

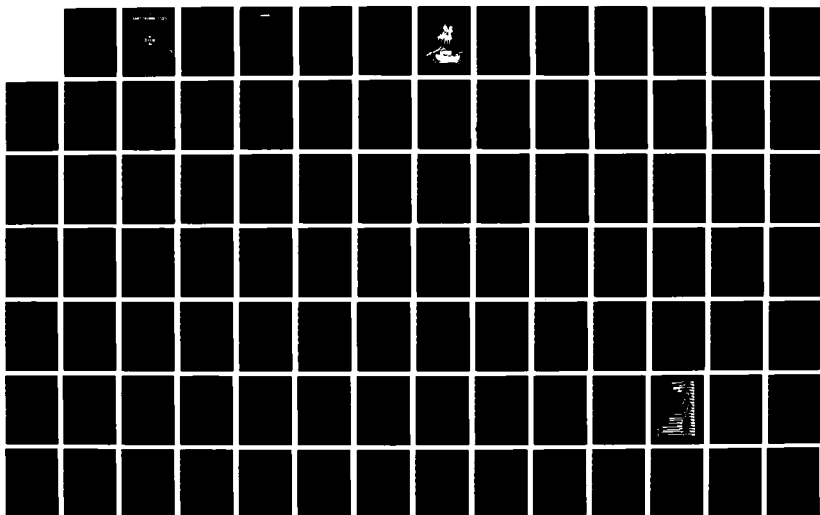
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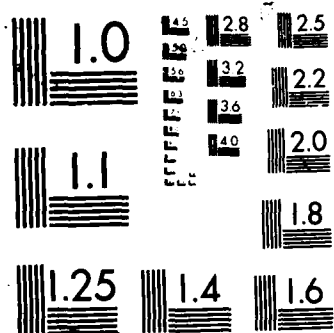
ARMY TRAINING STUDY: TRAINING EFFECTIVENESS ANALYSIS
(TER) SUMMARY VOLUME 2 ARMOR(U) ARMY TRAINING AND
DOCTRINE COMMAND FORT MONROE VA F J BROWN 08 AUG 70
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TRAINING EFFECTIVENESS ANALYSIS (TEA) 1978
SUMMARY

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188
Exp Date Jun 30, 1986

1a. REPORT SECURITY CLASSIFICATION Unclassified		1b. RESTRICTIVE MARKINGS None	
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)		6a. NAME OF PERFORMING ORGANIZATION U.S. Army Training Study Study Group	
6b. OFFICE SYMBOL (If applicable)		7a. NAME OF MONITORING ORGANIZATION U.S. Army Training and Doctrine Command Deputy Chief of Staff for Training	
6c. ADDRESS (City, State, and ZIP Code) Fort Monroe, VA 23651-5000		7b. ADDRESS (City, State, and ZIP Code) Fort Monroe, VA 23651-5000	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)	
9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		10. SOURCE OF FUNDING NUMBERS	
8c. ADDRESS (City, State, and ZIP Code)		PROGRAM ELEMENT NO.	PROJECT NO.
		TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) The Army Training Study. Training Effectiveness Analysis (TEA) Summary and TEA 170 Test Reports. Volume II. Armor			
12. PERSONAL AUTHOR(S) Brigadier General Frederic J. Brown III, et al			
13a. TYPE OF REPORT Final report	13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) 1978, August 8	15. PAGE COUNT 402
16. SUPPLEMENTARY NOTATION			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The Army Training Study (ARTS Study) conducted a comprehensive overview of Army training. The research probed across a wide range of training issues as the study group sought a broad perspective of army training. The study group conducted a field surveys at numerous continental US Army posts and schools. The data obtained was analyzed using the Training Effectiveness Analysis (TEA). The Training Effectiveness Analysis (TEA) summary volumes explain the analysis of the data gathered on both institutional training and unit training across a range of combat, combat support and combat service support systems and skills, supplemented by research into such completed tests as CAMMS, REALTRAIN and Chaparral. It provided some of the data necessary for the formulation of the Battalion Training Model and provided insight into the general state of training in the army.			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a. NAME OF RESPONSIBLE INDIVIDUAL Thot. McCool		22b. TELEPHONE (Include Area Code) 727-4337	22c. OFFICE SYMBOL AIT 6-B

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Accession For	
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DTIC TAB	☐
Unannounced	☐
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on Tank Gunnery Performance

PART I

TRAINING TIME RATIO SURVEY

Army Training Study M60A1 WEAPONS SYSTEM

TRAINING TIME

RATIO SURVEY



Fort Knox, Kentucky

TRAINING TIME

RATIO SURVEY

Prepared By

Army Training Study

System Work Team

M60A1 Weapons System

Fort Knox, Kentucky

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CHAPTER I

EXECUTIVE SUMMARY

BACKGROUND

The Army Training Study (ARTS) is a Training and Doctrine Command (TRADOC) sponsored study group tasked with analyzing the relationship between training resources and combat effectiveness for the Army of today and tomorrow. This analysis will support development of training programs for the complex weapons systems scheduled for delivery within the next decade. System Work Teams (SWTs) were established at selected Army schools to support the ARTS efforts; this report represents results of a Training Time Ratio Survey conducted by the Armor SWT (Ft Knox, KY).

PURPOSE/OBJECTIVES

While ARTS was in the formative stage, it was recognized that the impact of training in a TO&E unit caused by varying the basic Soldier Manual skills training within the institution should be examined prior to restructuring any training programs. This study was thus designed to provide insights into the impact of varying institutional training time relative to basic armor Soldier Manual skills upon armor TO&E unit training programs.

TEST DESIGN

The target audience for this survey was 66 officers and noncommissioned officers assigned to TO&E armor units of a mechanized infantry

division. Individuals filling the positions of battalion commander, battalion operations/training officer, company commander, first sergeant, platoon leader and platoon sergeant within the units selected to participate were administered a survey patterned after the Battalion Training Model. The Training Time Ratio Survey, consisting of seven sets, requested individual responses to questions related to frequency and length of training periods critical to proficiency in individual and collective tasks. These tasks were considered necessary for attaining and maintaining a fully combat-ready (95%) proficiency on an individual and unit basis.

LIMITATIONS

Careful analysis of demographic data pertinent to most of the individuals who participated in the survey indicated that time in service and armor experience for those personnel were below that which would normally be expected for the duty positions surveyed. Based upon this fact, plus the small sample size, and that all units surveyed were from the same division on one installation (thus restrained by the same training restrictions and facilities), any conclusions made must be severely limited in scope.

RESULTS AND FINDINGS

Survey results indicate that lowering the proficiency level of basic armor training graduates on Skill Level 1 or increasing the rate at which they arrive at a unit would increase unit training time requirements. This increase appears to be significant; significant to the point that low proficiency levels on Skill Level 1 tasks when coupled with a high replacement rate

would appear to make it impossible for a unit to maintain a fully combat-ready (95%) unit and individual proficiency level. Because of low experience levels in the small sample size, the use of linear relationships across all tasks in individual/collective/ARTEP mission training, and unfamiliarity with the basic armor training course of instruction and trainees, survey results should not be used to develop relationships between training time in the institution and training time in the unit, nor should they be used to establish unit training time requirements.

CONCLUSIONS

The training time requirements in a TO&E unit are adversely affected by decreasing the entry level proficiency of armor crewmen and/or increasing the replacement rate of these entry level soldiers. However, because of restrictions associated with this survey, a ratio between training time in the institution and training time in a unit that would have any reliability cannot be derived from the results of this limited study.

CHAPTER II

INTRODUCTION

BACKGROUND

The Army Training Study (ARTS) was conceived at the Training and Doctrine Command (TRADOC) in August 1977 with approval by the Vice Chief of Staff, Army. TRADOC was designated as the study sponsor with Department of the Army, Office of Deputy Chief of Staff, Operations as study proponent. The study group was established at Ft Belvoir, VA with System Work Teams (SWT's) located at the Army Schools; Air Defense Artillery (Ft Bliss, TX), Armor (Ft Knox, KY), Field Artillery (Ft Sill, OK), Ordnance (Aberdeen Proving Grounds, MD), Signal (Ft Gordon, GA), and Infantry (Ft Benning, GA).

INTRODUCTION

The Total Army's training task is to train the units and soldiers of the Army to the required level of combat effectiveness as efficiently as possible. Given the reality of dwindling resources, efficiency in the use of these resources is imperative; given that the Army must be prepared to fight and win, combat effectiveness is absolutely paramount.

To that end the Army Training Study was tasked to conduct an in-depth examination designed to determine the relationship between training resources and combat effectiveness for the Army of today and tomorrow. As importantly, the study is to begin the blueprinting of the training programs for the complex weapons systems scheduled for incorporation in the next decade, and this process is to be accomplished with the relationship of resources to combat

effectiveness clearly foremost in mind. This task will be accomplished by first determining relationships among resources allocated for both the institutional training system and the unit training effort. These categories will be further divided into those training programs directed at the individual and those designed for training the collective group. This functional relationship will be examined by its resultant training readiness, and finally the all-important combat readiness.

The blueprinting of training for the next decade will focus on the development of efficient, effective, and manageable training systems. The study will be working from a broad overview perspective, developing a conceptual training framework for achieving the optimum combat effectiveness as new weapons systems are added to the inventory.

MISSION

The mission of ARTS is to examine links between training resources, training programs, training readiness, and combat effectiveness. The purpose of this examination is three-fold: to convince executive agencies that reductions in the Army's training resources must be supported by solid analytical effort as well as professional assessments of senior military personnel, to develop a logical and more analytical way to tie resources to combat effectiveness, and to begin to formulate training programs for the complex weapons of the 1980's with the relationship of resources to combat effectiveness in mind. Working from an Army-wide perspective, ARTS will develop a conceptual training framework for achieving the optimum combat effectiveness when the major new weapons systems

are fielded in the mid-1980's. In this regard, ARTS began evaluating selected systems using specific data available in 1977-78. ARTS can then propose a guideline for training policies and programs to bridge the transition from today's Army to the mid-80's. Additionally, insights can be gleaned from this study that will enable senior Army commanders to make timely assessments and decisions about the current training system with the aim of modification toward optimization of cost and training effectiveness in the training base.

PURPOSE/OBJECTIVE

While the Army Training Study was still in its formative period, it was suggested that before effective training programs could be developed, some insight must be gained into the impact on training in a TO&E unit caused by varying the basic Soldier Manual skills training time within the institution. This impact must be examined thoroughly prior to the reformulation of training programs. The information gathered from surveys and tests will lead to long-range and comprehensive studies being developed to meet the objectives within the ARTS Training Effectiveness Analysis.

The long-term objective of ARTS is to provide general policy alternatives to guide further study efforts toward cost effective, proficient training for the weapons systems of the mid-1980's. The near-term objective can be translated into careful examination of differing Army training programs to determine the optimum training mix for combat effectiveness through individual and collective training proficiency. Data obtained from

studies conducted will provide input to war models for use as parameters in computer-simulated war games with the end result of more accurately evaluating overall combat effectiveness at optimum level with minimum of expenditure of both personnel and material resources.

As part of the overall near-term effort of ARTS, the Training Time Ratio Survey was designed as a data-collection instrument, limited in scope, which would provide insights into the impact on training in an armor TO&E unit caused by varying the basic armor Soldier Manual skills training time within the institution. The objectives established for this Training Time Ratio Survey are:

To determine the optimum ratio of individual training to collective training as a function of varying the individual training time in the training base;

To determine resource requirements for the Training Center for varying the lengths of training periods (12, 13, 14, and 15 week variations);

To determine the impact on unit training and unit readiness as a result of varying lengths of training periods (12, 13, 14, and 15 week variations);

To prepare notional Armor One Station Unit Training (OSUT) programs to determine differing levels of Soldier Manual skills for 19E and 19F Basic Armor Training (BAT) for 12, 13, 14, and 15 week courses;

To determine those Soldier Manual skills in terms of hours and subjects to be taught in the unit as a result of the unit receiving armor crewmen from a 12, 14, or 15 week course.

CHAPTER III

SURVEY METHODOLOGY/SURVEY DESIGN

SUBJECTS

The target population for the survey included the battalion commanders, battalion S-3s (operations/training officers), company commanders, company first sergeants, platoon leaders, and platoon sergeants. The total number of these positions within the four armor units surveyed was 128. In order to provide a sample size considered adequate for analysis purposes, each battalion was requested to furnish one battalion commander, one battalion S-3, three tank company commanders, three first sergeants, five platoon leaders, and five platoon sergeants for a total of eighteen individuals per battalion. This equated to 72 of the units' personnel to be surveyed. However, due to training situations, administrative factors (TDY, leave, etc), and an unforeseen communication gap, the sample size amounted to 66 personnel.

SURVEY INSTRUMENT

The survey used in this study was a modification of the one used in the Battalion Training Model (BTM) survey, which was prepared by the Army Training Study (ARTS) Group at Fort Belvoir in conjunction with the Actuarial Research Corporation of Falls Church, Virginia. The ARTS M60A1 Systems Work Team (SWT) extracted portions of the BTM survey and modified the sections to address the objectives of the study. It was an intentional procedure to establish some commonality in the surveys in order to facilitate compatibility

for future analyses. The composite draft of the Training Time Ratio Survey was then sent to the ARTS Group at Fort Belvoir where it was reduced in scope and modified by the ARTS Group and the Actuarial Research Corporation.

The final Training Time Ratio Survey administered by the SWT was composed of seven (7) sets or sections. Set 1 required that the individual make a comparison of the importance of the various 19E and 19F task groupings. Set 2 required the individual to determine the impact on frequency of training based on the replacement rate and proficiency of the basic armor training graduate. In the third set, the individual gave his estimate of the frequency and the length of time required to train the individual in Soldier Manual task groups. In Set 4 the individual selected the best training approach when faced with various categories of soldiers. In Set 5 the individual was asked to estimate the number of training periods per year and the average number of hours per training period required for each collective task based upon specific conditions within his unit. Set 6 had the individual estimate the training time and frequency required for various ARTEP missions. In Sets 3, 5, and 6 the respondent was given specific unit conditions to include: percent officer/noncommissioned officer fill; percent not present for training; percent personnel turnover per quarter; percent change in duty position per quarter; and percent of replacements per quarter of a given proficiency level of BAT graduate. Set 7 was a conglomerate of questions asking opinions on basic armor training, Skill Qualification Training, Army Training and Evaluation Program, and training records.

The survey was designed so that responses could be programmed into a computer for numerical analysis. Set 2 was designed to produce a numerical relationship with training time, a function of institutionally-achieved proficiency and replacement rate of trainees from the institution. This allowed numerical answers to be derived for all possible variations based upon responses on one variation. The assumption that this numerical relationship was constant for all training enabled the survey to be condensed so that the subject could respond to one variation within each of Sets 3, 5, and 6.

Set 7 of the survey was not structured as described above but rather enabled and encouraged the individual to make comments on training questions. Also included in the survey (Annex 'A') was a questionnaire guide listing 131 Soldier Manual tasks for the MOS 19E (gunner/loader) and 19F (driver). These tasks were combined into functional groups, and a skill level for each MOS was listed. This provided the interviewees a standard list for reference in making judgments/decisions.

TEST PROCEDURES

The sample population was selected from four armor battalions by identifying the duty positions that were targets for the survey, e.g., platoon leader. Divided into three groups, each group was given an orientation briefing by a SWT member on the purpose of the survey and the manner in which it would be conducted. The initial briefing included a video tape produced at the Armor Center which provided an overview of the BAT course of instruction.

A copy of the survey was provided to each person; however, there was no attempt to isolate the individual, and spontaneous discussion was allowed. Discussions were almost nil and those held were directed more at the mechanics of the survey rather than at the content of the questions. Members of the M60A1 Systems Work Team, Fort Knox, were present during the survey to provide assistance in explaining the survey questions. Each set was completed by all personnel as a group prior to the group proceeding to the next set; this method of conducting the survey allowed for standardized explanations to be given to each group.

LIMITATIONS

The results of the Training Time Ratio Survey were limited from the outset by the nature of the sample population. The sample size and composition were such that the responses provided by the participants were in narrow focus, i.e., all were from the same division and governed by the same training policies, which in all probability induced bias of some order into the responses. Additionally, the average number of responses for most questions was 51 to 53 (out of a total of 66 interviewees). This number of responses decreased even further when collective training as opposed to individual training was the subject of the questions.

The survey was geared to the instruction program of the current Basic Armor Training (BAT) for MOS 19E (gunner/loader) and 19F (driver) conducted in the Armor Center at Fort Knox, Kentucky. Since this is a recently (Jan 78) instigated course of instruction, the number of graduates has not been of a magnitude to permit an Army-wide assignment to

units in any quantity. A total of four BAT graduates from the new training program had been assigned to the division as of the date the survey was conducted. This placed a decided limitation on the personnel being surveyed since they did not have a thorough knowledge of a BAT graduate's proficiency or the course of instruction he had received. In regards to these limitations, the responses to the survey must be considered as the best estimates that could be made by professionals who are responsible for training armor crewmen in an active US Army unit.

CHAPTER IV
SURVEY RESULTS/DATA ANALYSIS

INTRODUCTION

This chapter discusses the findings of the Training Time Ratio Survey. The findings are presented in the order they appear in the survey questionnaire (from Set 1 thru Set 7) at Annex 'A'. A graphic display of the findings is provided in the annexes due to the numerically-oriented data extracted from the survey questionnaire. The pertinent annexes relating to each set are identified within the discussion of the findings for a particular set.

SET 1

Set 1 was designed to give a rating of the relative importance of task groupings from the standpoint of training a 19E and a 19F soldier to perform these tasks, in combat, as a member of a unit. The respondent was to compare each task grouping with a specified task group. The individual was to judge if it was more, less, or equally critical for accomplishing all the ARTEP missions. Based upon responses to the survey mean percentage by task group, for overall training requirements, were derived.

The results of the survey rated tank and crew weapons employment (11.1%) as the most important; with gunnery preparation a close second (10.8%) for a 19E soldier. Third in importance was turret maintenance procedures (8.7%), followed by combat skills (8.2%) and crew served

weapons maintenance (7.5%). Land mine warfare (2.1%) was rated as the least important; preceded by first aid (2.5%) and communications message handling procedures (2.6%). The remaining task groups had a percent weight between 5.7% and 3.0%. These ratings are displayed on pages C-1 and C-3, Annex C.

For the 19F driver, tactical operating procedures (11.2%) was by far the most important. Clustered at second thru fourth were driver mechanical operating procedures (9.1%), general maintenance procedures (8.9%), and hull maintenance procedures (8.6%), followed by combat skills (7.0%) and tank recovery procedures (6.9%). The least important task grouping for the 19F was first aid (2.2%), preceded by communications message handling procedures (2.5%) and communications equipment operations and maintenance (2.8%). The remaining task groups were clusters between 5.9% and 3.0%. These results are displayed on pages C-2 and C-3, Annex C.

SET 2

The respondents were asked to estimate the total number of training periods per year that would be needed to meet the objective of achieving and maintaining fully combat-ready (95%) unit proficiency for nine combinations derived from three levels of proficiency and three rates of replacements. An assumed base-line or "best" case was given as ten periods per year for a 10% influx per quarter of new Basic Armor Training graduates with a 95% individual proficiency.

The results indicate that it takes 1.3 times as much training time with a 15% replacement rate and 1.7 times as much with a 20% replacement rate when individual replacements have a 95% proficiency level. When individual replacements have an 85% proficiency level, it would take 1.6 times as much training time with a 10% replacement rate, 2.0 with a 15% replacement rate, and 2.5 with a 20%. With a 70% proficiency level, it requires 2.3 times as much training time with a 10% replacement rate, 2.9 with a 15%, and 3.4 with a 20%. These figures are found at Annex 'D'. From these figures, a graph was developed that indicates a straight-line projection. When graphed as a function of time versus replacement rate, the linear correlation was 1.00000 for 12-week (70%), 0.99994 for the 14-week course (85%), and 0.99961 for the 15-week course (95%). These graphs are shown on page D-5, Annex D.

SET 3

In Set 3 the respondent estimated the hours per period and the number of periods per year needed for individual training of the Soldier's Manual tasks in the unit for both 19E and 19F soldiers. The purpose of this training was to achieve and maintain a fully combat-ready (95% proficient) individual and unit status. Individuals were instructed to give estimates based upon the following conditions:

- 85% Officer/NCO fill
- 30% Not present for training (daily, all grades)
- 20% Turnover per quarter (movement in and out of unit)
- 40% Change in duty position per quarter
- 20% Replacement rate per quarter of BAT graduates at 70% proficiency at Skill Level 1

The mean of these responses is shown on page E-20 as the 20% replacement rate for a 12-week course. The estimates obtained were then used to determine the hours per period and hours per year for differing replacement rates when individual replacements arrive with various proficiency levels at Skill Level 1, using the multiplier factor determined in Set 2.

The responses show that for the 19E approximately 309 hours are required for individual training under these conditions. Tank and crew weapons employment at 41.5 hours/year and gunnery preparations at 39.0 hours/year require the most time. Tank recovery (5.4 hrs/yr), first aid (5.7 hrs/yr), land mine warfare (6.0 hrs/yr), and communications message handling procedures (6.4) require the least training time annually to obtain and maintain a 95% proficiency level. The remaining groups require between 8.4 hrs/yr and 27.6 hrs/yr.

For the 19F MOS, approximately 293.5 hrs/yr are required for individual training within the unit to obtain and maintain a 95% proficiency level. Groupings requiring the most training were hull maintenance procedures (27.3 hrs/yr), tank and crew weapons employment (27.0 hrs/yr), driver tactical operating procedures (25.8 hrs/yr), and general maintenance procedures (24.0 hrs/yr). A grouping of gunnery preparations (22.0 hrs/yr), map reading (20.0 hrs/yr), driver mechanical operating procedures (18.0 hrs/yr), and combat skills (17.0 hrs/yr) followed closely. First aid (5.7 hrs/yr), communications message handling procedures (6.0 hrs/yr), and land mine warfare procedures (6.3 hrs/yr) were the task groupings requiring the least training

time. Two separate clusters of the remaining task groups are located around 8.4 hrs/yr and 13.5 hrs/yr with tank recovery procedures by itself at 15.5 hrs/yr.

The remaining conditions for the 19E and 19F in terms of results for the hours/period, periods/year, and total hours/year were derived from multiplying the estimates given as responses by the factor derived from the responses in Set 2. These results are displayed on pages E-1 thru E-18, Annex E.

SET 4

Set 4 was designed to obtain opinions on the best training approaches for different training situations. For this set four classification codes of individuals were defined. These codes were: I - Fully trained and experienced personnel; II - Trained but inexperienced personnel; III - Trained personnel who require supervision and indicate a high decay rate on individual skills; IV - Personnel who are untrained in the subject. These classification codes were placed into seven groupings. These groupings were: codes I and II; I and III; I and IV; I, II, and IV; II and III; II and IV; and III and IV. For each of these groupings the survey respondent was given seven choices. These choices were:

- a. Two separate periods of formal training--one for initial training and one for retraining;
- b. One formal period oriented to those who need retraining with self-paced/off-duty instructions for the initial learners;

c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activities early;

d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period;

e. Two formal training periods--period one oriented to and attended by initial learners only--period two oriented toward all members and attended by the entire unit;

f. No change from current training policy (policy to be explained in remarks section);

g. Other (explained in remarks section).

The respondent indicated the best approach in each of three subject areas (gunnery, driving, and general subjects). The tabular results are shown on pages F-1, F-2, and F-3, Annex F.

The responses for the gunnery subjects show that the approach varied depending upon the situation. For codes I and II, training approach 'b' or 'c' were selected by 67.3% of the individuals. 30.9% selected 'b', (one formal for retrain-self-paced/off-duty for initial learners). For codes I and III, opinions were divided among four choices. These were approach 'b' with 18.2%, approach 'c' with 27.3%, approach 'd' with 14.5%, and approach 'e' with 23.6%. For codes I and IV opinion was divided between approach 'c' (one formal for initial with those not needing retraining released) with 32.8% and approach 'e' (two formal periods--one for initial--one for all personnel in unit) with 36.8%. Codes I, II, and IV

would be given approach 'e' since 41.4% indicated it was the best approach. 34.5% selected approach 'd' for codes II and III, but approach 'a' with 20%, 'c' with 14.5%, and 'e' with 16.4% indicate split opinion. For codes II and IV, 33.9% chose approach 'e' with 23.2% choosing 'a' and 21.4% choosing 'd'. Approach 'a' (33.9%) and 'b' (32.1%) were the best for codes III and IV, but approach 'e' had 21.4%. For the driver subjects and general subjects, the opinions varied in much the same manner as the gunnery subjects.

SET 5

In Set 5 the respondent was asked to estimate the number of training periods per year and the average number of hours per training period that must be conducted to maintain a fully combat-ready (95%) proficiency in ARTEP 71-2 mission tasks for each of the 17 listed collective training task groups. The following conditions were given:

- 85% Officer/NCO fill
- 30% Not present for training (daily, all grades)
- 20% Turnover per quarter (movement in and out of unit)
- 40% Change in duty position per quarter
- 10% Replacement rate per quarter of BAT graduates at 95% proficiency at Skill Level 1

The responses are shown on page G-7 under 10% replacement, 15 week. The other figures were derived using the factor from Set 2. Also in Annex G are graphs showing relationships of different course lengths and percentages of replacements (Pages G-10 and G-11), frequency of collective task per year by unit level (Page G-12), hours per year by unit level (Page G-13).

Based upon survey responses, the most frequent training should be conducted at battalion level for security and intelligence operations, employment of fighting vehicles, and communications and electronics warfare. Most frequently required training on platoon level include tactical movement, fire and maneuver, special techniques for operating at night/reduced visibility, combat techniques in built-up areas, reconnaissance, leadership, maintenance, and small arms employment. All other collective tasks should be taught at the same frequency at platoon and battalion level. Frequency of company level training equals that of platoon level training on only four collective tasks (electronic warfare, security and intelligence operations, mine field and obstacles, and small arms employment).

When the length of each training period is considered, the hours of platoon level collective training exceeds company level and battalion level collective training hours in all task groupings except the following five (where battalion level training requires the most hours of collective training time): tactical movements; NBC operations; combat techniques in built-up areas; hostile TAC air environment techniques; and reconnaissance and small arms employment (this being the only grouping in which company level training requires the most hours of collective training time).

SET 6

The respondent was asked to estimate, for his unit level and the next lower echelon, the number of training periods per year and the number

of hours per training period for each specific ARTEP mission that is required to maintain a fully combat-ready (95%) proficiency level in the ARTEP 71-2 mission tasks. The following conditions were given:

- 85% Officer/NCO fill
- 30% Not present for training daily
- 20% Turnover per quarter
- 40% Change in duty position per quarter
- 10% Replacement rate per quarter of BAT graduates at 95% proficiency at Skill Level 1

The mean of the responses is shown in Figure H-7 under 10% replacement, 15 week. The variations were derived by using the factor from Set 2. Also in Annex H are graphs relating weeks in the institution to hours of training required per year by the replacement rate (Figure H-10), the hours per task at each unit level, and the frequency per year by unit level.

Based upon the survey responses, very little training is required at tank crew level to maintain combat-ready proficiency on ARTEP 71-2 mission tasks. As on collective task training, more ARTEP mission training is considered necessary at platoon level on most tasks, with frequency of battalion level training being less than company or platoon level training on all ARTEP missions.

When length of training periods are analyzed with frequencies; however, company level ARTEP mission training requires more hours of training in the areas of deliberate attack and night attack. In the area of defense, platoon level and company level ARTEP mission training are the same.

In all other ARTEP missions, the hours/year for platoon level ARTEP mission training is greater than that required for company or battalion level. Total hours of ARTEP mission training per year at each unit level is displayed at Figure H-11 as 10% replacement rate with 15-week graduates.

SET 7

Set 7 was designed to get responses for various Army Training Study designated elements of investigation. Each question would allow some free response by the individual in the hopes of obtaining candid opinions which may lead to further study. The specific comments on each question are listed in Figure I-2, Annex I.

Questions 1 and 2 asked opinions on what should be added to or deleted from the Basic Armor Training course. Responses were varied but generally indicated less time should be spent on communications tasks and the M16A1 rifle and more time on maintenance.

Question 3 asked how well the proficiency on SM tasks measure an individual's ability to fight his weapon system. Individuals were given five choices (excellent, good, marginal, poor, and unsatisfactory) and of the 66 responses--9 chose excellent, 44 good, 10 marginal, 2 poor, and 1 unknown.

Question 4 asked individuals to rate how well the SQT measures an individual's ability to fight his weapon system. Responses chosen were--7 excellent, 38 good, 12 marginal, 6 poor, and 3 unknown.

Question 5 asked how well the SQT measures an individual's proficiency on SM tasks. The responses selected were--16 excellent, 29 good, 14 marginal, 4 poor, and 3 unknown.

Question 6 asked how well proficiency on ARTEP tasks measure the collective abilities to perform a unit's assigned mission. The responses chosen were--21 excellent, 32 good, 8 marginal, 2 poor, 1 unsatisfactory, and 2 unknown.

Question 7 asked at what level crew, individual, and platoon training records should be kept. The consensus of responses indicated that training records should be kept at company level. For individual records, 15 stated that records should be at battalion, 47 at company, 11 at platoon level. For crew records, 12 stated that the records should be maintained at battalion level, 43 at company, and 22 at platoon. Twenty also indicated that platoon records should be kept at battalion level, 42 at company, and 16 at platoon.

Questions 8 and 9 dealt with the carry-over of training in one area to another. Question 8 asked if there was an increase in individual proficiency as a result of collective (ARTEP) training; 56 of 66 stated yes with 11 indicating a major increase (15% or more), 37 significant increase (10-15%), 6 minor increase (5-10%), 2 barely recognizable (1-5%), and 3 unknown. Question 9 asked if there was a demonstrated increase in collective proficiency attributable to individual (SM) training; 57 of 66 stated yes with 8 no's and 1 unknown. Eight indicated a major increase, 20 significant, 24 minor, and 4 barely recognizable.

Questions 10 and 11 asked what impact increasing or decreasing the proficiency level of basic armor training graduates would have on unit

combat effectiveness. The responses for a decrease indicated 3 no effect, 16 slight, 43 significant, and 4 excessive. For increasing, individuals responded with 2 no effect, 20 slight, 36 significant, and 5 excessive.

CHAPTER V

DISCUSSION

The actual sample size of 66 respondents was less than the desired design of 72. Of these 66 individuals surveyed, 9 were outside the originally-intended target population. These were a battalion executive officer who was the acting battalion commander and had recently been the battalion S-3; a battalion command sergeant major who was a first sergeant filling the command sergeant major position; an E-8 battalion operations sergeant (MOS 19E); three company executive officers who had recently been platoon leaders; two maintenance sergeants, and one 4.2 inch mortar platoon sergeant. All but the maintenance sergeants and the mortar platoon sergeant could legitimately be included in the sample based upon their experience.

An examination of the demographic information of the people surveyed disclosed the fact that the armor experience of noncommissioned officers was far less than what would be expected. The experience of the officers was about normal for grade but slightly less than what would be expected for their duty position (particularly battalion S-3 and company commander).

Of the nineteen platoon sergeants surveyed, twelve had less than two years experience with armor. These twelve individuals had been reclassified into armor under the Combat Arms Reclassification Program

(CARP) and assigned to Fort Carson; thus were serving in their initial armor assignment. Had all enlisted duty positions requested in the survey population been filled with individuals in the authorized grade, it would be expected to obtain twelve E-8s and twenty E-7s. Actual grades surveyed were six E-8s, fifteen E-7s, and nine E-6s. This is well below expected and results in less experience being present.

Had all officer duty positions requested in the survey population been filled with individuals in the authorized grade, there would have been four LTCs, four MAJs, twelve CPTs, and twenty LTs. In actuality, two LTCs, one MAJ, ten CPTs, and twenty-three LTs were surveyed. The officers occupying the battalion S-3 positions were captains with less than 6 years time in service. This position is authorized a major who would have at least 12 years time in service. The platoon leaders also were lacking experience with 11 of the 17 surveyed having less than 1 year armor experience.

This survey required the individual to draw upon his experience with tanks and tank training to respond to the questions. The lack of experience of many of the individuals may have resulted in less reliable responses. This factor is compounded by exposure to only one division's armor units and the training limitations and policies. Although there was some qualified success in this study project as conducted; limitations on personnel experience, sample size, and the questionnaire format place severe restrictions on the conclusions that can be drawn from the responses to the survey.

Insights from the survey generally correlate with the emphasis in the 14-week basic armor course (as indicated by scheduled training time) and with the changes in the institutional variations. Generally, the tasks rated as the most critical in the survey received more training in the institution. In the variations the tasks rated as most critical generally were given more training as the course length increased.

One area of difference was map reading. In the previous institutional basic armor training course, map reading had received more emphasis than in the current 14-week program where it has been reduced to eight hours of instruction. Another ARTS study, Learning and Retention of Basic Armor Skills Within the Unit, indicated a very rapid decay rate for map reading skills. The map reading skills are also predominately Skill Level 2 skills, which are to be taught within the unit.

The guidance in Set 1 instructed the individual to judge the criticality in terms of accomplishing the ARTEP missions. This instruction may have influenced the response due to recent experience during an ARTEP. Certain individual skills may have received more stress due to grading procedures or perceived unit weakness in that specific area.

An in-depth look at the interviewee responses was made after the survey was administered. This resulted in an observation that guidance in the survey instructions may have influenced answers within Set 2. The last line of instructions for Set 2 establishes that periods would increase for less proficient replacements and for a higher replacement rate. Verbal instructions given during the survey also may have influenced

the individual to respond with increasing times. These instructions, both verbal and written, may have resulted in an indication of increased training time requirements where none or less than indicated would exist.

To arrive at the changes in training time required due to changes in the replacement rate and/or changes in the proficiency level, a factor based on a linear relationship developed from responses in Set 2 was used. This factor was used uniformly for all task groupings, collective tasks, and ARTEP missions. From the conceptualized training hours per task grouping for the various programs (Figure K-2), it is apparent that the training does not change uniformly for the various task groupings. In fact, there are only six task groupings within the 19E program and seven in the 19F program that change.

The results of Set 2 indicate that training time for individual training for individual training would be increased by 1.6 times as a result of decreasing the institutional course from 4 weeks to 12 weeks. For the 19E this would result in changes in four task groupings. In gunnery the 19E would now spend two days and nights on Table VIIc instead of four days and nights. In maintenance he would not learn to remove and install track (4 hr), have four less hours of instruction on before, during, and after operations maintenance procedures, and not have four hours of equipment serviceability criteria (ESC) training. It would be difficult to explain how all facets of his individual training would be increased by 1.6 times by only deducting these two days of Table VIIc firing and twelve hours of maintenance training.

The assumptive use of this multiplier for all task groupings for the individual training time requirement must be viewed critically. The same is true for the collective tasks and the ARTEP missions. It is apparent that certain individual tasks are much more important for certain collective tasks than others. Again, certain collective tasks and individual tasks inter-relate in the accomplishment of any ARTEP mission. The use of this factor used uniformly to obtain the times for the different conditions may have caused some inflated or deflated values for various individual and collective tasks and ARTEP missions.

After the results were analyzed, it became evident that the use of a single factor for all tasks or groupings within individual, collective, and ARTEP mission training could result in prejudiced training requirements. In view of the possible prejudiced training requirements from the use of this single factor and possible survey influence, the use of training times found within Sets 3, 5, and 6 should not be used for a comparison of training time between any course variations.

The results from Set 4 indicated a belief that separate training for personnel who are not up to the overall unit proficiency level is the best approach for training in the unit. Such an approach would lead to a program to raise proficiency levels of the new personnel up to the unit level. Such an initial upgrade program would invalidate the large increases in individual training and would especially lower the increases in ARTEP mission and collective task training due to low entry level proficiency.

A large increase in individual skill proficiency was indicated as a result of training for collective tasks or ARTEP missions. This increase, though not as great, was also indicated for collective tasks as a result of individual training. This added or reinforced training is not calculated in the hours of training required for individual, collective tasks or ARTEP missions. This factor may also tend to lower any changes in training time requirements associated with proficiency level changes.

The experience of the individuals surveyed should be weighed for the training time requirements for the individual tasks, collective tasks, and the ARTEP missions. It is possible that the individuals surveyed have not been exposed to training for an ARTEP and/or an SQT. Such a lack of experience would render responses by these individuals as suspect. This may have had a much greater impact due to the small sample size and the number of personnel with relatively little armor experience.

The personnel surveyed had no detailed concept of the training received in any of the institutional variations. A short briefing was given to acquaint them with some of the changes that had occurred with the revised armor training program. This was limited to approximately 20 minutes and was directed at the highlights of training in the new program. The contact with graduates of the new program was almost nonexistent. One graduate had a reporting date of 6 May and three of 28 May. These were the only graduates scheduled to arrive at the

division prior to the survey. The survey was given 30 May through 1 June 1978. No material was provided to the interviewees explaining any of the variations other than an estimated proficiency level.

CHAPTER VI

CONCLUSIONS

The findings of the survey questionnaire indicate that the officers and noncommissioned officers of the units queried believe that the training time requirements would be altered in their units if proficiency and/or rate of replacement of entry level replacements changed.

Due to the limitations of the sample in terms of size and armor experience; the non-applicability of the linear relationship developed for the questionnaire training scenarios from Set 2 data, and the viability of that factor for use in all the Set scenarios, i.e., collective/individual tasks and ARTEP missions, a ratio of training time in the institution versus the training time in a unit cannot be established from this study report.

At best, this is a very limited study effort that offers some insight into methodology and survey design, and points out that unit personnel are sensitive to variations in the basic armor training course of instruction.

MSP-78-24

THIS IS YOUR ID NUMBER.
IT SHOULD BE ENTERED AS
APPROPRIATE ON THE UPPER
RIGHT HAND CORNER OF ALL
YOUR QUESTIONNAIRES.

ID # _____
KEEP THIS NUMBER.

READ CAREFULLY

Please complete the following:

1. Your rank: (circle 1)

LTC	MAJ	CPT	1st LT	2nd LT
E-9	E-8	E-7	E-6	Other _____
				(specify)

2. Basic Branch: (circle 1)

Armor	Other _____
	(specify)

3. Total years service _____

4. Years in Armor _____ a/o Mechanized-Infantry _____

5. You are currently serving in what unit: Fill in the following:

Div. # _____ Bn. # _____ Co. _____

6. What is your current assignment? (circle
- only
- one)

Bn CO	Bn XO	Bn S-3	S-3 Staff
Tank/Rifle Co CO	Cbt Spt Co CO	Plt Ldr	
Pltn Sgt	Sqd Ldr		
Other _____			
(specify)			

7. How long have you been in that position?

_____ months

PLEASE DO NOT SIGN YOUR NAME!

SET 1SOLDIER'S MANUAL TASK RATING

A soldier holding the 19E or 19F MOS must attain Skill Level 1 or 2 in approximately 131 Soldier's Manual Tasks. Proficiency in these individual tasks permits the soldier to better integrate and function while serving in a combat unit.

The 131 tasks have been combined into 19 convenient, functional groups and have been listed in the Questionnaire Guide that has been distributed to you. Please familiarize yourself with the contents of the Guide before completing the 2 attached forms.

Recognizing that the Army is required to fight any place at any time, you are asked to rate the relative importance of these tasks from the standpoint of training a 19E and a 19F soldier to be able to perform these tasks in combat as a member of a unit. Prepare a separate rating form for the 19E and the 19F.

PROCEDURES

1. The Soldier's Manual tasks listed on the next page are in random order.
2. One task has been assigned a value of 10. You are to use this as your comparison item.
3. Compare the first item on the list with the comparison item and judge if it is more, less, or equally critical for accomplishing all the ARTEP missions.
 - a. If it is more critical, enter the number that shows how much more critical it is than the comparison item. Some examples:
 - Enter 30 if it is 3 times as critical
 - Enter 12 if it is 20% more critical
 - Enter 200 if it is 20 times as critical, etc.
 - b. If it is less critical, enter the number that shows how much less critical it is than the comparison item. Some examples:
 - Enter 2.5 if it is $\frac{1}{4}$ as critical
 - Enter .1 if it is 1/100th as critical
 - Enter 6 if it is 40% less critical, etc.
 - c. If it is equally critical, simply enter 10.
4. Next, compare the second item in the list with the comparison item in the same manner.
5. Compare each in turn to the comparison item following the above procedure.
6. You may use ANY POSITIVE NUMBER or FRACTION. Do not use zeros or negative numbers.
7. When you finish the 19E, go on to the 19F.

ID # _____

GUNNER/LOADER (19E) RATING FORM

(Refer to Questionnaire Guide as necessary
to help you complete the form)

- _____ 1. Intelligence and Security Procedures
- _____ 2. Driver Mechanical Operating Procedures
- _____ 3. Combat Skills
- _____ 4. Tank and Crew Weapons Employment
- _____ 5. Hull Maintenance Procedures
- _____ 6. First Aid
- _____ 7. General Maintenance Procedures
- _____ 8. Land Mine Warfare Procedures
- _____ 9. Communications Message Handling Procedures
- _____ 10. Turret Maintenance Procedures
- _____ 11. Individual NBC Procedures
- _____ 12. Individual Weapons Maintenance and Employment
- 10 _____ 13. Communications Equipment Operations and Maintenance
- _____ 14. Collective NBC Procedures
- _____ 15. Crew Served Weapons Maintenance
- _____ 16. Map Reading
- _____ 17. Tank Recovery Procedures
- _____ 18. Gunnery Preparations
- _____ 19. Driver Tactical Operating Procedures

ID # _____

DRIVER (19F) RATING FORM

(Refer to Questionnaire Guide as necessary
to help you complete the form)

- _____ 1. Intelligence and Security Procedures
- _____ 2. Driver Mechanical Operating Procedures
- _____ 3. Combat Skills
- _____ 4. Tank and Crew Weapons Employment
- _____ 5. Hull Maintenance Procedures
- _____ 6. First Aid
- _____ 7. General Maintenance Procedures
- _____ 8. Land Mine Warfare Procedures
- _____ 9. Communications Message Handling Procedures
- _____ 10. Turret Maintenance Procedures
- _____ 11. Individual NBC Procedures
- _____ 12. Individual Weapons Maintenance and Employment
- 10 _____ 13. Communications Equipment Operations and Maintenance
- _____ 14. Collective NBC Procedures
- _____ 15. Crew Served Weapons Maintenance
- _____ 16. Map Reading
- _____ 17. Tank Recovery Procedures
- _____ 18. Gunnery Preparations
- _____ 19. Driver Tactical Operating Procedures

SET 2TRAINING OF UNIT REPLACEMENTS

Your unit normally receives replacements who have completed Basic Armor Training (BAT). The graduates are assumed to have reached the following levels of individual proficiency, depending on the length of the BAT course:

BAT Course Length	% Attainment of Skill Level 1	Code*
15 Weeks	95	A
14 Weeks	85	B
12 Weeks	70	C

* A code letter has been assigned to represent the replacement who has attained a specific level.

Your unit must provide additional training to these replacements to achieve and maintain unit proficiency of 95%. The amount of training will vary depending on the number of replacements and their percent attainment of Skill Level 1 proficiency.

Assume the following base-line condition:

- Objective: Achieve & Maintain Fully Combat-Ready (95%) unit Proficiency
- Code A replacements at the rate of 10% of TOE unit strength per quarter
- A subject that requires 10 training periods per year

You are asked to estimate the total number of training periods per year that would be needed to meet the assumed objective for each of the conditions listed on the next page.

The assumed base-line or "best" case is given as item #1. More training periods would be required for less proficient replacements and for a higher replacement rate.

ID # _____

No. of
Training
Periods/Year

10

To Achieve and Maintain 95% Unit Proficiency with:

1. 10% Code A replacements per quarter
2. 15% Code A replacements per quarter
3. 20% Code A replacements per quarter
4. 10% Code B replacements per quarter
5. 15% Code B replacements per quarter
6. 20% Code B replacements per quarter
7. 10% Code C replacements per quarter
8. 15% Code C replacements per quarter
9. 20% Code C replacements per quarter

ID # _____

SET 3

SOLDIER'S MANUAL TASKS

You are asked to estimate the hours per period and the number of periods per year needed for individual training of the Soldier's Manual Tasks in the unit for both 19E and 19F soldiers. The purpose of this training is to achieve and maintain a fully combat-ready (95% proficient) individual and unit status.

The Soldier's Manual Tasks for the 19E and 19F MOS have been combined into 19 convenient, functional groups and are listed in the Questionnaire Guide that has been distributed to you. Refer to the guide as necessary to help you complete this form.

Assume the following conditions to exist in your unit:

- 85% officer/NCO fill
- 30% not present for training
(daily, all grades)
- 20% turnover per quarter
(movement in and out of unit)
- 40% change in duty positions per quarter
- 20% replacement rate* per quarter of Code C
(70% Proficiency of Skill Level 1) BAT
graduates.

Indicate only one time and frequency for each group.

Note: Enter N/A if a Soldier's Manual Task should not be trained for that particular MOS.

* Based on TOE unit strength.

ID # _____

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)

	Hours/Period	Periods/Year
1. Driver Mechanical Operating Procedures		
2. Driver Tactical Operating Procedures		
3. Gunnery Preparations		
4. Tank and Crew Weapons Employment		
5. General Maintenance Procedures		
6. Hull Maintenance Procedures		
7. Turret Maintenance Procedures		
8. Tank Recovery Procedures		
9. Communications Equipment Operations and Maintenance		
10. Communications Message Handling Procedures		
11. Intelligence and Security Procedures		
12. Individual NBC Procedures		
13. Collective NBC Procedures		
14. First Aid		
15. Land Mine Warfare Procedures		
16. Map Reading		
17. Combat Skills		
18. Individual Weapons Maintenance and Employment		
19. Crew Served Weapons Maintenance		

ID # _____

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year
1. Driver Mechanical Operating Procedures		
2. Driver Tactical Operating Procedures		
3. Gunnery Preparations		
4. Tank and Crew Weapons Employment		
5. General Maintenance Procedures		
6. Hull Maintenance Procedures		
7. Turret Maintenance Procedures		
8. Tank Recovery Procedures		
9. Communications Equipment Operations and Maintenance		
10. Communications Message Handling Procedures		
11. Intelligence and Security Procedures		
12. Individual NBC Procedures		
13. Collective NBC Procedures		
14. First Aid		
15. Land Mine Warfare Procedures		
16. Map Reading		
17. Combat Skills		
18. Individual Weapons Maintenance and Employment		
19. Crew Served Weapons Maintenance		

ID # _____

SET 4

TRAINING STRATEGIES

The training status of an individual in a unit can be classified for any specific subject matter as follows:

<u>Classification Group Code</u>	<u>Description</u>
I	Fully Trained & Experienced
II	Trained but Inexperienced
III	Trained but Requires Supervision (high decay)
IV	Untrained in Subject

At any given time a unit probably will have 2 to 4 classification groups represented.

In the three charts that follow, several training approaches are listed.

You are asked to select what you think the best approach is for training the stated classification groups. A separate chart has been provided for each of the following:

- Gunnery Subjects (Questionnaire Guide #3,4,7,19)
- Driver Subjects (Questionnaire Guide #1,2,5,6,8)
- General Subjects (Questionnaire Guide #9,10,11,12,13,14,15,16,17,18)

Please only one X or ✓ in each vertical column under each Classification Group.

Assume that all necessary training personnel and facilities equipment, ammunition, etc., are available to support the instruction.

Comments may be made on a Remarks page following the last chart.

For: Gunners Subjects (19E)

Questionnaire Guide #: 3,4,7,19

ID #

TRAINING APPROACH	Classification Groups					
	I & II	I & III	I & IV	I, II, & IV	II & III	II & IV
a. Two separate periods of formal training--one for initial training and one for retraining.						III & IV
b. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.						
c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activity early.						
d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period.						
e. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.						
f. No change from current training policy. (Explain in remarks section.)						
g. Other. (Explain in remarks section.)						

I Fully trained & Experienced
II Trained but Inexperienced
III Trained but requires Supervision (high decay)
IV Untrained in Subject

Classification

Codes

ID # _____

For: Driver Subjects (19F)

Questionnaire Guide #: 1,2,5,6,8

	Classification Groups						
	I & II	I & III	I & IV	I, II, & IV	II & III	II & IV	III & IV
TRAINING APPROACH							
a. Two separate periods of formal training--one for initial training and one for retraining.							
b. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.							
c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activity early.							
d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period.							
e. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.							
f. No change from current training policy. (Explain in remarks section.)							
g. Other. (Explain in remarks section.)							

I	Fully trained & Experienced
II	Trained but Inexperienced
III	Trained but requires Supervision (high decay)
IV	Untrained in Subject

For: General Subjects

Questionnaire Guide #: 9,10,11,12,13,
14,15,16,17,18

ID # _____

	Classification Groups					
	I & II	I & III	I & IV	I, II, & IV	II & III	II & IV II: I
TRAINING APPROACH						
a. Two separate periods of formal training--one for initial training and one for retraining.						
b. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.						
c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activity early.						
d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period.						
e. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.						
f. No change from current training policy. (Explain in remarks section.)						
g. Other. (Explain in remarks section.)						

I	Fully trained & Experienced
II	Trained but Inexperienced
III	Trained but requires Supervision (high decay)
IV	Untrained in Subject

Classification Codes

ID # _____

REMARKS

SET 5COLLECTIVE TASK TRAINING TIMES AND FREQUENCY

To enable the mechanized infantry/tank task force (ARTEP 71-2) to achieve a given level of proficiency in the collective tasks (shown in the table that follows), a precise scheduling of training periods is necessary. Such planning depends on valid estimates of the time (hours) required for each period and the number of periods that must be given each year.

You are asked to estimate for your level and the next lower echelon:
(below platoon not needed)

a. The number of training periods per year that must be conducted to maintain a fully combat-ready (95%) proficiency level in the ARTEP 71-2 mission tasks, i.e., the ability to successfully execute all aspects of the collective tasks to 95% of the TOE capability of the unit, weapons, and soldiers.

b. The average number of hours per training period.

Assume the following conditions to exist in your unit:

- 85% officer/NCO fill
- 30% not present for training (daily, all grades)
- 20% turnover per quarter (movement in and out of unit)
- 40% change in duty positions per quarter
- 10% replacement rate* per quarter of Code A (95% Proficiency of Skill Level 1) BAT graduates.

Keep in mind that these collective tasks are used in some or all of the ARTEP missions. For example, fire and maneuver is trained in attack, defense, delay, etc. Ensure that your estimate includes an allowance for teaching all applications of the collective task at the level requested.

Note: Enter N/A if the collective task should not be trained at a particular level.

* Of TOE strength.

Write in →

Collective Task

1. Perform tactical movements.
2. Perform security & intelligence operations.
3. Employ cover & concealment.
4. Employ fighting vehicles.
5. Employ fire & maneuver/movement.
6. Reorganize; consolidate.
7. Employ special techniques for operating at night & under limited visibility.
8. Employ special techniques for NBC operations.
9. Employ special techniques for combat in built-up areas.
10. Employ special techniques in hostile TAC air environment.
11. Employ communications & electronic equipment, incl. weapons in EW environment.
12. Organize & prepare battle positions, incl. mines & obstacles.
13. Breach minefields & obstacles.
14. Employ organic small arms.
15. Perform reconnaissance.
16. Perform leadership skills.
17. Maintenance.

[illegible]

SET 6ARTEP MISSION TRAINING TIME AND FREQUENCY

To achieve a specified proficiency level in executing the missions in ARTEP 71-2, The Mechanized Infantry/Tank Task Force, the number of training programs required per year will vary according to:

- The specific ARTEP mission
- Unit level at which training is performed
- Level of proficiency to be achieved and maintained

You are asked to estimate for all levels:

- a. The number of hours required for a training period.
(Time required to run the ARTEP mission. Do not include preparatory training time.)
- b. The number of times per year (frequency) the training period must be repeated in order to achieve a fully combat-ready (95%) proficiency level in the ARTEP 71-2 missions, i.e., ability to successfully execute all ARTEP tasks to 95% of the TOE capability of the unit, weapons and soldiers.

Assume the following conditions to exist in your unit:

- 85% officer/NCO fill
- 30% not present for training (daily, all grades)
- 20% turnover per quarter (movement in and out of unit)
- 40% change in duty positions per quarter
- 10% replacement rate* per quarter of Code A (95% proficiency of Skill Level 1) BAT graduates.

Note: Enter N/A if the training should not be done at a particular unit level.

* Of TOE strength.

