U.S. Army Research Institute
for the Behavioral and Social Sciences

Research Report 1498

Measuring and Assessing Technical Training Performance in the Army's Schools and Units: A Survey of Current Methods

Warren R. MacDiarmid
Hays Systems, Inc.

Dee H. Andrews
U.S. Army Research Institute

Betty Mohs
Hays Systems, Inc.

October 1988

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency Under the Jurisdiction of the Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

JON W. BLADES
COL, IN
Commanding

Research accomplished under contract
for the Department of the Army

Hays Systems, Inc.

Technical review by

J. P. Kincaid
Robert E. Solick

NOTICES

DISTRIBUTION: Primary distribution of this report has been made by ARI. Please address correspondence concerning distribution of reports to: U.S. Army Research Institute for the Behavioral and Social Sciences, ATTN: PERI-POX, 5001 Eisenhower Ave., Alexandria, Virginia 22333-5600.

FINAL DISPOSITION: This report may be destroyed when it is no longer needed. Please do not return it to the U.S. Army Research Institute for the Behavioral and Social Sciences.

NOTE: The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS --
2a. SECURITY CLASSIFICATION AUTHORITY --	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE --	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) --	5. MONITORING ORGANIZATION REPORT NUMBER(S) ARI Research Report 1498
6a. NAME OF PERFORMING ORGANIZATION Hay Systems, Inc. / 6b. OFFICE SYMBOL (If applicable) --	7a. NAME OF MONITORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences
6c. ADDRESS (City, State, and ZIP Code) 12424 Research Parkway Suite 250 Orlando, FL 32826	7b. ADDRESS (City, State, and ZIP Code) 5001 Eisenhower Avenue Alexandria, VA 22333-5600
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Project Manager for Training Devices (continued) / 8b. OFFICE SYMBOL (If applicable) --	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER F33657-84-D-2320
8c. ADDRESS (City, State, and ZIP Code) PM TRADE Naval Training Center Orlando, FL 32813 (continued)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. 63743A / PROJECT NO. 794 / TASK NO. 432 / WORK UNIT ACCESSION NO. C1

11. TITLE (Include Security Classification)
Measuring and Assessing Technical Training Performance in the Army's Schools and Units: A Survey of Current Methods

12. PERSONAL AUTHOR(S)
MacDiarmid, Warren R.; Mohs, Betty (Hay Systems); Andrews, Dee H. (ARI)

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 85/09 TO 87/02	1988, October	

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Training Performance Measurement, Survey Methods, Training Performance Assessment, Military Training

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

The objective of this project was to survey some methods in use in the Army's institutions and units to measure individual and collective training performance and determine how the resulting data are used. Six Military Occupation Specialties (MOS) were selected to provide a sample for the survey. Onsite surveys were conducted at the two service schools involved in training soldiers with those six MOS and at units of III Corps to which those soldiers were assigned. In addition to structured interviews, questionnaires were provided to key decision makers (KDM) in the schools to determine their data needs and whether they think those needs are being met. The Army generally develops its institutional training to be responsive to the needs of the units in the field. While there are anomalies in the system, what is trained in the school is, for the most part, what the soldier must do on the job. The performance of the individual soldiers and units is measured routinely and the results of that measurement are used to identify further training requirements. However,

(Continued)

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

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
Dee H. Andrews	(305) 646-5881	PERI-IF

DD Form 1473, JUN 86 *Previous editions are obsolete.* SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

ARI Research Report 1498

8a. NAME OF FUNDING/SPONSORING ORGANIZATION (Continued)

DOD Training and Performance Data Center

8c. ADDRESS (Continued)

Training and Performance Data Center (TPDC)
3280 Progress Drive
Orlando, FL 32826

19. ABSTRACT (Continued)

the performance is generally measured on a qualitative basis and is process not product oriented. For the most part, the resulting data are not used to the fullest extent possible. Moreover, there appears to be a lack of commonality of terms, due in part to the many documents confronting the member of the training community and the imprecision of the definition of various training-related terms in those documents.

Research Report 1498

Measuring and Assessing Technical Training Performance in the Army's Schools and Units: A Survey of Current Methods

Warren R. MacDiarmid
Hays Systems, Inc.

Dee H. Andrews
U.S. Army Research Institute

Betty Mohs
Hays Systems, Inc.

Field Unit at Orlando, Florida
Halim R. Ozkaptan, Chief

Training Research Laboratory
Jack H. Hiller, Director

U.S. Army Research Institute for the Behavioral and Social Sciences
5001 Eisenhower Avenue, Alexandria, Virginia 22333-5600

Office, Deputy Chief of Staff for Personnel
Department of the Army

October 1988

Army Project Number
2Q263743A794

Education and Training

FOREWORD

The Army Research Institute for the Behavioral and Social Sciences (ARI) performs research in technical training performance measurements and assessment (PMA) throughout the Army, both in its training institutions and its units. Of special interest is how the data that are generated as a result of training PMA are used to improve the training within the Army.

This report provides the results of a survey of a sample of six Military Occupational Specialties (MOS). The survey was conducted to determine how the training performance of soldiers with those technical MOS is measured and assessed in both the institution and the unit. The report also provides insight into how the resulting training PMA data are used by the Army's key decision makers to improve training.

The findings of this report confirm those of the 1985 Army Science Board's Summer Study: The Army's system of training PMA is often not providing adequate feedback to the developers of the training systems. Research to examine the problems identified in this report could improve both the performance measurement and training systems. The Army needs a quantifiable method for technical training performance measurement and assessment.

This project was performed under the research task called "Methods for Evaluating Training Systems Effectiveness." The project supports the Orlando Field Unit's mission to develop methods to optimize simulation-based training systems. It supports the Training Research Laboratory's research program by examining the current conduct of training performance measurement and assessment activities in Army schools and operational units. This research had two sponsors. One was the Army's Project Manager for Training Devices (PM TRADE) under a Memorandum of Understanding dated 18 May 1983 entitled, "Establishment of Technical Coordination between ARI and PM TRADE." The other sponsor was the Department of Defense's Training and Performance Data Center (TPDC) under a Memorandum of Agreement entitled, "Army Research Institute Coordination with TPDC" dated 24 April 1985. The Commanding Officer of PM TRADE and the Director of TPDC were briefed on the results of the project in September 1987. The proponents will use the project's findings to design training systems (PM TRADE) and to collect training and performance data.

EDGAR M. JOHNSON
Technical Director

ACKNOWLEDGMENTS

The authors gratefully acknowledge the contributions of a number of personnel who provided invaluable assistance in the design of this effort, the collection of data, and the preparation and review of the draft and final reports. It can truly be said that without their cooperation, this effort would have been immeasurably more difficult, if not impossible.

Dr. Halim Ozkaptan, Chief of the Orlando Field Unit of ARI, Dr. G. Thomas Silicia, Director of the Defense Training and Performance Data Center (TPDC), and Dr. Ronald C. Hofer, Chief of the Operations, Research, and Engineering Division of the Army's Project Manager for Training Devices (PM TRADE) helped to guide the design of the effort and kept the authors focused on objectives most meaningful to the Army. The experience and expertise they provided are most appreciated.

The number of respondents at the U.S. Army Aviation Logistics School, the U.S. Army Armor School, and U.S. Army III Corps who contributed their time and extensive knowledge of training and performance measurement and assessment techniques practiced within their respective arenas is too large to allow for individual recognition. However, special acknowledgment is made to Mr. Andrew Davis of the Aviation Logistics School, Mr. Gary Priest of the Armor School, and BG John R. Bahnsen, Jr., and Major Bobby Bullock of III Corps for their assistance in enabling the authors to meet with the various experts at each of those location.

Major (P) Ronald W. Tarr and Dr. Stephen C. Skiles of TPDC made a most significant contribution to this effort by their painstaking, thorough, and professional review of the draft and final reports.

Finally, the authors extend their thanks to Ms. Cathy Smith, Ms. Carla French, and Ms. Susan Porter of HAY Systems, Inc., for the professionalism they displayed in helping to sort and arrange data and prepare and format the report.

MEASURING AND ASSESSING TECHNICAL TRAINING PERFORMANCE IN THE ARMY'S SCHOOLS AND UNITS: A SURVEY OF CURRENT METHODS

EXECUTIVE SUMMARY

Requirement:

To survey some methods used to measure individual and collective technical training performance in the Army's institutions and units and determine how the resulting data are used.

Procedure:

Six Military Occupational Specialties (MOS) were selected to provide a sample for the survey. Onsite surveys were conducted at the two Service schools involved in training soldiers with those six MOS and at units of III Corps to which those soldiers were assigned. In addition to the structured interviews, questionnaires were provided to key decision makers (KDM) in the schools to determine their data needs and the extent to which those needs are being met. No attempt was made to survey the KDM in units since the KDMs at the schools are responsible for developing the training and training support material used throughout the Army, based in part on the feedback they receive from field units.

In addition, a literature review of recent and current research efforts that address training performance measurements and assessment was done. Current Army documents describing the training performance measurement and assessment (PMA) policies and procedures were also reviewed. The results of the review are published in a separate report entitled "A Review and Annotated Bibliography of Training Performance Measurement and Assessment Literature."

Findings:

The Army generally develops its institutional training to be responsive to the needs of the units in the field. While there are anomalies in the system, training for the most part, directly corresponds to what the soldiers must do on the job. The performance of the individual soldiers and units is measured routinely, and the results of that measurement are used to identify further training requirements. However, performance is generally

measured on a qualitative basis and is processed as opposed to product oriented. For the most part, the resulting data are not used to the fullest. Moreover, there appears to be a lack of commonality of terms, due in part to the many documents confronting the members of the training community and the imprecise definitions of various training-related terms in those documents.

Utilization of Findings:

This paper presents the results of a study based on a relatively small sample of MOS, schools, and units. The report provides a basis for developing more quantitative methods for PMA. The findings can serve as a springboard for further study such as how to improve the flow of feedback information from the Units to the schools and how to improve the training development processes so that the feedback generated from the field is used in the training and training support materials developed by the schools. At the very least, the survey results and the literature review confirm the previous findings of the 1985 Army Science Board's Summer Study that found that the Army's system of training PMA often does not provide the feedback needed by the developers of the training systems. Moreover, the survey calls attention to some lingering problems with Army training and measures performance.

MEASURING AND ASSESSING TECHNICAL TRAINING PERFORMANCE IN THE ARMY'S SCHOOLS AND UNITS: A SURVEY OF CURRENT METHODS

CONTENTS

Page

LIST OF TABLES

Page

LIST OF TABLES (Continued)

LIST OF FIGURES

Measuring and Assessing Technical Training Performance in the Army's Schools and Units: A Survey of Current Methods

OVERVIEW

Operational Problem

In order for the Army's training system to be as responsive to the needs of the Army as possible, it is imperative that there be a means to measure the performance of soldiers and units after training. Performance measurement has been defined as the scoring of trainee proficiency either subjectively (e.g., instructor opinion) or objectively (e.g., automatic computer measurement). (MIL-HDBK-220B.) Performance assessment involves the synthesis of all performance measurement information to assess trainee performance. (MIL-HDBK-220B.) This training performance measurement and assessment has a very important goal--it provides the Army's chain of command with information as to the state of readiness of the Army, as well as indications of possible causes of performance that are less than acceptable. Obviously, not all problems with substandard performance can be traced to inadequate training. But, certainly, training is one of the factors that contributes to readiness in the Army. The training performance measurement and assessment (PMA) system, then, is a primary barometer of how well the Army trains. The question that must constantly be addressed is whether training PMA is contributing to the goal of optimizing the effectiveness of the Army's training system. Recent studies such as the 1982 Defense Science Board and the Summer Study of the 1985 Army Science Board suggest that training PMA is, in fact, not entirely effective in accomplishing the intended goals.

Research Objectives

The objective of the research reported herein is to determine some of the training PMA methodologies in use in the Army's institutions and units and to provide an assessment of how well those methodologies contribute to increased effectiveness of the Army's training systems. An additional area investigated includes how effectively the data and information generated as a result of training PMA are used by the Army's key decision makers to make improvements in the area of training. The term key decision makers in this report is used to describe the officials at the TRADOC schools who are responsible for development of training and training support material used throughout the Army. Specifically, the term applies to the schools' Directors of Training and Doctrine.

Scope

In order to accomplish the research objectives, the Army Research Institute for the Behavioral and Social Sciences (ARI) Orlando Field Unit initiated a study effort to (1) perform an extensive literature search and review; (2) determine how the Army measures performance; (3) determine how the resulting data and information are used to improve Army training; (4) investigate the cost effectiveness of the methodologies used to measure performance; and (5) assess the contribution that training devices and simulators make to the effectiveness of the training PMA system. The second and third tasks are contained in this report. The remaining tasks are addressed in two separate reports entitled "A Review and Annotated Bibliography of Training Performance Measurement and Assessment Literature" and "Training Performance Measurement and Assessment: Techniques for Cost Effectiveness Analysis and Annotated Bibliography."

The effort reported here involved a survey of the methodologies used across six selected MOSs in various training situations both in the school and in the unit. It also entailed an identification of the key decision makers with regard to training in the schools, a determination of their data and information needs, and whether the results of the training PMA methodologies used satisfy those needs. In addition, recent research efforts concerning decision making were reviewed to determine whether other PMA methods might apply to the Army's situation.

SURVEY OF TRAINING PERFORMANCE MEASUREMENT METHODS

The Defense Science Board's (DSB) Summer Study of 1982, as well as the Army Science Board's (ASB) 1985 Summer Study, were critical of the measurement methods used by the Armed Services (in the case of the DSB) and the Army (in the case of the ASB). Specific criticisms pointed to the lack of objective standards to measure human performance and the lack of quantifiable measures of performance as two of the most serious of the shortcomings. Other studies (to be described later in this report) have investigated the training PMA in both the individual and collective training environments; they too found fault with some of the procedures used within the Army to measure performance in order to assess training. In fact, many of these research efforts produced findings that echoed the DSB and ASB Summer Studies. A recurrent theme in many of these studies has been the questionable validity and reliability of the training PMA methods used by the Army. The Army Research Institute (ARI) designed the current effort to explore more fully the problems that had been cited, and to provide a basis for suggesting ways by which training PMA in the Army might be improved. The first task of this effort was designed to address this aspect of the problem.

This task involved two related efforts. The first was a search for and review of previous research efforts that address training performance measurement and assessment (PMA). The second was the survey of training development personnel at a sample of TRADOC schools and trainers and training managers in a sample of FORSCOM units. In addition, survey instruments designed to be completed by decision makers were mailed to all the TRADOC schools. The task was designed to investigate the methods used by the schools and units to measure the training performance of individuals and collectives. The investigation was confined to those training PMA techniques used to support the training missions in both the institutional and unit environments. Specifically excluded were training PMA methods to support other requirements such as readiness reporting, although the distinction between these areas is not always clear.

Methodology

Performance Measurement Matrix. The methodology was designed to look at a small segment of the Army's training environment rather than at the entire universe. Accordingly, six MOSs were selected for inclusion in the study effort. The six MOSs are

19E10 - M60 Armor Crewman
19K10 - M1 Abrams Armor Crewman
63E10 - M1 Abrams Tank System Mechanic
63N10 - M60 A1/A3 Tank System Mechanic
67Y10 - AH1 Attack Helicopter Repairer
6BB10 - Aircraft Powerplant Repairer

These six MOSs were chosen as a result of discussions among the research sponsors. The basis of the discussions and resulting selection was data availability, mix between operator and maintainer MOSs, and cost effectiveness of the data collection process. The six MOSs represent a mix between operator MOSs and maintainer MOSs. Four armor-related MOSs were selected so that the data collection phase of the effort would be more cost effective; since data relating to institutional training of the four armor MOSs could be gathered at one installation--Fort Knox--considerably less coordination and travel would be required than if four different institutions were involved. The aviation maintenance MOSs were selected on the basis that these MOSs might be generalizable to the other Services. Moreover, these two MOSs are trained at one TRADOC school, the Aviation Logistics School at Fort Eustis, making data collection relatively more cost effective. Finally, it was believed that all six of these MOSs could be found at one installation--Fort Hood, Texas--which would again make the collection of data concerning training PMA in units more cost effective.

A matrix (Figure 1) provided the framework for the collection of data concerning training PMA. This data collection took place in the schools (institutions) that train the MOSs selected and in the units to which soldiers with those MOSs are assigned. Along the vertical axis of the matrix are arrayed the six MOSs selected. The horizontal axis is divided into institutional training and unit training. Institutional training is further divided into individual and collective training. Unit training is likewise divided into individual and collective training; in addition, individual training in units is further subdivided into categories of training identified by the U.S. Army Training and Doctrine Command (TRADOC) as discrete elements, to wit: integration training, sustainment training, and enhancement training.

The selection of the categories of individual training in units was to a certain extent arbitrary in light of conflicting guidance contained in a variety of publications. For example, AR 350-1, Army Training, states in part that Individual Training "is taught in units to sustain skills taught in the training base, teach those skills not taught in the training base, and through collective training, prepare the soldier to become a skilled member of his or her unit." TRADOC Regulation 350-7, a Systems Approach to Training, cites the following components of individual training in units; integration, train up, sustainment, transition, merger, and crosstrain. The TRADOC Primer cites the following components of individual training in units: integration training, sustainment training, train-up training, and cross training. In order to keep the matrix as concise and usable as possible, discussions were held with staff officers within the Office of the Deputy Chief of Staff for Training (ODCST) at TRADOC to solicit their views on the meanings of the various categories contained in the publications governing

	INSTITUTION		UNIT				
	INDIV	COLL	INDIVIDUAL			COLLECTIVE	
	AIT / OSUT		Integration (Initial) Training	Sustainment (Refresher) Training	Enhancement Training	Crew/Team Squad Training	Advanced Collective Training
	Individual	Collective					
19E10 M60 Armor Crewman							
19K10 M1 Abrams Armor Crew.							
63E10 M1 Abrams Tank System Mechanic							
63N10 M60A1/A3 Tank System Mechanic							
67Y10 AH1 Attack Helicopter Repairer							
68B10 Aircraft Powerplant Repairer							

Figure 1. Training performance measurement and assessment matrix/study architecture

individual training in units. Based on those discussions, it was decided to group train-up, cross-training, transition training, and merger training into a single category collectively called enhancement training. Accordingly, those three categories were incorporated into the matrix. The definitions of those categories is as follows:

Integration Training: The training a newly-assigned soldier needs before he/she can become a productive member of the unit. This may include task-related training the soldier has already received in the institution or it may involve training not previously received. According to the TRADOC Primer, soldiers in the Active Component (AC) "should be fully integrated within three months of arrival" in the units; those in the Reserve Component (RC), within one year."

Sustainment Training: Training the individual soldier receives to sustain proficiency in skills that have previously been learned, either in the institutional or the unit training environment. The TRADOC Primer states that the "frequency with which it is conducted will vary with individual and collective tasks, the role, location, and personnel fill of the units, as well as the desires of the commander."

Enhancement Training: Training the soldier has not previously been exposed to but which is required as a result of the introduction of new equipment; a change in doctrine, tactics, or procedures; to enable the soldier to perform the duties of other members of his/her unit; or to prepare the soldier for promotion up the career ladder.

The completed matrices, filled with the data gathered from the survey of six MOSS, are exhibited in Appendix D. Each cell of the matrix shows the number of tasks trained and evaluated, the standards that are used, the training PMA methodology employed, and the use of the resulting data by trainers, training managers, and key decision makers. In addition, the completed matrix provides insights to the generalizability of training PMA among the various MOSs, and by extension other similar MOSs, in the various training situations depicted. The cells also provide a convenient means of comparing the survey data among the six surveyed MOSs.

A literature search was conducted employing computer-assisted and manual approaches. The various reports that were accessed and reviewed provided valuable insights into the nature of the problems associated with training PMA. Although the relevant findings and conclusions of these reports are addressed in this report, the detailed results of the literature search are included in a separate report.

Survey. Contact was made with the schools which provide the institutional training for the six MOSs: the Armor School at Fort Knox, KY for MOS 19E10, 10K10, 63E10, and 63N10, and the

Aviation Logistics School at Fort Eustis, VA, for MOS 67Y10 and 68B10. Except for MOS 63E10 and 63N10, these schools are also the proponent for the design of the institutional training. (In those instances, although the Armor School actually presents the instruction and trains the MOS, it is the Ordnance Center and School that develops the curriculum and training materials for the courses.) The two schools involved in the actual training--the Armor School and the Aviation Logistic School--were visited for the purpose of explaining the scope of the study effort and soliciting their support. Personnel contacted during the original visits were Mr. Gary Priest of the Directorate of Training and Doctrine of the Armor School, and Mr. Andy Davis of the Directorate of Training and Doctrine of the Aviation Logistics School.

Following the initial visits to the two schools, arrangements were made to conduct structured interviews with personnel selected by the schools. The schools were requested to select only those personnel who would be likely to have the kinds of information that would be meaningful to the study effort. To this end, a draft survey instrument was provided the schools during the initial visit in order to outline for them the kinds of information being sought. Each school then drew up a list of personnel they believed would be most responsive and made arrangements for those personnel to meet with the survey team during a subsequent visit.

During the subsequent visit to each school, members of the survey team conducted in-depth structured interviews with the respondents identified by the school. The survey instrument used during the interviews is included in Appendix A.

Once the data were collected on institutional training and training PMA, efforts were undertaken to capture similar data at the units to which soldiers with the MOSs under study were subsequently assigned. Because Fort Hood, TX has such a large armor and aviation community, it was selected as the most likely installation for meeting the data needs of the study effort; moreover, if all the MOSs were located at a single installation, it would result in a conservation of travel funds. Accordingly, the Chief of Staff's Office at III Corps and Fort Hood was contacted to determine the feasibility of conducting structured interviews with personnel who would be in the best position to provide the kind of information/data needed. As with the schools, in order to assist the units in making that determination, a draft survey instrument was provided.

III Corps indicated its willingness to participate in the survey, and the Study Group in the Office of the III Corps Chief of Staff arranged for members of the survey team to meet with selected platoon sergeants, platoon leaders and company commanders in units to which the soldiers with the appropriate MOSs were assigned. At the time the MOSs were selected, III Corps had units associated with each of those MOSs; thus the

rationale for selecting these MOSs appeared sound and data were collected during the institutional surveys. However, two weeks prior to the arrival of the survey team at Fort Hood, the last of the M60 tank battalions were reorganized as M1 Abrams battalions, and it was no longer possible to interview the supervisors of MOS 19E10 and 63N10 soldiers. This development notwithstanding, discussions between the research staff and the contract officer's technical representative (COTR) resulted in the decision to keep the two M60-related MOSs in the data collection matrix even though data concerning the training performance measurement of those two MOSs in the unit environment would not be available. The rationale for this decision was that valuable information concerning performance measurement in the institution had been gathered and should not be discarded. There was also some discussion as to the viability of expanding the survey to include other units that still had M-60 tanks in their inventory. However, given the extensive lead time required to arrange surveys in the Army's field units, this idea was rejected.

Arrangements for the data collection trip to Fort Hood were made and structured interviews were conducted. The survey instrument used during these interviews is provided at Appendix B. Following preliminary analysis of the type and amount of data generated as a result of the initial survey, the COTR decided to expand the sample thereby increasing the amount of data on which the findings and conclusions of the report would be based. This preliminary analysis also provided greater insight as to the type of knowledge the respondents could reasonably be expected to have. In light of this, the questionnaire was changed slightly, eliminating some of the questions in the first and modifying some others. (This second questionnaire is provided at Appendix C.) In order not to invalidate the results from the first questionnaire, the data from both were pooled to the extent possible.

Additional information relative to the perceived effectiveness of the Army's PMA system in influencing the development of training programs was solicited from a variety of other agencies with responsibilities in training and performance measurement during the study. These agencies generally have a broader perspective of the PMA methods used across units, schools, and MOSs although the level of detail is not as great. The impressions resulting from discussions with officials at these agencies are generally in accord with the results of the surveys conducted at the two schools and the units of III Corps. The agencies contacted included the Army Training Board (ATB) and the Office of the Deputy Chief of Staff Training (ODCST) of the Army Training and Doctrine Command (TRADOC) at Fort Monroe, Virginia; the TRADOC Systems Analysis Agency (TRASANA) at White Sands Missile Range, New Mexico; the Combined Arms Training Activity (CATA) at Fort Leavenworth, Kansas; the Florida National Guard at St. Augustine, Florida; and Readiness Group Redstone, at Redstone Arsenal, Alabama.

Following the collection of data generated as a result of the literature review, the interviews conducted in the schools and units, and the discussions held with officials at the agencies mentioned in the preceding paragraph, the data were reduced and analyzed. These data have been used in formulating the results and findings of this section of the report.

Results/Findings

The following is a discussion of the results of the survey of training PMA as it is practiced in the Army. It was developed from the interviews with respondents at the Armor School, Aviation Logistics School, and units of III Corps. The respondents at the two schools were military and civilian officials involved in the analysis and design of the training programs used for training individual soldiers in the institutional environment and preparing the material used to support individual and collective training in the units. The respondents in the III Corps units were officers and non-commissioned officers involved in individual and collective training in the unit environment; without exception they held leadership positions at the platoon, company and battalion level. The survey sample does not permit ready generalizations across all MOSs, schools, and units. The validation of these findings, to an acceptable degree of confidence, would therefore require further research. However, it would appear from discussions with survey respondents and officials at the various source agencies, including those discussed in the preceding section, that a reasonably strong inference can be made that similar findings would be likely in most, if not all, of the MOSs involved in this study effort. The survey validated the findings of the literature review.

In the interests of brevity, this section presents only an overview of the pertinent findings and conclusions of the school/unit survey. The reader wishing to read the details of the survey and the rationale for arriving at the various findings/conclusions is referred to Appendix D of this report. The literature that was accessed and reviewed is addressed in a separate report.

Quantification of Performance Measurement Results. Although the previously-referenced Army Science Board's Summer Study of 1985 cited a need to increase quantification of training objectives, tasks, and measurement programs, to include data on skill retention and learning rates, there appears to have been little progress made to accomplish this. For the most part, the Army uses qualitative criteria to assess the effectiveness of its individual and collective training programs. As a result, the reliability of the data resulting from training performance measurement in the Army is in some cases questionable, and the most frequently cited weaknesses of the measurement system appear to remain.

Relationship of Tasks Trained to Job/Mission Requirements. Although pertinent regulations such as TRADOC Regulation 350-7, A Systems Approach to Training, require that tasks trained in the institution be developed based on an analysis of the individual and collective missions and tasks required in the job environment, there are indications that this is not being accomplished in accordance with established policy. The collective front-end analysis (CFEA) is designed to analyze a particular unit's mission and from that develop the collective and individual tasks, skills and knowledges that will allow for mission accomplishment. Discrepancies between institutional Programs of Instruction and the pertinent soldier's manual suggest that there is a disconnect between what is trained in the school and what is required of the soldier on the job. This apparent disconnect is supported by an article by senior officials at TRADOC (Duncan & Hartjen, 1985) in which the authors indicate that front-end analyses are not being conducted in accordance with policy guidelines in TRADOC Reg 350-7.

Process vs. Product Orientation. The Army, in its approach to measuring individual training performance, orients almost exclusively on the 'process' involved in task performance as opposed to the 'product.' While there is evidence to support the use of such 'process' orientation in an institutional training environment, especially where entry level training is being conducted, the research suggests that its extensive use in a unit training environment may be a questionable practice. This notwithstanding, the survey respondents indicated that, as a general rule, individual performance measurement in the unit training environment is process rather than product oriented. In both institutional and unit training, individual task training PMA is generally based on either the soldier's manual or a technical manual. These documents stress the procedures the soldier must follow in order to get a GO on the overall task. None of the survey respondents indicate that product-oriented training PMA is extensively used.

With respect to collective training in units, there is a greater tendency to focus on the product rather than the process. Survey respondents, especially those involved with armor crew training, note that in many cases process is less important than product. The most often cited example was in gunnery training, in which the respondents indicate that the important performance criterion is putting steel on the target rather than the gunnery procedures per se.

Criterion- vs. Norm-Referenced PMA. Criterion-referenced PMA compares the trainee's performance to a pre-established standard. The performance of a trainee's fellow trainees does not affect the rating of his performance under a criterion-referenced approach. Conversely, under a norm-referenced PMA strategy the trainee's performance rating is based upon the performance of his peers. The standard for an acceptable PMA rating for the trainee is based upon how well the top performers in his training class

do. There is virtually no norm-referenced training PMA being used in the various training programs for skill level 1 soldiers of the six surveyed MOSs. What little norm-referenced training PMA there is, is confined to the schools, and even in that environment it amounts to only a small percentage. In all instances of norm-referenced measurement, written tests are involved; 70% is generally the passing grade. The use of written tests, and norm-referenced training PMA, appears to be limited to subjects dealing with filling out forms and records.

Use of Feedback Data. Although the survey respondents without exception acknowledged the importance of the feedback loop between the units in the field and the TRADOC schools responsible for providing trained soldiers and training support material to the field units, there appears to be a breakdown in the Army's ability to make that loop effective. While it is true that TRADOC mandates that schools be proactive in accessing performance measurement data generated in the unit training environment, none of the survey respondents in the units have had any direct contact with representatives of the school having proponency for the type unit to which they are assigned. It is recognized that, due to the limited number of respondents surveyed during this effort, the conclusions drawn may be the result of sampling error. On the other hand, if the survey results are in fact valid and generalizable to other MOSs, this constitutes a potentially serious problem for the Army, since the effectiveness of the Systems Approach to Training (SAT) depends on the maintenance of an effective channel of communication between the units for which training and training support material is developed and the TRADOC school doing the development.

Lack of Standardized Terminology. While less serious perhaps than the problems discussed above, the authors noted that communication regarding training and training performance measurement is hampered by a lack of clear definitions of the terms used by those involved in the training and training development communities. Terms used in the TRADOC schools are often misunderstood by trainers in the units; on other instances, trainers in the units use terms that are different from terms used in TRADOC's training support materials. In addition, there are too many terms used, resulting in confusion on the part of many involved in the training process. This lack of a common terminology is seen as contributing to the lack of communication between TRADOC and the users of its products.

Discussion

The findings outlined above lead to some obvious conclusions. These are discussed below, and generally reflect the opinions of the authors.

Despite problems that exist within the Army with regard to the measurement of performance--problems that have been addressed

in detail in the Army Science Board's 1985 Summer Study--the Army would appear to be making some progress in coming to grips with the deficiencies of the system. Despite the gains made, there are areas in which much more progress needs to be made. Some of these are addresed below:

Reliability and Validity. Although very little hard data were available to the researchers to make assessments of the reliability and validity of the training PMA methodologies currently in use and the resulting data, the survey respondents were asked to provide their own assessments with regard to those areas. There were few differences between the respondents in the school and those in the units. Generally, these respondents believed that the methodologies used to evaluate individual performance were valid and evaluated what they were intended to. Moreover, they believed that the results obtained from different iterations of an evaluation were generally consistent over time. In the absence of statistical data, however, these assessments must be viewed with a certain amount of caution, since in many cases the researchers had to provide definitions of the terms before the respondents could answer. It may be said then that, to the extent the methodologies and data were claimed to be reliable and valid, the respondents could only provide indications of face reliability and validity.

