comprehensive Test period and testing of each task should be separate issues. Each task should be tested as an integral part of the task training block. The Comprehensive Test will then consist of those tasks that are selected (presumably because of their criticality) as a requirement for certification and award of the ILM. In short, the Comprehensive Test could remain as it currently is (if desired) and a testing phase added to each

block of existing instruction. Based on observation, sufficient time exists in instructional blocks to implement this. Another approach possible is to eliminate the single Comprehensive Test and substitute "gate tests" (small blocks of tests at the end of an entire functional block) or even aggregate all or selected tests cumulatively when testing at the end of practice for record. The point is that testing and its uses for certification has some degree of flexibility but that all tasks must be tested.

d. Testing need not be unduly time consuming in its application. It can be the final session in the practice model discussed in paragraph 13. But it must be scored in terms of the specific performance measures with a GO/NO GO standard applied. It cannot consist of an AI's "pretty good" or "good enough" evaluation during a random practice session. The soldier must know he is being tested and he must be given feedback on his performance.

e. When testing at the end of each training session, it is not necessary to require that each soldier receive a first-time GO on every task. Whether to remediate and retest each NO GO will depend on the cause of the NO GO. Some remediation can be handled through verbal feedback or retesting of the part failed. Group standards can be established through experience, or an 80% norm can be adopted as was done in this evaluation and modified if necessary with experience (modifying up more readily than downward). Any time that this standard is not met it should be a signal to the instructor that something went wrong during training--something left out or done inadequately. Reviewing the causes of task failures often reveals clues that help pinpoint the training weakness. Consistent results below the standard may mean that a more thorough analysis is needed involving the instructor's supervisor or outside resources. Thus, through testing, each class is subjected to a continuous validation.

f. Apart from student certification, test results serve the instructional process by revealing areas of deficiency. Where student test performance is consistently low, instruction was probably weak. To obtain this kind of diagnostic information systematically, a task standard for first time GOs should be established.

RECOMMENDATIONS

The question foremost in the reader's mind is: Did the 11M course validate? But seldom in training evaluation work can such a bottom-line question be answered unequivocally yes or no; nearly always it is a matter of degree. This evaluation is no exception: The answer is "yes, but . . ."--the "buts" being a series of qualifications, findings and shortcomings that were observed during the evaluation process and reported here.

Performance on the end-of-course criterion test was quite good, and for training that had not been tried out before, that is a significant accomplishment. Instruction was almost all performance oriented. And learning did take place. It is important to note that the 28 trainees who attended the course are 11M qualified despite the fact they went through a prototype, experimental course. Most importantly, the course needs refinement, not redesign, and almost all changes recommended can be implemented within the existing 11M course framework and task structure.

Many comments and suggestions are contained in the preceding Findings discussion and in the supporting Appendices A through D. These should be reviewed and implemented where it is feasible and within the charter of the IFV Task Force to do so. Some comments will be viewed as matters of instructional technique--and thus matters of preference rather than principle. Still others may be situation specific and may not occur the next time a class is given. The IFV Task Force is not the implementor of the course and it will be handed off to another group for incorporation into OSUT training, so some of the recommendations may be beyond the power of the IFV Task Force to implement. As long as the IFV Task Force is in existence, however, it should seek an active role in monitoring the instruction even though they relinquish the responsibility to teach it. It is hoped that the comments and discussion contained in this report will serve as a basis for that role.

The recommendations focus chiefly on those areas in which the IFV Task Force can modify and refine the course before turning it over for implementation. Seven specific recommendations are listed in order of importance.

1. Review the specific comments in Appendices A-D, paying particular attention to those in D. All comments should be considered though not all may require action.
2. Reinforce the model for conducting practice activities. The primary instrument under the control of the Task Force to do this is the Lesson Outline. Since this is an area requiring some instructor orientation and constant attention by instructional supervisors, discussions with groups outside the Task Force may be required to assure the model of good practice is instituted.
3. Develop tests for all tasks taught. Require that testing be included in each block of instruction. Develop and implement a plan to require demonstration of test validity and reliability.

4. Reinforce PMCS training by incorporating it as an applied theme on a scheduled, continuing basis throughout the course.

5. Expand the scope of the Driver Training Course and the FPW Range Course. The increased benefits of increased driver training are obtainable within current facilities. Expansion of the role of the FPW Range Course is a longer term planning requirement.

6. Consider obtaining a dynamic driver's station mockup.

7. Review the content of the following five classes to assure that the current scope is warranted. These are, in order of priority:

- a. Load, Stow Equipment on the IFV
- b. IFV Communications
- c. NBC Operations (Decontaminate IFV)
- d. Identify OPFOR Vehicles
- e. Range Determination

As a final note it should be emphasized that training evaluation is a continuing process. This initial effort concentrated primarily on sufficiency of material to support the course objectives and on identifying weak areas or potential problems in the trial application of that material. Course content, material, instructors, instructional locations, training aids and devices and instructional emphasis change over time, sometimes improving, sometimes not. But if student performance can be retained as the yardstick for instructional evaluation, perturbations in course design can be monitored and the quality controlled.

It is concluded that with modification the existing course can be implemented and the goals of IIM qualification met. Continued course evaluation is required, internally and on a selected basis, to assure that the modifications implemented were effective and that new instructional problems have not developed.

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APPENDICES

APPENDIX A
CLASS OBSERVATIONS

APPENDIX A

CLASS OBSERVATIONS INDEX

	Page
PREFACE	A-3
1. Vehicle Safety	A-5
2. Use Visual Signals	A-6
3. Identify and Perform Operator Maintenance on M2 Ammunition . . .	A-7
4. IFV Communications	A-9
5. Load/Unload 25mm Ready Boxes	A-10
6. Start/Shut Down an IFV	A-11
7. Use IFV Operator's Automotive Publications	A-12
8. Perform Operator Maintenance on the IFV	A-14
9. Drive the IFV	A-17
10. Drive the IFV in Limited Visibility (Night Driving)	A-17
11. Swim the IFV (Prepare IFV for Water Operations)	A-18
12. NBC Operations	A-19
13. Perform Operator Maintenance on M231	A-20
14. Install, Unload, Clear and Immediate Action on FPW	A-21
15. Load, Stow, Unload Smoke Grenades	A-21
16. Operate Boresight Kit	A-22
17. Load, Unload, Misfire Procedure-TOW	A-23
18. Engage Targets With the FPW (Range)	A-24
19. Load/Stow Equipment	A-25
20. Break and Join Track	(Not Observed)
21. Close Combat Team Drills	(Not Observed)
ANNEX A-1. TRAINING OBSERVATION WORKSHEETS	A-27

PREFACE

All but two classes were observed during the validation effort. Normally during a TPE the results of the observations are used selectively to identify causes of training deficiencies when the pass rate criterion has not been met. If the criterion is met, the observations are not reported. The assumption is that even though observations of shortcomings or potential problems were made, they did not affect the final performance outcome and developers should concentrate on applying fixes where real training deficiencies exist and not get side tracked into classes where student performance was acceptable. In this evaluation, however, all observations are reported. This is for two reasons. First, not all tasks were tested so performance deficiencies may exist which are not known; second, considerable effort was expended in conducting the observations and apparent shortcomings are worthy of consideration and review by course developers even though their impact on learning may not have been sufficient to preclude achievement of acceptable student performance.

As with most critical observations, these focus on identifying what is wrong rather than what is right. Hence the majority of comments are negative and may give a distorted picture of a class. In almost all classes, more things were right than wrong. But "right things" are the expected, the norm, and since "right things" don't need fixing they are seldom commented on. So the intent here was not to present a balanced picture of training, but to identify potential problem areas. Some classes were weaker than others. Where problems were frequent or severe enough to lead the observer to doubt seriously the overall value of the training, the class is so identified. Otherwise it should be assumed that the training objective was probably met despite shortcomings or comments.

The observation method has some obvious limitations. It deals with an event at only one point in time. Things can occur which may never occur again, or future classes may have problems that were not even hinted at in the class that was observed. Therefore, an effort was made to generalize as much as possible the comments--the specific incident is used only to highlight problem areas that probably will occur elsewhere or again.

The observer followed a checklist during the observations, but more as a format guide to assure all areas were covered rather than as a traditional rating sheet. Negative checks were used to generate notes and comments which form the basis for this annex. A copy of this list is at Annex A-1 at the end of this Appendix. Not all of the areas on the checklist were treated with equal importance during this evaluation. For example, "housekeeping" details (transportation, feeding of troops) was almost never commented on even though at times problems existed in these areas. This was because problems in this area were never, in the observer's opinion, severe enough to affect the training, and usually such problems were beyond the control of course personnel.

Some areas were continuously rated "OK" and hence do not require attention in this report. For example, access to instructor, instructor attitude, opportunity to ask questions, questions answered, were virtually never faulted and therefore not commented on.

Other areas were almost continuously downgraded. Most of these centered around practice, i.e., students ultimately perform on their own, faulty performance identified and corrected, instructions clear, critical discriminations and responses called for, quality of feedback. These were serious problems and were cited more often than not. Because of the importance of individual practice and how it is conducted, these are discussed, where applicable, under the appropriate class.

Another area of criticism which occurred continuously is mentioned here but seldom individually listed because of its general nature: With the exception of two classes (NBC Operation and Load TOW), students were never told at the start of the class what they would do in that class. They were told what the objective was or what they would learn but never the process they were about to experience in that learning. (For example, "This morning we are going to erect the swim barrier and prepare the vehicle for water operation. As I explain the procedures, Sgts Jones and Smith will erect the barrier. Keep moving around the vehicle where you can see what they are doing. After they have demonstrated erecting the barrier, each of you, in two-man groups, will perform one of the disassembly steps under my direction while the rest observe. Then, in three-man groups you will erect the barrier. Two men will perform the steps while the third man directs them using the TM. Finally, each of you will be tested individually on some of the steps you have practiced.") This overview of training events is especially important in hands-on training. It piques the student's interest and attention by telling him that he must do something. It is not crucial to learning but involves the student right at the start of the class by emphasizing his role. As observed, this was almost never done.

In the following listing of observations by class, dates are given on when the observation took place. Any date on or before 20 June 1981 was the first run of the class. Any date on or after 24 June 1981 was the second. When applicable, specific conditions that affected that class are stated.

1. Vehicle Safety (1 June 1981)

a. This class was 30 minutes long. Normally this class would involve use of the IFV, however, the IFV was damaged during a demonstration and was not available. This precluded any practical demonstration or practice and the instructor had to rely on GTA, a vehicle model and verbal explanation to carry the class.

b. The Lesson Outline called for three main task areas to be covered:

- (1) Extinguishing a Fire (automatic and manual)
- (2) Self evacuation of an IFV
- (3) Evacuating injured from an IFV

As tasks, these were barely covered. The primary emphasis of the class was safety "dos" and "don'ts." The absence of the vehicle may have affected what was taught but the emphasis in the class was not on doing any of the tasks or even describing them. This was particularly true regarding evacuation of injured crew members which was not even mentioned during the class.

c. The purpose of this class needs to be re-evaluated. Is it going to be a general safety orientation or are tasks going to be taught? The overall impression is that it is a general safety orientation. This is all right, but if so, drop the pretense that tasks are being learned. (NOTE: This comment applies even though, when observed, the vehicle was not available. The way the class was executed leads to the observation that the emphasis in this class would not have been on teaching the three tasks even if the vehicle had been available, although, of course, this cannot be known.)

d. Two minor occurrences during this class illustrate some general principles:

- (1) At one point a portable fire extinguisher was passed around for students to see and handle. Meanwhile the class discussion centered on a different topic. Students can't concentrate on both. Either wait until the object has passed around or concentrate on comments relative to the object the student is handling.
- (2) Crew positions were referred to by number-- a reference system very familiar to the instructor but at this early stage probably unknown to the students. Assess the student entry knowledges and make sure they know what is being talked about. A brief explanation can save a lot of confusion.

e. No practice was conducted (or possible) because of lack of a vehicle. For that reason the stated objectives of this class were not met. If the objective of evacuating injured from the vehicle is valid, this portion of the class should have been rescheduled when the vehicle became available.

2. Use Visual Signals (1 June 1981)

a. The Introduction given for this 50 minute class (and it followed the Lesson Outline) stressed the need to know these signals because of potential enemy jamming. This is not the primary purpose. The introduction should have stressed their role as drivers and the functions of and requirements for ground guides when moving track vehicles in many situations. This is a more immediate need for most of the signals than enemy jamming. A tie-in should be made to driving and maintenance functions.

b. During the demonstration phase both an AI and GTA were used to illustrate the signal. Both are not needed and the student doesn't know which one to watch. Use of the AI alone would have been better.

c. Two learning sets are involved in this class. The student must learn to receive (recognize) and to give the signals. They are integrated but separate. The students should first be taught to give the signals. This makes a difference in the demonstration. The demonstrator (for demonstrating giving the signals) must insure he reflects the student viewpoint. For example, he should face the same way the students are facing. The point is to get the students to imitate exactly what they see the demonstrator perform. For demonstrating receiving the signals he should be in a position relative to the students that they would normally see when receiving the signals (i.e., facing the students in most cases).

d. One of the GTA (neutral steer) was incorrect. This should not have been shown rather than pointing out the error.

e. After the demonstration, students were issued sets of flash cards containing the signals and broke into two-man groups for practice. Some comments:

- (1) No specific instructions on how to practice were given. Students were not told anything beyond to "take turns running through the signals." Eventually most students took turns giving the signals, but there was some initial discussion in groups about who was going to do what. Specific instructions should include: "The (number one man, man on the right) will use the flash card and call for a signal and the other man must give it. The man with the flash card will check and correct it if necessary. Then you will switch roles."

- (2) There were only two instructors to supervise eight groups (16 students).
- (3) The two-man groups were physically too close together. There was both verbal and visual interference between groups.
- (4) Students never practiced on their own without use of the flash cards.
- (5) Total practice lasted 14 minutes.

f. Initial practice on this task should start during the demonstration. Students should be taken out of the bleachers and arranged at double arms length in a semicircle (or in two ranks offset for observation) around the demonstrator. Each student should perform the signal as it is demonstrated and be checked by the AI. There should be one AI for every four students. During paired practice, this would be one AI available for every two groups.

g. The flash cards are a good idea but were not properly used. Early practices should allow reference to the flash cards while giving the signals. Then withdraw the flashcards from the individual signalling but allow the receiver to use them to check the signal. Finally, the receiver should practice identifying the signal without the flash cards. Flash cards should have the name of the signal printed on the back to insure all signals are covered without being prompted by the diagram.

h. The goal is to gradually withdraw reliance on the flash cards (for both giving and receiving the signals) until students can perform on their own. Eventually an unsophisticated time standard should be imposed (such as slow counting to 5 or 8) for both giving and recognizing. AI supervision is required throughout and AIs should identify where the problems are (not all signals are equally difficult to perform or remember) and direct practice to these signals.

i. Reconsider the priority of the signals taught. Concentrate primarily on the ones that are used by ground guides. There are some signals that a 10-level must recognize but will seldom give himself (dismount, mount, close up and stop, pass and keep going, prepare to move). These do not need practice in giving as much as recognizing. Give priority to the most used ground guide signals. Test these at the end of the class.

3. Identify and Perform Operator Maintenance on M2 Ammunition (1 June 1981)

a. Initial demonstration on identifying characteristics of ammunition and inspection of ammunition was given in the bleachers. Students then were moved to PE areas which consisted of two field tables set up about ten feet apart with different types of ammunition and belts containing "problem" ammunition. There was one TOW missile.

b. There was no apparent purpose or organization to the PE. Each table was manned by an instructor but primarily they were responding to student questions. Students handled the ammunition but mostly without direction. There was no individual practice as such; it was primarily small group discussion. The point is not that learning did not take place but that any such learning was not uniform. Students would wander from group to group wherever the topic being discussed seemed the most interesting at the time.

c. The demonstration portion of the class on how to inspect the TOW was difficult to follow because it was difficult to physically see what was being referred to. During the PE, one instructor covered this again, but he covered it for two students who were interested while two more students immediately adjacent were trying to disconnect/connect 25mm ammunition relatively unsupervised. There was no uniformity or plan evident in the practice.

d. This class was informally tested and more learning probably went on in the test than in the nominal PE session. During the test students had to identify eight types of ammunition, identify deficiencies in two belts (25mm and 7.62) of ammunition, identify color bands on the TOW and tell what the inspection points of the TOW were and what they would look for. No formal score was kept, but an informal tally showed six NO-GOs (out of 16) on identifying ammunition (primarily with the color bands on the TOW) and 12 NO-GOs (out of 16) on ammunition maintenance about evenly split between the TOW and the linked ammo. (An arbitrary standard of no errors allowable was applied to keep the tally.) Feedback was given and was fairly good in most cases but sometimes took the form of "coaching" ("Do you see anything wrong with this round?"). It could have been more emphatic ("You missed a short round. Go through the belt again and see if you can locate it."). And more positive feedback could have been used particularly this early in the course. During testing, essentially only one student could be tested at a time. Another AI was available and if another set of ammunition were available perhaps the waiting students could have done some limited practice or at least more handling of ammo during their hour wait. Also, testing results were likely passed back to those awaiting the test. Most students, however, seemed to take the testing fairly seriously and in effect it was probably the most productive part of this training. One standard is confusing. Students were required to identify ammunition by nomenclature (7.62mm, 5.56mm, 25mm). "Machinegun ammo" or "M16 ammo" were not accepted. It seems, unless there is a doctrinal reason, that it would be sufficient at this stage if the trainees could identify the weapon in which the ammunition were to be used.

e. The PE needs to be better organized. At the very least have the tables spread out where they don't interfere with each other and have different activities at each station. Control the movement of trainees between tables. Decide exactly what is going to be practiced (linking, identifying ammo, inspecting various belts, TOW) and make sure each student does each activity. Ideally a couple of more stations (tables)

are required but this would require more AIs. If the AI is going to repeat a portion of the demonstration (such as with the TOW), chances are everyone missed it, so make sure everyone receives it in groups small enough to see it. The basic requirement is to have a plan for the PE activities and then control the students to insure the plan is followed.

f. This class took 1 hour, 45 minutes.

4. IFV Communications (2 June 1981)

a. The tasks taught were hooking up the CVC and taking the radio (AN/GRC-160) from a man-pack to a vehicular mount configuration. Radio maintenance is specified as a task in the Lesson Outline but was not taught.

b. Students were familiar with the radio and radio-mounting task from previous OSUT instruction. In essence, this was mostly refresher training.

c. The intercom hookup was taught inside and around the back of the IFV. The radio class was taught on a table using a dismounted mount.

d. Radio mounting is an extremely difficult task to demonstrate to a large group because it is difficult to observe what is being demonstrated. Fortunately, this was a refresher class for this group and the demonstration was not critical (in fact, it was cut short for other reasons as discussed below). But if this lesson was to be primary instruction in this task it would be essential that a small group (four trainees) demonstration be used.

e. Weather was inclement and the class was taught in the IFV bay. There were noise and personnel distractions and the IFV was being intermittently run nearby. The instructor therefore cut the demonstration off and went to initial practice. This was certainly the correct procedure in this case particularly since trainees were to some extent already familiar with the task.

f. The student equipment was about 8:1. For practice an AI was available if another radio set and mount had been. This would have allowed more than one practice. What practice there was was quite good. Instructors closely monitored and corrected any errors. Students generally repeated steps done incorrectly even though only one practice each was performed.

g. The radio task was tested. The intercom task was not (admittedly there is not much that occurs in hooking up the crew intercom). Informally, there were only three NO-GOs observed during the testing. Feedback following each test was generally good although it could have been a little more emphatic ("You failed to remove the battery. That is a NO-GO."), although this is probably a matter of instructor style--whatever he feels comfortable with telling students.

h. Practice and testing on the radio task were not conducted on the vehicle. How this difference will affect performance on the job cannot be estimated. Generally, the goal should be to practice and test as close to job conditions as possible.

i. A training point occurred during this lesson which serves to illustrate an important precept of training. The practice of wetting the connections when connecting audio cable makes the task easier to perform. This is probably not in any manual but it is one of the "tricks" that experts or job experienced people do and novices don't know about. These things are vital to include in training. They arise frequently in mechanical tasks and probably won't even appear in any Lesson Outline but they can make a great deal of difference in performance. It is important that instructors include these type of hints on an informal basis.

j. Despite the fact that fairly good learning took place in this class, its criticality and scope as currently taught are questioned (see discussion under Findings, Item 4, page 14).

k. This class took approximately 2 hours. It was taught jointly with practice starting of the IFV.