ID # _____

ARTEP MISSION

1. Movement to contact.
2. Hasty attack.
3. Deliberate attack.
4. Exploitation.
5. Night attack.
6. Defense.
7. Delay.
8. Disengage (under pressure).
9. Defense of a built-up area.
10. Prepare a strong point.
11. Crossing water obstacles
(river crossing).
12. Passage of lines.

[illegible]

ID # _____

SET 7

TRAINING SURVEY

The following portion of the survey relates to unit and individual training. The questions require answers based on your professional experience and opinions.

1. What individual Soldier's Manual Tasks should be eliminated from Basic Armor Training (BAT)? List the Item Number from the Questionnaire Guide (for example, 1d, 3e, 19b).

2. Are there any additional items, not listed in the Questionnaire Guide that should be included in BAT?

3. How well does proficiency on SM tasks measure an individual's ability to fight his weapon system? What are the major strengths and weaknesses of the SM for measuring proficiency? (Check ✓)

_____ Excellent Comment:

_____ Good

_____ Marginal

_____ Poor

_____ Unsatisfactory

4. How well does the SQT measure an individual's ability to fight his weapon system? What are the major strengths and weaknesses? (Check ✓)

_____ Excellent Comment:

_____ Good

_____ Marginal

_____ Poor

_____ Unsatisfactory

5. How well does the SQT measure an individual's proficiency on SM tasks? (Check ✓)

_____ Excellent Comment:

_____ Good

_____ Marginal

_____ Poor

_____ Unsatisfactory

6. How well does proficiency on ARTEP tasks measure the collective abilities to perform a unit's assigned mission? (Check ✓)

_____ Excellent Comment:

_____ Good

_____ Marginal

_____ Poor

_____ Unsatisfactory

7. At what level should the following training records be kept? (Check ✓)

	Bn	Co	Plt
Individual Records			
Crew Records			
Platoon Records			

Please comment if you disagree or have suggestions.

8. Do you believe that in general there is a demonstrated increase in individual proficiency attributable to collective (ARTEP) training in units? (Check ✓)

Yes _____. If yes, how much? No _____. Comment:

_____ Major (15% or more)

_____ Significant (10% - 15%)

_____ Minor (5% - 10%)

_____ Barely recognizable (1% - 5%)

9. Do you believe that in general there is a demonstrated increase in collective proficiency attributable to individual (SM tasks) training in units? (Check ☒)

Yes _____. If yes, how much? No _____. Comment:

_____ Major (15% or more)

_____ Significant (10% - 15%)

_____ Minor (5% - 10%)

_____ Barely recognizable

10. What impact would decreasing the proficiency level on Soldier's Manual tasks of Basic Armor graduates have on your unit combat effectiveness?

_____ None Comment:

_____ Slight

_____ Significant

_____ Excessive

11. What impact would increasing the proficiency level on Soldier's Manual tasks of Basic Armor graduates have on your unit combat effectiveness?

_____ None Comment:

_____ Slight

_____ Significant

_____ Excessive

12. Estimate your current personnel status:

Officer/NCO fill _____ %

Not present for training (daily, all grades) _____ %

Turnover per quarter (movement in and out
of your unit level) _____ %

Replacement rate of new BAT graduates
per quarter _____ %

Change in duty positions per quarter _____ %

QUESTIONNAIRE GUIDE

This Guide lists 131 Soldier's Manual Tasks for the 19E (Gunner/Loader) and 19F (Driver) MOS. The Tasks have been conveniently combined into 19 functional groups. The skill levels for each MOS have also been listed.

This Guide will be useful in assisting you to complete SETS 1, 3, and 7. Refer to the Guide as often as you wish.

QUESTIONNAIRE GUIDE

Soldier's Manual Tasks/Groups

19E Gunner/Loader
19F Driver

		SKILL LEVEL	
		19E	19F
1.	Driver Mechanical Operating Procedures		
a.	start an M60A1	1	1
b.	stop an M60A1 tank engine	1	1
c.	extinguish fire on a tank	1	1
d.	prepare an M60A1 for fording	1	1
e.	install/operate driver's night vision devices on an M60A1	2	1
f.	start an M60A1 using auxillary power (slave) procedures	1	1
g.	start an M60A1 using tow starting procedures	1	1
2.	Driver Tactical Operating Procedures		
a.	drive over various terrain	1	1
b.	drive during various weather conditions	2	1
c.	negotiate obstacles in an M60A1	2	1
d.	negotiate a route using terrain for cover & concealment	1	1
e.	react to direct/indirect fire	1	1
f.	escape from a tank	1	1
g.	select/occupy firing position	2	1
h.	camouflage vehicle	1	1
i.	communicate using visual signal techniques	1	1

SKILL LEVEL	
19E	19F

3. Gunnery Preparations

a. boresight the M85 machinegun	1	2
b. mount/dismount M85 mg on M60A1	1	1
c. mount/dismount coax machinegun on M60A1	1	1
d. boresight a coax machinegun on a M60A1	1	2
e. zero a coax machinegun on a M60A1	1	2
f. stow/service ammunition on M60A1	1	1
g. perform loader prepare-to-fire checks on M60A1	1	2
h. boresight main gun on M60A1	1	2
i. zero the main gun	1	2
j. place turret into power operation	1	1
k. perform computer check	1	2
l. index range manually into computer	1	2
m. operate night vision optics	1	2
n. place computer into operation	1	2
o. boresight searchlight	1	2
p. remove/install M37 periscope	1	2

		SKILL LEVEL	
		19E	19F
4.	Tank and Crew Weapons Employment		
a.	engage targets w/M85 machinegun	1	1
b.	engage targets w/a coax machinegun	1	1
c.	load M60A1 main gun	1	2
d.	apply loader misfire procedure to main gun	1	1
e.	perform gunner misfire procedure to main gun	1	1
f.	operate searchlight	1	2
g.	adjust fire using BOT	1	2
h.	adjust fire using subsequent fire command	1	2
i.	engage targets using battlesight	1	2
j.	engage targets using precision fire	1	2
k.	engage targets from range card data	1	2
l.	prepare a range card	1	2
m.	perform driver's prepare-to-fire checks	2	1
n.	acquire targets	1	1
o.	communicate using visual signal techniques	1	1
5.	General Maintenance Procedures		
a.	perform preventive maintenance on BII on an M60A1	1	1
b.	remove/install track on a tank	1	1
c.	record operator's items of information in equipment logbook	1	1
d.	lubricate an M60A1 in accordance with lubrication order	1	1

		SKILL LEVEL	
		19E	19F
6.	Hull Maintenance Procedures		
a.	perform before operations checks and services on hull of an M60A1	2	1
b.	perform during operations checks and services on hull of an M60A1	2	1
c.	perform after operations checks and services on hull of an M60A1	2	1
d.	troubleshoot hull of an M60A1	2	1
7.	Turret Maintenance Procedures		
a.	perform before operations checks and services on turret of an M60A1	1	2
b.	perform during operations checks and services on turret of an M60A1	1	2
c.	perform after operations checks and services on turret of an M60A1	1	2
d.	perform preventive maintenance on optical equipment on a tank	1	1
e.	troubleshoot turret of an M60A1	1	2
f.	perform after firing checks and services on the M60A1 main gun	1	2
8.	Tank Recovery Procedures		
a.	recover a tank by similar vehicle	1	1
b.	remove an M60A1 heat shield	1	1
c.	disconnect an M60A1 final drive	1	1
d.	self-recover a tank	1	1
e.	prepare a tank for towing	1	1

		SKILL LEVEL	
		19E	19F
9.	Communications Equipment Operations & Maintenance		
a.	operate radio set AN/VRC-64	1	1
b.	install radio set AN/VRC-64	1	1
c.	perform operator maintenance on radio set AN/VRC-64	1	1
d.	install radio set AN/VRC-46	1	1
e.	operate radio set AN/VRC-46	1	1
f.	perform operator maintenance on radio set AN/VRC-46 and AN/VRC-47	1	1
g.	install "hot loop" wire communication	2	2
h.	place external phone into operation	1	1
10.	Communications Message Handling Procedures		
a.	transmit/receive a radio message	1	1
b.	send/receive a radio/telephone message	1	1
c.	use correct radio/telephone procedures	1	1
d.	establish, enter/leave radio NET	2	2
e.	use an automated CEOI	2	2
f.	authenticate transmissions & encrypt/decrypt numbers and grid zone letters using KAL 6k with KTC 1400 numerical code	2	2
11.	Intelligence and Security Procedures		
a.	acquire/identify targets	1	1
b.	prepare/submit a spot report	1	1
c.	identify friendly/threat aircraft	1	1
d.	prepare captured documents and material for processing	1	1
e.	identify friendly/threat vehicles	1	1
f.	prepare known or suspected enemy personnel for processing	1	1

		SKILL LEVEL	
		19E	19F
12.	Individual NBC Procedures		
a.	maintain protective mask and accessories	1	1
b.	put on a protective mask	1	1
c.	take cover as protection against NBC hazards	1	1
d.	decontaminate self & individual equipment	1	1
e.	determine personal needs and personal hygiene in a chemical environment	1	1
13.	Collective NBC Procedures		
a.	decontaminate unit equipment	1	1
b.	identify NBC hazards and take appropriate actions	1	1
c.	administer antidote to a nerve agent casualty	1	1
d.	prepare vehicle for nuclear attack	1	1
e.	give NBC alarm	1	1
f.	apply artificial respiration to a chemical agent casualty	1	1
14.	First Aid		
a.	evacuate wounded from tank	1	1
b.	perform mouth-to-mouth resuscitation and external cardiac massage	1	1
c.	stop bleeding	1	1
d.	identify and treat for shock	1	1
e.	splint a fracture	1	1
f.	administer emergency medical care for burns	1	1
g.	apply first aid for sun/heat injuries	1	1
h.	apply first aid for wet/cold injuries	1	1

		SKILL LEVEL	
		19E	19F
15.	Land Mine Warfare Procedures		
a.	locate mines by probing	1	1
b.	locate mines with a metallic mine detector	1	1
c.	identify minefield markers	1	1
d.	locate mines with a microwave mine detector	1	1
e.	destroy mine in place	1	1
16.	Map Reading		
a.	locate a point on a map	2	2
b.	measure ground distance	2	2
c.	orient a map to the ground	2	2
d.	determine elevation of a point on the ground using a map	2	2
e.	orient a map using a compass	2	2
17.	Combat Skills		
a.	camouflage/conceal self and individual equipment	1	1
b.	select individual positions that afford concealment/cover	1	1
c.	construct individual defensive position	1	1
d.	engage targets w/hand grenades	1	1

SKILL LEVEL	
19E	19F

18. Individual Weapons Maintenance & Employment

a. maintain a cal .45 pistol	1	1
b. engage targets with cal .45 pistol	1	1
c. maintain a M3A1 SMG	1	1
d. engage targets with a M3A1	1	1
e. perform operator maintenance on a M16A1 rifle	1	1
f. load/unload M16A1 magazine	1	1
g. load, reduce, stoppage, unload, clear M16A1 rifle	1	1
h. zero an M16A1 rifle	1	1
i. engage targets with M16A1 rifle	1	1

19. Crew Served Weapons Maintenance

a. maintain a M219 coax machinegun	1	1
b. maintain a M85 cal .50 machinegun	1	1

Figure B-1

POSITION

BN	Bn CO	Bn XO	CSM	S-3	Op SGT	Co CO	Co XO	1SG	Plt Ldr	Plt SGT	Other	TOTAL
1-77		1		1	1	2	2	1	5	5	2	20
4-40	1		1	1		3		1	4	5		16
2-34						2		2	3	4		11
6-32	1			1		3	1	2	5	5	1	19
TOTALS	2	1	1	3	1	10	3	6	17	19	3	66

Figure B-2
TIME IN SERVICE

RANK	<1	≤2	≤4	≤6	≤8	≤10	≤12	≤14	≤16	≤18	≤20	>20
LTC									1	1		
MAJ											1	
CPT			1	6	3							
1LT		4	4									
2LT	7	7	1									
E-8									1	1	4	
E-7							1		8	5	1	
E-6				2	1	4	2					

Figure B-3
ARMOR EXPERIENCE

RANK	<1	≤2	≤4	≤6	≤8	≤10	≤12	≤14	≤16	≤18	≤20	>20
LTC				1						1		
MAJ						1						
CPT			4	4	2							
1LT		6	2									
2LT	1	4										
E-8		1					1			1	2	
E-7	1	8		1			2		1	1		
E-6	1	1	1	4	1		1					

GUNNER/LOADER (19E) RATING FORM

(Refer to Questionnaire Guide as necessary
to help you complete the form)

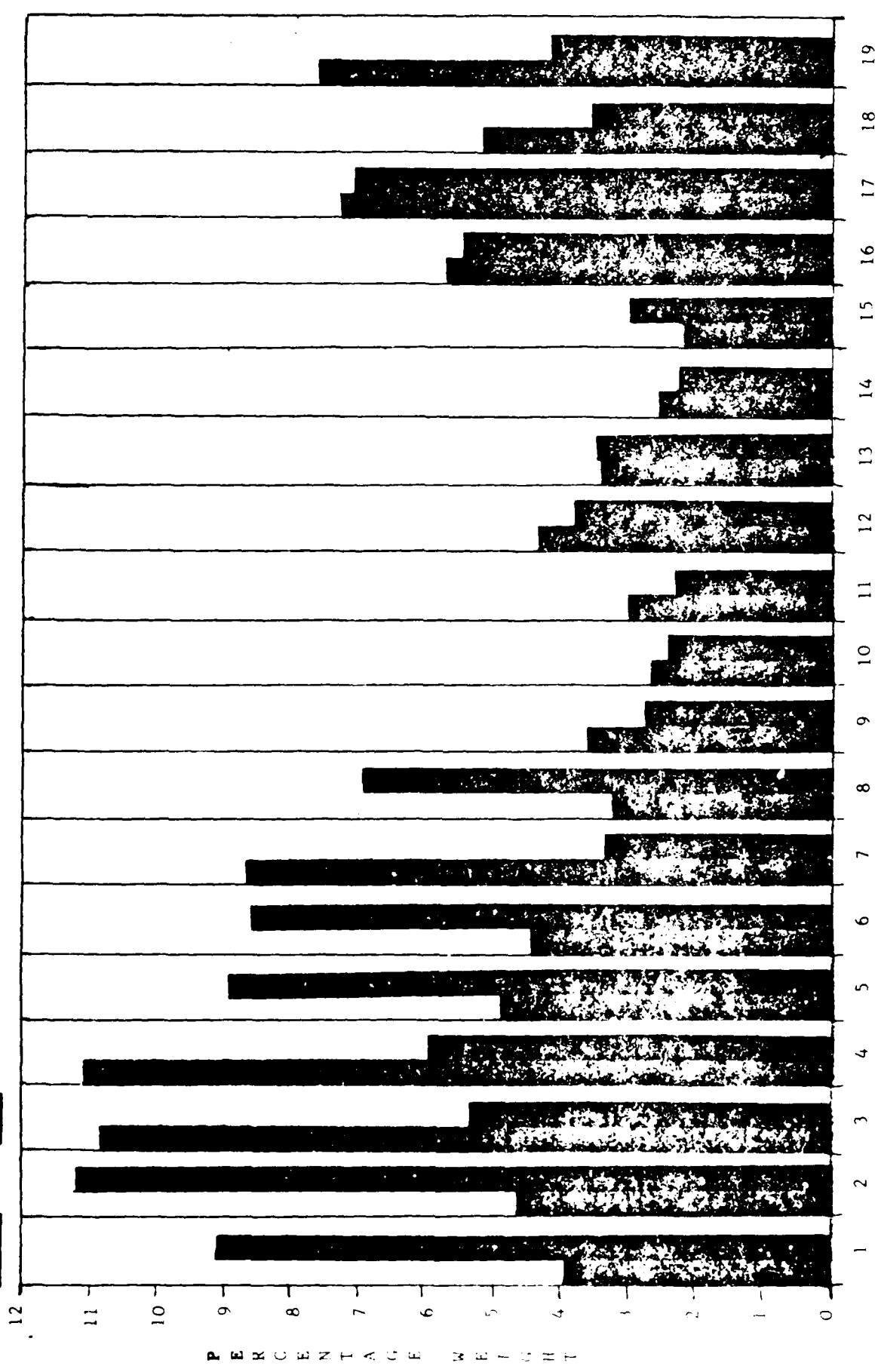
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<u>18.37</u>	2. Driver Mechanical Operating Procedures
<u>38.37</u>	3. Combat Skills
<u>52.00</u>	4. Tank and Crew Weapons Employment
<u>21.18</u>	5. Hull Maintenance Procedures
<u>11.51</u>	6. First Aid
<u>22.80</u>	7. General Maintenance Procedures
<u>10.00</u>	8. Land Mine Warfare Procedures
<u>12.30</u>	9. Communications Message Handling Procedures
<u>40.46</u>	10. Turret Maintenance Procedures
<u>20.32</u>	11. Individual NBC Procedures
<u>23.71</u>	12. Individual Weapons Maintenance and Employment
<u>16.83</u>	13. Communications Equipment Operations and Maintenance
<u>16.03</u>	14. Collective NBC Procedures
<u>34.83</u>	15. Crew Served Weapons Maintenance
<u>26.61</u>	16. Map Reading
<u>14.93</u>	17. Tank Recovery Procedures
<u>50.70</u>	18. Gunnery Preparations
<u>22.13</u>	19. Driver Tactical Operating Procedures

DRIVER (19F) RATING FORM

(Refer to Questionnaire Guide as necessary
to help you complete the form)

<u>11.02</u>	1. Intelligence and Security Procedures
<u>41.59</u>	2. Driver Mechanical Operating Procedures
<u>31.92</u>	3. Combat Skills
<u>26.98</u>	4. Tank and Crew Weapons Employment
<u>39.08</u>	5. Hull Maintenance Procedures
<u>10.00</u>	6. First Aid
<u>40.64</u>	7. General Maintenance Procedures
<u>13.65</u>	8. Land Mine Warfare Procedures
<u>11.25</u>	9. Communications Message Handling Procedures
<u>15.07</u>	10. Turret Maintenance Procedures
<u>17.34</u>	11. Individual NBC Procedures
<u>16.29</u>	12. Individual Weapons Maintenance and Employment
<u>12.71</u>	13. Communications Equipment Operations and Maintenance
<u>16.00</u>	14. Collective NBC Procedures
<u>19.14</u>	15. Crew Served Weapons Maintenance
<u>25.06</u>	16. Map Reading
<u>31.62</u>	17. Tank Recovery Procedures
<u>24.38</u>	18. Gunnery Preparations
<u>51.17</u>	19. Driver Tactical Operating Procedures

19E 19F



Left Column of Each Grouping is 19E

Right Column of Each Grouping is 19F

TASK GROUPINGS
(SET 1)

No. of
Training
Periods/Year

To Achieve and Maintain 95% Unit Proficiency with:

10.00

1. 10% Code A replacements per quarter

13.34

2. 15% Code A replacements per quarter

17.02

3. 20% Code A replacements per quarter

15.70

4. 10% Code B replacements per quarter

20.32

5. 15% Code B replacements per quarter

25.12

6. 20% Code B replacements per quarter

23.17

7. 10% Code C replacements per quarter

28.64

8. 15% Code C replacements per quarter

34.12

9. 20% Code C replacements per quarter

MULTIPLIERS FOR FREQUENCY

SET 3 - SOLDIER'S MANUAL TASKS

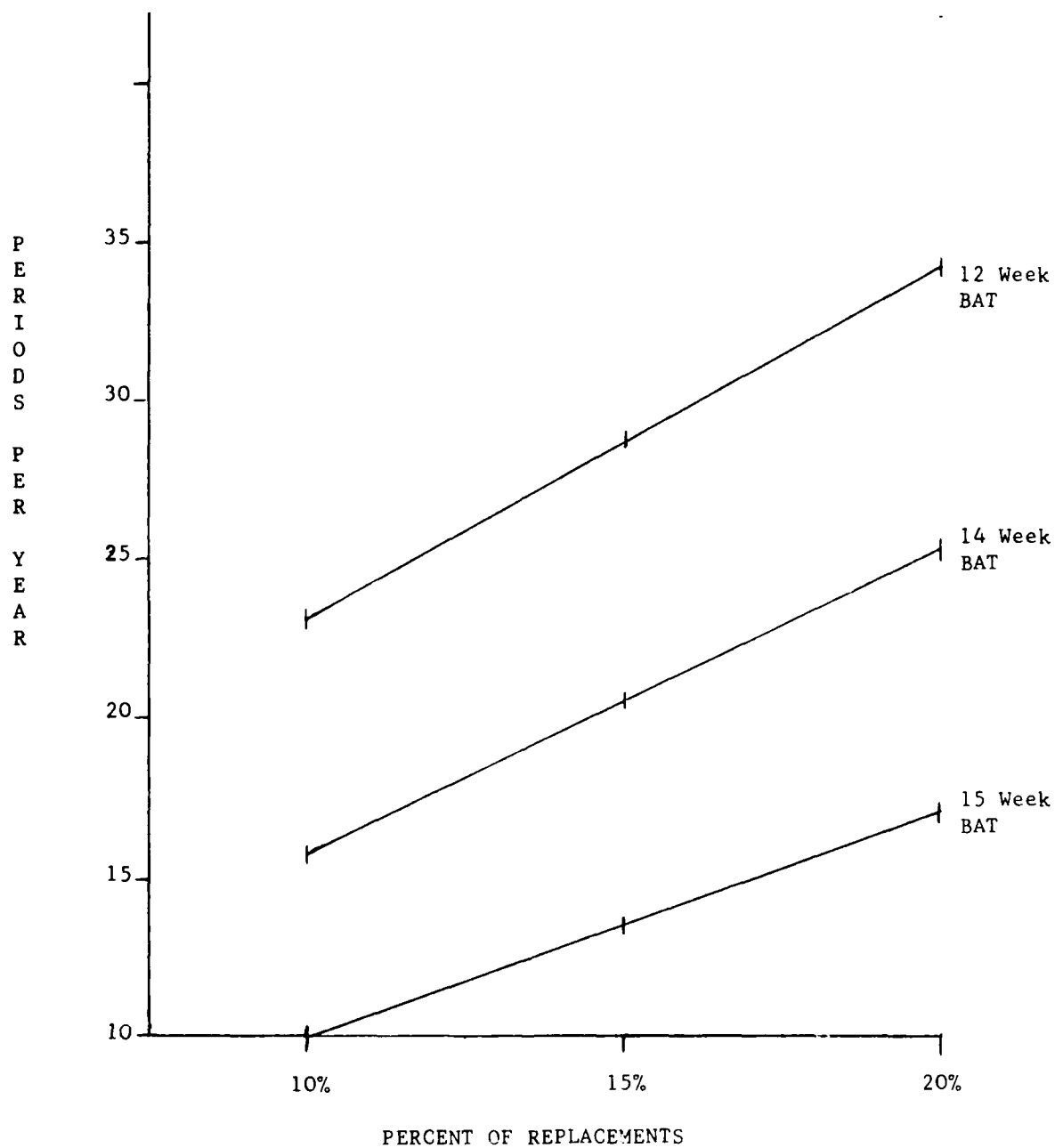
	10%	15%	20%
Code A - 15 Week	.29	.38	.50
Code B - 14 Week	.47	.59	.74
Code C - 12 Week	.68	.85	1.00

SETS 5 & 6 - COLLECTIVE TASKS & ARTEP MISSIONS

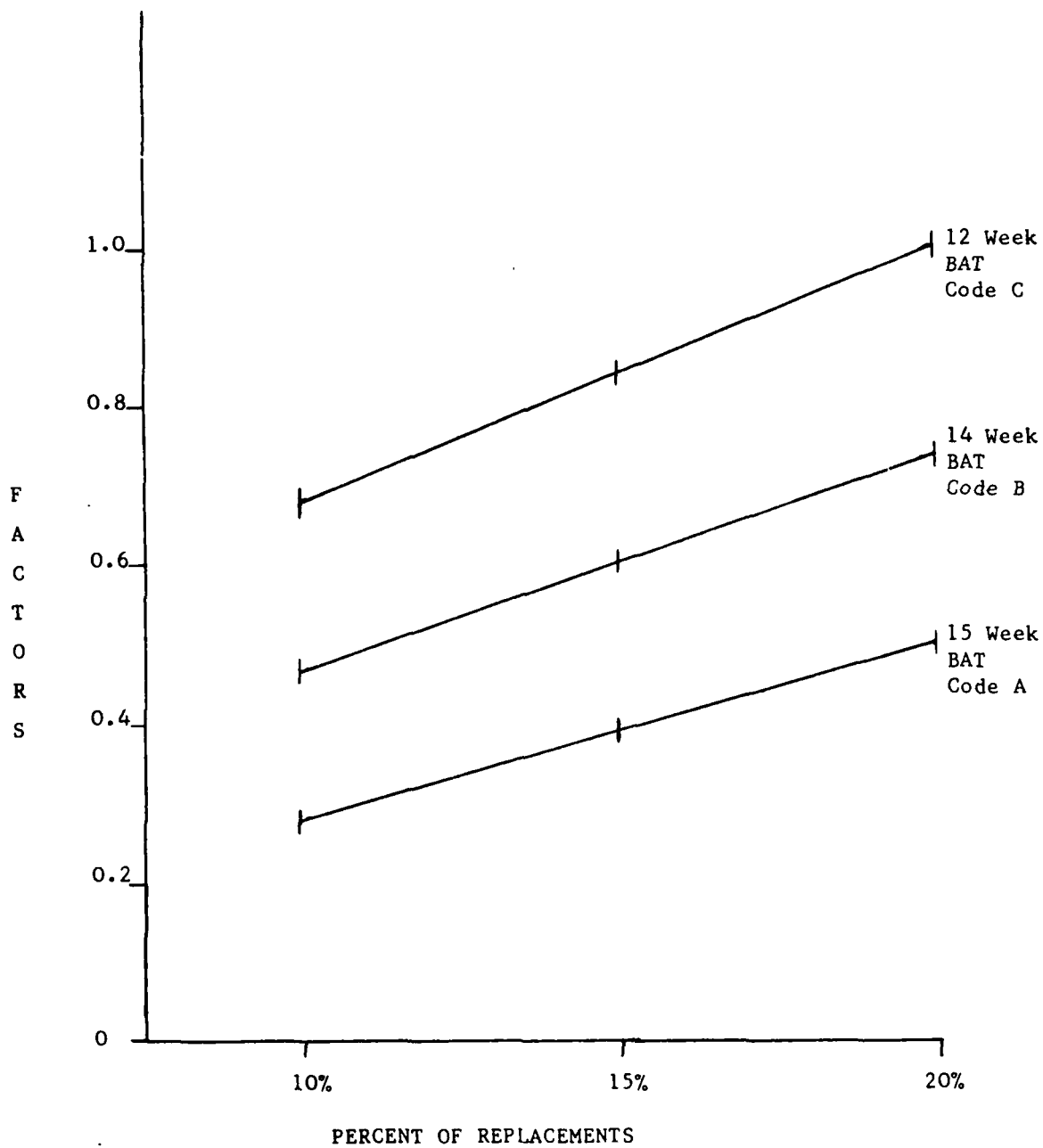
	10%	15%	20%
Code A - 15 Week	1.0	1.3	1.7
Code B - 14 Week	1.6	2.0	2.5
Code C - 12 Week	2.3	2.7	3.4

TRAINING OF UNIT REPLACEMENTS

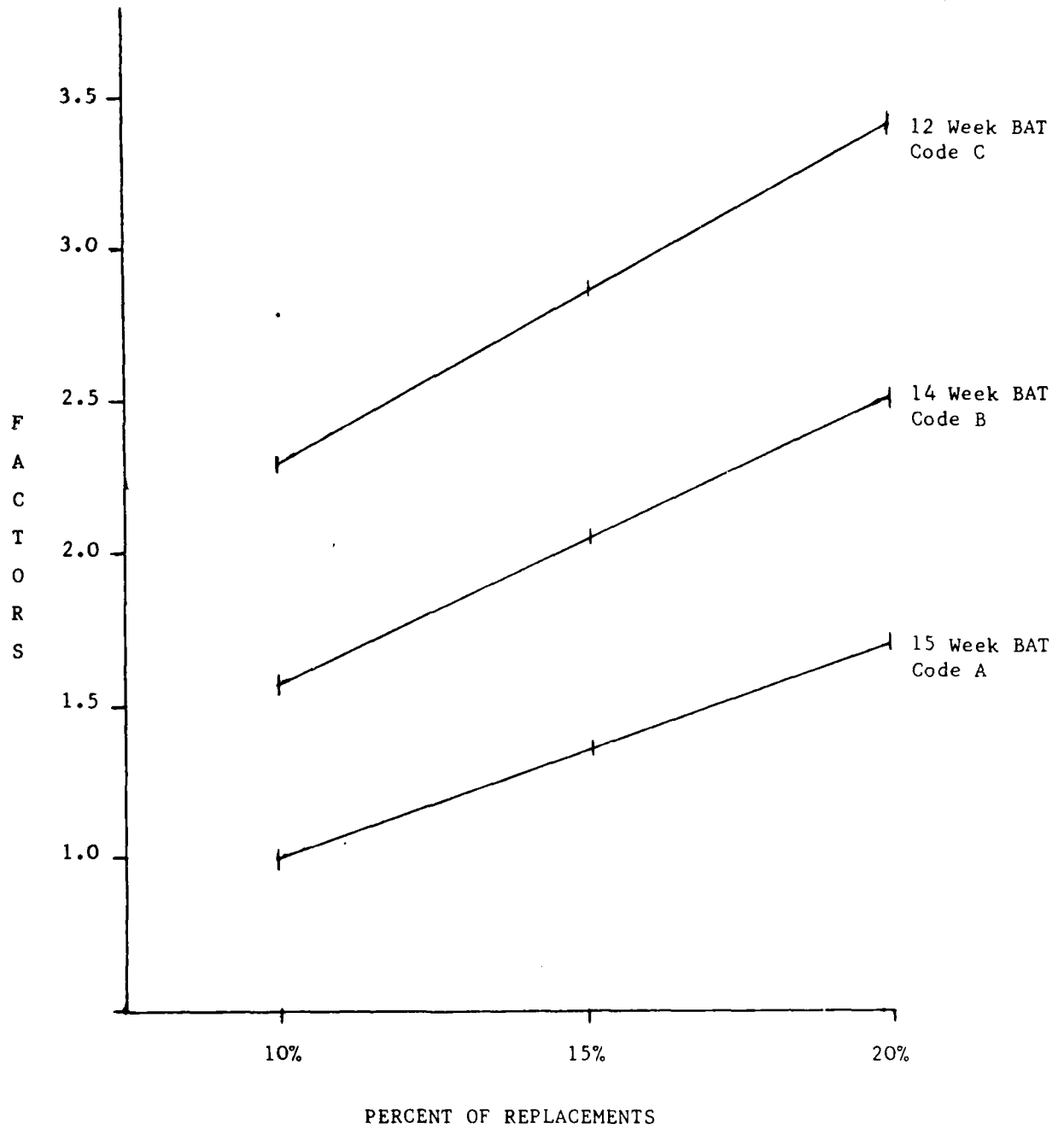
(SET 2)



SOLDIER'S MANUAL
MULTIPLIERS OF FREQUENCY
(SET 3)



FACTORS FOR
MULTIPLIERS OF FREQUENCY
(SETS 5 & 6)



10 % Fill With
12 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

		Gunner/Loader (19E)		Total
		Hours/Period	Periods/Year	
1.	Driver Mechanical Operating Procedures	2.1	3	6.3
2.	Driver Tactical Operating Procedures	2.9	3	8.7
3.	Gunnery Preparations	7.8	3	23.4
4.	Tank and Crew Weapons Employment	8.3	3	24.9
5.	General Maintenance Procedures	3.6	4	14.4
6.	Hull Maintenance Procedures	2.9	3	8.7
7.	Turret Maintenance Procedures	4.6	4	18.4
8.	Tank Recovery Procedures	1.8	2	3.6
9.	Communications Equipment Operations and Maintenance	2.1	3	6.3
10.	Communications Message Handling Procedures	1.6	3	4.8
11.	Intelligence and Security Procedures	2.1	3	6.3
12.	Individual NBC Procedures	4.8	2	9.6
13.	Collective NBC Procedures	2.4	3	7.2
14.	First Aid	1.9	2	3.8
15.	Land Mine Warfare Procedures	2.0	2	4.0
16.	Map Reading	4.5	3	13.5
17.	Combat Skills	4.0	3	12.0
18.	Individual Weapons Maintenance and Employment	3.6	3	10.8
19.	Crew Served Weapons Maintenance	3.5	3	10.5

186.7

15 % Fill With
12 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	3	6.3
2. Driver Tactical Operating Procedures	2.9	4	11.6
3. Gunnery Preparations	7.8	4	31.2
4. Tank and Crew Weapons Employment	8.3	4	33.2
5. General Maintenance Procedures	3.6	5	18.0
6. Hull Maintenance Procedures	2.9	4	11.6
7. Turret Maintenance Procedures	4.6	5	23.0
8. Tank Recovery Procedures	1.8	3	5.4
9. Communications Equipment Operations and Maintenance	2.1	3	6.3
10. Communications Message Handling Procedures	1.6	3	4.8
11. Intelligence and Security Procedures	2.1	3	6.3
12. Individual NBC Procedures	4.8	3	14.4
13. Collective NBC Procedures	2.4	3	7.2
14. First Aid	1.9	3	5.7
15. Land Mine Warfare Procedures	2.0	3	6.0
16. Map Reading	4.5	4	18.0
17. Combat Skills	4.0	4	16.0
18. Individual Weapons Maintenance and Employment	3.6	4	14.4
19. Crew Served Weapons Maintenance	3.5	4	14.0

239.4

20 % Fill With
12 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)			
	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	4	8.4
2. Driver Tactical Operating Procedures	2.9	5	14.5
3. Gunnery Preparations	7.8	5	39.0
4. Tank and Crew Weapons Employment	8.3	5	41.5
5. General Maintenance Procedures	3.6	6	21.6
6. Hull Maintenance Procedures	2.9	5	14.5
7. Turret Maintenance Procedures	4.6	6	27.6
8. Tank Recovery Procedures	1.8	3	5.4
9. Communications Equipment Operations and Maintenance	2.1	4	8.4
10. Communications Message Handling Procedures	1.6	4	6.4
11. Intelligence and Security Procedures	2.1	4	8.4
12. Individual NBC Procedures	2.8	5	14.0
13. Collective NBC Procedures	2.4	4	9.6
14. First Aid	1.9	3	5.7
15. Land Mine Warfare Procedures	2.0	3	6.0
16. Map Reading	4.5	5	22.5
17. Combat Skills	4.0	5	20.0
18. Individual Weapons Maintenance and Employment	3.6	5	18.0
19. Crew Served Weapons Maintenance	3.5	5	17.5

309.0

10 % Fill With
14 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	2	4.2
2. Driver Tactical Operating Procedures	2.9	2	5.8
3. Gunnery Preparations	7.8	2	15.6
4. Tank and Crew Weapons Employment	8.3	2	16.6
5. General Maintenance Procedures	3.6	3	10.8
6. Hull Maintenance Procedures	2.9	2	5.8
7. Turret Maintenance Procedures	4.6	3	13.8
8. Tank Recovery Procedures	1.8	1	1.8
9. Communications Equipment Operations and Maintenance	2.1	2	4.2
10. Communications Message Handling Procedures	1.6	2	3.2
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	4.8	1	4.8
13. Collective NBC Procedures	2.4	2	4.8
14. First Aid	1.9	1	1.9
15. Land Mine Warfare Procedures	2.0	1	2.0
16. Map Reading	4.5	2	9.0
17. Combat Skills	4.0	3	12.0
18. Individual Weapons Maintenance and Employment	3.6	2	7.2
19. Crew Served Weapons Maintenance	3.5	2	7.0

123.7

15 % Fill With
14 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	2	4.2
2. Driver Tactical Operating Procedures	2.9	3	8.7
3. Gunnery Preparations	7.8	3	23.4
4. Tank and Crew Weapons Employment	8.3	3	24.9
5. General Maintenance Procedures	3.6	4	14.4
6. Hull Maintenance Procedures	2.9	3	8.7
7. Turret Maintenance Procedures	4.6	4	18.4
8. Tank Recovery Procedures	1.8	2	3.6
9. Communications Equipment Operations and Maintenance	2.1	2	4.2
10. Communications Message Handling Procedures	1.6	2	3.2
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	4.8	2	9.6
13. Collective NBC Procedures	2.4	2	4.8
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.0	2	4.0
16. Map Reading	4.5	3	13.5
17. Combat Skills	4.0	3	12.0
18. Individual Weapons Maintenance and Employment	3.6	3	10.8
19. Crew Served Weapons Maintenance	3.5	3	10.5

176.4

20 % Fill With
14 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	3	6.3
2. Driver Tactical Operating Procedures	2.9	4	11.6
3. Gunnery Preparations	7.8	4	31.2
4. Tank and Crew Weapons Employment	8.3	4	33.2
5. General Maintenance Procedures	3.6	4	14.4
6. Hull Maintenance Procedures	2.9	4	11.6
7. Turret Maintenance Procedures	4.6	4	18.4
8. Tank Recovery Procedures	1.8	2	3.6
9. Communications Equipment Operations and Maintenance	2.1	3	6.3
10. Communications Message Handling Procedures	1.6	3	4.8
11. Intelligence and Security Procedures	2.1	3	6.3
12. Individual NBC Procedures	4.8	2	9.6
13. Collective NBC Procedures	2.4	3	7.2
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.0	2	4.0
16. Map Reading	4.5	4	18.0
17. Combat Skills	4.0	4	16.0
18. Individual Weapons Maintenance and Employment	3.6	4	14.4
19. Crew Served Weapons Maintenance	3.5	4	14.0

220.7

10 % Fill With
15 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (19E)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	1	2.1
2. Driver Tactical Operating Procedures	2.9	1	2.9
3. Gunnery Preparations	7.8	1	7.8
4. Tank and Crew Weapons Employment	8.3	1	8.3
5. General Maintenance Procedures	3.6	2	7.2
6. Hull Maintenance Procedures	2.9	1	2.9
7. Turret Maintenance Procedures	4.6	2	9.2
8. Tank Recovery Procedures	1.8	1	1.8
9. Communications Equipment Operations and Maintenance	2.1	1	2.1
10. Communications Message Handling Procedures	1.6	1	1.6
11. Intelligence and Security Procedures	2.1	1	2.1
12. Individual NBC Procedures	2.8	1	2.8
13. Collective NBC Procedures	2.4	1	2.4
14. First Aid	1.9	1	1.9
15. Land Mine Warfare Procedures	2.0	1	2.0
16. Map Reading	4.5	1	4.5
17. Combat Skills	4.0	1	4.0
18. Individual Weapons Maintenance and Employment	3.6	1	3.6
19. Crew Served Weapons Maintenance	3.5	1	3.5

72.7

15 % Fill With
15 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (13L)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	2	4.2
2. Driver Tactical Operating Procedures	2.9	2	5.8
3. Gunnery Preparations	7.8	2	15.6
4. Tank and Crew Weapons Employment	8.3	2	16.6
5. General Maintenance Procedures	3.6	2	7.2
6. Hull Maintenance Procedures	2.9	2	5.8
7. Turret Maintenance Procedures	4.6	2	9.2
8. Tank Recovery Procedures	1.8	1	1.8
9. Communications Equipment Operations and Maintenance	2.1	2	4.2
10. Communications Message Handling Procedures	1.6	2	3.2
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	2.8	2	5.6
13. Collective NBC Procedures	2.4	2	4.8
14. First Aid	1.9	1	1.9
15. Land Mine Warfare Procedures	2.0	1	2.0
16. Map Reading	4.5	2	9.0
17. Combat Skills	4.0	2	8.0
18. Individual Weapons Maintenance and Employment	3.6	2	7.2
19. Crew Served Weapons Maintenance	3.5	2	7.0

123.3

20 % Fill With
15 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Gunner/Loader (13E)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	2.1	2	4.2
2. Driver Tactical Operating Procedures	2.9	3	8.7
3. Gunnery Preparations	7.8	3	23.4
4. Tank and Crew Weapons Employment	8.3	3	24.9
5. General Maintenance Procedures	3.6	3	10.8
6. Hull Maintenance Procedures	2.9	3	8.7
7. Turret Maintenance Procedures	4.6	3	13.8
8. Tank Recovery Procedures	1.8	2	3.6
9. Communications Equipment Operations and Maintenance	2.1	2	4.2
10. Communications Message Handling Procedures	1.6	2	3.2
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	4.8	2	9.6
13. Collective NBC Procedures	2.4	2	4.8
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.0	2	4.0
16. Map Reading	4.5	3	13.5
17. Combat Skills	4.0	3	12.0
18. Individual Weapons Maintenance and Employment	3.6	3	10.8
19. Crew Served Weapons Maintenance	3.5	3	10.5

178.7

10 % Fill With
12 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Driver (13F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	3	10.8
2. Driver Tactical Operating Procedures	4.3	4	17.2
3. Gunnery Preparations	5.5	3	16.5
4. Tank and Crew Weapons Employment	5.4	3	16.2
5. General Maintenance Procedures	4.0	4	16.0
6. Hull Maintenance Procedures	3.9	5	19.5
7. Turret Maintenance Procedures	2.7	3	8.1
8. Tank Recovery Procedures	3.1	3	9.3
9. Communications Equipment Operations and Maintenance	2.0	3	6.0
10. Communications Message Handling Procedures	1.5	3	4.5
11. Intelligence and Security Procedures	2.1	3	6.3
12. Individual NBC Procedures	2.7	3	8.1
13. Collective NBC Procedures	2.2	3	6.6
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.1	2	4.2
16. Map Reading	4.0	3	12.0
17. Combat Skills	3.4	3	10.2
18. Individual Weapons Maintenance and Employment	3.3	3	9.9
19. Crew Served Weapons Maintenance	2.7	3	8.1

15 % Fill With
12 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	4	14.4
2. Driver Tactical Operating Procedures	4.3	5	21.5
3. Gunnery Preparations	5.5	3	16.5
4. Tank and Crew Weapons Employment	5.4	4	21.6
5. General Maintenance Procedures	4.0	5	20.0
6. Hull Maintenance Procedures	3.9	6	23.4
7. Turret Maintenance Procedures	2.7	4	10.8
8. Tank Recovery Procedures	3.1	4	12.4
9. Communications Equipment Operations and Maintenance	2.0		
10. Communications Message Handling Procedures	1.5		
11. Intelligence and Security Procedures			
12. Individual NBC Procedures			
13. Collective NBC Procedures			
14. First Aid			
15. Driver's Manual			
16. Driver's Manual			
17. Driver's Manual			
18. Driver's Manual			
19. Driver's Manual			

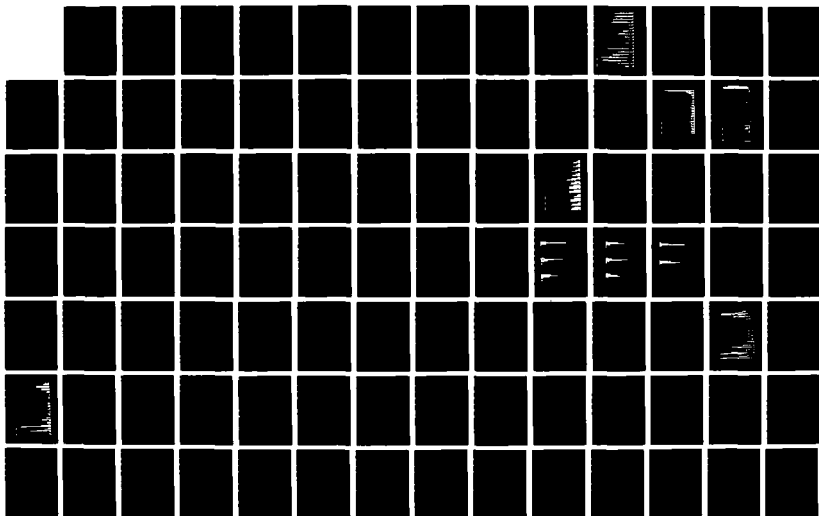
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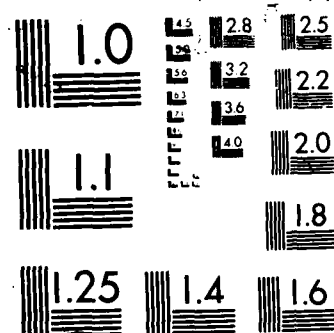
ARMY TRAINING STUDY: TRAINING EFFECTIVENESS ANALYSIS
(TEA) SUMMARY VOLUME 2 ARMOR(U) ARMY TRAINING AND
DOCTRINE COMMAND FORT MONROE VA F J BROWN 08 AUG 78
SBI-AD-F000 108 F/G 15/1

2/5

UNCLASSIFIED

NL





20 % Fill With
12 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	5	18.0
2. Driver Tactical Operating Procedures	4.3	6	25.8
3. Gunnery Preparations	5.5	4	22.0
4. Tank and Crew Weapons Employment	5.4	5	27.0
5. General Maintenance Procedures	4.0	6	24.0
6. Hull Maintenance Procedures	3.9	7	27.3
7. Turret Maintenance Procedures	2.7	5	13.5
8. Tank Recovery Procedures	3.1	5	15.5
9. Communications Equipment Operations and Maintenance	2.0	4	8.0
10. Communications Message Handling Procedures	1.5	4	6.0
11. Intelligence and Security Procedures	2.1	4	8.4
12. Individual NBC Procedures	2.7	5	13.5
13. Collective NBC Procedures	2.2	4	8.8
14. First Aid	1.9	3	5.7
15. Land Mine Warfare Procedures	2.1	3	6.3
16. Map Reading	4.0	5	20.0
17. Combat Skills	3.4	5	17.0
18. Individual Weapons Maintenance and Employment	3.3	4	13.2
19. Crew Served Weapons Maintenance	2.7	5	13.5

293.5

10 % Fill With
14 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	2	7.2
2. Driver Tactical Operating Procedures	4.3	3	12.9
3. Gunnery Preparations	5.5	2	11.0
4. Tank and Crew Weapons Employment	5.4	2	10.8
5. General Maintenance Procedures	4.0	3	12.0
6. Hull Maintenance Procedures	3.9	3	11.7
7. Turret Maintenance Procedures	2.7	2	5.4
8. Tank Recovery Procedures	3.1	2	6.2
9. Communications Equipment Operations and Maintenance	2.0	2	4.0
10. Communications Message Handling Procedures	1.5	2	3.0
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	2.7	2	5.4
13. Collective NBC Procedures	2.2	2	4.4
14. First Aid	1.9	1	1.9
15. Land Mine Warfare Procedures	2.1	1	2.1
16. Map Reading	4.0	2	8.0
17. Combat Skills	3.4	2	6.8
18. Individual Weapons Maintenance and Employment	3.3	2	6.6
19. Crew Served Weapons Maintenance	2.7	2	5.4

130.6

15 % Fill With
14 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	3	10.8
2. Driver Tactical Operating Procedures	4.3	4	17.2
3. Gunnery Preparations	5.5	2	11.0
4. Tank and Crew Weapons Employment	5.4	3	16.2
5. General Maintenance Procedures	4.0	4	16.0
6. Hull Maintenance Procedures	3.9	4	15.6
7. Turret Maintenance Procedures	2.7	3	8.1
8. Tank Recovery Procedures	3.1	3	9.3
9. Communications Equipment Operations and Maintenance	2.0	2	4.0
10. Communications Message Handling Procedures	1.5	2	3.0
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	2.7	3	8.1
13. Collective NBC Procedures	2.2	2	4.4
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.1	2	4.2
16. Map Reading	4.0	3	12.0
17. Combat Skills	3.4	3	10.2
18. Individual Weapons Maintenance and Employment	3.3	2	6.6
19. Crew Served Weapons Maintenance	2.7	3	8.1

175.2

20 % Fill With
14 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	4	14.4
2. Driver Tactical Operating Procedures	4.3	4	17.2
3. Gunnery Preparations	5.5	3	16.5
4. Tank and Crew Weapons Employment	5.4	4	21.6
5. General Maintenance Procedures	4.0	4	16.0
6. Hull Maintenance Procedures	3.9	5	19.5
7. Turret Maintenance Procedures	2.7	4	10.8
8. Tank Recovery Procedures	3.1	4	12.4
9. Communications Equipment Operations and Maintenance	2.0	3	6.0
10. Communications Message Handling Procedures	1.5	3	4.5
11. Intelligence and Security Procedures	2.1	3	6.3
12. Individual NBC Procedures	2.7	4	10.8
13. Collective NBC Procedures	2.2	3	6.6
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.1	2	4.2
16. Map Reading	4.0	4	16.0
17. Combat Skills	3.4	4	13.6
18. Individual Weapons Maintenance and Employment	3.3	4	13.2
19. Crew Served Weapons Maintenance	2.7	4	10.8

224.1

10 % Fill With
15 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS

(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	1	3.6
2. Driver Tactical Operating Procedures	4.3	2	8.6
3. Gunnery Preparations	5.5	1	5.5
4. Tank and Crew Weapons Employment	5.4	1	5.4
5. General Maintenance Procedures	4.0	2	8.0
6. Hull Maintenance Procedures	3.9	2	7.8
7. Turret Maintenance Procedures	2.7	1	2.7
8. Tank Recovery Procedures	3.1	1	3.1
9. Communications Equipment Operations and Maintenance	2.0	1	2.0
10. Communications Message Handling Procedures	1.5	1	1.5
11. Intelligence and Security Procedures	2.1	1	2.1
12. Individual NBC Procedures	2.7	1	2.7
13. Collective NBC Procedures	2.2	1	2.2
14. First Aid	1.9	1	1.9
15. Land Mine Warfare Procedures	2.1	1	2.1
16. Map Reading	4.0	1	4.0
17. Combat Skills	3.4	1	3.4
18. Individual Weapons Maintenance and Employment	3.3	1	3.3
19. Crew Served Weapons Maintenance	2.7	1	2.7

72.6

15 % Fill With
15 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	2	7.2
2. Driver Tactical Operating Procedures	4.3	2	8.6
3. Gunnery Preparations	5.5	2	11.0
4. Tank and Crew Weapons Employment	5.4	2	10.8
5. General Maintenance Procedures	4.0	2	8.0
6. Hull Maintenance Procedures	3.9	3	11.7
7. Turret Maintenance Procedures	2.7	2	7.4
8. Tank Recovery Procedures	3.1	2	6.2
9. Communications Equipment Operations and Maintenance	2.0	2	4.0
10. Communications Message Handling Procedures	1.5	2	3.0
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	2.7	2	5.4
13. Collective NBC Procedures	2.2	2	4.4
14. First Aid	1.9	1	1.9
15. Land Mine Warfare Procedures	2.1	1	2.1
16. Map Reading	4.0	2	8.0
17. Combat Skills	3.4	2	6.8
18. Individual Weapons Maintenance and Employment	3.3	2	6.6
19. Crew Served Weapons Maintenance	2.7	2	5.4

120.7

20 % Fill With
15 Week BAT Graduates

SOLDIER'S MANUAL TASK GROUPINGS
(Refer to the Questionnaire Guide as necessary)

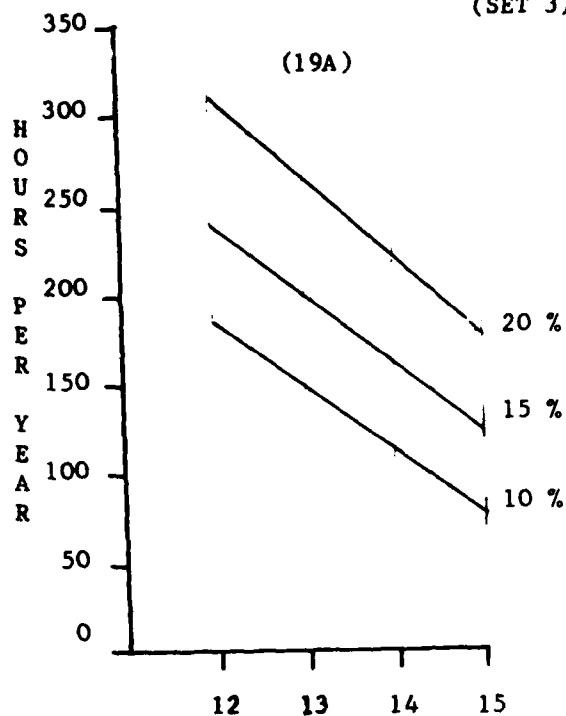
Driver (19F)