The authors believe that, given the fact that many of the product-oriented standards used in the Army's current training materials are qualitative and too subjective, a situation that numerous research efforts (e.g., Havron & McFarling, 1979; Hayes & Wallis, 1979) have reported on, an argument can be made that reliability generally increases the more the methodology is process-oriented. Thus, although a product-oriented approach has advantages, there could be unacceptable tradeoffs in terms of reliability were the Army to adopt a more product-oriented approach.

Process vs. Product. The Army's concentration on process oriented PMA is to a certain extent a philosophical issue and possibly reflects the personal inclinations of the TRADOC Commander. When criterion-referenced training was first being introduced to the TRADOC school system in the early 1970s, the Commanding General of TRADOC encouraged school commandants to provide standards that focused on whether a soldier met the particular criteria and not whether he performed all of the procedural steps along the way. In the case of the boresighting example discussed in detail in Appendix D, a soldier would receive a GO if the evaluator determined that the center of the barrel and the center of the infinity sight reticle were in fact on the same aiming point. The soldier's ability to perform the intervening steps was assumed if he met the standard. Obviously, if the soldier failed to align the barrel and the sight reticle as established in the standard, there had to be a basis for critiquing the failure and explaining to the soldier why he failed. Thus, even while TRADOC was emphasizing product, a

certain degree of process-orientation was evident in the training PMA system being developed by TRADOC schools.

In the authors' opinion, the concentration on "process," especially in the unit training environment, is a questionable practice. Given the fact that it is more costly (in terms of time required and number of evaluators required) to evaluate process as opposed to product, it probably would make better sense to measure training performance in terms of the ability of the soldier or unit to meet the performance standard rather than evaluate how the standard was met.

Criterion-Referenced PMA. There is no margin for error in the institutional training environment for those subject areas that are measured using the criterion-referenced approach. Not only must the students pass each procedure in a task to get a GO on the entire task, they must get a GO on every task in order to complete the course. The two schools involved in the survey have policies which require that if a soldier gets a NO GO on a task the first time his performance is measured, he receives additional training, often one-on-one with the instructor, until he can perform to standard. According to most of the survey respondents, if this intensive remedial training fails to produce a soldier who can perform the task, the soldier is reclassified to another MOS in which the he/she can perform or is boarded out of the Army. These actions however are taken only as a last resort.

Uses of Performance Measurement Data. Data generated as a result of training PMA are used in a variety of ways. In the institutional setting, they are used to determine whether the student is able to perform a particular task to the prescribed standard and whether remedial training is called for. They are also used to provide indications of the effectiveness of the instruction. For example, at the Armor school if there is a 20% or higher failure rate on a particular task, the Department of Evaluation and Standardization is required to investigate the reasons for that high rate. While some of the survey respondents indicate that data concerning first attempts at task accomplishment are captured and used as a quality control check, other respondents state that those data are generally not available.

In the unit training environment, individual task training PMA data are also used to determine if the soldier meets the prescribed standard of performance. The determination is used by the unit's trainers and training managers to make decisions as to future training requirements, i.e., whether to conduct remedial training or to move on to training on other tasks. The data are also used by the command structure to infer the effectiveness of the unit's individual training program. Finally, the training PMA data generated from the administration of the skill qualification tests are used for various personnel actions, such as promotion, reclassification, reassignment, and board actions.

With regard to collective task training PMA, data are collected and used to evaluate the unit's ability to accomplish its wartime and contingency missions and to infer the effectiveness of the unit's collective training program. In addition, the data are used to feed the readiness reporting system, a system that is used by commanders and staffs at higher levels of command.

Recommendations

While performance measurement data is almost universally recognized as being extremely important to improving the training conducted within the Army's schools and units, there does not appear to be any comprehensive system for ensuring that those data are used to accomplish that goal. Specifically, research is needed--and the results of the research analyzed and acted on--in the following areas:

Methods of enhancing the objectivity of performance measurement, either through increased quantification of the measurement system, improved standards or both.

Methods for improving the linkage between what the soldiers must do on the job (individually and as part of a unit) and what they are trained to do in both the institutional and unit training environments.

Identification/selection of areas or domains where process-oriented vs. product oriented PMA should be employed.

Identification of the most cost-effective means for ensuring that data resulting from PMA, whether in the institution or unit, are used to influence changes to the training received by soldiers and units.

Analysis of the extent to which all of the procedural steps included in training support material--and which are subject to performance measurement--are in fact necessary for job/mission accomplishment.

Analysis of the extent of confusion resulting from the large number of often contradictory regulations governing training and PMA.

Methods for improving the reliability and validity of the PMA system throughout the Army.

KEY DECISION MAKER SURVEY

The preceding sections of this report (and a separate report devoted to the literature review) have described the general state of the art of performance measurement and assessment (PMA). Methods by which it is currently addressed in today's Army were also explored.

The state of the art survey did not reveal any literature which addressed Army Key Decision Maker (KDM) performance measurement and assessment concerns. This void makes it difficult to draw conclusions about the effectiveness of the Army's current system. How can we know if the PMA systems meet Army requirements if we don't know what those requirements are?

The 1985 Army Science Board's findings addressed this problem of KDMs and training PMA in training. The Board stated that, "measurement of training is necessary to provide: feedback to trainers and training designers, and Return on Investment information to senior managers to guide expenditure of Army training resources." (p. 29). These `trainers' and `senior managers' are those identified as KDMs in this study. In order to keep the study focused as much as possible on training, the KDMs surveyed were those who manage the Directorates of Training and Doctrine at the major Army schools.

To fill the information void about KDMs described above, a methodology was devised for determining their PMA requirements. Key questions addressed were:

- Who are the KDMs in the Army's schools, with regard to training PMA?
- What are their key information requirements?
- Are they currently receiving the information necessary to satisfy their requirements?
- Is the information in qualitative or quantitative form? (A major concern of the 1985 Army Science Board.)
- Which information is most and least useful for the decisions the KDMs have to make?

Methodology

The methodology adapted for the survey combined elements of Policy Capturing Analysis (Madden, 1963) with elements of Policy Implications Analysis (Madey and Stenner, 1981) and the Delphi Technique (Dalkey, 1969). These techniques are used by management analysts, industrial-organizational psychologists, and evaluation specialists to determine critical aspects of policy development and information use by KDMs.

An abbreviated form of the methodologies described above was adapted for the KDM survey for two reasons. First, those methods described above are primarily intended to aid analysts in predicting future actions of managers and experts in policy making questions. This study was done for descriptive, rather than predictive purposes. The intent was to capture current concerns and interests of KDMs, while identifying training PMA issues for further study. The methodologies were also modified to reduce the time demands on respondents. Initial contacts with some of the respondents indicated that their schedules were extremely tight. The researchers determined that administration of the more formal methodologies may not have resulted in an adequate response rate had the respondents felt too much time was required.

Two questionnaires were developed. The first (Appendix E) was intended to query KDMs about their training PMA information needs. The questionnaire was sent out to twenty-three schools within the Army, of which nine responded. In the second questionnaire (Appendix F) consensus responses were developed for the key PMA items explored in the first questionnaire. Again, to obtain the highest response rate possible, and in the interest of the respondents' time, the instrument was kept brief. The instructions asked that the Director of Training and Doctrine (DOTD) complete the questionnaire. The goal of the consensus instrument was to have individuals respond who are truly KDMs. The results of the first inquiry had shown that the DOTD were considered, by all schools responding, to be the KDMs. A copy of the first questionnaire was included in the mailing of the second so that any new respondents could understand the context of the study. Eleven second round responses were received from the schools which participated. Included in this response were three major integrating centers: Combined Arms Center, Logistics Center, and Soldier Support Center.

Results/Findings

This section is organized around the two questionnaires which were used to collect data from the KDMs. Tables are provided for the results of each question. The first question from the first questionnaire asked the respondents, "Who, at the school, makes decisions on training performance measurement and assessment?" Every response indicated that the Director of Training and Doctrine makes these decisions. There also were a few responses which mentioned the Director of Evaluation and Standardization as an additional decision maker.

Table 1 shows the results of the second question from the first questionnaire. This question was intended to show how much impact the KDMs have on PMA issues.

TABLE 1. Effect of KDM decisions.

Question 2. How often do the KDM's decisions affect the following?

Note: The responses, in some cases, exceed the number of questionnaires returned, because some respondents gave more than one answer.

	Never	Seldom	Sometimes	Generally	Always
a. What is measured			3	6	1
b. When to measure		1	1	7	1
c. How to measure		2	2	4	2
d. What training devices are used to measure	1		5	2	1

It was important to determine exactly which PMA information was important and necessary for the KDMs to make their decisions. Table 2 shows the respondents' reactions to the need for, and availability of, certain types of PMA data. Table 3 displays the respondents' self-generated responses to an open-ended question about the additional types of PMA data which were needed by the KDMS.

TABLE 2. Type of PMA data required/received (close-ended question).

Question 3a. What kind of information does the KDM need/get to make decisions?

	Need this data?		Get this data?		Quantitative* or Qualitative?	
	YES	NO	YES	NO	QUAL	QUAN
1. Feedback from Active Units	9	0	8	1	9	5
2. Training Effectiveness Data (from the Institution)	9	0	7	2	6	6
3. Feedback from Instructors	9	0	7	2	7	1
4. Training Device Effectiveness Data	4	3	3	5	3	3
5. Cost Effectiveness Data	4	4	1	7	0	1
6. Dept. of Evaluation and Standardization	8	1	6	1	7	6
7. End of Cycle Test Results (from the Institution)	8	1	8	1	2	8
8. Test Validity and Reliability Data	7	2	5	3	4	3
9. Knowledge of Learning Rates	6	2	1	7	1	1
10. Skill and Qualification Test Results	7	1	7	1	4	7

* Where responses exceed the number of respondents (9), some respondents indicated that they received both quantitative and qualitative types of data.

TABLE 3. Type of PMA data required/received (open-ended question).

Question 3b. If the KDM needs other information not listed above, then list other types of data and indicate if the KDM gets this data by placing a check mark under the "YES" or "NO" column.

Other data needed	GETS THIS DATA YES	NO
1. Media Effectiveness	X	
2. Skill Perishability		X
3. Resource Constraints (e.g., vehicle, land, fuel, ammo, spare parts availability)	X	
4. Feedback from Reserve Units	X	
5. Field Returnee Reports		X
6. Learning Decay		X
7. Training Validation Data		X
8. Job Performance Data		X

Table 4 displays the respondents estimations about which sources of PMA data are most important. The average rank and standard deviation for each source are calculated.

TABLE 4. Most important sources of PMA data.

Question 4. Please indicate how important you believe the data selected for questions 3a. and 3b. are when decisions are made about training measurement and assessment. First, SELECT 10 types of data you believe are most important when making decisions. Second, RANK ORDER your selections. Let 1 indicate "very important" and 10 indicate "least important" of those selected.

Selection	Average Rank	Standard Deviation
End of Cycle Test Results (From the Institution)	1.7	.8
Feedback from Active Units	2.2	1.9
Department of Evaluation and Standardization Data	2.3	1.0
Test Validity/Reliability Data	3.2	1.3
Feedback from Instructors	3.8	2.2
Training Device Effectiveness Data	4.0	1.4
Skill and Qualification Test Results	4.4	2.1
Knowledge of Learning Rates	5.0	2.0
Cost Effectiveness Data	5.3	2.6
Training Effectiveness Data (From the Institution)	5.8	2.8

In addition to the selections shown above, some respondents ranked additional items (see 3b. above). These items are not included in the table above because each received only one response.

The second questionnaire presented to the KDMs (DOTD) consensus statements about the results of the first questionnaire. The intent was to check the reliability of the findings from the first questionnaire and to allow the KDMs to address additional areas of PMA when they so wished. Tables 5 through 11 display responses to each of the six questions.

TABLE 5. Key decision makers at the school.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 1. Who at the school makes decisions on training measurement and assessment?	DOTD/DOES	9	2

Rationale of those who did not agree with the consensus:

1. Under school Model 83, the training departments take the lead for design, development, and implementation. Therefore, many "measurement" action are theirs.

2. DOTD/DOES play a major role, however do not forget the AC/CG input. They drive the train.

TABLE 6. Impact of performance measurement and assessment decisions.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 2a. How often do your decisions affect WHAT performance is measured?	Generally	9	2

Rationale of those who did not agree with the consensus:

1. Again, it goes back to the Commanding General.
2. "What" is a subject matter decision and is determined by the school director.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 2b. How often do your decisions affect WHEN to measure performance?	Generally	10	1

TABLE 6. Impact of performance measurement and assessment decisions (continued).

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 2c. How often do your decisions affect HOW to measure performance?	Generally	10	1

Rationale of the respondent who did not agree with the consensus:

1. The subject matter expert has the greatest measurement input.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 2d. How often do your decisions affect what TRAINING DEVICES are used to measure performance?	Sometimes	7	4

Rationales of those who did not agree with the consensus:

1. Although the answer is presently "sometimes," it will soon change to "nearly always" as the emphasis on training devices increases.

2. No one examines an alternate answer to training devices, such as computer-based instruction.

3. Probably more frequently than "sometimes."

TABLE 7. PMA information required for decision making.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 3a.* What kind of information do you need to make your decisions?	Feedback from Units	8	3

Rationale of those who did not agree with the consensus:

1. Too much valuable time is lost evaluating and replying to field suggestions that are clearly worthless.

2. The units have a very narrow view. They are only concerned with what's best for their specific units.

3. No two units are managed the same, therefore doctrine is seldom implemented as intended. Feedback data in 99.99% of the cases is a compilation of opinions in different environments.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 3a. What kind of information do you need to make your decision?	Training Effectiveness Data	10	1

Rationale from the respondent who did not agree with the consensus:

1. Such feedback is just not included in the instruction or evaluation at our school.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 3a. What kind of information do you need to make your decisions?	Feedback from Students	10	1

* NOTE: Question 3a was repeated three times because the results of the first questionnaire showed these three types of information to be highly rated by the respondents.

TABLE 8. Qualitative vs. quantitative PMA.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 4. Is the information qualitative or quantitative?	Qualitative	7	2

Rationale of those who did not agree with the consensus:

1. We use both types extensively.

2. Although we presently use primarily qualitative data, we are attempting to use more quantitative sources to meet the goal of presenting our case more effectively to the Department of the Army and Congress.

TABLE 9. Most important PMA data.

	Consensus from first Questionnaire	Do you agree with Consensus? YES	NO
Question 5. What type of data is most important when making decisions on training and assessment?	Feedback from active units and end-of-cycle tests in the institutions	8	3

Rationales of those who did not agree with the consensus:

1. End-of-cycle test yes, but feedback from active units is in some cases diametrically opposed to data from other units.

2. We must include the Reserve Component in our decision process. They are of primary importance.

3. Our two most important sources of information are the units and feedback from our (the school's) field units.

TABLE 10. Least important PMA data.

	Consensus from first Questionnaire	Do you agree with Consensus?	
		YES	NO
Question 6. What type of data is least important when making decisions on training measurement and assessment?	Training Effectiveness Data	6	3

Rationale of those who did not agree with the consensus:

1. I believe training effectiveness data is most important, followed by unit feedback.

2. Our least effective source is the students while attending the course. They are just too focused on "how well" they are doing vs. any objective look at their performance against a criterion.

Discussion

Although this portion of the study did not derive data from every Key Decision Maker (KDM) in the Army schools, it did access information from a good percentage (39% of the schools for the first questionnaire and 48% for the second). It explored an area of training PMA which has apparently not been previously examined. It allowed the researchers to gain some understanding about PMA information requirements and uses. Perhaps most importantly it revealed a number of PMA issues which should be more closely examined in future research.

In general, the results of the second questionnaire validated the first. There are two possible exceptions to that statement. The first questionnaire revealed that the KDMs did not view information about training device effectiveness as being particularly important. However, certain responses on the second instrument gave indication that a number of the KDMs are, beginning at least, to value the PMA information which can be provided by the training device.

One of the problems with past and present training devices has been their confusing and complicated PMA systems, for those devices which have such systems. The instructors are usually inundated with PMA data since digitally based devices can record every possible trainee and instructor action. This "ocean" of data usually overwhelms the instructor and is often not used for that reason. As this problem becomes better understood, PMA systems are beginning to be designed more often with the user and KDMs in mind. It is perhaps for this reason that the KDMs who responded to the second questionnaire showed more interest in

Training Device Effectiveness data than was evident in the first response. It is important to note here that the set of respondents for the second instrument was not identical to the set that responded to the first questionnaire.

The second questionnaire results were less unanimous about the importance of Feedback from Active Units as a PMA data source. There were indications that some KDMs felt the units were too narrowly focused on the units' specific concerns to provide valid feedback data. In other words, such data may be so biased that it is of little use to a KDM who must train individuals for all of the Army. It is possible that the data might be more useful if the units received instruction about the PMA needs of the schools and were given structured interviews/questionnaires that specifically addressed the feedback needs of the school.

The survey revealed that the KDMs need information about Cost-Effectiveness Data and Trainee Learning Rates. However, it is clear that the KDMs do not receive this information on a regular basis. Cost-effectiveness data can help KDMs to determine whether the Army is getting the best training outcome for its training resource investment. It can also aid in obtaining additional resources, if required, by quantitatively showing potential sponsors quantitative areas of strength and weakness in the training program.

However, such cost-effectiveness data is obviously difficult to obtain. It requires a firm, quantitative understanding of both the resource input and the learning outcome of a training program. Quantifying resource inputs is difficult in the military because many costs are indirectly charged to the training program. For example, while we can calculate the cost of training an instructor for school duty, it is nearly impossible to determine the lost cost benefit of not having that instructor in a combat unit.

In like manner, it is often not possible to quantitatively determine the learning outcome of a training program. Our measurement techniques are still developing and it is clear, as evidenced by the responses to the questionnaires, that KDMs are not receiving enough of this information. The end result is a general quandary about the cost effectiveness of training programs. Managers would like this PMA data but it is not forthcoming.

Data about the learning rates of trainees can help KDMs answer such questions as:

- Is this group of trainees learning as quickly as previous trainees?
- Based upon their learning rate can we cut the length of a course? Do we need to lengthen the course?

- Should remediation sessions be made available to trainees based upon their slower than average learning rates?

To the degree that quantitative learning data is not provided to KDMs they will have to rely mainly on instructor feedback. Certainly such feedback is valuable, but it is always prone to bias and thus becomes less valuable than if it were paired with quantitative learning rate data.

The difficulty in measuring training outcomes, as mentioned above, is largely responsible for the seemingly contradictory finding about the need for Training Effectiveness Data. When asked about their need for such data, the KDMs unanimously responded that it was needed. However, when they were asked to rank order the importance of various PMA sources, Training Effectiveness Data was ranked last. This discrepancy is likely due, again, to the difficulty in obtaining valid Training Effectiveness Data. For example, the survey showed that 79% of the respondents received this type of data and yet they still ranked it as least important of all the PMA sources. Such a finding can be interpreted as a non-vote of confidence for the efficacy of the Training Effectiveness Data which is presently being generated.

Another seeming anomalous finding, concerns the importance of Feedback from Instructors as a PMA data source. The KDMs unanimously stated that such feedback is needed. Yet, such data was only ranked fifth out of ten when compared to other PMA sources. This may be yet another indication that KDMs value instructor feedback but in absence of quantitative Training Effectiveness Data as a cross-check, the KDMs tend to often look elsewhere for valid PMA information.

One final area of discussion. The 1985 Army Science Board made a strong point about the need for quantitative PMA data. The concept is that significant increases in training effectiveness can only come about as we are better able to measure where the training systems have come from, where they are now, and where they are going. The findings of this survey tend to support the ASB's recommendation that more quantitative data is required. The ASB's contention that quantitative data is generally unavailable is not supported however by one finding. The KDMs indicated that the PMA data they have access to is at least as much quantitative in nature as it is qualitative. The one exception is in the area of Feedback from Instructors, which was discussed above as being a problematic data source.

It is entirely possible that the KDMs and the ASB are defining qualitative and quantitative data differently. It is not clear in the ASB study how the Board defines the terms. The researchers in this study did not ask the respondents for their definitions, although such additional information would be helpful. Despite these definitional issues, it appears that the

true amount and type of quantitative PMA data which exists in the Army's training systems should be a continuing source of study.

Recommendations

This brief survey has shown that KDMs in Army schools do not, in many cases, receive the type of PMA data they feel they require. Future research should continue to define the types of data required. Effective methods should be developed for gathering such data. This survey topic should also be examined with other KDMs not directly associated with the daily operation of the schools (e.g., Training Doctrine Command (TRADOC), Deputy Chief of Staff for Operations and Plans (DCSOPS), Deputy Chief of Staff for Perscnnel (DCSPER), US Forces General Command (FORSCOM, US Army Europe (7th Army) (USAREUR), Department of Army (DA), Department of Defense (DoD, and Congress). Each of these agencies and organizations has their own PMA information needs, but the literature this study has examined has not revealed any information about those needs. Detailed techniques such as Policy Capturing and Policy Implications Analysis could help those interested in improving Army training to describe the present PMA information needs and uses of and by school KDMs. They also could help predict what data would be of most use. In turn, those techniques applied to non-school organizations would predict their future PMA information needs. As our technologies and capability for gathering PMA data increase, such information about KDM needs is vital.

SUMMARY

There is much good in the Army's way of training and measuring performance. Although there are undoubtedly perturbations in the system, performance is generally derived from the unit's mission and the job requirements of the individual soldiers. For the most part, the training PMA is based on job or mission related criteria and is performance-oriented. In addition, training PMA data are used to make decisions on additional training required in all the various training environments. Finally, there is an awareness of the importance of, if not a method of accomplishment, for making performance standards as objective as possible. If the personnel who were interviewed as part of this survey are in fact a representative sample of the individuals who develop, conduct and supervise the Army's training, then the Army's training system is in the hands of some very competent and dedicated people.

On the negative side, there appears to have been little progress made in remedying the problems noted during the Army Science Board's 1985 Summer Study. In very general terms, the authors have concluded that the Army has achieved little, if any, success at developing an integrated and cohesive system for measuring training performance and using the results to improve the training of its individuals and units. Obviously there are probably exceptions to that generalization; no conclusive evidence, however, was observed to suggest that the assumption is not valid.

There were several specific problems revealed during the study effort. For instance, there is still a great deal of reliance on subjective measures of performance. Evaluators are called on to measure performance against standards which require the evaluator to make judgment calls on the adequacy of the performance. This appears to be especially true in the area of collective training, although there are similar instances in the individual training environment.

The validity and reliability of the training PMA system is likewise open to criticism. Philosophically, the Army seems not to have made a decision as to how best to evaluate performance. A lingering problem is whether performance should be measured in a rigid, tightly controlled and scenario-driven environment, thereby achieving a higher degree of reliability while sacrificing some realism, or whether performance should be measured in an unstructured or non-standardized manner, thus increasing realism while sacrificing reliability. Moreover, there is evidence to suggest that mechanisms which would optimize the validity of the training PMA methodologies either are not available, are misunderstood by trainers and training developers, or are not being used.

The question of process versus product orientation as it applies to training PMA is a perplexing one. While a process orientation is important in initial training, and is arguably important in instances where the training PMA system is being used to provide a diagnostic function, it may be less than ideal in other circumstances. Since training PMA systems that are process-oriented are by their nature costly in terms of evaluator time, they tend to be inefficient. This leads inevitably to the conclusion that the training PMA system used within the Army could be made more efficient, if not more effective, if product-orientation methodologies were applied in the appropriate settings.

Finally, there seems to be a problem with communication in the training and training PMA arenas. To a certain extent, this may be the result of the plethora of publications to which trainers, training managers, and training developers must refer. For instance, trainers and training managers in a unit are faced with soldier's manuals, trainer's guides, job books, field manuals, technical manuals, unit Standard Operating Procedures (SOPs), and ARTEPs, all of which may contain information pertaining to individual and collective tasks and/or standards. Compounding the problem is the variety of training terms, many of them contradictory, contained in Army training publications. There is abundant evidence that terms such as quantitative versus qualitative training PMA, individual versus collective tasks, and the variety of terms used to categorize training (individual, collective, institutional, unit, integration, initial entry, sustainment, refresher, train-up, cross-training, and enhancement) are confusing to those who develop and implement training throughout the Army. In order for training and training PMA to improve significantly, the Army needs to insure that the terminology used is understood by all who are involved.

Future research efforts should be pursued to help alleviate the problems mentioned above. Some of these efforts might include: studies to determine the potential benefits of greater utilization of a product-oriented performance measurement system; studies on the potential advantages of using quantitative measures of performance in lieu of qualitative measures; methods for providing key decision makers necessary training PMA information; and studies to determine methods for improving the flow of performance measurement data between the schools and units. Each of these study efforts would provide the Army with insights into how to proceed to overcome problems surfaced during previous studies, such as the Army Science Board's Summer Study of 1985. There are problems which this effort found are still unresolved.

REFERENCES

Allen, T., Johnson, E., Wheaton, G., Knerr, C., & Boycan, G. (1982). Methods of evaluating tank platoon battle run performance: Design guidelines (ARI Technical Report 569; ADA 131969). Alexandria, VA: Army Research Institute.

Duncan, C.S., & Hartjen, R.C. (1985). Improving the training approach. Armor Magazine. March 1985. Ft. Knox, KY: US Army Armor Center.

Dalkey, N.C. (1969). The Delphi Method: An Experimental Study of Group Opinion. Rand Corporation, Santa Monica, CA.

Havron, M., & McFarling, L. (1979). Improved ARTEP methods for unit evaluation. Volume VI: Conventional ARTEP missions and engage (NPRDC Technical Report 86-8). San Diego: Navy Personnel Research and Development Center. (AD A162 931)

Hayes, J.F., & Wallis, M.R. (1979). Initial ARTEP validation results: 1974-1975 (ARI Research Note 79-22). Alexandria, VA: Army Research Institute. (AD A077 177)

Madden, J.M. (1963) An application to job evaluation of a policy capturing model for analyzing individual and group judgements. Report PRL-TDR-63-15, Personnel Research Laboratory, Aerospace Medical Division, Lackland AFB, TX, May 1963.

Madey, D, & Stenner, J. (1980). Policy implications analysis: A method for improving policy research and evaluation, Sage Publications: San Diego, CA.

ACRONYMS

ARI	Army Research Institute for the Behavioral and Social Sciences
APM	Advanced Simulator for Pilot Training (APM)
AC	Active Component
AFHRL	Air Force Human Resource Laboratory
ATB	Army Training Board
ARTEP	Army Training and Evaluation Program
AI	Artificial Intelligence
ASB-1985	Army Science Board 1985 Summer Study on Training and Training Technology
BTIS	Branch Training Teams
COTEAM	Combat Operations Training Effectiveness Model
CATA	Combined Army Training Activity
CO	Commanding Officer
DTIC	Defense Technical Information Center
DOES	Department of Evaluation and Standardization
DOTD	Directorate of Training and Doctrine
DA	Department of Army
DoD	Department of Defense
DCSOPS	Deputy Chief of Staff for Operations and Plans (HQDA)
DCSPER	Deputy Chief of Staff for Personnel (HQDA)
ERIC	Educational Resources Information Center
FORSCOM	US Army Forces Command
GAO	General Accounting Office

ACRONYMS (continued)

HQTRADOC	Headquarters, Training and Doctrine Command
KDM	Key Decision Maker
MOS	Military Occupational Specialty
MILES	Multiple Integrated Laser Engagement System
MTP	Military Training Plan
NCO	Non Commissioned Officer
NETT	New Equipment Training Team
OSUT	One-Station-Unit-Training
ODCST	Office of the Deputy Chief of Staff for Training
POI	Program of Instruction
PMS	Performance Measurement and Assessment
PMTRADE	Project Manager for Training Devices
RC	Reserve Component
STP	Soldier Training Product
SMCT	Soldier Manual-Common Tasks
SQT	Skill Qualification Test
TM	Technical Manual
TO&E	Table of Organization and Equipment
TRADOC	US Army Training and Doctrine Command
TPDC	Training and Performance Data Center
TRASANA	TRADOC Systems Analysis Agency
TEA	Training Effectiveness Analysis
T&EOs	Training and Evaluation Outlines
USAREUR	US Army Europe (7th Army)

GLOSSARY

Term	Definition
Active Component	The full-time component, on active duty, of the Total Force
Basic Combat Training	Basic introductory and indoctrination training given to newly inducted enlisted Active and Reserve personnel without prior military service. It provides a transition from civilian to military life, motivation to become a dedicated and productive member of the Army, and instruction in the basic skills, to include battlefield survivial skills, required by all members of the Army. (TRADOC Cir 350-3).
Collective Training	Training, either in institutions or units that prepares a group of individuals (crews, teams, squads, platoons, etc.) to accomplish tasks required of the group as an entity (TRADOC Cir 350-3)
Criterion Referenced Test	A test which measures what an individual must be able to do or must know, in order to successfully perform a task. An individuals' test performance is compared to an external criterion/prespecified performance standard which is derived from an analysis of what is required to do a particular task (TRADOC Cir 350-3).
Enhancement Training	A group of training situations wherein a a soldier in a unit is trained to perform tasks for which he/she has had previous training. Enhancement training may include cross-training, new equipment training or train-up training.
Individual Training	Training which the individual officer, NCO, or enlisted person receives in institutions, units or by extension self-study, that prepares the individual to perform

Term	Definition
	specified duties and tasks related to the assigned MOS and duty position (TRADOC Cir 350-3).
Institutional Training	Training, either individual or collective, conducted in schools (Army, service school, USAR school, NCO Academy, unit school) or Army Training Centers (TRADOC Cir 350-3).
Integration Training	Training that a soldier, newly arrived in a unit receives to complete his Initial Entry training on skill level 1 tasks (BTMS-AC-83-1).
Job Book	A book for the NCO supervisor useful in maintaining empirical data (training record) on a soldier's work performance in his duty position. It assists the NCO supervisor in keeping track of a soldier's ability to perform the tasks of a duty position, and planning to meet the training needs of the individual soldier (TRADOC Cir 350-3).
Norm-Referenced Test	A test which grades a student in relation to the performance of other students in contrast to criterion-referenced testing wherein a student is graded in relation to a prespecified performance standard (TRADOC Cir 350-3).
Objectivity	In testing, the degree to which a test is scored the same by two or more scorers acting independently (TRADOC Cir 350-3).
One-Station-Unit-Training	Initial entry training conducted at one installation in one unit with the same cadre and one POI. BT and AIT instruction are integrated in order to permit the early introduction of MOS specific

Term	Definition
	training, followed by adequate reinforcement training to assure mastery (TRADOC Cir 350-3).
Performance Assessment	The instructor synthesizes all performance measurement information to assess trainee performance. The performance measures may be objective (e.g., machine generated information such as number of target hits) or subjective (e.g., information gathered through the instructor senses as proper communication format used) (MIL-HDBK-220B).
Performance Measurement	The scoring of trainee proficiency either subjectively (e.g., instructor opinion) or objectively (e.g., automatic computer measurement) (MIL-HDBK-220B).
Process Task	A task which consists of a series of steps resulting in the soldier obtaining a single discrete result. The task is evaluated by observing the process and by scoring each step or element as it is performed in terms of sequence, completeness, accuracy, or speed. Examples are "put on the protective mask" and "take oral temperature." (TRADOC Cir 350-3).
Product Task	A task which terminates in a discrete product or outcome which is observable and measureable. The task is evaluated by looking at the product or outcome in terms of completeness, accuracy, tolerance, clarity, error or quantity. "Repair the carburetor" could also be an example of a product task (TRADOC Cir 350-3).
Qualitative	A term describing a performance measurement standard that relies on objective ratings or word

Term	Definition
	descriptions to determine adequacy of performance.
Quantitative	A term describing a performance measurement standard that relies on numbers to determine adequacy of performance.
Reliability	The degree to which a test instrument can be relied upon to yield the same result upon repeated administrations to the same population (TRADOC Cir 350-3).
Reserve Component	The part-time portion of the Total Forces e.g., the Army Reserve and Army National Guard.
Soldier's Manual	A manual that lists for the soldier those critical tasks needed to perform satisfactorily at his present skill level. In addition, the SM tells the soldier how to perform the tasks, the expected conditions under which they will be performed, and the standards which must be met. The SM is the basis for the tasks used in the SQT (TRADOC Cir 350-3).
Sustainment Training	Training a soldier receives in order for him/her to maintain proficiency in a skill previously learned.Technical ManualA publication containing a description of the equipment, weapons, or weapons systems with instructions for effective use, including one or more of the following sections, as required: maintenance instructions, modification instructions, repair parts lists, etc. (PM TRADE Manual).
Training and Evaluation Plan	A document prepared by a TRADOC school for each resident course that prescribes the training and testing concept of each course.