5. Load/Unload 25mm Ready Boxes (2 June 1981)

a. This class used a scale (1:1) mockup ready box for the demonstration and all practice (although in the second iteration of the class most students got one practice trial loading one of the actual boxes on the IFV). The use of this mockup is discussed in detail under the Findings section, Item 3, Page 10, of this report.

b. The first 15 minutes of the class was primarily a lecture using GTA on how to load ammo. This should be eliminated. Go directly to the demonstration using the mockup box. Both covered the same thing only the demonstration does it much better.

c. There appeared to be some student confusion between loading AP and loading HE, and switching the mockup end-for-end doesn't illustrate this very well. Even in the vehicle during the second iteration one student did not understand there were two separate boxes. Probably the only way to adequately demonstrate this is on the vehicle.

d. There was a lack of organization and uniformity in practice. All students got at least one practice but some apparently got more if they wanted it (the instructor/AI should decide when a student has enough practice--not the student). Practice groups varied in size from two to five although essentially only two could practice at a time. Some instructor monitoring and feedback was very good, but sometimes the instructor would be distracted by a question from someone else in the group. Another "station" was set up on linking 25mm ammo, but instructions on who was to be where doing what were not very clear.

e. The group was simply too large for the amount of equipment available. The limit on the boxes should be 3:1. This will require more boxes.

f. The lack of realism for final practice by using the mockups is believed to be a serious drawback in this class. However, the principles of "hanging rounds" can continue to be taught with the mockup. It is putting everything together into a complete task that cannot be done well on the mockup, i.e., unrealistic practice.

g. As topics, inspecting, linking, and unlinking ammo were integrated very well into the instructions, the PE and the test.

h. Most students did not ultimately perform the task on their own.

i. This task was tested, two people at a time. One student was the loader and the other the assistant, so that performance was sort of a mutual effort but not all students were required to perform the same. Although not ideal, this is much better than no testing especially if time is a problem (testing took 20 minutes for eight pairs). Two points should be noted about informal testing in general:

- (1) Even in a practice test, students should be told exactly what they must do even if it is the same as what they have just been practicing. Instructions can be standardized without being formal.
- (2) Even though standards are not being formally applied in a practice test, students should be told what the actual standards are that they must meet.

j. The overall impression about this class was the unevenness of practice. It was not uniformly "bad" practice; portions of it were excellent. But without following a practice plan there is no way to assure that all individuals get the same type and quantity of practice.

k. This class took 2 hours.

6. Start/Shut Down an IFV (2 June 1981)

a. The first part of this class was taught inside a classroom (Bldg. 5105). Practice was conducted at the IFV bay.

b. The availability of only one IFV for practice was a real disadvantage in this class. Only one student can practice at a time and a single initial practice required 10-15 minutes per student. (The instructors combined the practice with the radio practice on IFV commo. This reduced student down time.)

c. This class covers both starting and shut down procedure. Shut down procedure is primarily securing, locking, and checking the outside of the vehicle. It is given "equal weight" in instruction but does not seem to have the same importance as the starting procedure and much of the shut down procedures would seem to be unit prerogatives. Shut down procedure is never practiced. Its total inclusion or at least its emphasis should be reconsidered.

d. All practice was controlled, i.e., students were talked through. Students did not get an opportunity to perform the task without cues. (However, some students did get opportunities to start the vehicle on their own in other classes.) The practice was good initial practice. The main problem is that only initial practice was conducted.

e. Both GTA and slides were used during the orientation. The slides were much better than the GTA; in fact, the slides were of unusually high quality. However, a driver's station mockup would be of great value in this class (see discussion under Findings, Item 3, page 12).

f. The classroom was hot, stuffy and, because of the requirement for slides, dark. Had this class been conducted after lunch or later in the day a lot more students would have been "lost." The instructor did an excellent job of maximizing student involvement through questions and having students point out areas he had discussed on the slides. Still, with a large class, under these conditions, maintaining student attention is difficult. About the only solution is to try to cut the presentation as much as possible. In this case it would mean concentrating on the starting procedure itself. Leave actions preliminary to starting (entering the driver's compartment, adjusting the seat, hooking up CVC, towing/tow starting controls) to the PE portion.

g. The classroom time was 50 minutes plus an additional 2½ - 3 hours used in individual practice.

7. Use IFV Operator's Automotive Publications (2 June 1981)

a. This class, which took approximately 30 minutes, was taught in the IFV bay classroom.

b. The precise objectives of this class are not clear and the task is poorly stated in the Lesson Outline. It is difficult to separate the use of publications from PMCS and maintenance forms and records which was taught in the next block. Clearly, use of publications should be taught first but it relies a lot on information, situations and examples that are not really covered until PMCS. Basically, however, the objective is to locate information in the manuals.

c. This is a difficult subject to teach. It is one of the few subjects (along with maintenance forms and records) in the IFV course that is not specifically hardware oriented. It is not precisely a "soft skill" but is closer to it than other tasks taught in the course. And

it involves books--voluminous, wordy, confusing books. Most TM/FM are not well received by today's soldiers. This may be because the typical combat soldier is not particularly reading oriented, or because of poorly designed manuals. Whatever the reason, the ILM is likely no exception. So the approach to this subject cannot be based on principles of use of manuals. The soldier must be brought to demonstrate to himself the actual use of the manual to overcome his initial aversion to them. This is difficult particularly in a large class. The use of manuals requires some cross-referencing and referral. The soldier who reads a little slower or has trouble comprehending some words can get lost very quickly and is prone to give up and let the class flow on past him. Individual pacing and attention is as important here as it is in any hardware hands-on class. A further compounding problem in this class was that there were only one set of publications available for each two trainees. Sometimes this pairing can be helpful because one student who does not understand can follow what the other does, but more often what occurs is that the more assertive or more knowledgeable person ends up dominating the publications. Even sitting side by side, it is extremely difficult for two people to read the same publication.

d. Most of the terminology used in this class is new (PMCS, LO, dash-ten) but almost all of it was explained quite well. This is a very important aspect of this class. Don't lose the students right off with alien terminology.

e. The class centered around three publications: TM 9-2350-252-10-1, LO 9-2350-252-12-1, and TM 38-750. The first two publications are "musts" for the student. But TM 38-750 is not only confusing but seldom available to the soldier in units, and only a very small part of it is ever used by the operator. Consider deferring 38-750 to the PMCS (DA Forms) class (and even there using only an extract).

f. Too much information was presented "up front" and before it could be used. The organization of the TM was talked about (i.e., Operation in Chapter 2, Maintenance in Chapter 3) and "demonstrated" by holding up the book open to certain pages. Of course this could not be seen beyond the first row and the students had not even been told to open their TM yet.

g. The recommended approach is to get the students into the TM as quickly as possible. Start with the Table of Contents and work through the major Chapter headings. Pay particular attention to maintenance tables in Chapter 3 as this is one of the major uses of the manual. (In fact, if Chapter 2 and 3 are well covered some of the other less seldom used chapters should receive only scant attention.) Cover the index and the page and paragraph number system. Make sure the students understand the figure/illustration reference system. Cover both with lots of examples and have the students follow using their TM. Do the same with the LO. Then follow the Lesson Outline sequence of Determine Info Required, Locate Specific Info and so on. The systematic approach to finding and using information as outlined in the Lesson Outline (and done in the class) is good but only if familiarity with the publications is established first.

h. No PE was conducted. This class very much needs PE if the student is to discover that the TM does work. The recommendation is to start with an instructor controlled PE in which he presents a situation and then has the students follow him step by step in their manuals as he "discovers" the answer. Then go to a series of written situations (on a chalk board or handed out) in which the student must write out some short simple response that can only be found in the TM. Start out simple with the use of the Table of Contents and Index (What is the title of Chapter 3? What paragraph numbers discuss the final drives?) and proceed to more complex issues (What weight oil is used in the transmission in the wintertime? If you are going to drain engine oil, how large a container do you need to collect waste oil? At what temperature do you initiate cold weather starting procedure?). Make sure students work on their own. AI on a ratio of 1:3 are needed and must verify the student's answer and be especially alert for the student who is just "flipping pages" waiting for the right words to appear.

i. This class was quite well presented as far as the organization, sequence, and format of instructional material. The instructor took special effort to insure that students understood terminology. The motivational presentation on use and importance of publications (i.e., get the publication habit) was quite good. Yet it is felt that the objectives of this period of instruction were not met--the primary cause being that students did not do anything--they listened. This can, and should, be rectified within the time allocated for this class.

8. Perform Operator Maintenance on the IFV (3 June 1981)

a. This class was organized as follows: The first hour in the bay classroom, followed by approximately a 40 minute demo/PE on the vehicle, and then 40 minutes in the bay classroom on forms.

b. This is a complex and very important subject. Individually, the steps on the PMCS are not difficult, but taken collectively with the forms and use of the TM and LO, this is probably the most complex subject covered in the 11M course.

c. The initial time spent in the classroom discussing PMCS may not be warranted. There is no value to "explaining" individual steps in PMCS in a classroom setting. The purpose and definition of PMCS was nicely presented and some overview on organization of PMCS (before, during, after, weekly, monthly) is needed. But effort should be on getting to the vehicle as quickly as possible.

d. Availability of only one IFV was a definite problem in this class. A 15:1 ratio for demonstrating PMCS is simply not workable. The instructor tried to compensate for this by breaking into two groups but they were still working on the same vehicle (although at opposite ends/sides) and there was interference. Even a 7/8:1 ratio to equipment is too high for this topic. The goal should be no more than four (and preferably three) students to one IFV.

e. It was not clear whether what occurred on the vehicle was a demonstration or a PE or both. (It can be both but the point was it was not clearly organized for either.) There was no clear-cut plan or organization as to what the students were to be doing once they got to the vehicle. It started out clearly as a demonstration with instructor performance, then switched to having selected students perform, then into groups. PMCS items checked depended on which part of the vehicle was available and jumped between before, after, weekly, monthly. This situation is understandable because of the number of students and availability of only a single IFV. But the lesson to be learned is that a definite plan for practice is a requirement if chaos is to be avoided. (This is not to say that the situation observed deteriorated to the point of chaos. A lot of learning on individual PMCS steps did take place. But the systematic, complete coverage of PMCS was not conveyed during the practice.)

f. PMCS is especially complex to teach and practice. Some steps are only visual checks and require no "doing" but do require a knowledge of what to look for. Ideally, during practice enough "faults" will be present on the vehicle (or induced if necessary) to insure that the student knows what he is trying to recognize. Further complicating the task is that some steps require two people (one usually in the driver's compartment). Finally, some steps are simple and the individual can almost "learn" the step when he reads it from the PMCS table, while others are more involved and complex and require an instructor demonstration of how to perform. The point of this is that PMCS initial practice, more so than some other tasks, require a well thought out plan of approach for student involvement. The instructor/AI must identify what and where he is going to demonstrate. He must plan for what each student is going to be doing (who is doing the check, who reads the TM, who keeps the DA Form 2404, who acts as the driver and how the duties will be rotated). He must plan for how he is going to make sure students are looking for the correct things on visual inspections (induced conditions if necessary) and must prepare himself for what kind of feedback or response the student will give to indicate to the instructor he is or is not checking the correct item in the correct manner. This is clearly the most difficult of all the PE to be conducted. To learn the task correctly the student must be impressed with the orderly approach to PMCS. He must start with check number one and progress sequentially all the way through. This must be done on the vehicle and it simply cannot be done with 15 students at a time on one vehicle.

g. Three DA Forms are taught as part of this class: 2404, 2408-1, and 2408-14. The first two are essential for the operator but the DA Form 2408-14 is not filled out or maintained by him. By their nature, maintenance forms are confusing (different headings, different uses, different information, different symbols) and a detailed explanation of the DA Form 2408-14 only adds to the confusion on the other two forms. It is recommended that this form be dropped from the class.

h. The explanation and demonstration of the DA Form 2404 was quite good. Students had a DA Form 2404 and filled it out following the instructor's directions. The DA Form 2408-1 was not so well covered: Learning centered around a vignette and students did not complete a form. The main criticism of the DA Form 2404 PE was that student performance was not monitored closely. Students were asked if they "put down anything different" but if a student did not respond there was no way to tell if he had or had not responded correctly on his 2404. The need is for AIs to monitor (1:3) the student's work. The approach used (a series of situations) was adequate but a few more could be used with less instructor direction to insure the student knows how to use the form on his own. Students never did completely perform on their own with the result monitored or evaluated. Additionally, there are a great number of differing situations requiring differing entries. At least the most "common" ones should be practiced under differing initiating situations. Practice should emphasize entries, not just completing the heading (this was done correctly in the observed practices; emphasis was on maintenance entries).

i. The DA Form 2404 should probably be taught before PMCS and then utilized during PMCS PE. Enough faults should exist (or be induced) during PMCS so that the DA Form 2404 would require entries.

j. It is also recommended that TM 38-750 not be used as a complete document in the hands of the students for this class. It is a confusing publication that will seldom be used or ever seen by the soldier in his unit and the sheer mass and complexity of forms that it covers tends to overwhelm the student. Use a reproduced extract of the DA Form 2404 and 2408-1 portion if necessary or produce a student guide containing the same information.

k. One caution is necessary when teaching PMCS and maintenance forms. When the instructor is a maintenance trained person it is very easy to get into discussions of organizational maintenance requirements and duties and other topics that are beyond the scope of the student objectives. Maintenance subjects come very naturally to career maintenance personnel and it is easy for them to spill over into areas beyond the operator requirements. A maintenance-skilled instructor must make a conscious effort to restrict his instruction and discussion to the objectives and to the novice level of his soldier audience.

l. It is felt that the PMCS learning objectives were not fully met, primarily because of the absence of uniform practice coupled with the complexity of the task. (The favorable outcome on the PMCS Comprehensive Test is attributed to the fact that the PMCS test was limited to a single check which was practice tested at least twice before final testing.) However, it is not felt that the objective of total PMCS mastery can be met within the class constraints. Continuous exercise of PMCS is a requirement as discussed in the Findings section, Item 9, page 18, of the report. PMCS is an important enough subject that the extra effort this would require is probably worthwhile.

9. Drive the IFV (4 June 1981)

a. The 15 students and one IFV coupled with a vehicle breakdown that delayed the start of driving approximately three hours dictated that total driving time per student was about 15 minutes. This does not take advantage of the full potential of the course or the opportunity for full integration of driving/operating tasks. Still, the course was excellent and the training very good (see also Findings, Item 7, page 17).

b. Full integration of training on this course should consider requiring starting and shutting down the vehicle (stopping the engine--not securing the vehicle), maneuvering the vehicle with hand and arm signals (ground guide), ramp operation and driving buttoned up (which is performed on the night course). To provide each driver with two hours actual driving should be the goal. This would require a vehicle-student ratio of 1:4 and an increase in AI.

c. Tow starting the vehicle and slave starting the vehicle were taught in conjunction with the driving course. Hooking up the tow bar was practiced by only a selected few trainees, and tow starting was demonstrated but not practiced (the Lesson Outline calls for each student to tow start while driving, but the practicality of this is questionable).

d. Slave starting was practiced. Initially the instructor talked about how to connect the cables and demonstrated the outside connection on an M578. Talking about what goes on inside the driver's compartment of the IFV is not very practical and probably should wait until the PE where it can be demonstrated to each student. Each student got one practice on hooking up the slave cable inside the IFV (but at least two additional practices were held later during practice testing and review on this task).

e. All training was quite well done and no particular problem areas were observed. This activity is a high point of training and despite the delays and long periods spent riding in the crew compartment, students were enthusiastic and their reaction to the training very favorable.

10. Drive the IFV in Limited Visibility (Night Driving) (4 June 1981)

a. This four hour class was taught at night in the short driving area adjacent to the IFV building (4303).

b. Besides driving with the AN/VVS-2 the class covered removal of the M17 and installation and operation of the AN/VVS-2. Installation of the AN/VVS-2 was demonstrated on the vehicle. Although observation from outside the vehicle was better than expected it was difficult for all 15 students to observe the demonstration. And the demonstration of stowing the AN/VVS-2/M17 is, for all practical purposes, not observable. There is no real practical solution to this given the circumstances except perhaps to conduct two demonstrations with half of the group each time.

c. The PE on installing/removing the AN/VVS-2 was very good with the possible limitation that each student only got to perform it once. However, student practice was very closely monitored by instructors, feedback was given and students were required to do over again a step they did incorrectly. While some students could have benefited from another practice, for many a single practice was probably close to sufficient. The task is not difficult.

d. The driving course was very short--approximately one minute per student and consisted of driving a short oval. Because of the length of daylight during the summer, it was past 2100 before driving could begin. If classes are scheduled the next morning this could create a real problem if the driving portions were longer. Ideally, however, night driving should take place on the full driving course and involve obstacles and restricted maneuver as well as integrate starting the vehicle and flashlight signals. The night driving also needs to integrate demonstration of blackout markers and blackout driving. This was talked about during the day driving lesson but students never got a chance to see it applied or apply it themselves.

11. Swim the IFV (Prepare IFV for Water Operations) (30 June 1981)

a. This class is scheduled for eight hours including swimming the IFV. Since the prototype vehicle cannot swim, the class took approximately two hours.

b. Only a very brief introductory time was spent in the bleachers before moving to the vehicle for the demo (this was good). With 15 students, parts of the demonstration are hard to observe, particularly items like checking drain plugs. The demonstration involves all areas of the vehicle, and the instructor must remember to position the students where they can see before the step is demonstrated. On occasion students had to move to the other side of the vehicle to see something and by the time they got there it was over.

c. Equipment limitations affected this class. During the PE students worked in groups of five. This resulted in times when most of the students just sat in the bleachers. Five is also too large a group for learning the task--three is preferred and four is about maximum. Also students were limited to one PE so that each student got to do only a small part of the entire task. But without more vehicles or drastically increasing student waiting time there is not much more that can be done than was.

d. Early in the demonstration and early in the PE the use of the TM in performing this task was stressed and done. But as the demonstration and the PE progressed the TM was forgotten. If it is critical to use the TM, this needs constant emphasis during both demonstration and PE to insure its use is continuously reinforced.