	Hours/Period	Periods/Year	Total
1. Driver Mechanical Operating Procedures	3.6	3	10.8
2. Driver Tactical Operating Procedures	4.3	3	12.9
3. Gunnery Preparations	5.5	2	11.0
4. Tank and Crew Weapons Employment	5.4	3	16.2
5. General Maintenance Procedures	4.0	3	12.0
6. Hull Maintenance Procedures	3.9	4	15.6
7. Turret Maintenance Procedures	2.7	3	8.1
8. Tank Recovery Procedures	3.1	3	9.3
9. Communications Equipment Operations and Maintenance	2.0	2	4.0
10. Communications Message Handling Procedures	1.5	2	3.0
11. Intelligence and Security Procedures	2.1	2	4.2
12. Individual NBC Procedures	2.7	3	8.1
13. Collective NBC Procedures	2.2	2	4.4
14. First Aid	1.9	2	3.8
15. Land Mine Warfare Procedures	2.1	2	4.2
16. Map Reading	4.0	3	12.0
17. Combat Skills	3.4	3	10.2
18. Individual Weapons Maintenance and Employment	3.3	2	6.6
19. Crew Served Weapons Maintenance	2.7	3	8.1

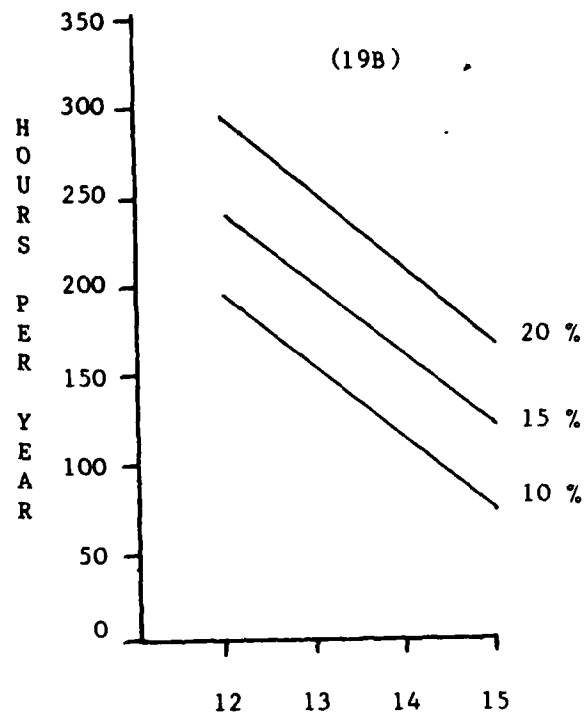
164.5

INDIVIDUAL TRAINING

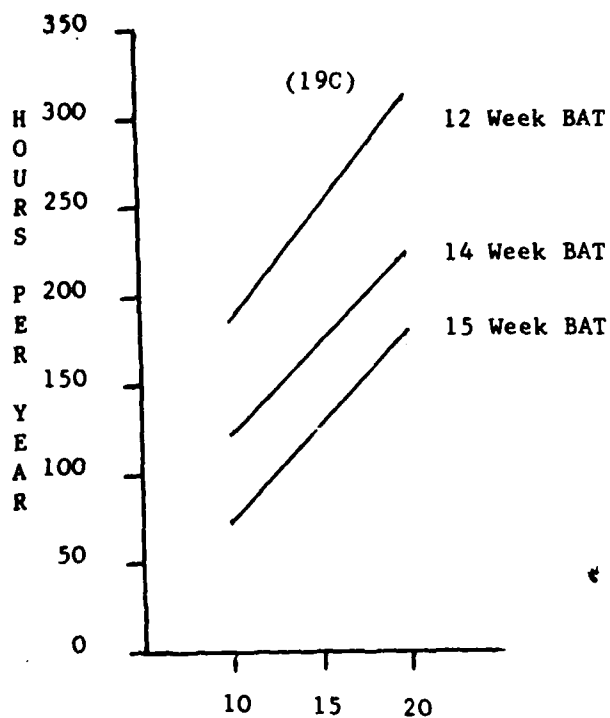
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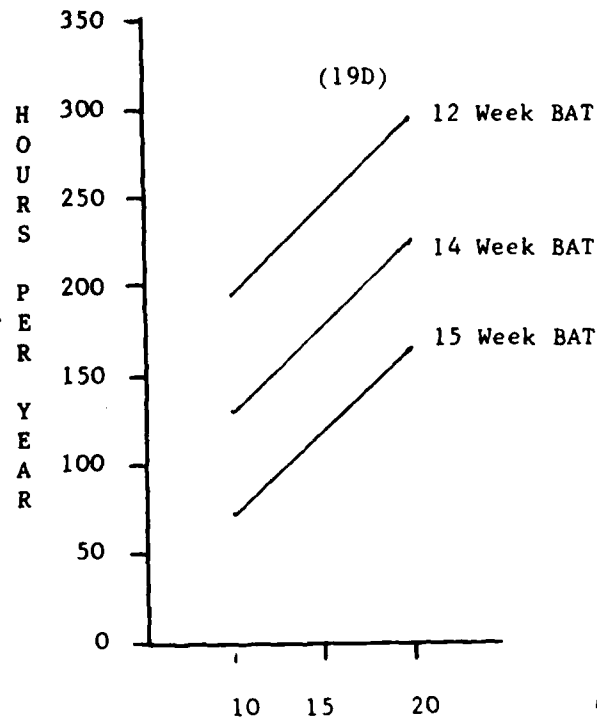
19E



19F



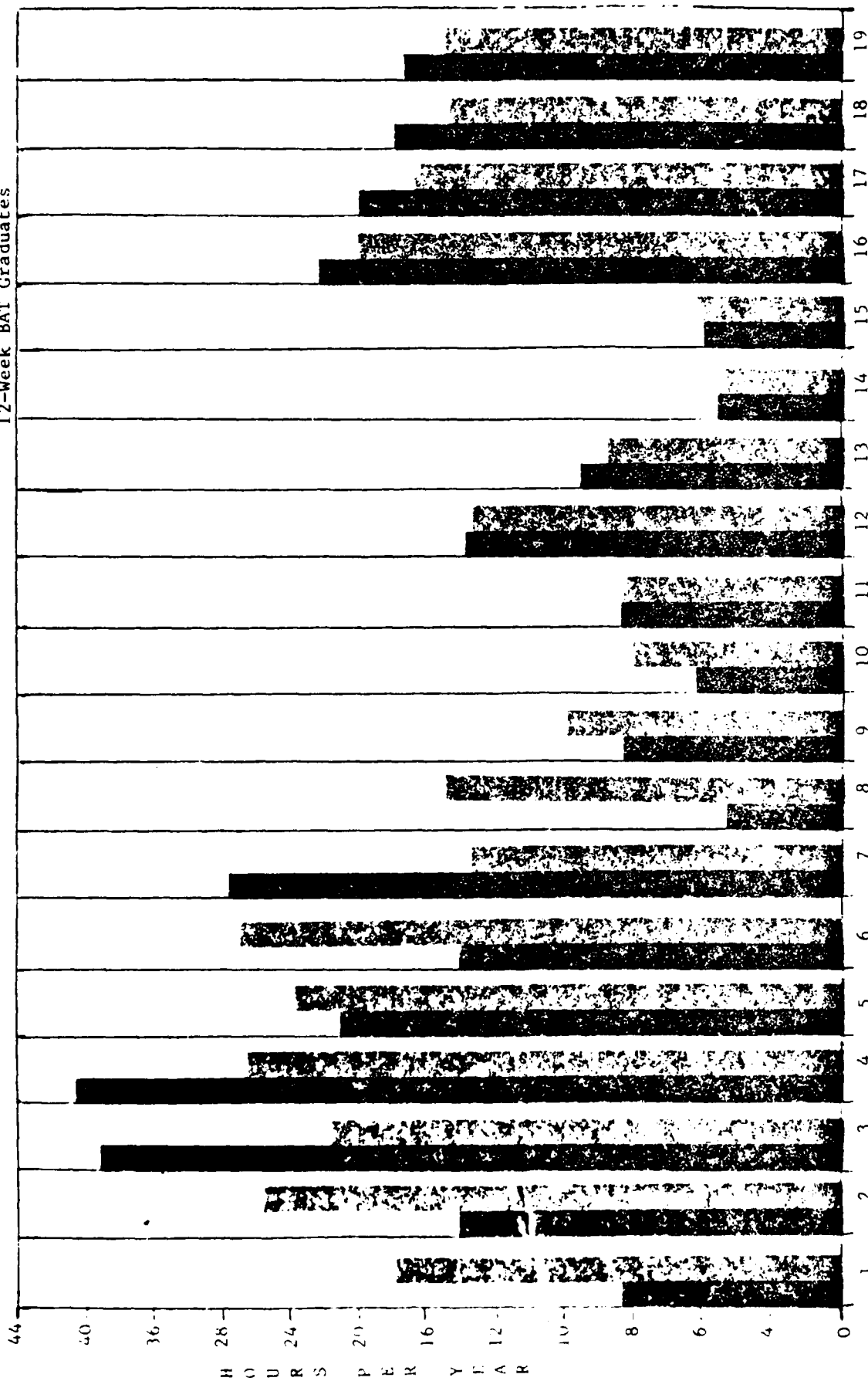
PERCENT OF REPLACEMENT



PERCENT OF REPLACEMENT

20% Replacement With
12-Week BAI Graduates

19E



TASK GROUPING

SET 3

Left Column of Each Grouping is 19E

Right Column of Each Grouping is 19F

For: Gunner Subjects (19E)
Questionnaire Guide #: 3,4,7,19

	Classification Groups							
	I & II	I & III	I & IV	I, II, & IV	II & III	II & IV	III & IV	
TRAINING APPROACH								
a. Two separate periods of formal training--one for initial training and one for retraining.	5.5	7.3	12.1	13.8	20.0	23.2	33.9	
b. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.	30.9	18.2	5.2	6.9	9.1	8.9	5.4	
c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activity early.	36.4	27.3	32.8	12.1	14.5	7.1	1.8	
d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period.	12.7	14.5	8.6	22.4	34.5	21.4	32.1	
e. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.	5.5	23.6	36.8	41.4	16.4	33.9	21.4	
f. No change from current training policy. (Explain in remarks section.)	3.6	1.8	1.7	0.0	0.0	0.0	0.0	
g. Other. (Explain in remarks section.)	5.5	7.3	3.4	3.4	5.5	5.4	5.4	

I	Fully trained & Experienced
II	Trained but Inexperienced
III	Trained but requires Supervision (high decay)
IV	Untrained in Subject

Classification Codes

For: Driver Subjects (19F)

Questionnaire Guide # 1,2,5,6,8

For: Driver Subjects (19F) Questionnaire Guide # 1,2,5,6,8	TRAINING APPROACH	Classification Groups							
		I & II	I & III	I & IV	I, II, & IV	II & III	II & IV	III & IV	
	a. Two separate periods of formal training--one for initial training and one for retraining.	7.0	5.3	10.3	8.6	20.8	10.5	31.6	
	b. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.	22.8	14.0	5.2	6.9	11.3	12.3	5.3	
	c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activity early.	31.6	40.4	34.5	25.9	18.9	14.0	8.8	
	d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period.	19.3	12.3	10.3	17.2	28.3	19.3	29.8	
	e. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.	8.8	21.1	37.9	39.7	17.0	42.1	22.8	
	f. No change from current training policy. (Explain in remarks section.)	7.0	1.8	0.0	0.0	0.0	0.0	0.0	
	g. Other. (Explain in remarks section.)	3.5	5.3	1.7	1.7	3.8	1.8	1.8	

I	Fully trained & Experienced
II	Trained but Inexperienced
III	Trained but requires Supervision (high decay)
IV	Untrained in Subject

For: General Subjects

Questionnaire Guide #: 9,10,11,12,13,
14,15,16,17,18

TRAINING APPROACH	Classification Groups						
	I & II	I & III	I & IV	I, II, & IV	II & III	II & IV	III & IV
a. Two separate periods of formal training--one for initial training and one for retraining.	3.6	7.3	15.3	10.5	14.3	20.7	27.6
b. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.	29.1	16.4	11.9	7.0	17.9	6.9	3.4
c. One formal period oriented to those who need initial training--with those who do not need retraining being released for other activity early.	34.5	32.7	28.8	26.3	19.6	10.3	10.3
d. One formal period oriented toward those who need initial training--all members attend and participate in the entire training period.	14.5	16.4	11.9	22.8	28.6	22.4	37.9
e. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.	5.5	20.0	27.1	28.1	12.5	34.5	17.2
f. No change from current training policy. (Explain in remarks section.)	5.5	3.6	1.7	1.8	3.6	1.7	1.7
g. Other. (Explain in remarks section.)	7.3	3.6	3.4	3.5	3.6	3.4	1.7

I	Fully trained & Experienced
II	Trained but Inexperienced
III	Trained but requires Supervision (high decay)
IV	Untrained in Subject

Classification Codes

10 % Fill with —
12 Week BAT Graduate.

MEAN RESPONSES PER SURVEY							
	BATTALION		COMPANY		PLATOON		TOTAL
	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Year
<u>Collective Task</u>							
1. Perform tactical movements.	5.4	9	6.3	7	9.8	11	200.5
2. Perform security & intelligence operations.	5.1	9	1.6	7	3.2	7	79.5
3. Employ cover & concealment.	8.4	9	2.2	7	3.6	9	123.4
4. Employ fighting vehicles.	9.5	11	5.7	7	8.2	9	218.2
5. Employ fire & maneuver/movement.	9.5	11	7.6	9	7.2	14	273.7
6. Reorganize; consolidate.	4.2	9	1.9	7	3.3	9	80.8
7. Employ special techniques for operating at night & under limited visibility.	5.6	9	6.4	7	5.6	11	156.8
8. Employ special techniques for NBC operations.	2.7	9	1.8	7	4.0	9	72.9
9. Employ special techniques for combat in built-up areas.	2.9	7	2.4	7	6.0	9	91.1
10. Employ special techniques in hostile TAC air environment.	3.1	9	2.3	7	3.8	9	78.2
11. Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	11	2.8	7	3.8	7	90.2
12. Organize & prepare battle positions, incl. mines & obstacles.	10.4	9	3.1	7	5.0	9	160.3
13. Breach minefields & obstacles.	2.2	7	1.9	7	2.7	7	47.6
14. Employ organic small arms.	2.2	5	3.9	7	2.2	7	53.7
15. Perform reconnaissance.	3.1	7	2.6	7	3.3	9	69.6
16. Perform leadership skills.	6.2	11	4.4	14	3.8	18	198.2
17. Maintenance.	10.4	23	6.1	94	5.4	110	1406.6

3401.3

G-1

Copy of this report is being
distributed to the following:

15 % Fill with —
12 Week BAT Graduates

MEAN RESPONSES PER SURVEY							
BATTALION		COMPANY		PLATOON		TOTAL	
Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year
<u>Collective Task</u>							
1. Perform tactical movements.	5.4	12	6.3	9	9.8	15	268.5
2. Perform security & intelligence operations.	5.1	12	1.6	9	3.2	9	104.4
3. Employ cover & concealment.	8.4	12	2.2	9	3.6	12	163.8
4. Employ fighting vehicles.	9.5	15	5.7	9	8.2	12	292.2
5. Employ fire & maneuver/movement.	9.5	15	7.6	12	7.2	17	356.1
6. Reorganize; consolidate.	4.2	12	1.9	9	3.3	12	107.1
7. Employ special techniques for operating at night & under limited visibility.	5.6	12	6.4	9	5.6	15	208.8
8. Employ special techniques for NBC operations.	2.7	12	1.8	9	4.0	12	96.6
9. Employ special techniques for combat in built-up areas.	2.9	9	2.4	9	6.0	12	119.7
10. Employ special techniques in hostile TAC air environment.	3.1	12	2.3	9	3.8	12	103.5
11. Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	15	2.8	9	3.8	9	119.4
12. Organize & prepare battle positions, incl. mines & obstacles.	10.4	12	3.1	9	5.0	12	212.7
13. Breach minefields & obstacles.	2.2	9	1.9	9	2.7	9	61.2
14. Employ organic small arms.	2.2	6	3.9	9	2.2	9	68.1
15. Perform reconnaissance.	3.1	9	2.6	9	3.3	12	90.9
16. Perform leadership skills.	6.2	15	4.4	17	3.8	23	255.2
17. Maintenance.	10.4	29	6.1	119	5.4	139	1778.1

4406.3

G-2

20 % Fill With —
12 Week BAT Graduates

Collective Task	MEAN RESPONSES PER SURVEY						
	BATTALION		COMPANY		PLATOON		TOTAL
	Hours Per Period	No. of Periods per Year	Hours Per Period	No. of Periods per Year	Hours Per Period	No. of Periods per Year	Hours Per Year
1. Perform tactical movements.	5.4	14	6.3	10	9.8	17	305.2
2. Perform security & intelligence operations.	5.1	14	1.6	10	3.2	10	119.4
3. Employ cover & concealment.	8.4	14	2.2	10	3.6	14	190.0
4. Employ fighting vehicles.	9.5	17	5.7	10	8.2	14	333.3
5. Employ fire & maneuver/movement.	9.5	17	7.6	14	7.2	20	411.9
6. Reorganize; consolidate.	4.2	14	1.9	10	3.3	14	124.0
7. Employ special techniques for operating at night & under limited visibility.	5.6	14	6.4	10	5.6	17	237.6
8. Employ special techniques for NBC operations.	2.7	14	1.8	10	4.0	14	111.8
9. Employ special techniques for combat in built-up areas.	2.9	10	2.4	10	6.0	14	137.0
10. Employ special techniques in hostile TAC air environment.	3.1	14	2.3	10	3.8	14	119.6
11. Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	17	2.8	10	3.8	10	134.0
12. Organize & prepare battle positions, incl. mines & obstacles.	10.4	14	3.1	10	5.0	14	246.6
13. Breach minefields & obstacles.	2.2	10	1.9	10	2.7	10	68.0
14. Employ organic small arms.	2.2	7	3.9	10	2.2	10	76.4
15. Perform reconnaissance.	3.1	10	2.6	10	3.3	14	103.2
16. Perform leadership skills.	6.2	17	4.4	20	3.8	27	296.0
17. Maintenance.	10.4	34	6.1	139	5.4	163	2081.7

5095.7

G-3

Copy available to DTIC does not
include the following information:

10 % Fill With —
14 Week BAT Graduates

Collective Task

1. Perform tactical movements.
2. Perform security & intelligence operations.
3. Employ cover & concealment.
4. Employ fighting vehicles.
5. Employ fire & maneuver/movement.
6. Reorganize; consolidate.
7. Employ special techniques for operating at night & under limited visibility.
8. Employ special techniques for NBC operations.
9. Employ special techniques for combat in built-up areas.
10. Employ special techniques in hostile TAC air environment.
11. Employ communications & electronic equipment, incl. weapons in EW environment.
12. Organize & prepare battle positions, incl. mines & obstacles.
13. Breach minefields & obstacles.
14. Employ organic small arms.
15. Perform reconnaissance.
16. Perform leadership skills.
17. Maintenance.

MEAN RESPONSES PER SURVEY						
BATTALION		COMPANY		PLATOON		TOTAL
Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours Per Year
5.4	6	6.3	5	9.8	8	142.3
5.1	6	1.6	5	3.2	6	54.6
8.4	6	2.2	6	3.6	6	83.0
9.5	8	5.7	5	8.2	6	153.7
9.5	8	7.6	6	7.2	10	193.6
4.2	6	1.9	5	3.3	6	54.5
5.6	6	6.4	5	5.6	8	110.4
2.7	6	1.8	5	4.0	6	49.2
2.9	5	2.4	5	6.0	6	62.5
3.1	6	2.3	5	3.6	6	52.9
4.0	8	2.8	5	3.8	5	65.0
10.4	6	3.1	5	5.0	6	107.9
2.2	5	1.9	5	2.7	5	34.0
2.2	3	3.9	5	2.2	5	37.1
3.1	5	2.6	5	3.3	6	48.3
6.2	8	4.4	10	3.8	13	143.0
10.4	16	6.1	66	5.4	77	948.8

2376.8

15 % Fill With —
14 Week BAT Graduates

Collective Task	MEAN RESPONSES PER SURVEY						
	BATTALION		COMPANY		PLATOON		TOTAL
	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Year
1. Perform tactical movements	5.4	8	6.3	6	9.8	10	179.0
2. Perform security & intelligence operations.	5.1	8	1.6	6	3.2	6	69.6
3. Employ cover & concealment.	8.4	8	2.2	6	3.6	8	109.2
4. Employ fighting vehicles.	9.5	10	5.7	6	8.2	8	194.8
5. Employ fire & maneuver/movement.	9.5	10	7.6	8	7.2	12	242.8
6. Reorganize; consolidate.	4.2	8	1.9	6	3.3	8	71.4
7. Employ special techniques for operating at night & under limited visibility.	5.6	8	6.4	6	5.6	10	139.2
8. Employ special techniques for NBC operations.	2.7	8	1.8	6	4.0	8	64.4
9. Employ special techniques for combat in built-up areas.	2.9	6	2.4	6	6.0	8	79.8
10. Employ special techniques in hostile TAC air environment.	3.1	8	2.3	6	3.8	8	69.0
11. Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	10	2.8	6	3.8	6	79.6
12. Organize & prepare battle positions, incl. mines & obstacles.	10.4	8	3.1	6	5.0	8	141.8
13. Breach minefields & obstacles.	2.2	6	1.9	6	2.7	6	40.8
14. Employ organic small arms.	2.2	4	3.9	6	2.2	6	45.4
15. Perform reconnaissance.	3.1	6	2.6	6	3.3	8	60.6
16. Perform leadership skills.	6.2	10	4.4	12	3.8	16	175.6
17. Maintenance.	10.4	20	6.1	82	5.4	96	1226.6

2989.0

20 % Fill With
14 Week BAT Graduates

MEAN RESPONSES PER SURVEY						
BATTALION		COMPANY		PLATOON		TOTAL
Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours Per Year
5.4	10	6.3	8	9.8	13	231.8
5.1	10	1.6	8	3.2	8	89.4
8.4	10	2.2	8	3.6	10	137.6
9.5	13	5.7	8	8.2	10	251.1
9.5	13	7.6	10	7.2	15	307.5
4.2	10	1.9	8	3.3	10	90.2
5.6	10	6.4	8	5.6	13	180.0
2.7	10	1.8	8	4.0	10	81.4
2.9	8	2.4	8	6.0	10	102.4
3.1	10	2.3	8	3.8	10	87.4
4.0	13	2.8	8	3.8	8	104.8
10.4	10	3.1	8	5.0	10	178.8
2.2	8	1.9	8	2.7	8	54.4
2.2	5	3.9	8	2.2	8	59.8
3.1	8	2.6	8	3.3	10	78.6
6.2	13	4.4	15	3.8	20	222.6
10.4	25	6.1	103	5.4	120	1536.3

3794.1

G-6

10 % Fill with —
15 Week BAT Graduates

MEAN RESPONSES PER SURVEY							
	BATTALION		COMPANY		PLATOON		TOTAL
	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours Per Year
<u>Collective Task</u>							
1. Perform tactical movements.	5.4	4	6.3	3	9.8	5	89.5
2. Perform security & intelligence operations.	5.1	4	1.6	3	3.2	3	34.8
3. Employ cover & concealment.	8.4	4	2.2	3	3.6	4	54.6
4. Employ fighting vehicles.	9.5	5	5.7	3	8.2	4	97.4
5. Employ fire & maneuver/movement.	9.5	5	7.6	4	7.2	6	121.1
6. Reorganize; consolidate.	4.2	4	1.9	3	3.3	4	35.7
7. Employ special techniques for operating at night & under limited visibility.	5.6	4	6.4	3	5.6	5	69.6
8. Employ special techniques for NBC operations.	2.7	4	1.8	3	4.0	4	32.2
9. Employ special techniques for combat in built-up areas.	2.9	3	2.4	3	6.0	4	39.9
10. Employ special techniques in hostile TAC air environment.	3.1	4	2.3	3	3.8	4	34.5
11. Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	5	2.8	3	3.8	3	39.8
12. Organize & prepare battle positions, incl. mines & obstacles.	10.4	4	3.1	3	5.0	4	70.9
13. Breach minefields & obstacles.	2.2	3	1.9	3	2.7	3	20.4
14. Employ organic small arms.	2.2	2	3.9	3	2.2	3	22.7
15. Perform reconnaissance.	3.1	3	2.6	3	3.3	4	30.3
16. Perform leadership skills.	6.2	5	4.4	6	3.8	8	87.8
17. Maintenance.	10.4	10	6.1	41	5.4	48	613.3

1464.2

15 % Fill With —
15 Week BAT Graduates

MEAN RESPONSES PER SURVEY							
Collective Task	BATTALION		COMPANY		PLATOON		TOTAL
	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours Per Year
1. Perform tactical movements.	5.4	5	6.3	4	9.8	6	111.0
2. Perform security & intelligence operations.	5.1	5	1.6	4	3.2	4	44.7
3. Employ cover & concealment.	8.5	5	2.2	4	3.6	5	68.8
4. Employ fighting vehicles.	9.5	6	5.7	4	8.2	5	120.0
5. Employ fire & maneuver/movement.	9.5	6	7.6	5	7.2	8	152.6
6. Reorganize; consolidate.	4.2	5	1.9	4	3.3	5	45.1
7. Employ special techniques for operating at night & under limited visibility.	5.6	5	6.4	4	5.6	6	87.2
8. Employ special techniques for NBC operations.	2.7	5	1.8	4	4.0	5	40.7
9. Employ special techniques for combat in built-up areas.	2.9	4	2.4	4	6.0	5	51.2
10. Employ special techniques in hostile TAC air environment.	3.1	5	2.3	4	3.8	5	43.7
11. Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	6	2.8	4	3.8	4	50.4
12. Organize & prepare battle positions, incl. mines & obstacles.	10.4	5	3.1	4	5.0	5	89.4
13. Breach minefields & obstacles.	2.2	4	1.9	4	2.7	4	27.2
14. Employ organic small arms.	2.2	3	3.9	4	2.2	4	31.0
15. Perform reconnaissance.	3.1	4	2.6	4	3.3	5	39.3
16. Perform leadership skills.	6.2	6	4.4	8	3.8	10	110.4
17. Maintenance.	10.4	13	6.1	53	5.4	62	793.3

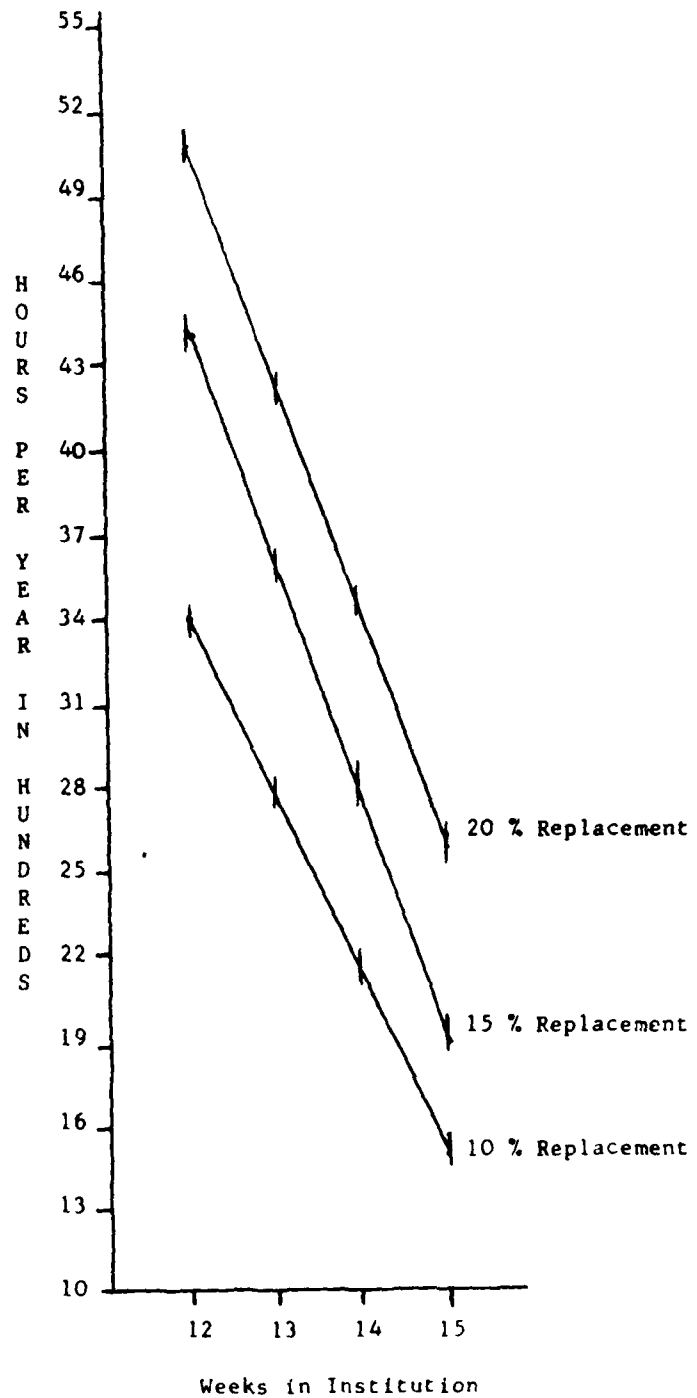
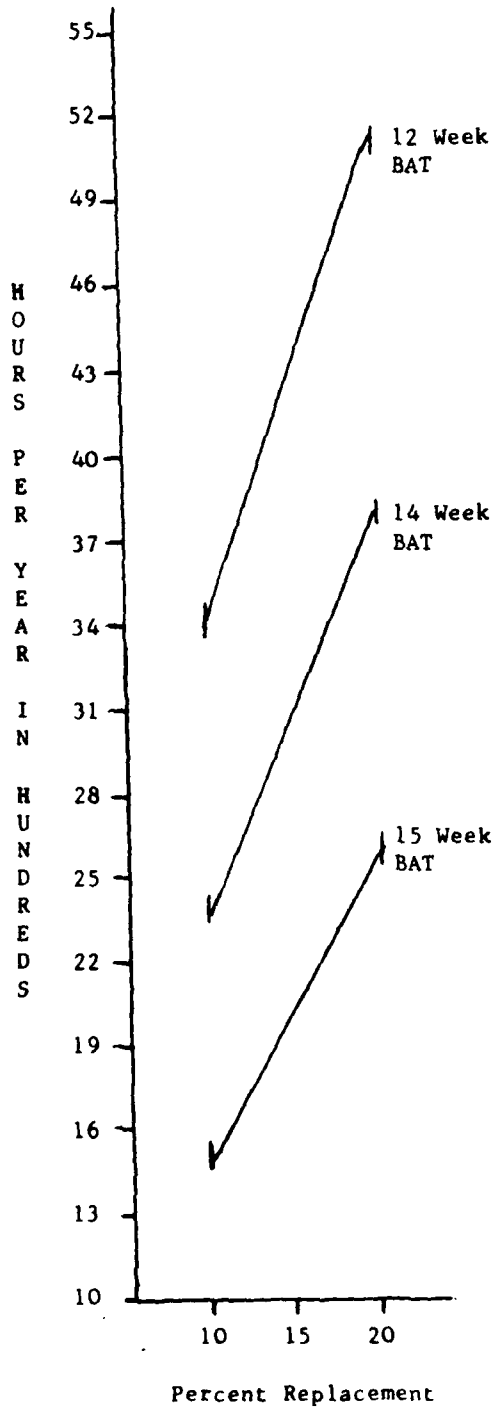
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20 % Fill With —
15 Week BAT Graduates

Collective Task		MEAN RESPONSES PER SURVEY						
		BATTALION		COMPANY		PLATOON		TOTAL
		Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours per Period	No. of Periods per Year	Hours Per Year
1.	Perform tactical movements.	5.4	7	6.3	5	9.8	9	157.5
2.	Perform security & intelligence operations.	5.1	7	1.6	5	3.2	5	59.7
3.	Employ cover & concealment.	8.4	7	2.2	5	3.6	7	95.0
4.	Employ fighting vehicles.	9.5	9	5.7	5	8.2	7	171.4
5.	Employ fire & maneuver/movement.	9.5	9	7.6	7	7.2	10	210.7
6.	Reorganize; consolidate.	4.2	7	1.9	5	3.3	7	62.0
7.	Employ special techniques for operating at night & under limited visibility.	5.6	7	6.4	5	5.6	9	121.6
8.	Employ special techniques for NBC operations.	2.7	7	1.8	5	4.0	7	55.9
9.	Employ special techniques for combat in built-up areas.	2.9	5	2.4	7	6.0	7	68.5
10.	Employ special techniques in hostile TAC air environment.	3.1	7	2.3	5	3.8	7	59.8
11.	Employ communications & electronic equipment, incl. weapons in EW environment.	4.0	9	2.8	5	3.8	5	69.0
	organize & prepare battle positions, incl. mines & obstacles.	10.4	7	3.1	5	5.0	7	123.3
12.	Breach minefields & obstacles.	2.2	5	1.9	5	2.7	5	34.0
14.	Employ organic small arms.	2.2	3	3.9	5	2.2	5	37.1
15.	Perform reconnaissance.	3.1	5	2.6	5	3.3	7	51.6
16.	Perform leadership skills.	6.2	9	4.4	10	3.8	14	153.0
17.	Maintenance.	10.4	17	6.1	70	5.4	82	1046.6

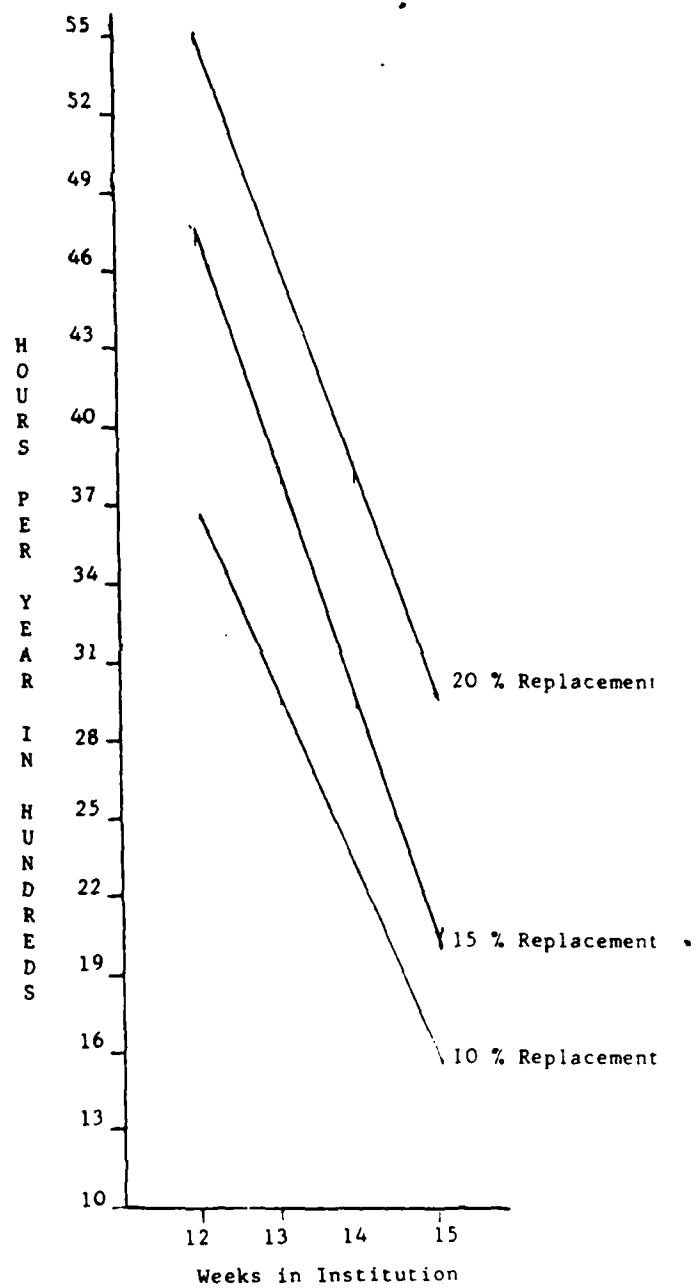
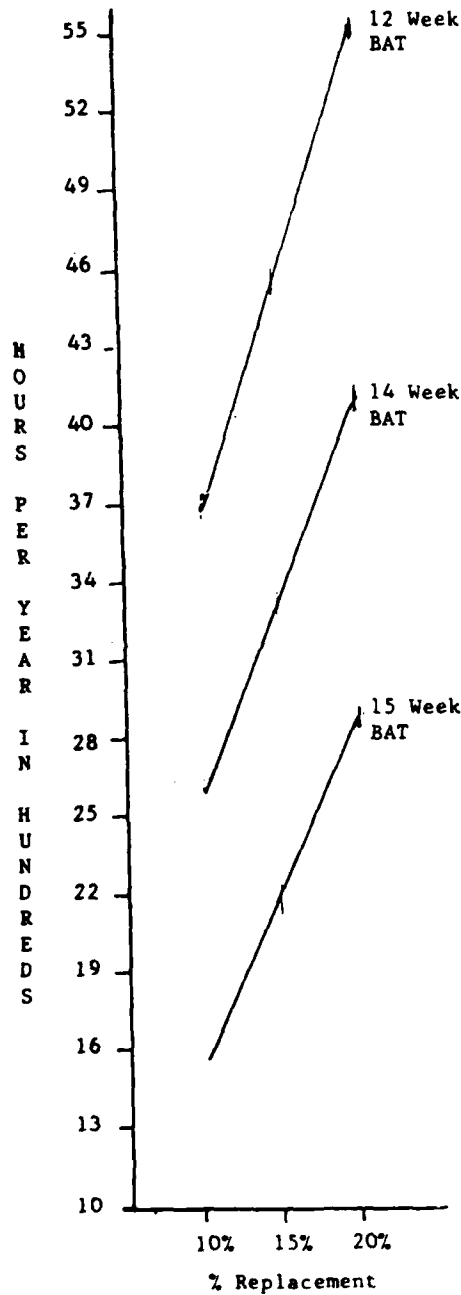
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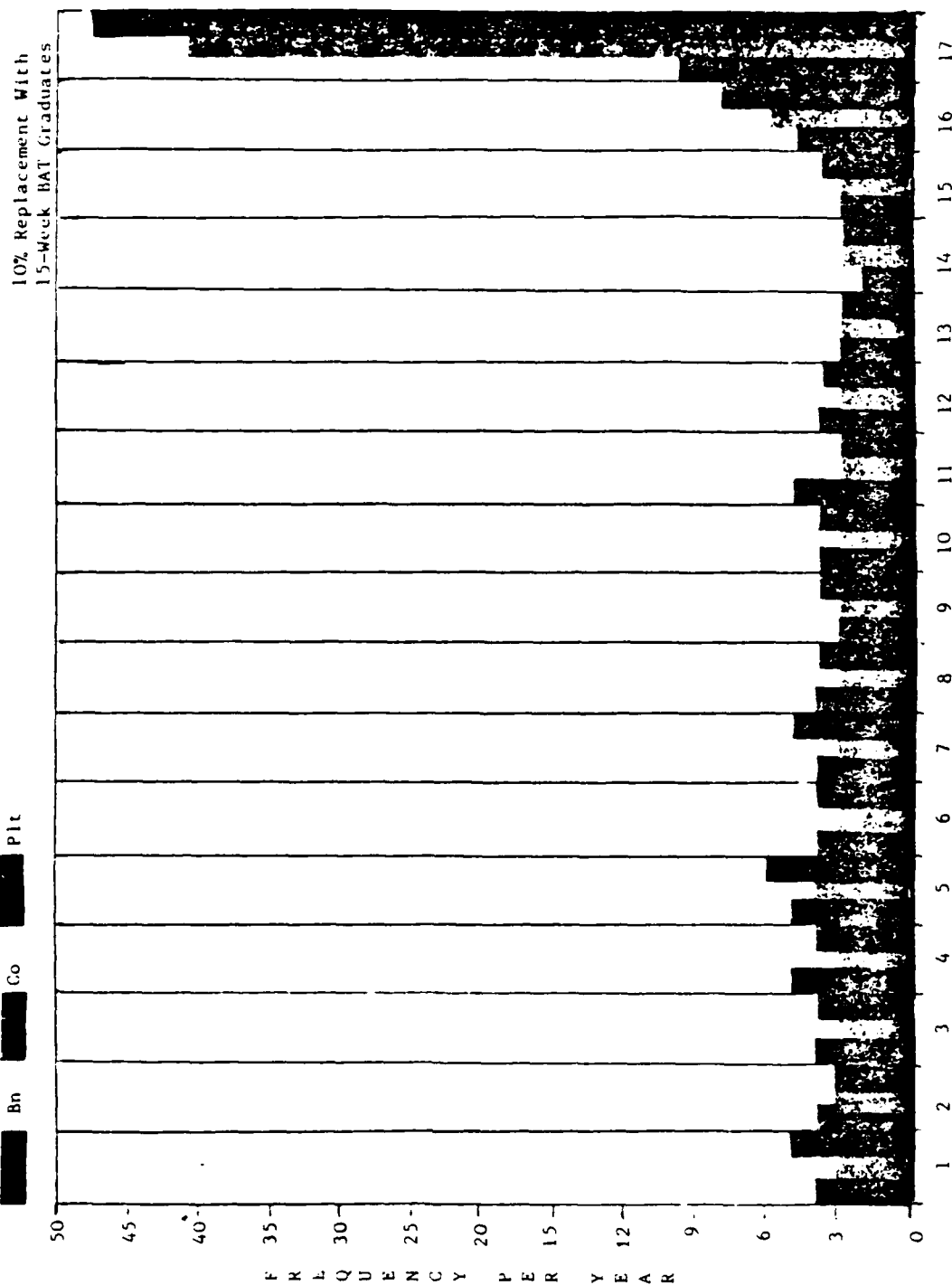
COLLECTIVE TRAINING TIME
(SET 5)



INDIVIDUAL AND
COLLECTIVE TRAINING TIME

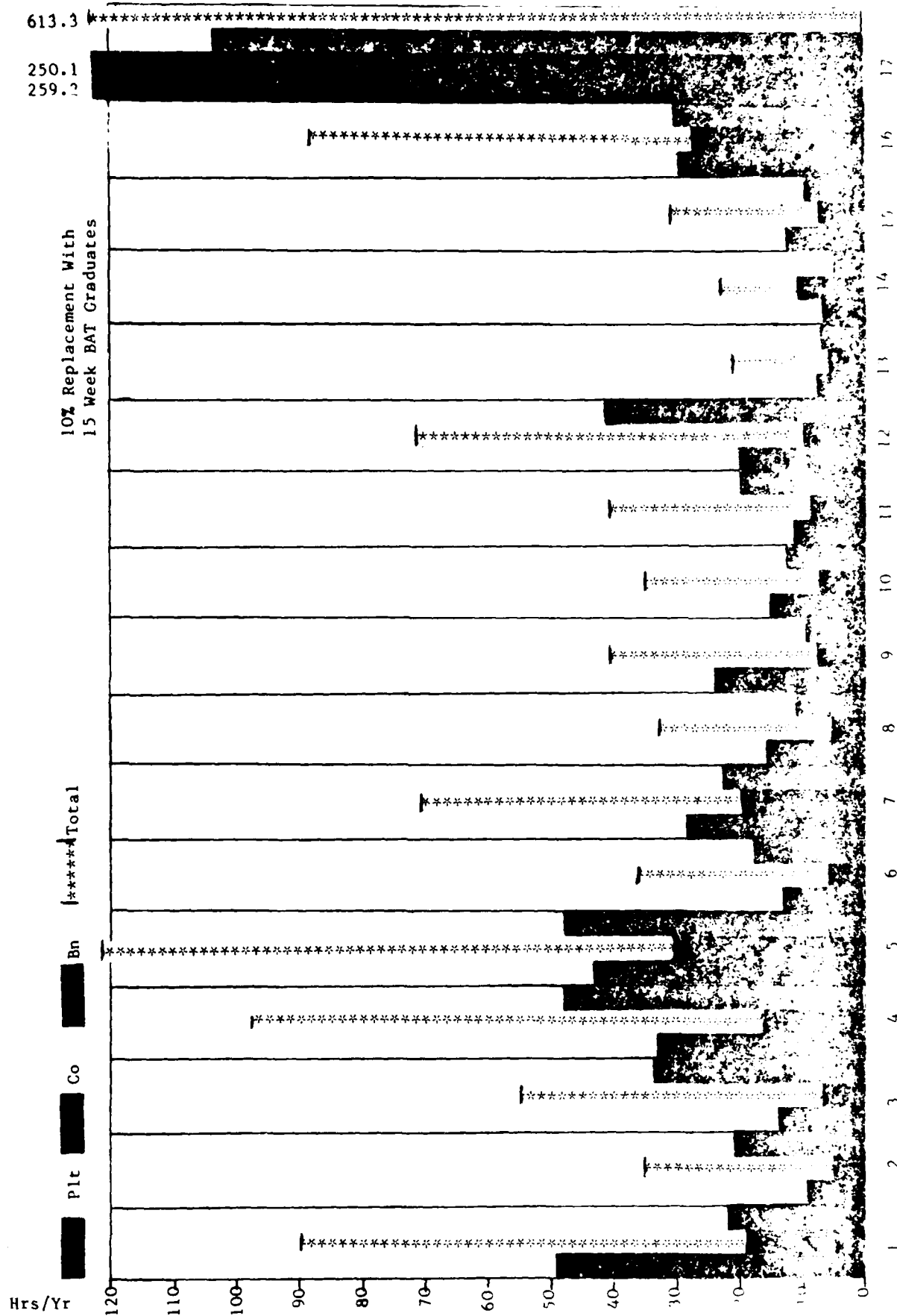
(SETS 3 & 5)





Left Column of Each task is Bn
 Center Column is Co
 Right Column is Plt

COLLECTIVE TASK
 SET 5



SET 5

10 % Fill With
12 Week BAT Graduates

	Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Total
	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	
1. Movement to contact.	4.4	5	4.3	7	4.8	7	1.2	2	88.1
2. Hasty attack.	4.1	2	4.1	7	3.8	7	.6	2	64.7
3. Deliberate attack.	5.1	5	5.1	7	4.9	7	.8	2	97.1
4. Exploitation.	3.8	2	3.1	5	3.4	7	.5	0	46.9
5. Night attack.	4.9	5	5.8	7	5.2	7	1.2	2	103.9
6. Defense.	5.6	5	5.4	7	5.4	7	1.4	2	106.4
7. Delay.	3.8	5	4.4	7	4.8	7	1.1	2	85.6
8. Disengage (under pressure).	3.9	2	3.6	5	4.2	7	1.0	2	57.2
9. Defense of a built-up area.	3.5	2	3.5	5	4.0	7	1.1	2	54.7
10. Prepare a strong point.	3.0	2	3.6	5	4.2	7	1.2	2	55.8
11. Crossing water obstacles (river crossing).	3.4	2	3.2	5	3.6	7	1.1	2	50.2
12. Passage of lines.	2.4	2	2.6	5	3.3	7	.9	2	42.7

853.3

15 % Fill With
12 Week BAT Graduates

ARTEP MISSION

1. Movement to contact.
2. Hasty attack.
3. Deliberate attack.
4. Exploitation.
5. Night attack.
6. Defense.
7. Delay.
8. Disengage (under pressure).
9. Defense of a built-up area.
10. Prepare a strong point.
11. Crossing water obstacles
(river crossing).
12. Passage of lines.

Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Hours Per Year
Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	
4.4	6	4.3	9	4.8	9	1.2	3	111.9
4.1	3	4.1	9	3.8	9	.6	3	85.2
5.1	6	5.1	9	4.9	9	.8	3	123.0
3.8	3	3.1	6	3.4	9	.5	0 (?)	60.6
4.9	5	5.8	9	5.2	9	1.2	3	132.0
5.6	6	5.4	9	5.4	9	1.4	3	135.0
3.8	6	4.4	9	4.8	9	1.1	3	108.9
3.9	3	3.6	6	4.2	9	1.0	3	74.1
3.5	3	3.5	6	4.0	9	1.1	3	70.8
3.0	3	3.6	6	4.2	9	1.2	3	72.0
3.4	3	3.2	6	3.6	9	1.1	3	65.1
2.4	3	2.6	6	3.3	9	.9	3	55.2

1093.8

20 % Fill With
12 Week BAT Graduates

ARTEP MISSION	Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Total
	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	
1. Movement to contact.	4.4	7	4.3	10	4.8	10	1.2	3	125.4
2. Hasty attack.	4.1	3	4.1	10	3.8	10	.6	3	93.1
3. Deliberate attack.	5.1	7	5.1	10	4.9	10	.8	3	138.1
4. Exploitation.	3.8	3	3.1	7	3.4	10	.5	0 (?)	67.1
5. Night attack.	4.9	7	5.8	10	5.2	10	1.2	3	147.9
6. Defense.	5.6	7	5.4	10	5.4	10	1.4	3	151.4
7. Delay.	3.8	7	4.4	10	4.8	10	1.1	3	121.9
8. Disengage (under pressure).	3.9	3	3.6	7	4.2	10	1.0	3	81.9
9. Defense of a built-up area.	3.5	3	3.5	7	4.0	10	1.1	3	78.3
10. Prepare a strong point.	3.0	3	3.6	7	4.2	10	1.2	3	79.8
11. Crossing water obstacles (river crossing).	3.4	3	3.2	7	3.6	10	1.1	3	71.9
12. Passage of lines.	2.4	3	2.6	7	3.3	10	.9	3	61.1

1217.9

10% Fill With
14 Week BAT Graduates

Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Hours Per Year
Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	
4.4	3	4.3	5	4.8	5	1.2	2	61.1
4.1	2	4.1	5	3.8	5	.6	2	48.9
5.1	3	5.1	5	4.9	5	.8	2	66.9
3.8	2	3.1	3	3.4	5	.5	0 (?)	33.9
4.9	3	5.8	5	5.2	5	1.2	2	72.1
5.6	3	5.4	5	5.4	5	1.4	2	73.6
3.8	3	4.4	5	4.8	5	1.1	2	59.6
3.9	2	3.6	3	4.2	5	1.0	2	41.6
3.5	2	3.5	3	4.0	5	1.1	2	39.7
3.0	2	3.6	3	4.2	5	1.2	2	40.2
3.4	2	3.2	3	3.6	5	1.1	2	36.6
2.4	2	2.6	3	3.3	5	.9	2	30.9
								604.5

ARTEP MISSION

1. Movement to contact.
2. Hasty attack.
3. Deliberate attack.
4. Exploitation.
5. Night attack.
6. Defense.
7. Delay.
8. Disengagement (under pressure).
9. Defense of a built-up area.
10. Prepare a strong point.
11. Crossing water obstacles (river crossing).
12. Passage of lines.

15 % Fill With
14 Week BAT Graduates

Bn. Level	Co. Level		Plt. Level		Tk. Crew Level		Total
	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	
4.4	4	4.3	6	4.8	6	1.2	74.6
4.1	2	4.1	6	3.8	6	.6	56.8
5.1	4	5.1	6	4.9	6	.8	82.0
3.8	2	3.1	4	3.4	6	.5	40.4
4.9	4	5.8	6	5.2	6	1.2	88.0
5.6	4	5.4	6	5.4	6	1.4	90.0
3.8	2	4.4	6	4.8	6	1.1	72.6
3.9	4	3.6	4	4.2	6	1.0	49.4
3.5	2	3.5	4	4.0	6	1.1	47.2
3.0	2	3.6	4	4.2	6	1.2	48.0
3.4	2	3.2	4	3.6	6	1.1	43.4
2.4	2	2.6	4	3.3	6	.9	36.8
							729.2

ARTEP MISSION

1. Movement to contact.
2. Hasty attack.
3. Deliberate attack.
4. Exploitation.
5. Night attack.
6. Defense.
7. Delay.
8. Disengage (under pressure).
9. Defense of a built-up area.
10. Prepare a strong point.
11. Crossing water obstacles (river crossing).
12. Passage of lines.