GLOSSARY (continued)

Term	Definition
Trainers' Guide	A publication prepared by an MOS proponent that specifies tasks taught to standards in the training base and those that must be initially trained in the unit (integration training).
Unit Training	Training, individual or collective, conducted in a unit (BTMSRC 83-1).
Validity	The degree to which a test measures what it purports to measure (Handbook in Research and Evaluation).

APPENDIX A

INSTITUTIONAL TRAINING SURVEY INSTRUMENT

PERFORMANCE MEASUREMENT QUESTIONNAIRE - MOS 63N10

Respondent's Position_____ **Experience**_____

Date of Interview_____ **Place of Interview**_____

Interviewer_____ **Time started**_____ **ended**_____

1 Every course or training program is founded on some form of training strategy. It being defined as a statement of the tasks that will be taught to the soldiers, where the training will take place, how it will be conducted, and when? Are you familiar with the strategy on which the training program for MOS 63N10 is based?

a. Yes ↓ b. No → *go to Question 6*

2. What is the strategy?_____

_____

_____

3. How was the strategy developed? (Who developed it, who approved it, and what influenced the development?)_____

_____

_____

_____

4. In your opinion, can the strategy be changed by your school?

a. Yes ↓ b. No → *go to Question 6*

5. Under what circumstances would it be?_____

_____

_____

_____

6. AR 611-201 contains a general statement of the tasks that a soldier with MOS 63N10 performs on the job. Here is that list. Are you familiar with which of these tasks are currently being taught in the training program?

a. Yes → *go to Question 7* b. No → *go to Question 8*

7. Please indicate on the list which of those tasks are currenly being taught at the Armor School in this program.

8. Of the tasks which are taught in the training program for MOS 63N10, what is the procedure for developing the tasks, conditions and standards?_____

_____

_____

_____

_____

9. A particular feedback mechanism -Performance measurement - is designed to evaluate the proficiency of a soldier in accomplishing certain tasks; it is commonly used to determine if a training program is effective. Are you familiar with how performance is measured in the training program for MOS 63N10?

a. Yes

b. No. → *go to question 21*

10. Performance can be measured in a variety of ways, such as end-of-cycle tests, observation of class participation, quizzes, graded hands-on exercises,even by devices which measure performance automatically. Please indicate with a check mark those tasks which are currently being trained in this program which are subject to some sort of performance meesurement. In the next column, indicate how the performance is meesured.

11. If devices are used in any way to meesure performance in this program, what are the devices and how are they used? In other words, please explain the process used to meesure performance by use of the device(s)._____

_____

_____

12. What is the purpose of performance meesurement in this program?_____

_____

13. Who determines the performance meesurement methodologies used in the program?_____

_____

14 Who prepares the performance measurement instruments?_____

_____

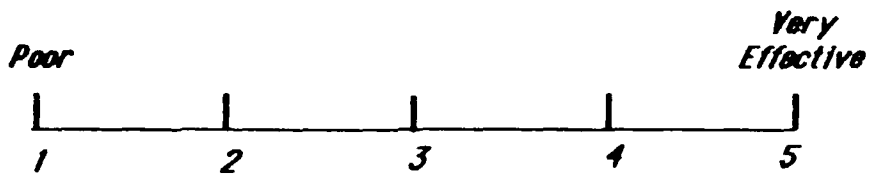
15. How are they prepared?_____ _____

_____

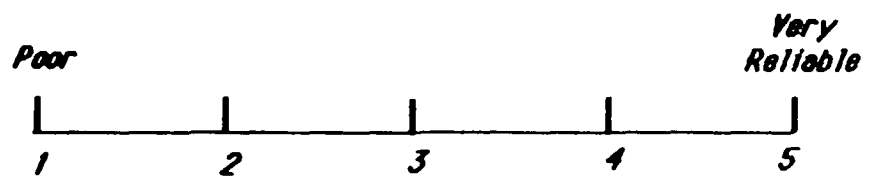
16. In your opinion, is there a direct relationship between the performance that is measured in the program and the performance that will be required of the soldier in the job environment?

a. Yes.	b. No.

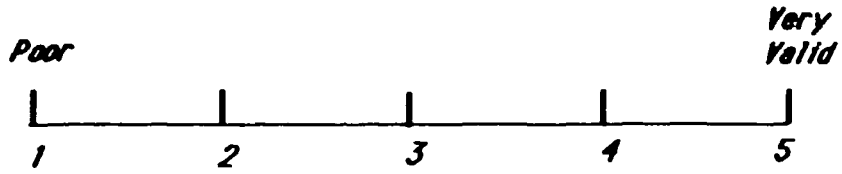
17. On a scale of 1 to 5 (5 being the most effective), how would you assess the effectiveness of the performance measurement system being used in this training program?



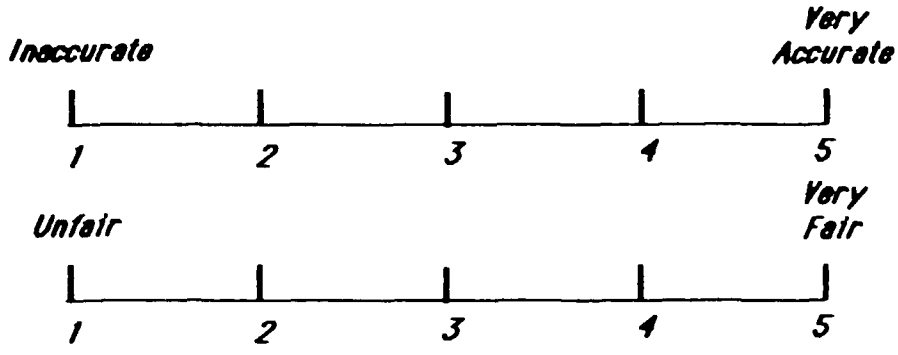
18. Reliability is frequently referred to as the measure of consistency; in the context of performance measurement instruments, it is the measure of the instruments'consistency over time. In other words, can the instruments be relied on to accurately measure something from one course to the next. In your opinion, on a scale of 1 to 5 - (5 being the highest rating)- are the instruments used in this training program reliable?



19. Validity is frequently referred to as the measure of appropriateness; in the context of the performance measurement instruments, it is the measure of whether the instrument does in fact measure what it claims to measure. In your opinion, on a scale of 1 to 5 (5 being the highest rating), are the instruments used in this training program valid?



20. Aside from the questions of reliability and validity, there is generally an opinion or perception on the part of the instructors and students of the accuracy and fairness of the performance measurement system. If you are familiar with how the overall performance measurement system for MOS 63N10 is regarded by the instructors and students, indicate those opinions (using I for Instructor, S for Student) on the following scales:



21. Regardless of how performance is measured, some form of measurement results are produced; do you know what use is made of the performance measurement results?

a. Yes

b. No → *go to Question 23*

22. Please explain how the results are put to use?_____

_____

_____

_____

23. Efficiency can be described as production of something effective with a minimum of waste, cost, or effort. The term training efficiency relates to the ability to produce a trained, i.e. effective, soldier while holding down the resources involved in the training process to the minimum practical. Are you able, from your perspective, to evaluate how efficient this training program is?

a. Yes

b. No → *go to Question 28*

24. What is the cost (ROM) to train one individual in this program? _____

_____

25. What cost elements are used to figure that cost? _____

_____

_____

_____

26. In your opinion, can this training program be made more efficient? i.e. reduce the per student costs?

a. Yes

b. No → *go to Question 28*

27. How? _____

_____

_____ _____

28. Who at the Armor School, either by name or by title, is in a position to make decisions as to what should or should not be done with respect to the training of MOS 63N10?

_____

_____

29. Which of the following decisions do they make or have impact on?

a. What to train? _____

b. How to train? _____

c. When to train? _____

d. Where to train? _____

e. How to evaluate? _____

30. In your opinion, in order for them to make such decisions, what data should the decision makers be receiving?_____

_____

_____

31. Again in your opinion, are those individuals getting those data?

Yes	No

32. If it were in your power to change the course of instruction for MOS 63N10 , what would you do to improve it?_____

_____

_____

_____

_____

33. What source documents should we look at in order to gain a clearer understanding of how MOS 63N10 is being trained at the Armor School?_____

_____

_____

_____

_____

APPENDIX B

UNIT TRAINING SURVEY INSTRUMENT I

Name_____ **Unit**_____ **Tel. Nr.**_____

Position_____ **Experience**_____

How are your platoon individual training requirements determined?

Who makes the determination, i.e. who decides what particular individual tasks your soldiers will train on in the unit?

What individual tasks are soldiers with MOS_____ required to perform in your unit?

Are those tasks performed to satisfy training requirements or to satisfy their job requirements?

What document lists the individual tasks soldiers in MOS _____ are required to perform?

Who prepares the training materials used to support the individual training conducted in your platoon?

How do you know the conditions under which these tasks should be trained?

How do you know the standards to which each task should be performed?

TRADOC views individual training in units as either integration training (training on initial entry skills when the soldier first arrives in the unit), sustainment training (training on skills previously learned either in the school or the unit), and enhancement training (training on skills not previously learned but which are needed for advancement or for performing tasks not previously performed, either as a result of new equipment, new doctrine, etc.). Do you break down individual training that way or do you use some other categorization?

If some other categorization is used, what is it?

What tasks do you teach in integration training? How do you conduct that training? How do you measure performance?

What tasks do you teach in sustainment training? How do you conduct that training? How do you measure performance?

What tasks do you teach in enhancement training? How do you conduct that training? How do you measure performance?

What percentage of your training time do you spend on individual tasks?

Is there a means for measuring the performance of the soldiers on these individual tasks? If not all, approximately what percentage of the tasks are subject to performance measurement?

How is individual task performance generally measured?

Who prepares the performance measurement instruments you use to evaluate the training of individual and collective skills?

When you measure performance, would you say you are generally more interested in the results of the performance or the process involved in the process? **[Give examples if it will help the respondent]**

On a scale of one to five (five being the highest rating) how would you evaluate the performance measurement system you use to measure individual task performance as to:

validity?_____
reliability?_____ _____
accuracy?_____
fairness?_____
effectiveness?_____

Provide examples of each category.

Do you use a pass/fail measurement system or a graded scale system. If a graded system, is it norm-based or criterion-based. **[Use examples to explain the difference between norm-based and criterion-based]**

Are training devices ever used in measuring individual task performance? If so, is the decision on whether the standard has been met made automatically by the device?

If the pass/fail or grading decision is made by a human observer, is the decision objective or subjective? [Does the standard itself require judgment on the part of the observer?]

What criteria do you use to determine if the soldier has had enough training on a particular task?

Who established the criteria?

What happens if a soldier continues to fail to reach the standard?

Assuming he meets the appropriate criteria, how do you determine what he gets trained on next?

Do you ever amend the conditions and/or standards that are prescribed by whatever source document you use?

Are there tasks that are performed by your soldiers that are not reflected in the source document that lays out the tasks your soldiers should perform?

If yes, how do you fit those into your training schedule? How do you determine the appropriate conditions and standards?

When a soldier or group of soldiers completes training on a particular individual task and has his or their performance measured, how are those results used?

Are there any individual tasks, critical to the accomplishment of the job of a soldier with MOS _____ that are not trained in the school prior to his joining the unit?

If yes, what are those tasks?

Do you believe that these tasks should be taught in the school?

Do you know why those tasks are not trained in the school?

Are there any individual tasks that soldiers with MOS _____ are trained to do in the school but which they cannot perform when they are in the unit?

Have you been able to determine why they are unable to do those particular tasks?

Have you ever talked with anyone from the _____School about the ability of their graduates to perform individual tasks on the job?

Do you think the _____ School is effectively training the MOS _____ soldiers in performing individual tasks?

If not, what should they do differently?

With reference to collective tasks, how are your platoon's collective training requirements determined?

Who makes the determination, i.e. who decides what particular collective tasks your platoon will train on?

What collective tasks are soldiers in your unit with MOS_____ required to perform?

What document lists the collective tasks soldiers in your unit with MOS _____ are required to perform?

Who prepares the training material to support the collective training requirements of your unit?

How do you know what conditions these tasks should be trained under?

How do you know what standards each task should be performed to?

TRADOC views collective training in units as that training which prepares groups of soldiers to perform collective tasks, i.e. those tasks which must be or are commonly performed by more than one soldier. Collective training in units is categorized according to the element performing the task, e.g. team, squad, section, platoon, company, etc. Do you break down collective training in units in that manner, or do you use some other categorization?

If some other categorization is used, what is it?

What collective tasks do you teach at the lowest level of organization in your unit? How do you conduct that training? How do you measure performance?

What collective tasks do you teach at higher levels of organization in your unit? How do you conduct that training? How do you measure performance?

What percentage of your training time do you spend on collective tasks?

Is there a means for measuring the performance of the soldiers on these collective tasks? If not all, approximately what percentage of the tasks are subject to performance measurement?

How is collective performance generally measured?

On a scale of one to five (five being the highest rating) how would you evaluate the performance measurement system you use to measure collective task performance as to:

validity? _____
reliability? _____
accuracy? _____
fairness? _____
effectiveness? _____

Do you use a pass/fail measurement system or a graded scale system. If a graded system, is it norm-based or criterion-based.

Are training devices ever used in measuring collective task performance? If so, is the decision on whether the standard has been met made automatically by the device?

If the pass/fail or grading decision is made by a human observer, is the decision objective or subjective? [Does the standard itself require judgment on the part of the observer?]

What criteria do you use to determine if the soldiers have had enough training on a particular collective task?

Who established the criteria?

What happens if a soldier continually fails to contribute to the accomplishment of the platoon's collective tasks?

Assuming they meet the appropriate criteria, how do you determine what task they get trained on next?

Do you ever amend the conditions and/or standards that are prescribed by whatever source document you use?

Are there collective tasks that are performed in your unit by soldiers with MOS _____ that are not reflected in the source document that lays out the collective tasks those soldiers should perform?

If yes, who makes the decision to include those tasks? How do you fit those into your training schedule? How do you determine the appropriate conditions and standards?

When a group of soldiers completes training on a particular task and has their performance measured, how are those results used?

Are there any collective tasks, critical to the mission accomplishment of your platoon, that the soldier is not trained in at the school prior to his joining the unit?

If yes, what are those tasks?

Do you believe those tasks should be trained at the school?

Do you know why those tasks are not trained in the school?

Are there any collective tasks your soldiers are trained to do in the school but cannot perform when they are in the unit?

Have you been able to determine why they are unable to do those particular tasks?

Have you ever talked with anyone from the _____School about the ability of their graduates to perform their collective tasks on the job?

Do you think the _____ School is effectively training the MOS _____ soldiers in how to perform collective tasks?

If not, what should they do differently?

In your opinion, should the schools train collective tasks?

In your opinion, is the link between the units and the schools an important one?

Is that link between unit and school accomplishing anything?

How can the link be improved?

Of all the decisions that are made which affect the training of your _____, who makes them, what percentage of the decisions that are made are made by them, and what kinds of decisions do they make? [The list of decision-makers may include those personnel not located at the particular installation.]

In order to make those kinds of decisions, what kind of information or data should they have on which to base those decisions?

Is it your belief that they are getting that information?

How can the data from the performance measurement system used in both individual and collective training in the units be used to improve the training?

Who should be receiving that data?

How can that data be given to the right decision makers?

APPENDIX C

UNIT TRAINING SURVEY INSTRUMENT II

The Army Research Institute (ARI) is conducting a study on how the Army conducts individual and collective training in units and how the performance of both individual and collective tasks is measured. Your assistance in completing the following questionnaire will help in that study.

Please answer the following questions *only as they pertain to MOS 68B10* to the best of your ability by circling the most appropriate answer. If an answer is 'other', please fill in the blank. Note that for some questions more than one answer may apply. Also note that some of the questions (1 through 18) deal with individual tasks, some (questions 19 through 37) deal with collective tasks, and the final five questions (38 through 42) deal with both individual and collective tasks. When you have finished, fold this paper so that the address is visible, staple it, and drop in the mail box — no stamp is necessary. Thanks for your cooperation.

Your duty position?_____ **How many months in job?**_____

1. Who decides what **individual** tasks will be trained on in your unit?

a. Sqd Ldr b. Plt Sgt c. Plt Ldr d. Co CO e. Bn CO f. Bde g. Div

2. What document would you go to in order to see the list of **individual** tasks soldiers with MOS 68B10 are required to perform?

a. Soldiers Manual b. ARTEP c. MOS Job Book d. Unit SOP e. Other _____ f. Don"t Know

3. What document would you go to in order to see the conditions and standards associated with the **individual** tasks?

a. Same as above b. Other _____ c. Don't know

4. **Individual Training in Units** is often referred to in a number of ways. Listed below are the categories frequently used in Army training publications. Circle the ones you are familiar with and would use when talking about the kind of **individual** training your unit does.

a. Integration Tng b. Sustainment Tng c. Enhancement Tng d. Skill Level Progression Tng

e. Transition Tng f. Merger Tng g. Reclassification Tng h. Other _____

5. Do you know what **individual** tasks are currently being trained on at the Aviation Logistics School for soldiers who are in training to become 68B10s?

a. Yes b. No

6. If the answer was yes, how do you know?

a. Saw a list put out by the Aviation Logistics School

b. Other _____

7. What percentage of your training time do you spend on **individual** tasks?

a. 0 — 20% b. 20 — 40% c. 40 — 60% d. 60 — 80% e. 80 — 100%

8. What percentage of the **individual** tasks that are trained are subject to some form of performance measurement?

a. 0 — 20% b. 20 — 40% c. 40 — 60% d. 60 — 80% e. 80 — 100%

9. How is the performance measured as a general rule? **[more than one answer may apply]**

a. SQT b. Formal hands-on performance test c. Formal paper/pencil test

d. Informal observation by supervisor/leader e. Other_____

10. The method you use to measure performance of **individual** tasks in your unit accomplishes what it's supposed to.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

11. The method you use to measure performance of **individual** tasks in your unit generally provides consistent results over a period of time.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

12. Most of the soldiers in your unit would say that the way their **individual** task performance is measured is fair.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

13. From your point of view, the way that performance of **individual** tasks is measured in your unit is effective.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

14. Which of the following best describes your **individual task** performance measurement system?

a. Go / no go ["you passed"] b. Graded scale ["you got a 93"]

15. Do you, or anyone else in your unit, ever change the **individual task** conditions and/or standards from what is written in the DA published documents?

a. Always b. Sometimes c. Seldom d. Never

16. Are your soldiers (MOS 68B10) required to perform any **individual** tasks that are not included in the DA published documents?

a. Always b. Sometimes c. Seldom d. Never

17. Are there any **individual** tasks, critical to the accomplishment of your unit's mission, that you know are not being trained at the Aviation Logistics school?

a. Many b. Some c. Very few d. None

18. Are there any **individual** tasks that 68B10s are trained on at the Aviation Logistics School but which they cannot perform once they are in the unit?

a. Many b. Some c. Very few d. None

19. Who decides what **collective** tasks will be trained on in your unit?

a. Sqd Ldr b. Plt Sgt c. Plt Ldr d. Co CO e. Bn CO f. Bde g. Div

20. What document would you go to in order to see the list of **collective** tasks soldiers with MOS 68B10 are required to perform?

a. ARTEP b. Unit SOP c. Other _____ d. Don"t Know

21. What document would you go to in order to see the conditions and standards associated with the **collective** tasks?

a. Same as above b. Other _____ c. Don't Know

22. At what levels of organization in your unit have you participated in **collective** training?

a. Crew b. Squad c. Section d. Platoon e. Company f. Battalion g. Brigade h. Division

23. Do you know what **collective** tasks are currently being trained on at the Aviation Logistics School for soldiers who are in training to become 68B10s?

a. Yes b. No

24. If the answer was yes, how do you know?

a. Saw a list put out by the Aviation Logistics School

b. Other _____

25. What percentage of your training time do you spend on **collective** tasks?

a. 0 – 20% b. 20 – 40% c. 40 – 60% d. 60 – 80% e. 80 – 100%

26. What percentage of the **individual** tasks that are trained are subject to some form of performance measurement?

a. 0 – 20% b. 20 – 40% c. 40 – 60% d. 60 – 80% e. 80 – 100%

27. How is **collective** task performance measured as a general rule? **[more than one answer may apply]**

a. External ARTEP evaluation b. Internal ARTEP evaluation c. Other _____

28. The method you use to measure performance of **collective** tasks in your unit accomplishes what it's supposed to?

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

29. The method you use to measure performance of **collective** tasks in your unit generally provides consistent results over a period of time.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

30. Most of the soldiers in your unit would say that the way their **collective** task performance is measured is fair.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

31. From your point of view, the way that performance of **collective** tasks is measured in your unit is effective.

a. strongly disagree b. disagree c. somewhat agree d. agree e. strongly agree

32. Which of the following best describes your **collective task** performance measurement system?

a. Go / no go ["you passed"] b. Graded scale ["you got a 93"]

33. Do you, or anyone else in your unit, ever change the **collective task** conditions and/or standards from what is written in the DA published documents?

a. Always b. Sometimes c. Seldom d. Never

34. Are your soldiers (MOS 68B10) required to perform any **collective** tasks that are not included in the DA published documents?

a. Always b. Sometimes c. Seldom d. Never

35. Are there any **collective** tasks, critical to the accomplishment of your unit's mission, that you know are not being trained at the Aviation Logistics School?

a. Many b. Some c. Very few d. None

36. Are there any **collective** tasks that 68B10s are trained on at the Aviation Logistics School but which they cannot perform once they are in the unit?

a. Many b. Some c. Very few d. None

37. In your opinion, to what extent should **collective** tasks be taught at the Aviation Logistics School?

a. Heavy emphasis b. Moderate extent c. A little d. Not at all

38. What happens to the results of performance measurement done in your unit? **[more than one answer may apply]**

a. Used to decide training requirements in unit. b. Sent to the Aviation Logistics School

c. Used for readiness evaluations. d. Other _____ e. Don't know

39. To what extent are training devices used to measure performance?

a. Very great extent b. Great extent c. Moderate extent d. Little extent e. None

40. When training devices are used in performance measurement, does the performance get recorded automatically by the device, or is an instructor required to record the results?

a. Automatically by device b. Instructor must record c. Some of each

41. If the instructor is required to record the results, must he use subjective judgment (in other words two different instructors viewing the same performance **could** have different opinions of whether the performance was a 'go' or 'no go') or are the standards objective (not subject to the judgment of the instructor)?

a. Requires subjective judgment b. Objective c. Some of each

42. Have you ever talked with anyone from the Aviation Logistics school about how well 68B10s can do their job?

a. Yes b. No c. No, but others in my unit have

Thanks for your help. Please fold this questionnaire so that the address is visible, staple it, and drop in the mail box. No stamp is necessary.

APPENDIX D

DETAILED DESCRIPTIONS OF SURVEY RESULTS

DETAILED DESCRIPTIONS OF SURVEY RESULTS

This appendix gives a detailed description of the procedures used to determine the PMA methods for the six MOSs. It also provides the detailed findings of the survey, both through narrative text and then through the use of the PMA matrices described in the body of the report. The appendix first discusses individual skills training in institutions, followed by collective training in institution, individual skills training in units, and finally collective skills training in units.

Training of Individual Skills in Institutions

Tasks Trained/Evaluated. The individual tasks selected for training in the institutions are generally those which the individual soldier is expected to accomplish when he/she is assigned to a unit, although in some instances there are discrepancies. For example, some tasks may be trained in the institution, as evidenced by their inclusion in the POI - although the soldier is apparently not expected to perform those tasks in the unit, since these tasks are not included in the appropriate soldier's manual. Conversely, there are some tasks that the soldier apparently is expected to perform in the unit but which are not trained in the institution. In other words, these tasks are listed in the soldier's manual but NOT the POI. Thus the number of tasks trained is not necessarily equal to the number of tasks the soldier will be required to perform in the unit. Table D-1 presents the number of MOS-related tasks trained in the schools and compares it to the number of MOS-related tasks contained in the appropriate soldier's manual for the particular MOS. Common tasks reflected in STP 21-1 SMCT, the common tasks soldier's manual, are not included. These numbers were arrived at by inspection of the respective programs of instruction (POIs) and the soldier's manuals for Skill Level 1.

In addition, not all tasks selected for training in the institution are trained to the standards that will be required in the unit. Each course POI states which of the tasks are not trained to standard. Table D-2 shows, for each of the six courses looked at in this effort, the number of tasks not trained to standard and compares that number with the total number of tasks reflected in the POI.

The school survey respondents indicate that this is generally due to a lack of available training time in the institutions. By way of elaborating on this point, the respondents cite the pressures on the school to get soldiers out of the training "pipeline" and into the units as rapidly as possible. Both the school and unit survey respondents claim that, to a certain extent, these discrepancies are remedied by means of the integration training the soldier receives when he arrives at the unit. However, since there is no formal documentation of the specific tasks trained during this integration training, no

Table D-1

Number of Tasks, by MOS, in Programs of Instruction compared with Soldier's Manuals

	POI	SM
19E10	64	175
19K10	64	813[a]
63E10	135	419[b]
63N10	N/A[c]	480[d]
67Y10	52	66
68B10	86[e]	105

[a] While the Soldier's Manual lists only 83 MOS-specific tasks, the Job Book lists 96 MOS-specific tasks.
[b] Includes 64 "duty position tasks" and 355 "related technical tasks."
[c] Number of tasks are not identified in POI but are believed to be approximately 135, due to similarity with MOS 63E10.
[d] Includes 50 "duty position tasks" and 430 "related technical tasks."
[e] In addition to the 86 tasks, POI reflects 40 "other tasks and subjects" which are grouped under the rubric "enabling skills."

Table D-2

Number of Tasks, by MOS, Not Trained to Standard in Schools, compared with Total Number of POI Tasks

	Not Trained to Standard	Number of POI Tasks
19E10	13	64
19K10	10	64
63E10	0	135
63N10	N/A	N/A
67Y10	11	52
68B10	1	86

definitive conclusion could be made as to whether all of those tasks are presented during the integration training phase.

As the data in Table D-2 show, the number of tasks trained in the school is less than the number of tasks the soldier is expected to be able to perform in the unit. The survey respondents indicated this is the case because the schools, faced with constraints on available time to train, can train only the most critical tasks the soldier will be required to perform when assigned to a unit. The shortfall is significantly different depending on the particular MOS. In the case of the two Career Field 63 MOSs, the soldier's manuals cite a large number of "related technical tasks" which according to the manuals can be accomplished if the soldier can perform the "duty position" tasks to the required standards.

A specific example may explain the seemingly large disparity between the number of tasks trained in the school and the number of tasks the soldier will be called on to perform in the unit; it also helps explain the relationship of these "duty position tasks" and "related technical tasks." Task # 091-499-1052, Replace generator/alternator (M35-series vehicle) is a duty position task cited in the soldier's manual for 63E10; several "related technical tasks", which appear to be very similar, include # 091-499-1113 Replace generator (60 Amp, 25 Amp), (M151 series vehicle); and # 091-499-1153, Replace regulator (M35 series vehicle). While it might be argued that these are not discrete tasks but rather the same task performed under different conditions, i.e., on different equipment, the Ordnance School - which is the proponent for the MOS - has obviously chosen to differentiate among the tasks and has given each a unique number. Other schools apparently do not necessarily identify tasks to the same level of detail; this would explain to some extent why the number of soldier's manual tasks for 63E10 and 63N10 is so large in relation to the number of tasks reflected in the POI and soldier's manuals for the other MOSs.

Inspection of the POIs and the interviews with school training development personnel reveal that performance is routinely measured during the courses at the schools, although there are slight discrepancies between the number of tasks trained and the number of tasks evaluated. Table D-3 presents the number of tasks that are evaluated for each of the MOS producing courses surveyed and compares the number of tasks evaluated to the number of tasks trained. In the two instances of one-station unit training (OSUT) - 19E10 and 19K10 - the number of tasks related to the basic training portion of the courses, i.e., the common soldier tasks, are not included; only the MOS specific tasks are considered in order to make those two courses more comparable to the other courses.

As can be seen from Table D-3, data are not available to support any generalizations. Only in the case of the two Armor

Table D-3

Number of Tasks Evaluated in School, by MOS, Compared with Number of Tasks Trained

	Tasks Evaluated	Tasks Trained
19E10	61	64
19K10	62	64
63E10	N/A	135
63N10	N/A	N/A
67Y10	N/A	52
68B10	N/A	36

Crewman MOSs where the course test and evaluation plans were available could specific findings be made. As could be expected, the number of tasks evaluated is fewer than the number of tasks trained. In the case of the other MOSs, although hard data were not available, there were indications, based on the results of the interviews with school personnel, that tasks are evaluated on a sampling basis, i.e., not every task trained is evaluated; those that are evaluated vary from course iteration to iteration. In some cases the POIs reinforced this perception on the part of the survey respondents. For example, the POI for the 63E10 course states that many examinations require the student to perform only "selected critical tasks" from the lessons covered by the exams.