12. NBC Operations (11 July 1981)

a. This instruction consists of donning the protective mask, donning protective clothing inside the IFV, operating the M11 decontamination apparatus and decontaminating the IFV.

b. Only five sets of protective clothing and five masks were available for 15 students. The masks used were M25, not M17. (It should be determined if IFV crewmen will carry the M25. If so, then this is what they should be trained with and the Lesson Outline changed. Students probably receive M17A1 training in OSUT but this is their only opportunity to experience the M25.)

c. Donning the protective clothing was demonstrated. If more sets of clothing/masks were available, students should be spread out and put on each item of clothing after it is demonstrated. (Even though donning protective clothing is taught elsewhere in OSUT, students did not know how to do it properly, it appeared.) Since only a limited number of students (five) can practice inside the IFV, if extra clothing were available those waiting to go inside the IFV could practice donning/removing instead of just sitting.

d. GTA were used to explain putting on protective clothing. These are not needed. The students should concentrate on the live demonstration.

e. The real practice of donning protective clothing comes from doing it inside the confines of the IFV. This was practiced once in groups of five. A time criteria (eight minutes) has been established for a crew to do this. Practice was not to this criteria. (But, in defense of the limited practice, it was a very hot, humid day. Wearing protective clothing and mask inside an essentially sealed vehicle is going to eventually lead to some heat casualties. Instructor personnel did closely monitor and instruct students to be aware of symptoms. As it was, one or two people didn't "feel well" even after the limited experience. So practically, this was probably all the PE that was possible.)

f. One of the criteria of donning protective clothing is to do it correctly (standards exist for the correct wear of protective clothing). Once they had donned the clothing crews were dismounted but the inspection was spotty and cursory. Individual inspection of each person should have been conducted according to some set criteria and corrections made. This is essentially the only way, besides timing, to give feedback on this task because of the difficulty of observing and correcting inside the IFV.

g. The decontamination portion of this class did not evidence any problems. However, the observer is ambivalent about the value of the practice. Students spray water from M11 on parts of the vehicle then wipe it down with soapy water and rinse. This is probably as realistic as real life but it seems like this is sort of useless practice. The

problem is that there is no way to give feedback. Perhaps if some staining type material were available for the M11 so the students could see the coverage and judge the extent of their removal, training efforts would be more valuable. The exercise just seems non-productive.

h. The instructor did something in this class that was so seldom observed it is worthy of special comment. At the start of the class he outlined exactly what the students would do in the allotted time. Not merely what they would learn but the activities they would go through in learning it. The impact of this on the total outcome is probably not particularly measurable but it adds a lot and leaves no doubt in the student's mind about what he is going to experience.

i. This class took approximately 2½ - 3 hours.

13. Perform Operator Maintenance on M231 (10 June 1981)

a. Only three FPW were available to the students for the demonstration and four for the PE for use by a total of 14 trainees. This limited student participation and limited practice although not seriously. (Most students got at least two practice trials on disassembly and assembly, and there was opportunity for more although it was not directed.)

b. The demonstration was excellent--the model of a demonstration when circumstance permit. The instructor performed a step, then the students did it. There were only two drawbacks:

(1) Only three students could do this.

(2) There were no AI available (there were concurrent outside personnel demands). This placed quite a burden on the instructor's attention. (One AI did show up late in the practice.)

c. The PE was quite well conducted. Because of the lack of AI the instructor had to divide his attention between four groups which limited the attention to any one individual. This was the only period of IFV training in which it was observed that peer instruction was used. On this task and in this instance it worked quite well.

d. At one point the students were told that they would not remove the handguards during disassembly. Then removal was demonstrated and the students also removed them. This was confusing. The teaching point was probably that the handguards are removed only when inspection shows accumulations of dirt underneath, but this was not very clear.

e. The student handout on inspection of the M231 is very poorly prepared particularly the illustrations.

f. The class was well organized. The large number of students and poor instructor student ratio (1:14) caused by lack of AI plus the lack of sufficient M231 led to some disorganization during the PE but not as much as would be expected under these conditions.

g. This class took approximately 2½ hours. There were subsequent practices on disassembly and assembly as well as complete maintenance following the range firing.

14. Install, Unload, Clear and Immediate Action on FPW (11 June 1981)

a. This class was performed on the IFV and took approximately 30 minutes. There were some subsequent practices in installing the FPW using the Firing Port mockup box.

b. Installation and removal of the FPW was demonstrated in groups of three. Following the demonstration students were talked through the installation/removal process. Students did not get to practice performing on their own (i.e., without instructor cues) during this class but did get subsequent chances to practice.

c. Immediate action and clearing did not seem to get much emphasis. Mostly students were just told the steps. (This caused problems during the Comprehensive Test. One reason could be the lack of practice. But another reason pertains to the differences between remedial action on the FPW and the M16 even though the weapons appear similar.)

d. Presumably there should be a time standard, at least for installing the FPW and at least for the ramp gunners. Practice should be to this standard.

e. The observed class was taught on the IFV. The subsequent iteration (it is believed) and testing of this class was done on the Firing Port mockup box. The advantages of using the mockup to train this task are not apparent but the disadvantages are. It is actually harder to observe on the mockup than on the IFV and not as many students can be trained at the same time. Use of the mockup, at least for this class, should be reconsidered.

15. Load, Stow, Unload Smoke Grenades (7 July 1981)

a. This class started in the bay classroom with a lecture on the smoke grenades and launchers based on information in the SM. The students were told to refer to their SM but only six of the 15 trainees had their SM with them. It was not clear if they had been told to bring their SM or not. It is also not certain that this portion of the class was planned to occur as it did. Repair work was being done on the vehicle ramp hydraulic and this may have necessitated retreating to the classroom. However, if this was planned, then this class should be changed to eliminate the classroom lecture presentation and go directly to the vehicle.

b. Cleaning and inspecting launchers was talked about but never demonstrated or practiced.

c. A grenade simulator is badly needed. The device used is ingenious but does not realistically simulate loading. Safety in loading (positioning of the body and hand) and loading sequence were about the limits of the practice with the device. Actual loading procedure practice was not realistically possible. (See comments under Findings, item 3, page 12.)

d. During loading PE, it came out that there were actually two positions possible for loading--combat loading and administrative loading. Not everyone practiced each although everyone did practice one. Practice loading (combat) was not under time standards. It presumably should be but it is difficult without more realistic grenade simulators.

e. At times during the instruction there seemed to be too much detailed instruction on what the gunner would be doing. The positioning of the turret at 3830 and 2820 mils and how this is done seems unnecessary for what the soldier being instructed has to learn to do.

f. Instructor attention to students during practice was excellent. The practice that was done, i.e., primarily on holding the grenade and positioning the body, was very good and generally sufficient in repetition for that portion of the task. However, full and complete task practice to include removing grenades from stowage boxes and loading under time limit from the partially opened hatch was not done.

g. This class took 2 hours.

16. Operate Boresight Kit (7 July 1981)

a. During the introduction to this class the purpose and importance of boresighting was not presented. Normally the purpose of most tasks is self evident and no explanation is necessary. Here that is not the case. What boresighting does and its results as well as the gunner's and "outside soldier's" role should be explained. Nothing too detailed or lengthy is required, but the concept of boresighting is one many soldiers (and certainly those being trained) are not familiar with.

b. The steps in boresighting were covered in the bay classroom using GTA. It is felt these could have been covered better in a demonstration on the vehicle although the demonstration cannot illustrate what the soldier will see through the eyepiece. One concept that needed some sort of illustration was "splitting the difference" when the reticle is off target on the 180° check. It is felt that this concept was not understood. Perhaps a GTA of the aiming point with a large movable reticle could best illustrate this.

c. Practice was done on the vehicle with three people at a time. Each individual laid one of the three weapon systems and observed the other two being laid. Since the procedure is the same for all three

this was adequate except it did not enforce practice of the sequence of boresighting the three systems. But this was stressed verbally by the instructor. Instructor monitoring of student performance was very good and each student's lay was doublechecked by the instructor.

d. A range of about 50 meters to the aiming point was used in practice instead of the 500 meters required. While this does not affect the procedure the student must use, it does affect the difficulty of task performance.

e. Considering the adverse equipment availability (15:1) and extremely hot weather conditions, quite good practice was achieved. Students appeared to be held to standard in the allowable tolerance of the lay, and good feedback was given during performance, particularly on the use of the safety streamer.

f. This class took approximately 2½ hours.

17. Load, Unload, Misfire Procedure-TOW (7 July 1981)

a. The demonstration of loading the TOW inside the IFV is difficult for 15 students to see because they must shift their attention from inside to outside the vehicle. The demonstrator must be aware of this and repeat the demonstration as necessary, directing students to where they can best see.

b. The instructor did tell the students exactly what they would do during the instructional block. This is noteworthy because it seldom occurred in other classes.

c. During PE, one man loading, not crew loading, is practiced. There are differences. If more practice time is available, consideration should be given to two man loading.

d. Although minimal, some time was spent in discussing how a misfired TOW is destroyed. This falls into the "nice to know" category. (Generally the course was remarkably free of "nice to know" information. Almost everything presented was essential. "Nice to know" information is not "bad" instruction; it's just that the student cannot distinguish the importance of the information he is receiving.)

e. Students were required to "talk through" the inspection of the round and launcher during loading PE. This is a complex matter. The requirement is unnatural and certainly not job realistic. But it is the only way that an instructor knows if and what the student is checking. The only alternative is to rig conditions, and this is usually only possible if multiple practice sessions are allowed.

f. Only one practice session was allowed although subsequent practices took place during the review. Unloading a misfired round was practiced in pairs (one at the tube; one on the ground). However, not each man got to practice each position.

g. Instructor monitoring of student performance, feedback and identification of faulty performance was excellent. As this was the second iteration of the class, the instructor in his summary identified where the previous class had problems particularly on the test. However, the nature of this task is such that more practice is needed using a TOW more closely weighted and balanced to the real TOW. The loading position is somewhat unnatural for some people and they need practice to feel more familiar with it. Practice is also needed to achieve the time standard.

h. This class required 2 hours.

18. Engage Targets With the FPW (Range) (8 July 1981)

a. This range used the Firing Port mockup boxes exclusively, an approach considered inferior to the use of the IFV. A suggested consideration is use of the mockup as a station to teach and practice weapon control and manipulation but to transist to the IFV as soon as possible to better teach the other objectives of the lesson. All moving engagements should be from the IFV. However, the boxes do facilitate control (see also discussion under Findings, Item 3, page 10).

b. There was a two hour delay in opening the range due to administrative problems. Planned concurrent training was used to fill this time and student waiting was not excessive. But once the range was opened most students and instructors were involved in one activity or another (ammo detail, target and range AI), so whether all the concurrent training called for in the Lesson Outline could realistically and effectively have taken place if the range opening had been "normal" may be questioned. It is easy to overschedule a range under the assumption that with only a few firing there is a lot of student down time. But range demands are almost always greater than anticipated and the result is that most concurrent training is not administered evenly and its effectiveness is questionable.

c. One training session was conducted on identification of OPFOR vehicles. The media for this consisted of GTA line drawings of various vehicles followed by a "test"/PE where students had to identify 20 vehicles from FM 1-88 (Vehicle Identification Handbook). The Identification Handbook was difficult to see in a large group. The instruction on identification covered each vehicle but did not give characteristic principles on which to generically identify vehicles (i.e., track and suspension, turrets, gun tubes). It is realized that this is possibly refresher training from 11B OSUT, but the class didn't appear to accomplish the objectives. Perhaps it was too ambitious to try teaching identification of so many vehicles, and the instruction should stress only the most "common" or most dangerous ones. (There are some excellent vehicle identification kits available developed separately by Ft. Rucker, Ft. Hood, and Ft. Knox, but all require facilities for showing 35mm slides.)

d. The range is supposed to incorporate target identification, fire commands and use of intercom (intercom not possible on the mockups) as well as manipulation of fires and control of fire between adjacent positions. It is hard to say from observation how well target identification and fire commands were incorporated into the firing. The general impression is that this was spotty at best. But judging from the observed fires, the latter two objectives (manipulation of fires and coordination of fires between positions) were accomplished quite well. The only reservation is that this learning was restricted to the mockups. What differences will exist for the soldier between the mockup and the actual vehicle cannot be accurately estimated at this point. But for many 11M soldiers, this will be their only opportunity to live fire the IFV for some time.

19. Load/Stow Equipment (18 July 1981)

a. This class involved an initial demonstration of storage of all items following a GTA showing stowage locations. Stowage in most cases is not difficult and merely involves following the stowage plan. The extent of the demonstration is probably not necessary. Some selected students could start immediately to stow the laid out equipment without the time consuming demonstration. The GTA are not needed.

b. Most stowage is done by following decals used as JPA and the stowage plan. Use of these aids needs more emphasis in the instruction. Some items are harder to stow than others and require a demonstration but most do not.

c. PE consisted of breaking the 13 students into two groups that competed against each other for the fastest time in stowing. This competition certainly added interest to the PE but had two drawbacks:

- (1) Students get caught up in the excitement of time competition and ignore care in handling of equipment. Close instructor supervision is required.
- (2) This is not inherently a time constrained task. On the job, the soldier does not operate under a time limit. The emphasis should be on doing it efficiently and correctly rather than hurriedly.

d. Overall, however, the class was conducted quite well and students were monitored well. Stowage was systematically checked to see that it was done correctly after the PE. Still the requirement to conduct the class at all, or at least in its current scope, is questioned (see discussion under Findings, Item 4, page 14).

e. This class took approximately 2½ hours.

20. Break and Join Track

(Not Observed)

21. Close Combat Team Drills

(Not Observed)

ANNEX A-1
TRAINING OBSERVATION WORKSHEETS

WORKSHEET: TRAINING ENVIRONMENT

ENVIRONMENTAL FACTORS	OK NOT OK	COMMENTS
Instructor-trainee ratio.		
Trainee-equipment ratio.		
Access to instructor.		
Access to equipment.		
Sufficient materials.		
Number trainees for space.		
Noise distractions.		
Observer distractions.		
Interruptions.		
Lighting.		
Temperature.		
Training event duration.		
Training aids.		

WORKSHEET: OBSERVATION OF TRAINING EVENTS - 1

INTRODUCTION/OVERVIEW AND PREREQUISITES		
OBSERVATION	ASSESSMENT	COMMENTS
	OK NOT OK	
Course objectives communicated to trainees.		
Purpose of the course or training event.		
How course/event relates to other courses/events.		
Positive and negative consequences for learning/not learning.		
Schedule and type of activities in course event.		
"Housekeeping" information.		
Assessment of entry skills/knowledges.		
Explanation of terminology or verbal facilitating knowledge.		
Answer questions.		
Unnecessary content.		

WORKSHEET: OBSERVATION OF TRAINING EVENTS - 2

DEMONSTRATION AND ISOLATED PRACTICE		
OBSERVATION	ASSESSMENT	COMMENTS
	OK NOT OK	
Demonstration of how to perform tasks given.		
Demonstration in small enough steps.		
Critical discriminations emphasized.		
Need-to-know emphasized. Nice-to-know minimized.		
Basic rules presented before exceptions.		
Opportunity/encouragement to ask questions provided.		
Questions answered.		
Job aids introduced as part of instruction.		
Level-of-reality progresses from low to high.		
Content of instruction logically sequenced.		
Sufficient repetition allowed.		
Active participation by trainees.		
Faulty performance identified & corrected.		
Feedback given on performance.		
Opportunity for remediation provided.		

WORKSHEET: OBSERVATION OF TRAINING EVENTS - 3

GENERAL OBSERVATIONS		
OBSERVATION	ASSESSMENT	COMMENTS
	OK NOT OK	
Instructor follows Instructor's Guide.		
AV called for, used.		
Training materials/handouts called for, used.		
Sessions start and end on time.		
Content of the module performance-based, not subject-matter-based.		
Session time adequate for objectives.		
Transition directions from one activity to another given.		
Session activities allow for range of abilities.		
Instructor's "attitude" positive.		
Frequent breaks provided.		
Summary provided.		

WORKSHEET: OBSERVATION OF PRACTICE

OBSERVATION CATEGORY	ASSESSMENT		COMMENTS
	OK	NOT OK	
Instructions clear?			
Level-of-reality close to real-world conditions as practical?			
Level-of-reality close to last activity of training?			
Call for integration of tasks that are integrated real-world?			
Sequence of tasks in practice same as in real world?			
Are critical discriminations and responses called for?			
Are trainees given feedback on performance?			
Did practice occur soon after completion of Input training?			
Were questions answered?			
Was faulty performance identified & corrected?			
Did students ultimately perform task on their own?			
Was performance "contaminated"?			

WORKSHEET: OBSERVATION OF TEST EVENTS

OBSERVATION	ASSESSMENT	COMMENTS
	OK / NOT OK	
Did the test occur soon after the completion of training?		
Were instructions clear?		
Are PASS/FAIL standards clear?		
Are PASS/FAIL standards fair?		
Level of reality is as close to real world as possible?		
Test sequence is the same as in real world?		
Are critical discriminations and responses called for?		
Test calls for integration of tasks that will be integrated in the real world?		
Were the specified tasks tested?		
Were the specified Standards applied?		
Are scorers different personnel than instructors?		
Was performance contaminated?		
Were students given feedback on their performance after testing?		

Approximate Number of First-Time Overall NO GO's _____

OVERALL RATING OF THE CLASS OR LESSON

- ☐ - EXCELLENT No performance problems predicted
- ☐ - GOOD Few performance problems predicted
- ☐ - FAIR Considerable performance problems predicted
- ☐ - POOR Widespread performance problems predicted

Summarize FAIR or POOR ratings: _____

Review each part of the worksheets and make a general assessment of the training event observed and noted. Use the chart below as a guide to the overall rating of the training event.

IF	AND	Consider Rating Event:
All trainees perform well in Practice.	Practice is high level of reality and equal to objectives, and objectives are in performance terms	EXCELLENT (Probably no performance problems predicted.)
Several trainees need remediation, but perform well in Practice.	Practice is high level, equals objectives, and based on performance.	GOOD (Few problems predicted.)
Many performers have difficulties in Practice.	OR there is no Practice.	FAIR (Considerable problems predicted.)
Widespread failure in Practice. No Practice.	OR many of the assessments are rated "Inadequate."	POOR (Widespread problems.)

APPENDIX B
LESSON OUTLINES REVIEW

APPENDIX B
Lesson Outlines Review Index

	Page
PREFACE	B-4
1. Communicate Within the IFV	B-12
2. NBC Task With the IFV	B-18
3. Close Combat Team Drills	B-19
4. Assembly, Disassembly and Operator's Maintenance the M231 FPW	B-20
5. Load, Unload and Clear M231 Firing Port Weapons	B-21
6. Introduction and Demonstration of the M231 Firing Port Weapon (Malone 3 Range)	B-22
7. Load/Unload 25mm Ready Boxes	B-25
8. Identify and Perform Operation Maintenance on Ammunition of the M2 IFV	B-26
9. Load, Unload and Stow M257 Smoke Grenades	B-26
10. Load, Unload and Reload TOW Launcher System	B-27
11. Operate Boresight Kit	B-28
12. Vehicle Safety	B-28
13. Communicate Using Visual Signalling Technique	B-29
14. Start/Shut Down an IFV	B-30
15. IFV Operator's Automotive Publications	B-31
16. Perform Operator's Maintenance on the IFV	B-32
17. Drive an IFV	B-33
18. Slave Start an IFV	B-34
19. Tow Start an IFV	B-34
20. Install/Operate AN/VVS-2	B-35

Lesson Outlines Review Index (Cont'd.)

	Page
21. Operate the IFV in Water	B-35
22. Break/Join Track on an IFV	B-36
23. Stow Equipment on the IFV	B-37
24. Evacuation of the IFV	B-37

PREFACE

The primary purpose of the Lesson Outline is to state the training objective(s) for the block of instruction. Additionally it provides guidance to the instructor on means or procedures in accomplishing those objectives.

Lesson Outlines generate much controversy as to their content and format. Ultimately, the IFV Task Force produced Lesson Outlines must conform to existing USAIS guidance on format. However, sufficient latitude should exist in content guidance to allow the Lesson Outlines to serve the needs of students and instructors. Rigid adherence to procedures without an analysis of the needs for a particular lesson is not productive and is probably not the intent of existing guidance.

The draft Lesson Outlines for the ILM course that were reviewed have one generalizable criticism: They do not contain sufficient direction on the organization and conduct of practice. They contain sufficient emphasis in "up-front" presentation detail of lesson goals, gain attention, lesson tie-in, motivation and orientation of students but generally little specific guidance on how the instructor should go about actually accomplishing the training objective. Since the purpose of hands-on training (which almost all of ILM training is) is to have the students do something, this should be the focus of the Lesson Outlines.