20 % Fill With
14 Week BAT Graduates

ARTEP MISSION	Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Total
	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	
1. Movement to contact.	4.4	5	4.3	8	4.8	8	1.2	3	98.4
2. Hasty attack.	4.1	3	4.1	8	3.8	8	.6	3	77.3
3. Deliberate attack.	5.1	5	5.1	8	4.9	8	.8	3	107.9
4. Exploitation.	3.8	3	3.1	5	3.4	8	.5	0 (?)	54.1
5. Night attack.	4.9	5	5.8	8	5.2	8	1.2	3	116.1
6. Defense.	5.6	5	5.4	8	5.4	8	1.4	3	118.6
7. Delay.	3.8	5	4.4	8	4.8	8	1.1	3	95.9
8. Disengage (under pressure).	3.9	3	3.6	5	4.2	8	1.0	3	66.3
9. Defense of a built-up area.	3.5	3	3.5	5	4.0	8	1.1	3	63.3
10. Prepare a strong point.	3.0	3	3.6	5	4.2	8	1.2	3	64.2
11. Crossing water obstacles (river crossing).	3.4	3	3.2	5	3.6	8	1.1	3	58.3
12. Passage of lines.	2.4	3	2.6	5	3.3	8	.9	3	49.3

969.7

10 % Fill With
15 Week BAT Graduates

	Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Total
	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	Hours per Period	Periods Per Year	
1. Movement to contact.	4.4	2	4.3	3	4.8	3	1.2	1	37.3
2. Hasty attack.	4.1	1	4.1	3	3.8	3	.6	1	28.4
3. Deliberate attack.	5.1	2	5.1	3	4.9	3	.8	1	41.0
4. Exploitation.	3.8	1	3.1	2	3.4	3	.5	0 (?)	20.2
5. Night attack.	4.9	2	5.8	3	5.2	3	1.2	1	44.0
6. Defense.	5.6	2	5.4	3	5.4	3	1.4	1	45.0
7. Delay.	3.8	2	4.4	3	4.8	3	1.1	1	36.3
8. Disengage (under pressure).	3.9	1	3.6	2	4.2	3	1.0	1	24.7
9. Defense of a built-up area.	3.5	1	3.5	2	4.0	3	1.1	1	23.6
10. Prepare a strong point.	3.0	1	3.6	2	4.2	3	1.2	1	24.0
11. Crossing water obstacles (river crossing).	3.4	1	3.2	2	3.6	3	1.1	1	21.7
12. Passage of lines.	2.4	1	2.6	2	3.1	3	.9	1	18.4

364.6

15 % Fill With
15 Week BAT Graduates

Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Total
Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Year
4.4	3	4.3	4	4.8	4	1.2	1	50.8
4.1	1	4.1	4	3.8	4	.6	1	36.3
5.1	3	5.1	4	4.9	4	.8	1	56.1
3.8	1	3.1	3	3.4	4	.5	0 (?)	26.7
4.9	3	5.8	4	5.2	4	1.2	1	59.9
5.6	3	5.4	4	5.4	4	1.4	1	61.4
3.8	3	4.4	4	4.8	4	1.1	1	49.3
3.9	1	3.6	3	4.2	4	1.0	1	32.5
3.5	1	3.5	3	4.0	4	1.1	1	31.1
3.0	1	3.6	3	4.2	4	1.2	1	31.8
3.4	1	3.2	3	3.6	4	1.1	1	28.5
2.4	1	2.6	3	3.3	4	.9	1	24.3

488.7

ARTEP MISSION

1. Movement to contact.
2. Hasty attack.
3. Deliberate attack.
4. Exploitation.
5. Night attack.
6. Defense.
7. Delay.
8. Disengage (under pressure).
9. Defense of a built-up area.
10. Prepare a strong point.
11. Crossing water obstacles (river crossing).
12. Passage of lines.

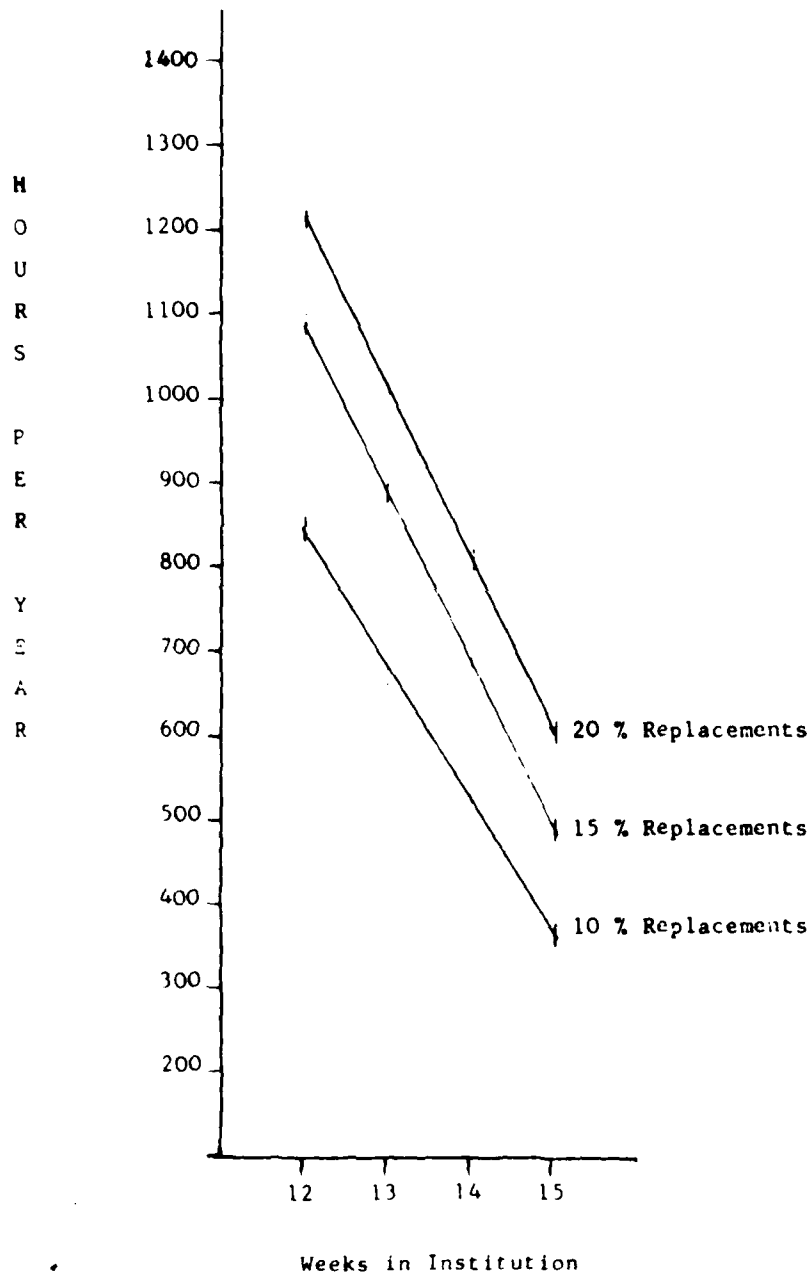
20 % Fill With
15 Week BAT Graduates

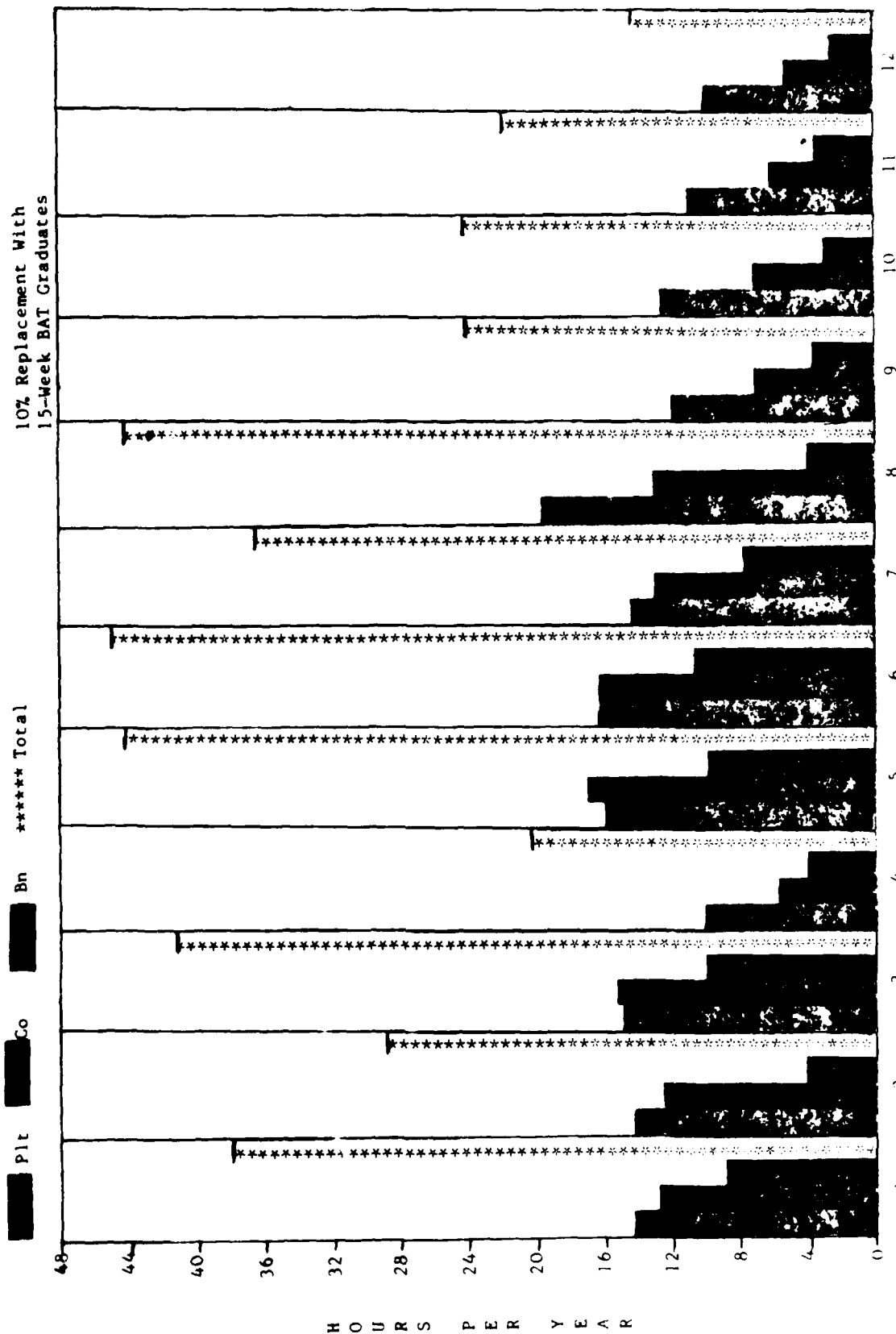
	Bn. Level		Co. Level		Plt. Level		Tk. Crew Level		Total
	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	Hours per Period	Periods per Year	
1. Movement to contact.	4.4	3	4.3	5	4.8	5	1.2	2	61.1
2. Hasty attack.	4.1	2	4.1	5	3.8	5	.6	2	48.9
3. Deliberate attack.	5.1	3	5.1	5	4.9	5	.8	2	66.9
4. Exploitation.	3.8	2	3.1	3	3.4	5	.5	0 (?)	33.9
5. Night attack.	4.9	3	5.8	5	5.2	5	1.2	2	72.1
6. Defense.	5.6	3	5.4	5	5.4	5	1.4	2	73.6
7. Delay.	3.8	3	4.4	5	4.8	5	1.1	2	59.6
8. Disengage (under pressure).	3.9	2	3.6	3	4.2	5	1.0	2	41.6
9. Defense of a built-up area.	3.5	2	3.5	3	4.0	5	1.1	2	39.7
10. Prepare a strong point.	3.0	2	3.6	3	4.2	5	1.2	2	40.2
11. Crossing water obstacles (river crossing).	3.4	2	3.2	3	3.6	5	1.1	2	36.6
12. Passage of lines.	2.4	2	2.6	3	3.3	5	.9	2	30.9

605.1

ARTEP MISSION

(SET 6)





ARTEP MISSION

SET 6

Hours per Year for Each
Plt, Co, Bn, Total

ID # _____

SET 7

TRAINING SURVEY

The following portion of the survey relates to unit and individual training. The questions require answers based on your professional experience and opinions.

1. What individual Soldier's Manual Tasks should be eliminated from Basic Armor Training (BAT)? List the Item Number from the Questionnaire Guide (for example, 1d, 3e, 19b).

See Annex for responses.

2. Are there any additional items, not listed in the Questionnaire Guide that should be included in BAT?

See Annex for responses.

3. How well does proficiency on SM tasks measure an individual's ability to fight his weapon system? What are the major strengths and weaknesses of the SM for measuring proficiency?

9 Excellent Comment:

44 Good See Annex for comments.

10 Marginal

2 Poor

0 Unsatisfactory

1 Unknown

4. How well does the SQT measure an individual's ability to fight his weapon system? What are the major strengths and weaknesses?

<u>7</u>	Excellent	Comment:
<u>38</u>	Good	See Annex for comments.
<u>12</u>	Marginal	
<u>6</u>	Poor	
<u>0</u>	Unsatisfactory	
<u>3</u>	Unknown	

5. How well does the SQT measure an individual's proficiency on SM tasks?

<u>16</u>	Excellent	Comment:
<u>29</u>	Good	See Annex for comments.
<u>14</u>	Marginal	
<u>4</u>	Poor	
<u>0</u>	Unsatisfactory	
<u>3</u>	Unknown	

6. How well does proficiency on ARTEP tasks measure the collective abilities to perform a unit's assigned mission?

<u>21</u>	Excellent	Comment:
<u>32</u>	Good	See Annex for comments.
<u>8</u>	Marginal	
<u>2</u>	Poor	
<u>1</u>	Unsatisfactory	
<u>2</u>	Unknown	

7. At what level should the following training records be kept?

	Bn	Co	Plt
Individual Records	15	47	11
Crew Records	12	43	22
Platoon Records	20	42	16

See Annex for comments.

8. Do you believe that in general there is a demonstrated increase in individual proficiency attributable to collective (ARTEP) training in units?

Yes 56. If yes, how much? No 7. Comment:

11 Major (15% or more)

See Annex for comments.

37 Significant (10% - 15%)

6 Minor (5% - 10%)

2 Barely recognizable (1% - 5%)

3 Unknown

9. Do you believe that in general there is a demonstrated increase in collective proficiency attributable to individual (SM tasks) training in units?

Yes 57 . If yes, how much? No 8 . Comment:

8 Major (15% or more) See Annex for comments.

20 Significant (10% - 15%)

24 Minor (5% - 10%)

4 Barely recognizable

1 Unknown

10. What impact would decreasing the proficiency level on Soldier's Manual tasks of Basic Armor graduates have on your unit combat effectiveness?

3 None Comment:

16 Slight See Annex for comments.

43 Significant

4 Excessive

1 Unknown

11. What impact would increasing the proficiency level on Soldier's Manual tasks of Basic Armor graduates have on your unit combat effectiveness?

2 None Comment:

20 Slight See Annex for comments.

36 Significant

5 Excessive

1 Unknown

12. Estimate your current personnel status:

Officer/NCO fill 77 %

Not present for training (daily, all grades) 29 %

Turnover per quarter (movement in and out of your unit level) 24 %

Replacement rate of new BAT graduates per quarter 2 %

Change in duty positions per quarter 22 %

The data recorded here represents a mean taken from all the responses provided.

ANNEX

TRAINING SURVEY

This annex includes the responses to specific questions for which comments or opinions were solicited in an effort to gain additional insights into training programs. The responses are recorded as stated on the questionnaire and are anonymous to encourage honest expression. The numbers appearing in parenthesis at the end of each comment corresponds to the functional group listed in the Questionnaire Guide (Annex) which lists 131 Soldier's Manual tasks for the 19E/F MOS.

1. What individual Soldier's Manual Tasks should be eliminated from Basic Armor Training (BAT)?

- Prepare an M60A1 for fording. (1)
- Install/operate driver's night vision devices on an M60A1. (1)
- Escape from a tank. (2)
- Remove/install M37 periscope. (3)
- Boresight an M85 MG. (3)
- Engage targets w/ M85 MG. (4)
- Prepare a range card. (4)
- Operate searchlight (searchlight will never be used in combat). (4)
- Perform preventive maintenance on BII on an M60A1. (5)
- Lubricate an M60A1 in accordance w/ lube order. (5)
- More emphasis should be placed on being extremely particular on small items, i.e., bolts missing. (5)
- Self-recover a tank. (8)
- Remove a M60A1 heat shield. (8)
- Install "hot loop" wire communication. (9)
- Perform operator maintenance on radio set AN/VRC-64 and AN/VRC-47. (9)
- Install radio set AN/VRC-46. (9)
- Transmit/receive a radio message. (10)
- Send/receive a radio/telephone message. (10)
- Use correct radio/telephone procedures. (10)
- Establish, enter/leave radio net. (10)
- Use an automated CEOI. (10)
- Authenticate transmissions and encrypt/decrypt numbers and grid zone letters using kal 65 with KTC 1400 numerical code. (10)
- Prepare captured documents and material for processing. (11)
- Prepare known or suspected enemy personnel for processing. (11)
- Determine personal needs and personal hygiene in a chemical environment. (12).
- Collective NBC procedures--most probably 30 mins after contact PLT's and SM units will be fighting different fronts and only in exceptional cases will larger than company elements be together fighting. (13)

- Evacuate wounded from a tank. (14)
- Locate mines by probing. (15)
- Locate mines w/ a metallic mine detector. (15)
- Locate mines w/ a microwave mine detector. (15)
- Destroy mine in place.
- Map reading. (16)
- Construct individual defensive position. (17)
- Engage targets w/ hand grenades. (17)
- Load/unload M16A1 magazine. (18)
- Perform operator maintenance on an M16A1 rifle. (18)
- Load, reduce, stoppage, unload, clear M16A1 rifle. (18)
- Zero an M16A1 rifle.
- Engage targets w/ M16A1 rifle. (18)

2. Are there any additional items, not listed in the Questionnaire Guide that should be included in BAT?

- Operations of M60A1 equipped with AOS. (4)
- More training should be given on the operation and care of the searchlight. (4)
- Include load, unloading, firing, and misfire procedure on crew served weapons. (4)
- Maintenance procedures. (5)
- Maintenance in more depth. (5)
- Pull pack. (5)
- How to requisition repair and replacement parts. (5)
- Difference in lub oils. (5)
- ESC system. (5)
- Use of manual. (5)
- I feel that a short troubleshooting class should be given on the automotive portion of the vehicle. (6)
- More emphasis on troubleshooting tech. (6)
- More on turret maint. (7)
- NBC should be stressed. (12)
- More thorough CBR training and examination. (12)
- Procedures for MEDDAC of injured personnel in absence of medic. (14)
- Practical exercise in decontamination of vehicles. (13)
- Use of Claymore mines. (15)
- Land navigation from a moving vehicle. (16)
- Percentile of slope. (16)
- Resection. (16)
- Intersection. (16)
- Map training to extend past basic items.
 Example (Teach orientation and navigation from a moving vehicle, a compass can't be used on the tank and tanks moving fast make map reading much different than walking. I guess the key is terrain navigation.) (16)
- Increase training in night operations eg night mount map reading. (16)
- Include some sort of terrain navigation either in vehicle or on foot. (16)

- Survival. (17)
- Dismounted warfare patrols. (17)
- Employ fwd obs procedures to call in indirect fire. (17)
- M79 grenade launcher-or M-203-is organic to armor units-training s/b included in basic. (18)
- Maintain HB M3 .50 cal machinegun. (19)
- Maintain mag 50. (19)
- More on crew served weapons. (19)
- Introduction of SM to supply accountability, i.e. personal responsibility as to field gear, tools, major equipment components. (General comment)
- Introduction to tactical formations at plt level. (General comment)
- No additional items need be added however SM's are not coming out of BAT with the required level of proficiency as needed by units. (General comment)

3. How well does proficiency on SM tasks measure an individual's ability to fight his weapon system?

- Major weakness is the SM's understanding of the requirement.
- Not enough actual main gun firing in relation to Table 9-10 in plt & company battle runs are conducted.
- Often stress/pressure under wartime conditions - not taken under consideration.
- The SM answers are not always the way a crewmember will operate and perform. Every tank crew has his own short cuts he utilizes after being on a tank crew for a while and the book will never have these listed.
- Not enough proficient leaders to check SM's strength and weaknesses and to train him in his weaknesses.
- Often crew must perform maint above his echelon because of lack of mechanics.
- I know several personnel in my plt that can go thru the procedure, but cannot apply them in a down range situation unless told.
- I believe the Soldier's Manual covers all task real well.
- Lack of performance oriented gunnery and tactical evaluations.
- An indiv may perform a task very well under test conditions, however the indiv only studied and practiced the task once in a two year period test time.
- Tank gunnery matches up learned skills and application of learned skills.
- There is not enough time spent training with the weapons systems on actual tank gunnery tables.
- Tankers tasks are basically common to fight the tank, from PVT to CPT. He needs to know individual tasks of all crewmen, then he could fight with his tank in any position or replace someone as required.
- The manual itself is good but the average BAT graduate doesn't seem to know it well enough.
- He knows that he can perform the task as well as understand.
- Strength in evaluation on a continual yearly basis.
- SM tasks not oriented enough towards maintaining and fighting in a tank/tank plt.

- Tasks are general, not specific to tank.
- Time requirements very often cannot be met & poor condition of equipment used due to age reflects on favorable completion of SQT.
- True proficiency can only be evaluated by actual performance with equipment in a simulated situation.
- Proficiency to fight system appears to be related equally with individual task proficiency and experience.
- It identifies concrete, simply stated tasks to be accomplished.
- Gives supervisor exact standards to judge how much a soldier knows compared to what he should know.
- Major weakness is in gunnery, just knowing what to do to accomplish the specific tasks is not enough. The only time the real determination can be made is when live firing is done.
- It doesn't measure experience which is the overriding key to success under duress.
- Under peace time environment an individual's proficiency can be measured easily but under combat environment his personality gets involved & he will either be outstanding or not good at all at what he does. The tests has no bearing on how an individual will react.
- The initial training does not always sink in and stay.

4. How well does the SQT measure an individual's ability to fight his weapon system?

- Demonstrates proficiency.
- At the present time SQT is not truly understood or administered by competent individuals and units thus a true picture is not clear in relation to the soldiers ability.
- The SQT doesn't take into consideration an easier or faster way to accomplish a task.
- Hands on philosophy is very realistic.
- SQT helps but there is no indication even if the indiv does good on the SQT how he will perform in combat.
- SM's train on only the items required by the SQT guidelines.
- Test does force SM to read correct procedure and perform same.
- If a man cares enough to learn his Sqt he cares enough to be a good tanker.
- It is excellent when preparation is managed carefully.
- Some of the task EM are required to perform EM doesn't see after AIT.
- The SQT definitely shows an indiv and his leaders how proficient a man is with his weapon and what area he needs to be trained in more.
- If graded fairly, but strictly, Sqt is a good means of measuring the knowledge of the job a man has. However getting out there on tank gunnery and doing it is a whole different world.
- Only tank gunnery tells the truth.
- Some tasks are too picky about procedure.
- Most individuals can successfully complete a given mission and effectively but not in book sequence.

- SQT hands on tasks are partly non-vehicle items, i.e. LAW, M18 mine, mask. Key tank tasks for each level should replace these in the hands-on portion. A mans ability to fire a LAW or set up M18 mine does not help him fight the tank.
- The test is good but some where along the line the things on the test are not taught or they are not retained by the soldier.
- SM understands the areas covered but majority cannot employ the procedure.
- Written test is not a fair estimate as some personnel are unable to take a written test.
- Strength - evaluation of specific areas.
Weakness - does not evaluation the combination of all areas in a simulated combat environment and situation.
- SM tasks not oriented enough toward maintaining & fighting in a tank/tank plt.
- Time requirement very often cannot be met & poor condition of equipment used due to age reflects on favorable completion of SQT.
- Exact procedures employed on SQT sometimes negate a soldier's innate ability to find out very quickly, in a crunch, how to use a weapon but not exactly the right way.
- The SQT test only so many of the SM tasks. In addition the soldier has know which tasks will be on SQT. The only thing that is determined is how well trained on those known tasks.
- Doesn't measure experience or attitude.

5. How well does the SQT measure an individual's proficiency on SM tasks?

- Studying on SQT Manual is like saying thats all a man needs to know.
- A soldier can accomplish a task as outlined in the SM and still not meet SQT standards if he doesn't follow a set order or perform in a certain way.
- SM's train only the task required.
- Need more "hands on"
- ARTEP results are the true measuring tool.
- Only hands-on testing demonstrates proficiency.
- In part due to some men not being able to take written tests, several of my men can perform, but did not do well on the written test.
- Many differences are to be found between the S.M., the TM and SQT test booklet which must be corrected in order for the soldier to know what is the desired response on the test.
- Well enough to achieve 90% validity.
- I would equate SQT w/ SM because that is how we trained our soldiers in ROK for their SQT tests, by using the SM's.
- It doesn't because all SQT areas have been crammed into his head and he doesn't retain half of it.
- The SQT test only so many of the SM tasks. In addition the soldier has to know which tasks will be on SQT. The only thing that is determined is how well trained on those known tasks.

6. How well does proficiency on ARTEP tasks measure the collective abilities to perform a unit's assigned mission?

- It give the unit a time to operate as a team and an ideal to know what to expect in different situations.
- The concept of an ARTEP is good if additional training is performed at a later period when it is least expected by an ARTEP team.
- Very good training ARTEP tasks show off very well (whether) a unit is training or not.
- The value of an ARTEP is very dependent upon the quality of the evaluator.
- There are too many restrictions that almost give the outcome before the problem has even started i.e. area limitations limits on a maneuver.
- Needs proficient umpires.
- Very effective in allowing Cdrs to see results of indiv & collective task at crew, platoon, and company level.
- When executed with careful planning, it can be fairly realistic of a unit's capabilities.
- Not enough emphasis on small unit training.
- Units only go through the phase to fill requirements and pass or fail.
- Often times all functions of a unit are not fully tested and the status of a unit is often misleading.
- I think ARTEP training is good I feel we should have more of this type training, making it as realistic as possible.
- However it is the best system so far as long as it is used as evaluation of the unit not a test of the commander. Note to must pressure is placed on Bn Co's and us to pass all ARTEP areas. It strains personal honest of high level cdr's div, bde, in that no div co or ADC(M) is about to stand-up and say my unit is not ready "FORCOM". The return question is why not general? instead of what shall we do to get ready.
- Basic weakness is in combat simulation, i.e. need something like REALTRAIN materials utilized on an ARTEP.
- Need a more realistic method of determining combat losses in an opposing forces ARTEP to really test a unit. Preferably at 3 or 6-1 odds.
- Tasks not tested tend to be ignored & not trained.
- Current ARTEP measures the unit and individual's ability to fight & survive in combat.
- The ARTEP is a good training program if time can be found to do it more than once a year.
- If the unit is proficient, then the leadership has the sole mission of controlling the output or energy of the unit. Today, commanders spend too much time teaching rather than commanding.

7. At what level should the following training records be kept? See Annex

- Crew and platoon records are best kept at Co & Bn where key personnel can be aware of training weakness.
- More emphasis must be placed on platoon records and scores.
- Must have trained training NCO's at (at) company level before they are kept at Co level.
- Records can be falsified to (too) easily anymore. A system of "what extra training can I obtain to make me a better soldier" should be adopted instead of what training do I need to pass. People are afraid to admit that they can (not) pass a training requirement, so they cheat on their records.
- Platoons should not keep record, only train.
- All training records should be kept at company level.
- A training NCO should be authorized at company level for this purpose.
- Company should keep all record. The new company commander or first SGT would know what to expect from his unit.
- We need to decentralize and get the clerks and records back at company level.

8. Do you believe that in general there is a demonstrated increase in individual proficiency attributable to collective (ARTEP) training in units?

- Evaluators do not examine the indiv's as much as they should due to the constraints of time, distance and number of evaluators.
- Most ARTEPs have little to do with the individual. We should train more frequently in small units - Plt size or less.
- Training is administered to fill requirements and does not fulfill the requirements to the individuals.
- We need to go back to Plt and company ATT. We also must give a numerical rating (for competition is the American way) Yes, ATT are only as good as the unit evaluating it are but so are the ARTEP. I believe in building foundations, example tank: tank gunnery; Plt: ATT; Co: ATT; Bn ARTEP.
- The training is generally good. However, we only get this type of training once a year.
- More trng is needed to bring unit back up to desired trng level.
- Need to make ARTEP more realistic in terms of an ARTEP evaluation team, making standard observations, and REALTRAIN equip to make more realistic.
- Training for an ARTEP opens up training time and resources for the unit that are not otherwise available.
- ARTEP has taken training time away from indiv. tasks.
- ARTEP training normally trains the leaders in the skills and in supervising individuals.

9. Do you believe that in general there is a demonstrated increase in collective proficiency attributable to individual (SM tasks) training in units?

- Would take a majority of a unit to produce significant results.
- The emphasis on individual training is good but the NCO's have not yet assumed responsibility for it.
- Not enough time for training for SM on individual task. Time is consumed by maintenance.
- I firmly beleave all personnel should be trained to do every job within the plt to include leading it.
- With more strenous evaluation, there will be more proficiency.
- Minor due to turbulence.
- Our soldiers did not score well on their last SQT's. Too much time has been spent supporting tasks from division, and not enough time has been devoted to training.
- Allows leaders more time for their training.
- System would work well if unit was allowed time to train in indiv tasks.
- SM tasks not related to day by day functioning of the unit. Nor are they oriented towards the combat mission of the unit.
- Again, the manual is good, but because of other commetments there is either not time or no people to train.
- When personell have the opertunity to accutally perform there duties they see a greater importance, thus learn more & try harder.

10. What impact would decreasing the proficiency level on SM tasks of Basic Armor graduates have on your unit combat effectiveness?

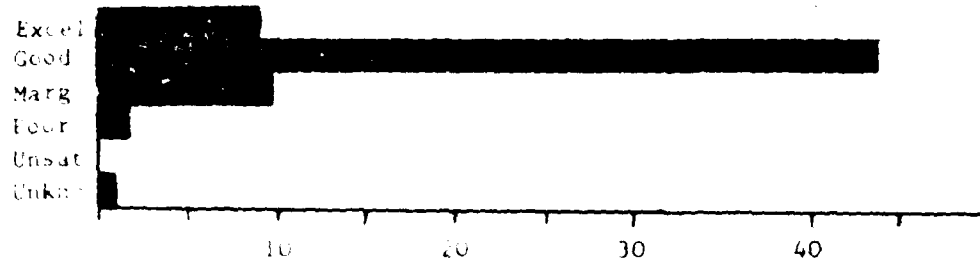
- The burden would then be placed on the unit for additional training of basic skills.
- Standards would be lowered for job requirement.
- FORSCOM units do not train sufficiently therefore any knowledge brought in by a new replacement is of value.
- The unit would bring SM up to standards.
- I dont want training decreased but I don't believe it should be restricted by the SM or MOS.
- It would down grade efficiency.
- We need the individual soldier to be highly qualified out of AIT. We don't have the time or money to spend on great amounts of review.
- Lowering proficiency requirements would obviously produce a soldier who knows less.
- Create a training nightmare for the CO.
- The proficiency the soldier learns once he gets to the unit depends on the leadership in the unit.
- We could train them ourselves but it would take longer.
- Would greatly decrease it; as we are very understrength, each person should be an expert at what he does.

- The more they learn at Basic, the less time has to be spent in individual trng. More time may be spent with unit trng.
- Need to keep standards high; something to shoot for.
- It is the major training event in a soldier's career. He must be ready to go when he reaches the unit.
- This would be making the units to lower their standards. We cannot win with substandard soldiers.
- The personell coming from BCT-AIT training now do not spend enough time on learning their equipment now.
- Would have to take training time to teach them.

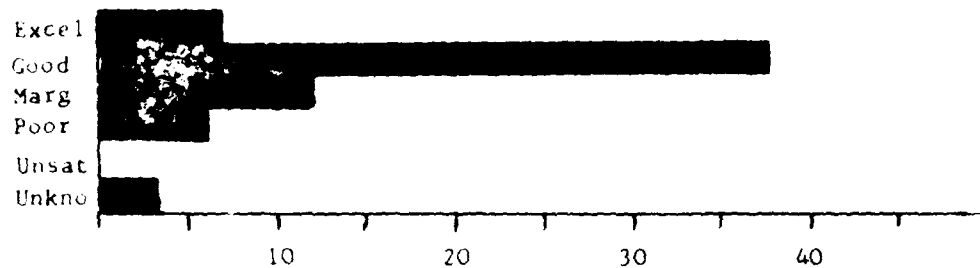
11. What impact would increasing the proficiency level on SM tasks of Basic Armor graduates have on your unit combat effectiveness?

- This would raise the standard permitting Bn to retain individuals.
- Because of a chronic lack of training we do not complement the new man's skills sufficiently with unit training.
- The unit would have a better SM coming in.
- Less class and more field time practicing what you know.
- This would aide greatly in eliminating the necessity for refresher tng.
- Would allow Co to train for higher levels of proficiency.
- The more time spent with individuals in Basic would make them more proficient and enable them to do a much better job when assigned to a unit.
- The current Soldiers Manual appears to be adequate, if the soldier can measure up to the tasks.
- Cut down on retraining time.
- Increased proficiency furthers your combat readiness.
- We could concentrate more on combined unit level training.

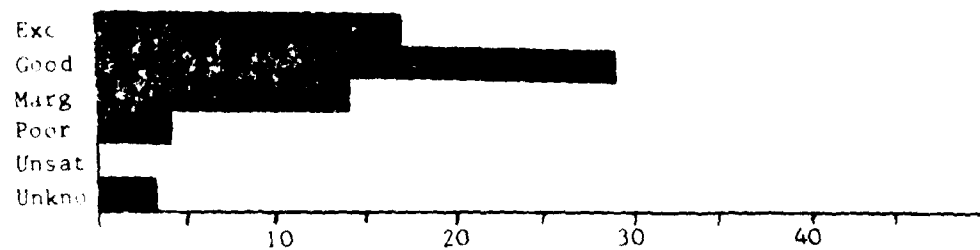
3. How well does proficiency on SM tasks measure an individual's ability to fight his weapon system? What are the major strengths and weaknesses of the SM for measuring proficiency?



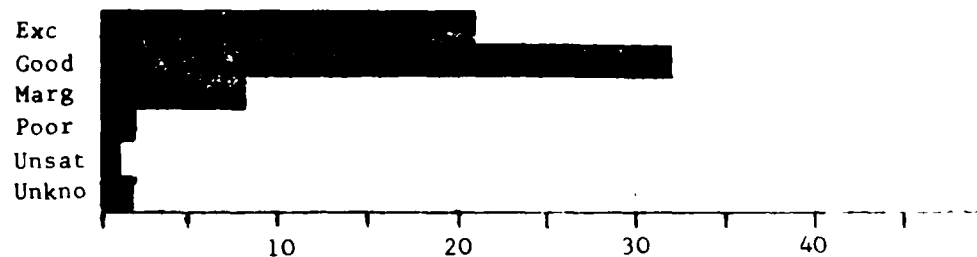
4. How well does the SQT measure an individual's ability to fight his weapon system? What are the major strengths and weaknesses?



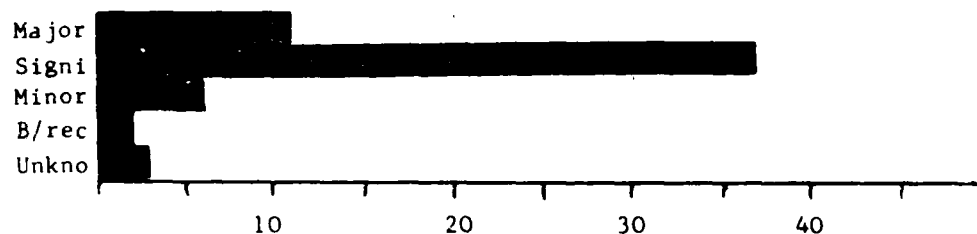
5. How well does the SQT measure an individual's proficiency on SM tasks?



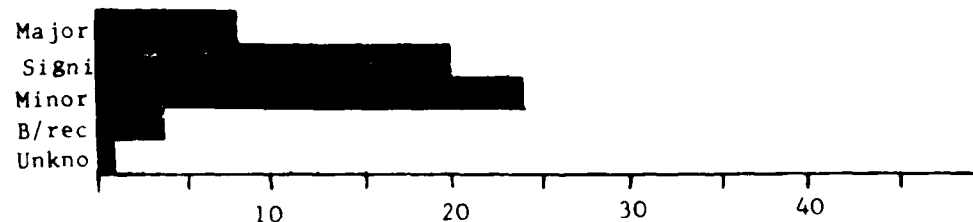
6. How well does proficiency on ARTEP tasks measure the collective abilities to perform a unit's assigned mission?



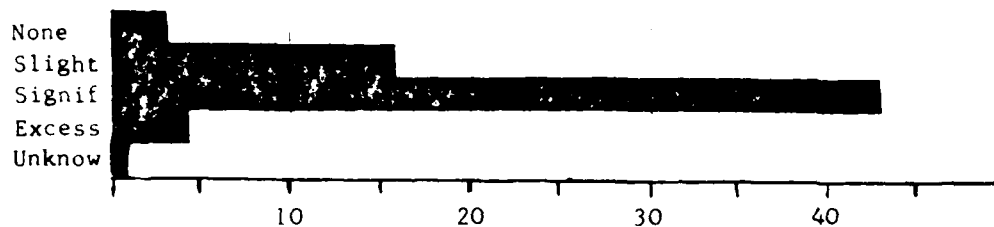
8. Do you believe that in general there is a demonstrated increase in individual proficiency attributable to collective (ARTEP) training in units?



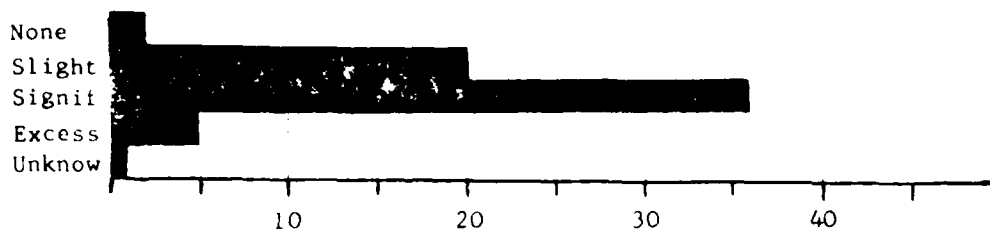
9. Do you believe that in general there is a demonstrated increase in collective proficiency attributable to individual (SM tasks) training in units?



10. What impact would decreasing the proficiency level on Soldier's Manual tasks of Basic Armor graduates have on your unit combat effectiveness?



11. What impact would increasing the proficiency level on Soldier's Manual tasks of Basic Armor graduates have on your unit combat effectiveness?



COURSE TITLE: M60A1 Armor Crewman/Tank Driver

COURSE NUMBER/MOS: 19E10/19F10

DOLLARS (FY78)	<u>OMA</u>	<u>MAP</u>	<u>PA</u>
<u>Variable</u>			
Program 8 Mission			
Instructional Dept	416	909	
Other	24		
Program 8 <u>TOE</u> Spt			
Ammunition			1433
Pay & Allowances			
Students		1746	
All others			
Travel Pay to Course		125	
Per Diem at Course			
Program 8 Base Ops	664	191	
Support Cost (Tng Aids)	<u> </u>	<u> </u>	<u> </u>
TOTAL:	1104	2971	1433
<u>Fixed</u>			
Program 8 Mission	258	455	
Program 8 Base Ops	460	71	
Program 8 TOE Spt			
Support Costs (Tng Aids)	<u>54</u>	<u>5</u>	<u> </u>
TOTAL:	722	531	
TOTAL VARIABLE & FIXED	<u>1826</u>	<u>3502</u>	<u>1433</u>

TIME/PERSONNEL:

Student Course Length 12 weeks, 0 days

Direct Man weeks of effort of

Instructional Dept's & School Overhead. Civ Mil

COURSE TITLE: M60A1 Armor Crewman/Tank Driver

COURSE NUMBER/MOS: 19E10/19F10

DOLLARS (FY78)

	<u>OMA</u>	<u>MAP</u>	<u>PA</u>
<u>Variable</u>			
Program 8 Mission			
Instructional Dept	546	985	
Other	26		
Program 8 <u>TOE</u> Spt			
Ammunition			1483
Pay & Allowances			
Students		1891	
All others			
Travel Pay to Course		125	
Per Diem at Course			
Program 8 Base Ops	772	207	
Support Cost (Tng Aids)	<u> </u>	<u> </u>	<u> </u>
TOTAL:	1344	3208	1483

Fixed

Program 8 Mission	258	455	
Program 8 Base Ops	460	71	
Program 8 TOE Spt			
Support Costs (Tng Aids)	<u>54</u>	<u>5</u>	<u> </u>
TOTAL:	772	531	
TOTAL VARIABLE & FIXED	<u>2116</u>	<u>3739</u>	<u> </u>

TIME/PERSONNEL:

1483

Student Course Length 13 weeks, 0 days

Direct Man weeks of effort of

Instructional Depts & School Ove Lead. Civ Mil

COURSE TITLE: M60A1 Armor Crewman/Tank Driver

COURSE NUMBER/MOS: 19E10/19F10

DOLLARS (FY78)

OMA

MAP

PA

Variable

Program 8 Mission

Instructional Dept 553 1061

Other 28

Program 8 TOE Spt

Ammunition 1483

Pay & Allowances

Students 2037

All others

Travel Pay to Course 125

Per Diem at Course

Program 8 Base Ops 802 223

Support Cost (Tng Aids) _____

TOTAL: 1383 3446 1483

Fixed

Program 8 Mission 258 455

Program 8 Base Ops 460 71

Program 8 TOE Spt

Support Costs (Tng Aids) 54 5

TOTAL: 772 531

TOTAL VARIABLE & FIXED

TIME/PERSONNEL:

2155

3977

1483

Student Course Length 14 weeks, 0 days

Direct Man weeks of effort of

Instructional Depts & School Overhead. Civ _____ Mil _____

COURSE TITLE: M60A1 Armor Crewman/Tank Driver

COURSE NUMBER/MOS: 19E10/19F10

DOLLARS (FY78)

	<u>OMA</u>	<u>MAP</u>	<u>PA</u>
<u>Variable</u>			
Program 8 Mission			
Instructional Dept	666	1137	
Other	30		
Program 8 <u>TOE</u> Spt			
Ammunition			1534
Pay & Allowances			
Students		2183	
All others			
Travel Pay to Course		125	
Per Diem at Course			
Program 8 Base Ops	898	239	
Support Cost (Tng Aids)	<u> </u>	<u> </u>	<u> </u>
TOTAL:	1594	3684	1534
<u>Fixed</u>			
Program 8 Mission	258	455	
Program 8 Base Ops	460	71	
Program 8 <u>TOE</u> Spt			
Support Costs (Tng Aids)	<u>54</u>	<u>5</u>	<u> </u>
TOTAL:	772	531	
TOTAL VARIABLE & FIXED	<u>2366</u>	<u>4215</u>	<u>1534</u>

TIME/PERSONNEL:

Student Course Length 15 weeks, 0 days

Direct Man weeks of effort of

Instructional Depts & School Overhead. Civ Mil

ESTIMATES OF TRAINING TIME FOR VARIOUS COURSE LENGTHS

	19E				19F			
	12	13	14	15	12	13	14	15
Administrative	101.5	104.5	116.5	119.5	107.5	110.5	122.5	125.5
Fundamentals	58	58	58	58	58	58	58	58
Physical Readiness Training	37	37	42	50	37	37	42	50
Testing & Review	137.5	129.5	142.5	142.5	127.5	121.5	128.5	139.5
Combat Skills and Tactics	58	58	58	58●	58	58	58	58
Communications	12	12	12	12	11	11	11	11
Weapons	63	63	63	63	58	58	58	58
Driving	8	12	12	25.5	75.5	112	118	122
Gunnery Classes	29	29	29	29	8	14	16	20
Gunnery Ranges	90.5	117.5	117.5	117.5	17.5	17.5	17.5	17.5
Maintenance	45	57	73	92	65	69	87	103
TOTAL	639.5	677.5	723.5	767.0	623.0	666.5	716.5	762.5

	19E				19F			
	12	13	14	15	12	13	14	15
ADMINISTRATIVE								
1. In/Out Processing	18	18	18	18	18	18	18	18
2. CIF Issue/Turn-In	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
3. Immunizations	2	2	2	2	2	2	2	2
4. Clothing Issue	4	4	4	4	4	4	4	4
5. Hearing Orientation	1	1	1	1	1	1	1	1
6. Cmdrs/DS Orientation	2	2	2	2	2	2	2	2
7. Dental Hygiene	1	1	1	1	1	1	1	1
8. Guard	8	8	8	8	8	8	8	8
9. Detail	12	12	16	16	12	12	16	16
10. Compensatory Time	9	9	9	9	12	12	12	12
11. Personal Hygiene	9	12	17	20	9	12	17	20
12. Prep/Clean-up	20	20	22	22	20	20	22	22
13. Family Day	4	4	4	4	4	4	4	4
14. Movement Time	9	9	10	10	12	12	13	13
TOTAL	101.5	104.5	116.5	119.5	107.5	110.5	122.5	125.5

19E/F

FUNDAMENTALS	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
1. Inspections	12	12	12	12
2. D & C	16	16	16	16
3. Role of Army/Armor	2	2	2	2
4. Chaplain Classes	4	4	4	4
5. Wearing of Uniform	1	1	1	1
6. Customs & Courtesies	4	4	4	4
7. Guard Classes	4	4	4	4
8. Code of Conduct	1	1	1	1
9. Geneva Convention	2	2	2	2
10. Military Justice	3	3	3	3
11. Drug Abuse	2	2	2	2
12. VD Orientation	1	1	1	1
13. US Government	1	1	1	1
14. Climate Orientation	1	1	1	1
15. Human Relations	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>
TOTAL	58	58	58	58

19E

19F

	12	13	14	15	12	13	14	15

PHYSICAL READINESS TRAINING

1. PRT	27	27	32	40	27	27	32	40
2. Confidence Course	2	2	2	2	2	2	2	2
3. BPFT/APFT	8	8	8	8	8	8	8	8
TOTAL	37	37	42	50	37	37	42	50

TESTING & REVIEW

1. Phase I DI Time	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
2. Cmdr's Time	45	37	40	42	35	29	31	42
3. Review	20	20	30	30	20	20	25	25
4. Tests	20	20	20	20	20	20	20	20
TOTAL	137.5	129.5	142.5	142.5	127.5	121.5	128.5	139.5

	19 E/F			
	12	13	14	15
COMBAT SKILLS AND TACTICS				
1. First Aid	4	4	4	4
2. Field Hygiene	1	1	1	1
3 NBC	6	6	6	6
4. Marches & Bivouacs	11	11	11	11
5. Combat Orientation	10	10	10	10
6. Defensive Combat Course	3	3	3	3
7. Combat Weapons Course	4	4	4	4
8. Land Mine Warfare	2	2	2	2
9. Map Reading	8	8	8	8
10. Tank Intro	3	3	3	3
11. Soviet Soldier	6	6	6	6
TOTAL	58	58	58	58

	19E				19F			
	12	13	14	15	12	13	14	15
COMMUNICATIONS								
1. Visual Signals	2	2	2	2	2	2	2	2
2. Operate FM Radio	3	3	3	3	3	3	3	3
3. Communicate over FM Radio	4	4	4	4	4	4	4	4
4. Enter/Leave NET	2	2	2	2	0	0	0	0
5. Anti-jamming	1	1	1	1	0	0	0	0
TOTAL	12	12	12	12	11	11	11	11

	19E				19F			
	12	13	14	15	12	13	14	15
WEAPONS								
1. M16A1	13	13	13	13	13	13	13	13
2. Hand Grenades	5	5	5	5	5	5	5	5
3. M219	11	11	11	11	6	6	6	6
4. M85	6	6	6	6	6	6	6	6
5. M3A1	6	6	6	6	6	6	6	6
6. M1911A1	16	16	16	16	16	16	16	16
TOTAL	63	63	63	63	58	58	58	58

	19E				19F			
	12	13	14	15	12	13	14	15
DRIVING								
1. Start/Stop	4	4	4	4	4	4	6	6
2. Basic Driving	4	4	4	4	4	4	4	4
3. Convoy Driving	0	0	0	4	4	4	4	4
4. Night Driving	0	0	0	5.5	5.5	5.5	5.5	5.5
5. Recovery Operations	0	4	4	8	4	4	8	8
6. Negotiate Obstacles (Day)	0	0	0	0	8	12	12	16
7. Negotiate Obstacles (Night)	0	0	0	0	5.5	11	11	11
8. Tactical Driving (Day)	*	*	*	*	8	8	8	8
9. Tactical Driving (Night)	*	*	*	*	5.5	5.5	5.5	5.5
10. Table VII c A Driving	*	*	*	*	16	32	32	32
11. Table VII c B Driving	*	*	*	*	11	22	22	22
TOTAL	8	12	12	25.5	75.5	112	118	122

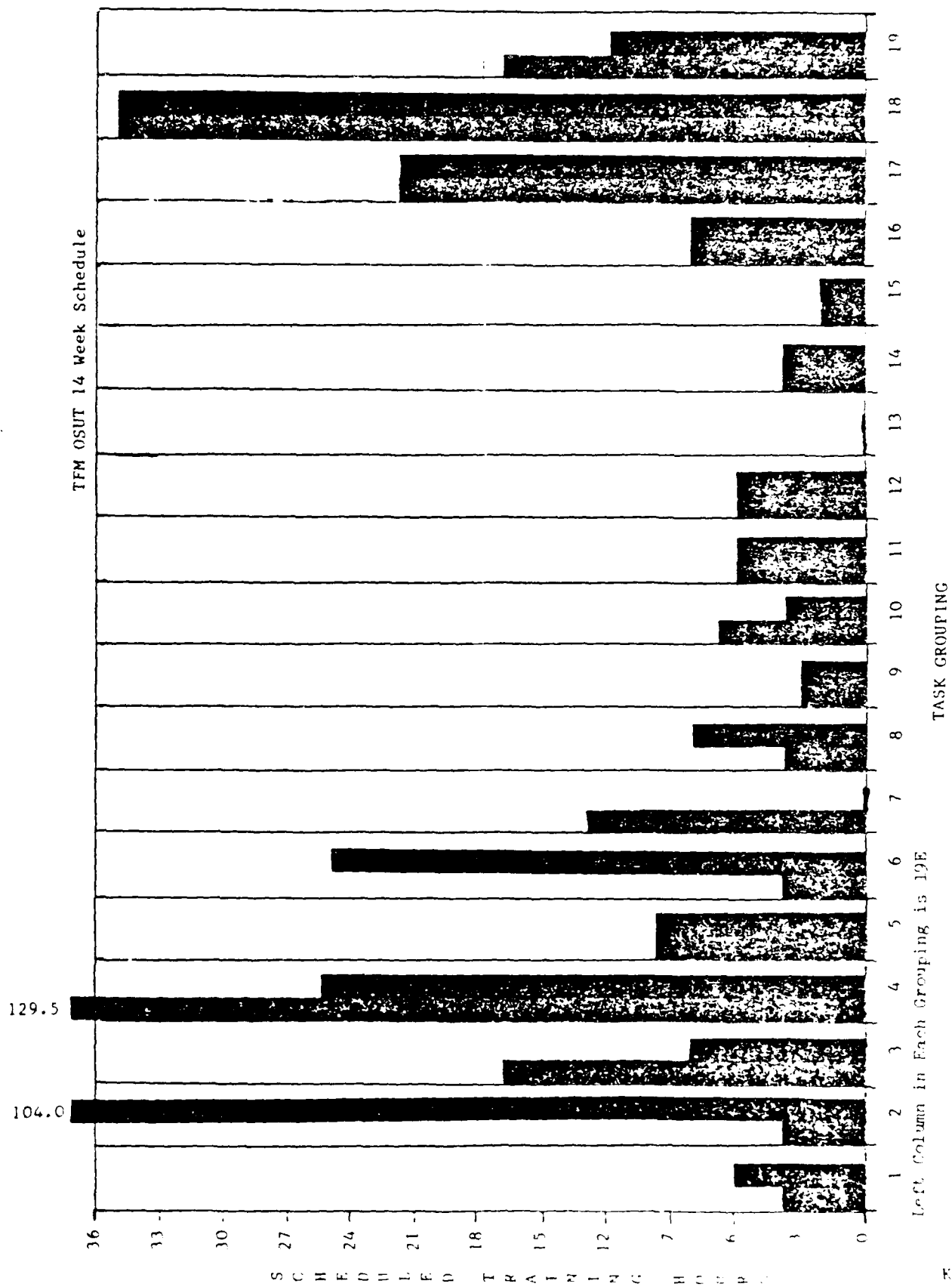
	19E				19F			
	12	13	14	15	12	13	14	15
GUNNERY CLASSES								
1. Place Turret into ops	4	4	4	4	4	4	4	4
2. Prepare to fire checks	2	2	2	2	0	0	0	2
3. Main Gun Ammo	2	2	2	2	2	2	2	2
4. Main Gun Operations	4	4	4	4	2	2	2	4
5. Conduct of Fire	8	8	8	8	0	6	8	8
6. Boresight	3	3	3	4	0	0	0	0
7. Breechblock	2	2	2	4	0	0	0	0
8. Aux Fire & Range Card	4	4	4	4	0	0	0	0
TOTAL	29	29	29	29	8	14	16	20