The authors selected one particular course--the 19K10 course--in order to take a closer look at one MOS and determine the relationships between tasks trained and those evaluated. This course was selected solely on the basis of the amount of information available - the authors were able to collect more documentation on this course than on any of the others. In addition to having access to the Program of Instruction, the authors were able to review the Soldier's Manual, the Job Book, and the Test and Evaluation Plan for the MOS 19K10 course. This afforded the opportunity to cross-check the tasks trained in the course, the tasks evaluated during the course, and the tasks required on the job.

The detailed examination of the 19K10 course reveals that the POI lists 64 discrete MOS-related tasks trained of which eight are not trained to standard. Of those 64 tasks trained, only two are not evaluated. These two tasks are shown in Table D-4. Since the Armor School evaluates the physical fitness of its students - an Army requirement - it appears that the listing of Task 171-123-1005 as not being evaluated is merely an administrative oversight, and the number of tasks not evaluated is more likely only one.

Table D-5 lists five tasks that are listed in the Test and Evaluation Plan for the course but which are not reflected in the Program of Instruction. The inclusion of the task "Establish Tank Firing Positions" in this as well as in Table D-4 is due to the misnumbering of the task in one of the two documents. Thus it appears likely that this task is trained AND evaluated. The listing of the remaining four tasks in Table D-5 is more than likely due to the differing publication dates of the two documents. It seems unlikely that the evaluation of a task for which the soldier had received no training would go unnoticed, and unresolved, past one iteration of the course.

Another minor discrepancy noted was the fact that of all the tasks listed in the POI for the MOS 19K10 course (there are 159 tasks, all but 64 of which are common tasks, i.e., not specifically related to the MOS), 42 do not appear in any of the training publications produced for the units. In other words,

Table D-4

19K10 Tasks in POI Not Evaluated

Task Number	Task
171-123-1005	Attain an Appropriate Level of Physical Fitness
171-123-1008	Establish Tank Firing Positions

Table D-5

Tasks Evaluated in 19K10 Course but Not Reflected in POI

Task Number	Task
031-123-1008	Establish Tank Firing Positions
071-325-0001	Employ a Live Fragmentation Grenade
081-831-1012	Give First Aid to a Blister Agent Casualty
081-931-1033	Apply a Dressing to an Open Head Wound
171-126-1065	Inspect Hydraulics on an M1/M1A1 Tank

those 42 tasks do not appear in either the soldier's manual for 19K10, the job book, or the soldier's manual of common tasks. One could infer from this that tasks are trained in the 19K10 course that are not required to be performed by the soldier in his job. A closer examination of these 42 tasks (Table D-6) does not necessarily support such an inference. Thirty-seven of the tasks are those generally associated with Basic Combat Training (e.g., identify rank, execute drill movements, react to the sounding of "Retreat," etc.) and, while not specifically cited in training support material, are commonly required as tasks which are appropriate for all soldiers. The remaining five tasks (171-126-1054, -1055, -1057, -1058, and -1060) are specific to the MOS. There is no explanation in any of the documents reviewed as to why these 42 tasks are not reflected in the training support material mentioned. Inspection of the tasks suggest that their inclusion in the POI is appropriate. The five MOS-related tasks appear to be appropriate for inclusion in the training support material as well.

Finally, there are a number of tasks that are required of the 19K10 soldier in the unit but are not trained in the school. These tasks are listed in Table D-7. As previously indicated, the assumption has to be made that these tasks are addressed in integration training once the soldier is assigned to a unit, but there is no documentation to check the validity of this assumption.

Returning to the investigation of all the selected MOSs, it appears that the procedures used to decide which tasks are not trained in the school, thus leaving the training of those tasks to the unit during integration training, may be somewhat flawed. TRADOC Reg 350-7, A Systems Approach to Training, requires the schools to conduct front-end analyses of individual job requirements, publish soldier's manuals outlining the tasks for which the soldier is responsible, and select tasks for training in the school (reflected in the POI for the particular MOS-producing course). Thus the task selection process is predicated on the analysis of the unit's mission and the individual skills and tasks that soldiers with that particular MOS need to possess or be able to perform in order for the unit to accomplish its mission. However, there are some indications that the policies are not being fully implemented. An article by senior staff officers at HQ TRADOC (Duncan & Hartjen, 1985) and discussions with senior officials of the Army Training Board (ATB) indicate that front-end analyses are not currently being accomplished by the TRADOC schools in strict accordance with the established policies. Thus it is possible that the task selection methodology, and the measurement of individual performance in the schools, is less than what is called for in TRADOC Reg 350-7 with the result that there may be a disconnect between tasks trained and measured in the schools and those that are required to be performed in the job environment.

Table D-6

Tasks Listed in 19K10 POI but not in FM 21-1 (Common Skills), Soldier's Manual or Job Book

Task Number	Task
071-503-1008	Decontaminate Individual Equipment
071-326-0001	Set Up and Strike a Shelter-Half Tent
071-326-0002	Identify, Prepare, and Wear Army Issue Uniforms
071-326-0010	Report to an Officer Indoors
071-326-0011	Report to an Officer Outdoors
071-326-0012	React to an Approaching Officer
071-326-0013	React to an Approaching NCO
071-326-0014	Identify Rank
071-326-0015	React to Passing Colors
071-326-0016	React to the Playing of "The National Anthem" and "To the Colors"
071-326-0017	React to the Playing of "The Army Song"
071-326-0018	React to the Sounding of "Reveille"
071-326-0019	React to the Sounding of "Retreat"
071-326-0020	React to an Officer Entering a Building
071-326-0030	Execute Drill Movements Without Arms
071-326-0031	Execute Drill Movements With Arms
071-326-0032	Perform as a Squad Member During the Conduct of Squad Drill
071-326-0033	Perform as a Squad Member During the Conduct of Platoon Drill
071-326-0034	Perform as a Squad Member During the Conduct of Company Drill
071-327-0002	Compete a 12-15 Mile (20-24 km) Tactical Foot March
071-327-0003	Conditioning Obstacle Course
071-327-0004	Confidence Obstacle Course
071-328-0011	Prepare for Working Inspection
071-328-0012	Prepare for an In-Quarters Inspection (Standby in Duty Uniform)
071-328-0013	Prepare for In Ranks Inspection
071-328-0014	Prepare for In-Quarters Inspection (Full Field Lay-Out)
071-331-0050	React to an Inspecting Officer
071-331-0051	Summon Commander of Relief
071-331-0052	Challenge Unknown Person(s)
071-331-0053	Apprehend an Intruder
071-331-0054	Stand an Informal Guard Mount
081-831-1035	Protect Yourself Against Heat
081-831-1036	Protect Yourself Against Cold
081-831-1037	Protect Yourself Against Biting Insects
081-831-1038	Protect Yourself From Diarrhea and Dysentery
081-831-1039	Practice Personal Hygiene to Maintain Fitness
171-126-1054	Adjust Operating Cam on the 105mm Main Gun on an M1 Tank
171-126-1055	Refuel an M1/M1A1 Tank
171-126-1057	Unlock Stuck Parking Brakes on an M1/M1A1 Tank
171-126-1058	Service the Air Induction System on an M1/M1A1 Tank
171-126-1060	Prepare an M1/M1A1 Tank for Power Pack Removal
171-126-1090	Perform Operator Maintenance and Layout of Bll

Table D-7

19K10 Soldier's Manual or Job Book Tasks (Excluding Those Listed in FM 21-1) Not Trained in 19K10 Course

Task Number	Task
031-503-3006	Conduct Partial Decontamination
051-192-1001	Install/Remove the M14 Blasting Antipersonnel Mine
051-192-1002	Install/Remove the M16A1 Bounding Fragmentation Antipersonnel Mine
051-192-1014	Install/Remove US Antihandling Devices on Antitank Mines
051-192-1023	Locate Mines Using the AN/PSS-11 Mine Detector
051-192-1024	Locate Mines Using the AN/PRS-7 Mine Detector
061-283-6003	Call for/Adjust Indirect Fire
071-315-0030	Place an AN/PVS-5 (Night Vision Goggles) Into Operation
071-315-0031	Perform Operator Maintenance on the AN/PPVS-5 (Night Vision Goggles)
071-331-0802	Process Known or Suspected Enemy Personnel/Documents/Equipment
113-587-1050	Mount Radio Set AN/VRC-46
113-587-3077	Perform Operator's PMCS on Radio Sets AN/VRC-12 or -47, etc
113-588-4023	Repair Field Wire
113-622-1006	Install Radio Set Control Group AN/GRA-39(*)
113-622-2004	Operate Radio Set Control Group AN/GRA-39(*)
171-123-1090	Perform Preventive Maintenance on Basic Issue Items (BII)
171-126-1011	Troubleshoot the AN/VVS-2 Night Vision Viewer on an M1 Tank
171-126-1013	Troubleshoot the Engine on an M1 Tank
171-126-1014	Troubleshoot the Transmission on an M1 Tank
171-126-1015	Troubleshoot the Personnel Heater on an M1 Tank
171-126-1016	Troubleshoot the Gas Particulate Filter Unit on an M1 Tank
171-126-1031	Troubleshoot the Fire Control System on an M1 Tank
171-126-1032	Troubleshoot the 105mm Main Gun on an M1 Tank
171-126-1037	Perform Operator Maintenance on M1 Tank Periscopes
171-126-1040	Evacuate a Wounded Crewman from an M1 Tank
171-126-1048	Replace a Thrown Track on an M1 Tank
171-126-1050	Perform Manual Extraction of a Main Gun Round on an M1 Tank
171-126-1051	Operate the AN/VVS-2 Night Vision Viewer in Loader's Hatch on an M1 Tank
181-906-1501	Apply the Customs and Laws of War Governing Forbidden Targets, Tactics, etc
181-906-1502	Apply the Customs and Laws of War Governing Treatment of Captives, etc
181-906-1503	Apply the Customs and Laws of War Governing Protection of Civilians, etc
181-906-1504	Apply the Cusoms and Laws of War Governing Prevention/Reporting of Criminal Acts

The TRADOC policy of requiring that the tasks selected for training and evaluation in the institution be based on an analysis of the tasks required of the soldier in the job environment appears to be sound if not without flaw in its implementation. Several research efforts provide evidence that methodologies for developing training PMA measurement systems based on job-requirements are effective. For example, Burroughs (1985) provides criterion performance measures for reliable tests of non-procedural M1 tank driver skills that could serve as standards for tank driver simulator training. Harper and Gutman (1981) cite specific maintenance-related performance measures for use in developing and implementing an Army Maintenance Performance System. Biers and Sauer (1983) focused on M1 Abrams gunnery performance and used an aptitude measurement methodology to design job sample tests (both computer-based and hands-on) for armor crewmen. The common feature of these methodologies is that the tasks that are trained are based on the tasks that are performed in the job environment.

Despite the discrepancies noted in the tasks trained/evaluated in the institution and those required in the unit, it would appear that for the most part the tasks reflected in the POIs are generally in consonance with those that are performed by the soldiers on the job. It is further assumed that similar findings would be made if all MOS-producing courses throughout the TRADOC school system were surveyed.

Performance Standards. The standards used for measuring individual task performance in the institutions surveyed are almost without fail process-oriented rather than product-oriented. Process in this instance refers to `how' a soldier performs a particular task; this is in contrast to a product-oriented approach which grades the outcome of the task, or `what' the soldier has done. An example can be found in the task of boresighting a machine gun on an M60 tank. The standard contained in the soldier's manual for this task states that the soldier has satisfactorily performed the task if the center of the barrel and the center of the infinity sight reticle are on the same aiming point. This is a product-oriented approach. The soldier's manual also provides an evaluation guide that identifies 31 steps which the soldier must pass in order to get a GO on the task. This is a process-oriented approach. The fact that the institutions tend to use the process-oriented approach might be expected, since the schools are training MOS skills that have not previously been learned.

Generally, the POIs refer to the standards contained in the applicable soldier's manual or, especially in the maintenance related courses, to a particular technical manual. Inspection of the soldier's manuals reveals that these publications contain, in addition to a `standards statement', a list of performance measures under the rubric "Evaluation Guide." In almost every instance, the trainer/evaluator is instructed to use the performance measures to evaluate the proficiency of the soldier

in accomplishing a particular task. Following the list is a statement which provides guidance to the evaluator. As an example, STP 17-19E1-SM contains the following statement for every task: "Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any step is failed (F). If the soldier fails any step, show what was done wrong and how to do it correctly." (p. 2-5, 2-13, 2-16, 2-19, etc.) This statement can be found for almost every task in every soldier's manual investigated, thus providing evidence that process-oriented performance standards are the norm, rather than the exception, when measuring individual performance in the schools.

Thus, as a general rule, instead of evaluating the soldier on whether he can accomplish a task to the specified criterion or standard, he/she is evaluated on whether each and every step of the task, as described in the evaluation guide, is performed correctly. Often, the evaluation guide requires that the performance of the procedural steps be in the proper order, which is further evidence of a process-orientation.

It is the opinion of the authors that the process approach is probably a proper orientation, given the fact that the quality of the institutional training program can best be evaluated through the evaluation of the behavior of the soldiers undergoing the training. As Popham pointed out in 1971, evaluation and recording of the learner's behavior, as opposed to the product of the behavior, is necessary in order to subsequently evaluate the quality of the training program itself. Popham went on to state that "all learner behavior requires recording in order to be used as a criterion measure for educational evaluation." Thus, in an institutional training environment, especially when presenting entry level training, process orientation is more important and valuable than product orientation.

Performance Measurement Methodologies. Training PMA during individual training in the institution is a combination of formal, i.e., scheduled, evaluations - conducted at the conclusion of a block of instruction, following a group of blocks of instruction (known as 'gate' tests) and as end-of-course comprehensive tests - and informal evaluations by the instructor during practical exercises conducted during the presentation of instruction. With respect to the formal evaluations, the methodology is primarily hands-on, as opposed to written (i.e., paper and pencil tests). This appears to be a conscious matter of policy at the TRADOC schools. For example, the Armor School requires justification for any evaluation reflected in the POI that is NOT hands-on; the Directorate of Evaluation and Standardization challenges any proposed written evaluation as a matter of course. As evidence of this policy, one that is assumed to be common in at least some other TRADOC schools, Table 8 presents, by surveyed MOS, the number of hours devoted in the course to formal, scheduled written evaluations and hands-on evaluations.

Table D-8

Hours Devoted to Written Evaluations, by MOS, Compared with Hands-on Evaluations

	Written Evaluation	Hands-on Evaluation
19E10	0 [a]	30 [b]
19K10	0	30 [c]
63E10	5.6	62.7
63N10	6.2	63.7
67Y10	8	49
68B10	8	67

[a] Excludes 2 hour written exam on General Military Subjects.
[b] Excludes 4 hours Physical Readiness Test and 16 hours devoted to Gate I and Gate II examinations which are not MOS-specific.
[c] Excludes 2 hour exam on General Military Subjects, 4 hours Physical Readiness Test and 16 hours devoted to Gates I and II examinations which are not MOS-specific.

With respect to the written evaluations, the GO/NO GO criterion is generally based on the soldier's passing a total of 70% of the items presented in the test. In the case of hands-on tests, however, the soldier receives a GO for the task only if all the steps listed in the Evaluation Guide are passed. The informal evaluations made by the instructors during practical exercises likewise is process-oriented, wherein the instructor judges the ability of the soldier to accomplish the various procedural steps of the task in the proper sequence. This policy is specified not only in the POIs reviewed during the study effort, but is reflected in the interviews with the individuals surveyed at the schools. Again, as discussed in the previous section, this is in keeping with the general notion that the evaluation process is important in evaluating the training system or course of instruction as well as providing the individual soldiers and their instructors a means of identifying areas where remedial training is required.

Use of Performance Measurement Data. As TRADOC Reg 350-7, A Systems Approach to Training, points out, "evaluation is pointless unless action is taken to correct deficiencies and discrepancies revealed by that process, and the management function of providing for quality control is equally important during each phase of the training process." (p. 14). In implementing this philosophy of evaluation, the TRADOC schools surveyed, and by inference all TRADOC schools, evaluate the performance of the soldiers in their courses and use the results of that evaluation process for a variety of purposes.

In any discussion of the uses to which the training PMA data are used, it is important to include the audit trail of those data. There is little evidence either from previous research results or the results of the survey to suggest that data other than the final grades are captured. For example, if a soldier receives a GO the first time he/she is evaluated, while a second soldier receives a GO only after four attempts, the data captured do not differentiate between the two; the second soldier receives remedial training until a GO is attained. While such differentiation is immaterial to a decision on the ability of the soldier to perform a task, it is very material to the evaluation of the program of instruction. Were these data to be captured, much could be learned about the training effectiveness and efficiency of the training system, an area which, while not totally ignored in the schools, could apparently be improved.

The survey respondents indicate that training PMA results are used to determine what, if any remedial training is required for the soldier to get a GO on each task evaluated. In those instances where the soldier gets a NO GO, he or she is given remedial training, often one-on-one with the instructor, and given the opportunity(ies) to perform the task successfully. Should a soldier continue to fail, attempts are made to isolate the particular problem. As a last resort, the soldier is eliminated from the course and reclassified or else is eliminated

from the Army, although this apparently is very rare. This remediation and successful performance on each task is crucial in the institutional environment since the soldier must be proficient in all, or almost all, tasks trained in order to graduate the course and be awarded the MOS. Previous research (Maxey, 1985; Sticha, Edwards, et al., 1984; and Fineberg, Meister & Farrell, 1978) indicates that remedial training based on the results of task training PMA is both appropriate and effective; the survey revealed that this use of training PMA data is acknowledged by all the respondents.

Other uses are made of the results of the training PMA data. TRADOC Reg 350-7 states that "feedback is used to evaluate the program, assess the quality of soldiers' performances and check the organization's responsiveness to training needs." (p. 14). In implementing this policy at the Armor School, the Department of Evaluation and Standardization has an automated data base that contains the results of the training PMA. In light of the fact that the system calls for remedial training for those soldiers who fail to meet the standard, and that ultimately almost all soldiers pass, it is questionable as to how useful the data base is. The Armor School personnel interviewed state that data concerning first and final go/no-go attempts are being captured. If a soldier fails on an initial attempt, data are gathered on subsequent and final attempts. Furthermore, if there is greater than 20% failure rate a close investigation of the training itself is undertaken, and the necessary adjustments made.

The use of training PMA data by key decision makers at the TRADOC schools is addressed more fully in that section of this report beginning on page 15.

Collective Training in Institutions

There is no collective training conducted in any of the MOS producing courses surveyed, although some of the survey respondents, especially those involved in the maintenance courses, do indicate that in their opinion some collective training is in fact being conducted. This opinion is probably due, in the opinion of the authors, to a basic misunderstanding of the definition of collective training on the part of the survey respondents. Some of the respondents do indicate that if the accomplishment of a task requires more than one soldier, they view that task as a collective task. This is not the definition provided in guidance from TRADOC, however. TRADOC Regulation 350-7, A Systems Approach to Training, defines a collective task as one which "requires echelon participation for its accomplishment," (p. 45) such as a unit performing a task while its subordinates echelons simultaneously perform different tasks. The regulation further states than "an activity that requires more than one person to perform the same individual tasks for its completion is not considered to be a collective task; e.g., lifting a load that is too heavy for one individual." (p. 45). This would account for the survey respondents claiming that

collective tasks are taught in the courses, whereas the POIs do not reflect collective task training.

Although collective training per se is not reflected in any of the POIs, some of the POIs reviewed allude to a collective environment. For example, the POI for the 19E10 and 19K10 courses reflect a 98-hour field exercise in which "previously learned individual skills are reinforced in a collective tactical environment using MILES equipment." In those instances, approximately 20 individual skills are identified but no collective skills are specifically mentioned.

The fact that the MOS producing courses do not include collective training (a situation which is assumed to be the norm throughout the TRADOC school system) is in keeping with Department of the Army level guidance. Appendix A of AR 350-1, Army Training, the Army's capstone regulation governing training, defines collective training as that "training in units to prepare cohesive teams and units to accomplish their combined arms missions on the integrated battlefield." It would appear that not mentioning collective training in conjunction with institutional training is no oversight, thus leading to the conclusion that Army policy is that collective training is to be conducted only in the unit training environment.

There is an element of confusion, however, with respect to the conduct of collective training in institutions. On the one hand, the conclusion that must be drawn from AR 350-1 is that collective training is conducted only in the unit, not the institution. However, the TRADOC Primer, an internal publication designed to "provide a comprehensive introduction to what TRADOC does and how it runs", defines collective training as "training either in institutions (emphasis added) or units, that prepares cohesive teams and units to accomplish their ....missions."

Despite this apparent difference in perspective, there is no documentation specifying what, if any, collective training is conducted in institutions. Accordingly, there is no formal collective training PMA specified in any of the documents reviewed during this study effort.

This notwithstanding, the Armor School does appear to get involved in collective training PMA, and presumably the training that precedes the measurement. As previously mentioned, the 98-hour field exercise conducted toward the end of the 19E10 and 19K10 courses, uses MILES, which is an engagement simulation system designed to evaluate collective performance in a force-on-force exercise. The use of MILES would seem to indicate that, at least at the Armor School, some collective training is provided in the two courses.

Integration Training (Training of Individual Skills in Units)

Tasks Trained/Evaluated. There is no formal documentation as to the number of tasks that are trained and evaluated in the integration training phase of individual training in units. Moreover, none of the respondents interviewed during the unit surveys was able to state how many tasks are trained in this particular phase. In arriving at the numbers that are reflected in the matrices in Appendix C, the authors subtracted the number of MOS specific tasks contained in the POI from the number of MOS specific tasks shown in the appropriate soldiers' manual or job book for Skill Level 1. The result is believed to be a reasonably approximate estimate of the number of tasks that a soldier needs training on in order to prepare him/her to be an effective member of the unit, which is the definition of integration training. Table D-9 shows the number of tasks by MOS.

In two instances - 67Y10 and 68B10 - the soldier's manuals make reference to an MOS training plan (MTP) published in the trainer's guide that identifies critical tasks for each subject area and specifies where soldiers are initially trained on each task. Although these trainer's guides were not available for the study effort, they would appear to provide valuable clues as to what the school (in this case the Aviation Logistics School) views as the scope of integration training. However, in no case in the unit surveys did a respondent, when asked about integration training, refer directly or indirectly to these trainer's guides. Thus it would appear that those who would benefit most from such information may not be receiving it.

Although no formal documentation concerning the number of tasks was accessed for this effort, the survey respondents were able to provide insights into the extent and nature of integration training in their units. For the most part, the respondents indicate that the unit determines its own integration training requirements, generally based on the observed ability of its newly assigned soldiers. In the case of the maintenance related MOSs, respondents are able to indicate general areas in which recent school graduates need training. For example, survey respondents indicated that newly assigned soldiers with MOS 63E10 are weak in the areas of wiring, use of wiring diagrams, theory, and the use of test equipment, thus implying that this is the general thrust of their units' integration training requirements.

On the other hand, unit training personnel who work with soldiers with MOS 67Y10 state that their biggest integration training requirement is in the area of maintenance paperwork; although they acknowledge that this area is trained in the schoolhouse, the training is not in sufficient depth, it is trained as a separate task rather than being integrated with other training, and the soldiers receive it too early in the course, so that by the time they arrive in the unit, they have forgotten what they learned. Survey respondents who are familiar with integration training for MOS 68B10 soldiers state that the

Table D-9

Approximation of Number of Tasks Involved in Integration Training, by MOS.

	Number of Tasks
19E10	111
19K10	19
63E10	284 [a]
63N10	N/A
67Y10	14
68B10	19

[a] Based on 419 tasks (64 "duty position" and 355 "related technical" tasks) listed in soldier's manual less 135 "MOS related tasks" listed in POI

most important area requiring integration training is in the area of troubleshooting (although investigation of the POI at the Aviation Logistics School indicates that 20 specific troubleshooting tasks are trained).

Performance Standards Used. While the unit survey respondents seem uncertain as to the precise number of tasks involved in integration training, they do know what performance standards are used. In the case of MOS 19K10, the unit survey respondents indicate that they use the standards contained in the Soldier's Manual and STP 21-1-SMCT (Soldier's Manual of Common Tasks). As discussed previously, these documents, in addition to providing a standards statement for each task, include an Evaluation Guide which is a process-oriented checklist. The soldier must pass each step of the test if he/she is to get a GO for the entire task. Thus the standards used are almost exclusively process-oriented. The survey respondents familiar with integration training for the maintenance related MOSs - 63E10, 67Y10, and 68B10 - state that they use the applicable technical manual (TM) as the source document for standards. The respondents further indicate that the standards are procedural, step-by-step checklists.

Performance Measurement Methodology. The measurement of performance related to integration training is generally similar across all the MOSs surveyed. For the 19K10 MOS, task performance is observed by the soldier's supervisor, generally a tank commander, during field exercises or drills, i.e., during collective training periods. Thus, the training PMA is relatively unstructured and informal. In the case of the 63E10 MOS, performance is evaluated by observation of the soldier by Skill Level 2 or Skill Level 3 mechanics. Almost all evaluation is a result of hands-on performance and is graded as pass/fail. The respondents state that subjective judgment is used by evaluators to determine whether performance is a GO or NO GO. MOS 67Y10 soldiers have their performance measured against the standards (the applicable -10, -20, or -30 technical manual) and are graded on a GO/NO-GO basis. The evaluation, which is process-oriented, is made by supervisors (NCOs) with a checklist in hand. Respondents knowledgeable of MOS 68B10 indicate that evaluators observe the soldiers' performance during practical exercises, during actual job performance, and in formal evaluations.

In order to facilitate the measurement of individual task performance, unit trainers are encouraged to use a standardized form which is contained in all soldier's manuals. This form (DA Form 5164-R) is locally reproducible, and unit trainers are encouraged to fill in the procedural steps involved in the accomplishment of the task, reproduce the form in the number of copies required to evaluate the soldiers' performance, and check off each step as it is performed. The form (which is shown in Figure D-1) is designed to evaluate any individual training in units, not just integration training. Despite the availability

HANDS-ON EVALUATION For use of this form see STP 17-19E1-SM; the proponent agency is TRADOC		DATE 1 April 84	
TASK TITLE Clear M3/M3A1 Submachine Gun		TASK NUMBER 171-122-1002	
ITEM #	PERFORMANCE MEASURE TITLE	SCORE (Check One) PASS	FAIL
1	Remove the magazine.	☒	☐
2	Raise the cover.	☒	☐
3	If bolt is forward, pull to the rear.	☒	☐
4	Look inside chamber and feel for obstructions.	☐	☒
5	Press the trigger and let bolt go forward.	☒	☐
6	Close the cover.	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
EVALUATOR'S NAME SFC Johnson		UNIT B Co, 1st Bn	
SOLDIER'S NAME PFC Coleman		STATUS ☐ GO ☒ NO GO	

DA FORM 5164-R, DEC 82

NOTE: This is an example of a completed form, as provided in STP 17-19E1-SM.

Figure D-1. DA Form 5164-R.

of the form, none of the respondents indicate that they use the form when evaluating individual performance in the unit.

Sustainment Training (Training of Individual Skills in Units)

Use of Performance Measurement Data. With no exceptions, survey respondents indicate that the data resulting from performance measurement following integration training are used to identify and diagnose performance weaknesses. This provides the basis for on-the-spot corrections of the performance deficiencies, counselling of the individual soldiers, and determining further training requirements so that remedial training can be implemented.

The term sustainment training, as used in this effort, refers to refresher training on individual tasks already learned by the soldier either in the institution (initial entry training for the six MOSs selected) or in the unit (integration training). It is an area that does not lend itself to easy definition, explanation, or discussion. Part of the problem stems from the variety of publications which address the training of individual tasks in units and the variety of terms used to describe that training. For example, sustainment training as used in this effort is assumed to include tasks that are found in the soldier's manual for a particular MOS, the Soldier's Manual of Common Tasks (STP 21-1-SMCT), the appropriate Job Book, and the MOS Training Plan (MTP) contained in the appropriate Trainer's Guide. The lack of a single-source document for use by the trainers and training managers in the units is seen as a source of confusion, especially since these documents are not necessarily in agreement as to what tasks the soldier is responsible for. Moreover, the tasks that are included in these various publications are variously known as common tasks, MOS skill level tasks, duty position tasks, related technical tasks, generic tasks, and enabling skills. Notwithstanding these problems, the unit survey respondents provided a significant amount of information relating to the area of sustainment training, although it was not possible to validate their observations with any official documentation or published research.

Number of Tasks Trained/Evaluated. There is no document that specifically identifies the number of tasks that are to be included in sustainment training in units. In the absence of such documentation, the authors made the assumption that the tasks listed in the document (of those mentioned in the preceding section) that contains the greatest number of tasks provides the best indication of what tasks the soldier is accountable for. However, there is an element of confusion associated with this selection. The soldier's manuals for the two tank mechanic MOSs, for example, refer to duty position tasks and related technical tasks. Since the manuals make the statement that if the soldier can do the former tasks to standard, he/she can successfully perform the latter tasks, there is some question as to the

necessity for including those related technical tasks in the sustainment training category.

Accordingly, the number of common, duty position, related technical, and MOS skill level tasks for each of the MOSs surveyed is shown in Table D-10, along with the source document(s) used to arrive at those numbers.

Survey respondents generally are unable to state the number of tasks involved in sustainment training. For example, the survey respondents involved with unit training of MOS 19K10 state that sustainment training is most likely to involve MOS-specific tasks. In addition, all the tasks which are included in sustainment training are subject to evaluation, although none of the respondents, nor any of the documents, specifically addressed how many tasks are involved.

Survey respondents familiar with the training of MOS 63E10 soldiers similarly are unable to state how many tasks are included in sustainment training or how many are subject to evaluation. Documentation for the MOS does not clarify the issue. For example, the Soldier's Manual (STP 9-63E12-SM) lists 64 Skill Level 1 duty position tasks and 355 related technical tasks, while the Job Book lists 78 Skill Level 1 tasks.

It would appear that documents exist that would clarify the situation with regard to MOSs 67Y10 and 68B10. The documents are the MOS Training Plans (MTP) for these two MOSs. According to the soldier's manuals - STP 55-67Y12-SM and 55-68B12-SM respectively - the MTP "identifies critical tasks for each subject area" and "recommends how often soldiers should be trained to sustain proficiency." Despite the reference to these MTPs in the soldier's manuals, survey respondents did not indicate that they have knowledge of them or use them in the conduct of sustainment training.