The main guidance for preparing Lesson Outlines is apparently contained in the USAIS booklet titled Lesson Outline.¹ While this booklet is primarily intended as a format guidance document, it undoubtedly serves as an exemplar for content for those preparing Lesson Outlines. As such, the booklet has a major shortcoming: It is more suited for the "traditional" classroom lecture presentation of soft-skill learning than for the hands-on performance training that is encountered in the ILM training. This does not mean that performance training oriented Lesson Outlines cannot fit the USAIS format guidance--only that the booklet does not provide a good example of the type of training required in the ILM course. The problem is one of emphasis rather than specific content. The booklet emphasizes oral presentation and the desire is to emphasize practice. There are several other generalizable areas that should be kept in mind during the rewrite of the draft ILM Lesson Outlines.

1. Training Objectives. The key to all Lesson Outlines lie in the construction of a well written, achievable training objective. Training objectives consist of three parts:

- a. The task--what the soldier will be able to do after the training that he could not do before.
- b. The condition--the circumstances under which the soldiers will perform the task including what items the soldiers will have available to perform.

¹U.S. Army Infantry School. Lesson Outline. Ft. Benning, Georgia, Undated.

c. The standard--the criteria for knowing when the task has been done right; how well the soldier must perform to get a GO when tested.

The emphasis on the development of the training objective is on training, not on the job. A common mistake is to use a job task description for a training objective. While training objectives are derived from job objectives, they are not always the same. Many tasks in the 11M course are lifts out of the draft 11M Soldier's Manual (SM) and do not fit the training environment. For example, the lesson on Operate the Boresight Kit states that the task is "Operate a boresight kit" and for the Conditions and Standards states a reference to the SM task (#071-313-4000). This does not adequately define what the instructor is supposed to teach. A better construction might be:

Task: Acting as the gunner's assistant, the soldier will tell the gunner where to position, in sequence, the 25mm, 7.62 machinegun and TOW launcher by installing and sighting through the boresight components until all weapons are laid on the same aiming point. He will tie on and remove the safety streamer as he proceeds and will remove and stow the boresight components when completed.

Conditions: Given an IFV with the 25mm and 7.62 machinegun mounted, a boresight kit (Pye-Watson) and an AI occupying the gunner's position. A target with right angles will be located between 50-150 meters from the IFV. The weapons will be laid at least 5 mils in deflection and 5 mils in elevation or depression off the aiming point prior to starting the task.

Standard: The 25mm, 7.62 machinegun and TOW launcher must be laid on the aiming point so that the horizontal and vertical lines of the reticle sight are exactly on line with the horizontal and vertical lines of the target. The safety streamer must be in place at all times. The task must be completed and boresight kit stowed within 15 minutes. (Gunner will not be required to boresight sights.)

(NOTE: This is not offered as perfection in writing a training objective. But the important point is that it specifies the trainee's role in boresighting--he does not perform full boresight--only directing the laying of the weapons. The time standard in this case is arbitrary because the task is not normally time constrained. It is included primarily for administrative purposes. It could be left out. The training objective, as written, also forms the basis for testing the task.)

It is a common criticism throughout the reviews that the training objective is just a restatement of or reference to the Soldier's Manual task. For the developer, the SM task may be the start point of determining content but

SM task statements are seldom adequate to describe for the instructor what the student is supposed to be able to do. For one thing, SM task statements are rarely detailed enough; the SM task statement is generally a task title. The training objective task must be more descriptive. For example, the soldier does not learn "Perform Maintenance on the M231 FPW"--that is the name of the class. What he is to learn is to "disassemble the FPW into nine pieces and components, remove all rust, moisture dirt and accumulated firing deposits from the components; lubricate the components except the bolt face with a light coat of LSA and reassemble the pieces so that the weapon functions." (Again this is not offered as necessarily a final edition of the task statement.) The detail required in the task statement, however, should not be confused with the performance measures that will be taught. In the FPW example, how to remove what pieces are the performance measures.

Condition statements in the SM are also generally not sufficient for training objectives. The SM condition reflects usually all the conditions that will be found on the job and statements such as "in all terrain," "in temperatures below 40°," "in an NBC environment," "in training or combat," are common examples. (To give the draft ILM SM its due, however, most of the condition statements are well written. They describe the equipment needed and the shape that equipment must be in. They will serve as a good basis for the lesson training objective conditions.) But the point is that the soldier will not be learning the task in all terrain, below 40°, in NBC conditions or in combat. Make the conditions specific to the training conditions that will exist.

The standard does not list what the soldier does; it lists the criteria for knowing when it has been done right. The steps to be performed and usually the sequence are part of the task statement (although steps in the task statement should not be confused with the performance measures). By accepted inference the steps are included in this standard but avoid using "IAW" in the standard. Do include an outcome and/or accuracy statement if applicable. Outcomes are usually how most performances are judged but it may not necessarily describe how all performances are measured in a testing situation. Remember that the standard should assist the trainee in judging his own performance as well as being the guidance to the instructor.

Training objectives are not easy to write. They evolve through review and experience. Developers should not get hung up on precise items to include or exclude in a training objective and the format and wording should be the least of the developer's concern. Start out by describing what the soldier is going to do at the end of the subject lesson that he could not do before it. The emphasis must be on doing. Soldiers normally do physical things that have a physical manifestation. In extreme examples, they can name or list or even describe actions but they cannot familiarize or take appropriate actions or know something or recognize something else. Write in enough detail so the instructor knows what he has to teach the soldier so the soldier can do what is described. Concentrate on only the training environment. Show the draft training objectives to instructors for their understanding and reaction. Remember it is written for them, not for some training analysis reviewer. Finally, training objectives are written to be used--they are not entries to be included pro forma in the Lesson Outline and thereafter and forevermore ignored. If instructors and students

and test developers are not relying on the training objectives to tell them what they must do than the training objective is inadequate. Likewise if the training objective cannot be accomplished within the training context then it must be revised realistically.

2. Task Detailing. The purpose of the Lesson Outline is not to teach the instructor how to do the task. Some of the draft 11M Lesson Outlines contain what appears to be too much detail on performing the task from the instructor's viewpoint. Part of instructor training should be the orientation that the first thing he does to prepare for teaching a new class is to perform the task himself no matter how familiar he might think himself with the task. This does not mean that task detailing is not necessary in the Lesson Outline but it should be presented as steps in the demonstration. The task detailing should not be a technical description of how to perform the step if the only purpose is to instruct the instructor. The orientation should be on what is needed to instruct the student. The best way to insure this is accomplished is to select "key performance steps." A key performance step is defined as a step where:

- a. Experience has shown that novice performers have problems.
- b. There is a "special" way to perform the step that is not readily apparent to novice performers but that makes it easier to perform correctly. An example is wetting the o-ring on the radio female audio connector before connecting.
- c. There is a safety or equipment damage possibility connected with the step.

These steps should be highlighted with particular emphasis during presentation to alert the instructor that they require more detailed instruction or demonstration. Other steps, however, need not be listed with enabling steps or knowledges if only presented for the instructor's benefit. Simply list the step or action that the demonstration must cover.

(NOTE: Key performance steps will not exist for every task and some tasks will have several. They should not be arbitrarily selected. Some key performance steps will only emerge as experience with instruction and trainees is gained.)

3. Introduction.

a. The Introduction in the USAIS format consists of the Gain Attention, Lesson Tie-In, Motivation and Scope. Many of the 11M Lesson Outlines have more emphasis on the Introduction to the lesson than on the demonstration, and particularly, on the application. It is not that these prepared introductions are "bad" but in some Lesson Outlines they appear to be more elaborate than is warranted.

b. The Gain Attention step is sometimes overdone. This step often involves a quasi-humorous skit or presentation. It is easy for the

writer of a Lesson Outline to get carried away with his own dramatic inclinations at this point and indeed, USAIS guidance urges imagination. This is not to argue that Gain Attention steps should not be included nor that imagination should be stifled, but there are a few common sense guidelines to keep in mind:

- (1) Not every lesson need have a formal Gain Attention presentation. If one of the primary purposes of the Gain Attention step is to establish rapport with the students, limit the more involved skits to early in the course or to the first class in the morning or to when a new instructor first has contact with the students. Don't try to force one in where it doesn't fit.
- (2) Keep the equipment and support requirements simple. Tape recorders, moving vehicles, firepower demonstrations, costumes and other requirements often result in the logistic burden for the Gain Attention step exceeding that of the lesson.
- (3) Make sure it's feasible. For example, the Gain Attention step for the IFV Communications class involves tuning into a commercial country-western station with the tactical FM radio. In most areas, these operating frequencies do not coincide.
- (4) Make sure the Gain Attention step is not counter-productive. For example, the 11M CBR class has a skit where demonstrators spray water out of the M11 at each other and the students. Yet one of the teaching points is that DS-2 is highly corrosive. While most students will recognize the entertainment purpose of this skit, there will be some who think such behavior should or can be imitated.
- (5) The Gain Attention step is usually best left to the instructor. Some instructors can tell a good opening joke (most can not!), some instructors have meaningful related personal experiences, some instructors can handle rhetorical questions. The point is that it is difficult and often counter-productive to try to specify in a Lesson Outline what another instructor should use to gain attention. So while a Gain Attention step may be specified, in most cases the content of that step should be left up to the individual instructor.

- (6) If an involved Gain Attention is specified and it doesn't work, does not produce the desired result or just goes flat--drop it. It is worse to have an instructor go through something that provokes no reaction or that he is uncomfortable with than it is to do nothing at all.

c. Both the Lesson Tie-In and the Motivation steps are often overdone. Furthermore, the purpose of the Lesson Tie-In is unclear. More appropriately what is probably intended is a task tie-in--how this task relates to other tasks. The tie-in should relate to the trainee's job as an ILM, not necessarily to a specific lesson that he has been or will be taught. In any case, it probably needs emphasis only where it is not obvious. Learning disassembly of the FPW has a more obvious tie-in with the job than assisting in boresighting. In the latter case he probably does not possess a concept of the importance or role of boresighting. In the case of weapon disassembly, the tie-in with the job is obvious and really need not be stated.

d. The Motivation likewise need not be overdone. The importance of the task should be stressed where it is not obvious. Remote motivations (e.g., "ultimate survivability on the battlefield") are not as good as more immediate ones (e.g., "the M231, like any precision built instrument, simply will not work when you need it if not cleaned and lubricated"). For the instructor, the motivation step is a good place to insert life experiences about what has occurred when the task was not performed correctly, but again this is an instructor technique and not necessarily a prepared paragraph for the Lesson Outline.

e. The Scope is an important part of the introduction but it should not be limited to only just a task statement of the objective of the instruction. It should also outline the activities that the instructional block will cover as they relate to the student. For example: "At the end of this two hours you will be able to give and react to 15 arm and hand signals. We will demonstrate each arm and hand signal to you. You will then break into pairs and practice giving the arm and hand signals using flashcards. Then you will practice the signals without the cards until you can give and recognize all the signals on your own. Finally, before you finish this afternoon you will be individually tested on all of the signals." This approach tells the student both what is planned and what is expected of him.

4. Demonstration. Most draft Lesson Outlines are adequate in their coverage of the demonstration. However, again some guidelines should be followed.

a. Combine as much of the explanation of the task with the demonstration as possible. While some "up front" rules and explanations may be necessary, never have the instructor verbally run through the steps before the demonstration and then follow this presentation with the demonstration.

b. If the task and equipment permit, combine the demonstration with the first student walk through. The goal should be to avoid passive student observation whenever possible. Some examples of where this is possible are M231 maintenance, arm and hand signals, and donning of protective clothing. These all involve fairly long tasks with sufficient material/equipment to allow the students to perform steps or blocks of steps immediately after they are demonstrated.

c. Do not demonstrate tasks that cannot be observed--at least not in a group demonstration. For example, drive the IFV is not a demonstrable task. Do not be reluctant to drop group demonstrations and go directly to individual demonstrations when the task and equipment warrant it.

5. Practice. For almost all Lesson Outlines, practice has nonexistent or inadequate coverage. It is not sufficient to simply require practice; the Lesson Outline should specify some structure and organization. Some general rules regarding practice:

a. Specify the organization for practice. This will normally be dependent upon equipment/materials. If there is enough for each individual there is rarely a problem with organization. Likewise, one set of equipment per two individuals does not usually create an organizational problem. When this ratio is exceeded, however (as was often the case when only one IFV was available), it may be necessary to either set up stations, to select parts of the task for separate practice, to integrate practice on a previously learned even though unrelated task or at the very least to specify that uninvolved students must be positioned where they can observe the task being practiced by others. Group practice is appropriate for some tasks and should be specified when applicable. Group practice is any time the student does not perform the entire task on his own or when the student interacts with another student during practice. Some examples are IFV PMCS, don protective clothing inside the IFV, and arm and hand signals. The organization for these practices needs to be specified in the Lesson Outline.

b. No practice is to be done unsupervised. Insure the number of AIs is adequate for the practice structure planned. (One AI for three students actively involved in practice is a good planning ratio but this will vary with the type and physical location of the task practice.)

c. Specify the outcome of practice. Ideally each student will practice the task until he can perform the task at least once completely on his own. Equipment, space and time availability will sometimes cause modification to this but this should be the exception.

d. The developer of the Lesson Outline should review his plan to determine how much time he plans on the instructor devoting to practice. The goal for the ILM type tasks should be 75% or roughly 45 minutes out of every hour (include testing time as practice time). Not all instructional blocks can reach that goal but if practice time is not that high, take a good look at what is taking up the most time; it could be

that there is too much emphasis on Introduction or passive Demonstration. In short, too much talking and not enough doing. Look for ways to actively involve the student earlier or to combine necessary explanation with hands-on activities.

6. Detail of Lesson Outlines. The Lesson Outline is intended to be used both in planning for the class and during execution. To be usable during the class it must not be cumbersome or difficult to follow. The Lesson Outline is exactly that--an outline. It is not intended to be a script for the instructor to read.

a. "Scripting" instruction has been defended as a means of providing instructors, primarily novice instructors, with information that they may use during the class. The problem with putting optional information and deliveries in a Lesson Outline is that the instructor does not necessarily know what is optional and what is not. Once an instructor knows he can drop or alter part of a Lesson Outline it becomes psychologically easier for him to drop or alter more essential parts of the Outline. The guidance for dealing with novice instructors is training, rehearsal and practice--time consuming and difficult but worth it for such an important job. Lesson Outlines, once they are finalized, should not be deviated from by the instructor. If deviation is necessary, it should be so exceptional that it is only done after the instructor receives permission to do so from his supervisor and then only in reaction to a situational condition. If "permanent" deviations are necessary, the Lesson Outline should be revised. Therefore, to make the Lesson Outline both usable and enforceable it should avoid specificity except where the intent is that specific steps, procedure or words be followed.

b. As an outline and guidance document the Lesson Outline should emphasize instructor actions rather than instructor words. In fact, in any performance training, words should not be the focus of the instructor. A good performance training instructor should adopt as a goal the teaching of a class without any talking. While it is not seriously suggested that tasks will be taught this way, if this model is kept in mind by the instructor it will help him focus on what performance training is all about and would help turn some instructors away from the lecture-oriented method of instruction that has been allowed to creep back into performance training. Likewise, the developer of the Lesson Outline should keep this non-verbal model in mind as he prepares the Lesson Outline. Don't try to give the instructor words to use, give him actions to take.

Following is an individual review of the primary class draft Lesson Outlines developed for 11M training.

1. Lesson Outline: Communicate Within the IFV

a. (Page 2, IV A, Introduction) The Gain Attention procedure is "cute" but the relation with the lesson is nebulous. However, since the purpose of the Gain Attention step is only to establish some rapport and contact with the students, the relation probably does not have to be direct. It is questioned, though, if the value of this step is worth the equipment (3 radios and a tape recorder) required. The requirement to tune in a commercial FM station may be difficult to meet as most commercial stations are outside the 30-75.95 megahertz range of tactical radios. (The same problem is noted on page 7 during student practice when the instructor is told to use a "frequency preset to popular music.") Additionally some type of speakers should be provided if the demonstration is to work. These are relatively minor comment as they have no effect on actual training but as noted on page 2 of the Lesson Outline, the effect is lost if it doesn't work.

b. (Page 3, para 2, Motivation) This general discussion of the importance of communication does not really bring home the role of the vehicular communications on the IFV. Perhaps it needs to be tied in stronger to the IFV. The point should be made that they (the crewmen) will be responsible for maintaining the AN/VRC-64 and that the only way they can communicate effectively on board the IFV is through the intercom. There is nothing "wrong" with the content of the motivation as is, except it doesn't tie-in strongly with what the individual may be required to do on the IFV.

c. (Page 4, A, Prepare Radio Set AN/VRC-64 for a Mounted Operation) The conditions specify "a radio station within range." It was initially assumed that this was a receiving station with which the student would make commo checks during practice but there is no indication later in demonstration or practice that this is done. If "a radio station within range" is a commercial station as discussed in para 2, it must be insured that one can be received. Besides, the commercial station approach seems to be a poor way to show the students that the radio works. The demonstration and practical exercise should show the full capability of the system, i.e., they should show transmitting as well as receiving.

d. (Page 4, steps 1-4) Some confusion exists (perhaps only in the mind of this reviewer) on the scope of this task. The implication seems to be that the IFV radio will be regularly dismounted for off-vehicle operation. This would seem to be contradictory to IFV doctrine as it would leave the vehicle without communications. This is not to say that installing and removing the radio from the mount should not be learned but presumably this must be performed only in conjunction with maintenance or when the radio must be removed for administrative security reasons.

Additionally, the procedure in steps 1-4 is questioned because some confusion seems to exist regarding the radio configuration. Although radio configurations and componentry changes, the understanding is that the AN/VRC-64 was not capable of off vehicle operations, and that the

components mentioned in steps 1-4 on page 4 (892 antenna, ST-138 harness, 503 accessory bag, etc.) were part of the AN/GRC-160.

The purpose of this class (besides the performance of the three tasks) is probably to orient soldiers to the IFV radios, therefore it is questioned whether the IFV of the platoon leader and the platoon sergeant will mount the AN/VRC-47 (RT 524 with aux) and, if so, whether this configuration need be taught or at least pointed out.

e. (Page 5, steps 5-11) These steps cover installing the amplifier (AM 2060/GRC) on the mount. If the radio set is an AN/GRC-160, the point should be made that the AM 2060 is not dismantled when the RT is. In fact, even in normal maintenance the 2060 will probably rarely be dismantled. Steps 6 and 7, page 5, are actually the same step, the OA 3633/GRC group consisting of the amplifier with special purpose set power cable. Step 11 (page 5) calls for connecting the antenna cable assembly between the amplifier and antenna matching unit. However, there is no matching unit (MX 670+7/VRC or AB-719/VRC) called for in the equipment list. However, it is noted that during "routine" removal of the amplifier the antenna cable will probably not be disconnected from the matching unit so just showing the cable connection to the amplifier is probably sufficient. But as this is the student's first introduction to the radio system and the components are dismantled on a demonstration table, the instructor should be alerted to point out what this cable is and where it goes (or comes from) as if the procedure were taking place inside the vehicle. (This same comment applies to connecting the cable assembly to the RT (page 6, step 6).

f. (Page 6 and 7, Notes and Cautions) The NOTE on page 6 needs some rewriting as this is still the demonstration phase and the reference to "the soldier" needs to be changed.

Caution 2 (page 6) needs some further explanation and it is not clear that this caution actually applies. However, without some explanation and equipment it is not going to be clear to the student what the warning entails.

Caution 3 (page 7) should emphasize to the instructor that it is the power controls on the amplifier (2060) that turn the radio on. It is probably important to stress this to students as, given their familiarity with the AN/PRC-77, they must be made aware of the differences between that set and the AN/VRC-64.