	19E				19F			
	12	13	14	15	12	13	14	15
GUNNERY RANGES								
1. Tables I, II, III A	4	4	4	4	4	4	4	4
2. Tables I, II, III B	5.5	5.5	5.5	5.5	0	0	0	5.5
3. Table IV A	16	16	16	16	0	0	0	0
4. Table IV B	11	11	11	11	0	0	0	0
5. Table VI A	8	8	8	8	8	8	8	8
6. Table VI B	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
7. Table VIIc A	16	32	32	32	*	*	*	*
8. Table VIIcB	11	22	22	22	*	*	*	*
9. Tactical Driving (Day)	8	8	8	8	*	*	*	*
10. Tactical Driving (Night)	5.5	5.5	5.5	5.5	*	*	*	*
TOTAL	90.5	117.5	117.5	117.5	17.5	17.5	17.5	23

	19E				19F			
	12	13	14	15	12	13	14	15
MAINTENANCE								
1. Preventive Maint BII	2	2	2	2	2	2	2	2
2. Remove/Install Track	0	0	4	4	4	4	4	8
3. Log Book	4	4	4	4	4	4	4	4
4. BDA (Auto)	0	4	4	4	9	9	9	9
5. BDA (Turret)	4	4	4	4	0	0	0	0
6. Insp/Repl Sus Sys Items	0	0	0	4	4	4	8	8
7. Troubleshoot Hull	0	0	0	0	4	4	4	12
8. Troubleshoot Turret	3	3	3	10	0	0	0	0
9. Lubricate Hull	0	0	0	0	0	0	0	2
10. Lubricate Turret	2	2	2	2	0	0	0	0
11. Perform ESC	0	0	4	4	0	0	4	4
12. Assist in Scheduled Maint	0	0	0	0	0	0	0	0
13. Insp & Sucs Batteries	0	0	0	0	0	0	0	0
14. Fire Extinguishers	0	0	0	0	0	0	0	0
15. Maint Svcs	30	38	46	54	38	42	52	54
TOTAL	45	57	73	92	65	69	87	103

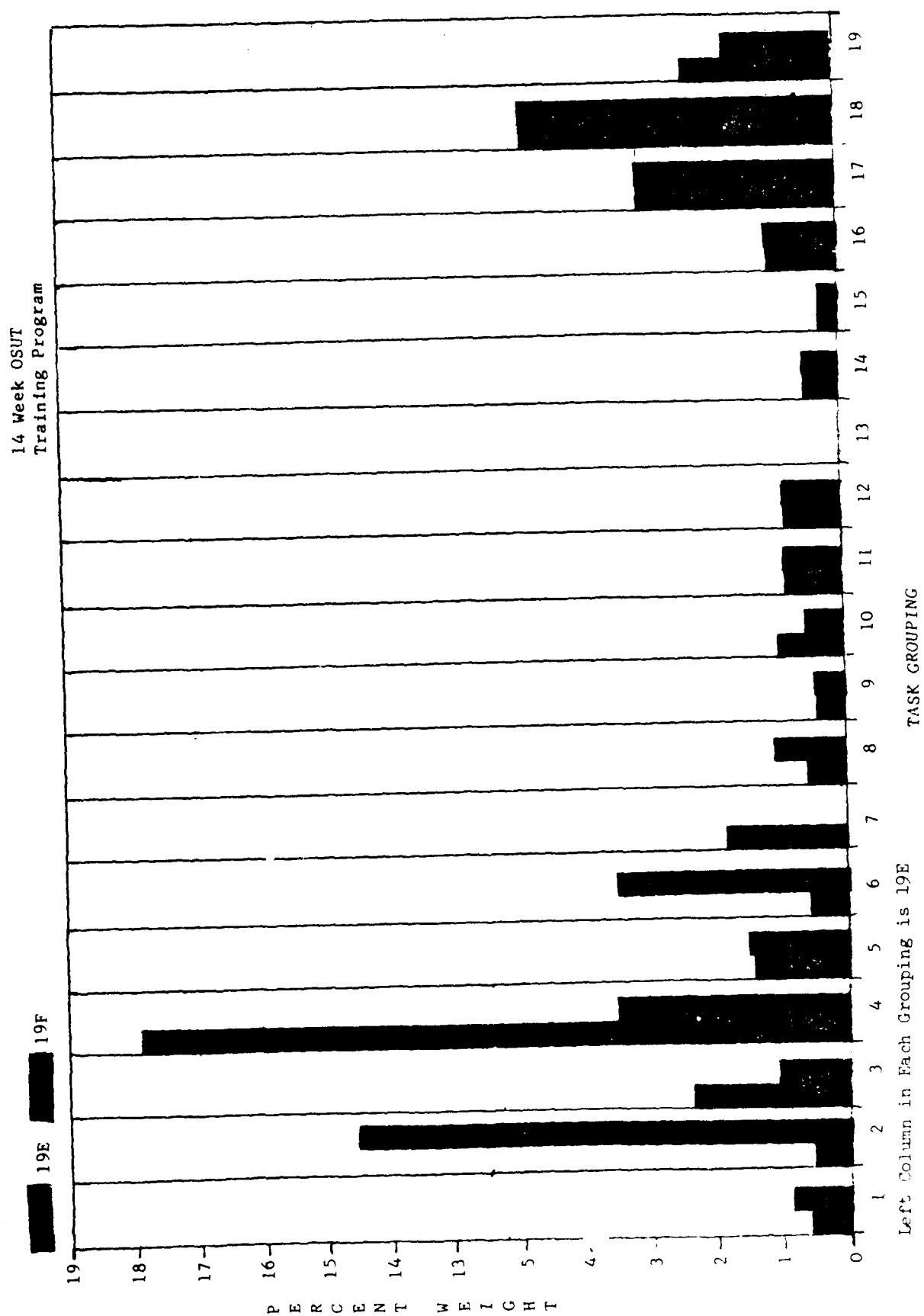
TRAINING TIME PER TASK GROUP FOR VARIOUS COURSE LENGTHS

	19E				19F			
	12	13	14	15	12	13	14	15
1. Driver Mechanical Operating Procedures	4	4	4	4	4	4	6	6
2. Driver Tactical Operating Procedures	4	4	4	9.5	67.5	104	104	108
3. Gunnery Preparations	17	17	17	17	8	8	8	10
4. Tank and Crew Weapons Employment	102.5	129.5	129.5	129.5	17.5	23.5	25.5	31
5. General Maintenance Procedures	6	6	10	10	10	10	10	16
6. Hull Maintenance Procedures	0	4	4	8	17	17	25	33
7. Turret Maintenance Procedures (Tank)	9	9	13	20	0	0	0	0
8. Recovery Procedures	0	4	4	8	4	4	8	8
9. Communications Equipment Operations & Maintenance	3	3	3	3	3	3	3	3
10. Communications Message Handling Procedure	7	7	7	7	4	4	4	4
11. Intelligence and Security Procedures	6	6	6	6	6	6	6	6
12. Individual NBC Procedures	6	6	6	6	6	6	6	6
13. Collective NBC Procedures	-	-	-	-	-	-	-	-
14. First Aid	4	4	4	4	4	4	4	4
15. Land Mine Warfare Procedures	2	2	2	2	2	2	2	2
16. Map Reading	8	8	8	8	8	8	8	8
17. Combat Skills	22	22	22	22	22	22	22	22
18. Individual Weapons Maintenance & Employment	35	35	35	35	35	35	35	35
19. Crew Served Weapons Maintenance	17	17	17	17	12	12	12	12



PERCENT WEIGHT OF HOURS SCHEDULE IN EACH TASK GROUPING OF VARIOUS COURSE LENGTHS

	19E				19F			
	12	13	14	15	12	13	14	15
1. Driver Mechanical Operating Procedures	.63	.59	.55	.52	.64	.60	.84	.79
2. Driver Tactical Operating Procedures	.63	.59	.55	1.24	10.83	15.60	14.52	14.16
3. Gunnery Preparations	2.66	2.51	2.35	2.22	1.28	1.20	1.12	1.31
4. Tank and Crew Weapons Employment	16.03	19.11	17.90	16.88	2.81	3.53	3.56	4.07
5. General Maintenance Procedures	.94	.89	1.38	1.30	1.61	1.50	1.40	2.10
6. Hull Maintenance Procedures	.00	.59	.55	1.04	2.73	2.55	3.49	4.33
7. Turret Maintenance Procedures (Tank)	1.41	1.33	1.80	2.61	0.00	0.00	0.00	0.00
8. Recovery Procedures	.00	.59	.55	1.04	.64	.60	1.12	1.05
9. Communications Equipment Operations & Maintenance	.47	.44	.41	.39	.48	.45	.42	.39
10. Communications Equipment Handling Procedure	1.09	1.03	.97	.91	.64	.60	.56	.52
11. Intelligence and Security Procedures	.94	.89	.83	.78	.96	.90	.84	.79
12. Individual NBC Procedures	.94	.89	.83	.78	.96	.90	.84	.79
13. Collective NBC Procedures	.00	.00	.00	.00	0.00	0.00	0.00	0.00
14. First Aid	.63	.59	.55	.52	.64	.60	.56	.52
15. Land Mine Warfare Procedures	.31	.30	.28	.26	.32	.30	.28	.26
16. Map Reading	1.25	1.18	1.11	1.04	1.28	1.20	1.12	1.05
17. Combat Skills	3.44	3.25	3.04	2.87	3.53	3.30	3.07	2.89
18. Individual Weapons Maintenance & Employment	5.47	5.17	4.84	4.56	5.62	5.25	4.88	4.59
19. Crew Served Weapons Maintenance	2.66	2.51	2.35	2.22	1.93	1.80	1.67	1.57



PART II

ARMOR SURVEY REPORT

This report was prepared by Actuarial Research Corporation and submitted to the Army Training Study (ARTS) under provisions of purchase order DABT 56-78-P-E752. All results are subject to revision by further analysis, comparison with other data, and further testing. The views, opinions, and/or findings contained herein are not to be construed as an official Department of the Army or the US Army Training and Doctrine Command (TRADOC) position, policy, or decision unless so designated by other official documentation.

FINAL REPORT

ARMOR SURVEY

Prepared for the

U.S. ARMY ARMOR SCHOOL

Ft. Knox, Kentucky

by

ACTUARIAL RESEARCH CORPORATION

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July 1978

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I. INTRODUCTION

A. Purpose and Objectives

This report details the results of a study that was conducted for the U.S. Army Armor School during the period of 22 May and 21 July 1978. The purpose of the study was to provide data relative to the impact on unit training programs that would result from varying the length of the Basic Armor Training (BAT) course. The information derived would be used for analysis by the Army Training Study (ARTS).

The primary objective of the effort was to acquire sufficient data to permit the Armor School and ARTS to determine:

1. The optimum ratio of individual to collective training as a function of varying individual training time in the training base,
2. Resources requirements for varying the lengths of training periods (12, 14, 15 week variations of BAT), and
3. The impact on unit readiness and installation responsibilities as a result of varying the lengths of training periods.

The lack of meaningful empirical data needed to satisfy the objectives of the study was acknowledged. Also it was recognized that much of the desired information was of the type that could be derived only from the qualitative judgments of experienced

military personnel. For these reasons, the medium of a survey was selected as the data collection instrument. A copy of the survey form is found in Appendix A.

B. Feature

This study utilizes a unique methodology, Magnitude-Estimation Scaling (MAG-ES), to measure the relative criticality of training Soldier's Manual tasks for two separate MOS. The MOS are:

- 19E - Gunner/Loader
- 19F - Driver

MAG-ES provides a weighted quantified prioritization of the issues that reflect the collective perceptions or value judgments of experienced military personnel with respect to qualitative, subjective issues such as "criticality" of training. The weighted priorities provide the decision maker with guidance for adjusting training programs in accordance with changes in available resources. A brief description of MAG-ES may be found in Appendix B.

C. Scope and Content

The report is divided into three main sections:

1. Section 1 - Introduction
2. Section 2 - Respondent Profiles
3. Section 3 - Polling Results

Section 2 describes the general characteristics, i.e., rank, assignment, years of experience, etc., of the pool of respondents. Section 3 summarizes the results of the survey.

D. Limitations

The study has two minor limitations:

1. The total respondent pool was somewhat small compared to a similar survey conducted for ARTS; 66 vs. 269.
2. All respondents were located in one division whereas the ARTS survey had 5 separate and distinct sources.

The only foreseeable problems may be a built-in bias reflecting one division's point of view and some minor instabilities in the data. Neither are considered serious for purposes of the study.

The data derived is believed to be compatible and consistent with the developmental design status of the Battalion Training Model.

II. RESPONDENT PROFILES

Each of the respondents was asked to complete an anonymous questionnaire relative to pertinent biographical information. The purpose of this information is to establish the credentials of the respondent and ascertain whether he has sufficient background to participate in the survey. Respondent Profiles summarizes the biographical data.

A. Data Sources

The survey was administered to personnel representing four separate armor battalions in the 4th Mechanized Infantry Division, Ft. Carson, Colorado. Of 66 respondents, 64 officers and enlisted men were members of the Armor Branch. Since the material covered was armor-oriented, two non-armor respondents, both E-7, were removed from the data base.

Table I summarizes the distributions of the 64 respondents by rank and assignment. Of the 64, a total of 11 respondents, including Company Executive Officers (Co XO), First Sergeants, Mortar and Motor Platoon Sergeants were reclassified to the next lowest echelon by mutual agreement with the sponsor. The purpose was to enhance the computational base, the rationale being that the next lower echelon was commensurate with their previous experience. The position and computational reassignment are as follows:

TABLE I
DISTRIBUTION OF RESPONDENTS
by
Rank and Assignment
n = 64

Assignment	Rank									Totals
	LTC	Maj	Capt	1st Lt	2d Lt	E-9	E-8	E-7	E-6	
Bn CO	2									2
Bn XO		1								1
Bn S-3			3							3
Bn S-3 Staff							1			1
Tk Co. CO			7	3						10
Pltn Ldr				5	16					21
CSM						1				1
Pltn Sgt							4	13	7	24
Tk Cmdr									1	1
Totals	2	1	10	8	16	1	5	13	8	64

<u>No.</u>	<u>Position</u>	<u>Computational Assignment</u>
3	Co XO	Pltn Ldr
6	1st Sgts	Pltn Sgt
2	Mortar Pltn Sgt	Pltn Sgt

B. Experience

A review of the respondent's total service revealed that only 33 of the 64 equaled or exceeded 3 years.^{1/} It was concluded that this requirement to establish credentials as a respondent was far too stringent, since some 48% of the input data would be lost.

By mutual agreement the eligibility requirement was reduced to a total service of 1 year or more. Only one respondent, a second lieutenant failed to qualify. The new total or Qualified Pool of respondents for computational purposes, therefore, became 63. Table II summarizes the average experience of the Qualified Pool by rank in terms of total service and years in the armor branch. Note that 2 officers and 4 NCOs also have had mechanized infantry experience.

Although time in present assignment data was obtained, certain distortions in the information prevent meaningful interpretation. Many of the NCOs had only been recently assigned yet their total level of experience implied considerably greater background than was indicated. Conversely several 1st Sgts had been in the position for extended periods, i.e., years. The averages, therefore, would tend to be unreasonably high.

^{1/} A minimum service of 3 years was required of ARTS BTM respondents in order to qualify as respondents.

TABLE II
EXPERIENCE SUMMARIES
of the
QUALIFIED RESPONDENT POOL
n = 63

Rank	n	Ave. Total Years of Service	Ave. Years Experience in Armor	n	Ave. Years Experience in Mech. Inf.
LTC	2	16.5	11.0	-	
Maj	1	19.0	9.0	-	
Capt	10	6.2	5.5	2	1
1st Lt	8	3.0	2.8	-	
2d Lt	15	2.0	1.5	-	
E-9	1	19.0	12.0	1	7
E-8	5	18.6	12.2	-	
E-7	13	16.3	4.2	1	4
E-6	8	9.4	5.5	2	3

III. POLLING RESULTS

A. General

The results of six of the seven-part survey are reported in four topical categories. The results of Set 7, "Training Survey", are being reported separately by the Army School as are the "Remarks" of Set 4, "Training Strategies".

The four categories consist of the following:

1. Soldier's Manual Task Ratings - the separate weighted prioritization of Soldier's Manual Task generic groupings for 19E and 19F MOS by Magnitude-Estimation Scaling; Set I.
2. Training of Unit Replacements - the measurement of the impact on unit training of replacements who are BAT graduates of courses varying in length from 12 to 15 weeks; Set II.
3. Times and Frequencies - Estimates of the number of hours and the number of repetitions per year to train specific Soldier's Manual Tasks for the 19E and 19F MOS, collective tasks, and ARTEP missions (Sets III, V, & VI).
4. Training Strategies - selection of alternative approaches for unit training of soldiers with varying degrees of background or experience in the subject matter.

Each topic is discussed separately. Included are a summary of the results, interpretations thereof, and

instructions for utilization of the data. Where appropriate separate conclusions will be drawn.

B. Soldier's Manual Task Ratings

1. Analysis

The 19E (Gunner/Loader) and 19F (Driver) Soldier's Manual consist of 131 identified tasks. For convenience the tasks have been grouped generically into 19 functional groups for analysis.^{1/}

Using the Magnitude-Estimation Scaling (MAG-ES) methodology, the Qualified Pool of respondents were asked to rate the relative criticality of training for the 19 functional groups. The context for comparing the items was that training must be accomplished to enable the Army "to fight any place at any time".

Tables III and IV summarize the ratings in the form of weighted prioritizations of the 19 Soldier's Manual Tasks for the 19E and 19F MOS respectively. The tasks are presented in descending order of criticality. The relative weights are displayed graphically in Figures 1 and 2.^{2/}

^{1/} A listing of all 131 tasks by functional group may be found in the "Questionnaire Guide", an adjunct to the survey, a copy of which is located in Appendix A.

^{2/} The lines connecting the points are used to emphasize the relative displacement. The resulting curve has no mathematical significance.

TABLE III

RELATIVE CRITICALITY OF SOLDIER'S MANUAL TASKS

19E(Gunner/Loader)

n = 63

Rank Order	I.D. ^{1/} No.	19E Soldier's Manual Tasks	Relative Weight
1	4	Tank & Crew Weapons Employment	5.2
2	18	Gunnery Preparations	5.1
3	10	Turret Maintenance Procedures	4.0
4	3	Combat Skills	3.8
5	15	Crew Served Weapons Maintenance	3.5
6	16	Map Reading	2.7
7	12	Individual Weapons Maintenance & Employment	2.4
8	7	General Maintenance Procedures	2.3
9	19	Driver Tactical Operating Procedures	2.2
10	5	Hull Maintenance Procedures	2.1
11	11	Individual NBC Procedures	2.0
12	2	Driver Mechanical Operating Procedures	1.8
13	13	Communications Equipment Operations & Maintenance	1.7
14	14	Collective NBC Procedures	1.6
15	17	Tank Recovery Procedures	1.5
16	1	Intelligence and Security Procedures	1.4
17	9	Communications Message Handling Procedures	1.2
18	6	First Aid	1.2
19	8	Land Mine Warfare Procedures	1.0

^{1/} The I.D. No. refers to the number signifying the order of presentation for the 19E & 19F rating forms in Set 1. These numbers are retained for identification purposes in all subsequent tables and figures.

TABLE IV
RELATIVE CRITICALITY OF SOLDIER'S MANUAL TASKS
19F (Driver)
n = 63

<u>Rank Order</u>	<u>I.D. No.</u>	<u>19F Soldier's Manual Tasks</u>	<u>Relative Weight</u>
1	19	Driver Tactical Operating Procedures	5.1
2	2	Driver Mechanical Operating Procedures	4.2
3	7	General Maintenance Procedures	4.1
4	5	Hull Maintenance Procedures	3.9
5	3	Combat Skills	3.2
6	17	Tank Recovery Procedures	3.2
7	4	Tank and Crew Weapons Employment	2.7
8	16	Map Reading	2.5
9	18	Gunnery Preparations	2.4
10	15	Crew Served Weapons Maintenance	1.9
11	11	Individual NBC Procedures	1.7
12	12	Individual Weapons Maintenance and Employment	1.6
13	14	Collective NBC Procedures	1.6
14	10	Turret Maintenance Procedures	1.5
15	8	Land Mine Warfare Procedures	1.4
16	13	Communications Equipment Operations & Maintenance	1.3
17	9	Communications Message Handling Procedures	1.1
18	1	Intelligence and Security Procedures	1.1
19	6	First Aid	1.0

Figure 1

RELATIVE CRITICALITY OF SOLDIER'S MANUAL TASKS

19E(Gunner/Loader)

n = 63

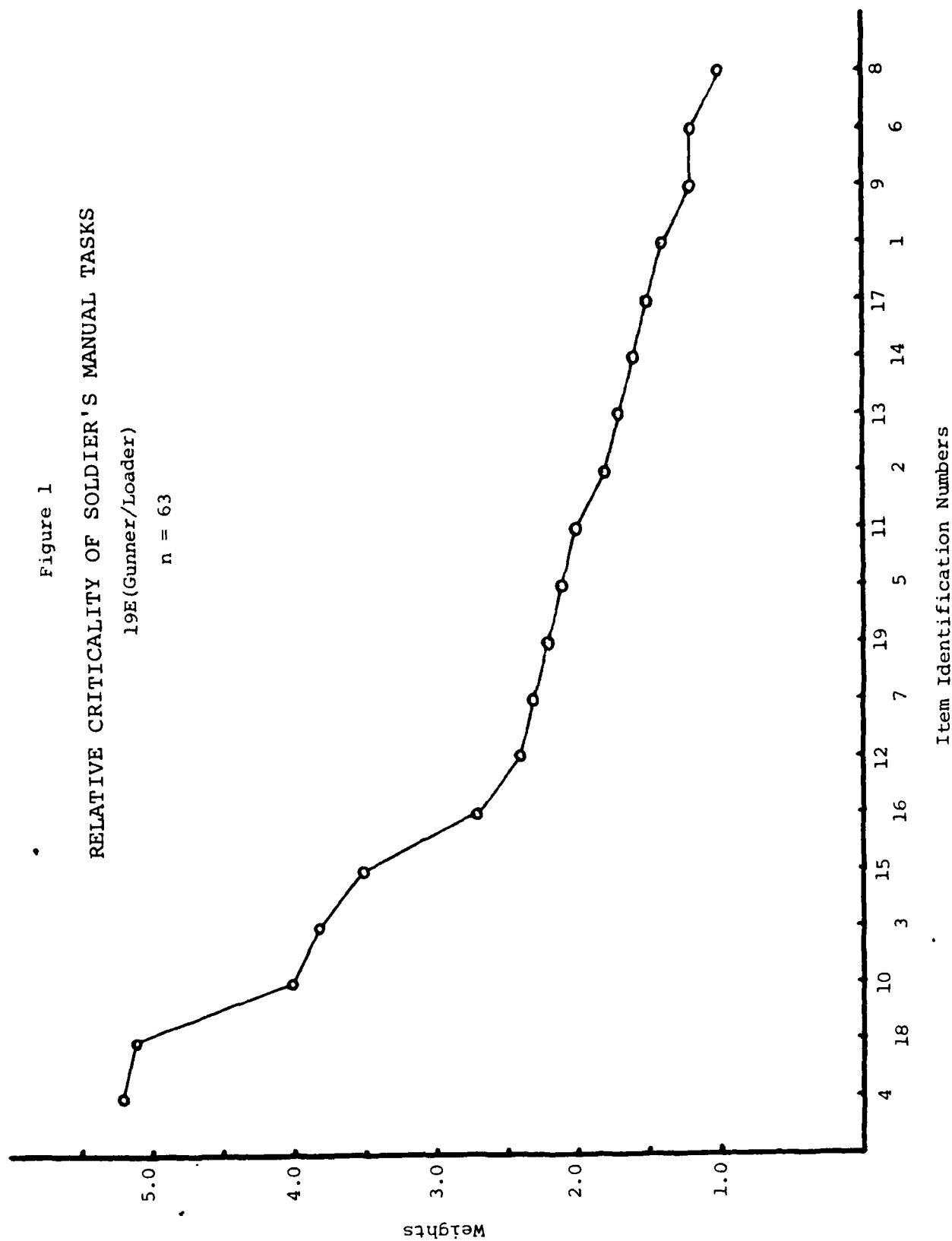
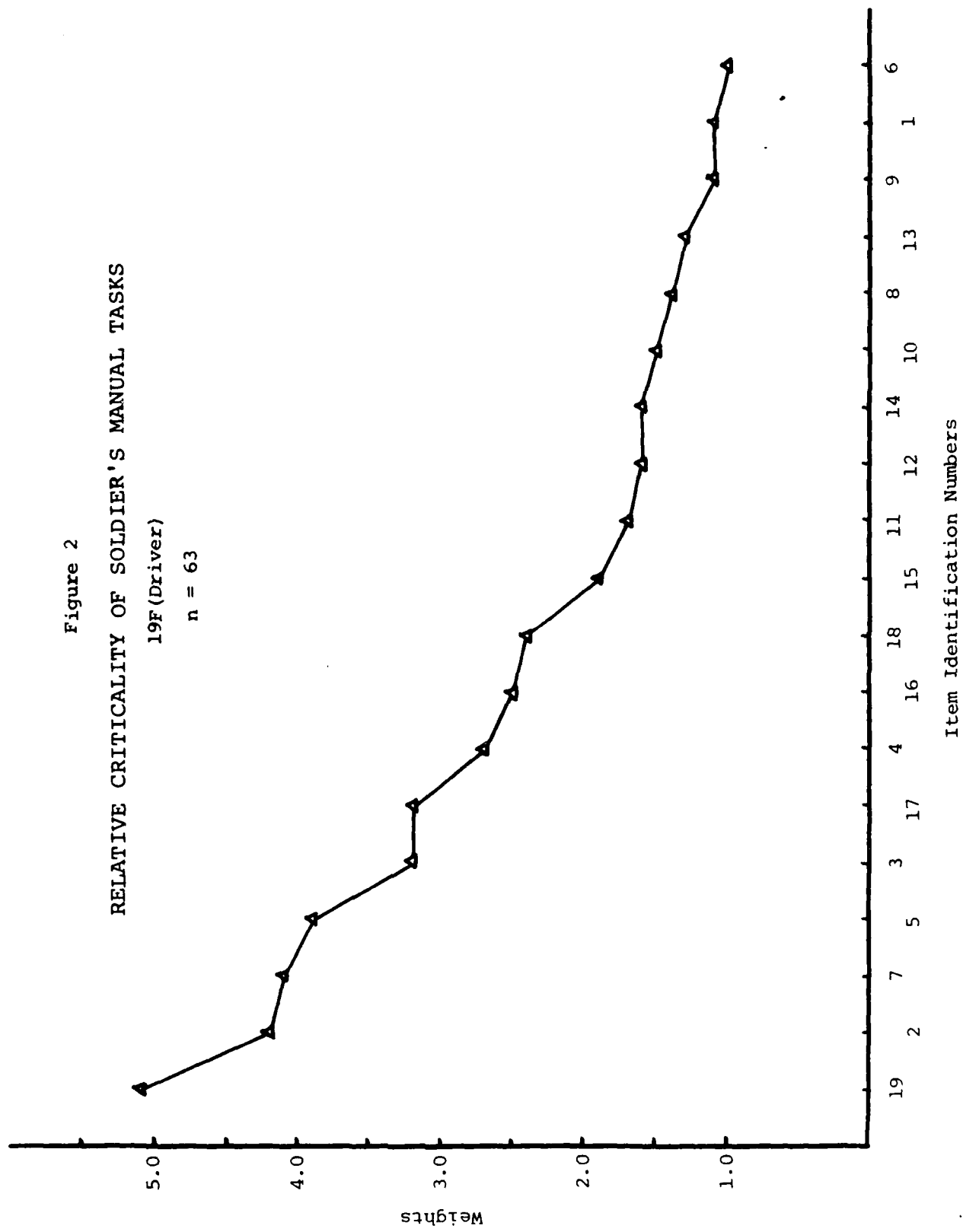


Figure 2
 RELATIVE CRITICALITY OF SOLDIER'S MANUAL TASKS
 19F (Driver)
 n = 63



CAUTION

The weights for each MOS cannot be compared directly, e.g., a rating of 1.0 for 19E is not identical to 1.0 for 19F. Hence, the weights are not to be compared except where specifically stated.

With respect to the 19E MOS, the Qualified Pool collectively rated Task No. 4, Tank and Crew Weapons Employment, as the most critical training issue with a relative weight of 5.2. The weight can be interpreted as being 5.2 times more critical than the lowest rated item, i.e., Task No. 8, Land Mine Warfare Procedures, with a weight of 1.0. Conversely, the lowest item can be considered to be 19 percent as critical as the highest.

Because MAG-ES establishes ratios among each of the tasks, the same logic applies between any two items; e.g., Task 10 (wt. 4.0) is two times more critical as Task 11 (wt. 2.0); Tasks 9 and 6 with identical weights are 50% as critical as Task 12.

There is no limitation on the number of items that may be judged by the respondents as being of equal criticality.

As might be expected gunner/loader operational activities received the greatest emphasis. Maintenance procedures also rate relatively high.

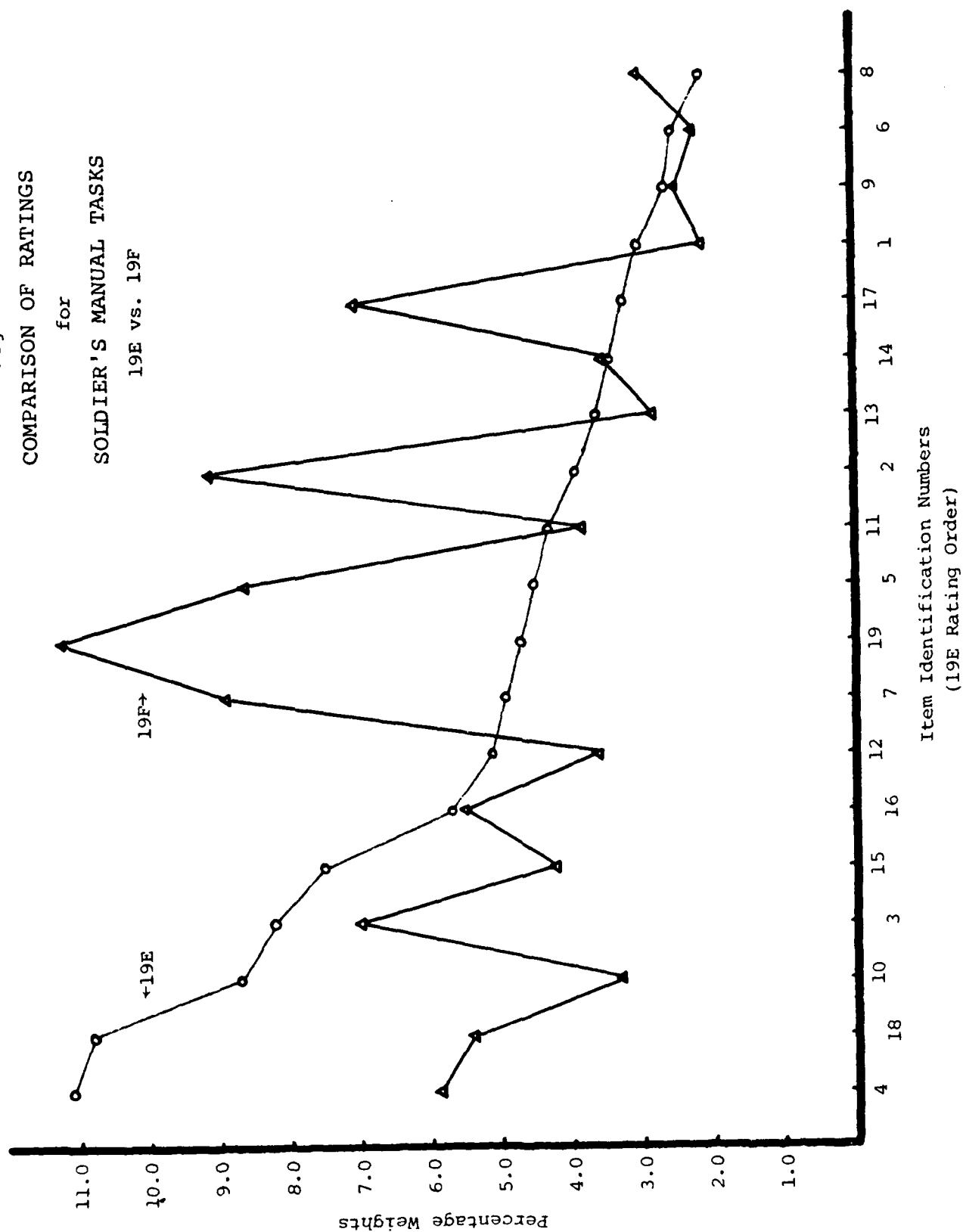
Since the weights are additive it is possible to group all operational tasks and all maintenance tasks separately and compare the weights. Any imbalance in the number of items, e.g., 3 operational and 5 maintenance, may be nullified by dividing the sum of the weights by the number to derive an "average criticality" factor. The factors may then be readily compared.

The 19F ratings clearly show the stress or the operational and maintenance aspects of the driver with Item No. 19 (wt. 5.1) being the highest and Item No. 6 (wt. 1.0) the lowest. These ratings appear to be in keeping with the requirements of the MOS.

Since the Soldier's Manual Tasks are identical for both MOS, a comparison was made of the 19E and 19F ratings as shown in Figure 3. Note that a scale change from weights to percentage weights was necessary to affect the comparison.

The comparison very clearly demonstrates the difference in flows between the two MOS. Those items for which very little difference is noticed are for the most part general tasks.

Figure 3
COMPARISON OF RATINGS
for
SOLDIER'S MANUAL TASKS
19E vs. 19F



Comparisons were conducted between officer and NCO ratings for both MOS. Any apparent differences were judged to be insignificant, hence, the information has been omitted.

2. Utilization

The weights provide the training planner with unusual guidance for designing programs that meet the needs of the respective MOS. It is now possible to stress the more critical tasks providing that training in the less critical are not totally forgotten or unduly jeopardized. The capability for adjusting schedules more precisely in the event of imposed resource constraints is provided.

The reader is cautioned, however, not to equate priorities with cost of training. A very critical task may be relatively inexpensive to train, whereas a very low rated item may be very costly. A knowledge of unit training costs in conjunction with the weights is essential in conducting the trade-offs.

C. Training of Unit Replacements

1. Analysis

This portion of the survey attempted to measure the impact on unit training that would be incurred by the inflow of Basic Armor Training (BAT) graduates. Two variables are associated with the BAT replacements:

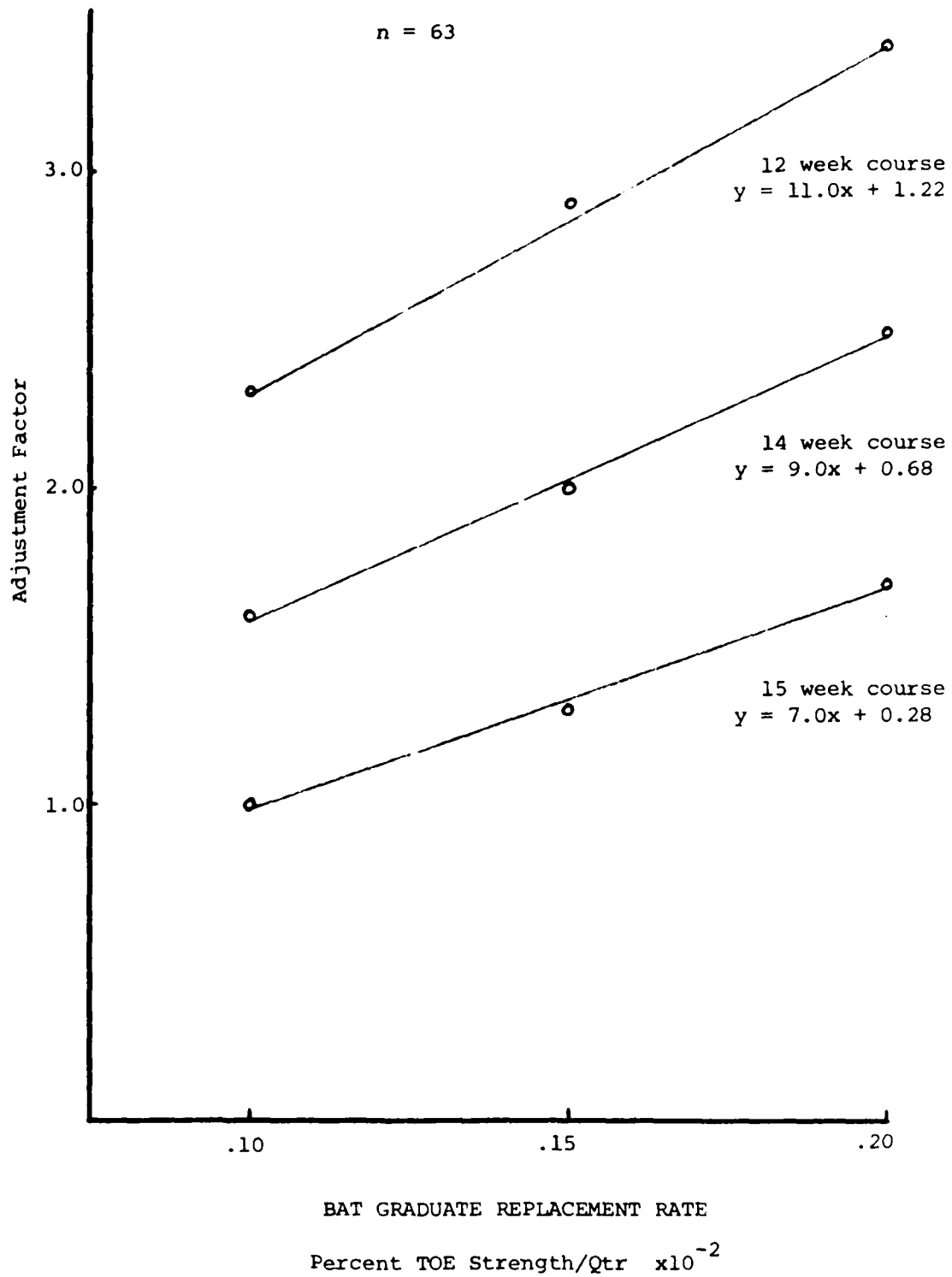
- a. The length of their BAT course, i.e., 12, 14, or 15 week courses, factors that for the purpose of this study are associated with proficiency levels of 70, 85, and 95 percent respectively; and
- b. The rate of replacement input, parametrically assumed to be 10, 15, and 20 percent per quarter.

The respondents were asked to estimate the additional amount of time that would be required to train replacements with less BAT background and at increasing influx rates. These estimates were then converted to general first-order multiplication factors that could be used to adjust training schedule frequencies in accordance with the entry conditions.

Figure 4 depicts the adjustment curves for the three types of BAT training courses, i.e., a 12, 14, or 15 week course. Note that the slope of the straight line approximations increases as the length of the course decreases. In other words the incremental increase in training requirements rises as the preparation of the replacement decreases. This condition obviously creates a greater burden on the unit, especially as the replacement rate increases.

Figure 4

IMPACT OF BASIC ARMOR TRAINING
GRADUATE REPLACEMENTS ON
UNIT TRAINING



2. Utilization

The adjustment factor scale (Y axis) is valid only if the base condition, i.e., the set of unit personnel conditions for which the frequency of training is based, happens to be 10 percent replacement rate of 15 week BAT graduates. If the frequencies, however, are based on another set of conditions, e.g., 15 percent replacement rate of 14 week graduates, the scale must be changed. In the latter case, all data points would be normalized or divided by 2.0. The 1.0 would become 0.5 and the 3.0, 1.5. Any base condition within the range of empirical data shown may be used as the new normalization point.

D. Times and Frequencies

1. Analysis

The respondents were asked to estimate the number of hours per period and the number of periods per year that would be required for training the 19E and 19F Soldier's Manual Tasks (Set III of the Questionnaire) collective tasks, (Set V) and ARTEP missions (Set VI). Base conditions representative of unit personnel training detractors, e.g., turbulence, were specified for each group.

Initial tabulations revealed a generally wide range of responses for any given subject. Some of the responses

were obviously excessive and beyond the realm of practicality. To reduce the effects of the extreme responses, and hence, possible severe distortions in the data, an adjustment technique was employed.

All responses beyond the arithmetic mean plus one standard deviation were eliminated and new means computed. The disadvantage of this approach is the loss of some responses from the data base. In view of the improved stability of the data, however, the overall impact was believed to be minimal.

2. Utilization

The data for all three subjects has been summarized in tabular form and adjustment factors applied for the full range of BAT replacement conditions set forth in Set II, i.e., 12, 14, and 15 week BAT graduate replacements at rates of 10, 15, and 20 percent -- 9 cases overall. Products of time and frequency as well as confidence levels are given also.

With respect to collective task and ARTEP mission estimates, values are given for squad, platoon, company, and battalion level.

All data is presented in Appendix C in tabular form.

E. Training Strategies

The training status of an individual in a unit probably can be classified according to one of the following with respect to any particular subject matter:

- Fully trained and experienced - Code I
- Trained but inexperienced - Code II
- Trained but requires supervision
(high decay) - Code III
- Untrained in the subject
matter - Code IV

At any one time the unit may have any combination of the above represented. In order to accomplish effective, meaningful training, the trainer must somehow accomodate to the situation.

Six alternative approaches were postulated by the Armor School and presented to the respondents for their consideration.

The training approaches are:

1. Two separate periods of formal training -- one for initial training and one for retraining.
2. One formal period oriented to those who need retraining with self-paced/off duty instructions for the initial learners.
3. One formal period oriented to those who need initial training -- with those who do not need retraining being released for other activity early.
4. One formal period oriented toward those who need initial training -- all members attend and participate in the entire training period.

5. Two formal training periods: Period One oriented to and attended by initial learners only. Period Two oriented toward all members and attended by the entire unit.

6. No change from current training policy.

The seventh category, "Other", solicited suggestions and remarks. (The latter are being summarized by the Armor School.) Given seven combinations of training status classifications, the respondents were asked to select the approach or strategy they believed would best accomplish the objectives for unit training of Soldier's Manual Tasks.

Three aspects of training were posed: 19E - Gunnery subjects, 19F - Driver subjects, and General subjects.

Tables V, VI, and VII, summarize by percentage of response the most desirable strategy for any one grouping of individuals.

The approach with the greatest percentage of responses may be assumed to be the most desirable although for Groups I & IV, two approaches, 3 and 5, and Groups III & IV, two approaches, 1 and 4, were consistently rated at almost equal frequencies.

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ARMY TRAINING STUDY: TRAINING EFFECTIVENESS ANALYSIS
(TEA) SUMMARY VOLUME 2 ARMOR(U) ARMY TRAINING AND
DOCTRINE COMMAND FORT MONROE VA F J BROWN 00 AUG 70

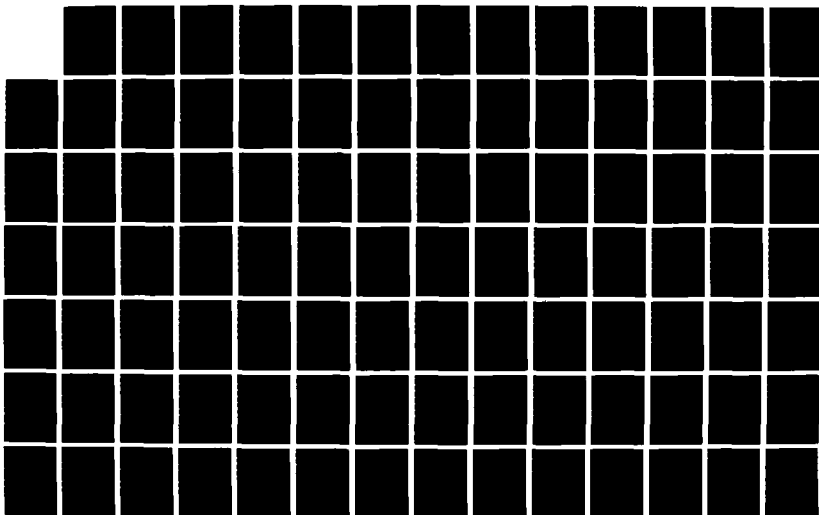
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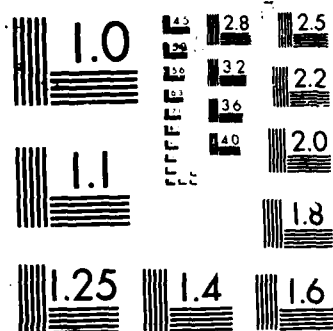


TABLE V
 TRAINING STRATEGIES
 for
 GUNNERY SUBJECTS*
 (19E)

Training Approach	Training Status Classification Group Codes						
	I & II	I & III	I & IV	I, II & IV	II & III	II & IV	III & IV
1.	5.5	7.3	12.1	13.8	20.0	23.2	33.9
2.	30.9	18.2	5.2	6.9	9.1	8.9	5.4
3.	36.4	27.3	32.8	12.1	14.5	7.1	1.8
4.	12.7	14.5	8.6	22.4	34.5	21.4	32.1
5.	5.5	23.6	36.2	41.4	16.4	33.9	21.4
6.	3.6	1.8	1.7	--	--	--	--
7.	5.5	7.3	3.4	3.4	5.5	5.4	5.4
n	55	55	58	58	55	56	56

* Reference: Questionnaire Guide Soldier's Manual Tasks Nos. 3,4,7,19.

TABLE VI
TRAINING STRATEGIES
for
DRIVER SUBJECTS*
(19F)

Training Approach	Training Status Classification Group Codes						
	I & II	I & III	I & IV	I,II & IV	II & III	II & IV	III & IV
1.	7.0	5.3	10.3	8.6	20.8	10.5	31.6
2.	22.8	14.0	5.2	6.9	11.3	12.3	5.3
3.	31.6	40.4	34.5	25.9	18.9	14.0	8.8
4.	19.3	12.3	10.3	17.2	28.3	19.3	29.8
5.	8.8	21.1	37.9	39.7	17.0	42.1	22.8
6.	7.0	1.8	--	--	--	--	--
7.	3.5	5.3	1.7	1.7	3.8	1.8	1.8
n	57	57	58	58	53	57	57

* Reference: Questionnaire Guide Soldier's Manual Tasks Nos. 1,2,5,6,8.

TABLE VII
TRAINING STRATEGIES
for
GENERAL SUBJECTS*

Training Approach	Training Status Classification Group Codes						
	I & II	I & III	I & IV	I,II & IV	II & III	II & IV	III & IV
1.	3.6	7.3	15.3	10.5	14.3	20.7	27.6
2.	29.1	16.4	11.9	7.0	17.9	6.9	3.4
3.	34.5	32.7	28.8	26.3	19.6	10.3	10.3
4.	14.5	16.4	11.9	22.8	28.6	22.4	37.9
5.	5.5	20.0	27.1	28.1	12.5	34.5	17.2
6.	5.5	3.6	1.7	1.8	3.6	1.7	1.7
7.	7.3	3.6	3.4	3.5	3.6	3.4	1.7
n	55	55	59	57	56	58	58

* Reference: Questionnaire Guide Soldier's Manual Tasks Nos. 9,10,11,12,13
14,15,16,17,18.

APPENDIX A:
QUESTIONNAIRE & QUESTIONNAIRE GUIDE

This appendix is omitted as it is identical to Annex A of Part I of this volume, Training Time Ratio Survey Study.

APPENDIX B:

MAG-ES -- A BRIEF DESCRIPTION

The Magnitude Estimation Scaling Procedure*

Subjective, qualitative judgments can be summarized in many ways. The typical polling procedure simply requires some form of a yes-no response to an issue. The results are presented in terms of the percent of a group that agrees or disagrees with an issue. When the percentage is high a consensus is indicated and an intensity of feeling is implied, but in reality the actual degree of the intensity is unknown.

It is also common to have items ranked in order of some quality such as attractiveness, goodness, importance, and so on. An average rank of an item can then be shown as well as the rank order correlation among different sets. But the size of the intervals between ranks and the intensity of the feeling expressed are unknown.

A refinement of these polling/rating procedures is to provide the respondent with a spectrum of response categories that represents a range from "never" to "always", or some other set of descriptors. The number of intermediate categories between the extremes (e.g., "never" and "always") varies, commonly runs from five to seven, but may be larger. The intent usually is to provide a series of equally spaced response categories.

There are two major shortcomings to such a procedure. First, the usual treatment of the ensuing data implicitly assumes equal intervals when in fact the categories simply have been assigned numbers from 1 to 5, or 1 to 7. In reality, however, the intervals are almost always unequal, and to an unknown degree, with respect to intensity, amount, or other quality.

* Taken from "Agricultural Aviation User Requirement Priorities," The Actuarial Research Corporation, Falls Church, Virginia, NASA Report 145215.

It is incorrect to conclude that the first category is half the amount of the second category or one-third of the third category, even though numbers have been assigned to each interval. There can be a further compounding due to the descriptors applied to the categories. Depending on the words chosen to define each category, the distribution of responses can be skewed one way or the other. Strictly speaking, it is improper to compute arithmetic means and similar statistics since the intervals are not equal. In practice, however, such calculations are rarely inhibited.

For several decades there has been an intensive effort to devise judgment scales that have the attribute of additivity. Thurstone and Chave's early study of attitudes toward the church (Ref. A1) and subsequent work on "equal appearing intervals" was an elegant approach to the phenomenon of proportionality that is inherent in human judgments, wherein the variability of judgments is approximately proportional to the magnitude of the stimulus (or reference object, or item).

The method of paired comparisons used to establish these intervals is a tedious procedure for the rater when a large number of items is involved. For example, with forty items, 780 comparisons are required. The work of Stevens (Ref. A2) and others reflected a direct approach to the problem of establishing scale intervals by requiring the subject to estimate ratios of magnitudes with respect to a reference point.

Until quite recently this procedure of magnitude estimation has been applied mainly to psychophysical phenomena. Gradually a body of studies has accumulated in which the relationship between judgments of non-physical events and objective indices of these events has been examined, e.g., the preference for watches, odors, occupations; the importance

of monarchs; the degree of frustration and aggression in a military setting; and the seriousness of delinquents' crimes (Refs. A3, A4, A5, A6, A7, and A8). A decade ago it was noted that the magnitude estimation scaling that was used in psychophysics showed a remarkable consistency in these other applications and it was suggested that herein was a means to create a metric, i.e., a scale that had the characteristic of additivity (A9). The first major application of magnitude estimation to the scaling of qualitative events occurred in the study of crimes (Ref. A8) noted above. Shortly thereafter applications were made to the assessment of the seriousness of insurgents' activities in Southeast Asia (Refs. A10, A11) and the determination of how much credibility was placed on intelligence reports that had been previously graded according to source reliability and content truthfulness (Ref. A12).

The procedure in Magnitude Estimation is simple in concept. Each item in a list is compared to a single reference item which is initially assigned any non-zero positive number. If the item being appraised is judged to have more or less of a given quality than the reference item, this is noted by assigning a value that shows the magnitude of the judgment in terms of multiples or fractions of the value assigned to the reference number. For example, if the reference item has been given a value of fifteen (15) and the compared item is judged to be three times more worthwhile (or serious, or desirable, or inhibitory, or whatever the characteristic at issue may be) a value of 45 is noted. If it is judged to be only half as worthwhile, a value of $15/2$ or 7.5 is entered. Any

multiple or fractional value is permitted except zeros (since geometric means are calculated using logarithms and zeros cannot be handled) or negative numbers (since degrees of "absence of a quality" makes little sense).