As mentioned above, there appears to be no single source document that unit trainers and training managers can use to identify which tasks a soldier with a particular MOS is expected to be able to perform. Thus the implication must be that unit trainers/training managers are required to go to more than one source document to determine what tasks are candidates for sustainment training and evaluation, thereby complicating the unit's sustainment training mission. One may assume that if a soldier is expected to be able to perform a particular task, then he/she can likewise expect to have that performance measured either during informal evaluations in the unit or in the context of the formally-administered annual Skill Qualification Test (SQT).

Performance Standards Used. Performance standards used in evaluation of tasks included in sustainment training are those found in either the appropriate soldier's manual or technical manual. Whereas the standards statement is generally a

Table D-10

Estimated Number Of Tasks, By MOS And Source Document, Requiring Sustainment Training.

	Soldier's Manual				Job Book		
	Common/ Shared Tasks	Duty Position Tasks	Related Tech. Tasks	MOS Skill Level Tasks	Duty Position Tasks	Related Tech. Tasks	MOS Skill Level Tasks
19E10	170				136		34
19K10	84				53		30
63E10		64	355		64	355	
63N10		50	430		[NOT AVAILABLE]		
67Y10				66	[NOT AVAILABLE]		
68B10				105	[NOT AVAILABLE]		

product-oriented standard (e.g., task 171-122-1041, Boresight the M240 Coax machine gun on an M48A5/M60-Series Tank, the soldier has satisfactorily performed the task if "the center of the barrel and the center of the infinity sight reticle are on the same aiming point," (STP 17-19E1-SM) (p. 3-62), the evaluator is instructed to use the Evaluator's Guide which is a process-oriented checklist to determine whether or not the soldier gets a GO on the task. According to the soldier's manual, this checklist is provided "to help the trainer conduct year-round, hands-on evaluations." In the boresighting example, there are 31 steps which are evaluated, each of which the soldier must pass to score a GO. Thus, regardless of whether the soldier does in fact meet the criteria reflected in the standard, he/she will get a NO GO if any step is failed.

When it comes to the standards used, not all of the MOSs were treated the same. For MOS 19K10, the standards used are those that are reflected in the appropriate soldier's manual. In the case of MOS 63E10, the standards statement in the soldier's manual refers the reader to the appropriate technical manual (TM), e.g. "you must ground-hop the power pack in accordance with the appropriate publications." (p. 2-12). However, the soldier's manual also includes an Evaluation Guide with a list of Performance Measures. Although the technical manuals were not reviewed against the performance measures listed in the soldier's manuals, it seems reasonable to expect that the performance measures reflect the technical manuals and can be used by the evaluator without his/her having to refer to the TM itself. The soldier's manuals for the two aviation maintenance-related MOSs likewise refer the reader to the appropriate TM.

Survey respondents, in general, state that the source of the standards used is either the soldiers' manual or the technical manual. The respondents involved in the training of MOS 68B10 state that they use both.

Performance Measurement Methodology. Task performance is measured in at least two ways in all the MOSs surveyed. There is an informal evaluation which generally is conducted on a daily or frequent basis, often in the context of actual job performance or during individual or collective training periods. In those instances, the task performance is measured - or, more accurately stated, evaluated - against the standards described above. The supervisor or NCO observes the performance of the task, in some instances actually using a checklist to record the accomplishment of the procedural steps listed in the Evaluation Guide. In addition to the reproducible form contained in all soldier's manuals (DA Form 5164-R), the evaluator is encouraged to use the applicable Job Book published by the School. This is a small, pocket-sized book (several pages of the Job Book for MOS 19K10 are reproduced below in Figure D-2) in which an evaluator can record GO/NO GO grades as a result of his/her evaluation of the soldier's performance. Unlike the soldier's manual (which should contain the same number of tasks, although this has not been

SECTION II
DUTY POSITION TASKS
63E, M1 ABRAMS TANK AUTOMOTIVE
MECHANIC/RECOVERY VEHICLE OPERATOR
SKILL LEVEL 1
REFERENCE: STP 9-63E12-SM

TASK NUMBER AND TITLE	GO	NO GO	DATE
TANK COMBAT, 105MM, M1			
091-490-1001 Remove/Install Power Pack			
091-490-1002 Ground-Hop Power Pack			
091-490-1014 Troubleshoot Fault Symptom (Engine Aborts or Does Not Start)			
091-490-1016 Troubleshoot Fault Symptom (Engine Power Loss)			
091-490-1020 Replace Electromechanical Fuel System			
091-490-1021 Clean Fuel Nozzle Assembly			

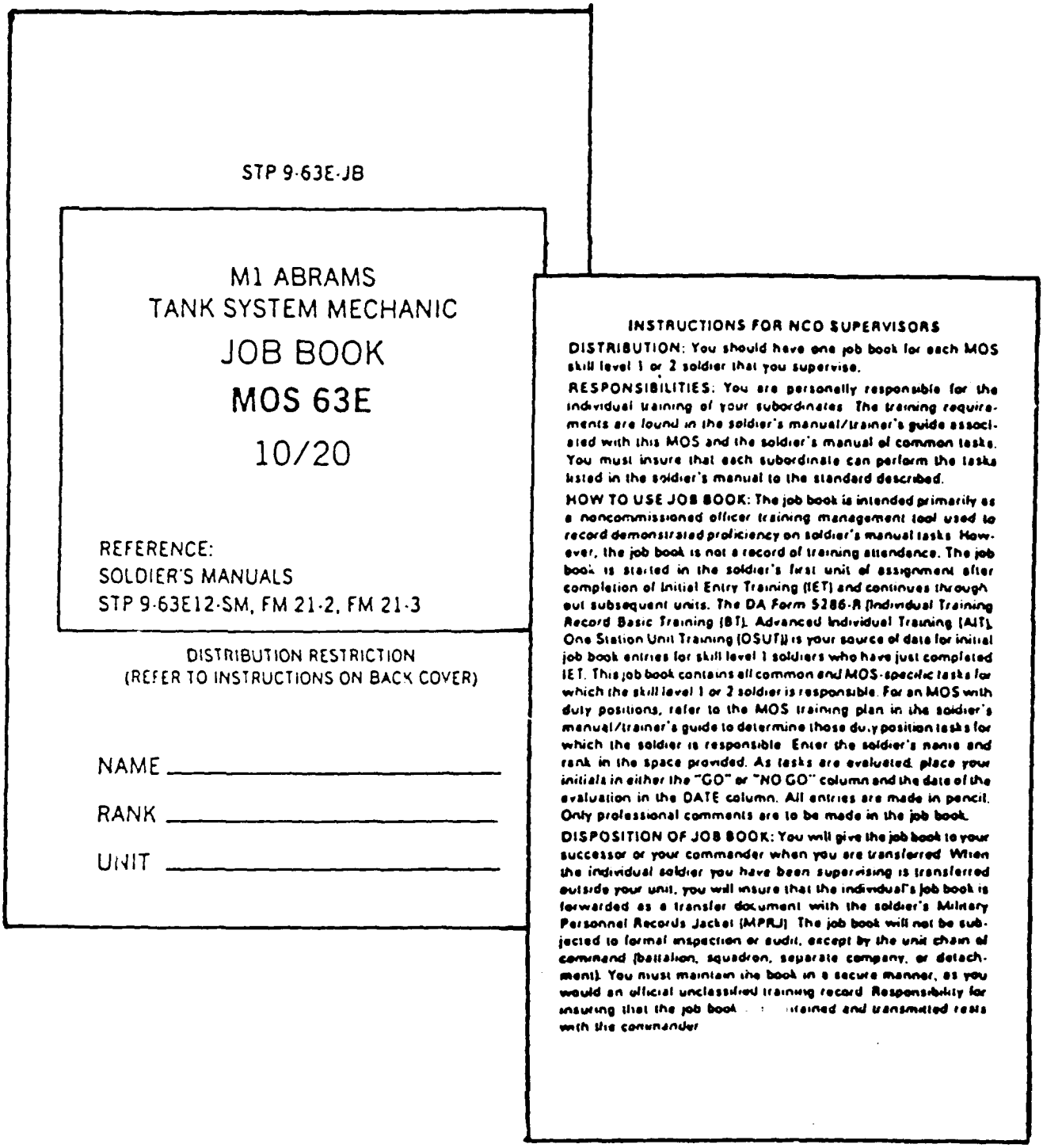
17

SECTION III
RELATED TECHNICAL TASKS
63E, M1 ABRAMS TANK AUTOMOTIVE
MECHANIC/RECOVERY VEHICLE OPERATOR
SKILL LEVEL 1
REFERENCE: STP 9-63E12-SM

TASK NUMBER AND TITLE	GO	NO GO	DATE
TANK, COMBAT, 105MM, M1			
091-490-1003 Replace Oil Filter			
091-490-1004 Replace Oil Pump Assembly			
091-490-1005 Replace Oil Filter, Oil Pump to Oil Cooler			
091-490-1006 Replace Valve, Air Bleed			
091-490-1007 Remove/Install Engine Oil Cooler			
091-490-1008 Remove/Install Engine Oil Cooler Inlet or Outlet Tube (Left Side)			

31

Figure D-3. Sample Pages from STP 9-63E-JB.



STP 9-63E-JB

M1 ABRAMS
TANK SYSTEM MECHANIC
JOB BOOK
MOS 63E
10/20

REFERENCE:
SOLDIER'S MANUALS
STP 9-63E12-SM, FM 21-2, FM 21-3

DISTRIBUTION RESTRICTION
(REFER TO INSTRUCTIONS ON BACK COVER)

NAME _____

RANK _____

UNIT _____

INSTRUCTIONS FOR NCO SUPERVISORS

DISTRIBUTION: You should have one job book for each MOS skill level 1 or 2 soldier that you supervise.

RESPONSIBILITIES: You are personally responsible for the individual training of your subordinates. The training requirements are found in the soldier's manual/trainer's guide associated with this MOS and the soldier's manual of common tasks. You must insure that each subordinate can perform the tasks listed in the soldier's manual to the standard described.

HOW TO USE JOB BOOK: The job book is intended primarily as a noncommissioned officer training management tool used to record demonstrated proficiency on soldier's manual tasks. However, the job book is not a record of training attendance. The job book is started in the soldier's first unit of assignment after completion of Initial Entry Training (IET) and continues throughout subsequent units. The DA Form 5286-R (Individual Training Record Basic Training (BT), Advanced Individual Training (AIT), One Station Unit Training (OSUT)) is your source of data for initial job book entries for skill level 1 soldiers who have just completed IET. This job book contains all common and MOS-specific tasks for which the skill level 1 or 2 soldier is responsible. For an MOS with duty positions, refer to the MOS training plan in the soldier's manual/trainer's guide to determine those duty position tasks for which the soldier is responsible. Enter the soldier's name and rank in the space provided. As tasks are evaluated, place your initials in either the "GO" or "NO GO" column and the date of the evaluation in the DATE column. All entries are made in pencil. Only professional comments are to be made in the job book.

DISPOSITION OF JOB BOOK: You will give the job book to your successor or your commander when you are transferred. When the individual soldier you have been supervising is transferred outside your unit, you will insure that the individual's job book is forwarded as a transfer document with the soldier's Military Personnel Records Jacket (MPRJ). The job book will not be subjected to formal inspection or audit, except by the unit chain of command (battalion, squadron, separate company, or detachment). You must maintain the book in a secure manner, as you would an official unclassified training record. Responsibility for insuring that the job book [illegible] retained and transmitted rests with the commander.

Figure D-2 Sample Pages from STP 9-63E-JB (continued).

shown to be the case in those instances investigated), the Job Book does not contain a standards statement or an Evaluation Guide and corresponding performance measures. Its use would appear to be further limited by the fact that there is room to record the results of only one iteration of the task performance.

In the case of MOS 67Y10 as well as 68B10, both of which relate to aviation maintenance, there is a process which serves as a more formal evaluation of individual task performance - the technical inspection. Due to the safety factor associated with flying, there is a requirement for the work performed by Skill Level 1 mechanics to be checked by school-trained technical inspectors. These inspectors must certify that the work that has been performed on the aircraft or its powerplant has been accomplished in accordance with the procedures specified in the applicable technical manual. Thus, in addition to the informal observation by the soldier's supervisor, there is yet another method for evaluating the soldier's performance of the tasks related to sustainment training. While this approach is the ideal way of performing inspections, an educational specialist at the Aviation Logistics school had this to say , "No formal requirement exists for relating Technical Inspector (TI) inspection failures to performance failures or vice-versa, unless an individual TI takes it upon himself to make the relationship and follow through. Unfortunately, this rarely happens. The TI is a busy man in most units due to poor Modified Table of Organization and Equipment Structure."

None of the unit survey respondents indicate that basic or common tasks are emphasized in the evaluation of individual performance. In every instance, the focus appears to be primarily on "duty position" or "related technical", i.e., MOS-specific, tasks.

For all the MOSs, there is a structured, formalized means for evaluating the soldier's ability to perform the tasks associated with sustainment training. This is through the administration of the Skill Qualification Test (SQT) which is given annually to all soldiers in the MOS. These tests formerly included a hands-on component in which the soldiers' performance was observed in a standardized test situation. However, due to difficulty in developing reliable test instruments, the hands-on component has been replaced by a test which is strictly a paper-based evaluation instrument. While performance of most of the skills involved in sustainment training across all the MOSs surveyed cannot, in the strictest sense, be evaluated through such paper-based tests, the SQT does provide a mechanism to evaluate the extent of the soldiers' knowledge related to the tasks.

Use of Performance Measurement Data. Without exception, the personnel surveyed in the units stated their belief that the data that are generated as a result of training performance measurement within the unit are used by unit training managers to determine the remedial training required to overcome

deficiencies. Even the informal evaluation of how well a soldier performs a certain task provides the supervisors an indication of what additional training is required in order to bring a soldier up to the specified criterion level of performance. Similarly, the SQT results are provided the supervisors so they can determine training requirements. Thus the respondents indicated that the results of the training performance measurement are used within the unit, although there is some question in their minds, as discussed below, as to whether the data are being used by the TRADOC schools in developing courses or training support material.

Respondents from aviation maintenance units also indicate that, in addition to identifying training requirements, the data generated from training PMA are used to determine the extent of supervision that Skill Level 1 mechanics need as they perform their jobs. None however states that the requirement to have technical inspectors check the work of the Skill Level 1 mechanics is ever bypassed.

Results of sustainment training PMA, both the informal observation results and the SQT results, are also provided to the soldier. This feedback system gives the individual insights into areas in which he/she is weak and identifies areas where additional training is necessary.

The Skill Qualification Tests results, in addition to identifying future training requirements, are also used to support various personnel actions, such as promotion and reclassification. Moreover, SQT results are provided to the proponent schools; TRADOC Reg 350-7 requires the schools to analyze these results to determine training problems being encountered by units in the field so that remedies can be designed to overcome these problems.

In addition to providing training PMA data to the individual soldiers, their supervisors, and the schools which have proponency for the particular MOSs, units are encouraged to make entries concerning individual performance in a Job Book. The Job Book is designed to become a part of the soldier's individual personnel records and forwarded to the new unit when the soldier is reassigned. Inasmuch as this study effort did not address soldiers transferring from one unit to another, this aspect of the use of training PMA data was not addressed.

Finally, there is a mechanism whereby the TRADOC schools are required to be proactive in seeking out training PMA data. TRADOC Reg 350-7 requires the schools to conduct external evaluations to determine "whether or not the duty position or mission performance requirements have been satisfied in the most effective and efficient manner commensurate with the conditions and constraints that prevail in the representative unit setting." Specific requirements include the development of an

evaluation policy, preparation of an external evaluation plan, the establishment of feedback channels, the preparation of statements of work for contracted studies, the preparation of a branch training team visitations plan, the collection and analysis of data/information and the preparation of evaluation reports, and the distribution of evaluation reports to the appropriate offices/agencies for action.

According to the current TRADOC school model, the Director of Evaluation and Standardization (DOES) is responsible for establishing these Branch Training Teams (BTTs) and sending them to units to which soldiers with MOSs for which the school is proponent are assigned in order to determine, among other things, the performance shortfalls of the graduates. These teams are charged with accessing training PMA data as well as subjective information from unit trainers in order to have a data base on which to improve the quality of institutional training as well as the training materials the schools develop to support training in the units. Despite the existence of this proactive system, the implementation of the program appears to be somewhat lacking. Although the school respondents state that the BTTs visit units on a regular basis, none of the unit survey respondents states that he had ever talked with anyone from the respective schools. While many of the respondents see the link between the unit and the school as a very important one, most of the unit respondents believe the link is not as operative as it might be. Again, the conclusions drawn may be the result of sampling error, given the relatively small size of the sample used in this effort.

Enhancement Training (Training of Individual Skills in Units)

Enhancement training is, for the purposes of this study, defined as training that prepares a soldier to accomplish tasks that he has not previously been required to perform. These new tasks may be required as a result of the introduction of new equipment, as in the case of the M1 tank replacing the M60 tank, or as a result of changes in tactics or procedures. Enhancement training is also required to prepare a soldier to perform at a higher level, i.e., to prepare him for promotion.

Tasks Trained/Evaluated. With respect to the first category, i.e., enhancement training to support a change in equipment, tactics, or procedures, there is no list of prescribed tasks. The new tasks will be dependent upon the new equipment, tactics, or procedures. Until those changes come about, the extent of the training required to enable the soldier to perform the new tasks cannot be determined. The required training is developed by the proponent TRADOC school based on the change; generally, if the training is occasioned by a change in equipment, a New Equipment Training Team (NETT) will be created to accomplish the training on site in the unit. For training to support changes in tactics and doctrine, the TRADOC school will generally develop a training program specifically to support the training in units. In the case of preparing a soldier for promotion to the next higher

skill level, the authors reviewed the appropriate soldier's manuals and, where available, the appropriate job books for each of the MOSs to determine the number of tasks Skill Level 2 soldiers were required to perform that were above and beyond the requirements for SL 1 soldiers. The number of these tasks is shown in Table D-11.

As can be seen, the number of additional tasks that a soldier at the next higher skill level will be required to perform varies among MOSs; moreover, depending on what source document is reviewed the number of additional tasks may even vary within a single MOS. Thus for 19E10, the Job Book reflects 12 additional tasks whereas the Soldier's Manual reflects 34. In the case of MOS 68B10, the soldier's manual states that "technical tasks for this MOS are the same for Skill Levels 1 and 2;" Table 11 thus reflects `0' for the number of tasks required at the higher level.

Performance Standards Used. The performance standards used in enhancement training necessitated by a change in equipment will be reflected in the POI used by the NETT. Similarly, for changes in tactics and procedures, the appropriate TRADOC school will develop the standards as part of the training support material. For enhancement training to prepare a soldier for promotion, the standards are provided in the appropriate soldier's manual or applicable technical manual.

Performance Measurement Methodology. Since the training programs that are used for the conduct of enhancement training are generally unique to a special situation, there are no data available as to the methodologies used in those instances to measure performance. In general, unit survey respondents indicate that observation by members of the NETT or by the soldiers' first-line supervisors is the accepted methodology. For enhancement training to support promotion or performance at a higher skill level, respondents indicate that observation of performance against the standards specified in the soldier's manual or technical manual is the primary means of evaluating performance.

Use of Performance Measurement Data. Survey respondents in general indicate that training PMA data generated through the observation of soldiers' performance are used to determine the completion of training, i.e., when the soldier can move on to training on the next task. This is seen as being the equivalent of stating that the data are used to identify the necessity for further training on a task that the soldier is unable to perform.

Crew/Team/Squad Training (Training of Collective Skills in Units)

Although a significant portion of available training time in units is devoted to collective training, the identity of the specific MOSs is lost in the training support material developed by the schools. For example, each type of Table of Organization

Table D-11

Estimated Number of Tasks, by MOS and Source Document, Requiring Enhancement Training for Task Performance at Skill Level 2.

	Job Book				Soldier's Manual		
	Common Tasks	Duty Position Tasks	Related Tech. Tasks	MOS Skill Level Tasks	Duty Position Tasks	Related Tech. Tasks	MOS Skill Level Tasks
19E10	10			2			34
19K10	9			1			30
63E10	22	31	78		31	78	
63N10		[NOT AVAILABLE]			23	50	
67Y10		[NOT AVAILABLE]					12
68B10		[NOT AVAILABLE]					0

Evaluation Program (ARTEP) which specifies the collective tasks that the unit must be able to perform along with the associated conditions and prescribed standards. However, the ARTEP does not specifically identify the soldiers by MOS and skill level who are involved in the collective task accomplishment, nor which individual tasks are associated with the accomplishment of the collective task. Although this shortcoming is being addressed in the Improved ARTEP Program currently underway throughout the TRADOC, the current state of the ARTEPs precludes the generation of comprehensive data concerning this area of training.

Number of Tasks Trained/Evaluated. In view of the data void identified in the preceding paragraph, it is not possible to identify the number of collective tasks required of each of the six MOSs in the unit training environment. Moreover, since soldiers with a particular MOS are assigned to different types of units, each of which has its own unique ARTEP, the number of collective tasks identified against each MOS would depend on the unit to which the soldier was assigned. For these reasons, no data are available which indicate the extent of the collective training requirements for the six MOSs surveyed.

Performance Standards Used. Standards are provided in the ARTEPs as mentioned above. Although TRADOC requires its schools to make the standards as objective as possible, one of the principal complaints concerning the ARTEP is that the current standards are seriously flawed. Among the most frequent criticisms of the ARTEP standards are that they are:

- Compound standards - That is they contain more than one criterion, making it impossible to assess task performance if one or more (but less than all) the criteria are failed. For example, if the standard contains four criteria, and one is failed, there is no guidance as to whether the whole task performance should be rated GO or NO GO.

- Vague - That is they leave the evaluator unsure of what specific measures should be applied to determine successful task accomplishment.

- They contain statements about what to do as opposed to how well to do it. For example, the standards for a particular task are often in reality subtasks.

- Subjective - They rely too greatly on the subjective judgment of the evaluator. This is a particularly serious criticism in light of the frequent comments concerning the lack of adequate training for the evaluator personnel.

Performance Measurement Methodology. While it is impossible, for reasons mentioned above, to isolate the training PMA methodology used to measure collective task performance against

each of the six MOSs surveyed, some comments can be made concerning collective task training PMA in general. The evaluations are made either informally or formally, generally at some interval prescribed by higher headquarters. Informal ARTEP evaluations can be conducted through observation by the commander at all levels of command or supervision, such as by the Battalion Commander down to and including the team, crew, or squad leader. These informal observations of performance, measured against the ARTEP standards, allows the leader to identify performance deficiencies so that remedial training can be scheduled and conducted. Again, given the nature of the ARTEP document itself, the ARTEP does not allow for measurement of individual training deficiencies, although certainly the Army expects its leaders to be aware that a collective task performance deficiency may be the result of individual task performance deficiencies.

The more formal ARTEP evaluations are specifically called out in a training schedule such as put out by the division staff. Normally, these evaluations are referred to as 'external' ARTEP evaluations, indicating that the evaluators come from outside the unit being evaluated. As in informal evaluations, individual task performance is not specifically addressed, although the evaluators are free to mention such deficiencies if they are contributing factors to the collective task performance deficiency.

Use of Performance Measurement Data. Although the Branch Training Teams organized by each of the TRADOC schools is encouraged to access all training-related data at the units, to include data relating to collective training, the evidence suggests that these data are not getting back to the schools. None of the survey respondents, either at the institution or the unit, indicated that there is any routine feedback of collective performance data to the proponent school.

Both the informal (internal) and formal (external) ARTEP evaluations are used to identify performance deficiencies and thus determine collective training requirements. Usually, this information is generated during after-action reports following the ARTEP evaluation, during which the evaluator(s) will discuss the results of the evaluation, commenting on the unit's strengths and weaknesses and recommending how performance can be improved.

In addition, the results of the evaluations are used to infer the effectiveness of the unit's collective training program and to provide input to the command's readiness evaluation system.

Advanced Collective Training (Training of Collective Skills in Units)

The problems related to the lack of a cross-walk between collective task performance and the task requirements associated with each of the six surveyed MOSs is even more pronounced in the context of advanced collective training. In other words, it is

each of the six MOSs surveyed, some comments can be made concerning collective task training PMA in general. The evaluations are made either informally or formally, generally at some interval prescribed by higher headquarters. Informal ARTEP evaluations can be conducted through observation by the commander at all levels of command or supervision, such as by the Battalion Commander down to and including the team, crew, or squad leader. These informal observations of performance, measured against the ARTEP standards, allows the leader to identify performance deficiencies so that remedial training can be scheduled and conducted. Again, given the nature of the ARTEP document itself, the ARTEP does not allow for measurement of individual training deficiencies, although certainly the Army expects its leaders to be aware that a collective task performance deficiency may be the result of individual task performance deficiencies.

The more formal ARTEP evaluations are specifically called out in a training schedule such as put out by the division staff. Normally, these evaluations are referred to as 'external' ARTEP evaluations, indicating that the evaluators come from outside the unit being evaluated. As in informal evaluations, individual task performance is not specifically addressed, although the evaluators are free to mention such deficiencies if they are contributing factors to the collective task performance deficiency.

Use of Performance Measurement Data. Although the Branch Training Teams organized by each of the TRADOC schools is encouraged to access all training-related data at the units, to include data relating to collective training, the evidence suggests that these data are not getting back to the schools. None of the survey respondents, either at the institution or the unit, indicated that there is any routine feedback of collective performance data to the proponent school.

Both the informal (internal) and formal (external) ARTEP evaluations are used to identify performance deficiencies and thus determine collective training requirements. Usually, this information is generated during after-action reports following the ARTEP evaluation, during which the evaluator(s) will discuss the results of the evaluation, commenting on the unit's strengths and weaknesses and recommending how performance can be improved.

In addition, the results of the evaluations are used to infer the effectiveness of the unit's collective training program and to provide input to the command's readiness evaluation system.

Advanced Collective Training (Training of Collective Skills in Units)

The problems related to the lack of a cross-walk between collective task performance and the task requirements associated with each of the six surveyed MOSs is even more pronounced in the context of advanced collective training. In other words, it is

more difficult to associate the collective tasks for higher echelons such as platoon, company and battalion with particular MOSs. For this reason, no findings concerning the number of tasks trained/evaluated, performance standards used, training PMA methodologies or use of training PMA data could be developed, other than those findings discussed within the context of crew/team/squad training described above.

Synopsis of School and Unit Surveys

A replay of the overall matrix (Figure D-3) is provided on page D-37 to assist the reader in reviewing the matrices that follow. These matrices provide detailed synopses of the surveys conducted at the schools and units involved in this effort. Each of the blocks provide a summary of the comments made by respondents with regard to each of the six MOSs addressed in the effort (arrayed along the vertical axis) and the categories of training (arrayed along the horizontal axis). The purpose of this section is to provide elaboration on the basis for the findings and conclusions presented in the text of this report.