The first note (page 7) needs to be rewritten to be applicable to the situation. Part of it appears to be text for instruction and part instruction to the students. Also the students don't have hands on the equipment yet.

g. (Page 7, step D) There will be no "signal" on the demonstration as there is no power source provided or specified. Perhaps this step is simulated.

h. (Page 7, second note from bottom) The radio is now going to be dismantled. The sequence on this instruction is questioned. Normally the soldier will start with the radio mounted. Probably dismantling should be taught first.

i. (Page 8, steps 9-11) The amplifier is being removed. While this may be necessary occasionally the point should be made that this is not necessary for off-vehicle operation (assuming an AN/GRC-160). In short, this does not tie-in with steps 1-4, page 4--the start point.

Throughout the procedures the steps listed for instruction are obviously directly out of the SM. And the SM entry has just as obviously been prepared by the Signal Center. There is nothing wrong with this and it is not a criticism, but the Ft. Gordon folks tend to get carried away with their nomenclature (e.g., OA/3733/GRC, J551, MX-2799/VRC, MX-6707/VRC, MT-1029/VRC). Infantrymen are being trained here, not signalmen. The instructors should therefore resist the inclination (suggested in the steps) to use the technical nomenclature and use word descriptions instead. If instructors start calling it the CX-4655/GRC instead of "this short cable" a lot of soldiers are going to be lost.

j. (Page 8, Note) A test is implied ("those who fail . . .") but no test is included in the Lesson Outline materials. Is the task tested here?

The whole area of student practice (as outlined on page 8 and page 9) is given rather scant emphasis. It is realized that AI are competent and presumed that most, if not all, have been through instructor training. It is also realized that more occurs here than is reflected in this paragraph. Still, it must be emphasized that the hands-on practice is the most important phase of training--not only here but in any instructional block. AI guidance for interaction with students during practice should be provided. Perhaps the principles are covered in instructor training sessions and it is considered superfluous to include it here but it seems that more emphasis is placed on the demonstration phase than the practice phases. The notation of "the AI having a practice table in the center of the tables" is disconcerting. The AI belongs as close to the students as he can get even if he has to rotate.

k. (Page 9, the review and questions) Certainly reviews are necessary to emphasize important points but it is not clear if watching another installation, dismantling demonstration will accomplish that much. Probably emphasizing the cautions is the most important point. Besides the first question response is incorrect (if the procedure listed on page 4 was taught) and the last question is an attempt to teach nomenclature--hardly performance oriented.

l. (Page 10 and 11, Intercom Control Box and CVC) It is unclear from the presentation whether the IFV uses the AN/VIC-1 or some new intercom and whether the control box is the C-2298 or a new connector.

m. (Page 10) NOTE following TRANSITION requires the instructor to set up "an intercom system . . . connected to a power source." This is probably easier said than done. Is the entire system required? It would appear that the power source serves no purpose. Probably all that is required is the CVC, control box and cord for the demonstration.

n. (Page 10) The explanation of the parts of the control box is given rather short treatment. Is this all the parts? What about the control box switch and volume control mentioned on page 11? These may be explained on the GTA (assuming the GTA 10 refers to the control box) and normally it is not a good idea to merely point out parts without relating them to their function. But still the explanation of the control box does not seem to be complete.

o. (Page 11, steps 2 and 3) This is not a very good explanation. What "other connector box?" Probably what is meant is "audio connectors" on a single connector or control box. But if it is important (and it usually is) to connect the radio cord to one connector and the intercom to the other, the means of identifying which is which should be stressed here.

p. (Page 11, step 4) What is the "correct selection?" How does the soldier know he is "correct?" Needs more explanation. (NOTE: It is realized that the Lesson Outline is not meant to be a complete script of the class and it is not automatically assumed that because something is not covered or is insufficiently covered in the Lesson Outline, it will not be in the class. Nonetheless these comments are made to alert lesson planners where potential problems could occur. The assumption is not necessarily that they will occur.)

q. (Page 11, step 5) How does the soldier adjust the mike volume? How does he know he has it correct? What does "turn on" the transmit switch mean? Is this the thumb switch? What is a "systems voice check"? Does everyone talk at once? Is this a squad drill controlled by the TC?

r. (Page 12, the practical exercise) This is a rather simple task. Consider, therefore, eliminating the horseshoe practice on the dismounted intercoms and going directly to the IFV. Even though the IFV space is limited, with the ramp down a single AI should be able to observe and assist the trainees. Someone should be in the TC (or Driver position) and the intercom set should be on and the soldiers should conduct an intercom check with that individual. Practice should include some drill on quickly connecting and disconnecting the headset/CVC.

(Page 12, Question) The stem asks for seven steps. Only six are listed in the answer and these do not correspond to the demonstration steps on page 11. Regarding having a selected soldier perform the procedure (final NOTE, page 12) this does not have much training value for the remaining soldiers but it probably does have some motivational impact.

s. (Page 13, Transition) The transition ties maintenance into the previous intercom (one hour, not two hours as indicated) block of instruction. But maintenance training will be primarily on the radio, and only troubleshooting of the intercom system will be taught. Tie it back to the first block of instruction. If a strong presentation was made there on the importance of radio communication, then the logical connection is that the soldier must do certain things to insure that the communication link does not fail.

t. (Page 14, Before Operation) The before operations checks are not listed in the Lesson Outline. They may be in GTA 13, but the other (during, after) are listed and as there are only two before operations checks, those should probably be listed as well.

u. (Page 14, GTA instructions) The GTA sequence goes from 11 to 13 to 17. Is this because "standard" GTAs are being used? This should be checked and verified before final presentation.

v. (Page 14) No after operations checks as such are indicated. The only real after operations checks and service is cleaning which is apparently not covered in the presentation. Steps 1 through 4 (page 15) are weekly and/or monthly checks. This is not to say that the soldier should not know these but there is a difference between what is being taught and what the soldier should actually perform after operations. On step 1 (top of page 15) the procedure is correct but the equipment conditions (on page 17) indicate that the IFV can mount the AT 912/VRC antenna. If this is true, the AT 912/VRC uses the AB-719/VRC matching unit which does not have the manual frequency indicator. The differences should probably be pointed out.

w. (Page 15, Troubleshoot the Intercom) Reconsider the scope of this procedure and task. The soldier is being taken into the AM-1780/VRC and the connecting cables from the AM-1780/VRC to the control boxes. While this may be within the crew member's area of responsibility it is a "new" area (the AM-1780/VRC operation has not been taught previously) and a fair amount of information to process in a relatively short time. Consideration should be given to defer this portion of the task to unit training.

x. (Page 16, step b) The term "audio accessory" as used here may be confusing as the terminology was not used previously in the intercom class. In b, it identifies the "long cord with the yellow band" as "used to communicate with the distant station" (presumably then, the radio cord). This is exactly opposite what is taught in the block on intercom operation (page 10 and 11).

y. (Page 12, NOTE on practice) The PE is being done on the vehicle. While this will be necessary for troubleshooting the intercom, it is going to be difficult for the preventive maintenance checks and services on the radio with six soldiers inside the IFV. The phrase "AI will go over each . . . technique . . ." is not understood. Is he going to do the same thing that was done in the demonstration? If so, this appears to be a waste of time.

The term "how the item would look or appear" is misleading since it implies a visual recognition while many of the checks are not.

The procedure of having defective equipment is a good one although it requires some preparation and a lot of equipment and not all faults are easily induced. The requirement to set up an entire intercom for the intercom troubleshooting is not practical off the vehicle nor is training it off the vehicle very effective.

The self-test is okay but consider making this the entire practical exercise but limiting it to the radios. Drop the AI presentation, issue the hand out and let the student go to a station where all the preventive maintenance checks can be performed. Have some faults induced. Consider scoring performance. Eliminate the exercise returning to the IFV (top of page 18) as it doesn't seem to serve much additional purpose. However, if it is retained, the indication is that there is a test. Is there? If so, where is it and what is the testing procedure?

z. (Page 18, second question) The response is technically inaccurate. The ANT-FREQ control should be rotated through each band range position and the antenna relay motor should be heard.

The answer to the fourth question appears to be incomplete. It is also questioned whether it is really the intent to make soldiers internalize the troubleshooting procedure and recall from memory or whether this is something that they should be taught to rely on the TM for.

aa. (Maintenance and troubleshooting) The conditions and equipment list for this task call for clean cloth, trichloroethylene, mild soap, water, radio station within range. The cleaning materials are never used (cleaning is not included) and there is no need for the radio station. Drop these equipment requirements or include instructions on using them.

bb. (Training Aids section) It is assumed that the information on equipment follows a standard USAIS format and therefore should not be tampered with but it would appear that a consolidated equipment list, where equipment is listed only once, would be beneficial in addition to the equipment presentation by instructional and task phase.

cc. (GTA) No judgment can be made regarding the content of or requirements for GTA. The Training Aids section indicates that a total of 69 GTA are required. It doesn't appear that many were indicated during the presentations. But the number (69) seems excessive for what are relatively short demonstration presentations. Use of GTA should be reviewed to determine they are, in fact, necessary whenever they are used. GTA can be valuable but it is not necessary or beneficial to require a GTA anytime its use is possible. When used, they should actually enhance training.

dd. (Implementor Instruction Guidance, para 4) The concept of instruction indicates three tests. Test scoresheets and instructor directions for administration of tests are not included.

2. Lesson Outline: NBC Task With the IFV

a. Three tasks are taught in this four hour block. The first task is a combination of putting on the protective mask (M17) and putting on protective clothing. It is not known whether donning protective clothing is taught in previous OSUT but it is presumed donning the M17 mask is. It is also not known if the operation of the M11 is taught in earlier OSUT. The point is that whatever is taught previously in OSUT should not be retaught here. Reviewed perhaps--very briefly--but the main emphasis should be on performing the task within the environment of the IFV and not on retraining the basic task.

b. (Page 2, IV A, Gain Attention) Reconsider this approach. Not only is the skit not very related to the training to be received but it seemingly condones a dangerous practice. DS2 is a highly corrosive substance (see warning on page 7) and even though the soldiers will be using water during practice, horseplay with the M11 shouldn't appear to be condoned. Most observers will undoubtedly be able to separate the lightly comic approach of the demonstration from the real world but there will be always a few who won't.

c. (Page 6, NOTE) The note states the "learning point will be the confusion and tightness of the vehicle." It is not. The learning point has to be that the soldiers can accomplish the task despite the confusion and tightness.

The practice approach is good. But it might be advisable to go to an untimed, but as quickly as they can, practice after walk through and then to the timed practices.

In regards to the "test," not only the individuals who don't meet the time standard should be retested but also the entire group. Correct wearing should be part of the standard, not merely spot corrections. Individuals should be encouraged to help each other--both in donning and checking each other for proper wear. Group cooperation and coordination should be stressed to meet the three minute 15 second time limit. (Incidentally, where did the time limit come from? It is an acceptable start point but developers should be prepared to modify it based on future experience. If the first soldiers trained can meet the standard with time to spare, be prepared to tighten it. However, caution should be used in relaxing the standard until it is demonstrated that trained troops cannot meet it.)

d. (Page 9) The use of the M11 seems to be a fairly simple task. The PE NOTE indicates that the AI will again talk each group through what has just been presented in the demonstration and explanation.

It does not seem that both are necessary. The AI should be prepared to reinforce the instruction or the bleacher demonstration could be cut out and the AI do just a short demonstration and a talk through but both are probably not required.

e. (Page 9) The PE NOTE indicates that each soldier must demonstrate how to decontaminate "each piece" (referring assumedly to the five areas mentioned in the preceding paragraph). This will be time consuming and the use of the M13 kit on the floor seems to be outside the scope of this lesson (although not outside the scope of this task). It is recommended that the requirements of this entire activity be reviewed as it is not clear that whatever the soldiers are learning is worth the time and effort required. This comment is not intended to discourage practice sessions but only to insure that actual training value is achieved when tasks are practiced.

f. (Page 10-15, Load 25mm Ammo Boxes) Is this much instruction (including demonstration) needed? Loading the 25mm ammo boxes is (or should be) a previously taught class. Here they are applying the task under altered conditions (wearing protective clothing). While instructors should be prepared to talk through portions of the practice as needed, presentation of the entire class is not warranted. Certainly a bleacher presentation and demonstration followed by a "complete talk through by the AI" (page 15) is not needed for this task. Students should go directly to the practical work with AI's monitoring.

3. Lesson Outline: Close Combat Team Drills

a. (II. Training Objectives) The standards for both the training objectives tell how to do it, not how to judge if it is done correctly. This is actually a team task even though portions of it are performed individually. Therefore the training objective should be stated somewhat along the following lines:

Task: Remove or clear FPW and dismount the IFV as a squad with all squad weapons and wearing load bearing equipment and assume firing positions as directed by the TC.

Conditions: Given an IFV with driver, TC and full squad, all squad weapons stowed, FPW installed with magazines inserted. Squad members will be wearing intercom and will have load bearing equipment stowed beneath their seat. Ramp will be closed. Exit will be through the ramp.

Standard: On command, the squad will dismount in the direction specified by the TC within _____ minutes. Rear FPW will be dismounted before ramp is lowered and all FPW will be left cleared.

(NOTE: As with all training objectives, the above is not meant to be the final statement. It must be reviewed by SME and rewritten to avoid any misinterpretation of what the task requires. But it is intended as a direction for the type of information that should be contained in the training objective. The task, Mounting the IFV, should be similarly treated.)

b. (Page 4, Lesson Tie-In) This Lesson Tie-In is "forced." In effect there is no lesson tie-in for this class.

c. (Page 4, Motivation) This is an example of an extremely general motivation statement that probably does not do much to motivate.

d. (Page 4, Scope) The scope does not outline what the student is going to experience during the two hours that he is in this class. He should be told specifically what he is going to do. He is also not "learning principles," he is going to perform as a squad number in a specific task.

e. (Page 5, Transition) It is not clear what is being transitioned from. Are the preceding seven paragraphs and notes instruction to be presented? If so, the instruction appears out of sequence. If not, this transition paragraph is more like an introduction.

f. (Page 10-11, Practical Exercise) The organization and detail for the PE are very good. However, it should be decided if dismounting (and mounting) through the combat door are an essential part of this task. If so, this should also be practiced.

4. Lesson Outline: Assembly, Disassembly and Operator's Maintenance of the M231 FPW

a. The inclusion by reference to the SM for the Conditions and Standard of the Training Objective is probably not acceptable from USAIS requirements and further should be avoided as a matter of principle. The task statement in the SM is a job objective and usually will not match the requirements of the statement of the training objectives. For example, the Conditions for the first task (Assemble and Disassemble the M231 FPW) state, "On a live fire range." This is neither accurate nor complete.

b. (Page 2, Scope) This covers what will be shown but doesn't emphasize what the soldier will do.

c. (Page 3, Body, Identify External Components) The instructions do not clearly specify that each student will have a weapon in front of him but this is implied by later demonstration of disassembly/assembly. If this is the case (and it should be) the soldiers should identify the parts on their weapon. This is one instance where a GTA (instead of a display weapon) would be recommended.

d. The procedure for demonstrating the disassembly/assembly by having the students perform steps immediately after the instructor performs them is very good.

e. (Page 8, NOTE 1, re practice) How does the instructor know when "the students have had enough practice"? Practice should be a weaning process, gradually withdrawing assistance and cues. Therefore, this NOTE should specify that each student should eventually perform disassembly/assembly on his own, without assistance, at least once. This gives the AIs some guidance on determining "enough practice."

f. (Page 9 and 10, Inspecting and lubricating) The procedure used in demonstrating disassembly/assembly, i.e., having students perform each step immediately after the instruction, should be continued for these two procedures.

5. Lesson Outline: Load, Unload and Clear M231 Firing Port Weapon

a. See comments on Disassembly/Assembly of FPW (para 4) regarding the adequacy of the training objectives.

b. (Page 2, Gain Attention) This paragraph does not seem to be related to the task being taught.

c. (Page 2, Motivation and Scope) The motivation statement certainly states the obvious and does not seem to be directly related to the task. The motivation probably should tie into the operational requirement to remove/install the rear FPW when dismounting/mounting, the requirement to rapidly reload when engaging targets and the requirement to sustain fire (immediate action). The statement in the Scope ("you will be ready to fire the weapon") is more properly part of the motivation.

d. (Page 2-7, Body) This is a difficult task to demonstrate. If the IFV is used the space and observability are very restricted. A small group (perhaps three soldiers) can observe the demonstration inside the vehicle. But despite these difficulties and restrictions, very little learning will take place if it is not demonstrated. Just talking about the task (even if GTA are used) will not accomplish much. While loading, unloading and clearing and immediate action can be demonstrated on a dismounted weapon, the only practical way to demonstrate the mounting/dismounting is inside the vehicle using small groups. This should be planned for and direction included for dividing the group for instruction.

e. There are no instructions included for conducting the practical exercise. Because of space restrictions probably three soldiers (and an AI) is the maximum that can practice at a time inside each available IFV. The mounting/dismounting must be done inside the IFV. The loading/immediate action should be practiced with the weapon

mounted but could be done dismounted. The organization, conduct and outcomes of practice must be specified.

6. Lesson Outline: Introduction and Demonstration of the M231 Firing Port Weapon (Malone 3 Range)

a. It is difficult to discern exactly what the training objectives for this session are. There appear to be eight "tasks." As listed in the Lesson Outline these are:

- (1) Familiarize with the M231 Firing Port Weapon characteristics and capabilities.
- (2) Respond to fire commands from the TC.
- (3) Communicate targets to the TC/Gunner.
- (4) Determine range of targets.
- (5) Identify OPFOR armored vehicles.
- (6) The IFV infantrymen must acquire and engage targets with the M231 firing port weapon on a firing range. [sic]
- (7) Load, unload 25mm ready boxes.
- (8) Load, unload TOW launcher system.

b. Task (1) (Familiarize with the M231) is not a task. Soldiers cannot "familiarize." The task probably should be to "name the capabilities and characteristics of the M231" but even this is not a very worthwhile objective. If it is felt necessary to give the soldier this type of information it should be combined and presented with another lesson (such as maintenance). But that the soldier must know and be able to state the characteristics hardly seems necessary. The statement in the Motivation ("You will also need to know the characteristics of the M231 to be able to operate this weapon effectively") is simply not true.

The final paragraph in the Body for this task seems to be getting at something different from "characteristics and capabilities"; namely, techniques for engaging targets. Although the technique of target engagement is very important, this does not seem the place to cover it. Further, it does not seem to be covered very well as far as how the technique is demonstrated to the soldier. The paragraph states that "this technique . . ." will be explained at Station 1. However, there is nothing at Station 1 that covers this technique. The statements in Section VI, Conclusion, regarding Application and the Closing Statement are an attempt to make this "task" seem important. It is questioned whether they are really true. It is recommended that this whole period be dropped as a separate block of instruction.

c. Task (2) (Respond to the TC Fire Commands) and Task (3) (Communicate targets to the TC (Gunner)) are taught at the same station. This is appropriate. However, it would appear that there are only four commands that the TC would/can issue. It is doubted if this is complete. In Task (3), a portion of the task (determine range) is taught at another station. Either that station should be taught first and applied here or the teaching of range determination should be integrated with this lesson.

These tasks have four other tasks "tacked on" (install, load, immediate action and clear FPW). These are tasks that have been taught previously. These tasks are used in conjunction with the commands. While the AIs must be prepared to correct and prompt any incorrect performance it is not necessary for them to teach the tasks as required in this portion of the Lesson Outline. This is a waste of training time.