In theory, the reference item can be assigned any value or each respondent can assign his own value prior to making the judgments (Ref. A8). Based on past applications of the procedure, the instructions are more easily followed when a value of ten (10) is provided for each reference number. Unless there is a specific reason to use a single reference item (such as a known or conventional standard) each item is randomly used as a reference among the judges. To compensate for position, or order effects on the compared items, each respondent is given a different, randomly ordered list of items.

It has been traditional to prepare test booklets that present only one item on a page and to instruct each subject not to refer back to scores assigned to prior items. The cost of preparing such booklets is quite high and various alternative procedures have been tried to reduce the costs of printing and assembling the booklets. Computer-generated and printed booklets with random orders and multiple items per page have been used with little loss of fidelity. Some subjects have reported difficulty in handling fractional values where the reference item was considered to have the highest value. A practical compromise is to provide a minimum of 3 or 4 item orders and a designation of 4-8 reference items which can be expected to fall within the extreme weights. This designation requires preliminary information from a pre-test of similar or, better, identical items.

The use of booklets with one item per page to decrease the likelihood of referring back to earlier judgments is practical only when the test group is small enough so that the test administrator can adequately monitor the procedures. In the case of mailed responses, the experimenter will not know if any backreferencing has taken place and it is thus more expedient to display the items in a continuous list.

The subjects should be instructed about the context (the setting, the conditions, or the scenario) in which the judgments are to be made. In effect, this establishes a frame of reference for the respondent.

The Magnitude Estimation Scaling Procedure (MAG-ES) has several distinct advantages. The technique allows each respondent to make judgments without a restriction on the range of values applied to each item. The scores are expressions of the magnitude of the relative quality or intensity at issue. In addition the resulting weights (geometric means) are additive, a characteristic that provides the opportunity to relate highly dissimilar items (the classic "apple" and "orange" dilemma) quantitatively in terms of magnitude so that they can be compared on a common scale.

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MAGNITUDE-ESTIMATION SCALING,
A BRIEF DESCRIPTION*

I. PROBLEM

Decision-makers in all walks of life are continually called upon to provide direction and guidance relative to programs or activities for which there is no precedence or rational substantiation. By virtue of the attendant unknowns, quantitative assessments of all salient factors is all but impossible.

The decision-maker's ultimate resolution in these circumstances, therefore, is largely a product of experience and a qualitative, highly subjective assessment on the part of the supporting staff as well as the executive. Unfortunately, such processes are prone either to inaccurate interpretation of existing facts or to the inadvertent introduction of personal bias. While subjectivity and disciplined intuition can produce positive results, the lack of inherent structure in the reasoning process can lead all too often to inappropriate conclusions resulting in the selection of less than desirable courses of action.

An alternative evaluation procedure often utilized in the absence of quantified analysis is the convening of a panel of experts or recognized authorities on the subject. Although a useful device for identifying problem areas as well as some possible solutions thereto, the ensuing discussions frequently degenerate into unproductive, costly, and time-consuming debate. Further, such debates can be influenced significantly by dominant personalities who may be inaccurate or strongly biased in

* Presented to the 44th National Meeting of the Operations Research Society of America, San Diego, California, 1973, by Robert L. Kaplan.

their assessments. The net results, therefore, are seldom satisfactory and any agreements relative to solutions normally can only be achieved with considerable acrimony or by hopeless resignation by all participants.

Another factor normally inhibiting quantitative assessment is the usual nonhomogenous or dissimilar nature of the factors involved. Although people tend to combine "apples" and "oranges" by some form of mental or numerical exercise, the derived results usually violate mathematical law. The net results, therefore, are unable to withstand rigorous examination and, hence, cannot be justified logically.

Manifestations of these problems have long been acknowledged. Staffs, analysts, and executives have recognized the requirement for a more objective, orderly means of obtaining reliable, defensible measurements for those subjects defying direct quantification. Although a number of techniques and approaches have been used or are being used, most prove unsatisfactory and unreliable in general usage, the reason being the lack of fundamental mathematical logic in the methodology.

II. MAGNITUDE-ESTIMATION SCALING

A. General Description

A unique methodology, Magnitude-Estimation Scaling (MAGES), offers an effective, logical solution to the aforementioned difficulties associated with such widely diverse problems as establishing priorities, allocating research resources, assessing program benefits, or measuring social impact.

MAGES is a technique whereby a large number of recognized authorities (that is, personnel well versed in the particular subject under examination) are solicited to reflect their individual perceptions as to the relative importance of various key factors pertaining to the subject. A specially devised and administered questionnaire is used to record the perceptions. The responses are then mathematically aggregated by geometric means to provide:

1. An overall rank-ordering of elements, and
2. A series of weighting factors indicative of the relative emphasis to be assigned to each rank-ordered item.

The technique is extremely flexible insofar as subjects for application are concerned. With respect to environmental research, for example, MAGES could be used to:

1. Establish the relative degrees of "seriousness" for various major problem areas or within a given problem area, sub-elements thereof, e.g., Major area: Environmental impact; sub-elements -- noise, air pollution, land use, erosion, sociological effects.
2. Identify regional or local problem areas and evaluate the severity of conditions using results obtained above.
3. Establish the relative degrees of "Importance" of competing remedial measures.
4. Assign weighting factors to evaluation criteria to be used in cost-effectiveness models, simulations, etc., for determining the effectivity of these remedial measures and programs.

It should be noted that MAGES should only be used in those instances where standard quantitative measures (such as may be derived from physical or scientific laws) are unavailable.

B. Characteristics

One fundamental characteristic differentiates MAGES from most other similar quantification techniques. MAGES is based upon a defensible mathematical principle -- the ratio scale. This feature provides the essential logic that permits the combination of highly dissimilar subjects on a common reference scale. The ratio scale provides the additive qualities that permit the addition and subtraction of weighting factors. The capability permits the combining of groups of subjects, for example, the evaluation of competing groups of "packaged" remedial programs.

It is the almost universal use of "Category" scaling by other group response methodologies such as the well-known "Delphi" method which separate them from the unique and more consistent MAGES approach.

Another characteristic of MAGES is the manner in which group response is combined. As mentioned earlier, the individual responses are computed using the geometric mean. This technique provides tremendous damping power, the n^{th} root rather than the arithmetic mean $\frac{\sum x}{n}$, n being the number of respondents. Extreme responses from the overly biased or possibly aberrant respondent, although included in the computation, are thusly tempered. Furthermore, since the responses are written, polemics and lengthy unproductive debate are avoided.

C. Respondents

The success of MAGES is to a large extent dependent upon the qualifications and unbiased selection of the respondents or experts. By unbiased selection we mean it is desirable that all sides of the argument be polled. Normally, selection is made after the subject matter has been described in terms of its salient issues. Recognized authorities well versed on the particular subject from academia, Government agencies, research institutions, private enterprise, and consulting firms would be identified and asked to participate. It is highly desirable that some degree of parity in the numbers of diverse respondents be achieved, however, to prevent inadvertent bias.

The number of respondents should never be less than 25, with at least 50 being highly desirable. Depending upon the complexity of the subject and questionnaire, each respondent should spend no more than 30 to 60 minutes completing his questionnaire.

The polling of experts may be conducted on an individual basis or at technical meetings, conventions, and similar gatherings. The latter has been found to be the most convenient and economical.

D. Questionnaire

The most critical element in the application of MAGES is the preparation of the questionnaire used in polling the experts. The questionnaire in effect is the synthesis of the problem being addressed and must be compiled with utmost attention to objectivity to preserve the mathematical logic of the methodology and prevent consistency.

The questionnaire is formed by conducting a comprehensive analysis of the problem under consideration. The objective is to establish the scope of the problem and its systems boundaries, as well as identify the salient factors and parameters. All relevant information and data, including opposing points of view are used as source material if necessary. The level of detail must correspond to the desired depth and focus of the stated problem.

Objectivity in the questionnaire is preserved by eliminating any item that would unduly bias the respondent. For example, in establishing the priorities for research programs, the estimated costs should be omitted. The format of the questionnaire itself reflects the "ratio" principle and the method of execution enhances objectivity of the response.

III. SUMMARY

MAGES offers a positive solution to a number of difficult problem areas such as the establishment of priorities for research programs. It has the ability to focus the most knowledgeable minds on a subject without incurring the burden of unproductive debate. The output is mathematically defensible and relatively free from untenable extremes.

The basic methodology has evolved from psychological testing techniques and has been used in the past to describe the seriousness of urban crime (Ref. 1) and insurgency in Thailand (Refs. 2, 3, and 4). The technique also was used to establish a priority ranking and relative emphasis scale for proposed Criminal Justice Programs (Ref. 5). The results

obtained in these experimental applications were highly convincing, defensible, and consistent.

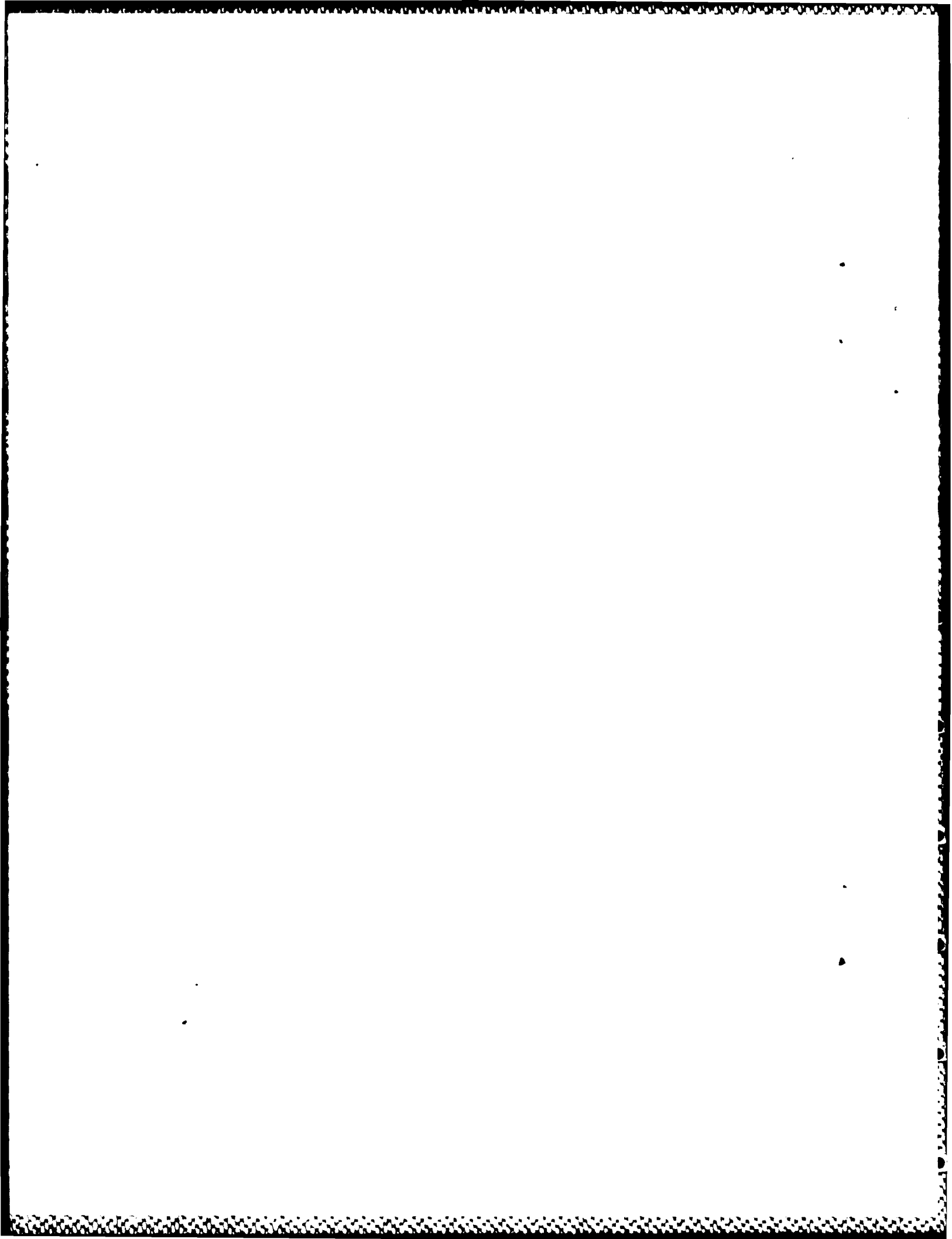
We believe that the methodology is an extremely powerful analytic tool and that sufficient promise has been shown to warrant further research and more utilitarian applications.

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APPENDIX C:

TIME & FREQUENCY DATA

The tables in this appendix show the mean training hours and frequencies required to achieve and maintain a fully combat-ready (95% proficient) individual or unit status depending on the percent replacement of TOE strength per quarter and the BAT course length. The .95 confidence interval is indicated by the HIGH and LOW entries in the tables.

The tables are arranged as follows:

Table I - Soldier's Manual task groupings for Gunner/Loader (19E) and Driver (19F) - from Set III in the survey.

Table II - Collective Tasks at Battalion, Company, Platoon and Squad levels - Set V in the survey.

Table III - ARTEP Missions at Battalion, Company, Platoon and Squad levels - Set VI in the survey.

Each table consists of nine parts (A-I) corresponding to the different sets of adjustment factors (assumptions) used. The factors and pages on which the tables can be found are as follows:

Table Part	Adjustment Factors Applied		Page Number for Table:			
	% Replacement of TOE Strength Per Quarter	Length of BAT Course	I SM Tasks (19E)	II Collective Tasks (19F)	III ARTEP Missions	
A	10%	15 weeks	2	5	56*	84*
B	15%	15 weeks	8	11	59	86
C	20%	15 weeks	14	17	62	88
D	10%	14 weeks	20	23	65	90
E	15%	14 weeks	26	29	68	92
F	20%	14 weeks	32	35	71	94
G	10%	12 weeks	38	41	74	96
H	15%	12 weeks	44	47	77	98
I	20%	12 weeks	50*	53*	80	100

* Base condition used in survey.

TABLE I-A. SET III ADJUSTMENT TO SOLDIER'S MANUAL TASKS

GUNNER/LIAISON	CONDITION--	10 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER			
		14 WEEK RAT GRADUATES		YEAR TOTAL HOURS	
		MEAN	FREQUENCY		
01 DRIVER MECHANICAL OPERATING PROCEDURES	MEAN	2.1	1.	2.1	
	LOW	1.4	1.	1.4	
	HIGH	2.4	1.	2.4	
	N	53	56		
02 DRIVER TACTICAL OPERATING PROCEDURES	MEAN	2.9	1.	2.9	
	LOW	2.4	1.	2.4	
	HIGH	3.4	1.	3.4	
	N	51	56		
03 GUNNERY PREPARATIONS	MEAN	7.8	1.	7.8	
	LOW	5.9	1.	5.9	
	HIGH	9.6	2.	10.2	
	N	52	56		
04 TANK AND CREW WEAPONS EMPLOYMENT	MEAN	8.3	1.	8.3	
	LOW	6.3	1.	6.3	
	HIGH	10.4	2.	20.8	
	N	54	56		
05 GENERAL MAINTENANCE PROCEDURES	MEAN	3.6	2.	7.2	
	LOW	2.9	1.	2.9	
	HIGH	4.4	2.	8.8	
	N	46	57		
06 HULL MAINTENANCE PROCEDURES	MEAN	2.9	1.	2.9	
	LOW	2.2	1.	2.2	
	HIGH	3.6	2.	7.2	
	N	54	56		
07 TURRET MAINTENANCE PROCEDURES	MEAN	4.6	2.	9.2	
	LOW	3.6	1.	3.6	
	HIGH	5.6	2.	11.2	
	N	54	56		
08 TANK RECOVERY PROCEDURES	MEAN	1.4	1.	1.4	
	LOW	1.4	1.	1.4	
	HIGH	2.1	1.	2.1	
	N	54	56		

COMMUNICATIONS

00 COMMUNICATIONS FOUO OPER AND MAINT

MEAN
LOW
HIGH
N

HOURS

FREQUENCY

YEAR
TOTAL
HOURS

2.1
1.4
2.4

1.
1.
57

010 COMMON MESSAGE HANDLING PROCEDURES

MEAN
LOW
HIGH
N

1.4
1.4
1.4
57

1.
1.
57

1.4
1.4
1.4

011 INTELLIGENCE AND SECURITY PROCEDURES

MEAN
LOW
HIGH
N

2.1
1.7
2.4
57

1.
1.
58

2.1
1.7
2.4

012 INDIVIDUAL NRC PROCEDURES

MEAN
LOW
HIGH
N

2.4
2.2
3.3
57

1.
1.
57

2.4
2.2
6.6

013 COLLECTIVE NRC PROCEDURES

MEAN
LOW
HIGH
N

2.4
2.0
2.4
56

1.
1.
58

2.4
2.0
2.4

014 FIRST-AID

MEAN
LOW
HIGH
N

1.9
1.6
2.2
54

1.
1.
55

1.9
1.4
2.2

015 LAND MINE WARFARE PROCEDURES

MEAN
LOW
HIGH
N

2.0
1.4
2.4
54

1.
1.
57

2.0
1.4
2.4

016 AIR READING

MEAN
LOW
HIGH
N

4.5
3.4
5.4
54

1.
1.
57

4.5
3.4
10.4

WINNERS/LOSERS

		HOURS	FREQUENCY	MEAN	LOW	HIGH	N	YRAN TOTAL HOURS
017 COMBAT SKILLS		4.0	1.					4.0
		2.9	1.					2.9
		5.0	2.					10.0
		50	54					
018 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT		3.6	1.					3.6
		2.9	1.					2.9
		4.4	1.					4.4
		54	56					
019 CREW SERVED WEAPONS MAINTENANCE		3.5	1.					3.5
		2.9	1.					2.9
		4.2	2.					8.4
		52	55					
TOTAL SUM OF PRODUCTS			72.7					
			51.1					
			129.5					

Summary

		HOURS	FREQUENCY	YEAR TOTAL HOURS
11 DRIVER MECHANICAL OPERATING PROCEDURES	MEAN	3.6	1.	3.6
	LOW	2.9	1.	2.9
	HIGH	4.3	2.	8.6
	N	51	57	
12 DRIVER TACTICAL OPERATING PROCEDURES	MEAN	4.3	2.	8.6
	LOW	3.5	1.	3.5
	HIGH	5.1	2.	10.2
	N	50	56	
13 GUNNERY PREPARATIONS	MEAN	5.5	1.	5.5
	LOW	3.4	1.	3.4
	HIGH	7.5	1.	7.5
	N	57	56	
14 TANK AND CPT 4 WEAPONS EMPLOYMENT	MEAN	5.4	1.	5.4
	LOW	3.7	1.	3.7
	HIGH	7.1	2.	14.2
	N	57	56	
15 GENERAL MAINTENANCE PROCEDURES	MEAN	4.0	2.	8.0
	LOW	3.0	1.	3.0
	HIGH	4.9	2.	9.8
	N	51	55	
16 MRL MAINTENANCE PROCEDURES	MEAN	3.9	2.	7.8
	LOW	2.9	2.	5.8
	HIGH	4.9	2.	9.8
	N	54	57	
17 TURRET MAINTENANCE PROCEDURES	MEAN	2.7	1.	2.7
	LOW	2.0	1.	2.0
	HIGH	3.4	2.	6.8
	N	56	54	
18 TANK RECOVERY PROCEDURES	MEAN	3.1	1.	3.1
	LOW	2.5	1.	2.5
	HIGH	3.7	2.	7.4
	N	56	57	

SUBJECTS		HOURS	FREQUENCY	YEAR	
				TOTAL	HOURS
00 COMMUNICATIONS FOUJIP OFFER AND MAINT	MEAN	2.0	1.	2.0	
	LOW	1.7	1.	1.7	
	HIGH	2.3	1.	2.3	
	N	58	58		
010 COMMON MESSAGE HANDLING PROCEDURES	MEAN	1.5	1.	1.5	
	LOW	1.3	1.	1.3	
	HIGH	1.7	1.	1.7	
	N	53	56		
011 INTELLIGENCE AND SECURITY PROCEDURES	MEAN	2.1	1.	2.1	
	LOW	1.6	1.	1.6	
	HIGH	2.5	1.	2.6	
	N	58	57		
012 INDIVIDUAL NRC PROCEDURES	MEAN	2.7	1.	2.7	
	LOW	2.2	1.	2.2	
	HIGH	3.2	1.	3.2	
	N	58	58		
013 COLLECTIVE NRC PROCEDURES	MEAN	2.2	1.	2.2	
	LOW	1.8	1.	1.8	
	HIGH	2.5	1.	2.5	
	N	58	58		
014 FIRST-AID	MEAN	1.9	1.	1.9	
	LOW	1.5	1.	1.5	
	HIGH	2.2	1.	2.2	
	N	55	55		
015 LAND MINE WARFARE PROCEDURES	MEAN	2.1	1.	2.1	
	LOW	1.7	1.	1.7	
	HIGH	2.5	1.	2.5	
	N	54	57		
016 MAP READING	MEAN	4.0	1.	4.0	
	LOW	3.1	1.	3.1	
	HIGH	5.0	2.	10.0	
	N	54	57		

DUTIES		HOURS	FREQUENCY	YEAR TOTAL HOURS
017 COMBAT SKILLS	MEAN	3.4	1.	3.4
	LOW	2.6	1.	2.6
	HIGH	4.2	1.	4.2
	N	55	55	
018 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT	MEAN	3.3	1.	3.3
	LOW	2.6	1.	2.6
	HIGH	4.1	1.	4.1
	N	56	56	
019 CREW SERVED WEAPONS MAINTENANCE	MEAN	2.7	1.	2.7
	LOW	2.2	1.	2.2
	HIGH	3.3	2.	6.6
	N	53	56	
TOTAL SUM OF PRODUCTS				
	MEAN		72.6	
	LOW		49.1	
	HIGH		116.2	
GRAND SUM OF PRODUCTS				
	MEAN		145.3	
	LOW		100.2	
	HIGH		245.7	

TABLE I-B. SFT JTT ADJUSTMENT TO SOLDIER'S MANUAL TASKS

15 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

15 WEEK NAT GRADUATES

CONDITIONS	MEAN LOW HIGH N	HOURS	FREQUENCY	YEAR TOTAL HOURS
1 DRIVER MECHANICAL OPERATING PROCEDURES	2.1 1.4 2.4 51	2.0 2.0 2.0 56	2.0 2.0 2.0 56	4.2 3.8 4.4
2 DRIVER TACTICAL OPERATING PROCEDURES	2.9 2.4 3.4 51	2.0 2.0 2.0 56	2.0 2.0 2.0 56	5.4 4.8 6.4
3 GUNNERY PREPARATIONS	7.4 5.9 9.8 52	2.0 2.0 2.0 56	2.0 2.0 2.0 56	15.6 11.8 19.2
4 TANK AND CREW WEAPONS EMPLOYMENT	8.3 6.3 10.4 54	2.0 2.0 2.0 56	2.0 2.0 2.0 56	16.6 12.6 20.8
5 GENERAL MAINTENANCE PROCEDURES	3.5 2.4 4.4 56	2.0 2.0 3.0 57	2.0 2.0 3.0 57	7.2 5.6 13.2
6 HULL MAINTENANCE PROCEDURES	2.9 2.2 3.6 55	2.0 2.0 2.0 56	2.0 2.0 2.0 56	5.8 4.4 7.2
7 TOWEL MAINTENANCE PROCEDURES	4.6 3.6 5.6 54	2.0 2.0 3.0 56	2.0 2.0 3.0 56	9.2 7.2 16.8
8 TASK RECOVERY PROCEDURES	1.4 1.4 2.1 55	1.0 1.0 2.0 55	1.0 1.0 2.0 55	1.8 1.6 4.2

GENERAL DUTIES

			HOURS	FREQUENCY	YEAR TOTAL HOURS
00 COMMUNICATIONS EQUIP OPER AND MAINT	MEAN		2.1	2.	4.2
	LOW		1.4	2.	3.6
	HIGH		2.4	2.	4.8
	N		57	57	
010 COMMON MESSAGE HANDLING PROCEDURES	MEAN		1.6	2.	3.2
	LOW		1.4	1.	1.4
	HIGH		1.8	2.	3.6
	N		55	57	
011 INTELLIGENCE AND SECURITY PROCEDURES	MEAN		2.1	2.	4.2
	LOW		1.7	2.	3.4
	HIGH		2.6	2.	4.2
	N		57	58	
012 INDIVIDUAL NHC PROCEDURES	MEAN		2.4	2.	4.8
	LOW		2.2	2.	4.4
	HIGH		3.3	2.	6.6
	N		57	57	
013 COLLECTIVE NHC PROCEDURES	MEAN		2.4	2.	4.8
	LOW		2.0	2.	4.0
	HIGH		2.9	2.	5.8
	N		56	58	
014 FIRST-AID	MEAN		1.9	1.	1.9
	LOW		1.6	1.	1.6
	HIGH		2.2	2.	4.4
	N		54	55	
015 LAND MINE WAREfare PROCEDURES	MEAN		2.0	1.	2.0
	LOW		1.6	1.	1.6
	HIGH		2.4	2.	4.8
	N		58	57	
016 G.P. READING	MEAN		4.5	2.	9.0
	LOW		3.6	2.	7.2
	HIGH		5.4	2.	10.8
	N		59	57	

GENERAL DATA				YEAR	
				TOTAL	HOURS
017 COMBAT SKILLS	MEAN	HOURS	FREQUENCY	4.0	
	LOW	4.0	2.	5.8	
	HIGH	2.9	2.	10.0	
	N	5.0	54		
018 INDIVIDUAL WEAPONS TRAIN AND EMPLOYMENT	MEAN	HOURS	FREQUENCY	7.2	
	LOW	3.6	2.	5.8	
	HIGH	2.9	2.	8.4	
	N	4.4	56		
019 CREW SERVED WEAPONS MAINTENANCE	MEAN	HOURS	FREQUENCY	7.0	
	LOW	3.5	2.	5.6	
	HIGH	2.9	2.	4.4	
	N	4.2	55		
TOTAL SUM OF PRODUCTS				123.3	
	MEAN			96.0	
	LOW			166.0	
	HIGH				

INSTRUCTORS

		MEAN	LOW	HIGH	N	HOURS	FREQUENCY	YEAR TOTAL HOURS
01 DRIVER MECHANICAL OPERATING PROCEDURES	MEAN	3.6					2.	7.2
	LOW	2.4					2.	4.8
	HIGH	4.3					2.	4.6
	N	53					57	
02 DRIVER TACTICAL OPERATING PROCEDURES	MEAN	4.3					2.	8.6
	LOW	3.5					2.	7.0
	HIGH	5.1					3.	15.3
	N	50					54	
03 GUNNERY PREPARATIONS	MEAN	5.5					2.	11.0
	LOW	3.4					2.	6.8
	HIGH	7.5					2.	15.0
	N	57					56	
04 TANK AND CREW EMPLOYMENT	MEAN	5.4					2.	10.8
	LOW	3.7					2.	7.4
	HIGH	7.1					2.	14.2
	N	57					56	
05 G. FRAI MAINTENANCE PROCEDURES	MEAN	4.7					2.	8.0
	LOW	3.0					2.	6.0
	HIGH	6.9					3.	14.7
	N	53					55	
06 HULL MAINTENANCE PROCEDURES	MEAN	3.9					3.	11.7
	LOW	2.9					2.	5.8
	HIGH	4.9					3.	14.7
	N	50					57	
07 TURRET MAINTENANCE PROCEDURES	MEAN	2.7					2.	5.4
	LOW	2.0					2.	4.0
	HIGH	3.4					2.	6.8
	N	56					54	
08 TANK RECOVERY PROCEDURES	MEAN	3.1					2.	6.2
	LOW	2.3					2.	4.6
	HIGH	3.7					2.	7.4
	N	56					57	

			HOURS	FREQUENCY	YEAR TOTAL HOURS
00 COMMUNICATIONS COUNCIL OPER AND MAINT	MEAN		2.1	2.	4.0
	LOW		1.7	1.	1.7
	HIGH	N	2.3	2.	4.6
			54		
10 COMMON MESSAGE HANDLING PROCEDURES	MEAN		1.5	2.	3.0
	LOW		1.3	1.	1.3
	HIGH	N	1.7	2.	3.4
			54		
11 INTELLIGENCE AND SECURITY PROCEDURES	MEAN		2.1	2.	4.2
	LOW		1.6	1.	1.6
	HIGH	N	2.6	2.	5.2
			54		
12 INDIVIDUAL NRC PROCEDURES	MEAN		2.7	2.	5.4
	LOW		2.2	2.	4.4
	HIGH	N	3.2	2.	6.4
			54		
13 COLLECTIVE NRC PROCEDURES	MEAN		2.2	2.	4.4
	LOW		1.4	1.	1.4
	HIGH	N	2.5	2.	5.0
			55		
14 FIRST-AID	MEAN		1.9	1.	1.9
	LOW		1.5	1.	1.5
	HIGH	N	2.2	2.	4.4
			55		
15 LAND VINE WARFARE PROCEDURES	MEAN		2.1	1.	2.1
	LOW		1.7	1.	1.7
	HIGH	N	2.5	2.	5.0
			54		
16 MAP READING	MEAN		4.0	2.	8.0
	LOW		3.1	2.	6.2
	HIGH	N	5.0	2.	10.0
			54		

ITEMS	MEAN	HOURS	FREQUENCY	YEAR TOTAL HOURS
17 COMBAT SKILLS	MEAN	3.4	2.	6.8
	LOW	2.6	2.	5.2
	HIGH	4.2	2.	4.4
	N	51	56	
18 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT	MEAN	3.3	2.	6.6
	LOW	2.6	2.	5.2
	HIGH	4.1	2.	4.2
	N	55	56	
19 CREW SERVED WEAPONS MAINTENANCE	MEAN	2.7	2.	5.4
	LOW	2.2	2.	4.4
	HIGH	3.3	2.	6.6
	N	53	56	
TOTAL SUM OF PRODUCTS	MEAN		120.7	
	LOW		82.8	
	HIGH		163.0	
	N			
GRADE SUM OF PRODUCTS	MEAN		244.0	
	LOW		178.8	
	HIGH		323.0	
	N			

TABLE I-C. SET III ADJUSTMENT TO SOLUTIONS MANUAL TASKS

20 PER CENT REPLACEMENT OF T O E STRENGTH PER QUARTER

15 WEEK DAY GRADUATES

CONDITION--

MINIMUM/ADJUSTERS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
1. DRIVER MECHANICAL OPERATING PROCEDURES	MEAN	2.1	2.	4.2
	LOW	1.4	2.	2.8
	HIGH	2.4	3.	7.2
	N	53	56	
2. DRIVER TACTICAL OPERATING PROCEDURES	MEAN	2.9	3.	8.7
	LOW	2.4	2.	4.8
	HIGH	3.4	3.	10.2
	N	51	56	
3. GUNNERY PREPARATIONS	MEAN	7.8	3.	23.4
	LOW	5.9	2.	11.8
	HIGH	9.6	3.	28.8
	N	52	56	
4. TASK AND CREW EMPLOYMENT	MEAN	8.3	3.	24.9
	LOW	6.3	2.	12.6
	HIGH	10.4	3.	31.2
	N	54	56	
5. GENERAL MAINTENANCE PROCEDURES	MEAN	3.6	3.	10.8
	LOW	2.4	3.	7.2
	HIGH	4.4	4.	17.6
	N	56	57	
6. HULL MAINTENANCE PROCEDURES	MEAN	2.4	3.	7.2
	LOW	2.2	2.	4.4
	HIGH	3.6	3.	10.8
	N	55	56	
7. TOW-BIT MAINTENANCE PROCEDURES	MEAN	4.6	3.	13.8
	LOW	3.6	3.	10.8
	HIGH	5.6	4.	22.4
	N	54	56	
8. TASK RECOVERY PROCEDURES	MEAN	1.4	2.	2.8
	LOW	1.4	2.	2.8
	HIGH	2.1	2.	4.2
	N	55	56	

CIPHER/NAIDS

YEAR
TOTAL
HOURS

FREQUENCY

HOURS

01 COMMUNICATIONS
EQUIP OPER AND MAINT

MEAN
LOW
HIGH
N

2.1
1.4
2.4
57

2.0
2.0
3.0
57

4.2
3.6
7.2

02 COMMON MESSAGE
HANDLING PROCEDURES

MEAN
LOW
HIGH
N

1.6
1.4
1.4
55

2.0
2.0
3.0
57

3.2
2.4
5.4

03 INTELLIGENCE AND
SECURITY PROCEDURES

MEAN
LOW
HIGH
N

2.1
1.7
2.6
57

2.0
2.0
3.0
54

4.2
3.4
7.4

04 INDIVIDUAL NRC
PROCEDURES

MEAN
LOW
HIGH
N

4.4
4.0
5.6
57

2.0
1.0
2.0
57

9.6
4.0
11.2

05 COLLECTIVE NRC
PROCEDURES

MEAN
LOW
HIGH
N

2.4
2.0
2.4
54

2.0
2.0
3.0
54

4.4
4.0
9.4

06 FIRST-AID

MEAN
LOW
HIGH
N

1.9
1.4
2.2
54

2.0
2.0
2.0
55

3.4
3.2
4.4

07 FUND TIME WARFARE
PROCEDURES

MEAN
LOW
HIGH
N

2.0
1.4
2.4
54

2.0
2.0
2.0
57

4.0
3.2
4.4

08 B B B B B B B B

MEAN
LOW
HIGH
N

4.4
3.6
5.4
54

3.0
2.0
3.0
57

13.2
7.2
16.2

COMBAT/MAINT

	MEAN	HOURS	FREQUENCY	YEAR TOTAL HOURS
17 COMBAT SKILLS	LOW	4.0	3.	12.0
	HIGH	2.0	2.	5.0
	N	5.0	3.	15.0
		50	54	
14 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT	MEAN	3.0	3.	10.0
	LOW	2.0	2.	5.0
	HIGH	4.0	3.	13.0
	N	54	56	
14 CREW SERVED WEAPONS MAINTENANCE	MEAN	3.0	3.	10.0
	LOW	2.0	2.	5.0
	HIGH	4.0	3.	13.0
	N	52	55	
TOTAL SUM OF PRODUCTS	MEAN		178.7	
	LOW		108.2	
	HIGH		238.6	

10. TOWERS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
1 DRIVER MECHANICAL OPERATING PROCEDURES	MEAN	3.6	3.	10.8
	LOW	2.9	2.	5.8
	HIGH	4.3	3.	12.9
	N	53	57	
2 DRIVER TACTICAL OPERATING PROCEDURES	MEAN	4.3	3.	12.9
	LOW	3.5	3.	10.5
	HIGH	5.1	4.	20.4
	N	50	56	
3 GUNNERY PREPARATIONS	MEAN	5.5	2.	11.0
	LOW	3.4	2.	6.8
	HIGH	7.5	3.	22.5
	N	57	56	
4 TANK AND CREW WEAPONS EMPLOYMENT	MEAN	5.4	3.	16.2
	LOW	3.7	2.	7.4
	HIGH	7.1	3.	21.3
	N	57	56	
5 GENERAL MAINTENANCE PROCEDURES	MEAN	4.0	3.	12.0
	LOW	3.0	3.	9.0
	HIGH	4.9	4.	19.6
	N	53	55	
6 HULL MAINTENANCE PROCEDURES	MEAN	3.9	4.	15.6
	LOW	2.9	3.	8.7
	HIGH	4.9	4.	19.6
	N	54	57	
7 TURRET MAINTENANCE PROCEDURES	MEAN	2.7	3.	8.1
	LOW	2.0	2.	4.0
	HIGH	3.4	3.	10.2
	N	56	58	
8 TANK RECOVERY PROCEDURES	MEAN	3.1	3.	9.3
	LOW	2.5	2.	5.0
	HIGH	3.7	3.	11.1
	N	56	57	

DUTIES	HOURS			FREQUENCY	YEAR TOTAL HOURS
	MEAN	LOW	HIGH		
01 COMMUNICATIONS EQUIP OPER AND MAINT	2.0	1.7	2.3	2.	4.0
				2.	3.4
				2.	4.6
	N			58	
010 COMMUN MESSAGE HANDLING PROCEDURES	1.5	1.3	1.7	2.	3.0
				2.	2.6
				2.	3.4
	N			56	
011 INTELLIGENCE AND SECURITY PROCEDURES	2.1	1.6	2.6	2.	4.2
				2.	3.2
				2.	5.2
	N			57	
012 INDIVIDUAL NMC PROCEDURES	2.7	2.2	3.2	3.	8.1
				2.	4.4
				3.	0.6
	N			58	
013 COLLECTIVE NMC PROCEDURES	2.2	1.4	2.4	2.	4.4
				2.	3.6
				3.	7.5
	N			54	
014 FIRST-AID	1.0	1.4	2.2	2.	3.4
				2.	3.0
				2.	4.4
	N			55	
015 LAND MINE WARFARE PROCEDURES	2.1	1.7	2.4	2.	4.2
				2.	3.4
				2.	5.0
	N			57	
016 MAP READING	4.0	3.1	5.0	3.	12.0
				2.	6.2
				3.	15.0
	N			57	

DUTIES		HOURS	FREQUENCY	YEAR	
				TOTAL	HOURS
17 COMBAT SKILLS	MEAN	3.4	3.	10.2	
	LOW	2.6	2.	5.2	
	HIGH	4.2	3.	12.6	
	N	51	55		
18 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT	MEAN	3.3	2.	6.6	
	LOW	2.6	2.	5.2	
	HIGH	4.1	3.	12.3	
	N	55	56		
19 CREW SERVED WEAPONS MAINTENANCE	MEAN	2.7	3.	8.1	
	LOW	2.2	2.	4.4	
	HIGH	3.3	3.	9.9	
	N	51	56		
TOTAL SUM OF PRODUCTS		MEAN	164.5		
		LOW	101.8		
		HIGH	227.1		
GRAND SUM OF PRODUCTS		MEAN	343.2		
		LOW	210.0		
		HIGH	465.7		

TABLE I-D. SFT III ADJUSTMENT TO SOLIDIFIED MANUAL TASKS

CONDITION--	10 PER CENT REPLACEMENT OF T O E STRENGTH PER QUARTER			
	14 WEEK RAT GRADUATES			YEAR TOTAL HOURS
	HOURS	FREQUENCY		
GENERAL DUTIES				
OPERATING PROCEDURES 11 DRIVER MECHANICAL	HIGH	2.4	2.	4.8
	LOW	1.4	2.	3.6
	MEAN	2.1	2.	4.2
	N	51	56	
OPERATING PROCEDURES 12 DRIVER TACTICAL	HIGH	3.4	2.	6.8
	LOW	2.4	2.	4.8
	MEAN	2.9	2.	5.8
	N	51	56	
PREPARATIONS 13 GUNFIRE	HIGH	9.6	3.	28.8
	LOW	5.9	2.	11.8
	MEAN	7.8	2.	15.6
	N	52	56	
LEADERS EMPLOYMENT 14 TANK AND CREW	HIGH	10.4	3.	31.2
	LOW	6.3	2.	12.6
	MEAN	8.3	2.	16.6
	N	54	56	
PROCEDURES 15 GENERAL MAINTENANCE	HIGH	4.4	3.	13.2
	LOW	2.4	2.	5.6
	MEAN	3.6	3.	10.8
	N	54	57	
PROCEDURES 16 MILE MAINTENANCE	HIGH	3.6	3.	10.8
	LOW	2.2	2.	4.4
	MEAN	2.9	2.	5.4
	N	55	56	
PROCEDURES 17 TURRET MAINTENANCE	HIGH	5.6	3.	16.8
	LOW	3.6	2.	7.2
	MEAN	4.6	3.	13.8
	N	54	56	
PROCEDURES 18 TANK RECOVERY	HIGH	2.1	2.	4.2
	LOW	1.6	1.	1.6
	MEAN	1.8	1.	1.8
	N	55	55	

GENERAL/OTHERS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
EQUIP OPER AND MAINT BY COMMUNICATIONS	HIGH	2.4	2.	4.8
	LOW	1.4	2.	2.8
	MEAN	2.1	2.	4.2
	N	52	57	
HANDLING PROCEDURES OTO COMMUN MESSAGE	HIGH	1.4	2.	2.8
	LOW	1.4	1.	1.4
	MEAN	1.6	2.	3.2
	N	55	57	
SECURITY PROCEDURES ALL INTELLIGENCE AND	HIGH	2.6	2.	5.2
	LOW	1.7	2.	3.4
	MEAN	2.1	2.	4.2
	N	57	58	
PROCEDURES VIA INDIVIDUAL NHC	HIGH	5.6	1.	5.6
	LOW	4.9	1.	4.9
	MEAN	4.8	1.	4.8
	N	57	57	
PROCEDURES VIA COLLECTIVE NHC	HIGH	2.4	2.	4.8
	LOW	2.0	2.	4.0
	MEAN	2.4	2.	4.8
	N	56	58	
VIA FIRST-aid	HIGH	2.2	2.	4.4
	LOW	1.6	1.	1.6
	MEAN	1.9	1.	1.9
	N	54	55	
PROCEDURES VIA LAND LINE WAREARE	HIGH	2.4	2.	4.8
	LOW	1.6	1.	1.6
	MEAN	2.0	1.	2.0
	N	54	57	
VIA AIR ROUTING	HIGH	5.6	3.	16.8
	LOW	3.6	2.	7.2
	MEAN	4.5	2.	9.0
	N	54	57	

DISPERSED

	HOURS	FREQUENCY	YEAR TOTAL HOURS
117 COMBAT SKILLS			
HIGH	5.0	3.	15.0
LOW	2.0	2.	5.0
MEAN	4.0	54	8.0
	N		
4416 AND EMPLOYMENT			
HIGH	4.4	2.	8.8
LOW	2.0	2.	5.0
MEAN	3.4	54	7.2
	N		
4416 MAINTENANCE			
HIGH	4.2	3.	12.6
LOW	2.0	2.	5.0
MEAN	3.4	54	7.0
	N		
TOTAL SUM OF PRODUCTS			
MEAN		123.7	
LOW		95.4	
HIGH		203.9	

FACTORS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES IN DRIVER MECHANICAL	HIGH	4.3	3.	12.9
	LOW	2.9	2.	5.8
	MEAN	3.6	2.	7.2
	N	51	57	
OPERATING PROCEDURES IN DRIVER TACTICAL	HIGH	5.1	3.	15.3
	LOW	3.5	2.	7.0
	MEAN	4.3	3.	12.9
	N	50	56	
PREPARATIONS IN GUNNERY	HIGH	7.5	2.	15.0
	LOW	3.4	2.	6.8
	MEAN	5.5	2.	11.0
	N	57	56	
WEAPONS EMPLOYMENT IN TANK AND CREW	HIGH	7.1	3.	21.3
	LOW	3.7	2.	7.4
	MEAN	5.4	2.	10.4
	N	57	56	
PROCEDURES IN GENERAL MAINTENANCE	HIGH	4.9	3.	14.7
	LOW	3.0	2.	6.0
	MEAN	4.0	3.	12.0
	N	53	55	
PROCEDURES IN HULL MAINTENANCE	HIGH	4.9	4.	19.6
	LOW	2.9	3.	8.7
	MEAN	3.9	3.	11.7
	N	54	57	
PROCEDURES IN TIRE RET. MAINTENANCE	HIGH	3.4	3.	10.2
	LOW	2.7	2.	4.0
	MEAN	2.7	2.	5.4
	N	56	58	
PROCEDURES IN TANK RECOVERY	HIGH	3.7	3.	11.1
	LOW	2.7	2.	5.0
	MEAN	3.1	2.	6.2
	N	56	57	

D-TWERS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
GROUP OPER AND MAINT COMMUNICATIONS	HIGH	2.3	2.	4.6
	LOW	1.7	1.	1.7
	MEAN	2.0	2.	4.0
	N	55	54	
HANDLING PROCEDURES TO COMMON MESSAGE	HIGH	1.7	2.	3.4
	LOW	1.3	1.	1.3
	MEAN	1.5	2.	3.0
	N	53	56	
SECURITY PROCEDURES ALL INTELLIGENCE AND	HIGH	2.6	2.	5.2
	LOW	1.6	1.	1.6
	MEAN	2.1	2.	4.2
	N	53	57	
PROCEDURES 112 INDIVIDUAL NRC	HIGH	3.2	2.	6.4
	LOW	2.2	2.	4.4
	MEAN	2.7	2.	5.4
	N	54	54	
PROCEDURES 113 COLLECTIVE NRC	HIGH	2.5	2.	5.0
	LOW	1.4	1.	1.4
	MEAN	2.2	2.	4.4
	N	55	54	
114 FIRST-ATO	HIGH	2.2	2.	4.4
	LOW	1.5	1.	1.5
	MEAN	1.9	1.	1.9
	N	55	55	
PROCEDURES 115 1 AND 4500 VAREADE	HIGH	2.5	2.	5.0
	LOW	1.7	1.	1.7
	MEAN	2.1	1.	2.1
	N	54	57	
116 110 READING	HIGH	5.0	3.	15.0
	LOW	3.1	2.	6.2
	MEAN	4.0	2.	8.0
	N	54	57	

CATEGORIES	HOURS	FREQUENCY	YEAR TOTAL HOURS
17 COMBAT SKILLS	HIGH	20	804
	LOW	20	502
	MEAN	20	608
	N	55	
MAINT AND EMPLOYMENT FOR INDIVIDUAL WEAPONS	HIGH	20	402
	LOW	20	502
	MEAN	20	608
	N	56	
WEAPONS MAINTENANCE AND CREW SERVED	HIGH	30	909
	LOW	20	404
	MEAN	20	504
	N	56	
TOTAL SUM OF PRODUCTS	MEAN	130.6	
	LOW	85.7	
	HIGH	195.6	
GRADE SUM OF PRODUCTS	MEAN	249.7	
	LOW	181.3	
	HIGH	398.8	

TABLE I-E. SET III ADJUSTMENT TO SOLDIER'S MANUAL TASKS

15 PER CENT DEPLACEMENT OF TOTAL STRENGTH PER QUARTER

14 WEEK DATA COORDINATES

CONDITION	HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATIONS SOLDIER'S A. DRIVER OF CHANTAL	HIGH LOW MEAN N	3. 2. 2. 56	7.2 3.6 4.2
OPERATIONS SOLDIER'S B. DRIVER TACTICAL	HIGH LOW MEAN N	3. 2. 3. 56	10.2 4.4 4.7
OPERATIONS SOLDIER'S C. GUNNERY	HIGH LOW MEAN N	4. 2. 3. 56	39.4 11.8 23.4
OPERATIONS SOLDIER'S D. TANK AND CFW	HIGH LOW MEAN N	4. 2. 3. 56	41.6 12.6 24.4
OPERATIONS SOLDIER'S E. G. FRAI MAINTENANCE	HIGH LOW MEAN N	4. 3. 4. 57	17.6 4.4 14.4
OPERATIONS SOLDIER'S F. HILL MAINTENANCE	HIGH LOW MEAN N	4. 2. 3. 56	14.4 4.4 4.7
OPERATIONS SOLDIER'S G. TANK MAINTENANCE	HIGH LOW MEAN N	4. 3. 4. 56	22.4 10.4 14.4
OPERATIONS SOLDIER'S H. TANK MAINTENANCE	HIGH LOW MEAN N	2. 2. 2. 56	4.2 3.2 3.6

GUNNER/DRIVERS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
EQUIP OPEL AND MAINT AND COMMUNICATIONS	HIGH	2.9	3.	7.2
	LOW	1.9	2.	3.6
	MEAN	2.1	2.	4.2
	N	52	57	
HANDLING PROCEDURES AND COMMUN MESSAGE	HIGH	1.4	3.	5.4
	LOW	1.4	2.	2.4
	MEAN	1.4	2.	3.2
	N	55	57	
SECURITY PROCEDURES AND INTELLIGENCE AND	HIGH	2.4	3.	7.8
	LOW	1.7	2.	3.4
	MEAN	2.1	2.	4.2
	N	57	58	
PROCEDURES AND INDIVIDUAL NHC	HIGH	5.6	2.	11.2
	LOW	4.0	1.	4.0
	MEAN	4.8	2.	9.6
	N	57	57	
PROCEDURES AND COLLECTIVE NHC	HIGH	2.4	3.	8.4
	LOW	2.0	2.	4.0
	MEAN	2.4	2.	4.4
	N	56	58	
ATA FIRST-ATO	HIGH	2.2	2.	4.4
	LOW	1.4	2.	3.2
	MEAN	1.9	2.	3.8
	N	54	55	
PROCEDURES AND LAND MINE WARNING	HIGH	2.4	2.	4.8
	LOW	1.4	2.	3.2
	MEAN	2.0	2.	4.0
	N	54	57	
ATA UP WARNING	HIGH	5.4	4.	21.6
	LOW	3.4	2.	7.2
	MEAN	4.4	3.	13.5
	N	54	57	

REQUIREMENTS		HOURS		FREQUENCY		YEAR TOTAL HOURS	
17 COMBAT SQUADS	HIGH	5.0	4.	4.	20.0		
	LOW	2.9	2.	2.	5.8		
	MEAN	4.0	3.	3.	12.0		
	N	50	54				
WEAPON AND EQUIPMENT FOR 1 DIVISIONAL WEAPONS	HIGH	4.4	3.	3.	13.2		
	LOW	2.9	2.	2.	5.8		
	MEAN	3.5	3.	3.	10.4		
	N	54	56				
WEAPONS MAINTENANCE TO CREW SERVED	HIGH	4.2	4.	4.	16.8		
	LOW	2.4	2.	2.	5.6		
	MEAN	3.5	3.	3.	10.5		
	N	52	55				
TOTAL SUM OF PRODUCTS		MEAN	176.4				
		LOW	108.2				
		HIGH	276.8				

		HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES 1 DRIVER MECHANICAL	HIGH	4.3	4.	17.2
	LOW	2.9	2.	6.8
	MEAN	3.6	3.	19.8
	N	53	57	
OPERATING PROCEDURES 2 DRIVER TACTICAL	HIGH	5.1	4.	20.4
	LOW	3.5	3.	10.5
	MEAN	4.3	4.	17.2
	N	50	56	
PREPARATIONS 3A GUNFIRE	HIGH	7.5	3.	22.5
	LOW	3.4	2.	6.8
	MEAN	5.5	2.	11.0
	N	57	56	
LOADS EMPLOYMENT 3B TANK AND CREEP	HIGH	7.1	4.	28.4
	LOW	3.7	2.	7.4
	MEAN	5.4	3.	14.2
	N	57	56	
PROCEDURES 4 GENERAL MAINTENANCE	HIGH	4.9	4.	19.6
	LOW	3.0	3.	9.0
	MEAN	4.0	4.	16.0
	N	53	55	
PROCEDURES 5 WHEEL MAINTENANCE	HIGH	4.9	5.	24.5
	LOW	2.9	4.	11.6
	MEAN	3.9	4.	15.6
	N	54	57	
PROCEDURES 7 TURRET MAINTENANCE	HIGH	3.4	4.	13.6
	LOW	2.0	2.	6.0
	MEAN	2.7	3.	8.1
	N	55	54	
PROCEDURES 8 TANK RECOVERY	HIGH	3.7	4.	14.8
	LOW	2.5	2.	5.0
	MEAN	3.1	3.	9.3
	N	56	57	

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POST OFFICE	GROUPS	NUMBER OF OFFICERS	YEAR TOTAL HOURS
COMMUNITY OPERATIONS COMMUNICATION	HIGH	2.3	4.6
	LOW	1.7	3.4
	MEAN	2.0	4.0
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	1.7	3.4
	LOW	1.3	2.6
	MEAN	1.5	3.0
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	2.6	5.2
	LOW	1.6	3.2
	MEAN	2.1	4.2
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	3.2	9.6
	LOW	2.2	6.6
	MEAN	2.7	9.1
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	2.5	7.5
	LOW	1.4	3.6
	MEAN	2.2	4.4
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	2.2	4.4
	LOW	1.5	3.0
	MEAN	1.9	3.8
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	2.5	5.0
	LOW	1.7	3.4
	MEAN	2.1	4.2
COMMUNITY OPERATIONS COMMUNICATION	N	54	
COMMUNITY OPERATIONS COMMUNICATION	HIGH	5.0	20.0
	LOW	3.1	6.2
	MEAN	4.0	12.0
COMMUNITY OPERATIONS COMMUNICATION	N	54	