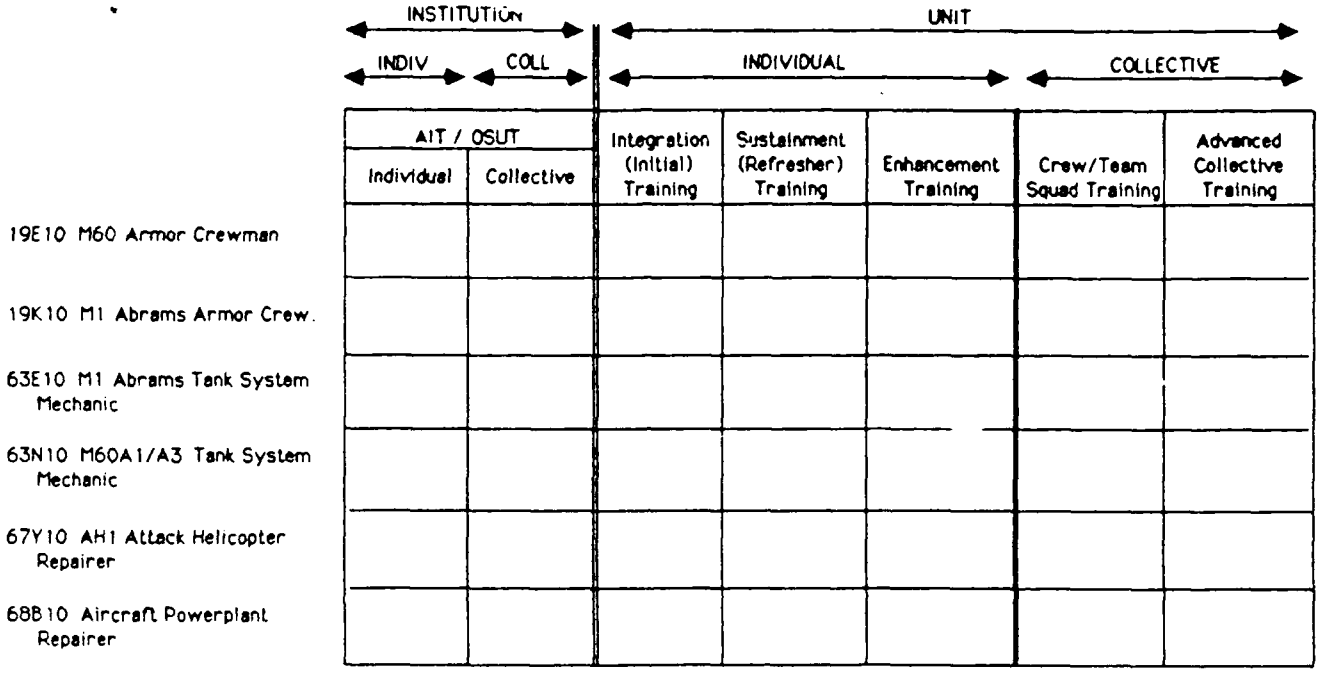
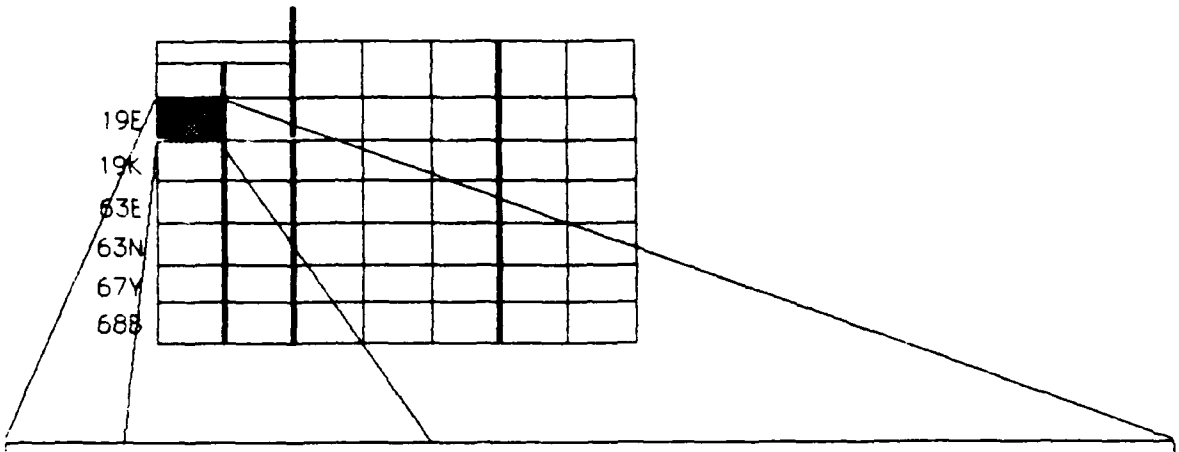
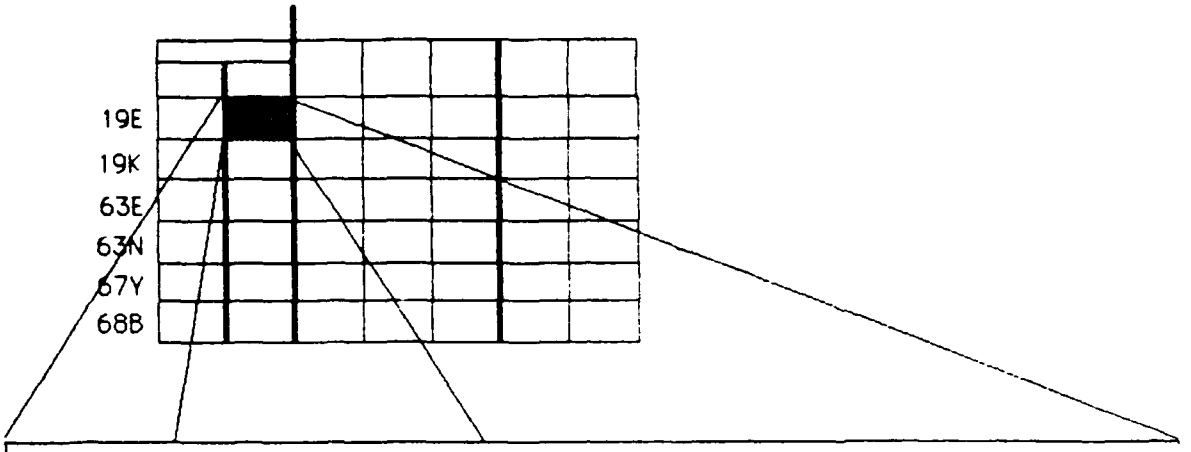


Figure D-3. Training performance measurement and assessment matrix/study architecture



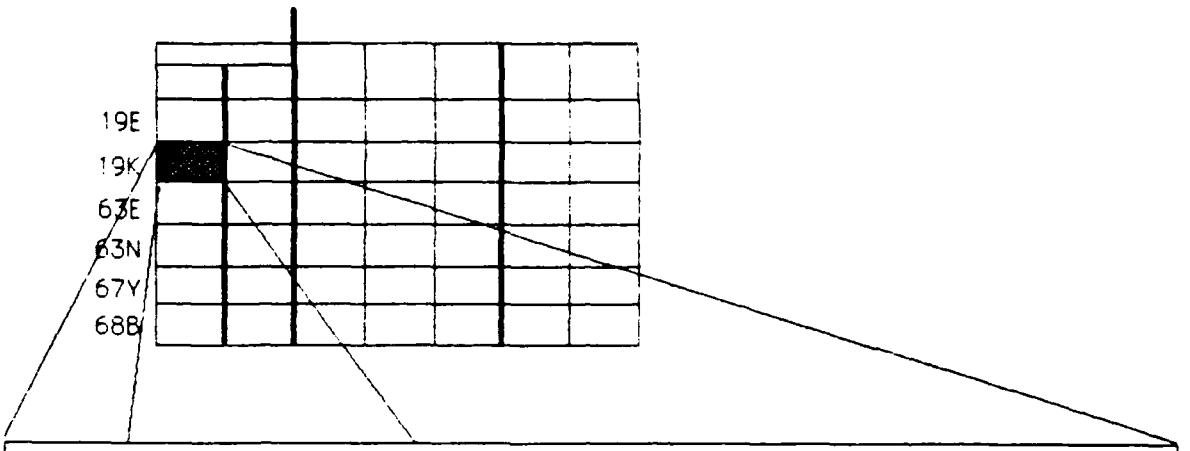
MOS: 19E10 **Type Training:** Training of Individual Skills in Institutions

Number of Tasks Trained/ Evaluated:	64 discrete MOS-related tasks are reflected in the Program of Instruction; these do not include a number of common tasks taught in the Basic Training portion of this OSUT situation. A total of 61 tasks are specifically evaluated; survey indicates perhaps as low as 50% of tasks trained are evaluated, but this is believed to refer to all tasks.
Performance Standards Used:	POI refers to standards contained in Soldier's Manual for MOS 19E Skill Level 1. Survey respondents also indicate Soldier's Manual is the source of the standards. Soldier's Manual contains standards (product-oriented) as well as an evaluation guide which lists performance measures (process-oriented) If soldier fails any step in the process-oriented evaluation guide, he receives a NO-GO for the entire task, regardless of whether he meets the standard.
Performance Measurement Methodology:	Examinations at end of each major block of instruction (22 hours are hands-on, 2 hours are written). There are three "Gate" tests, each of which is an 8-hour hands-on performance evaluation. Gate 1 marks the end of the BT phase of training, Gate 2, and Gate 3 which is the end-of-course comprehensive test. All hands-on tests are scored Go/ No Go. To pass, soldier must get a "Go" on each and every step involved in the task.
Use of Performance Measurement Data:	Data generated as a result of performance measurement are used to identify student weaknesses so remedial training can be conducted Continued failure may lead to adverse personnel actions, e.g. reclassification to another MOS. Data also aggregated to provide quality control check of instruction. Must pass all tasks to get MOS.
Source(s) of Information:	Draft POI, Course Number. 19E10-OSUT, US Army Armor School, June 1985. Interviews with staff members of the US Army Armor School (Dec 85).



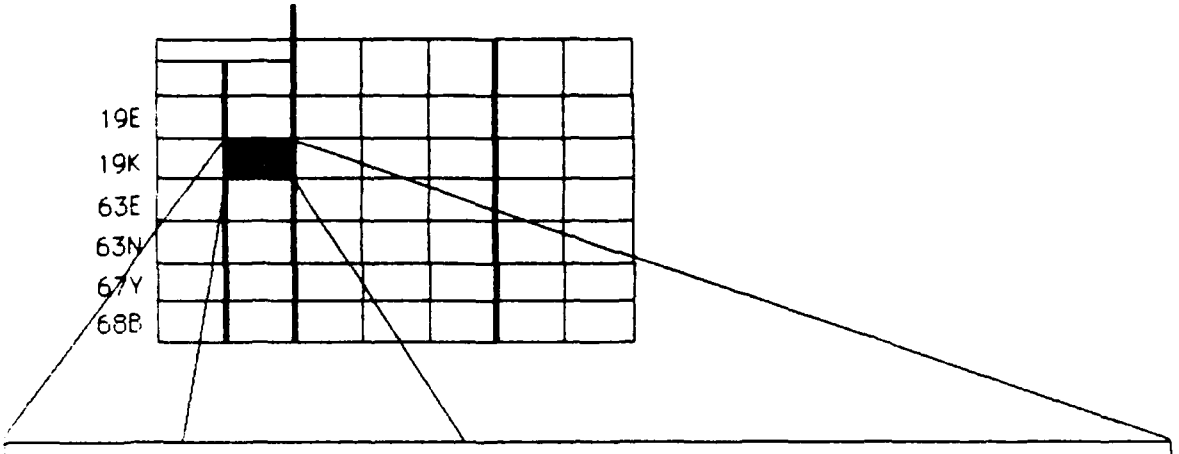
MOS: 19E10 **Type Training** Training of Collective Skills in Institutions

Number of Tasks Trained/ Evaluated:	Not identified. POI reflects a 98-hour field exercise in which "previously learned individual skills are reinforced in a collective tactical environment using MILES equipment"; 21 individual skills are identified but no collective skills are specifically mentioned
Performance Standards Used:	N/A
Performance Measurement Methodology:	N/A
Use of Performance Measurement Data:	N/A
Source(s) of Information:	Draft POI, Course Number 19E10-OSUT, US Army Armor School, June 1985. Interviews with staff members of the US Army Armor School (Jan 1986).



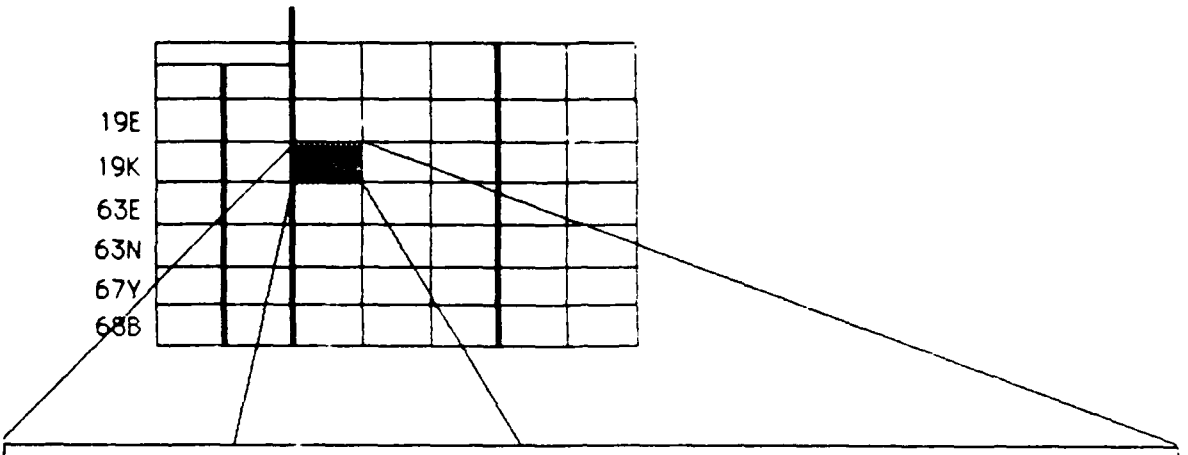
MOS: 19K10 **Type Training** Training of Individual Skills in Institutions

Number of Tasks Trained/ Evaluated:	64 discrete MOS-related tasks are listed in the POI, these do not include a number of common tasks trained as part of this OSUT situation. 62 of these tasks are evaluated. A total of 5 tasks are reflected in the POI but not tested. See text for further elaboration of these and other discrepancies. Soldier must master all tasks to receive MOS
Performance Standards Used:	POI refers to Soldiers Manual standards of performance. Soldiers Manual for MOS 19K10, as well as FM 21-1 (Common Tasks Manual) contains performance standards (product oriented) AND evaluation guide (process oriented). If soldier fails any performance measure in the process-oriented evaluation guide, he receives a NO-GO for the task, regardless of whether he meets the standard.
Performance Measurement Methodology:	Soldiers are evaluated by observation of instructors during practical exercises. In addition, there are examinations at end of each major block of instruction. There are three 'Gate' tests, each of which is an 8-hour hands-on performance evaluation. Gate 1 marks the end of the BT phase of training, Gate 2, and Gate 3 which is the end-of-course comprehensive test.
Use of Performance Measurement Data:	Data generated as a result of performance measurement are used to identify student weaknesses so remedial training can be conducted. Continued failure may lead to adverse personnel actions, e.g. reclassification to another MOS. Data also aggregated to provide quality control check of instruction.
Source(s) of Information:	Draft POI, Course Number: 19K10-OSUT, US Army Armor School, June 1985. Training and Evaluation Plan for the M1/M1A1 Abrams Armor Crewman Course, US Army Armor School, Jan 1986. Interview with staff members of the US Army Armor School, Dec 1985



MOS: 19K10 **Type Training** Training of Collective Skills in Institutions

Number of Tasks Trained/ Evaluated:	Not identified. POI reflects a 98-hour Tankers Field Exercise in which "previously learned individual skills are reinforced in a collective tactical environment"; 20 individual tasks are specifically mentioned but no collective skills are specifically mentioned.
Performance Standards Used:	N/A
Performance Measurement Methodology:	N/A
Use of Performance Measurement Data:	N/A
Source(s) of Information:	Draft POI, Course Number: 19K10-OSUT, US Army ARmor School, June 1985. Interviews with staff members of the US Army Armor School, Dec 1985.



MOS: 19K10 **Type Training** Integration Training (Training of Individual Skill in Units)

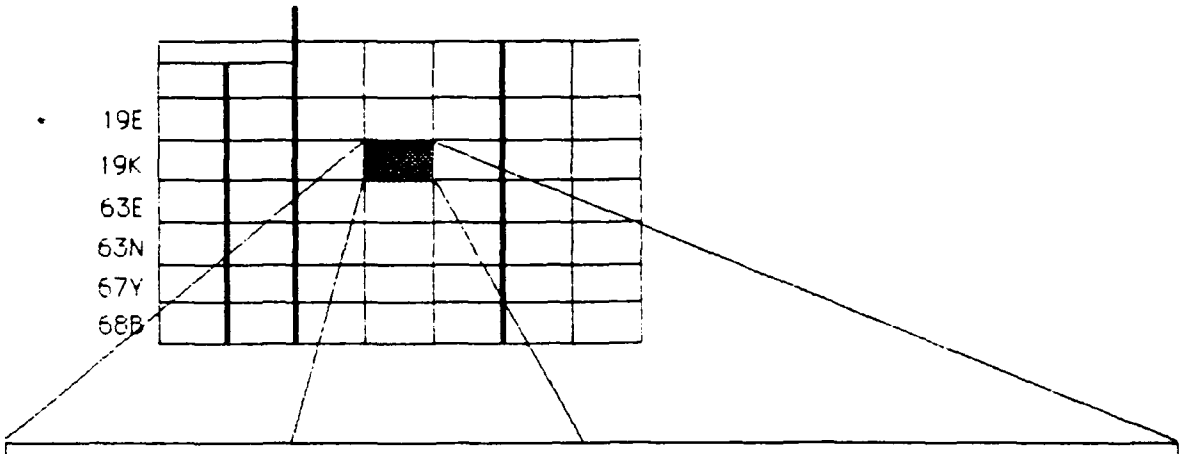
Number of Tasks Trained/ Evaluated: No formal documentation specifying number of skills to be trained/ evaluated. Total number of MOS-specific tasks identified for soldiers with MOS 19K10 is 83. Since school trains 64 of these tasks, inference is that 19 tasks are candidates for integration training. Unit survey respondents do not indicate knowledge of how many tasks are taught in integration training.

Performance Standards Used: Unit survey respondents indicated that standards contained in Soldier's Manual are used. However, Soldier's Manual and FM 21-1 (Common Tasks) also contain Evaluation Guides which are process-oriented rather than product-oriented. Using the Guides, if a soldier fails any performance measure in the guide, he receives a NO-GO for the entire task, regardless of whether he meets the standard.

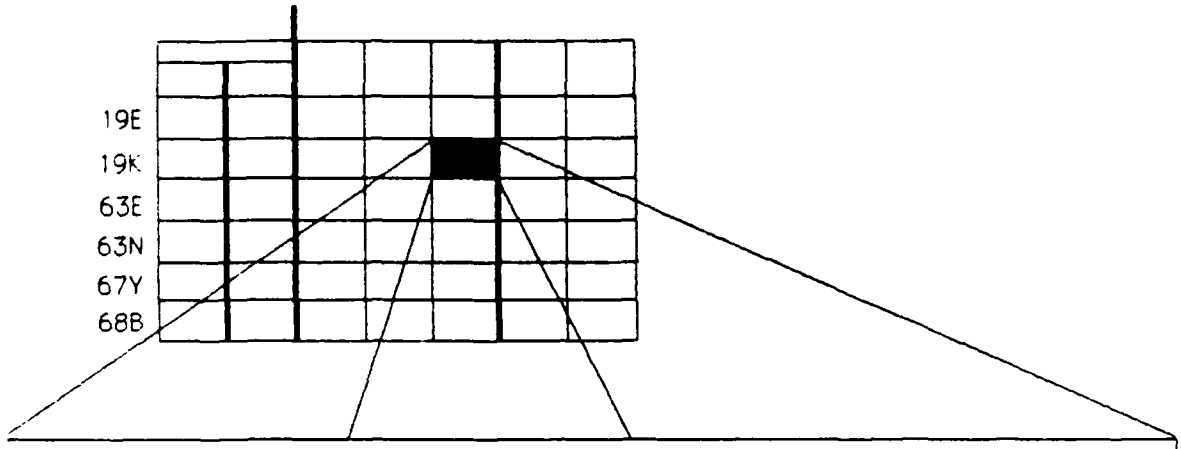
Performance Measurement Methodology: When a soldier is assigned to the unit, he is observed by his first-line supervisor, a NCO, to determine the extent of additional training required. Observation or individual task performance normally takes place during field exercises or drills, i.e. during collective training periods.

Use of Performance Measurement Data: Survey respondents indicate that, for the most part, results of the performance measurement are used to determine future individual training requirements.

Source(s) of Information: STP 17-19K1-SM, Soldier's Manual for MOS 19K, Skill Level 1 (Sep 1984); STP 21-1-SMCT, Soldier's Manual of Common Tasks, Skill Level 1 (Oct 1985); Interviews with unit trainers in various III Corps units, Ft. Hood, TX (Jan 1986)



MOS: 19K10	**Type Training** Sustainment Training (Training of Individual Skills in Units)
Number of Tasks Trained/ Evaluated:	A total of 223 discrete tasks (both common and MOS-specific) have been identified for soldiers with MOS 19K10. All 223 are candidates for sustainment training, although survey respondents indicated the MOS specific tasks are the most likely to be trained in the unit. All are subject to evaluation, but there is no formal documentation of which are evaluated in the unit
Performance Standards Used:	Performance standards are those that are reflected in the appropriate Soldier's Manual. These standards are generally product-oriented, the Soldier's Manual also contains process-oriented Evaluation Guides for each task. If the soldier fails any performance measure in the Evaluation Guide, he receives a NO-GO for the entire task, regardless of whether he meets the stated standard.
Performance Measurement Methodology:	Performance is evaluated informally by observation by NCOs, the first-line supervisors of the soldier. In addition, Skill Qualification Tests, primarily consisting of written components, are administered annually to all soldiers with the MOS. These tests are prepared by the proponent school and are administered to all soldiers with the MOS throughout the Army.
Use of Performance Measurement Data:	Results of informal evaluations are used to identify requirements for future training of the individual soldier. SQT results are used to support personnel actions, provide the individual soldier with feedback as to how well he can perform, and provide his supervisors with the same information.
Source(s) of Information	STP 17-19K1-SM, Soldier's Manual for MOS 19K, Skill Level 1 (Sep 1984), STP 21-1-SMCT, Soldier's Manual of Common Tasks, Skill Level 1 (Oct 1985), Interviews with unit trainers in various III Corps units, Ft Hood, TX (Jan 1986)



MOS: 19K10 **Type Training** Enhancement Training (Training of Individual Skills in Units)

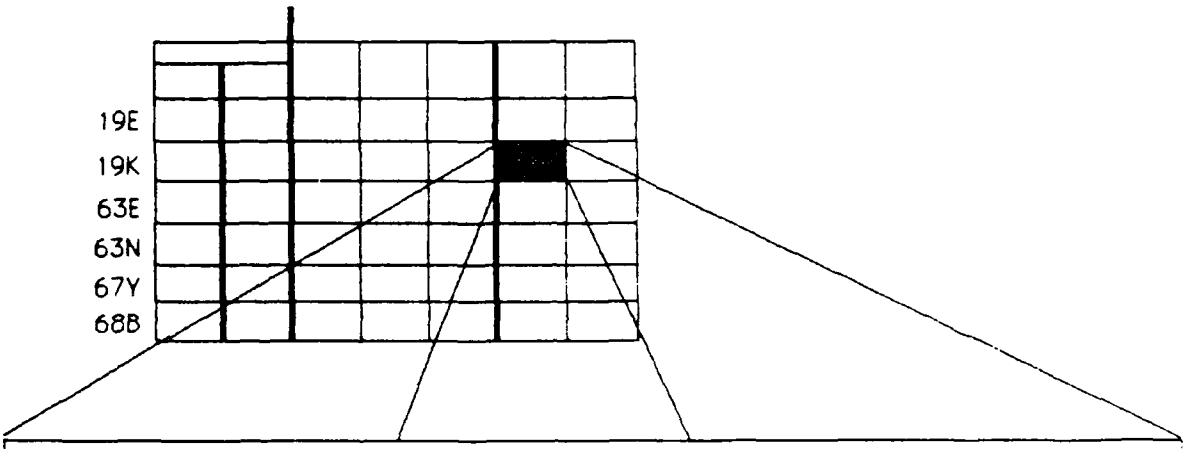
Number of Tasks Trained/ Evaluated: If the enhancement training is required as a result of new equipment or other changes, the number of tasks to be trained will be specified in appropriate training programs specifically designed to support the change. For preparation for promotion, the Soldier's Manual cites 30 additional tasks for Skill Level 2 although the Job Book lists 9 common and 1 MOS skill level tasks at Skill Level 2.

Performance Standards Used: Performance standards will be provided in the appropriate training program developed to support the enhancement training. In the case of the training designed to prepare a soldier for the next higher skill level, the standard is provided in the Soldier's Manual.

Performance Measurement Methodology: Not determined. The methodologies used are dependent upon the unique training program designed to support a particular requirement for enhancement training. In the case of enhancement training to progress to Skill Level 2, the Soldier's Manual provides approximately 12 performance measures, each of which is required to be passed in order to get a 'GO' on the task.

Use of Performance Measurement Data: Survey respondents indicate the data generated is used to determine when enough training had been given.

Source(s) of Information: Interviews with unit trainers in various III Corps units, Ft Hood, TX (Jan 1986); STP 17-19K24-SM-TG, Soldier's Manual for MOS 19K, Skill Level 2/3/4 (Sep 1984).



MOS: 19K10 **Type Training** Crew/Team/Squad Training (Training of Collective Skills in Units

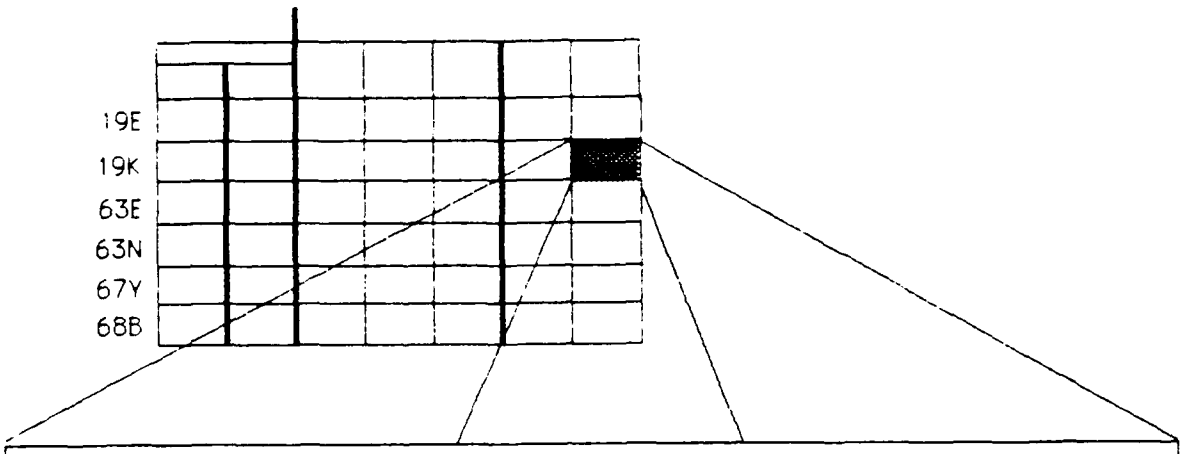
Number of Tasks Trained/ Evaluated: ARTEPs designed for specific type units identify the collective tasks the unit must be able to perform but do not specifically identify the MOS and skill level of the soldiers who are involved in the performance of the tasks. Improved ARTEPs will provide such a crosswalk Currently, ARTEP 71-2 (Armor/Mechanized Infantry Task Force) identifies a total of 8 missions and 76 tasks for armor crews

Performance Standards Used: The ARTEP provides a standard for each task listed These standards are either quantitative or qualitative, and involve extensive evaluator judgment

Performance Measurement Methodology: Collective task performance is measured informally by observation by unit leaders, using criteria published in the ARTEP Training and Evaluation Outlines. Formal ARTEP evaluations are made by evaluators, usually from units other than the one being evaluated, against the ARTEP criteria.

Use of Performance Measurement Data: Data generated as a result of informal evaluations are used to identify weaknesses and thereby determine collective training requirements Formal ARTEP evaluations are used by the chain of command to determine training requirements, support readiness evaluations, and to determine the effectiveness of the unit's collective training program.

Source(s) of Information: ARTEP 71-2, Mechanized Infantry/Tank Task Force
Interviews with unit trainers in various III Corps units, Ft Hood, TX (Jan 1986)



MOS: 19K10 **Type Training** Advanced Collective Training (Training of Collective Skills in Units)

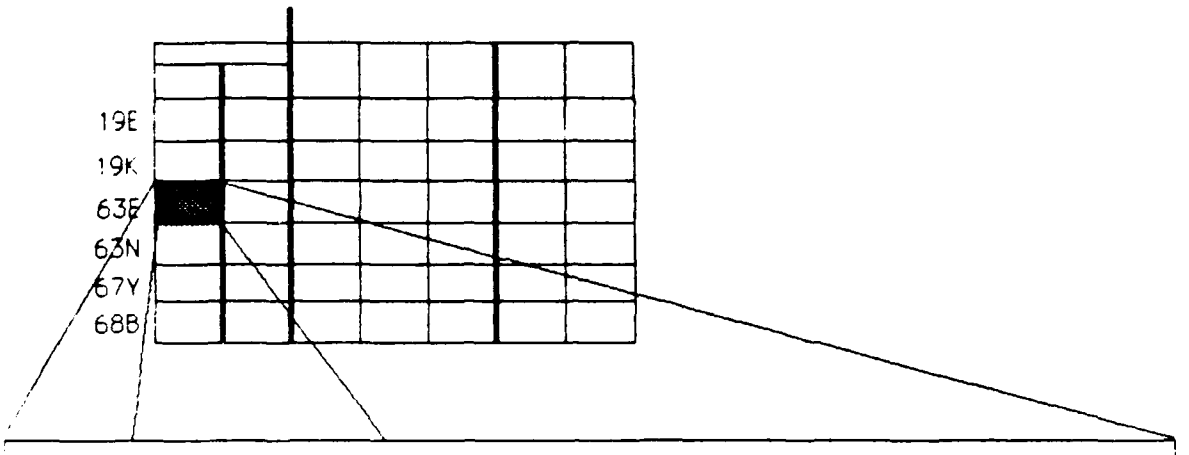
Number of Tasks Trained/ Evaluated: ARTEPs designed for specific type units identify the collective tasks the unit must be able to perform but do not specifically identify the MOS and skill level of the soldiers who are involved in the performance of the tasks. Improved ARTEPs will provide such a crosswalk. Currently, ARTEP 71-2 (Armor/Mechanized Infantry Task Force) identifies a total of 7 missions and 71 tasks for armor platoons (5 missions and 56 tasks for company teams)

Performance Standards Used: The ARTEP provides a standard for each task listed. These standards are either quantitative or qualitative, and involve extensive evaluator judgment.

Performance Measurement Methodology: Collective task performance is measured informally by observation by unit leaders, using criteria published in the ARTEP Training and Evaluation Outlines. Formal ARTEP evaluations are made by evaluators, usually from units other than the one being evaluated, against the ARTEP criteria.

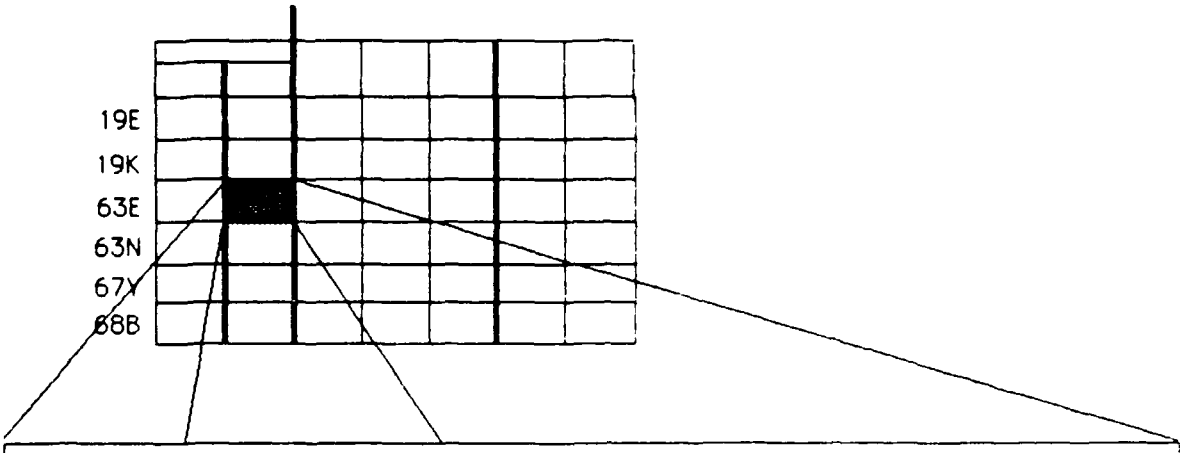
Use of Performance Measurement Data: Data generated as a result of informal evaluations are used to identify weaknesses and thereby determine collective training requirements. Formal ARTEP evaluations are used by the chain of command for training requirement determinations, support readiness evaluations, and to determine the effectiveness of the unit's collective training program.

Source(s) of Information: ARTEP 71-2, Mechanized Infantry/Tank Task Force
Interviews with unit trainers in various III Corps units, Ft Hood, TX (Jan 1986)



MOS: 63E10 **Type Training** Training of Individual Skills in Institutions

Number of Tasks Trained/ Evaluated:	A total of 135 discrete tasks are reflected in the Program of Instruction. All tasks are MOS specific, i.e. they do not include common tasks listed in FM 21-1 (Common Tasks Manual). Not all listed tasks are evaluated, due to limited time available, the Armor School samples performance of some of the tasks.
Performance Standards Used:	The POI refers to applicable Technical Manuals for standards
Performance Measurement Methodology:	5.6 hours of written examinations (70% is the pass-fail criterion) and 62.7 hours of performance examinations (without error is the pass-fail criterion) are scheduled in POI. Some performance is evaluated at the completion of the class, otherwise end-of-block and end-of-course evaluations of "selected critical tasks" are scheduled. Evaluations are made in 'sterile' conditions, not the conditions expected to be encountered on-the-job.
Use of Performance Measurement Data:	Performance data are used to identify student weaknesses to determine remedial training requirements and identify lessons that need modification (20% failure rate gets special attention). Feedback data are provided to DOES at USA Ordnance Center and School.
Source(s) of Information:	POI 611-63E10, US Army Ordnance Center & School, Nov 1983. Interviews with staff members of the US Army Armor School (Jan 1986).