Although this station specifies practice it seems to concentrate practice on responding to fire commands, with no mention of practice on reporting targets. The requirement to repeat the fire commands in a step by step walk through three times seems excessive. The soldiers must learn to associate the command with an appropriate action and practice so they can complete the action quickly but the primary purpose is to learn what the fire commands mean. Practice on reporting targets, realistically, is difficult to set up. Practice can be obtained by using pop-up targets or on a short cross country course where targets are "uncovered." Some rudimentary practice can be conducted outside the vehicle to teach sequence of the acquisition and time requirements using flip charts but ultimately the task should be practiced in the IFV using the intercom. This would also help train the individual squad members' section of responsibility.

d. Task (4) (Determine Range to Targets) and Task (5) (Identify OPFOR Armored Vehicles) are taught at the same station. Both these tasks can be time consuming. Range estimation should be practiced with feedback until the soldier obtains a "feel" for ranges over a variety of terrain. The Lesson Outline also does not specify the number of OPFOR vehicles that must be learned nor the number of NATO tanks that must be identified by characteristics. It is also not known whether this block of instruction constitutes a review or an initial learning process. If a review or application of previously learned instruction, there should not be too much problem, but if the tasks are being learned and practiced initially, the time requirements to do a proper job may be excessive to all else that has to be accomplished during the overall training block. The Lesson Outline also specifies testing. While testing is encouraged in conjunction with training, it will add more time to the requirement.

Support requirements for these tasks (various pop-up targets at various ranges, 1-35mm vehicle identification courses) while necessary and not excessive for the training value, nonetheless are additional requirements that must be considered.

(NOTE: Reconsider the use of using binoculars to identify targets. If the crew member normally will identify vehicles without binoculars--as is normally the case in the IFV--this is how it should be practiced.)

If these tasks are essential for the ILM, consideration should be given to deleting them from the range exercise and scheduling them for a separate block. Generally on a range, the conduct of the range (i.e., the actual firing) is the driving consideration for scheduling and use of available time. Concurrent training, when used, must be centered around tasks and training that has sufficient flexibility to facilitate the main purpose of range firing. Training for these two tasks does not appear to have that flexibility. Additionally, separate scheduling of vehicle identification might allow use of a facility where a 35mm slide kit of OPFOR vehicles can be utilized.

f. Task (7) (Load/Unload 25mm Boxes) and Task (8) (Load TOW) are taught in the same block. "Taught" is misleading for although some of the material in the Lesson Outline indicates that this is a task to be learned, other references indicate that these tasks are only tested. It is not clear exactly what is to occur. Since the tasks are taught previously this could be either a practice or a practice test. No guidance (other than the inclusion of a test) for what is to occur with these tasks is contained in the Lesson Outline.

g. This entire Lesson Outline needs to be redone with emphases on what will occur in conjunction with stationary and moving firing from the IFV. Except for firing techniques and firing commands, all other training events are applications of tasks that are taught previously. If concurrent training is necessary it should be set up with the following priorities:

- (1) First, train on tasks that are directly applicable to range activities.
- (2) Next, practice previously learned tasks that are not related to range activities.

Concurrent training should be flexible so that it can be used to fill times when soldiers are not actively involved in firing. For this reason, review and practice of previous tasks are often selected for concurrent training. Ideally, however, all soldiers should have the same degree of involvement in concurrent subjects.

One of the main shortcomings of this Lesson Outline is that it appears to try to do much during the block. By the time firing soldiers, ammo detail and target detail (if needed) are pulled out there may not be many soldiers left for the other stations. Additionally, range operations generally require more instructor personnel leaving fewer personnel to conduct training and supervise practice at the other stations. A more realistic approach to this block of training might involve a critical review of the number of tasks being covered with an eye toward eliminating those actually not required for range firing.

7. Lesson Outline: Load/Unload 25mm Ready Boxes

a. (Page 1) The Training Objectives need to be redone consistent with earlier discussions.

b. (Page 1, Lesson Tie-In) This is a consistent weak point in the Introduction. Perhaps the Lesson Tie-In should emphasize that this is the only training they will receive on loading the 25mm boxes. (Also, the students will not be trained on loading the M240C.)

c. (Page 2, Motivation) The motivation should stress the role of certain personnel in loading the 25mm and that any of them could be assigned to those positions at any time. It should emphasize that there is no other practical way to load the ammo boxes; the gunner is completely dependent on these squad members.

d. (Page 2, Scope) The Scope as stated is not sufficient. It should emphasize what the students will experience during the training period.

e. (Page 2-7, Body) This appears to be a straight lecture using GTA. If so, it is too much information to absorb and retain and is a poor way to train. The explanation should be incorporated with a demonstration or a series of demonstrations such as inspecting the ammunition, linking the ammunition, loading the boxes. Probably the 25mm ammo box mockup should be used to enhance observability. If the demonstration is conducted inside the IFV, the number of people who can actively observe will be limited.

f. The Implementor/Instructor Guidance attached to the Lesson Outline gives the only indication of student practice (in the NOTE following paragraph 3). Unless there is something in the USAIS format guidance precluding it, the instructions in that NOTE should be incorporated into the Lesson Outline. Practice would be centered around five distinct areas:

- (1) Inspecting ammo.
- (2) Joining and breaking ammo.
- (3) Loading HE ammo.
- (4) Loading AP ammo.
- (5) Unloading ammo boxes.

These are logical breakpoints for both presentation of instruction and practice. Ultimately, of course, in practice the student must put (1) and (2) together with (3) and (4).

g. (Page 3, para i, j, k) If this is meant to be a sequence of instruction it is confusing and probably does not reflect on the job performance. It doesn't seem practical to have all the AP and HE (300 rounds

total) strewn out on the floor. It is recommended that loading the HE and AP boxes be treated separately.

h. (Page 4) The NOTE following para 3 pertaining to the decal is important. Students should be taught to incorporate JPA into their performance where they exist. This is an important use of GTA. A GTA reproducing the JPA should be used and, as this JPA is rather complex, its use should be taught. In short, this NOTE needs more emphasis and incorporation into the instruction.

8. Lesson Outline: Identify and Perform Operator's Maintenance on Ammunition of the M2 IFV

a. Training Objectives need to be rewritten in line with previous discussion.

b. The Gain Attention step indicates there are ten different casualty producing rounds. Only eight are identified in the Body.

c. The practical exercise for this class is not specified although some indication of the type of PE is contained in the accompanying Implementor/Instructor Guidance (para 3). (NOTE: Paragraph 4 of that guidance is confusing and probably should be eliminated.) However, no guidance is contained anywhere on exactly what is to occur during practice. The first part of the task (ID ammo) is strictly a recognition activity; there is no physical activity involved. Inspecting ammo is also primarily recognition of conditions but handling of the ammunition is required. The ammo ID could be group practiced. The setup for ammo inspection implied in the Implementor/Instructor Guidance is probably adequate but conditions of the TOW missile are not specified.

9. Lesson Outline: Load, Unload and Stow M257 Smoke Grenade

a. The Training Objectives need to be redone in accordance with previous discussion.

b. (Page 3, NOTES 1 and 2) It will probably be easier for the students to observe the subsequent actions on inspecting if they are positioned on top of the IFV. Therefore, for this portion of the instruction the turret should be positioned where it will maximize student accessibility and observability which may not be as indicated in NOTE 1.

c. (Page 4, NOTE at top of page) Students do not "demonstrate": instructors do. Students practice. It is realized that this is only wording and the intent of the NOTE is clear. But the Lesson Outline throughout should make clear what the instructor does, when he does it, and what and when the students do.

d. (Page 4, para a, Unpacking smoke grenades) This is good practice but is it realistic to have each student open/unpack his own smoke grenade? Will subsequent storage and use of unpacked smoke grenades be a problem?

e. (Page 4, NOTE at bottom of the page) The students are working with freshly unpacked smoke grenades. Is it a requirement to wipe all smoke grenades or only those that have been previously unpacked and stored in the stowage boxes? Is wiping always required or only if the grenade is dirty/greasy (inspection)? The intent of NOTE is good; only its application within the training context is being questioned.

f. (Page 8, NOTE) This note specifies the practice but does not emphasize the role of the instructor/AIs in that practice. As a minimum it should specify what things the AI should particularly watch for (e.g., how the grenade is held; positioning of the body) and how much practice is needed (e.g., until the student performs the task correctly on his own at least once).

g. (Page 8 and 9, Conclusion) The suggested closing statements partially emphasize the use of the grenade launchers. But the soldiers being trained are not responsible for their employment. The closing remarks should emphasize the inspection and loading/unloading that the trainees are responsible for.

10. Lesson Outline: Load, Unload and Reload TOW Launcher System

a. The Training Objectives should be rewritten in line with previous discussions.

b. (Page 2, Orient Students) This is not a bad introduction.

c. (Page 3, NOTE on student seating) Insure that observation is possible for six students.

d. (Page 3 and 4, Inspecting TOW missile) This is a repeat of (presumably) earlier instruction. While it is desirable to incorporate inspection into this lesson it is not necessary that the instruction be repeated. The instructor should be prepared to repeat necessary portions or to elicit student responses to calculate how much they retained. But this can be done inside the IFV (job conditions) without going to the tables and going through the step by step instruction as outlined.

e. The requirement for practice for this task is generally adequately outlined as far as it goes. But the amount of practice (i.e., performing on their own) needs to be specified for guidance of the instructors. Also on the task of loading, a goal time limit needs to be established and applied during practice. This may or may not be the ultimate job performance time. It is realized that a loading time may not be empirically established by this point but some reasonable time limit should be established for training even if it must be modified later.

11. Lesson Outline: Operate a Boresight Kit

a. Redo the Training Objective in accordance with previous discussion.

b. (Page 2) Probably in the Scope, the students should have outlined for them what their role in boresighting is; that they are not going to be taught complete boresight but that they will learn and practice what their interactions with the gunner/TC will be. Normally in OSUT level tasks, it is not necessary to dwell on the concept of "why" a task is done. In most cases (maintenance, weapons disassembly, etc.) it is self evident what is being accomplished. But boresighting is a concept that is new to and likely not understood by the soldiers. It does not really relate to anything previous in their experiences. Therefore some minimal time should be spent explaining why and what is being done. No great detail, of course, just some basic background on boresighting and on what the gunner is doing and why the trainee's role is important.

c. (Page 2, Body) It is not clear that the instructor (or AI) is demonstrating this as the explanation is proceeding. If not, it should be and this should be specified in the instructor instructions.

d. (Page 2, para 2) The explanation of the boresight picture will be difficult for students to conceptualize until they look through the Pye-Watson. A GTA is probably required here.

e. (Page 3, para 3, Re: the 0.5 mil error) How does the soldier determine less than or greater than 0.5 mils? What is his reference for the measurement? If he must judge this, some instruction must be included. The concept of "taking up one half" the error also needs some illustration and demonstration. Some soldiers may have problems understanding it or applying it. This could be demonstrated and practiced with a GTA sight picture of the target and a large, movable reticle.

f. The Lesson Outline does not specify the Practical Exercise although the Implementor/Instructor Guidance does indicate practice. But no specifics for organizing the practice are included. For example, it is probably not necessary (if timing and vehicles are a problem) to have each individual trainee practice boresighting all three systems. More attention needs to be given to the hands-on practice portion of this Lesson Outline.

12. Lesson Outline: Vehicle Safety

a. Training Objective. This is the type of training objective that is extremely difficult to write. But the one listed is inadequate because it does not specify anything that the soldier is to do. Additionally, the standard is not a standard. It doesn't describe "how well" the soldier has to do anything.

What probably exists here is a series of three training objective tasks, i.e.:

- (1) State the safety requirements in the areas of General Safety, Hull Safety, Turret Safety and Maintenance Safety.
- (2) Evacuate an IFV in case of fire.
- (3) Evacuate a swimming IFV in case of sinking.

Tasks 2 and 3 are definitely trainable tasks. Task (1) is also but it covers those particular actions that are affective and therefore difficult to train and practice (e.g., How do you practice-train "not smoking on the IFV"?). They are primarily knowledge type actions that can otherwise only be observed discretely for compliance over time. Therefore only the knowledge portion can be directly approached in training although subsequent reinforcement by action can take place during later training.

b. (Page 2-4, Body) The instructions on the safety principles, incorporating demonstrations wherever practical, is outlined quite well.

c. (Page 4-6) The instruction on evacuation of the vehicle probably does not accomplish much. The duties of the different squad members, depending on their location, are not going to be remembered. Either this portion should be practiced with the entire squad, each individual rotating through different positions, or consideration should be given to deferring this instruction to unit training and perhaps only focusing on the responsibilities of the driver in event of a fire.

13. Lesson Outline: Communicate Using Visual Signalling Techniques

a. The Training Objective needs to be redone in accordance with previous discussions.

b. (Page 1, Lesson Tie-In) This lesson tie-in is just a continuation of the Gain Attention paragraph. It doesn't "tie-in" to anything else the student does in the course or will do on the job. The possible lesson tie-in here is potentially quite strong: that he will be giving and responding to visual signals during driving, maintenance and probably other lessons.

c. (Page 2, Motivation) This motivation statement is weak and limited in its applicability. There are more immediate requirements to know visual signals. Visual signals are not restricted to commander-subordinate communications. In fact, one of their primary purposes for the ILM soldier will be to control movement of the vehicle with a ground guide.

d. (Page 2-8, Body) The demonstration for this task seems unnecessarily complicated. It involves the use of three points of demonstration--the GTA, the AI and the vehicle. The students must divide their attention among all three. Although it gives the student the context of the relation between the signal and vehicle movement, the focus of the student's should be on the signal. Unfortunately, it will probably be on the vehicle. This procedure for the demonstration also requires an excessive amount of maneuvering by the vehicle. It is recommended that the demonstration be limited to the AI.

e. (Page 8, para 1) The practice specified here (having the soldier repeat the signal after the instructor) is good but it is not necessary to feature it as a separate training event. It should be combined with the preceding demonstration.

f. (Page 8, para 2) This requires the second soldier, on receipt of the signal, to "perform the action." What is intended here? Assuming the second soldier is not in the IFV there is no "action" that can be performed. What is actually required is that the second soldier identify and correct (if necessary) the signal being given. This is good practice but only if the second soldier knows the signal or has access to a training aid showing what the signal should be.

g. (Page 9, List of Signals To Be Practiced) Only ten of the 22 demonstrated signals are practiced. While it is true that some of the demonstrated signals will not be given by the 11M10, it is assumed that they must be recognized by him. Therefore, they should be practiced (or else not included in the demonstration). The flashlight signals to be practiced are not listed.

14. Lesson Outline: Start/Shut Down an IFV

a. The training objectives need to be redone and stated fully.

b. (Page 2-4, para a-g) If it is necessary to include entering the vehicle and driver's seat in this instruction, this could be possibly better covered during a demonstration on the actual vehicle rather than relying on GTA. The confines of the vehicle will preclude demonstrating most of the starting procedure on the actual vehicle for a group presentation but where actual vehicle demonstration is possible it should be used.

c. (Page 5, para 3) Hooking up the CVC is covered in the class "Communication Within the IFV" (or should be). This does not mean that it is not a step to be covered here but the detailed instructions of performing it should not be necessary to repeat for all students.

d. (Page 10, NOTE at top of page) This note seems to indicate that a PE is in progress at this point. It is not clear what is going on.

e. (Page 11) The fact that shutting down the engine is a part of starting the IFV and not part of Shut Down an IFV may be a little hard to grasp. This is probably of more importance for the organization of the material than for student learning.

f. Although the Implementor/Instructor Guidance indicated PE, no organization or structure or details on the conduct of the PE are included.

15. Lesson Outline: IFV Operator's Automotive Publications

a. The training objective task is not an adequate statement of the training task. The portion of training objective included in the standard is a closer description of what the student must do and should be included in the task statement.

b. (Page 2, Scope) The scope statement does not seem to be the type information desired under Scope. This type of statement does not appear to have much meaning to the trainee. Instead, the Scope should outline the instruction he is about to receive.

c. (Page 3-11, Body) The approach used to instruct students on identifying and finding information in publications is adequate. But students should get more practice on differing situations involving putting together the principles that they have been taught. The use of GTAs is all right for illustrating extracts from the publication to the entire class but it insures student attention is focused on the GTA, not on the publication in their hands. The process should involve weaning them from the GTA as quickly as possible to a verbal walk through of a situation by the instructor to finally applying the instruction to situations without cues. More than one application of the material is needed and these should require more than just spot checking by questioning several students. It may require students to write down page numbers or short answers and will require active AIs to check and correct.

d. (Page 6, question 3) This is a poor illustration of the use of TM 38-750. Going to TM 38-750 would not help the student find the information asked for in the question. (In fact, the inclusion of TM 38-75- as a publication that the student must know how to use is questioned. TM 38-750 is a formidable document and only a small portion of that publication is applicable to the trainee. Additionally, in units, most 11M10 will not have access to TM 38-750. Even in this class he doesn't really use it. Although this is a doctrinal issue, it is recommended that consideration be given to dropping TM 38-750 and concentrating on the Operator's TM and LO.)

e. The Implementor/Instructor Guidance draft indicates that this class can be taught "practically anywhere." Reconsider this. Although in application publications can be used anywhere, the purpose of this instruction is to provide student familiarity with the publications and

to develop an initial sense of ease in their use. If the student is physically cramped and has to contend with the wind and other outdoor elements, he is going to become discouraged. Everything should be aimed at enhancing the students' ease of working with the publications. This is one of the few IFV classes that should be taught indoors in a well lighted area with ample workspace. Later on he can apply the learning under more rigorous conditions.

16. Lesson Outline: Perform Operator's Maintenance on the IFV

a. The training objective needs to be restated. Most of what is listed under Standard is actually part of the task statement. (The conditions appear to be adequate.) This is a difficult training objective to write for it must identify what the student will be able to do after training--not necessarily what he will be required to do on the job. For example, during-operations PM checks are not performed as part of the class and should be dropped from the training objective.

b. (Page 2) The Scope does not present an overview of the instruction. The statement "you will be thoroughly skilled on operation and maintenance" is not going to ring true even to naive students.

c. (Page 10, PE) This outline for the PE is good as far as it goes. There are, however, certain areas or checks that may require an instructor demonstration or walk through prior to the student performing it. The PMCS list should be reviewed with this in mind and the instructor be told which items require special treatment.

The PE instructions should make it clear that the students will first cover Before Operations Maintenance and then After Operations (they will probably not actually perform During and Weekly/Monthly).

With limited vehicles, the approach used in the PE instructions is basically correct. The configuration and activities of students must be tailored to fit the conditions of the task. Some trial will probably be required to come up with the best involvement of all students but the instructor needs to be given as much guidance on what students should be doing as possible. Since they will change from check to check it is not going to be easy but without such guidance it will be likely that the students who are not actually performing the check will be ignored. For example, in some checks a driver is required to manipulate controls while a second person checks results. A third soldier can be responsible for reading the check and "supervising" it. (Another soldier could be responsible for filling out the DA Form 2404 if an entry were required.) On other checks only one soldier might be actively involved. The point is to get as many soldiers involved as possible and to rotate duties evenly. This is not the "best" practice but it is the only practical application under restricted equipment and time conditions. The point is that this type of practice is difficult to set up and control and it therefore should be specified in the Lesson Outline.

c. (Page 13-18, DA Form 2404) Consideration should be given to scheduling the section on the DA Form 2404 before the PMCS and then having the students use the 2404 for any actual problems encountered during PMCS PE.

d. (Page 18-19, DA Form 2408-14) Although the orientation to the DA Form 2408-14 is brief, consideration should be given as to whether its retention is warranted. The soldier is not responsible for completing this form and responsibility for its accuracy is generally determined in the unit. More importantly it comes on top of two other forms that the trainee is required to know how to fill out. Care should be taken to not overwhelm and possibly confuse the trainees with forms. Consider leaving the DA Form 2408-14 for unit training.

e. No practical work is specified for the forms. Students should practice filling in the headings and then be given a series of situations which require making entries on the forms. This PE should involve use of the operator's TM. Monitoring/feedback is an important requirement.

17. Lesson Outline: Drive an IFV

a. Insure that the training objective reflects what actually is trained, i.e., the driver course. Tow starting, slave starting, and perhaps also the AN/VVS-2 should also be listed as tasks in this section.

b. (Page 3-15, Body) A lot of the information presented in the Body is "extraneous" information. The presentation should be limited primarily to the information necessary to drive the vehicle on the driving course. (This should also be restricted to daylight operation. Nighttime operation principles should be presented before the night driving phase.) Items such as tow starting, preparation for fording, TOW firing, NBC driving and night convoy driving would be dropped. Pivot steering and backing instruction would be included only if these actions are going to be performed during driving the course.