		HOURS	FREQUENCY	YEAR TOTAL HOURS
COMBAT SKILLS	HIGH	4.2	3.	12.6
	LOW	2.6	2.	5.2
	MEAN	3.4	3.	10.2
	N	51	55	
MAINT AND EMPLOYMENT OF INDIVIDUAL WEAPONS	HIGH	4.1	3.	12.3
	LOW	2.6	2.	5.2
	MEAN	3.3	2.	6.6
	N	55	56	
WEAPONS MAINTENANCE BY CREW SERVED	HIGH	3.3	4.	13.2
	LOW	2.2	2.	4.4
	MEAN	2.7	3.	8.1
	N	53	56	
TOTAL SUM OF PRODUCTS	MEAN		175.2	
	LOW		104.7	
	HIGH		258.8	
GRADE SUM OF PRODUCTS	MEAN		359.7	
	LOW		212.9	
	HIGH		535.6	

TABLE 1. GET IT AT DISTANCE TO SOLICITOUS MANUAL TASKS

20 PER CENT DEPLACEMENT OF T O F STUDENT PER QUARTER

14 WEEK DAY GRADUATES

COURSE/GRADUATES	HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES 1 DRIVER MECHANICAL	HIGH	4.	9.6
	LOW	3.	5.4
	MEAN	3.	6.3
	N	56	
OPERATING PROCEDURES 2 DRIVER TACTICAL	HIGH	4.	13.6
	LOW	3.	7.2
	MEAN	4.	11.6
	N	56	
PREPARATIONS 1 GUNNERY	HIGH	4.	34.4
	LOW	3.	17.7
	MEAN	4.	31.2
	N	56	
OPERATING PROCEDURES 2 TASK AND CREW	HIGH	4.	41.6
	LOW	3.	14.9
	MEAN	4.	33.2
	N	56	
OPERATING PROCEDURES 3 GUNNERY MAINTENANCE	HIGH	5.	22.0
	LOW	4.	11.2
	MEAN	4.	14.4
	N	57	
OPERATING PROCEDURES 4 GUNNERY MAINTENANCE	HIGH	4.	14.4
	LOW	3.	6.6
	MEAN	4.	11.6
	N	56	
OPERATING PROCEDURES 5 TOWNET MAINTENANCE	HIGH	5.	24.0
	LOW	4.	14.4
	MEAN	4.	14.4
	N	56	
OPERATING PROCEDURES 6 TASK RECOVERY	HIGH	3.	6.3
	LOW	2.	3.2
	MEAN	2.	3.6
	N	55	

CONNER/JOHNS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
EQUIP OPER AND MAINT AND COMMUNICATIONS	HIGH	2.4	4.	9.6
	LOW	1.8	3.	5.4
	MEAN	2.1	3.	6.3
	N	52		
HANDLING PROCEDURES AND COMMUNICATIONS	HIGH	1.8	4.	7.2
	LOW	1.4	2.	2.8
	MEAN	1.6	3.	4.8
	N	55	57	
SECURITY PROCEDURES AND INTELLIGENCE AND	HIGH	2.6	4.	10.4
	LOW	1.7	3.	5.1
	MEAN	2.1	3.	6.3
	N	57	58	
PROCEDURES AND INDIVIDUAL NRC	HIGH	5.6	2.	11.2
	LOW	4.0	1.	4.0
	MEAN	4.8	2.	9.6
	N	57	57	
PROCEDURES AND COLLECTIVE NRC	HIGH	2.8	4.	11.2
	LOW	2.0	3.	6.0
	MEAN	2.4	3.	7.2
	N	56	54	
AS FIRST-ADJ	HIGH	2.2	3.	6.6
	LOW	1.5	2.	3.2
	MEAN	1.9	2.	3.8
	N	54	55	
PROCEDURES AND LAND MINE MAINTENANCE	HIGH	2.4	3.	7.2
	LOW	1.6	2.	3.2
	MEAN	2.0	2.	4.0
	N	58	57	
AS TOP READING	HIGH	5.4	4.	21.6
	LOW	3.6	3.	10.8
	MEAN	4.5	4.	18.0
	N	54	57	

CUMULATIVE HOURS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
PIZ CORRECT SKILLS	HIGH	5.0	4.	20.0
	LOW	2.9	3.	8.7
	MEAN	4.0	4.	16.0
	N	50	56	
MAINT AND EMPLOYMENT ON INDIVIDUAL WEAPONS	HIGH	4.4	4.	17.6
	LOW	2.9	3.	8.7
	MEAN	3.6	4.	14.4
	N	54	56	
WEAPONS MAINTENANCE TO CREW SERVED	HIGH	4.2	4.	16.8
	LOW	2.8	3.	8.4
	MEAN	3.5	4.	14.0
	N	52	55	
TOTAL SUM OF PRODUCTS	MEAN		220.7	
	LOW		150.9	
	HIGH		313.3	

NOTES

		HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES 1) DRIVER MECHANICAL	HIGH	4.4	4.	17.2
	LOW	2.9	3.	8.7
	MEAN	3.6	4.	14.4
	N	54	57	
OPERATING PROCEDURES 2) DRIVER TACTICAL	HIGH	5.1	5.	25.5
	LOW	3.5	4.	14.0
	MEAN	4.3	4.	17.2
	N	50	56	
PREPARATIONS 3) GUNFIRE	HIGH	7.5	4.	30.0
	LOW	3.4	3.	10.2
	MEAN	5.5	3.	16.5
	N	57	56	
READY'S EMPLOYMENT 4) TANK AND CREW	HIGH	7.1	4.	28.4
	LOW	3.7	3.	11.1
	MEAN	5.4	4.	21.6
	N	57	56	
PROCEDURES 5) GENERAL MAINTENANCE	HIGH	4.9	5.	24.5
	LOW	3.0	4.	12.0
	MEAN	4.0	4.	16.0
	N	53	55	
PROCEDURES 6) HULL MAINTENANCE	HIGH	4.9	6.	29.4
	LOW	2.9	4.	11.6
	MEAN	3.9	5.	19.5
	N	54	57	
PROCEDURES 7) TURRET MAINTENANCE	HIGH	3.4	4.	13.6
	LOW	2.0	3.	6.0
	MEAN	2.7	4.	10.8
	N	56	58	
PROCEDURES 8) TANK RECOVERY	HIGH	3.7	4.	14.8
	LOW	2.4	3.	7.5
	MEAN	3.1	4.	12.4
	N	56	57	

ROUTINES

		HOURS	FREQUENCY	YEAR TOTAL HOURS
ROUTING PROCEDURES 10 COMMUNICATIONS	HIGH	2.3	3.	6.9
	LOW	1.7	2.	3.4
	MEAN	2.0	3.	6.0
	N	55	58	
HANDLING PROCEDURES 10 COMMUNICATIONS	HIGH	1.7	3.	5.1
	LOW	1.3	2.	2.6
	MEAN	1.5	3.	4.5
	N	53	56	
SECURITY PROCEDURES 11 INTELLIGENCE AND	HIGH	2.6	3.	7.8
	LOW	1.6	2.	3.2
	MEAN	2.1	3.	6.3
	N	58	57	
PROCEDURES 12 INDIVIDUAL NRC	HIGH	3.2	4.	12.8
	LOW	2.2	3.	6.6
	MEAN	2.7	4.	10.8
	N	58	58	
PROCEDURES 13 COLLECTIVE NRC	HIGH	2.5	4.	10.0
	LOW	1.8	2.	3.6
	MEAN	2.2	3.	6.6
	N	55	58	
14 FIRST-AID	HIGH	2.2	3.	6.6
	LOW	1.5	2.	3.0
	MEAN	1.9	2.	3.8
	N	55	55	
PROCEDURES 15 LAND MINE APPARE	HIGH	2.5	3.	7.5
	LOW	1.7	2.	3.4
	MEAN	2.1	2.	4.2
	N	54	57	
16 MAP READING	HIGH	5.0	4.	20.0
	LOW	3.1	3.	9.3
	MEAN	4.0	4.	16.0
	N	54	57	

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	HOURS	FREQUENCY	YEAR TOTAL HOURS
017 COMBAT SKILLS	HIGH	4.2	14.8
	LOW	2.6	7.8
	MEAN	3.4	13.6
	N	51	
MAINT AND EMPLOYMENT 018 INDIVIDUAL WEAPONS	HIGH	4.1	14.4
	LOW	2.6	7.8
	MEAN	3.3	9.9
	N	56	
WEAPONS MAINTENANCE 019 CREW SERVED	HIGH	3.3	13.2
	LOW	2.2	6.6
	MEAN	2.7	17.8
	N	53	
TOTAL SUM OF PRODUCTS	MEAN	224.1	
	LOW	138.4	
	HIGH	306.5	
GRADE SUM OF PRODUCTS	MEAN	455.6	
	LOW	249.3	
	HIGH	619.0	

TABLE I-G. SET III ADJUSTMENT TO SOLDIER'S MANUAL TASKS

10 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

CONDITION--

12 WEEK RAT GRADUATES

GUNNER/GRADUATES

		HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES OF DRIVER MECHANICAL	HIGH	2.4	3.	7.2
	LOW	1.4	3.	5.4
	MEAN	2.1	3.	6.3
	N	53	56	
OPERATING PROCEDURES OF DRIVER TACTICAL	HIGH	3.4	3.	10.2
	LOW	2.4	3.	7.2
	MEAN	2.9	3.	8.7
	N	51	56	
PREPARATIONS OF GUNFIRE	HIGH	9.4	4.	34.4
	LOW	5.9	3.	17.7
	MEAN	7.4	3.	23.4
	N	52	56	
WEAPONS EMPLOYMENT ON TASK AND CREW	HIGH	10.4	4.	41.6
	LOW	6.3	3.	18.9
	MEAN	8.1	3.	28.9
	N	54	56	
PROCEDURES OF GENERAL MAINTENANCE	HIGH	4.4	5.	22.0
	LOW	2.4	3.	14.4
	MEAN	3.6	4.	14.4
	N	56	57	
PROCEDURES OF HULL MAINTENANCE	HIGH	3.6	4.	14.4
	LOW	2.2	3.	6.6
	MEAN	2.9	3.	8.7
	N	55	56	
PROCEDURES OF TURRET ATTENDANCE	HIGH	5.4	5.	24.0
	LOW	3.6	3.	10.8
	MEAN	4.6	4.	14.4
	N	54	56	
PROCEDURES OF TANK RECOVERY	HIGH	2.1	3.	6.3
	LOW	1.4	2.	3.2
	MEAN	1.4	2.	3.6
	N	55	55	

ENGINEERS/OPERATORS

GROUP OPER AND MAINT COMMUNICATIONS

HANDLING PROCEDURES IN COMMON MESSAGE

SECURITY PROCEDURES IN INTELLIGENCE AND

PROCEDURES IN INDIVIDUAL NRC

PROCEDURES IN COLLECTIVE NRC

IN FIRST-AID

PROCEDURES IN LAND LINE MESSAGE

IN P READING

	HOURS	FREQUENCY	YEAR TOTAL HOURS
HIGH	2.4	3.	7.2
LOW	1.4	3.	5.4
MEAN	2.1	3.	6.3
N	57	57	
HIGH	1.4	3.	5.4
LOW	1.4	2.	2.8
MEAN	1.4	3.	4.8
N	55	57	
HIGH	2.4	3.	7.8
LOW	1.7	3.	5.1
MEAN	2.1	3.	6.3
N	57	58	
HIGH	5.6	2.	11.2
LOW	4.0	1.	4.0
MEAN	4.4	2.	9.6
N	57	57	
HIGH	2.4	3.	9.4
LOW	2.0	3.	6.0
MEAN	2.4	3.	7.2
N	56	58	
HIGH	2.2	3.	6.6
LOW	1.4	2.	3.2
MEAN	1.9	2.	3.8
N	54	55	
HIGH	2.4	3.	7.2
LOW	1.4	2.	3.2
MEAN	2.0	2.	4.0
N	58	57	
HIGH	5.4	4.	21.6
LOW	3.4	3.	10.8
MEAN	4.4	3.	13.5
N	54	57	

GUINNESS/RAIFDS

	HIGH	LOW	MEAN	N	HOURS	FREQUENCY	YEAR TOTAL HOURS
017 COMBAT SKILLS							
	HIGH	LOW	MEAN	N	5.0	4.	20.0
					2.9	3.	8.7
					4.0	3.	12.0
					50	56	
018 MAINT AND EMPLOYMENT VIA INDIVIDUAL WEAPONS							
	HIGH	LOW	MEAN	N	4.4	3.	13.2
					2.9	3.	8.7
					3.5	3.	10.5
					54	56	
019 WEAPONS MAINTENANCE VIA CREW SQUAD							
	HIGH	LOW	MEAN	N	4.2	4.	16.8
					2.4	3.	8.4
					3.5	3.	10.5
					52	55	
TOTAL SUM OF PRODUCTS							
	MEAN					186.7	
	LOW					144.5	
	HIGH					203.5	

NOTES

		HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES A DIVER MECHANICAL	HIGH	4.3	4.	17.2
	LOW	2.9	3.	8.7
	MEAN	3.6	3.	10.8
	N	51	57	
OPERATING PROCEDURES A DIVER TACTICAL	HIGH	5.1	5.	25.5
	LOW	3.5	3.	10.5
	MEAN	4.3	4.	17.2
	N	50	56	
OPERATIONS A GUNNERY	HIGH	7.5	3.	22.5
	LOW	3.4	3.	10.2
	MEAN	5.5	3.	16.5
	N	57	56	
OPERATIONS A TASK AND CREW	HIGH	7.1	4.	28.4
	LOW	3.7	3.	11.1
	MEAN	5.4	3.	16.2
	N	57	56	
OPERATIONS A GENERAL MAINTENANCE	HIGH	4.9	5.	24.5
	LOW	3.0	3.	9.0
	MEAN	4.0	4.	16.0
	N	53	55	
OPERATIONS A MAINTENANCE	HIGH	4.9	5.	24.5
	LOW	2.9	4.	11.6
	MEAN	3.9	5.	19.5
	N	54	57	
OPERATIONS A MAINTENANCE	HIGH	3.4	4.	13.6
	LOW	2.0	3.	6.0
	MEAN	2.7	3.	8.1
	N	55	58	
OPERATIONS A MAINTENANCE	HIGH	3.7	4.	14.8
	LOW	2.5	3.	7.5
	MEAN	3.1	3.	9.3
	N	56	57	

		SCORES	FREQUENCY	YEAR TOTAL HOURS
ROUTINE OPER AND MAINT OF COMMUNICATIONS	HIGH	2.3	3.	6.3
	LOW	1.7	2.	3.4
	MEAN	2.0	3.	6.0
	N	54	54	
HANDS ON PROCEDURES IN COMMUNICATIONS	HIGH	1.7	3.	5.1
	LOW	1.3	2.	2.6
	MEAN	1.5	3.	4.5
	N	53	56	
SECURITY PROCEDURES IN INTELLIGENCE AND	HIGH	2.6	3.	7.8
	LOW	1.6	2.	3.2
	MEAN	2.1	3.	6.3
	N	54	57	
PROCEDURES IN INDIVIDUAL NUC	HIGH	3.2	3.	9.6
	LOW	2.2	3.	6.6
	MEAN	2.7	3.	8.1
	N	54	58	
PROCEDURES IN COLLECTIVE NUC	HIGH	2.5	3.	7.5
	LOW	1.4	2.	3.6
	MEAN	2.2	3.	6.6
	N	55	54	
IN FIRST-710	HIGH	2.2	3.	6.6
	LOW	1.5	2.	3.0
	MEAN	1.9	2.	3.4
	N	55	55	
PROCEDURES IN LAND STN WARFARE	HIGH	2.5	3.	7.5
	LOW	1.7	2.	3.4
	MEAN	2.1	2.	4.2
	N	54	57	
IN MAP READING	HIGH	5.0	4.	20.0
	LOW	3.1	3.	9.3
	MEAN	4.0	3.	12.0
	N	54	57	

RETURNERS		HOURS	FREQUENCY	YEAR TOTAL HOURS
017 COMBAT SKILLS	HIGH	4.2	3.	12.6
	LOW	2.6	3.	7.8
	MEAN	3.4	3.	10.2
	N	51	55	
TRAINING AND EMPLOYMENT FOR INDIVIDUAL WEAPONS	HIGH	4.1	3.	12.3
	LOW	2.6	3.	7.8
	MEAN	3.3	3.	9.9
	N	55	56	
WEAPONS MAINTENANCE TO CREW SERVED	HIGH	3.3	4.	13.2
	LOW	2.2	3.	6.6
	MEAN	2.7	3.	8.1
	N	53	56	
TOTAL SUM OF PRODUCTS		MEAN	195.7	
GRAND SUM OF PRODUCTS	LOW	131.9		
	HIGH	290.1		
	MEAN	390.5		
	LOW	276.4		
	HIGH	573.4		

TABLE I-III. GET 111 ADJUSTMENT TO SOLDIER'S MANUAL TASKS

15 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

CONDITIONS--

12 WEEK ROT GRADUATES

COMBINATION OF TASKS

YEAR
TOTAL
HOURS

FREQUENCY

HOURS

OPERATING PROCEDURES
1. DUTY OF GENERAL

HIGH
LOW
MEAN
N

2.4
1.4
2.1
5.1

4.
3.
3.
5.6

0.6
5.4
6.3

OPERATING PROCEDURES
2. DUTY OF TACTICAL

HIGH
LOW
MEAN
N

3.4
2.4
2.9
5.1

4.
3.
4.
5.6

13.6
7.2
11.6

PREPARATIONS
1. GUNNERY

HIGH
LOW
MEAN
N

9.6
7.9
7.8
5.2

5.
3.
4.
5.6

48.0
17.7
31.2

WEAPONS EQUIPMENT
1. TANK AND CUE

HIGH
LOW
MEAN
N

10.4
6.3
8.3
5.6

5.
3.
4.
5.6

52.0
18.9
33.2

PROCEDURES
1. GENERAL MAINTENANCE

HIGH
LOW
MEAN
N

4.4
2.4
3.6
5.6

6.
4.
5.
5.7

26.4
11.2
14.0

PROCEDURES
2. MAINTENANCE

HIGH
LOW
MEAN
N

3.4
2.2
2.9
5.6

5.
3.
4.
5.6

14.0
6.6
11.6

PROCEDURES
3. TURRET MAINTENANCE

HIGH
LOW
MEAN
N

5.6
3.6
4.6
5.6

6.
4.
5.
5.6

33.6
14.6
23.0

PROCEDURES
4. TANK RECOVERY

HIGH
LOW
MEAN
N

2.1
1.6
1.6
5.6

3.
3.
3.
5.6

6.3
4.4
5.4

COMMUNICATIONS

		HOURS	FREQUENCY	YEAR TOTAL HOURS
FOUR OPER AND MAINT AND COMMUNICATIONS	HIGH	2.4	4.	9.6
	LOW	1.4	3.	5.4
	MEAN	2.1	3.	6.3
	N	57		
HANDLING PROCEDURES AND COMMUNICATION	HIGH	1.4	4.	7.2
	LOW	1.4	3.	4.2
	MEAN	1.4	3.	4.4
	N	55	57	
SECURITY PROCEDURES AND INTELLIGENCE AND	HIGH	2.4	4.	10.4
	LOW	1.7	3.	5.1
	MEAN	2.1	3.	6.3
	N	57	58	
PROCEDURES AND INDIVIDUAL NRC	HIGH	5.6	3.	16.8
	LOW	4.0	2.	8.0
	MEAN	4.4	3.	14.4
	N	57	57	
PROCEDURES AND COLLECTIVE NRC	HIGH	2.4	4.	11.2
	LOW	2.0	3.	6.0
	MEAN	2.4	3.	7.2
	N	56	58	
AND FIRST-TO	HIGH	2.2	3.	6.6
	LOW	1.6	3.	4.8
	MEAN	1.9	3.	5.7
	N	54	55	
PROCEDURES AND FIRST-TO AND MAINT	HIGH	2.4	3.	7.2
	LOW	1.6	3.	4.8
	MEAN	2.0	3.	6.0
	N	54	57	
AND FIRST-TO AND MAINT	HIGH	5.4	5.	27.0
	LOW	3.6	3.	10.8
	MEAN	4.5	4.	18.0
	N	54	57	

YFAM	TOTAL HOURS	FREQUENCY	HOURS	HIGH LOW MEAN N
25.0	5.	5.0	HIGH	
18.7	3.	2.3	LOW	
16.0	4.	4.0	MEAN	
	54	50	N	
17.6	4.	4.4	HIGH	
9.7	3.	2.9	LOW	
14.4	4.	3.6	MEAN	
	56	54	N	
21.0	5.	4.2	HIGH	
14.4	3.	2.8	LOW	
14.0	4.	3.5	MEAN	
	55	53	N	
239.4			MEAN	
161.1			LOW	
367.1			HIGH	

COMBAT SKILLS	COMBAT SKILLS
HIGH	4.4
LOW	2.9
MEAN	3.6
N	54

MAINT AND EMPLOYMENT FOR INDIVIDUAL WEAPONS	MAINT AND EMPLOYMENT FOR INDIVIDUAL WEAPONS
HIGH	4.4
LOW	2.9
MEAN	3.6
N	54

WEAPONS MAINTENANCE FOR CREW SERVED	WEAPONS MAINTENANCE FOR CREW SERVED
HIGH	4.2
LOW	2.8
MEAN	3.5
N	53

TOTAL SUM OF PRODUCTS	TOTAL SUM OF PRODUCTS
MEAN	239.4
LOW	161.1
HIGH	367.1

DIFFER

		HOURS	FREQUENCY	YEAR TOTAL HOURS
OPERATING PROCEDURES 11 DRIVER MECHANICAL	HIGH	4.3	5.	21.5
	LOW	2.9	3.	8.7
	MEAN	3.6	4.	14.4
	N	53	57	
OPERATING PROCEDURES 12 DRIVER TACTICAL	HIGH	5.1	6.	30.6
	LOW	3.5	4.	14.0
	MEAN	4.3	5.	21.5
	N	50	56	
OPERATING PROCEDURES 13 GUNNERY	HIGH	7.5	4.	30.0
	LOW	3.4	3.	10.2
	MEAN	5.5	3.	16.5
	N	57	56	
WEAPONS EMPLOYMENT 14 TANK AND CREW	HIGH	7.1	5.	35.5
	LOW	3.7	3.	11.1
	MEAN	5.4	4.	21.6
	N	57	56	
PROCEDURES 15 GENERAL MAINTENANCE	HIGH	4.9	6.	29.4
	LOW	3.0	4.	12.0
	MEAN	4.0	5.	20.0
	N	53	55	
PROCEDURES 16 HULL MAINTENANCE	HIGH	4.0	7.	34.3
	LOW	2.9	5.	14.5
	MEAN	3.9	6.	23.4
	N	56	57	
PROCEDURES 17 TURRET MAINTENANCE	HIGH	3.4	5.	17.0
	LOW	2.0	3.	6.0
	MEAN	2.7	4.	10.4
	N	56	54	
PROCEDURES 18 TANK RECOVERY	HIGH	3.7	5.	18.5
	LOW	2.5	3.	7.5
	MEAN	3.1	4.	12.4
	N	56	57	

	HOURS	FREQUENCY	YEAR TOTAL HOURS
ROUTING OPER AND MAINT OR COMMUNICATIONS	HIGH	2.3	6.9
	LOW	1.7	5.1
	MEAN	2.0	6.0
	N	54	
HANDING PROCEDURES TO COMMUN MESSAGE	HIGH	1.7	5.1
	LOW	1.4	3.9
	MEAN	1.5	4.5
	N	53	
SECURITY PROCEDURES OF INTELLIGENCE AND	HIGH	2.6	7.8
	LOW	1.6	4.8
	MEAN	2.1	6.3
	N	54	
PROCEDURES OF INDIVIDUAL NRC	HIGH	3.2	12.8
	LOW	2.2	6.6
	MEAN	2.7	10.8
	N	54	
PROCEDURES OF COLLECTIVE NRC	HIGH	2.5	10.0
	LOW	1.8	5.4
	MEAN	2.2	6.6
	N	55	
14 FIRST-TO	HIGH	2.2	6.6
	LOW	1.5	4.5
	MEAN	1.9	5.7
	N	55	
PROCEDURES OF TIME WAREARE	HIGH	2.5	7.5
	LOW	1.7	5.1
	MEAN	2.1	6.3
	N	54	
PROCEDURES OF WAREARE	HIGH	5.0	25.0
	LOW	3.1	9.3
	MEAN	4.0	16.0
	N	54	

OFFICERS

	HOURS	FREQUENCY	YEAR TOTAL HOURS
GIFT COMBAT SKILLS	HIGH	4.	16.8
	LOW	3.	7.8
	MEAN	4.	13.6
	N	54	
Talent and Employment for Individual Weapons	HIGH	4.	16.4
	LOW	3.	7.8
	MEAN	3.	9.9
	N	56	
Weapons Maintenance to Crew Served	HIGH	5.	16.5
	LOW	3.	6.6
	MEAN	4.	10.8
	N	56	
Total Sum of Products	MEAN	240.2	
	LOW	150.0	
	HIGH	348.2	
Square Sum of Products	MEAN	490.5	
	LOW	312.0	
	HIGH	715.2	

TABLE I-1. SET III ADJUSTMENT TO SOLDIER'S MANUAL TASKS

20 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

CONDITION--

12 WEEK RAT GRADUATES

SOLDIER/1000ERS

			HOURS	FREQUENCY	YEAR TOTAL HOURS
01 DRIVER MECHANICAL OPERATING PROCEDURES	MEAN		2.1	4.	8.4
	LOW		1.8	4.	7.2
	HIGH		2.4	5.	12.0
	N		53	56	
02 DRIVER TACTICAL OPERATING PROCEDURES	MEAN		2.9	5.	14.5
	LOW		2.4	4.	9.6
	HIGH		3.4	5.	17.0
	N		51	56	
03 GUNFIRE PREPARATIONS	MEAN		7.8	5.	39.0
	LOW		5.9	4.	23.6
	HIGH		9.6	6.	57.6
	N		52	56	
04 TANK AND CREW -FAVORABLE EMPLOYMENT	MEAN		8.3	5.	41.5
	LOW		6.3	4.	25.2
	HIGH		10.4	6.	62.4
	N		54	56	
05 GENERAL MAINTENANCE PROCEDURES	MEAN		3.6	6.	21.6
	LOW		2.8	5.	14.0
	HIGH		4.4	7.	30.8
	N		56	57	
06 HULL MAINTENANCE PROCEDURES	MEAN		2.1	5.	10.5
	LOW		2.2	4.	8.8
	HIGH		3.6	6.	21.6
	N		55	56	
07 TURRET MAINTENANCE PROCEDURES	MEAN		4.6	6.	27.6
	LOW		3.6	5.	18.0
	HIGH		5.6	7.	39.2
	N		54	56	
08 TANK RECOVERY PROCEDURES	MEAN		1.4	3.	5.4
	LOW		1.4	3.	4.8
	HIGH		2.1	4.	8.4
	N		55	55	

COMBINED DATA

		HOURS	FREQUENCY	YEAR TOTAL HOURS
00 COMMUNICATIONS EQUIP OPER AND MAINT	MEAN	2.1	4.	4.4
	LOW	1.4	4.	7.2
	HIGH	2.4	5.	12.0
	N	52		
010 COMMON MESSAGE HANDLING PROCEDURES	MEAN	1.4	4.	6.4
	LOW	1.4	3.	4.2
	HIGH	1.4	5.	9.0
	N	54	57	
011 INTELLIGENCE AND SECURITY PROCEDURES	MEAN	2.1	4.	4.4
	LOW	1.7	4.	6.4
	HIGH	2.4	5.	13.0
	N	57	58	
012 INDIVIDUAL NPC PROCEDURES	MEAN	2.4	5.	14.0
	LOW	2.2	4.	8.4
	HIGH	3.3	6.	19.4
	N	57	57	
013 COLLECTIVE NPC PROCEDURES	MEAN	2.4	4.	9.6
	LOW	2.0	4.	8.0
	HIGH	2.4	5.	14.0
	N	56	54	
014 FIRST-AID	MEAN	1.2	3.	5.7
	LOW	1.2	3.	4.4
	HIGH	2.2	4.	8.4
	N	54	55	
015 LAND MINE WARFARE PROCEDURES	MEAN	2.0	3.	6.0
	LOW	1.4	3.	4.4
	HIGH	2.4	4.	9.6
	N	44	57	
016 MAP READING	MEAN	4.5	5.	22.5
	LOW	3.4	4.	14.4
	HIGH	5.4	6.	32.4
	N	57	57	

COMBINED DATA

	MEAN	HOURS	FREQUENCY	YEAR TOTAL HOURS
017 COMBAT SKILLS				
MEAN	4.0		5.	20.0
LOW	2.0		4.	11.6
HIGH	5.0		6.	30.0
N	50		54	
018 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT				
MEAN	3.6		5.	19.0
LOW	2.9		4.	11.6
HIGH	4.4		5.	22.0
N	54		56	
019 CREW SERVED WEAPONS MAINTENANCE				
MEAN	3.5		5.	17.5
LOW	2.8		4.	11.2
HIGH	4.2		6.	25.2
N	52		55	
TOTAL SUM OF PRODUCTS				
MEAN			309.0	
LOW			204.6	
HIGH			444.9	

			HOURS	FREQUENCY	YEAR TOTAL HOURS
11 DRIVER MECHANICAL OPERATING PROCEDURES	MEAN		3.6	5.	18.0
	LOW		2.9	4.	11.6
	HIGH		4.3	6.	25.8
	N		51	57	
12 DRIVER TACTICAL OPERATING PROCEDURES	MEAN		4.3	6.	25.8
	LOW		3.5	5.	17.5
	HIGH		5.1	7.	35.7
	N		50	56	
13 GUNNERY PREPARATIONS	MEAN		5.5	4.	22.0
	LOW		3.4	4.	13.6
	HIGH		7.5	5.	37.5
	N		57	56	
14 TANK AND CREW WEAPONS EMPLOYMENT	MEAN		5.4	5.	27.0
	LOW		3.7	4.	14.8
	HIGH		7.1	6.	42.6
	N		57	56	
15 GENERAL MAINTENANCE PROCEDURES	MEAN		4.0	6.	24.0
	LOW		3.0	5.	15.0
	HIGH		4.9	7.	34.3
	N		53	55	
16 HULL MAINTENANCE PROCEDURES	MEAN		3.9	7.	27.3
	LOW		2.9	6.	17.4
	HIGH		4.9	8.	39.2
	N		54	57	
17 TURRET MAINTENANCE PROCEDURES	MEAN		2.7	5.	13.5
	LOW		2.0	4.	8.0
	HIGH		3.4	6.	20.4
	N		56	58	
18 TANK RECOVERY PROCEDURES	MEAN		3.1	5.	15.5
	LOW		2.5	4.	10.0
	HIGH		3.7	6.	22.2
	N		56	57	

FUNCTIONS	MEAN LOW HIGH N	HOURS	FREQUENCY	YEAR TOTAL HOURS
01 COMMUNICATIONS COUNCIL OPER AND MAINT	2.0 1.7 2.3 55	4. 3. 4. 58	8.0 5.1 9.2	
02 COMMON MESSAGE HANDLING PROCEDURES	1.5 1.3 1.7 53	4. 3. 4. 56	6.0 3.9 6.8	
03 INTELLIGENCE AND SECURITY PROCEDURES	2.1 1.6 2.6 58	4. 3. 4. 57	8.4 4.8 10.4	
04 DIVISIONAL NHC PROCEDURES	2.7 2.2 3.2 58	5. 4. 5. 58	13.5 8.8 16.0	
05 COLLECTIVE NHC PROCEDURES	2.2 1.8 2.5 55	4. 3. 5. 58	8.8 5.4 12.5	
06 FIRST-AID	1.9 1.5 2.2 55	3. 3. 4. 55	7. 4.5 8.8	
07 LAND MINE WARFARE PROCEDURES	2.1 1.7 2.5 58	3. 3. 4. 57	6.3 5.1 10.0	
08 MAP READING	4.0 3.1 5.0 54	5. 4. 6. 57	20.0 12.4 30.0	

	MEAN	HOURS	FREQUENCY	YEAR TOTAL HOURS
017 COMBAT SKILLS				
LOW	3.4	5.	17.0	
HIGH	2.4	4.	10.4	
N	4.2	5.	21.0	
	51	55		
018 INDIVIDUAL WEAPONS MAINT AND EMPLOYMENT				
MEAN	3.3	4.	13.2	
LOW	2.6	4.	10.4	
HIGH	4.1	5.	20.5	
N	55	56		
019 CREW SERVED WEAPONS MAINTENANCE				
MEAN	2.7	5.	13.5	
LOW	2.2	4.	8.8	
HIGH	3.3	6.	19.8	
N	53	56		
TOTAL SUM OF PRODUCTS	MEAN		293.5	
	LOW		187.5	
	HIGH		422.7	
GRAND SUM OF PRODUCTS	MEAN		602.5	
	LOW		392.1	
	HIGH		867.5	

TABLE II-A. SET V ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

10 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

15 WEEK MAT GRADUATES

CONDITION--

TASK	ATTACHMENT				COMPANY				PLATOON				SQUAD		YEAR TOTAL HOURS
	YEAR	100	WEEK	WEEK	YEAR	100	WEEK	WEEK	YEAR	100	WEEK	WEEK	YEAR	100	
01 TACTICAL MOVEMENTS	YEAR	100	2.4	4	21.6	6.3	3	14.9	9.4	5	49.0	0.0	0.0	0.0	89.5
	100	4.1	4	12.4	3.5	3	10.5	5.6	4	22.4	0.0	0.0	0.0	45.3	
	WEEK	100	2.7	4	10.4	9.1	4	14.4	14.1	7	98.7	0.0	0.0	0.0	165.9
02 SECURITY AND INTELLIGENCE OPERATIONS	YEAR	100	2.1	4	20.4	1.6	3	4.8	3.2	3	9.6	0.0	0.0	0.0	34.8
	100	3.0	4	0.0	1.3	3	3.9	2.1	3	6.3	0.0	0.0	0.0	19.2	
	WEEK	100	2.3	5	16.5	1.4	4	7.2	4.3	4	17.2	0.0	0.0	0.0	60.9
03 COMBAT COORDINATION	YEAR	100	2.4	4	13.6	2.2	3	6.6	3.6	4	14.4	0.0	0.0	0.0	54.6
	100	3.2	4	5.4	1.6	2	2.8	2.8	4	11.2	0.0	0.0	0.0	19.4	
	WEEK	100	2.0	4	60.0	3.0	4	12.0	4.5	5	22.5	0.0	0.0	0.0	94.5
04 EMPLOYMENT AND FIGHTING OPERATIONS	YEAR	100	2.5	5	47.5	5.7	3	17.1	8.2	4	32.8	0.0	0.0	0.0	97.4
	100	3.2	4	6.4	2.8	2	5.6	4.0	4	16.0	0.0	0.0	0.0	29.0	
	WEEK	100	2.8	4	110.6	9.6	4	34.4	12.5	5	62.5	0.0	0.0	0.0	207.5
05 EMPLOYMENT AND MANEUVER	YEAR	100	2.5	5	72.5	7.6	4	30.4	7.2	6	43.2	0.0	0.0	0.0	121.1
	100	4.1	4	3.3	4.1	3	12.3	4.9	4	19.6	0.0	0.0	0.0	41.2	
	WEEK	100	2.9	4	111.3	11.0	5	55.0	9.5	7	66.5	0.0	0.0	0.0	232.8
06 RECONNAISSANCE AND CONSOLIDATION	YEAR	100	2.2	4	16.4	1.9	3	5.7	3.3	4	13.2	0.0	0.0	0.0	35.7
	100	2.1	4	6.3	1.5	2	3.0	2.1	4	8.4	0.0	0.0	0.0	17.7	
	WEEK	100	2.4	4	25.6	2.3	4	4.2	4.5	5	22.5	0.0	0.0	0.0	57.3
07 NIGHT OPERATIONS	YEAR	100	2.6	4	22.4	4.4	3	14.2	5.6	5	24.0	0.0	0.0	0.0	69.6
	100	3.3	4	3.2	4.5	3	13.5	3.4	4	15.2	0.0	0.0	0.0	37.9	
	WEEK	100	2.9	4	15.5	4.3	4	33.2	7.3	6	43.8	0.0	0.0	0.0	112.6
08 NIGHT OPERATIONS	YEAR	100	2.7	4	10.4	1.4	3	7.4	4.0	4	16.0	0.0	0.0	0.0	32.2
	100	3.0	4	6.4	1.3	2	2.6	2.4	3	8.4	0.0	0.0	0.0	17.4	
	WEEK	100	2.0	4	15.5	2.3	4	4.2	5.2	5	26.0	0.0	0.0	0.0	50.4

[illegible]

TASK	INITIALION			COMPANY			PLATON			SQUAD			YEAR TOTAL
	MRS	FREQ	PROD	MRS	FREQ	PROD	MRS	FREQ	PROD	MRS	FREQ	PROD	
Q17 MAINTENANCE	MEAN	11.4	10.	104.0	6.1	41.	251.1	5.4	49.	259.2	0.0	0.	613.3
	LOS	22.6	6.	-10.4	4.7	12.	56.4	4.2	22.	32.4	0.0	0.	138.4
	WTRG	23.4	15.	351.0	7.4	70.	518.0	6.7	73.	449.1	0.0	0.	1358.1
	WTRG	0	0	0	14	15	30	30	20	0	0	0	
TOTAL SUM OF PRODUCTS	MEAN			654.6			441.6			594.3		0.0	1494.5
	LOS			68.9			154.7			267.3		0.0	490.8
	WTRG			1123.2			852.3			1059.7		0.0	3035.2

TABLE II-B. SET V ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

15 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

15 WEEK RAY GRADUATES

CONDITION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	MUS	FREQ	PRON	MRS	FREQ	PRON	MRS	FREQ	MRS	PRON	FREQ	MRS	FREQ	PRON	FREQ	MRS	
Q1 TACTICAL MOVEMENTS	MEAN	5.4	5.	27.0	6.3	4.	25.2	9.9	6.	58.8	0.0	0.0	0.0	0.0	0.0	0.0	111.0
	LOW	3.1	5.	15.5	3.5	4.	14.0	5.6	5.	28.0	0.0	0.0	0.0	0.0	0.0	0.0	57.5
	HIGH	7.7	5.	38.5	9.1	5.	45.5	14.1	9.	126.0	0.0	0.0	0.0	0.0	0.0	0.0	210.9
Q2 SECURITY AND INTELLIGENCE CONC	MEAN	5.1	5.	25.5	1.6	4.	6.4	3.2	4.	12.8	0.0	0.0	0.0	0.0	0.0	0.0	44.7
	LOW	3.0	4.	12.0	1.3	4.	5.2	2.1	4.	8.4	0.0	0.0	0.0	0.0	0.0	0.0	25.6
	HIGH	7.3	6.	33.8	1.8	5.	9.0	4.3	5.	21.5	0.0	0.0	0.0	0.0	0.0	0.0	74.3
Q3 COVER-CONCEALMENT	MEAN	4.4	5.	42.0	2.2	4.	4.8	3.6	5.	18.0	0.0	0.0	0.0	0.0	0.0	0.0	68.8
	LOW	1.8	4.	7.2	1.6	3.	4.2	2.4	5.	14.0	0.0	0.0	0.0	0.0	0.0	0.0	25.4
	HIGH	15.0	5.	75.0	3.0	5.	15.0	4.5	6.	27.0	0.0	0.0	0.0	0.0	0.0	0.0	117.0
Q4 EMPLOY-FLIGHTING	MEAN	3.5	6.	57.0	5.7	4.	22.8	8.2	5.	41.0	0.0	0.0	0.0	0.0	0.0	0.0	120.8
	LOW	3.2	3.	9.6	2.8	3.	4.4	4.0	5.	20.0	0.0	0.0	0.0	0.0	0.0	0.0	38.0
	HIGH	17.8	9.	102.2	8.6	5.	43.0	12.5	6.	75.0	0.0	0.0	0.0	0.0	0.0	0.0	260.2
Q5 FIVE AND MANEUVER	MEAN	3.5	6.	57.0	7.6	5.	38.0	7.2	8.	57.6	0.0	0.0	0.0	0.0	0.0	0.0	152.6
	LOW	3.1	4.	12.4	4.1	4.	14.4	4.9	5.	24.5	0.0	0.0	0.0	0.0	0.0	0.0	53.3
	HIGH	17.0	9.	103.1	13.0	6.	46.0	9.5	9.	85.5	0.0	0.0	0.0	0.0	0.0	0.0	204.6
Q6 RECONNAISSANCE	MEAN	4.2	5.	21.0	1.9	4.	7.6	3.3	5.	16.5	0.0	0.0	0.0	0.0	0.0	0.0	45.1
	LOW	2.1	4.	4.4	1.5	3.	4.5	2.1	5.	10.5	0.0	0.0	0.0	0.0	0.0	0.0	23.4
	HIGH	7.4	5.	32.0	2.3	5.	11.5	4.5	6.	27.0	0.0	0.0	0.0	0.0	0.0	0.0	70.5
Q7 RECONNAISSANCE	MEAN	3.6	5.	28.0	6.4	4.	25.6	5.6	6.	33.6	0.0	0.0	0.0	0.0	0.0	0.0	87.2
	LOW	2.3	5.	11.5	4.5	4.	14.0	3.8	5.	19.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5
	HIGH	7.9	5.	44.5	4.3	5.	41.5	7.3	4.	58.6	0.0	0.0	0.0	0.0	0.0	0.0	124.4
Q8 RECONNAISSANCE	MEAN	2.7	5.	13.5	1.8	4.	7.2	4.0	7.	10.0	0.0	0.0	0.0	0.0	0.0	0.0	40.7
	LOW	1.6	5.	8.0	1.3	3.	3.0	2.8	4.	11.2	0.0	0.0	0.0	0.0	0.0	0.0	23.1
	HIGH	7.4	5.	19.5	2.3	5.	11.5	5.2	6.	31.2	0.0	0.0	0.0	0.0	0.0	0.0	62.2

1A

	BATTALION				COMPANY				PLATOON				SECTION				YEAR TOTAL
	WKS	FREQ	PRON	HWS	FREQ	PRON	HWS	FREQ	PRON	HWS	FREQ	PRON	HWS	FREQ	PRON	HWS	
Q1 COMBAT IN BATTALION A BATTALION	2.0	4	11.6	2.4	4	9.6	2.4	4	5	30.0	0.0	0	0.0	0	0.0	0.0	51.2
	1.2	4	5.2	1.7	3	5.1	1.7	3	4	16.0	0.0	0	0.0	0	0.0	0.0	26.8
	0.8	5	10.0	3.0	5	15.0	3.0	5	6	48.0	0.0	0	0.0	0	0.0	0.0	92.0
	7	4		14	14				30								
Q1 COMBAT IN BATTALION B BATTALION	1.1	5	15.5	2.3	4	9.2	2.3	4	5	19.0	0.0	0	0.0	0	0.0	0.0	43.7
	1.1	4	4.4	1.7	4	6.8	1.7	4	4	10.0	0.0	0	0.0	0	0.0	0.0	21.2
	0.8	5	10.0	2.9	5	14.5	2.9	5	5	25.0	0.0	0	0.0	0	0.0	0.0	40.3
	4	4		17	17				30								
Q1 COMBAT IN BATTALION C BATTALION	1.0	6	14.0	2.4	4	11.2	2.4	4	4	15.2	0.0	0	0.0	0	0.0	0.0	50.4
	0.5	5	2.5	1.8	4	7.2	1.8	4	4	9.6	0.0	0	0.0	0	0.0	0.0	19.3
	1.5	4	6.0	3.4	5	14.0	3.4	5	5	26.0	0.0	0	0.0	0	0.0	0.0	106.0
	7	4		15	14				32								
Q1 BATTLE BATTALIONS A BATTALION	1.4	5	52.0	3.1	4	12.4	3.1	4	5	25.0	0.0	0	0.0	0	0.0	0.0	49.4
	0.9	4	3.4	2.6	4	10.4	2.6	4	4	15.2	0.0	0	0.0	0	0.0	0.0	22.0
	2.1	4	174.4	3.7	5	14.5	3.7	5	6	36.6	0.0	0	0.0	0	0.0	0.0	224.5
	7	4		15	14				28								
Q1 BATTLE BATTALIONS B BATTALION	2.2	4	4.4	1.9	4	7.6	1.9	4	4	10.8	0.0	0	0.0	0	0.0	0.0	27.2
	1.5	3	4.5	1.6	3	4.4	1.6	3	4	8.8	0.0	0	0.0	0	0.0	0.0	14.1
	1.0	5	15.0	2.2	4	4.8	2.2	4	5	16.0	0.0	0	0.0	0	0.0	0.0	30.8
	4	4		13	17				31								
Q1 BATTLE BATTALIONS C BATTALION	2.2	3	6.4	3.3	4	15.4	3.3	4	4	8.8	0.0	0	0.0	0	0.0	0.0	31.0
	0.5	0	0.0	2.5	3	7.5	2.5	3	4	6.8	0.0	0	0.0	0	0.0	0.0	14.3
	0.0	5	25.0	5.3	4	21.2	5.3	4	5	13.5	0.0	0	0.0	0	0.0	0.0	50.7
	5	4		17	17				28								
Q1 BATTLE BATTALIONS D BATTALION	1.1	4	12.4	2.6	4	10.4	2.6	4	5	16.5	0.0	0	0.0	0	0.0	0.0	39.3
	1.8	4	7.2	1.9	3	5.7	1.9	3	4	9.6	0.0	0	0.0	0	0.0	0.0	22.5
	0.4	5	22.0	3.2	5	16.0	3.2	5	6	25.2	0.0	0	0.0	0	0.0	0.0	63.2
	4	4		14	14				20								
Q1 BATTLE BATTALIONS E BATTALION	2.2	4	47.2	4.4	4	35.2	4.4	4	10	38.0	0.0	0	0.0	0	0.0	0.0	110.4
	0.0	4	0.0	2.6	5	13.0	2.6	5	5	13.0	0.0	0	0.0	0	0.0	0.0	26.0
	1.5	4	100.0	6.1	10	61.0	6.1	10	14	70.0	0.0	0	0.0	0	0.0	0.0	231.0
	4	4		14	17				30								

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	MRS	FRFQ	PRDN	PHUD	MRS	FRFQ	PHUD	PHUD	MRS	FRFQ	PRDN	PRDN	MRS	FRFQ	PRDN	PRDN	
OIL MAINTENANCE	MEAN	11.4	13.	145.2	6.1	53.	323.3		5.4	62.	314.8		0.0	0.	0.0		793.3
	10%	-2.6	5.	-13.0	4.7	16.	75.2		4.2	29.	121.8		0.0	0.	0.0		144.0
	WGM	21.4	19.	846.6	7.4	91.	673.6		6.7	95.	616.5		0.0	0.	0.0		1754.5
TOTAL SUM OF PRODUCTS	MEAN			516.3			576.1				756.4				0.0		1906.8
	10%			92.3			210.3				346.4				0.0		640.0
	WGM			1410.6			1090.6				1349.3				0.0		3879.1

TABLE II-C. SET V. ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

20 PER CENT REPLACEMENT OF T O E STRENGTH PER QUARTER

15 WEEK RAT GRADUATES

CONTINUED--

TASK	COMPANY				PLATOON				SQUAD				YEAR TOTAL
	CS	PROG	HRS	FREQ	PROG	HRS	FREQ	PROG	HRS	FREQ	PROG	HRS	
01 TACTICAL MOVEMENTS	HEAD	7.4	7.0	17.4	31.5	9.8	9.0	89.2	0.0	0.0	0.0	0.0	157.5
	LOW	3.1	7.0	21.7	17.5	5.6	7.0	39.2	0.0	0.0	0.0	0.0	78.4
	WING	7.7	7.0	13.9	63.7	14.1	12.0	169.2	0.0	0.0	0.0	0.0	286.8
02 SECURITY AND INTELLIGENCE	HEAD	7.1	7.0	35.7	4.0	3.2	5.0	16.0	0.0	0.0	0.0	0.0	59.7
	LOW	3.0	5.0	15.0	6.5	2.1	5.0	10.5	0.0	0.0	0.0	0.0	32.0
	WING	7.3	9.0	65.7	12.6	4.3	7.0	30.1	0.0	0.0	0.0	0.0	108.4
03 COVER-CONCEALMENT	HEAD	7.4	7.0	58.8	11.0	3.6	7.0	25.2	0.0	0.0	0.0	0.0	95.0
	LOW	1.4	5.0	9.0	4.2	2.8	7.0	19.6	0.0	0.0	0.0	0.0	32.8
	WING	12.0	7.0	105.0	21.0	4.5	9.0	40.5	0.0	0.0	0.0	0.0	166.5
04 EMPLOYMENT VEHICLES	HEAD	2.5	9.0	45.5	28.5	8.2	7.0	57.4	0.0	0.0	0.0	0.0	171.4
	LOW	3.2	3.0	9.5	8.4	4.0	7.0	28.0	0.0	0.0	0.0	0.0	46.0
	WING	12.8	12.0	100.0	60.2	12.5	9.0	112.5	0.0	0.0	0.0	0.0	362.3
05 FIGHTING MANEUVERS	HEAD	2.5	9.0	45.5	28.5	8.2	7.0	57.4	0.0	0.0	0.0	0.0	171.4
	LOW	3.2	3.0	9.5	8.4	4.0	7.0	28.0	0.0	0.0	0.0	0.0	46.0
	WING	12.8	12.0	100.0	60.2	12.5	9.0	112.5	0.0	0.0	0.0	0.0	362.3
06 RECONNAISSANCE CONDUCT	HEAD	2.5	9.0	45.5	28.5	8.2	7.0	57.4	0.0	0.0	0.0	0.0	171.4
	LOW	3.2	3.0	9.5	8.4	4.0	7.0	28.0	0.0	0.0	0.0	0.0	46.0
	WING	12.8	12.0	100.0	60.2	12.5	9.0	112.5	0.0	0.0	0.0	0.0	362.3
07 NIGHT OPERATIONS	HEAD	2.5	9.0	45.5	28.5	8.2	7.0	57.4	0.0	0.0	0.0	0.0	171.4
	LOW	3.2	3.0	9.5	8.4	4.0	7.0	28.0	0.0	0.0	0.0	0.0	46.0
	WING	12.8	12.0	100.0	60.2	12.5	9.0	112.5	0.0	0.0	0.0	0.0	362.3
08 AIR OPERATIONS	HEAD	2.7	7.0	18.7	4.4	4.0	9.0	50.4	0.0	0.0	0.0	0.0	55.9
	LOW	1.5	7.0	11.2	3.3	2.8	5.0	18.0	0.0	0.0	0.0	0.0	20.1
	WING	12.0	7.0	27.3	16.1	5.2	9.0	46.4	0.0	0.0	0.0	0.0	90.2