MOS: 63E10 **Type Training** Training of Collective Skills in Institutions

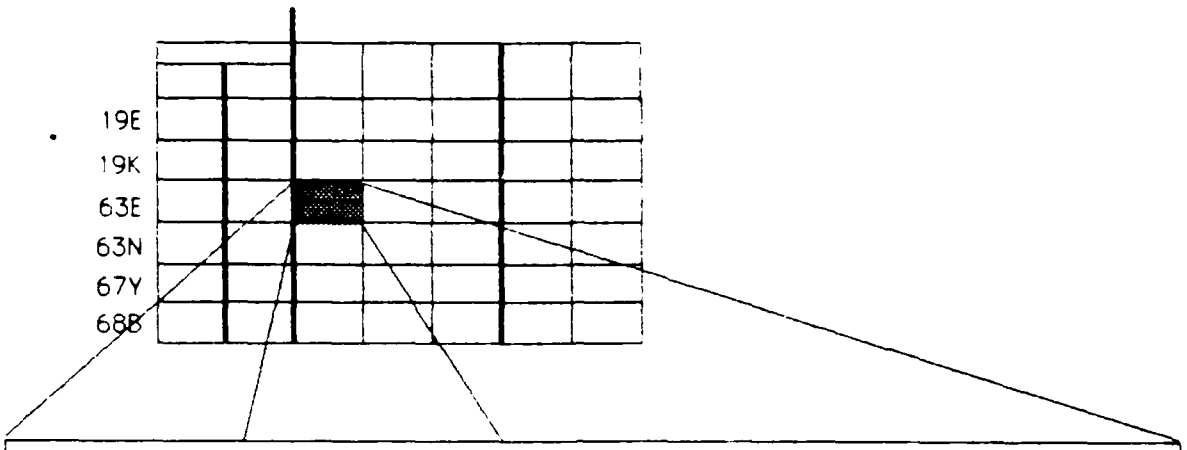
Number of Tasks Trained/ Evaluated: No collective skills/tasks are reflected in the POI.

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

Use of Performance Measurement Data: N/A

Source(s) of Information: POI 611-63E10, US Army Ordnance Center & School, (Nov 1985)
Interviews with staff members of the US Army Armor School (Jan 1986)



MOS: 63E10 **Type Training** Integration Training (Training of Individual Skills in Units)

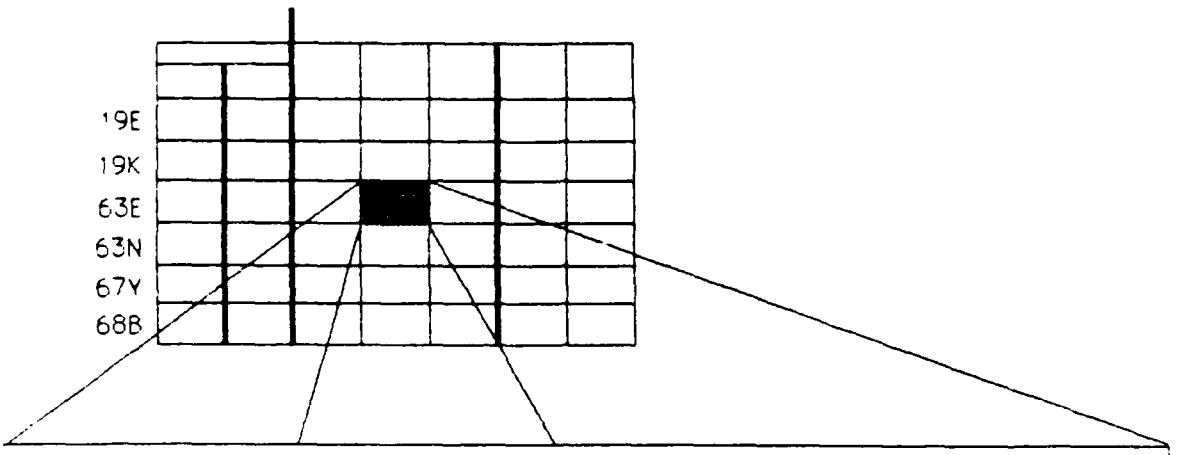
Number of Tasks Trained/ Evaluated: Not determined. Number of tasks varies according to perceptions of training requirements in units. Survey respondents cite wiring, use of wiring diagrams, theory, and use of test equipment as areas where recently graduated soldiers were weak.

Performance Standards Used: Survey respondents state that they use the applicable TM as a source document for standards.

Performance Measurement Methodology: Performance is evaluated by observation of the soldier by Skill Level 2 or Skill Level 3 mechanics. Amost all evaluation is a result of hands-on performance and is graded as pass/fail. Respondents state that subjective judgment is used by evaluators to determine whether performance is a go or no-go. Although PM instruments are contained in Soldiers Manual, supervisors prepare some (20%) of the instruments used.

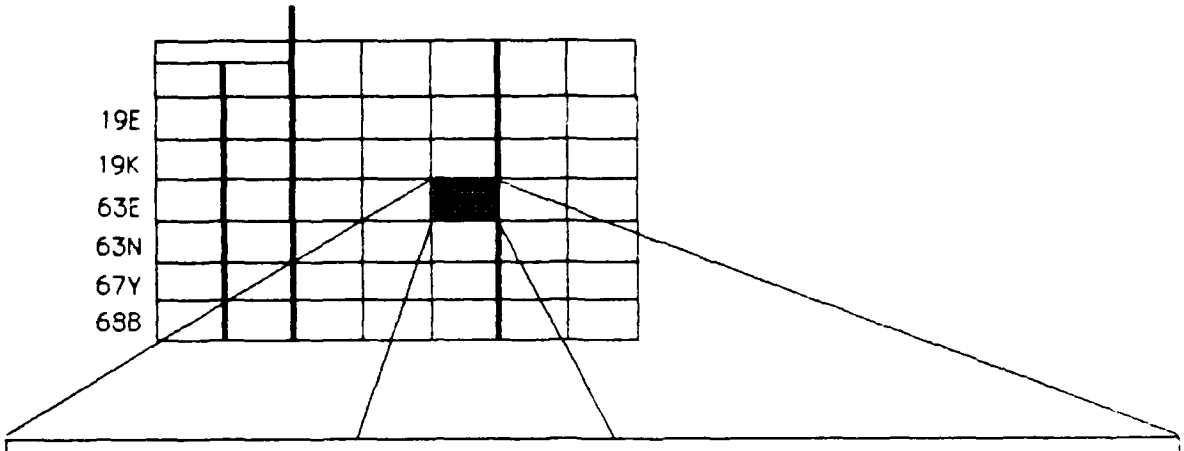
Use of Performance Measurement Data: Limited distribution. Data are used by NCOs to improve mechanics' performance, i.e. through counselling and on-the-spot corrections.

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan '986)



MOS: 63E10 **Type Training** Sustainment Training (Training of Individual Skills in Units)

Number of Tasks Trained/ Evaluated:	Not determined. Soldier's Manual lists 64 Skill Level (SL) 1 duty position tasks ("a solid sample of the kinds of tasks expected of you on the job") and 355 related technical tasks ("that can be performed when you meet the standards" on the duty position tasks.) Job Book reflects 78 SL1 tasks, while POI for individual training at the Armor School lists 135 tasks.
Performance Standards Used:	Standards in Soldier's Manual refer soldier to the appropriate Technical Manual, e.g. "you must ground-hop the power pack in accordance with the appropriate publications." Evaluation Guide in Soldier's Manual provides a list of Performance Measures, each of which is graded pass or fail, and all of which must be passed in order to get a GO on the task.
Performance Measurement Methodology:	Survey respondents state that performance is measured generally through observation by NCOs, and that grading is GO/NO-GO. If any step in process is failed, score is NO-GO. In addition, soldiers are tested annually (written test) by the SQT.
Use of Performance Measurement Data:	Feedback on performance measurement results provided to soldier to identify weaknesses and additional training requirements. NCOs determine future training requirements based on performance results.
Source(s) of Information:	STP 9-63E12-SM, Soldier's Manual for MOS 63E, Skill Level 1/2, (Apr 1985), STP 9-63E-JB, Job Book for MOS 63E10/20, Apr 1985); Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986).



MOS: 63E10 **Type Training** Enhancement Training (Training of Individual Skills in Units)

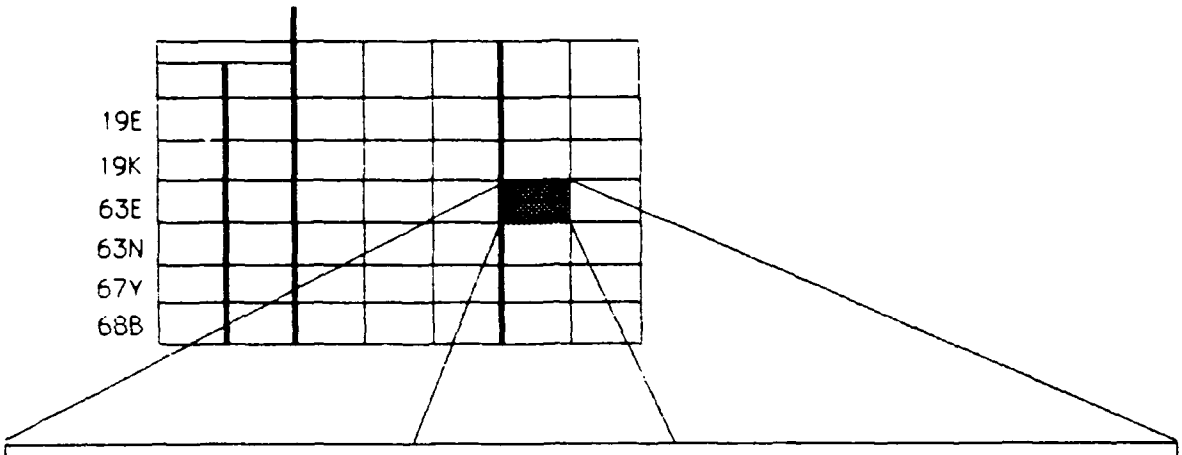
Number of Tasks Trained/ Evaluated: If the enhancement training is required as a result of new equipment or other changes, the number of tasks to be trained will be specified in appropriate training programs specifically designed to support the change. For preparation for promotion, the Soldier's Manual cites 31 duty position tasks and 78 related technical tasks for SL 2, primarily in the areas of troubleshooting, adjusting, and inspecting.

Performance Standards Used: Soldier's Manual standards, which refer the soldier to the applicable Technical Manual, are used. Evaluation Guides, which are process-oriented performance measures, are also included in the Soldier's Manual.

Performance Measurement Methodology: Survey respondents state that supervisors (NCOs) evaluate performance by observation.

Use of Performance Measurement Data: Not determined

Source(s) of Information: STP 9-63E12-SM, Soldier's Manual for MOS 63E Skill Levels 1 and 2, Apr 1985, Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986)



MOS: 63E10 **Type Training** Crew/Team/Squad Training (Training of Collective Skills in Units)

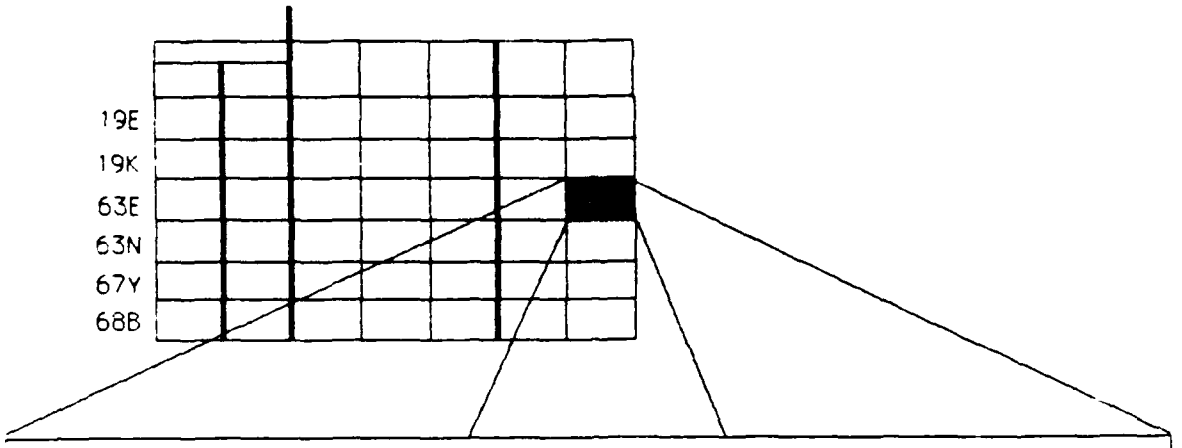
Number of Tasks Trained/ Evaluated: Not determined. Unable to identify source document listing collective skills for MOS 63E10. Survey respondents tend to think of collective tasks as those requiring more than one soldier to accomplish (in contradiction with TRADOC Reg 350-7). Many respondents view collective tasks as SM tasks performed in a field setting.

Performance Standards Used: Not determined.

Performance Measurement Methodology: Not determined.

Use of Performance Measurement Data: Not determined.

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986).



MOS: 63E10 **Type Training** Advanced Collective Training (Training of Collective Skills in Units)

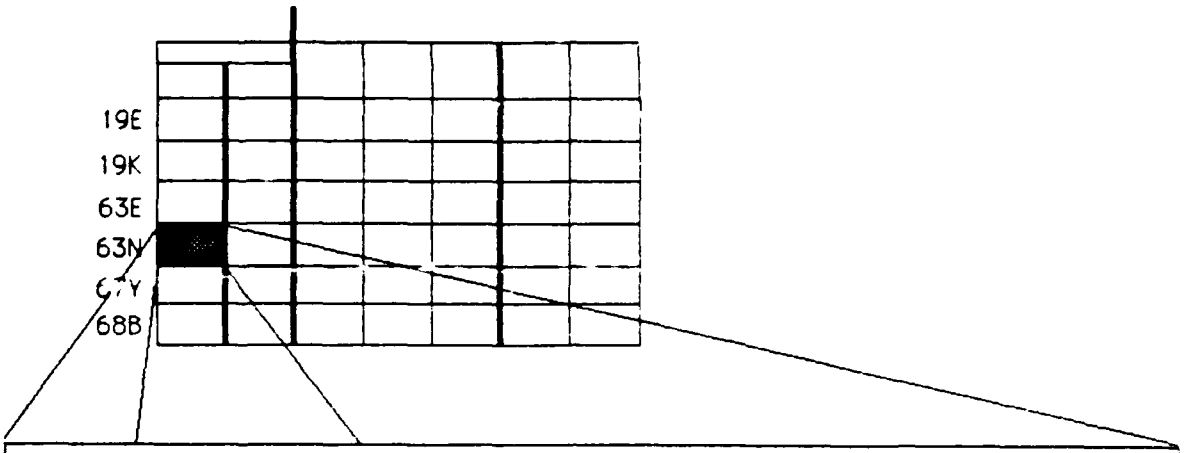
Number of Tasks Trained/ Evaluated: Not determined. No documentation apparently exists which outlines advanced collective tasks specifically for MOS 63E10

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

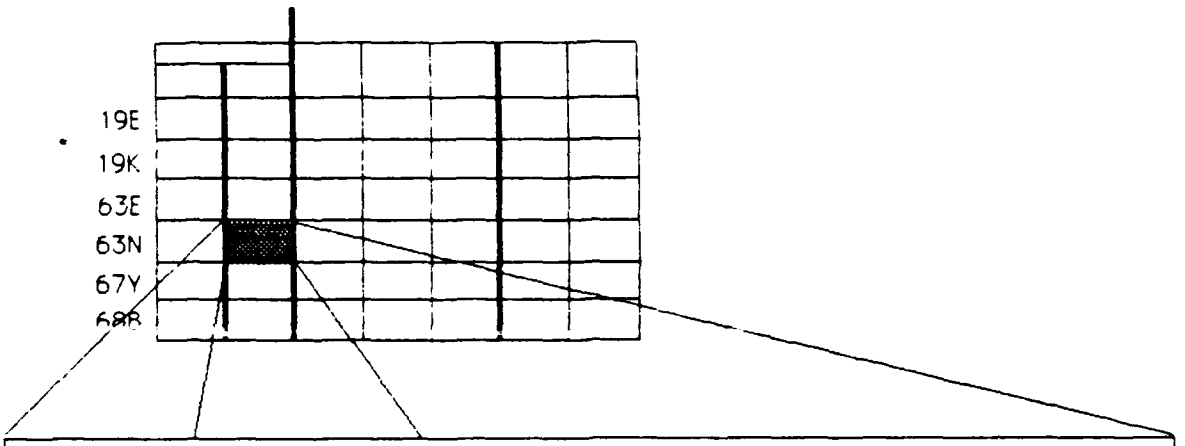
Use of Performance Measurement Data: N/A

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986).



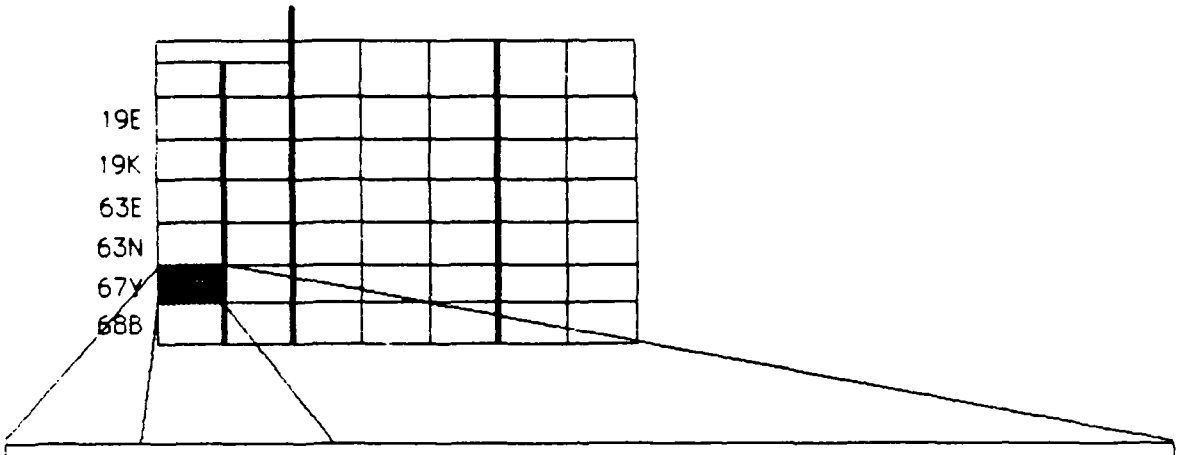
MOS: 63N10 **Type Training** Training of Individual Skills in Institutions

Number of Tasks Trained/ Evaluated:	Not specifically identified in POI. Number of tasks trained is believed to be similar to the number of tasks for MOS 63E10 (135 discrete tasks). All tasks are MOS specific, i.e. they do not include common tasks listed in FM 21-1 (Common Tasks Manual). Almost all tasks are apparently evaluated as they are trained
Performance Standards Used:	The POI refers to applicable Technical Manuals for standards
Performance Measurement Methodology:	6.2 hours of written examinations (70% is the pass-fail criterion) and 63.7 hours of performance examinations (without error is the pass-fail criterionn) are scheduled in POI. Almost all task performances are evaluated at the completion of the training on the particular task, with one 16 hour end-of-course evaluation. Evaluations are made in 'sterile' conditions, not the conditions expected to be encountered on-the-job
Use of Performance Measurement Data:	Performance data are used to identify student weaknesses to determine remedial training requirements and identify lessons that need modification (20% failure rate gets special attention). Feedback data are also provided to DOES at USA Ordnance Center and School.
Source(s) of Information:	POI 611-63N10, US Army Ordnance Center & School (May 1985). Interviews with staff members of the US Army Armor School (Jan 1986).



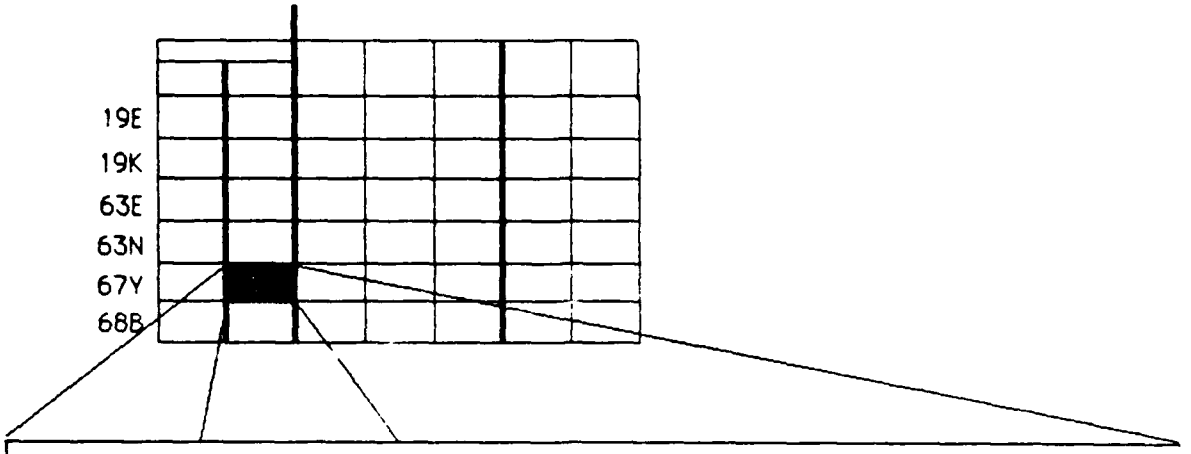
MOS: 63N10 **Type Training** Training of Collective Skills in Institutions

Number of Tasks Trained/ Evaluated:	No collective skills/tasks are reflected in the POI
Performance Standards Used:	N/A
Performance Measurement Methodology:	N/A
Use of Performance Measurement Data:	N/A
Source(s) of Information:	POI 611-63N10, US Army Ordnance Center & School (May 1985), Interviews with staff members of the US Army Armor School (Jan 1986).



MOS: 67Y10 **Type Training** Training of Individual Skills in Institutions

Number of Tasks Trained/ Evaluated:	52 discrete tasks are trained during the course. Task performance is evaluated on a sampling basis at the completion of major blocks of instruction.
Performance Standards Used:	The POI refers to "applicable aviation maintenance publications" for standards. Survey respondents indicate that those as well as the standards listed in the Soldier's Manual are the standards used by the instructors.
Performance Measurement Methodology:	Survey respondents indicate that in the evaluation of task performance, instructors stress process due to the risk involved in flying and safety considerations. Instructors observe student performance during training. Hands-on performance evaluation is conducted after every major block of instruction plus end-of-course comprehensive test. POI reflects 49 hours of hands-on tests and 8 hours of written tests.
Use of Performance Measurement Data:	Performance data are used by instructors to identify student weaknesses to determine remedial training requirements and identify lessons that need modification. If students fail to respond to remedial training, they are reclassified
Source(s) of Information:	POI 600-67Y10, US Army Aviation Logistics School (Apr 1985), Interviews with staff members of the US Army Aviation Logistics School (Jan 1986).



MOS: 67Y10 **Type Training** Training of Collective Skills in Institutions

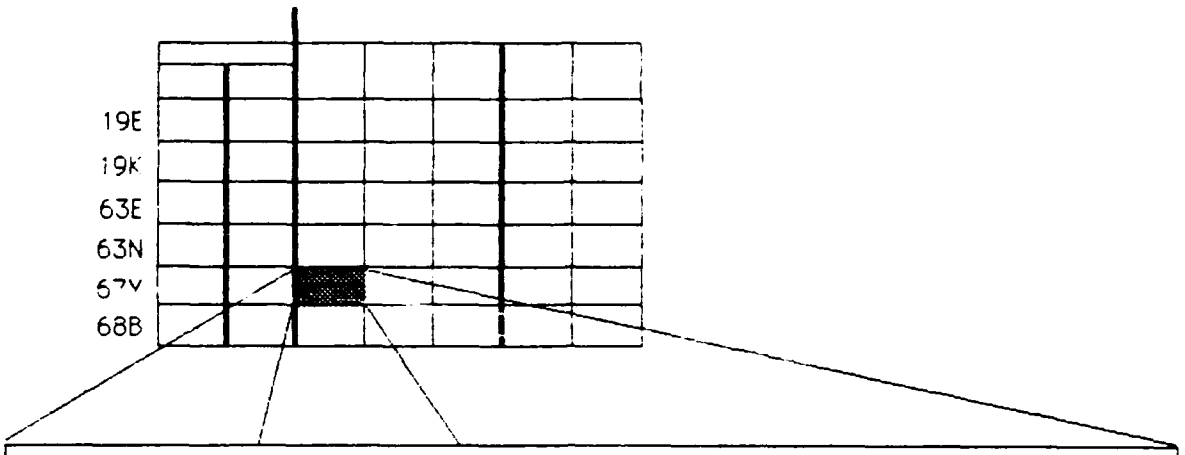
Number of Tasks Trained/ Evaluated: No collective skills/tasks are reflected in the POI

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

Use of Performance Measurement Data: N/A

Source(s) of Information: POI 600-67Y10, US Army Aviation Logistics School (Apr 1985), Interviews with staff members of the US Army Aviation Logistics School (Jan 1986)



MOS: 67Y10 **Type Training** Integration Training (Training of Individual Skills in Units)

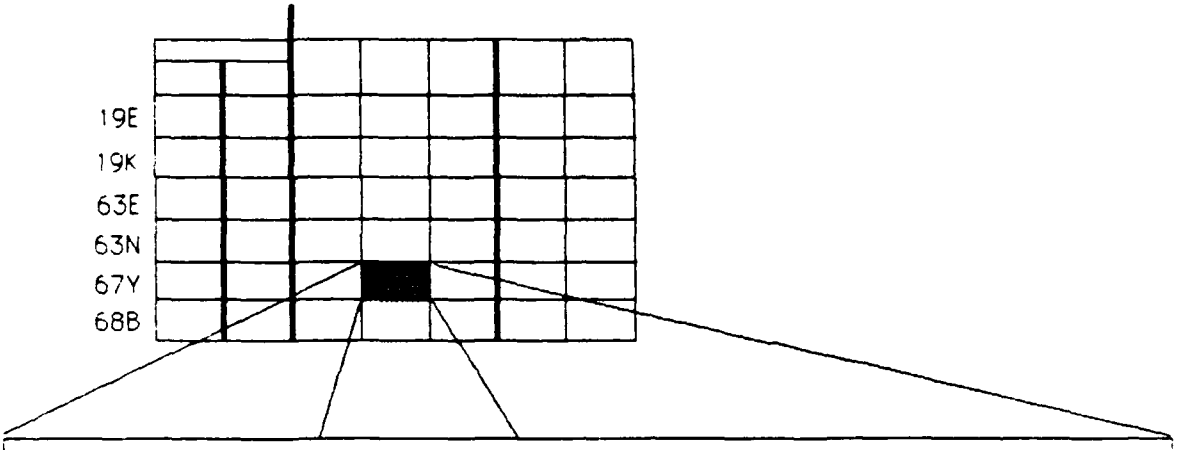
Number of Tasks Trained/ Evaluated: Soldier's Manual (STP 55-67Y12-SM) refers to an MOS training plan (MTP) published in the trainer's guide (TG) that identifies critical tasks for each subject area and specifies where soldiers are initially trained on each task. (N.B. that the Soldier's Manual lists 66 SL1 tasks, while the POI lists 52 tasks, of which 11 are not trained to standard.) However, survey respondents do not indicate that they use or have knowledge of the TG. Survey respondents claim that units determine their own integration training requirements and that maintenance paperwork is their biggest training requirement, that the students get it too early in their MOS course, there's not enough depth, and it's taught in a 'vacuum', so that by the time they arrive in the unit, they have forgotten what they learned.

Performance Standards Used: Appropriate -10, -20, and -23 technical manuals provide the standards used by the unit.

Performance Measurement Methodology: Performance is measured against standards, and is graded on a pass/fail basis. Observation is made by supervisors (NCOs) with checklist in hand. Emphasis is on process.

Use of Performance Measurement Data: Used by supervisor to identify performance weaknesses and determine training requirements.

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986), STP 55-67Y12-SM, Soldier's Manual for MOS 67Y, Skill Levels 1 and 2



MOS: 67Y10 **Type Training** Sustainment Training (Training of Individual Skills in Units)

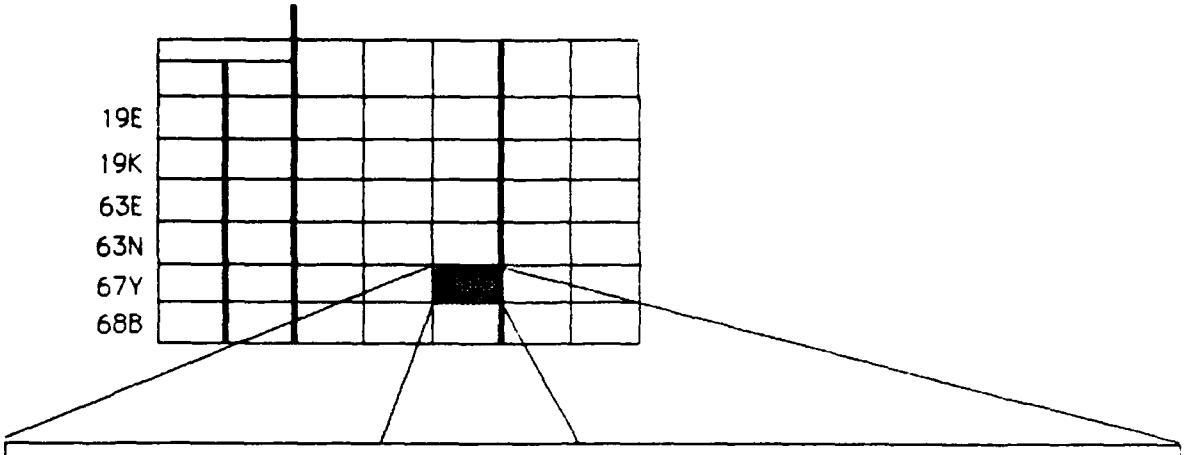
Number of Tasks Trained/ Evaluated: Soldier's Manual (STP 55-67Y12-SM) lists 66 Skill Level 1 tasks. It also refers to an MOS training plan (MTP) published in the trainer's guide (TG) and states that the MTP " identifies critical tasks for each subject area" and "recommends how often soldiers should be trained to sustain proficiency." There is no indication of how many tasks are to be evaluated.