This does not mean that general driving principles or safety instructions should not be presented. But specific instruction for tasks that will not be performed is probably wasted and only adds to the information that the trainee must sort through in application.

c. (Page 16, Note 2, Use of protective mask, smoke generator, acquiring targets) While these are all worthwhile activities, be careful not to overwhelm the student driver with tasks and the AI with responsibility. Make sure that the activities suggested are realistic. This is the driver's first experience with maneuvering the vehicle and this should receive maximum attention. Much of what is achievable will depend on time available per student but be wary of starting out requiring too much.

d. The instructions indicate that slave starting and tow starting are part of this lesson although they are not included in this Lesson Outline (they are separate Outlines). Although largely a matter of format and organization, it is questioned why that particular approach was used here and a different approach used on Range Firing (FPW). There seem to be many similarities between the two activities and it is thought the Lesson Outline format would be similar.

18. Lesson Outline: Slave Start an IFV

a. Redo the training objective in accordance with previous discussions. Insure a slave source is specified in the conditions.

b. (Page 1, Gain Attention) The draft Gain Attention statement is seemingly unrelated. Perhaps it is not complete.

c. (Page 2, Motivation Statement) Come now! Soldiers are being taught to slave start a vehicle, not preparing to repulse an invasion. Attempt a little more realistic motivation.

d. (Page 3-4, Body) This specifies a demonstration of the slaving techniques (using the AI). However all that most students will be able to observe will be what occurs outside of the vehicle (positioning the vehicle, passing the slave cable). Since observing the actual hook up inside the IFV is not practical, it will probably be necessary to rely on GTA and possibly some type of mock up of the slave connection.

19. Lesson Outline: Tow Start an IFV

a. The task statements of the Training Objectives need to be written to reflect what the student is going to do. For example, connecting the tow equipment (cables, bar) should be part of the task statement and the Conditions statement should reflect the requirement for a towing vehicle.

b. (Page 8) The PE NOTE specifies six man groups for the practice while the Implementor/Instructor Guidance specifies 12 man groups. In any case the Implementor/Instructor Guidance specify that each student will connect the tow cables and tow bar and that each student will drive the towed vehicle and TC the towing vehicle. The intent to provide individual practice in all aspects is commendable and is encouraged. However, realistically it is doubtful if this can be done in one hour.

c. (NOTE: The instruction (page 7) specifies that the radio be used to notify the towing vehicle when the towed vehicle is started. Recommend that a horn signal system be used for the practice sessions with the radios for backup. Consideration might also be given to manning the towing vehicle with an AI TC instead of a student to maximize control.)

20. Lesson Outline: Install/Operate AN/VVS-2

a. The Training Objective indicates seven tasks as part of this lesson. Although at what point a behavior is broken out as a task is largely a judgment call, consideration should be given to combining some of the tasks listed. For example, Inspect/Install, Prepare to Operate and Operate the AN/VVS-2 could probably be combined into a single task. There is no great problem with leaving them as separate tasks except that it is more difficult and time consuming generally to prepare a lot of small task statements, conditions and standards and it is not consistent with the procedure followed in most of the other course Lesson Outlines.

b. The Implementor/Instructor Guidance for the Practical Exercise is fairly good. However, if the situation specified in paragraph 4 exists (no mockup available) consideration should be given to eliminating at least part of the bleacher instructions since it will have to be repeated on the vehicle anyway. The AI should also be prepared to go through the demonstration more than once depending on how many students there are and their ability to observe or the AI can talk a student through while the next one or two students to perform observe.

21. Lesson Outline: Operate the IFV in Water

a. The Training Objectives need to be redone eliminating the reference to the SM. The second task (Predip) needs to be completely redone particularly if the students are not going to actually predip. What is currently listed as the standard in that task is actually how the task is done, not a standard. The third task (swimming) must also be modified if actual swimming is not conducted as part of this lesson.

b. The Caution statement is well appreciated but if it is going to be read verbatim, make it meaningful for the student. For example, "referring to TM 9-2350-251-10-1 frequently" is not specific guidance. If it is desired that the soldier follow the TM, make this a requirement, i.e., "You must first read and then perform each step as listed in the TM on page _____ when preparing the vehicle. The vehicle will not be prepared without using the TM." Don't tell the soldier what his supervisor's responsibilities are; tell him what his are, i.e., "You must notify the TC when you have prepared the vehicle. You will not swim the vehicle until your TC has given you the specific okay to do so." (NOTE: These changes are suggested only if they are consistent with doctrine.)

c. (NOTE: Part of the instruction, possibly in the introduction, should specify the difference between fording and swimming particularly since different procedures are required.)

d. (Page 12-13, Predipping) The draft specifies that "Demonstrators will perform each step as the instructor talks through it." Is this really intended? This will require quite a bit of support and the student learning from passively observing will be minimal. The same

comment applies to page 14-15 (Swimming the IFV). Outside of the demonstration that the IFV swims there will be minimal learning on what to do. The things that the driver (demonstrator) does inside the driver compartment cannot be "demonstrated" although the results of them can be (e.g., turning in the water).

e. (Implementor/Instructor Guidance Practical Exercise) The Guidance specifies the initial two hours as "classroom" instruction. There is a lot of information to absorb without application. If possible, fording preparation, prep for swimming and after water operation should be practiced right after they are taught. Minimum reliance should be placed on instruction in bleachers via the GTA and effort should be made to maximize student involvement in the demonstrations of vehicle prep, erecting the swim barrier and after water operations. This involvement may only consist of moving the students closer to or on the vehicle during the demonstration but even that is better than having them passively observe from afar.

f. The Practical Exercise for this class is quite involved and more guidance is needed in its conduct. For example, erecting the water barrier will probably involve only two or three soldiers at a time with the remainder observing and then rotating. This organization should be specified. PE should also specify the use of the TM if this is to be a requirement. Likewise the procedure for predipping and after water operations maintenance should be spelled out, i.e., who and how many are going to do what. Although actually swimming the vehicle is an individual practice, the actions of those not driving should be specified. If consistent with safety and administrative requirements they should occupy the crew compartment. But as a practical matter this may not be possible. Whichever, it should be specified.

g. (NOTE: Practical problems may exist with actually having each student swim the vehicle such as availability of support (scuba divers) and the number of swimmable IFVs as well as a suitable site that allows multiple swimming vehicles. This lesson should therefore have contingency instructions for the conduct of practice if full scale practice is not feasible.)

22. Lesson Outline: Break/Join Track on an IFV

a. The standard of the Training Objective is not a standard. "IAW" specifies how, not how well. The proper standard should be related to time (if applicable) and the track joining standard should also be related to the correct track tension.

b. (Page 2-10) The Body of the instruction relies too heavily on GTA. Since breaking the track is easily observable, any demonstrations should take place on the actual vehicle.

23. Lesson Outline: Stow Equipment on the IFV

a. The Training Objectives breaks out into 11 tasks. Each category of equipment (sometimes consisting only of one item) is treated as a task. While this seems excessive it may be the only practical and realistic way to approach the training objective. However, consideration might be given to redoing the training objective to consolidate these 11 tasks into a single task along the lines of "Stow the equipment listed in the Stowage Guide as specified by the Stowage Guide and vehicle decals" and then making each of the categories subtasks or steps in the task. This might or might not make it easier to write and instruct. This whole Lesson Outline, starting with the Training Objective, needs further thought.

b. For most of the stowage items, the primary learning will be to follow the stowage plan (or unit loading plan) and using the Job Performance Aids (usually in the form of decals) on the vehicle. For most items the stowage and securing is pretty straightforward. But some items may require special instructions or cues to properly stow and hence a demonstration is needed. A careful discrimination of items is needed and the demonstration centered on only those areas where some real learning is necessary. For most items, however, it will merely be necessary to follow the stowage plan to determine location--a fairly straightforward process. This will eliminate most of the steps that currently specify a demonstration.

c. The use of GTAs for this class seems excessive. Virtually all of the demonstration necessary can be shown right on the vehicle. The student should be taught to use the TM Stowage Guide (or a handout stowage plan for class use and retention). A single reproduction of this as a GTA might be used for group reference purposes but individual GTA for each category of items does not seem to be warranted.

d. Consideration should also be given to reducing the scope of this class. Stowage plans are often a matter of unit SOP and might be better left to unit instruction. Further, not all items listed for stowage are equally important because they are carried only infrequently or not at all in some units. If the outline were reorganized and the stowage items prioritized, perhaps on the frequency of their use in typical units, then some decisions could be made on which stowage items should be emphasized. For example, pioneer tools would be rated among the top and stowage of commo or CBR equipment near the bottom. Limiting the scope of the class is, of course, a doctrinal decision but review might reaffirm if this entire instruction were warranted or not.

24. Lesson Outline: Evacuation of the IFV

a. Redo the Training Objectives to insure they correspond to the training environment and to what the soldiers will learn to do in the class.

b. (Page 2 and 3 (unnumbered), Body) The instructions call for instructor and AI demonstration but it is unclear exactly what is to be demonstrated.

c. (Page 4 (unnumbered), Evacuation of the Driver) Much of this demonstration will be difficult to observe because it takes place inside the vehicle. Portions, such as placing the pistol belt around the victim's chest, should be demonstrated outside the vehicle where it can be observed.

d. (Page 7 (unnumbered), PE NOTE) The organization for this PE is sufficiently specified. However, reconsider the practice of evacuating through the cargo hatch in light of earlier instruction until some proficiency is demonstrated on the overall handling of casualties and evacuating through other exits. The simultaneous evacuation practice through the hatch and ramp door is not very feasible.

e. (Page 8 (unnumbered), Question 4) The expected answer is not complete.

APPENDIX C
TEST REVIEW

APPENDIX C
TEST REVIEW INDEX

	Page
PREFACE	C-3
1. Install/Remove M231 FPW	C-7
2. Load/Unload 25mm Ready Boxes	C-7
3. Install and Assemble the AN/VRC-160	C-8
4. Prepare DA Form 2404, Equipment Daily Log	C-8
5. Slave Start the IFV	C-8
6. Perform Operator Maintenance on the M231 FPW	C-9
7. Load/Unload TOW Launcher	C-10
8. NBC Decontamination of the IFV	C-11
9. Drive the IFV	C-12
10. PMCS	C-12
11. Visual Signals	C-13

PREFACE

Quality control of performance training is available only through the use of tests. Tasks which are not tested are tasks which are not completely trained. It is only from detailed test results that the trainer or training manager knows (a) that trainees can perform a given task on completion of training, and (b) just where training was weak if trainees cannot do the task. The IIM course currently tests approximately 17 tasks in 11 tests. The goal must be to test all IIM tasks taught. But this does not mean that the course cannot retain flexibility in when those tasks are tested or in the requirements for IIM certification. (See also discussion under Findings, Item 14, page 25.)

There are several principles of test development which are discussed below. These are followed by a detailed review of the 11 existing tests.

1. Test Validation

a. Both existing tests and any future tests should go through a validation procedure before being formally adopted. USAIS has undoubtedly published procedural guidance for validating tests, and such guidance should be followed. An outline of a validation procedure is given below. It is not meant to conflict with USAIS guidance but to supplement or reinforce it as the case may be.

- (1) Have tests reviewed by subject matter experts to assure that they are technically correct. Administer the tests to these experts to determine if they perform in accord with the performance measures.
- (2) Establish test reliability. Have qualified scorers set up the tests as required by the set-up instructions. Administer the test to trial subjects and have the tests scored simultaneously by at least four scorers. Verify that performance measures are observable and scorable. Compare scorer results to see if scorers who observed the same actions interpreted the performance measures the same. Identify areas of disagreements and their causes through interviews with the scorers and test subjects. Revise or clarify tests as needed.

b. Although superseded, the 1 December 1977 edition of Guidelines for Development of Skill Qualification Tests¹ contains a good outline of procedures for trying out hands-on performance tests which are applicable to the type tests in the IIM course.

¹U.S. Army Training Support Center. Guidelines for Development of Skill Qualification Tests. Individual Training and Evaluation Directorate, Ft. Eustis, Virginia, December 1977.

2. Test Instructions. For tests administered during OSUT level training, the test set-up instructions probably do not have to be as detailed or precise as, for example, for SQT tests. This is because those who set up and deliver the IIM training tests are more constant and more of a known quantity than those who administer SQT. However, again, the SQT model is not a bad model to follow and Chapter 4 of the above referenced SQT manual provides much applicable information. The scorer needs to have specified the equipment conditions and needs instructions for setting up stations when multiple tests are being administered. In some tasks, detailed instructions are needed on scoring specific performance measures. However, unlike SQT which includes these scoring instructions separately, the scoring instructions are normally included right with the performance measure.

3. Time Limits. Time limits for tasks fall into two categories: Those that are inherently part of the task and administrative time limits. The former time limit is established by the characteristics of the task itself, e.g., putting on the protective mask, misfire procedure, loading the TOW. In these tasks the time limit is as much a factor of performance as doing the steps correctly. Other tasks are not inherently time constrained, but a time is usually established for purposes of test administration. The scorer must at some liberal but fixed time cut off the test when a student obviously cannot perform. Trainees seldom, if ever, fail these tasks solely because of the time limit. Examples of these tasks are all maintenance tasks to include PMCS and DA Forms, decontaminating the vehicle, slave starting, IFV commo, boresighting. It is important to keep the two concepts of time limits separate. Don't establish restrictive time limits in testing for tasks that are not normally time constrained on the job. There may, of course, be some time constrained tasks for the IFV for which precise time limits have not yet been established (loading the TOW, donning protective apparel inside the IFV). The only feasible approach is to have SME "best guess" a time and then adjust that time up or down as real world experience is gained. The goal on time constrained tasks for OSUT level performance should probably be that at least 70-80% of trainees be able to achieve the time criteria, but this is somewhat dependent on the amount of task practice they get.

4. Verbal Testing. Normally scoring verbal responses should be avoided. The goal is to make the test as much a reflection of job conditions as possible. Verbal testing is often abused in performance testing. It becomes the easy way out for the test developer, a way of shortcutting task coverage. When used, verbal testing must be limited to those situations in which a specific short response is indicated such as, "How long do you wait for a hang fire? What weight oil will you request to add to the road wheels?" To be avoided are descriptions of actions to be taken, such as, "Describe how you would inspect the TOW missile"; or, "Tell me what step you would do next." These are not only unnatural reactions but place unrealistic emphasis on trainee verbal skills as well as requiring the scorer to interpret the response.

5. Examinee Instructions. Standardized instructions to the examinee are required for each task tested. Keep them short and to the point. Do not try to give the examinee a "situation"--simply tell him what he must do. Any test instructions that require over 30 seconds to deliver verbally are probably too long. Remember, the examinee has been learning and practicing the task. He knows what he is going to do. All that is needed is a short, simple, verbal cue to get him started.

6. Performance Measures

a. Performance measures tell the scorer what to look for in scoring the task. They are not supposed to tell the examinee how to do the task. They should be short and direct and developed with the emphasis toward ease of scoring.

b. Not every step required in doing the task need be scored. In fact, there is a limit to what a scorer can observe and score. Remember that a scorer, no matter how well trained and familiar with the task, is still dividing his time between the student and the scoresheet. Studies by Ford¹ indicate that somewhere between 8-11 performance measures on a scoresheet is all that a scorer can handle on a task of five minutes or less. And the scoresheet itself should exist on a single page. Concentrate on scoring those items where deficiencies are likely to exist or where behavior of proceeding steps is inferred. This later involves product scoring, but product scoring does not have to be limited to an end product. It can merely be points when interim results are measurable without scoring the process that led to these results. And product scoring does not mean that other necessary process performance measures cannot be also used. Some tasks lend themselves to this better than others. Boresighting, weapon disassembly/assembly, donning protective clothing, commo, install FPW, stow equipment, fill out DA Form 2404, identify OPFOR vehicles, are all examples of tasks that the scoresheet should concentrate on products. Drive the IFV, visual signals, reduce a stoppage in the FPW, load the TOW, close combat drills are examples of tests that require process scoring or where the product is so fleeting that it is treated as a process. The emphasis in test development should be towards product or part-product tests. They are generally more easily and accurately scored.

7. Collective Testing. Most 11M course tasks will be individually tested. There are exceptions. Putting on protective clothing inside the IFV, erecting the swim barrier, and close combat drills are at least three examples of situations where more than one individual is tested at a time or where individuals must interact during the testing. These tests need a slightly different treatment in their construction and administration.

¹ Ford, P. and Campbell, C.H. "Some Factors That Affect Reliability of Hands-On Tests." Paper presented at the Military Training Association Conference, San Diego, California, October 1979.

8. Standards. Normally the standards for task performance in OSUT are the same as for anyone who is required to do the task on the job. Any altering of the standard for OSUT is a matter of policy and generally is a command decision. Sometimes standards, particularly time standards, are relaxed for OSUT level training because these soldiers are at the entry level. But this should not be done lightly, as relaxing of standards can mean that the field commander is not getting the soldier he thinks he is getting.

9. Test Application. Most tests should be administered directly following the training and as an integral part of the training. This means that the test instructions must be oriented towards the instructor and his AIs. This does not preclude a centralized, end-of-course comprehensive test used for certification.

10. Feedback. Feedback is integral to all OSUT testing, even during the comprehensive testing. Testing is just a part of the training process and feedback is a requirement. Scorers should be encouraged to give realistic (not exaggerated) positive feedback as well as feedback on what went wrong. Ideal feedback includes retraining and retesting. However, feedback is given after not during the test.

Following are comments on the 11 existing IIM tests. Emphasis is on the scoresheets themselves rather than the administration/set-up instructions, except where certain implications are apparent from the scoresheets. Technical accuracy was not a main consideration in this review. Although comments are specific, most are applicable to future test developments.

1. Install/Remove M231 FPW

a. PM 1. Cut down the number and length of the sub-PM a-e. All the scorer needs to look for is if the brass catcher bag is in place and if the examinee pulls the FPW to the rear. Why the soldier pulls the FPW rearward should not be part of the PM. A suggested rewrite:

"1. Install FPW

- a. FPW locked in port (scorer must check).
- b. Brass catcher bag attached.
- c. Examinee pulls rearward on FPW after installation.
- d. Completes within ____ seconds."

b. PM 2b. How does the scorer know what "insure" means? If the examinee must perform a visual check then the scorer must know what to look for. (Fortunately on the IFV, the visual check is easy to observe.) But be specific. Don't run the risk of some scorers requiring a physical check and others allowing a visual check.

c. PM 2d. Why the magazine is tapped is not a performance measure. The only thing the scorer is looking for is if the examinee does or does not tap the magazine.

d. PM 3c. The parenthetical note applies only if dummy rounds are used which must be covered in the test set-up conditions. The scorer cannot judge if the examinee observed the round eject (although it should be obvious), so change this to read, "(round must eject)" as a note directed to the scorer.

e. PM 4d. Re the parenthetical instructions: How does the examinee know he is supposed to do this? What if he forgets to say it--is that evidence that he cannot perform the task? Either specify conditions so that this action is required (if possible) or drop this as a PM.

f. Questions for doing PM 4d. This should be discouraged, but if retained make sure the question is specific, i.e., "How many rounds in how long a time must be fired to have a hot barrel?" The second question doesn't make much sense as written--how long must you wait for what?

g. PM 5d. How does the examinee "check"? What should the scorer look for?

2. Load/Unload 25mm Ready Boxes

a. PM 1. Insure that the set-up instructions are specific as well as the instructions to the scorer on this part of the task. How will the ammo be identified? Will the scorer hand the examinee each round or will he just lay out the ammo and tell the examinee to identify it? How precisely it is done is not important but it should be done the same for each examinee.

b. PM 2. Again the set-up instructions must be specific. How long are the belts; are the loose faulty rounds in with other rounds or by themselves? What exactly is meant by "Did the soldier . . . note?" Must he tell exactly what is wrong with the round or merely indicate that something is? Change PM 2c to read, "Checks 25mm alignment by fanning the belt."

c. PM 3a. How does the scorer score "proper" linking? (A detailed description of what the scorer is observing for is not necessary but descriptions of standards that include "properly," "correctly," etc., are always "flag words" in test construction and the test reviewer should always question their use and intent.)

3. Install and Assemble the AN/VRC-160

This is a fairly straightforward scoresheet. Not all the PM are strictly necessary (a and b) but they are not excessive. Consider adding any necessary instructions to the scorer on how to judge the secureness of the mounting if this is to be evaluated.

4. Prepare DA Form 2404, Equipment Daily Log

(NOTE: This test was already informally revised during the tryouts.)

a. This is a true product test in that the examinee fills out the DA Form 2404 and it is (or can be) scored at a later time.

b. This test is normally administered based on different situations which are given to different examinees.

c. Using the situational approach, it is possible to do away with the scoresheet as it currently exists and its reliance on words to judge performance. Prepare a master DA 2404 "template" for each of the situations with the blocks filled in correctly. Use this to compare with the student's product. Some "words" may still be necessary to explain allowable variations or deviations but this would simplify the scoring process, would show precisely what entries the scorer is to look for, and would not require the detailed explanation of all possible entries based on the existing situations.

5. Slave Start the IFV

a. PM 1. Will the student do this or will his actions be inside the IFV? Drop the statement "preferably another IFV." The student will hook it up to whatever the scorer tells him is the power source.

b. Caution note. Who is this caution for--the scorer? If so, it is appropriate although the consequences of doing (last sentence) need not be stated.

c. PM 3, 4, and 5 say the same thing differently and PM 4 only refers to PM 5 so it can't be evaluated. PM 5a-f are only applicable if they can (and will) be scored. PM 5b and 5d are unobservable and can't be scored so should be dropped. PM 5g is very unlikely to occur. (It is not visualized that examinees will troubleshoot the IFV IAW Chapter 3, TM 9-2350-252-10-1, as required in this PM.) It should be dropped. In fact, PM 3, 4, and 5 should consist of one PM that states:

"Start engine. (Score examinee NO-GO if he cranks engine for more than 15 consecutive seconds. If engine does not start, the examinee must wait 30 seconds before trying again. If the engine still does not start, discontinue the test and troubleshoot the vehicle.)"

d. PM 6. Will this be scored? If so, the scorer must be in a position to observe a and b. PM 6c is not understood. Who is not going to hear the warning tone--the scorer or the examinee? If the examinee only, then how will the scorer score it?

e. PM 7. Recommend that this PM be dropped in its entirety. Its use is very conditional and it clutters, lengthens and confuses the scoresheet. The conditions should specify that the above 40° starting procedure will be used even if this requires testing in a vehicle bay. Or if the below 40° starting procedure is to be used consistently (such as during the winter months), then have two separate scoresheets. But don't try to combine both on one scoresheet. (NOTE: If below 40° starting procedure is tested, insure that it has been taught.)

f. PM 8. How does the examinee, and the scorer, judge "smoothly"? What "vehicle" does the examinee have to remove the cable from--the slaved IFV or both that and power source? This must be specified both to the scorer and the examinee.

6. Perform Operator Maintenance on the M231 FPW

a. PM 1a. Verify the consistency of the requirement to remove the hand guards with the class instruction.

b. PM 1a-3. Consider making this a product-scored test instead of attempting to score the process as is now indicated. The PM would read:

"1. Soldier must remove the following parts (check layout after disassembly):

- a. drive spring guides
- b. buffer
- c. drive spring washer
- d. three nested springs (separated)
- e. bolt carrier
- f. charging handle

- g. striker
- h. firing pin and retaining pin
- i. bolt cam pin
- j. extractor pin and insert
- k. bolt
- l. upper receiver
- m. lower receiver

2. Completes disassembly in 2 minutes."

c. PM 2a-o. See if the same product approach can be used with assembly. Will the weapon pass the function check if it is incorrectly assembled? If not, the scorer can use this to score assembly. If the function check and some other specific checks must be made to verify correct assembly, then whatever is necessary should be specified. But the point is that listing the entire process and requiring its observation is probably not necessary. If the function check approach to scoring is possible the scorer would still have to disassemble a weapon that did not pass, both to provide feedback and to prepare the weapon for the next examinee. But this is not substantially different from what is currently required.

d. The product oriented approach allows multiple and simultaneous testing by one scorer (probably up to three examinees). The test as written dictates a 1:1 testing situation.

e. PM 3 must be process scored and should be left as written.

7. Load/Unload TOW Launcher

a. PM 1a-g. Some of the individual PM are hard to score because even if the examinee is observed looking at and feeling the missile (and most of the checks are visual), it is not known exactly what he was looking for. For example, PM 1a and b are essentially meaningless PM--it is virtually impossible to tell if one or the other is being checked for. There are essentially two alternatives--one is to use a missile that contains some of the listed defects and score the examinee NO-GO if he attempts to load it. (This has the disadvantage of easy G-2 by soldiers waiting to be tested.) The second alternative is to only score what actions are observable, i.e., if the examinee picks up the round and immediately starts to go into the loading procedure, he is scored NO-GO. There is no attempt to score most of the specific checks. Neither of these approaches is entirely satisfactory, of course, but then neither is the current approach. Sometimes testing is a compromise. It is better to score accurately what is feasible to score than to list meaningless performance measures just because it implies task coverage.

b. PM 2c. A similar problem exists with this PM although it may be feasible to place some leaves or debris in the tube and evaluate the soldier's response. As is, this cannot readily be scored. The same is

true of 2d. The only way to determine if the examinee knows that the umbilicals must be retracted is to have them extended. This may be impractical in the test situation. If so, this PM should be dropped.

c. The purpose of the NOTE after PM 2g is not clear. Is this to keep him from loading another missile? If so, and if it is desired to have him load the inboard side, why not put a missile in the outboard side or include these instructions at the start of the test?

d. PM 2h. Avoid the term "should." It connotes elective or preferable, but not required, behavior and may confuse scorers. Try "h. Closes cargo hatch and announces: 'TOW LOADED.'"

e. PM 3. Some detailed scorer instructions will be needed for setting up the two-man test. For example, the scorer will probably have to designate the topside and groundman. Also consideration should be given to separating this test from the loading portion if a cumulative overall GO/NO-GO is given. First, it is administratively difficult to keep track of scoresheets. Second, a team can get a NO-GO because of one man's performance and it is not fair to give the individual an overall NO-GO if he did his part correctly. A separate test would eliminate these problems. Also to be done strictly correctly, soldiers should be tested in both roles which may not be feasible.

f. PM 3e. How will the examinee know which way is "down range?" Also, the way the PM is written the examinee is being evaluated on whether he walks 50 meters. It is doubtful if this was the intent. Recommend dropping this PM.

8. NBC Decontamination of the IFV

a. PM 6 implies some judgment about what to spray. The conditions should specify the setup so that there are items that must not be sprayed (such as the FPW) and the soldier who does spray them receives a NO-GO. This is probably easier to score than trying to point out what should be decontaminated.

b. PM 7 is, strictly speaking, not part of placing the M11 into operation. Yet it is, or can be, a very time consuming step and there is really no way to judge whether it is being done correctly although it is an obvious NO-GO if it were not done at all.

c. In the actual conduct of this test during the tryout the washing seemed to get more of the attention (at least by the student). The use of the Firing Port mockup box station for this task is not very realistic although it was probably necessary because of equipment constraints.

d. The portion of this test dealing with putting the M11 into operation is good. Reconsider if anything of value is being determined in

PM 6 and 7 (particularly #7). It is not a requirement that every portion of every task be tested. Some are not observable or scoreable, some not feasible, and others appear to test something but on closer examination don't. PM 7 may be in this last category.

9. Drive the IFV

a. This will be a difficult test to score as it is written because so much of the listed performance takes place in the driver's compartment and is unobservable. In most driving tests, the maneuver or result of what the driver does is all that can be evaluated. Consider testing this with the IFV by establishing a series of required maneuvers or actions that the driver must perform. This may be a short driving course within confines laid out by engineer tape including right and left turns, backing, pivot steer and stopping on a specified mark. Some standard for determining acceptable--or more precisely, unacceptable--performance should be established for scoring.

b. The PM listed, particularly PM 1e, 2a and c, and 3 tell the performer how to do the task and don't tell the scorer how to score it.

10. PMCS

a. This test consists of a requirement to check the track and suspension. As written, PM 1, 2 and 3 are not observable. There is no way to tell if the examinee is checking the idler wheel and roller hubs or if he is just "taking a walk" because he saw another examinee do it. PM 3 is scorable if the oil level is low in one or more of the hubs and this was the way this task was tested in the tryout. But with the same hub and with this the only check being tested, it must be assumed that word was quickly passed to "put oil in the second road wheel."

b. This is a task where the present test does not adequately cover the entire task (PMCS). But it is fully recognized that complete task coverage is probably impossible because of the length of the task. An alternative is to select a series of different PMCS checks and assign them randomly to examinees. This has the disadvantage of assuming that all checks are equal in their difficulty which is probably not the case and thus creates potential problems of test fairness. Another approach is to select the "most difficult" two or three checks (the ones where greatest performance problems are anticipated) and having everyone perform them but varying the induced faults. (In any PMCS test, induced faults are almost a requirement. Most PMCS checks are visual without physical manifestations of what is occurring. Without induced faults it cannot be determined if the check was made and, if made, if the examinee knows what he is looking for.)

c. The area of PMCS testing needs further study with an eye towards increasing task coverage and yet remaining within the bounds of feasibility (time, equipment and scorer constraints). It might prove helpful

to look into what other tests (SQT, Driver Qualification Courses) are using as an approach to PMCS at other institutions (Transportation School, Armor School, USAIS M113 training). However, the observer's experience is that other existing PMCS tests are not very satisfactory either. But an innovative approach in this area would be worthwhile. Perhaps if the daily approach to PMCS by students (as outlined in the Findings, Item 9, page 18) were adopted, the PMCS test could be integrated with this practice.

11. Visual Signals

This is a straightforward scoresheet that presents no problems. However, several considerations are offered:

- (a) Insure that the signals tested are the "most important," i.e., the basic ones that the soldier must know when he arrives in his unit.
- (b) Consider a time limit for starting the signal-- maybe 5-8 seconds.
- (c) Consider signal recognition as a corresponding requirement for some signals. As drivers, soldiers must respond to signals. This would require some verbal response on the part of the student and must be handled carefully. The response required should be elicited in terms of, "As a driver, what would you do if you received the following signal?" rather than in a requirement to name the signal. Instructions to the scorer must be carefully written to help him identify what are acceptable and unacceptable responses.

APPENDIX D
ANALYSIS OF MARGINAL PERFORMANCE TEST RESULTS

APPENDIX D
ANALYSIS OF MARGINAL TEST RESULTS INDEX

	Page
PREFACE	D-3
1. Prepare DA Form 2404	D-5
2. Load/Unload 25mm Ready Boxes	D-5
3. Install/Remove M231 FPW	D-7

PREFACE

Three tests reflect evidence of performance deficiencies because of marginal first-time pass rates. The tests and percent first-time passes are:

- a. Prepare DA Form 2404, Equipment Daily Log . . . 82%
- b. Load/Unload 25mm Ready Boxes 71%
- c. Install/Remove M231 FPW 79%

In considering causes of performance deficiency, the first consideration is whether the deficiency is the result of a lack of skills and knowledges or whether there is some cause peripheral to training. The latter often pertains to the test itself, e.g., unclear pass/fail criteria, poor test directions, different equipment from training to testing, different content in tests. If the test is technically weak or requires behavior other than what was trained (assuming the "right" behavior was trained), we can, of course, draw no conclusions about the quality of training from test results. Since the tests used in the 11M course have not been independently validated this cannot be ruled out as a cause, but less formal evidence indicates that failures were not attributable to poor tests or poor testing procedures. It appeared that (a) the tests covered the corresponding behaviors trained, and (b) any problems in test construction (such as unclear performance measures or unobservable actions) were more likely to be resolved in the examinee's favor rather than against him--thus, in this training situation, imprecise or deficient tests may have resulted in an inflated pass rate, but failures are probably true failures.

The assumption then is that the observed performance deficiencies are due to incomplete training, that there is lack of the requisite skills and knowledges in some individuals that are causing the failures. Yet in attempting to pinpoint the causes it is important to remember that there may be multiple causes and that in the weighing of observations some evidence may be judgmentally "better" than others. Many observations may be relevant but all observations do not have equal impact on the training process.

One further consideration is also relevant, and that regards the severity of the training deficiency. Persistent substandard performance is an indication of the degree of deficiency; that is, if after repeated remediation the results do not improve significantly, the problem is more serious. But an evaluation of severity in the present situation requires a look at the 11M10 course training-testing sequence. TPE is based on first time testing, that is, the first time the test standard is formally applied. In the 11M course some tasks were (quite correctly) "tested" in the training and all 11 tests were practice tested during a review period prior to the Comprehensive test. But in almost all cases the tests were more practice than testing. Feedback was given but standards were not rigidly applied and (most important from the validation point of view) records on performance were not kept. In short, while the same tasks or part-tasks were performed that were on the test, there were no formal tests. Instructions to the

students were more informal and the practice test situation lacked the rigor of the later test situation. Just as importantly, the students knew it was a practice. This procedure is not questioned from a training viewpoint; in fact, it was good training and preparation for the Comprehensive tests but it did "muddy the waters" from a TPE validation standpoint.

The importance of the conduct of the IIM testing procedure and the preliminary events is in its impact on the judgment of severity of the training deficiencies. During the Comprehensive testing, failures were remediated and retested. Of a total of 30 first time NO-GOs, 29 achieved a GO on the retest. One student required a third test to pass (in filling out the DA Form 2404). Normally this would indicate that the performance deficiencies are not very severe. However, because in the narrow sense it was not the students' first-time exposure to the tests and test-like conditions, the deficiencies should perhaps be treated as more severe than indicated on the surface. They are not alarming since satisfactory performance was achieved quite quickly and with spot remediation but they are judged "moderately severe."

The specific areas of performance deficiencies are described on the following pages along with an analysis of probable causes.

1. Prepare DA Form 2404

a. Students were given one of five situations. The errors that caused NO-GOs were mostly ones of omission such as failure to put in the date (particularly when no maintenance deficiency was found) and failure to circle the item number.

b. This is one of those tasks where the action varies with conditions. The task is difficult to apply general rules to because there are too many of them to apply and they are seemingly contradictory. For example, the date is always entered in block 10c but is only entered in block 5 if a deficiency or shortcoming is noted. Further, part of the information for completing the form is contained on the form itself, part in the TM, and some must be generalized from past experience or newly learned. All of this leads to a task that needs a lot of varied practice.

c. Part of the problem lies with where the emphasis is placed during practice and the extent of the feedback. During practice the emphasis is often on getting the correct item number, the deficiency and the correct symbol for the deficiency. It is easy for the AI to concentrate on these major items and overlook the more routine entries; or if they are spotted to just tell the student about them instead of making him correct them. Clearly these "minor" areas need more emphasis.

d. When a task can vary by conditions or situation it is important to practice over the full range of conditions. Naturally with the DA Form 2404 it is impossible to practice every entry that could possibly be made. But the situation when there are no deficiencies or shortcomings noted may be considered so simple that it is not given proper emphasis. Likewise such areas as multiple entries should be practiced.

e. The type of practice may be important in this case. When a driver has a single DA Form 2404 and inspects the vehicle and then returns that single DA Form 2404, he may pay more attention to the detailed entries he must make. In the classroom training situation he has many DA Form 2404s and several different situations. His attention is more likely focused on the printed situation and the information it contains than on information he must produce himself. A chance to practice in a more job-like setting may cause the student to pay more attention to the "routine areas," especially if his DA Form 2404 were corrected and returned to him. Sometimes it's not only the amount of practice but also the practice setting. If a daily maintenance schedule was adopted (as described in the Findings, Item 9, page 18) a fuller range of DA Form 2404 situations might be covered.

2. Load/Unload 25mm Ready Boxes

a. One failure was in identifying ammunition, one in laying the first five rounds, two in hanging the 24th/25th rounds, and four in inspecting ammo.

b. Taking the most common first, there are four errors that the student must identify in two linked belts and some loose 5.56 ammo. It is entirely possible that the student does not follow a systematic procedure in inspecting the ammo and merely overlooks one of the errors. Another possibility is that the student does not recognize the faulty ammunition when he sees it. One is a case of not doing something; the second is not knowing something. In either case it is believed that the contributory cause is the emphasis that the task receives in relation to other tasks as well as the opportunity to apply the knowledge originally taught. The main task being tested here is loading the ready boxes and that is where the instructor and student emphasis is during practice. It is more "important" than ID or inspecting ammo. This could affect student preparation. During training of ammo inspection the systematic approach to inspection did not receive much emphasis. Does the student merely look or should he touch each round? Does he start always from one end of the belt? Should the belt be laid out or should he feed it through his hands? Since the faulty ammunition is fairly obvious once spotted, it is believed the problem lies more in how to inspect rather than what to inspect for. Thus the emphasis for correction here is not in the amount of practice but in insuring a system for inspection is taught in the original class.

c. The three failures in hanging the ammunition may point to both an instructional failure and a problem with the equipment. During one of the 25mm ammo loading classes one of the AIs showed some of the students a method of checking the count by checking the distance between the lowest hanging round and the floor of the ammo box. If this was universally taught it would provide the student who miscounts or is unsure of where to start the count a means of verifying the hanging point. In the area of equipment, the actual IFV ready box has a job performance aid decal on loading the box affixed to it. This decal is not used during training or testing, the argument being that these decals get torn or otherwise obliterated. But the result might be that training conditions are made more difficult than actual job conditions. If the JPA were provided, this would not alter the training but would offer job relevant aids to performance.

d. The single failure in ID ammo is not widespread enough to warrant analysis.

(NOTE: Although the failures in this test were treated collectively for purposes of analysis, the test actually involves three tasks. Because the failures were spread over these three tasks they are not as serious nor as indicative of specific problems as if they were all concentrated on the same task. Taken on a task by task basis, performance did meet the 80% criteria.)

3. Install/Remove M231 FPW

a. Five of the failures were in the task Perform Remedial Action and one was in the area of Perform Immediate Action (both of these being part of Reduce a Stoppage in an M231 FPW).

b. This task was simply not practiced sufficiently against a time criteria. The actions of performing remedial action, performing immediate action and unloading and clearing are all very similar but with some differences. Likewise, while physically similar to the M16, these actions are performed somewhat differently on the M231. A third factor is that there are steps in remedial actions that must be simulated if dummy rounds are not used, thus removing some of the realistic cues and placing greater emphasis on following a set procedure. On balance, confusion probably exists on exactly what is required in this procedure.

c. The procedure needs to be reinforced through practice and the student must be made aware of the fact that the procedures are distinct and involve different steps. Practicing remedial actions with dummy rounds might help reinforce the procedures, but it is likely that this will remain an area of confusion until the soldiers achieve a level of weapon familiarity that may not be achievable during IIM training.

For first time training, the performance deficiencies evidenced in the tasks tested were remarkably few. This does not imply that more widespread or serious problems do not exist in the tasks that were not tested or that the existing tests might not be more discriminating after validation. But the current indications are generally favorable. As the TPE observes when discussing first time training: "No matter the skill of the training developer. No matter the qualifications of the instructors. The first time training is given, it is apt to have many 'bugs' in it. Training is an infant technology and is highly probalistic at best."¹

¹Harliss, J.H., *op. cit.*, pg. 3-63.