Performance Standards Used: The Soldier's Manual provides evaluation guides "to help the trainer conduct year-round, hands-on evaluations." Evaluation guides are lists of process-oriented performance measures based on the appropriate Technical Manual — each must be passed for the soldier to get a GO on the task; each step must be in proper sequence.

Performance Measurement Methodology: Evaluations are conducted "during individual training sessions or unit collective task performance." Survey respondents indicated that evaluations are based on quality and speed of work and are made by school-trained technical inspectors. Formal SQT evaluations are made annually

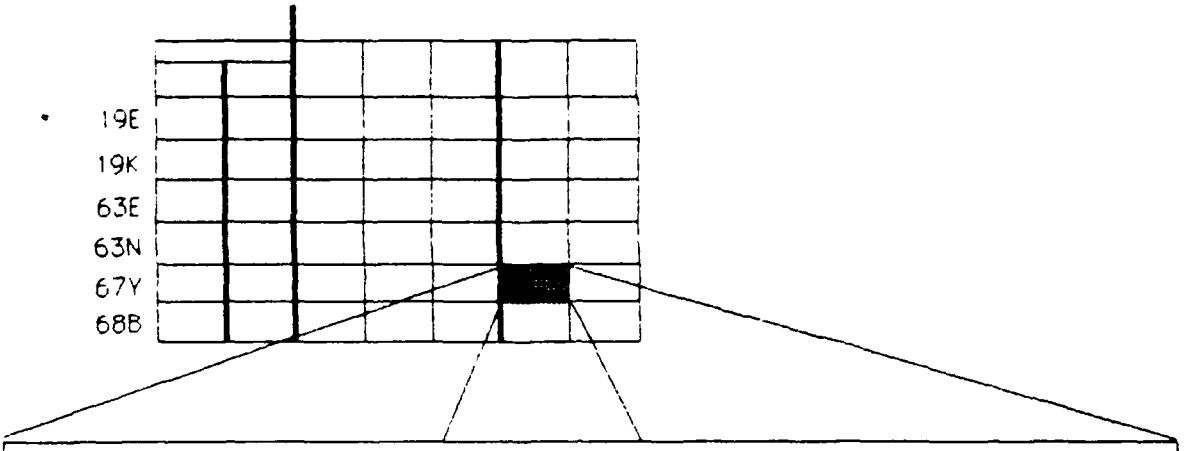
Use of Performance Measurement Data: Performance data are used to identify performance deficiencies so that remedial training on tasks not passed can be conducted SQT data are provided to supervisors in order for them to make decisions concerning training requirements.

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986); STP 55-67Y12-SM, Soldier's Manual for MOS 67Y, Skill Levels 1 and 2.



MOS: 67Y10 **Type Training** Enhancement Training (Training of Individual Skills in Units)

Number of Tasks Trained/ Evaluated:	No formal documentation specifically addressing number of tasks for enhancement training. Soldier's Manual lists 12 discrete tasks for SL 2, generally involving the replacement of components. The TG recommends a "strategy for training soldiers to perform higher level tasks. Respondents indicate that enhancement training based on the introduction of new equipment or changes in procedures is dependent on non-standardized training programs developed to support those unique situations
Performance Standards Used:	In the case of higher level tasks, the SM provides evaluation guides containing performance measures based on the appropriate technical manuals. These are used as the performance standards in training resulting from new equipment or changes to procedures, the standards are reflected in the appropriate training program
Performance Measurement Methodology:	Performance is measured against standards and is graded on a pass/ fail basis. Emphasis is on process
Use of Performance Measurement Data:	Performance data are used to determine when training is complete and to identify whether additional training is required
Source(s) of Information:	Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986), STP 55-67Y12-SM, Soldier's Manual for MOS 67Y, Skill Levels 1 and 2



MOS: 67Y10 **Type Training** Crew/Team/Squad Training (Training of Collective Skills in Units)

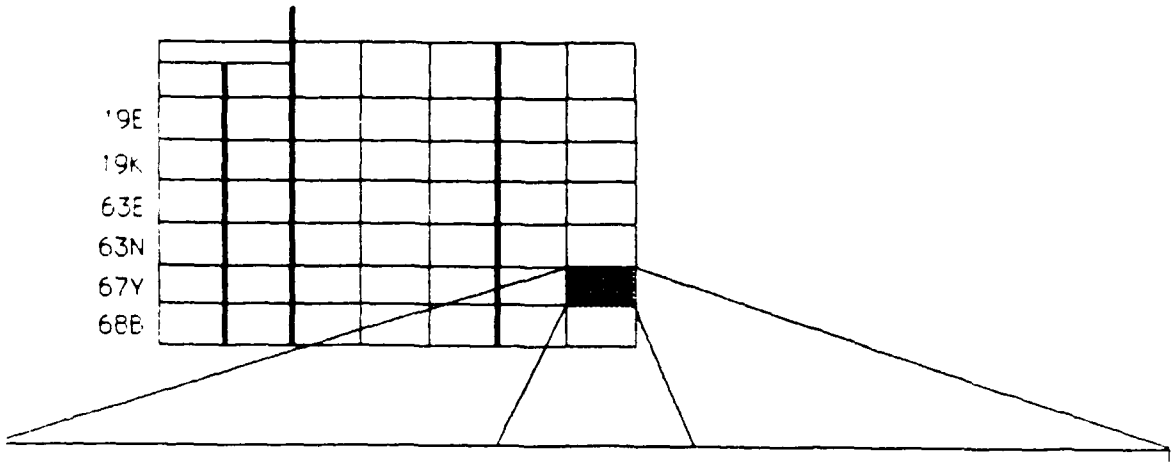
Number of Tasks Trained/ Evaluated: Not determined. Unable to identify source document listing collective skills for MOS 67Y10. Survey respondents tend to think of collective tasks as those requiring more than one soldier to accomplish (in contradiction with TRADOC Reg 350-7). Many respondents view collective tasks as SM tasks performed in a field setting.

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

Use of Performance Measurement Data: N/A

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, Tx (Jan 1986)



MOS: 67Y10 **Type Training** Advanced Collective Training (Training of Collective Skills in Units)

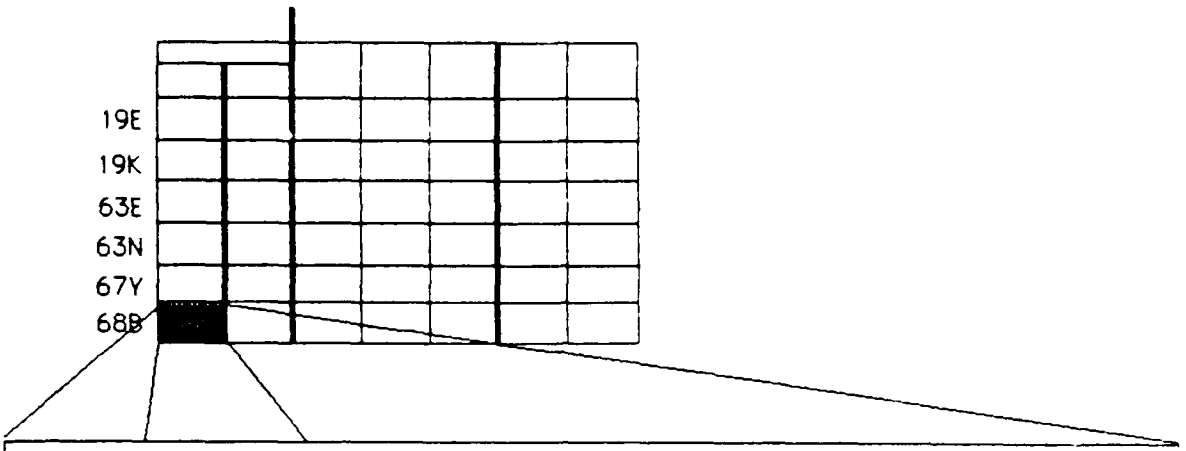
Number of Tasks Trained/ Evaluated: Not determined. No documentation apparently exists which outlines advanced collective tasks specifically for MOS 67Y10

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

Use of Performance Measurement Data: N/A

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986).



MOS: 68B10 **Type Training** Training of Individual Skills in Institutions

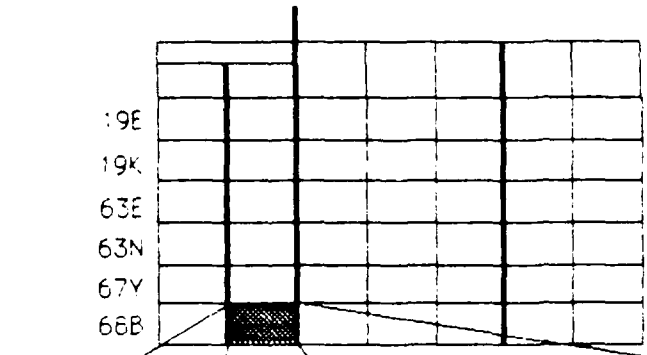
Number of Tasks Trained/ Evaluated: 86 discrete tasks are trained during the course. In addition, the POI lists a total of 40 "other tasks and subjects taught in resident training" which are grouped under the rubric "Enabling Skills." There is no indication as to how many of the tasks are evaluated.

Performance Standards Used: The POI does not make specific reference to performance standards used. Respondents state that the standards used are determined by a panel of subject matter experts (SMEs) (usually MOS-holders who rotate in from the field to the school).

Performance Measurement Methodology: Performance is evaluated generally following every major block of instruction. POI calls for 67 hours of hands-on performance evaluations (40 of which constitute the end-of-course comprehensive examination) and 8 hours of written examinations. No indication of grading system used.

Use of Performance Measurement Data: Not determined. Respondents indicate that DOES monitors test results and failures, apparently as a quality control check of the course itself, and to determine the student's "readiness" to perform in the field.

Source(s) of Information: POI 601-68B10, Aircraft Powerplant Repairer Course, US Army Aviation Logistics School (Sep 1984). Interviews with staff members of the Aviation Logistics School (Dec 1985).



MOS: 68B10 **Type Training** Training of Collective Skills in Institutions

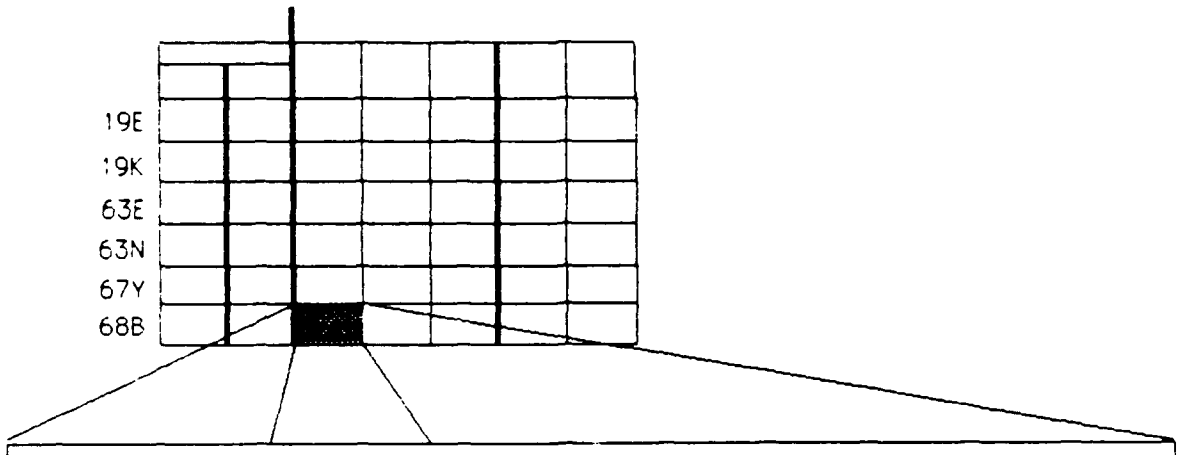
Number of Tasks Trained/ Evaluated: No collective skills/tasks are reflected in the POI.

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

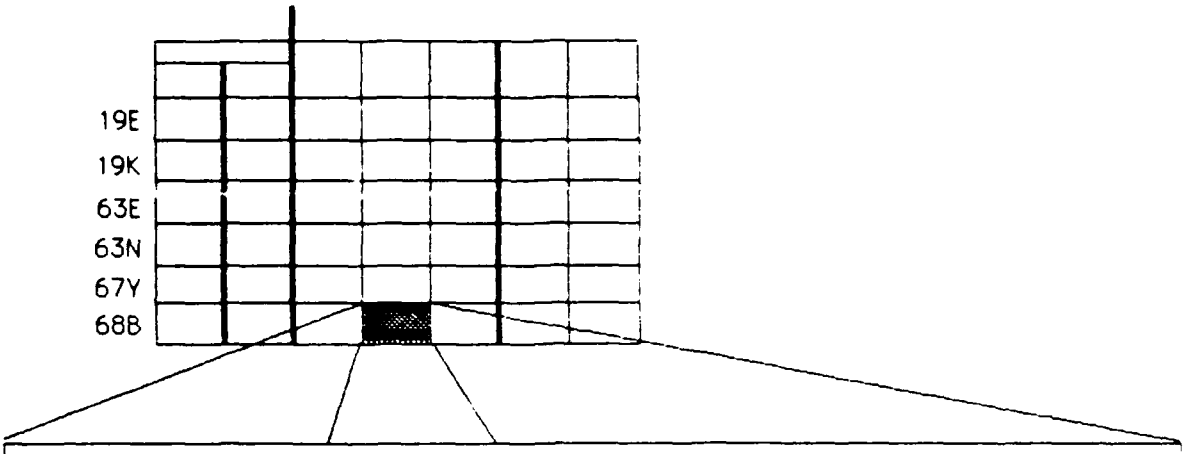
Use of Performance Measurement Data: N/A

Source(s) of Information: POI 601-68B10, Aircraft Powerplant Repairer Course, US Army Aviation Logistics School (Sep 1984) Interviews with staff members of the Aviation Logistics School (Dec 1985)



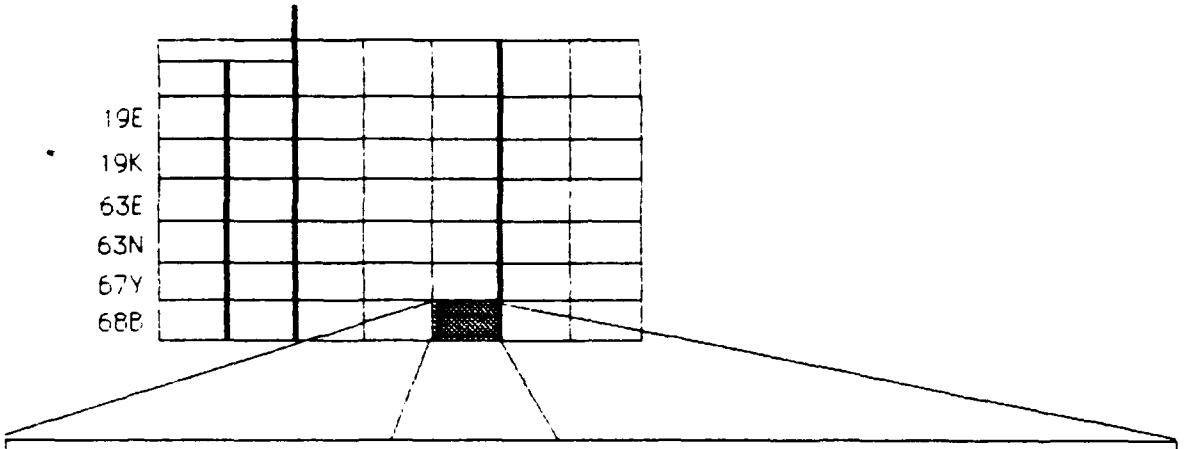
MOS: 68B10 **Type Training** Integration Training (Training of Individual Skills in Units)

Number of Tasks Trained/ Evaluated:	Soldier's Manual (STP 55-68B12-SM) refers to an MOS training plan (MTP) published in the trainer's guide (TG) that identifies critical tasks for each subject area and specifies where soldiers are initially trained on each task. (N.B. that the Soldier's Manual lists 105 SL 1 tasks, while the POI lists 86 tasks, of which only 1 is not trained to standard.) Survey respondents did not indicate that they use or have knowledge of the TG. Respondents also state that soldiers arriving in their units do not have a good foundation in troubleshooting, although school POI refers to 20 troubleshooting tasks trained at the school.
Performance Standards Used:	Survey respondents indicate that the appropriate technical manuals provide the performance standards used by the unit.
Performance Measurement Methodology:	Evaluators observe soldiers' performance during practical exercises, during actual job performance, and in formal evaluations. Survey respondents indicate that process is emphasized.
Use of Performance Measurement Data:	Used by supervisor to identify performance weaknesses and determine training requirements.
Source(s) of Information:	Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986); STP 55-68B12-SM, Soldier's Manual for MOS 68B, Skill Levels 1 and 2.



MOS: 68B10 **Type Training** Sustainment Training (Training of Individual Skills in Units)

Number of Tasks Trained/ Evaluated:	Soldier's Manual (STP 55-68B12-SM) lists 105 Skill Level 1 tasks. It also refers to an MOS training plan (MTP) published in the trainer's guide (TG) and states that the MTP "identifies critical tasks for each subject area" and "recommends how often soldiers should be trained to sustain proficiency." There is no indication of how many tasks are to be evaluated
Performance Standards Used:	The Soldier's Manual provides evaluation guides "to help the trainer conduct year-round, hands-on evaluations." Evaluation guides are lists of process-oriented performance measures based on the appropriate Technical Manual — each must be passed for the soldier to get a GO on the task, moreover each step must be in the proper sequence. Respondents indicate that they use technical manuals and evaluation guides in the Soldier's Manual.
Performance Measurement Methodology:	Evaluations are conducted "during individual training sessions or unit collective task performance." Survey respondents indicate that performance is observed by the supervisors and that technical inspectors check to make sure the task has been performed to standard. In addition, formal evaluations of the ability to perform are made through the administration of the annual SQT.
Use of Performance Measurement Data:	TG contains information so trainers can determine how often soldiers need training to ensure that they sustain proficiency. Respondents indicate that data are used to determine the amount of training or supervision the soldiers require.
Source(s) of Information:	Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986); STP 55-68B12-SM, Soldier's Manual for MOS 68B, Skill Levels 1 and 2



MOS: 68B10 **Type Training** Enhancement Training (Training of Individual Skills in Units)

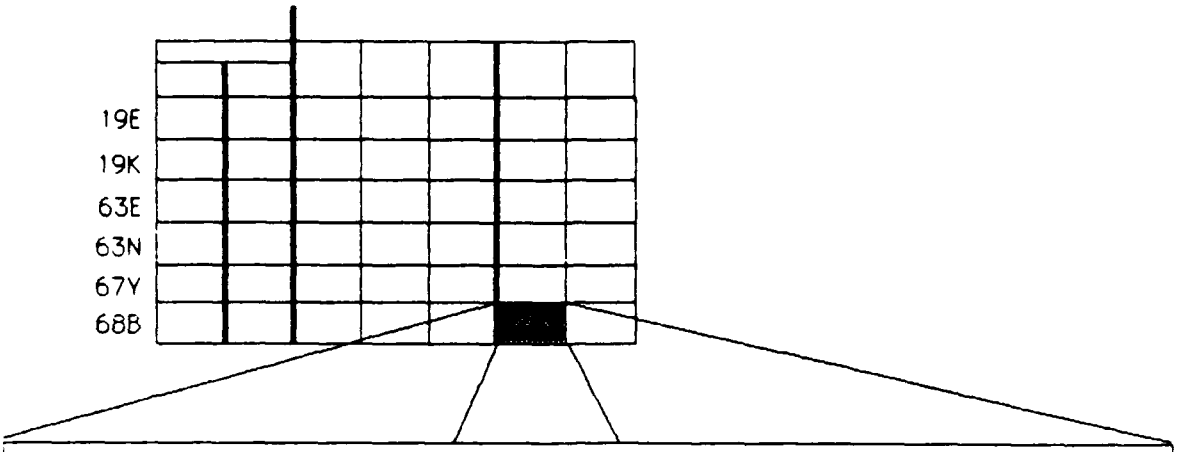
Number of Tasks Trained/ Evaluated: No formal documentation specifically addressing number of tasks for enhancement training. Soldier's Manual states that "technical tasks for this MOS are the same for skill levels 1 and 2" although it refers to a section of the trainer's guide (TG) which recommends a strategy for training soldiers to perform higher level tasks. Respondents indicate that enhancement training based on the introduction of new equipment or changes in procedures is dependent on non-standardized training programs developed to support those unique situations.

Performance Standards Used: In the case of higher level tasks, there is no indication as to the performance standards used. In training resulting from new equipment or changes to procedures, the standards are reflected in the appropriate training program.

Performance Measurement Methodology: Not identified

Use of Performance Measurement Data: Not identified.

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986). STP 55-68B12-SM, Soldier's Manual for MOS 68B, Skill Levels 1 and 2



MOS: 68B10 **Type Training** Crew/Team/Squad Training (Training of Collective Skills in Units)

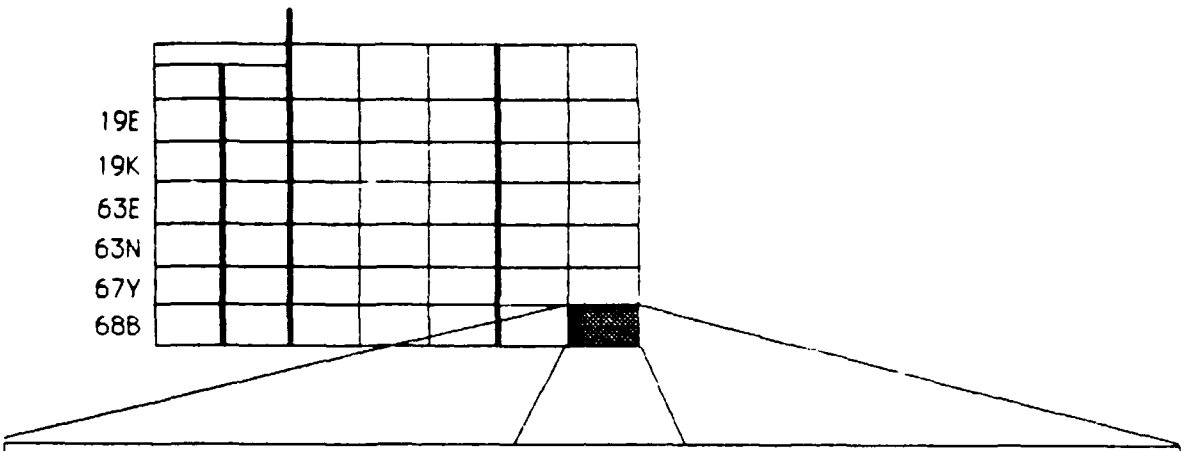
Number of Tasks Trained/ Evaluated: Not determined. Unable to identify source document listing collective skills for MOS 68B10. Survey respondents tend to think of collective tasks as those requiring more than one soldier to accomplish (contradicting TRADOC Reg 350-7). Respondents view collective tasks as SM tasks performed in a field setting.

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

Use of Performance Measurement Data: N/A

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986).



MOS: 68B10 **Type Training** Advanced Collective Training (Training of Collective Skills in Units)

Number of Tasks Trained/ Evaluated: Not determined. Nod documentation apparently exists which outlines advanced collective tasks specifically for MOS 68B10

Performance Standards Used: N/A

Performance Measurement Methodology: N/A

Use of Performance Measurement Data: N/A

Source(s) of Information: Interviews with unit trainers in various III Corps units, Fort Hood, TX (Jan 1986).

APPENDIX E

KEY DECISION MAKER QUESTIONNAIRE I

PERFORMANCE MEASUREMENT QUESTIONNAIRE - UNIT

This questionnaire was developed by the U. S. Army Research Institute to determine key decision maker information needs in relation to training measurement, assessment, and cost effectiveness.
A space is provided for your name. If you would rather remain anonymous, feel free to do so. When you have finished, fold this paper so that the address is visible and place it in the mail box - no stamp is necessary. Thank you for your cooperation.

Name_____ **Position** _____

Experience _____

PART I

1. WHO IN YOUR UNIT makes decisions on training performance measurement and assessment?

_____

_____

2. HOW OFTEN do your decisions affect the following? [Please indicate your answers by placing a checkmark in the appropriate box.]

frequency / decision	NEVER	SELDOM	SOMETIMES	GENERALLY	ALWAYS
a. What is Measured					
b. When to Measure					
c. How to Measure					
d. What Training Devices are Used to Measure					

3a. What kind of information do you need/get to make your decision? [Please indicate your answer by placing a check mark under the appropriate columns.]

DATA	Do You Need This Data?		Do You Get This Data?		Is It Qualitative or Quantitative	
	Yes	No	Yes	No	Qual	Quan
1. Feedback from within unit						
2. Training Effectiveness Data						
3. Feedback from Institution						
4. Requirements of Own Unit						
5. Cost Effectiveness Data						
6. Requirements of Higher HQs						
7. SQT Results						
8. ARTEP Results						
9. Knowledge of Learning Rates						
10. Tng Device Effectiveness Data						

3b. If you need other information not listed above, then list other types of data and indicate if you get this data by placing a check mark under "YES" or "NO" column.

LIST OTHER TYPE DATA YOU NEED	Do You Get This Data?		Is It Qualitative or Quantitative?	
	Yes	No	Qual	Quan
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

PART II

Please indicate how important you believe the data you selected for questions 3a and 3b are when you make decisions about training measurement and assessment.
First, SELECT 10 types of data you believe are most important when making decision.
Second, RANK ORDER you selections. Let 1 indicate "very important" and 10 indicate "least important".
Third, WEIGH each selection by indicating with percentages, how much value you attribute to each factor when making your decisions. Please make sure that the percentages add up to 100%.
For example, if you select "SQT results" as one of the 10 types of data you believe are most important when making decisions about training measurement and assessment, prioritize it in order of importance and assign a percentage to indicate how important it is when making your decisions.

List and Rank Order Your Selections	Weight (%)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

TOTAL = 100%

PART III

PLEASE USE THE FOLLOWING SPACE TO WRITE ADDITIONAL COMMENTS YOU WOULD LIKE TO MAKE.

PERFORMANCE MEASUREMENT QUESTIONNAIRE - SCHOOL

This questionnaire was developed by the U. S. Army Research Institute to determine key decision maker information needs in relation to training measurement, assessment, and cost effectiveness.
A space is provided for your name. If you would rather remain anonymous, feel free to do so. When you have finished, fold this paper so that the address is visible and place it in the mail box - no stamp is necessary. Thank you for your cooperation.

Name_____ **Position** _____

Experience _____

PART I

1. WHO AT THE SCHOOL makes decisions on training performance measurement and assessment?

_____

_____

2. HOW OFTEN do your decisions affect the following? [Please indicate your answers by placing a checkmark in the appropriate box.]

frequency / decision	NEVER	SELDOM	SOMETIMES	GENERALLY	ALWAYS
a. What is Measured					
b. When to Measure					
c. How to Measure					
d. What Training Devices are Used to Measure					

3a. What kind of information do you need/get to make your decision? [Please indicate your answer by placing a check mark under the appropriate columns.]

DATA	Do You Need This Data?		Do You Get This Data?		Is it Qualitative or Quantitative	
	Yes	No	Yes	No	Qual	Quan
1. Feedback from Active Units						
2. Training Effectiveness Data						
3. Feedback from Instructors						
4. Tng Device Effectiveness Data						
5. Cost Effectiveness Data						
6. DOES Data						
7. End of Cycle Test Results						
8. Test Validity & Reliability Data						
9. Knowledge of Learning Rates						
10. SQT Results						

3b. If you need other information not listed above, then list other types of data and indicate if you get this data by placing a check mark under "YES" or "NO" column.

LIST OTHER TYPE DATA YOU NEED	Do You Get This Data?		Is it Qualitative or Quantitative?	
	Yes	No	Qual	Quan
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

PART II

Please indicate how important you believe the data you selected for questions 3a and 3b are when you make decisions about training measurement and assessment.
First, SELECT 10 types of data you believe are most important when making decision.
Second, RANK ORDER you selections. Let 1 indicate "very important" and 10 indicate "least important".
Third, WEIGH each selection by indicating with percentages, how much value you attribute to each factor when making your decisions. Please make sure that the percentages add up to 100%.
For example, if you select "SQT results" as one of the 10 types of data you believe are most important when making decisions about training measurement and assessment, prioritize it in order of importance and assign a percentage to indicate how important it is when making your decisions.

List and Rank Order Your Selections	Weight (%)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

TOTAL = 100%

PART III

PLEASE USE THE FOLLOWING SPACE TO WRITE ADDITIONAL COMMENTS YOU WOULD LIKE TO MAKE.

APPENDIX F

KEY DECISION MAKER QUESTIONNAIRE II

A questionnaire developed by the US Army Research Institute (ARI) was previously sent to you to determine Key Decision Maker information needs in relation to training measurement, assessment, and cost effectiveness. A copy of that questionnaire is enclosed for your reference. Based on a consensus of responses received from you and other decision makers, we have developed the following to show the most frequent responses to each question asked in the questionnaire. Please place a check mark under the appropriate column to indicate whether you agree with the consensus and if not, state your reason(s) for non-agreement.

Question *	Consensus	Do you agree? Yes	Do you agree? No	If no, please state your rationale
PART I 1. Who at the school makes decisions on training measurement and assessment?	DOES/DOTD			
2a) How often do your decisions affect WHAT performance is measured?	Sometimes/Generally			
2b) How often do your decisions affect WHEN to measure performance?	Generally			
2c) How often do your decisions affect HOW to measure performance?	Generally			
2d) How often do your decisions affect what TRAINING DEVICES are used to measure performance?	Sometimes			

Question #	Consensus	Do you agree? Yes	No	If no, please state your rationale
PART I 3a) What kind of information do you need to make your decisions?	Feedback from active units			
	Training Effectiveness data			
	Feedback from Instructors			
Is this information qualitative or quantitative?	Qualitative			
PART II What type of data is MOST IMPORTANT when making decisions on training measurement and assessment?	Feedback from active units (with a 10 - 20% attributed weight) and end-of-cycle tests (with a 5 - 20% attributed weight)			
What type of data is LEAST IMPORTANT when making decisions on training measurement and assessment?	Training device effectiveness data (with a 5 - 10% attributed weight) and training effectiveness data (with a 5 - 10% attributed weight)			

Your name?_____ Your duty position?_____ Your telephone number?_____

Use the next page to add any comments you may have.

Once you have completed the form, simply fold it so that the mailing label is visible, staple it and drop it in the mail.

Thanks for your cooperation!!!