TASK	BATTALION				COMPANY				PLATOON				SQUAD			YEAR TOTAL
	MDS	FREQ	PRD	MRS	FREQ	PRD	MRS	FREQ	PRD	MRS	FREQ	PRD	MRS	FREQ	PRD	HOURS
01 COMBAT IN BUILT-UP AREAS	MEAN	2.0	5.0	14.5	2.4	5.0	12.0	4.0	7.0	42.0	0.0	0.0	0.0	0.0	0.0	68.5
	LOW	1.9	3.0	5.7	1.7	3.0	5.1	4.0	5.0	20.0	0.0	0.0	0.0	0.0	0.0	30.8
	HIGH	3.8	7.0	26.6	3.0	7.0	21.0	8.0	9.0	72.0	0.0	0.0	0.0	0.0	0.0	119.6
010 HOSTILE TAC AID ENVIRONMENT	MEAN	3.1	7.0	21.7	2.3	5.0	11.5	3.4	7.0	26.6	0.0	0.0	0.0	0.0	0.0	59.8
	LOW	2.1	5.0	5.5	1.7	5.0	4.5	2.5	5.0	12.5	0.0	0.0	0.0	0.0	0.0	26.5
	HIGH	5.1	10.0	51.0	2.9	7.0	20.3	5.0	7.0	35.0	0.0	0.0	0.0	0.0	0.0	106.3
011 COMMUNICATIONS IN T + ENVIRONMENT	MEAN	5.0	9.0	36.0	2.8	5.0	14.0	3.8	5.0	19.0	0.0	0.0	0.0	0.0	0.0	69.0
	LOW	4.5	7.0	3.5	1.8	5.0	9.0	2.4	5.0	12.0	0.0	0.0	0.0	0.0	0.0	24.5
	HIGH	7.5	10.0	75.0	3.8	7.0	26.6	5.2	7.0	36.4	0.0	0.0	0.0	0.0	0.0	138.0
012 BATTLE POSITIONS	MEAN	10.4	7.0	72.8	3.1	5.0	15.5	5.0	7.0	35.0	0.0	0.0	0.0	0.0	0.0	123.3
	LOW	7.9	5.0	4.5	2.4	5.0	13.0	3.8	5.0	19.0	0.0	0.0	0.0	0.0	0.0	27.5
	HIGH	21.8	10.0	218.0	3.7	7.0	25.9	6.1	9.0	54.9	0.0	0.0	0.0	0.0	0.0	298.8
013 HREF-CH INTERFACES AND OBSTACLES	MEAN	2.2	5.0	11.0	1.9	5.0	9.5	2.7	5.0	13.5	0.0	0.0	0.0	0.0	0.0	34.0
	LOW	1.5	3.0	4.5	1.6	3.0	4.8	2.2	5.0	11.0	0.0	0.0	0.0	0.0	0.0	20.3
	HIGH	4.0	7.0	21.0	2.2	5.0	11.0	3.2	7.0	22.4	0.0	0.0	0.0	0.0	0.0	54.4
014 EMPLOY INDICATOR SMALL AREA	MEAN	2.2	3.0	6.6	3.9	5.0	19.5	2.2	5.0	11.9	0.0	0.0	0.0	0.0	0.0	37.1
	LOW	2.5	0.0	0.0	2.5	3.0	7.5	1.7	5.0	8.5	0.0	0.0	0.0	0.0	0.0	16.0
	HIGH	5.0	7.0	15.0	5.3	5.0	26.5	2.7	7.0	18.9	0.0	0.0	0.0	0.0	0.0	80.4
015 RECOMMUNICATIONS	MEAN	3.1	5.0	15.5	2.6	5.0	13.0	3.3	7.0	23.1	0.0	0.0	0.0	0.0	0.0	51.6
	LOW	3.8	5.0	9.0	1.9	3.0	5.7	2.4	5.0	12.0	0.0	0.0	0.0	0.0	0.0	26.7
	HIGH	6.4	7.0	30.2	3.2	7.0	22.4	4.2	9.0	37.8	0.0	0.0	0.0	0.0	0.0	91.0
016 TACTICAL COMMUNICATIONS	MEAN	6.2	9.0	55.8	4.4	10.0	44.0	3.8	14.0	53.2	0.0	0.0	0.0	0.0	0.0	153.0
	LOW	3.0	5.0	0.0	2.6	7.0	18.2	2.6	7.0	18.2	0.0	0.0	0.0	0.0	0.0	36.4
	HIGH	12.5	10.0	125.0	6.1	14.0	85.4	5.0	19.0	95.0	0.0	0.0	0.0	0.0	0.0	308.4

TASK	BATTALION				COMPANY				PLATOON				SQUAD			YEAR TOTAL
	HRS	FREQ	PROD		HRS	FREQ	PROD		HRS	FREQ	PROD		HRS	FREQ	PROD	
OIL MAINTENANCE	MEAN	10.4	17.	176.3	6.1	70.	427.0		5.4	82.	442.8		0.0	0.	0.0	1046.6
	MIN	2.6	7.	-19.2	4.7	20.	94.0		4.2	37.	155.4		0.0	0.	0.0	231.2
	MEAN	23.6	26.	603.6	7.4	119.	880.6		6.7	124.	830.8		0.0	0.	0.0	2319.8
	MIN	4	4	16	16	15		30	24				0	0		
TOTAL SUM OF PRODUCTS	MEAN			801.5			748.7				1026.5				0.0	2576.7
	MIN			114.1			253.8				455.5				0.0	823.4
	MEAN			1310.2			1466.5				1829.8				0.0	5226.5

TABLE II-D SET V ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

10 PER CENT REPLACEMENT OF T O E STRENGTH PER QUARTER

14 WEEK NAT GRADUATES

CONTINUED--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	HRS	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HOURS
O1 TACTICAL MOVEMENTS	MEAN	1.4	6.	12.4	6.3	5.	31.5	9.4	8.	78.4	0.0	0.	0.0	0.0	0.	0.0	142.3
	LOW	1.1	6.	12.4	3.5	5.	17.5	5.6	6.	33.4	0.0	0.	0.0	0.0	0.	0.0	69.7
	HIGH	1.7	6.	16.2	9.1	6.	54.6	14.1	11.	155.1	0.0	0.	0.0	0.0	0.	0.0	255.9
O2 SECURITY AND INTELLIGENCE OPERATIONS	MEAN	1.1	6.	10.4	1.4	5.	8.0	3.2	5.	16.0	0.0	0.	0.0	0.0	0.	0.0	54.6
	LOW	1.0	5.	15.0	1.3	5.	6.5	2.1	5.	10.5	0.0	0.	0.0	0.0	0.	0.0	32.0
	HIGH	1.3	6.	14.6	1.8	6.	10.8	4.3	6.	25.8	0.0	0.	0.0	0.0	0.	0.0	85.0
O3 COMBAT-CONCEALMENT	MEAN	1.4	6.	50.4	2.2	5.	11.0	3.6	6.	21.4	0.0	0.	0.0	0.0	0.	0.0	83.0
	LOW	1.2	6.	9.0	1.4	5.	4.2	2.9	6.	16.8	0.0	0.	0.0	0.0	0.	0.0	30.0
	HIGH	1.6	6.	10.0	1.0	6.	18.0	4.5	8.	36.0	0.0	0.	0.0	0.0	0.	0.0	144.0
O4 EMPLOY FIGHTING VEHICLES	MEAN	1.5	8.	16.0	5.7	5.	28.5	8.2	6.	49.2	0.0	0.	0.0	0.0	0.	0.0	153.7
	LOW	1.2	3.	9.4	2.9	3.	8.4	4.0	6.	24.0	0.0	0.	0.0	0.0	0.	0.0	42.0
	HIGH	1.8	11.	173.8	8.6	6.	51.6	12.5	12.	100.0	0.0	0.	0.0	0.0	0.	0.0	325.4
O5 FIRE AND MANEUVER	MEAN	1.5	8.	16.0	7.5	6.	45.6	7.2	10.	72.0	0.0	0.	0.0	0.0	0.	0.0	193.6
	LOW	1.1	5.	15.5	4.1	5.	20.5	4.0	6.	29.4	0.0	0.	0.0	0.0	0.	0.0	65.4
	HIGH	1.9	11.	174.0	11.0	8.	88.0	9.5	11.	104.5	0.0	0.	0.0	0.0	0.	0.0	367.4
O6 REORGANIZATION-COMBAT	MEAN	1.2	6.	25.2	1.9	5.	9.5	3.3	6.	19.8	0.0	0.	0.0	0.0	0.	0.0	54.5
	LOW	1.1	5.	10.5	1.5	3.	4.5	2.1	6.	12.6	0.0	0.	0.0	0.0	0.	0.0	27.6
	HIGH	1.4	6.	19.4	2.3	6.	13.8	4.5	8.	36.0	0.0	0.	0.0	0.0	0.	0.0	88.2
O7 NIGHT OPERATIONS	MEAN	1.6	6.	13.6	6.4	5.	32.0	5.6	8.	44.8	0.0	0.	0.0	0.0	0.	0.0	110.4
	LOW	1.3	6.	13.0	4.5	5.	22.5	3.4	6.	22.8	0.0	0.	0.0	0.0	0.	0.0	50.1
	HIGH	1.9	6.	13.6	11.7	15.	43.8	7.3	10.	73.0	0.0	0.	0.0	0.0	0.	0.0	176.2
O8 NBC OPERATIONS	MEAN	1.7	6.	16.2	1.4	5.	9.0	4.0	6.	24.0	0.0	0.	0.0	0.0	0.	0.0	49.2
	LOW	1.6	6.	13.6	1.3	3.	3.9	2.9	5.	14.0	0.0	0.	0.0	0.0	0.	0.0	27.5
	HIGH	1.9	6.	13.6	2.3	6.	13.8	5.2	8.	41.6	0.0	0.	0.0	0.0	0.	0.0	78.8

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	LOS	FREQ	PROB	MRS	FREQ	PROB	MRS	FREQ	PROB	MRS	FREQ	PROB	MRS	FREQ	PROB	MRS	
09 COMBAT IN BUILT-UP AREAS	MEAN	2.9	5.	14.5	2.4	5.	12.0	6.0	6.	36.0	0.0	0.0	0.0	0.0	0.0	0.0	62.5
	LOW	1.0	3.	5.7	1.7	3.	5.1	4.0	5.	20.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8
	HIGH	4.8	6.	22.4	3.0	6.	18.0	8.0	8.	44.0	0.0	0.0	0.0	0.0	0.0	0.0	104.8
		7	8		16			32	30		0		0				
010 HOSTILE TAC AIR ENVIRONMENT	MEAN	3.1	6.	18.6	2.3	5.	11.5	3.4	6.	22.8	0.0	0.0	0.0	0.0	0.0	0.0	52.9
	LOW	1.1	5.	5.5	1.7	5.	4.5	2.5	5.	12.5	0.0	0.0	0.0	0.0	0.0	0.0	26.5
	HIGH	5.1	10.	51.0	2.0	6.	17.4	5.0	6.	30.0	0.0	0.0	0.0	0.0	0.0	0.0	98.4
		8	8		17			10	30		0		0				
011 COMMUNICATIONS IN ENVIRONMENT	MEAN	4.0	8.	12.0	2.9	5.	14.0	3.8	5.	19.0	0.0	0.0	0.0	0.0	0.0	0.0	65.0
	LOW	1.5	6.	3.0	1.8	5.	9.0	2.4	5.	12.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0
	HIGH	7.5	10.	75.0	3.8	6.	22.8	5.2	6.	31.2	0.0	0.0	0.0	0.0	0.0	0.0	129.0
		7	8		15			32	29		0		0				
012 BATTLE POSITIONS	MEAN	1.4	6.	62.4	3.1	5.	15.5	5.0	6.	30.0	0.0	0.0	0.0	0.0	0.0	0.0	107.9
	LOW	1.0	5.	4.5	2.6	5.	13.0	3.4	5.	19.0	0.0	0.0	0.0	0.0	0.0	0.0	27.5
	HIGH	2.9	10.	218.0	3.7	6.	22.2	6.1	8.	48.8	0.0	0.0	0.0	0.0	0.0	0.0	289.0
		7	7		15			29	24		0		0				
013 BREACH OBSTACLES AND OBSTACLES	MEAN	2.2	5.	11.0	1.9	5.	9.5	2.7	5.	13.5	0.0	0.0	0.0	0.0	0.0	0.0	34.0
	LOW	1.5	3.	4.5	1.6	3.	4.8	2.2	5.	11.0	0.0	0.0	0.0	0.0	0.0	0.0	20.3
	HIGH	3.0	6.	18.0	2.2	5.	11.0	3.2	6.	19.2	0.0	0.0	0.0	0.0	0.0	0.0	48.2
		8	8		13			31	27		0		0				
014 EMPLOY ORGANIC SMALL ARMS	MEAN	2.2	3.	6.5	3.9	5.	19.5	2.2	5.	11.0	0.0	0.0	0.0	0.0	0.0	0.0	37.1
	LOW	1.5	0.	0.0	2.5	3.	7.5	1.7	5.	8.5	0.0	0.0	0.0	0.0	0.0	0.0	16.0
	HIGH	3.0	6.	10.0	5.3	5.	26.5	2.7	6.	16.2	0.0	0.0	0.0	0.0	0.0	0.0	72.7
		5	5		17			28	28		0		0				
015 RECONNAISSANCE	MEAN	3.1	5.	15.5	2.6	5.	13.0	3.3	6.	19.8	0.0	0.0	0.0	0.0	0.0	0.0	48.3
	LOW	1.8	5.	2.0	1.9	3.	5.7	2.4	5.	12.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7
	HIGH	4.4	6.	26.4	3.2	6.	14.2	4.2	8.	33.6	0.0	0.0	0.0	0.0	0.0	0.0	79.2
		9	7		16			31	20		0		0				
016 LEADER/COMMANDER CELLS	MEAN	2.2	8.	69.6	4.4	10.	44.0	3.9	13.	49.4	0.0	0.0	0.0	0.0	0.0	0.0	143.0
	LOW	0.0	5.	0.0	2.6	6.	15.6	2.4	6.	15.6	0.0	0.0	0.0	0.0	0.0	0.0	31.2
	HIGH	12.5	10.	135.0	6.1	13.	79.3	5.0	14.	80.8	0.0	0.0	0.0	0.0	0.0	0.0	294.3
		8	7		14			28	32		0		0				

TASK	BATTALION				COMPANY				PLATOON				SQUAD		YEAR TOTAL
	LOU	FREQ	PRON	HRS	FREQ	PRON	HRS	FREQ	PRON	HRS	FREQ	PRON	HRS	FREQ	HOURS
017 MAINTENANCE	MEAN	10.4	16.	156.6	6.1	66.	402.6	5.4	77.	415.8	0.0	0.	0.0	0.	984.8
	LOW	-2.6	6.	-15.6	4.7	19.	89.3	4.2	35.	147.0	0.0	0.	0.0	0.	220.7
	HIGH	21.6	24.	561.6	7.6	112.	824.8	6.7	117.	783.9	0.0	0.	0.0	0.	2174.3
TOTAL SUM OF CONDUCTS	MEAN				16	15		30	24				0	0	
	LOW														
	HIGH														
TOTAL SUM OF CONDUCTS	MEAN			717.0			716.7			943.1					2376.8
	LOW			109.2			246.5			421.3					777.0
	HIGH			1736.3			1345.6			1688.9					4820.8

TABLE II-E. SET 7 ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

15 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

14 WEEK ROT GRADUATES

CONDITION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	MEAN	LOS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	
01 TACTICAL MOVEMENTS	10.4	5.6	4.0	43.2	6.3	6.0	37.8	9.8	10.0	98.0	0.0	0.0	0.0	0.0	0.0	0.0	179.0
	10.4	4.1	4.0	28.8	3.5	6.0	21.0	5.5	8.0	44.8	0.0	0.0	0.0	0.0	0.0	0.0	90.6
	10.4	7.7	4.0	61.6	9.1	4.0	72.8	14.1	14.0	197.6	0.0	0.0	0.0	0.0	0.0	0.0	331.8
02 SECURITY AND INTELLIGENCE OPNS	10.4	5.1	4.0	40.8	1.6	6.0	9.6	3.2	6.0	19.2	0.0	0.0	0.0	0.0	0.0	0.0	69.6
	10.4	4.0	6.0	18.0	1.3	6.0	7.8	2.1	6.0	12.6	0.0	0.0	0.0	0.0	0.0	0.0	38.4
	10.4	7.3	10.0	73.0	1.8	4.0	14.4	4.3	8.0	36.8	0.0	0.0	0.0	0.0	0.0	0.0	121.8
03 COVER-CONCEALMENT	10.4	1.4	4.0	17.2	2.2	6.0	13.2	3.6	8.0	28.8	0.0	0.0	0.0	0.0	0.0	0.0	109.2
	10.4	1.8	6.0	10.8	1.6	4.0	5.6	2.8	8.0	22.4	0.0	0.0	0.0	0.0	0.0	0.0	38.8
	10.4	1.0	8.0	120.0	3.0	6.0	24.0	4.5	10.0	45.0	0.0	0.0	0.0	0.0	0.0	0.0	189.0
04 EMPLOY FIGHTING VEHICLES	10.4	3.5	10.0	35.0	5.7	6.0	34.2	8.2	8.0	65.6	0.0	0.0	0.0	0.0	0.0	0.0	194.8
	10.4	3.2	4.0	12.0	2.9	4.0	11.2	4.0	8.0	32.0	0.0	0.0	0.0	0.0	0.0	0.0	56.0
	10.4	14.0	14.0	221.2	4.6	4.0	68.8	12.5	10.0	125.0	0.0	0.0	0.0	0.0	0.0	0.0	415.0
05 FIRE AND MANEUVER	10.4	3.5	10.0	35.0	7.6	8.0	60.8	7.2	12.0	86.4	0.0	0.0	0.0	0.0	0.0	0.0	242.2
	10.4	3.1	6.0	18.6	4.1	6.0	24.6	4.9	8.0	39.2	0.0	0.0	0.0	0.0	0.0	0.0	82.4
	10.4	15.0	14.0	222.6	11.0	10.0	110.0	9.5	14.0	133.0	0.0	0.0	0.0	0.0	0.0	0.0	465.6
06 REORGANIZE-CONSOLIDATE	10.4	4.2	8.0	33.6	1.9	6.0	11.4	3.3	8.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	71.4
	10.4	2.3	6.0	12.6	1.5	4.0	6.0	2.1	4.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0	35.4
	10.4	6.6	4.0	51.2	2.3	4.0	14.4	4.5	10.0	45.0	0.0	0.0	0.0	0.0	0.0	0.0	114.6
07 NIGHT OPERATIONS	10.4	5.6	8.0	44.8	6.4	6.0	38.4	5.6	10.0	56.0	0.0	0.0	0.0	0.0	0.0	0.0	139.2
	10.4	2.3	8.0	18.6	4.5	6.0	27.0	3.8	8.0	30.4	0.0	0.0	0.0	0.0	0.0	0.0	75.8
	10.4	3.0	8.0	71.2	4.3	4.0	65.6	7.3	12.0	87.6	0.0	0.0	0.0	0.0	0.0	0.0	225.2
08 NBC OPERATIONS	10.4	2.7	4.0	21.6	1.4	6.0	10.4	4.0	4.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	64.4
	10.4	1.6	4.0	12.6	1.3	4.0	5.2	2.4	7.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0	34.8
	10.4	4.0	4.0	31.2	2.3	6.0	18.6	5.2	12.0	52.0	0.0	0.0	0.0	0.0	0.0	0.0	101.6

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	HRS	FREQ	PHON	HRS	FREQ	PHON	HRS	FREQ	PHON	FREQ	PHON	HRS	FREQ	PHON			
00 COMBAT IN BUILT-UP AREAS	MEAN	2.2	6.	17.5	2.4	6.	14.4	6.0	8.	48.0	0.0	0.	0.0	0.0	79.8		
	LOW	1.0	4.	7.5	1.7	4.	6.4	4.0	6.	24.0	0.0	0.	0.0	0.0	34.4		
	HIGH	4.8	8.	30.5	3.0	16.	24.0	8.0	10.	80.0	0.0	0.	0.0	0.0	134.4		
		7	8		14	16		12	30				0				
010 HOSTILE TAC ATU ENVIRONMENT	MEAN	3.1	8.	24.9	2.3	6.	13.8	3.8	8.	30.4	0.0	0.	0.0	0.0	69.0		
	LOW	1.1	6.	6.6	1.7	6.	10.2	2.5	6.	15.0	0.0	0.	0.0	0.0	31.8		
	HIGH	5.1	12.	61.2	2.9	6.	23.2	5.0	8.	40.0	0.0	0.	0.0	0.0	124.4		
		8	4		17	17		30	30				0				
011 COMMUNICATIONS IN FV ENVIRONMENT	MEAN	4.0	10.	40.0	2.8	6.	16.8	3.4	6.	22.8	0.0	0.	0.0	0.0	79.6		
	LOW	1.5	8.	4.0	1.4	6.	10.8	2.4	6.	14.4	0.0	0.	0.0	0.0	29.2		
	HIGH	7.5	12.	80.0	3.8	16.	30.4	5.2	8.	41.6	0.0	0.	0.0	0.0	162.0		
		7	8		14	16		12	28				0				
012 BATTLE POSITIONS	MEAN	1.4	8.	43.2	3.1	6.	14.6	5.0	8.	40.0	0.0	0.	0.0	0.0	141.8		
	LOW	1.0	6.	5.4	2.6	6.	15.6	3.8	6.	22.8	0.0	0.	0.0	0.0	33.0		
	HIGH	2.8	12.	81.6	3.7	16.	29.6	6.1	10.	61.0	0.0	0.	0.0	0.0	352.2		
		7	7		14	16		20	24				0				
013 BREACH OBSTACLES	MEAN	2.2	6.	13.2	1.0	6.	11.4	2.7	6.	16.2	0.0	0.	0.0	0.0	40.8		
	LOW	1.5	4.	5.0	1.6	4.	6.4	2.2	6.	13.2	0.0	0.	0.0	0.0	25.6		
	HIGH	3.0	8.	24.0	2.2	13.	13.2	3.2	8.	25.6	0.0	0.	0.0	0.0	62.8		
		8	8		13	17		31	27				0				
014 EMPLOY ORGANIC SMALL ARMS	MEAN	2.2	4.	8.8	3.0	6.	23.4	2.2	6.	13.2	0.0	0.	0.0	0.0	45.4		
	LOW	1.5	0.	0.0	2.5	4.	10.0	1.7	6.	10.2	0.0	0.	0.0	0.0	20.2		
	HIGH	3.0	8.	40.0	5.3	17	31.8	2.7	8.	21.6	0.0	0.	0.0	0.0	93.4		
		5	4		17	17		28	28				0				
015 RECONNAISSANCE	MEAN	4.1	6.	19.6	2.6	6.	15.6	3.3	8.	26.4	0.0	0.	0.0	0.0	60.6		
	LOW	1.8	6.	10.8	1.9	4.	7.6	2.4	6.	14.4	0.0	0.	0.0	0.0	32.8		
	HIGH	6.4	8.	35.2	3.2	16.	25.6	4.2	10.	42.0	0.0	0.	0.0	0.0	102.8		
		4	7		14	16		31	20				0				
016 LEADER/COMMANDER	MEAN	4.2	10.	42.0	4.4	12.	52.8	3.4	14.	60.8	0.0	0.	0.0	0.0	175.6		
	LOW	1.0	6.	0.0	2.6	8.	29.8	2.6	8.	20.8	0.0	0.	0.0	0.0	41.6		
	HIGH	7.5	12.	84.0	6.1	16.	97.6	5.0	22.	110.0	0.0	0.	0.0	0.0	357.6		
		8	7		14	17		28	32				0				

TASK	BATTALION			COMPANY			PLATOON			SQUAD			YEAR TOTAL HOURS
	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	
017 MAINTENANCE	MEAN	10.4	20.	208.0	6.1	82.	500.2	5.4	96.	514.4	0.0	0.	1226.6
	LO	-2.6	H.	-20.8	4.7	24.	112.8	4.2	44.	184.8	0.0	0.	276.8
	HIGH	21.4	30.	702.0	7.4	140.	1036.0	6.7	146.	978.2	0.0	0.	2716.2
					16	15		30	28		0	0	
TOTAL SUM OF PRODUCTS	MEAN			617.2			883.2			1188.6			2949.0
	LO			117.6			309.4			536.6			941.6
	HIGH			2246.4			1704.6			2119.4			6070.4

TABLE II-F. SET V ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

20 PER CENT REPLACEMENT OF T O E STRENGTH PER QUARTER

14 WEEK HAT GRADUATES

CONDITION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	MEAN	LOW	HIGH	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	HOURS
Q1 TACTICAL MOVEMENTS	MEAN	7.4	10.0	10.0	54.0	6.3	8.0	50.4	9.8	13.0	127.4	0.0	0.0	0.0	0.0	0.0	231.8
	WTR	10.0	10.0	10.0	41.0	3.5	8.0	28.0	5.6	10.0	56.0	0.0	0.0	0.0	0.0	0.0	115.0
Q2 SECURITY AND INTELLIGENCE NON	MEAN	5.1	10.0	10.0	31.0	1.6	8.0	12.8	3.2	8.0	25.6	0.0	0.0	0.0	0.0	0.0	89.4
	WTR	10.0	10.0	10.0	24.0	1.3	8.0	10.4	2.1	8.0	16.8	0.0	0.0	0.0	0.0	0.0	51.2
Q3 COVER--COVER/REARMENT	MEAN	1.4	10.0	10.0	44.0	2.2	8.0	17.6	3.6	10.0	36.0	0.0	0.0	0.0	0.0	0.0	137.6
	WTR	10.0	10.0	10.0	14.4	1.4	8.0	7.2	2.8	10.0	28.0	0.0	0.0	0.0	0.0	0.0	49.6
Q4 EMPLOY FIGHTING VEHICLE	MEAN	2.5	13.0	13.0	123.4	5.7	8.0	45.6	8.2	10.0	82.0	0.0	0.0	0.0	0.0	0.0	251.1
	WTR	10.0	10.0	10.0	16.0	2.8	8.0	14.0	4.0	10.0	40.0	0.0	0.0	0.0	0.0	0.0	70.0
Q5 FIDE AND MANEUVER	MEAN	1.5	13.0	13.0	123.4	5.7	8.0	45.6	8.2	10.0	82.0	0.0	0.0	0.0	0.0	0.0	251.1
	WTR	10.0	10.0	10.0	16.0	2.8	8.0	14.0	4.0	10.0	40.0	0.0	0.0	0.0	0.0	0.0	70.0
Q6 REORGANIZE--CONSULTANT	MEAN	4.2	10.0	10.0	42.0	1.0	8.0	15.2	3.3	10.0	33.0	0.0	0.0	0.0	0.0	0.0	90.2
	WTR	10.0	10.0	10.0	16.4	1.5	8.0	7.5	2.1	10.0	21.0	0.0	0.0	0.0	0.0	0.0	45.3
Q7 NIGHT OPERATIONS	MEAN	3.6	10.0	10.0	36.0	6.6	8.0	51.2	5.6	13.0	72.8	0.0	0.0	0.0	0.0	0.0	140.0
	WTR	10.0	10.0	10.0	24.0	4.5	8.0	36.0	3.6	10.0	36.0	0.0	0.0	0.0	0.0	0.0	97.0
Q8 NBC OPERATIONS	MEAN	2.7	10.0	10.0	27.0	1.8	8.0	14.4	4.0	10.0	40.0	0.0	0.0	0.0	0.0	0.0	81.4
	WTR	10.0	10.0	10.0	14.0	1.3	8.0	6.4	2.8	10.0	28.0	0.0	0.0	0.0	0.0	0.0	44.0

TASK	BATTALION				COMPANY				PLATOON				SECTION				YEAR TOTAL HOURS
	HQS	FREQ	PRON	PHON	HQS	FREQ	PRON	PHON	HQS	FREQ	PRON	PHON	HQS	FREQ	PRON	PHON	
00 COMBAT IN BUILT-UP AREAS	2.0	8	23.2	14.2	2.4	8	23.2	14.2	6.0	10	60.0	40.0	0.0	0	0.0	0.0	102.4
MEAN	1.9	8	9.5	8.5	1.7	8	9.5	8.5	4.0	8	32.0	32.0	0.0	0	0.0	0.0	50.0
LOW	1.8	10	30.0	30.0	3.0	10	30.0	30.0	8.0	13	104.0	104.0	0.0	0	0.0	0.0	172.0
HIGH	7	8			14	14			32	30			0	0			
010 HOSTILE TAC AID ENVIRONMENT	3.1	10	31.0	14.4	2.3	8	31.0	14.4	3.8	10	38.0	38.0	0.0	0	0.0	0.0	87.4
MEAN	1.1	8	8.4	13.6	1.7	8	8.4	13.6	2.5	8	20.0	20.0	0.0	0	0.0	0.0	42.4
LOW	5.1	15	76.5	24.0	2.0	10	24.0	24.0	5.0	10	50.0	50.0	0.0	0	0.0	0.0	155.5
HIGH	8	8			17	17			30	30			0	0			
011 COMMUNICATIONS IN ENVIRONMENT	4.0	13	52.3	22.4	2.8	8	22.4	22.4	3.8	8	30.4	30.4	0.0	0	0.0	0.0	108.8
MEAN	5	10	5.0	16.4	1.8	8	16.4	16.4	2.4	8	19.2	19.2	0.0	0	0.0	0.0	38.6
LOW	7.5	15	112.5	38.0	3.8	10	38.0	38.0	5.2	10	52.0	52.0	0.0	0	0.0	0.0	202.5
HIGH	7	8			15	16			32	28			0	0			
012 BATTLE POSITIONS	11.4	10	104.0	24.8	3.1	8	24.8	24.8	5.0	10	50.0	50.0	0.0	0	0.0	0.0	178.8
MEAN	7.9	8	7.2	20.8	2.6	8	20.8	20.8	3.8	8	30.4	30.4	0.0	0	0.0	0.0	44.0
LOW	21.8	15	327.0	37.0	3.7	10	37.0	37.0	6.1	13	79.3	79.3	0.0	0	0.0	0.0	443.3
HIGH	7	7			15	16			20	20			0	0			
013 HURDLE W/STIFFNESS AND OBSTACLES	2.2	8	17.6	15.2	1.9	8	15.2	15.2	2.7	8	21.6	21.6	0.0	0	0.0	0.0	58.4
MEAN	1.5	5	7.5	8.0	1.4	5	8.0	8.0	2.2	8	17.6	17.6	0.0	0	0.0	0.0	33.1
LOW	3.0	10	30.0	17.6	2.2	8	17.6	17.6	3.2	10	32.0	32.0	0.0	0	0.0	0.0	79.6
HIGH	8	8			13	17			31	27			0	0			
014 EMPLOY ORGANIC SMALL ARMS	2.2	5	11.0	31.2	3.9	8	31.2	31.2	2.2	8	17.6	17.6	0.0	0	0.0	0.0	59.8
MEAN	2.5	0	0.0	12.5	2.5	8	12.5	12.5	1.7	8	13.6	13.6	0.0	0	0.0	0.0	26.1
LOW	7.0	10	59.0	42.4	5.3	8	42.4	42.4	2.7	10	27.0	27.0	0.0	0	0.0	0.0	119.4
HIGH	5	5			17	17			28	24			0	0			
015 RECONNAISSANCE	3.1	8	24.0	21.8	2.4	8	21.8	21.8	3.3	10	33.0	33.0	0.0	0	0.0	0.0	78.6
MEAN	1.8	8	14.5	9.5	1.9	5	9.5	9.5	2.4	8	19.2	19.2	0.0	0	0.0	0.0	43.1
LOW	4.4	10	64.0	32.0	3.2	10	32.0	32.0	4.2	13	54.6	54.6	0.0	0	0.0	0.0	130.6
HIGH	6	7			14	16			31	23			0	0			
016 LEADER/COMMANDER SQUAD	3.2	13	102.6	66.0	4.4	15	66.0	66.0	3.8	20	76.0	76.0	0.0	0	0.0	0.0	222.6
MEAN	2.0	8	9.0	23.0	2.6	10	23.0	23.0	2.6	10	26.0	26.0	0.0	0	0.0	0.0	52.0
LOW	12.5	15	107.5	122.0	6.1	20	122.0	122.0	5.0	24	140.0	140.0	0.0	0	0.0	0.0	449.5
HIGH	8	7			14	17			28	32			0	0			

TASK	BATTALION				COMPANY				PLATOON				SECTION				YEAR TOTAL HOURS
	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	
O17 MAINTENANCE	10.4	25.	260.0	6.1	103.	628.3	5.4	120.	548.0	0.0	0.	0.0	0.0	0.	0.0	0.0	1536.3
	10.4	10.	226.0	4.7	30.	141.0	4.2	55.	231.0	0.0	0.	0.0	0.0	0.	0.0	0.0	346.0
	23.4	39.	486.2	7.4	175.	1295.0	6.7	183.	1226.1	0.0	0.	0.0	0.0	0.	0.0	0.0	3410.3
TOT L SUM OF PRODUCTS	115.2		1155.2			1129.5			1499.4								3794.1
	178.0		178.0			396.5			620.2								1254.7
	2019.2		2019.2			2140.0			2699.4								7668.6

TABLE II-G. SET V ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

TASK	CONDITION--										10 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER									
	BATTALION					COMPANY					12 WEEK HAT GRADUATES					PLATOON				
	MEAN	LOW	HIGH	HRS	FREQ	PROB	HRS	FREQ	PROB	PROB	HRS	FREQ	PROB	PROB	HRS	FREQ	PROB	PROB	PROB	YEAR TOTAL HOURS
01 TACTICAL MOVEMENTS	5.4	3.1	7.7	9.	49.6	6.3	7.	44.1	9.8	11.	107.8	0.0	0.	0.0	200.5					
	LOW	3.1	7.7	9.	49.6	6.3	7.	44.1	9.8	11.	107.8	0.0	0.	0.0	200.5					
	HIGH	7.7	9.	49.6	6.3	7.	44.1	9.8	11.	107.8	0.0	0.	0.0	200.5						
02 SECURITY AND INTELLIGENCE ON	5.1	3.0	7.3	9.	45.9	1.6	7.	11.2	3.2	7.	22.4	0.0	0.	0.0	79.5					
	LOW	3.0	7.3	9.	45.9	1.6	7.	11.2	3.2	7.	22.4	0.0	0.	0.0	79.5					
	HIGH	7.3	9.	45.9	1.6	7.	11.2	3.2	7.	22.4	0.0	0.	0.0	79.5						
03 CONFIDENTIALITY	4.4	1.8	7.0	9.	75.6	2.2	7.	15.4	3.6	9.	32.4	0.0	0.	0.0	121.4					
	LOW	1.8	7.0	9.	75.6	2.2	7.	15.4	3.6	9.	32.4	0.0	0.	0.0	121.4					
	HIGH	7.0	9.	75.6	2.2	7.	15.4	3.6	9.	32.4	0.0	0.	0.0	121.4						
04 EMPLOY FIGHTING VEHICLES	9.5	3.2	15.8	16.	104.5	5.7	7.	39.9	8.2	9.	73.8	0.0	0.	0.0	218.2					
	LOW	3.2	15.8	16.	104.5	5.7	7.	39.9	8.2	9.	73.8	0.0	0.	0.0	218.2					
	HIGH	15.8	16.	104.5	5.7	7.	39.9	8.2	9.	73.8	0.0	0.	0.0	218.2						
05 PIPE AND MANEUVER	4.5	1.1	7.9	11.	104.5	7.6	9.	64.4	7.2	14.	100.8	0.0	0.	0.0	273.7					
	LOW	1.1	7.9	11.	104.5	7.6	9.	64.4	7.2	14.	100.8	0.0	0.	0.0	273.7					
	HIGH	7.9	11.	104.5	7.6	9.	64.4	7.2	14.	100.8	0.0	0.	0.0	273.7						
06 REORGANIZATION	4.2	2.1	6.3	9.	37.8	1.9	7.	13.3	3.3	9.	29.7	0.0	0.	0.0	80.8					
	LOW	2.1	6.3	9.	37.8	1.9	7.	13.3	3.3	9.	29.7	0.0	0.	0.0	80.8					
	HIGH	6.3	9.	37.8	1.9	7.	13.3	3.3	9.	29.7	0.0	0.	0.0	80.8						
07 NIGHT OPERATIONS	5.6	3.3	7.9	9.	70.4	6.6	7.	44.8	5.6	11.	61.6	0.0	0.	0.0	154.8					
	LOW	3.3	7.9	9.	70.4	6.6	7.	44.8	5.6	11.	61.6	0.0	0.	0.0	154.8					
	HIGH	7.9	9.	70.4	6.6	7.	44.8	5.6	11.	61.6	0.0	0.	0.0	154.8						
08 NIGHT OPERATIONS	2.7	1.6	3.9	9.	24.3	1.8	7.	12.6	4.0	9.	18.9	0.0	0.	0.0	41.1					
	LOW	1.6	3.9	9.	24.3	1.8	7.	12.6	4.0	9.	18.9	0.0	0.	0.0	41.1					
	HIGH	3.9	9.	24.3	1.8	7.	12.6	4.0	9.	18.9	0.0	0.	0.0	41.1						

TASK	METAL TION				COMPANY			PLATOON			SQUAD			YEAR TOTAL
	MEAN	LOW	HIGH	STDEV	MRS	FREQ	PRON	MRS	FREQ	PRON	MRS	FREQ	PRON	
00 COMBAT IN BUILT-UP AREA	2.0	7.0	20.3	2.4	7.0	16.8	54.0	6.0	9.0	54.0	0.0	0.0	0.0	91.1
010 HOSTILE FAC AND ENVIRONMENT	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	46.0
011 COMMUNICATIONS IN ENVIRONMENT	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	140.2
012 BATTLE POSITIONS	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	78.2
013 BREACH OBSTACLES	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	37.1
014 EMPLOY ORGANIC SMALL ARMS	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	142.5
015 RECONNAISSANCE	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	90.2
016 LEA FR/COMMANDED SQUAD	1.0	5.0	9.5	1.7	5.0	8.5	28.0	4.0	7.0	28.0	0.0	0.0	0.0	33.9
														146.0
														160.3
														38.5
														405.6
														47.6
														30.9
														71.2
														53.7
														24.4
														106.4
														69.6
														38.9
														114.6
														198.2
														46.8
														409.8

TASK	BATTALION				COMPANY				PLATOON				SQUAD		YEAR TOTAL
	HRS	FREQ	PROD	PROD	HRS	FREQ	PROD	PROD	HRS	FREQ	PROD	PROD	HRS	FREQ	
OUT MAINTENANCE	11.4	23.	242.2	6.1	94.	573.4	5.4	110.	504.0	0.0	0.	0.0	0.0	0.	1406.6
	10.2	9.	23.4	4.7	24.	131.6	4.2	51.	214.2	0.0	0.	0.0	0.0	0.	322.4
	23.4	14.	715.6	7.4	161.	1191.4	6.7	164.	1125.6	0.0	0.	0.0	0.0	0.	3112.6
	1	4	1	1	15	1	30	28	1	1	1	1	1	1	
TOTAL SUM OF PRODUCTS	MEAN		1042.9			1017.7			1340.7			0.0			3401.3
	LOW		141.1			365.0			413.7			0.0			1139.4
	HIGH		2562.6			1942.7			2409.0			0.0			6014.3

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ARMY TRAINING STUDY: TRAINING EFFECTIVENESS ANALYSIS
(TER) SUMMARY VOLUME 2 ARMOR(U) ARMY TRAINING AND
DOCTRINE COMMAND FORT MONROE VA F J BROWN 08 AUG 78

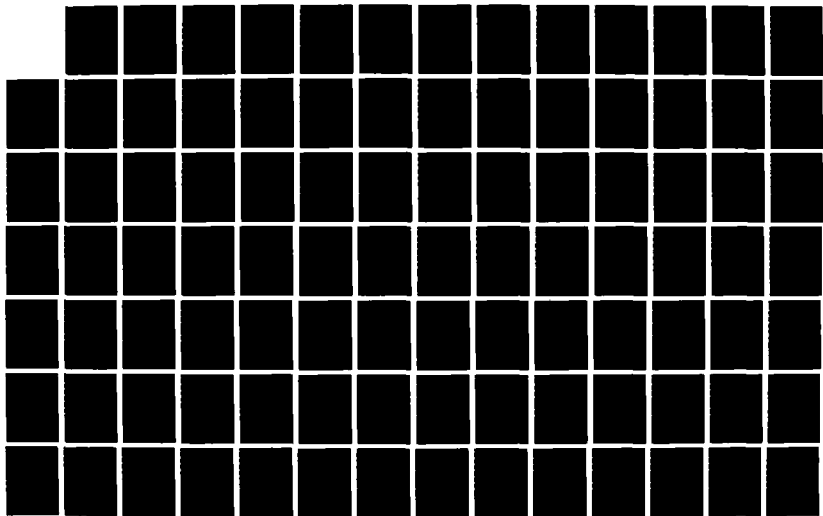
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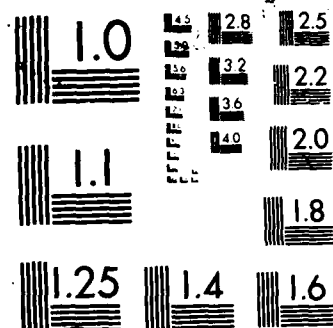


TABLE II-II. SFT V ADJUSTMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

15 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

TASK	CONDITION--														YEAR TOTAL HOURS
	BATTALION							COMPANY							
	12 WEEK RAT GRADUATES							PLATOON							
	HRS	FREQ	PROB	HRS	PROB	HRS	PROB	HRS	PROB	HRS	PROB	FREQ	PROB		
01 TACTICAL MOVEMENTS	MEAN	5.4	12	64.8	6.3	9	56.7	9.9	15	147.0	0.0	0	0.0	268.5	
	LOW	3.1	12	37.2	3.5	9	31.5	5.6	12	67.2	0.0	0	0.0	135.9	
	HIGH	7.7	12	92.4	10.2	12	109.2	14.1	20	282.0	0.0	0	0.0	483.6	
	"	7	7		17	16		31	31		0				
02 SECURITY AND INTELLIGENCE OPERATIONS	MEAN	5.1	12	61.2	1.6	9	14.4	3.2	9	28.8	0.0	0	0.0	104.4	
	LOW	3.0	9	27.0	1.3	9	11.7	2.1	9	18.9	0.0	0	0.0	57.6	
	HIGH	7.3	15	109.5	1.9	12	21.6	4.3	12	51.6	0.0	0	0.0	182.7	
	"	4	4		15	17		31	27		0				
03 COVER-CONCEALMENT	MEAN	5.4	12	100.8	2.2	9	19.8	3.4	12	43.2	0.0	0	0.0	163.8	
	LOW	3.2	9	54.2	1.4	9	12.6	2.8	12	33.6	0.0	0	0.0	58.2	
	HIGH	7.6	12	140.0	3.0	12	36.0	4.5	15	67.5	0.0	0	0.0	283.5	
	"	4	7		15	15		31	30		0				
04 EMPLOY FIGHTING VEHICLES	MEAN	4.5	15	132.5	5.7	9	51.3	8.2	12	98.4	0.0	0	0.0	292.2	
	LOW	3.2	6	19.2	4.6	6	14.8	4.0	12	48.0	0.0	0	0.0	84.0	
	HIGH	7.8	20	316.0	17	15	103.2	12.5	15	187.5	0.0	0	0.0	606.7	
	"	4	4		17	15		31	24		0				
05 LIFT AND MANEUVER	MEAN	4.5	15	132.5	7.6	12	91.2	7.2	17	122.4	0.0	0	0.0	356.1	
	LOW	3.1	9	27.0	4.1	9	36.9	4.9	12	58.8	0.0	0	0.0	123.6	
	HIGH	7.9	20	314.0	11.0	15	165.0	9.5	20	190.0	0.0	0	0.0	673.0	
	"	4	4		16	16		24	31		0				
06 REORGANIZE-CONSOLIDATE	MEAN	4.2	12	50.4	1.9	9	17.1	3.3	12	39.6	0.0	0	0.0	107.1	
	LOW	2.1	9	18.9	1.5	6	9.0	2.1	12	25.2	0.0	0	0.0	53.1	
	HIGH	6.3	12	76.8	2.3	12	27.6	4.5	15	67.5	0.0	0	0.0	171.9	
	"	4	7		16	15		31	31		0				
07 REPORT OPERATIONS	MEAN	5.4	12	67.2	6.4	9	57.6	5.4	15	81.0	0.0	0	0.0	208.8	
	LOW	3.3	12	27.6	4.5	9	40.5	3.8	12	45.6	0.0	0	0.0	113.7	
	HIGH	9.0	12	108.0	9.3	12	99.6	7.3	17	124.1	0.0	0	0.0	330.5	
	"	7	4		17	15		28	31		0				
08 NBC OPERATIONS	MEAN	2.7	12	12.4	1.4	9	12.6	4.0	12	48.0	0.0	0	0.0	96.6	
	LOW	1.6	12	19.2	1.3	6	7.8	2.9	9	25.2	0.0	0	0.0	52.2	
	HIGH	3.9	12	46.8	2.3	12	27.6	5.2	15	78.0	0.0	0	0.0	152.4	
	"	4	4		16	16		31	31		0				

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	WHS	FREQ	PRON	WHS	FREQ	PRON	WHS	FREQ	PRON	WHS	FREQ	PRON	WHS	FREQ	PRON	HOURS	
Q0 COMBAT IN BUILT-IN AREAS	MEAN 10 HIGH	2.0 1.0 1.0 7	9 6 12 4	26.1 11.4 45.4	2.4 1.7 3.0 16	9 6 12 16	21.6 10.2 36.0	6.0 4.0 8.0 32	12 9 15 30	72.0 36.0 120.0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	119.7 57.6 201.6	
Q10 HOSTILE TAC & ID ENVIRONMENT	MEAN 10 HIGH	3.1 1.1 4.1 8	12 9 17 8	17.2 9.9 46.7	2.3 1.7 2.9 17	9 4 12 17	20.7 15.3 36.9	3.8 2.5 5.0 30	12 9 12 30	45.4 22.5 60.0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	103.5 47.7 151.5	
Q11 COMMUNICATIONS IN ENVIRONMENT	MEAN 10 HIGH	4.0 1.5 7.5 7	15 12 17 8	60.0 6.0 127.5	2.8 1.9 3.8 15	9 4 12 16	25.2 16.2 45.6	3.9 2.4 5.2 32	9 9 12 28	34.2 21.4 62.4	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	119.4 43.8 235.5	
Q12 BATTLE POSITIONS	MEAN 10 HIGH	10.4 -0 21.9 7	12 9 17 7	126.9 -9.1 370.4	3.1 2.4 3.7 15	9 9 12 16	27.9 23.4 44.4	5.0 3.8 6.1 20	12 9 15 20	60.0 34.2 91.5	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	212.7 49.5 506.5	
Q13 REACH MINIFIELDS AND OBSTACLES	MEAN 10 HIGH	2.2 1.5 3.0 9	9 6 12 4	19.8 9.0 34.0	1.9 1.6 2.2 13	9 6 9 17	17.1 9.4 19.8	2.7 2.2 3.2 31	9 9 12 27	24.3 19.8 38.4	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	61.2 38.4 99.2	
Q14 EMPLOY OPERATIVE SMALL ARMS	MEAN 10 HIGH	2.2 -5 5.0 5	6 0 12 5	13.2 0.0 60.0	3.9 2.5 5.3 17	9 6 9 17	35.1 15.0 47.7	2.2 1.7 2.7 28	9 9 12 28	19.9 15.3 32.4	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	68.1 30.3 140.1	
Q15 RECONNAISSANCE	MEAN 10 HIGH	3.1 1.9 4.4 9	9 9 12 7	27.3 16.2 52.4	2.4 1.9 3.2 14	9 6 12 16	23.4 11.4 30.4	3.3 4.2 4.2 31	12 9 15 20	39.4 21.6 63.0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	90.9 49.2 154.2	
Q16 LEADER/COMMANDER SQUAD	MEAN 10 HIGH	6.2 1.0 12.5 9	15 9 17 7	53.0 0.0 212.5	4.4 2.4 6.1 14	17 12 23 17	74.8 31.2 140.3	3.8 2.4 5.0 28	23 12 32 32	87.4 31.2 140.0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	255.2 62.4 517.4	

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	MRS	FREQ	QDQD	MRS	FREQ	QDQD	MRS	FREQ	QDQD	MRS	FREQ	QDQD	MRS	FREQ	QDQD	MRS	
OIL MAINTENANCE	HEAD	10.4	29.	301.5	6.1	119.	725.9	5.4	139.	750.4	0.0	0.	0.0	0.	0.0	0.0	1778.1
	101	2.4	12.	31.2	4.7	35.	164.5	4.2	64.	268.8	0.0	0.	0.0	0.	0.0	0.0	402.1
	WTH	21.4	44.	1029.4	7.4	203.	1502.2	6.7	212.	1420.4	0.0	0.	0.0	0.	0.0	0.0	3952.2
		4			14	14		30	20		0	0					
TOTAL SUM OF PRODUCTS	HEAD			1345.4			1296.0			1744.9							4406.3
	101			306.4			459.4			793.5							1459.3
	WTH			3267.5			2499.0			3006.3							8862.9

TABLE II-1. SET V ASSIGNMENTS TO COLLECTIVE TASKS TRAINING FREQUENCIES

20 HRP PER CENT REPLACEMENT OF T O E STRENGTH PER QUARTER

12 WEEK PAT GRADUATES

CONDITION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	
Q1 TACTICAL MOVEMENTS	MEAN	7.6	14.	15.6	6.3	10.	10.	6.3	9.4	17.	16.6	0.0	0.	0.	0.0	0.0	335.2
	MIN	4.1	14.	4.6	3.5	10.	10.	3.5	5.6	14.	78.4	0.0	0.	0.	0.0	0.0	156.8
Q2 SECURITY AND INTELLIGENCE OPN	MEAN	7.7	14.	107.4	9.1	14.	14.	127.4	14.1	24.	119.4	0.0	0.	0.	0.0	0.0	573.6
	MIN	7	7	17	17	14	14	17	31	31	0	0	0	0	0	0	119.4
Q3 (CONVULSION) COMBATMENT	MEAN	5.1	14.	11.4	1.4	10.	10.	14.0	3.2	10.	32.0	0.0	0.	0.	0.0	0.0	64.0
	MIN	3.0	10.	10.0	1.4	10.	10.	14.0	2.1	10.	21.0	0.0	0.	0.	0.0	0.0	209.5
Q4 EMPLOY FIGHTING MANEUVERS	MEAN	1.4	14.	117.4	2.2	10.	10.	22.0	3.4	14.	50.4	0.0	0.	0.	0.0	0.0	190.0
	MIN	1.4	14.	14.0	1.4	10.	10.	14.0	2.4	14.	39.2	0.0	0.	0.	0.0	0.0	67.0
Q5 FIRE AND MANEUVERS	MEAN	15.0	14.	210.0	15	15	15	42.0	4.5	17.	76.5	0.0	0.	0.	0.0	0.0	328.5
	MIN	4	7	210.0	15	15	15	42.0	31	30	0	0	0	0	0	0	333.3
Q6 REORGANIZATION	MEAN	9.5	17.	161.5	5.7	10.	10.	57.0	8.2	14.	114.8	0.0	0.	0.	0.0	0.0	98.0
	MIN	3.2	7.	22.4	2.4	7.	7.	19.6	4.0	14.	56.0	0.0	0.	0.	0.0	0.0	712.1
Q7 NIGHT OPERATIONS	MEAN	15.0	24.	341.6	11.0	17.	17.	187.0	12.5	17.	212.5	0.0	0.	0.	0.0	0.0	411.9
	MIN	4	4	341.6	14	14	14	187.0	24	24	228.0	0.0	0.	0.	0.0	0.0	140.6
Q8 NIGHT OPERATIONS	MEAN	15.0	24.	341.6	11.0	17.	17.	187.0	12.5	17.	212.5	0.0	0.	0.	0.0	0.0	796.6
	MIN	4	4	341.6	14	14	14	187.0	24	24	228.0	0.0	0.	0.	0.0	0.0	124.0
Q9 NIGHT OPERATIONS	MEAN	15.0	24.	341.6	11.0	17.	17.	187.0	12.5	17.	212.5	0.0	0.	0.	0.0	0.0	60.9
	MIN	4	4	341.6	14	14	14	187.0	24	24	228.0	0.0	0.	0.	0.0	0.0	192.3
Q10 NIGHT OPERATIONS	MEAN	15.0	24.	341.6	11.0	17.	17.	187.0	12.5	17.	212.5	0.0	0.	0.	0.0	0.0	237.6
	MIN	4	4	341.6	14	14	14	187.0	24	24	228.0	0.0	0.	0.	0.0	0.0	130.4
Q11 NIGHT OPERATIONS	MEAN	15.0	24.	341.6	11.0	17.	17.	187.0	12.5	17.	212.5	0.0	0.	0.	0.0	0.0	386.8
	MIN	4	4	341.6	14	14	14	187.0	24	24	228.0	0.0	0.	0.	0.0	0.0	111.8
Q12 NIGHT OPERATIONS	MEAN	15.0	24.	341.6	11.0	17.	17.	187.0	12.5	17.	212.5	0.0	0.	0.	0.0	0.0	59.5
	MIN	4	4	341.6	14	14	14	187.0	24	24	228.0	0.0	0.	0.	0.0	0.0	175.2

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	WCS	FRFO	PRFO	WCS	FRFO	PRFO	WCS	FRFO	PRFO	WCS	FRFO	PRFO	WCS	FRFO	PRFO		
00 COMBAT IN BUILT-UP AREAS	2.0 10.0 10.0 WCS 1.0 1.0 7	10.0 7.0 14.0 14	23.0 13.3 53.2 A	2.4 1.7 3.0 14	10.0 7.0 14.0 14	24.0 11.9 42.0 A	4.0 4.0 8.0 32	14.0 10.0 17.0 30	84.0 40.0 136.0 30	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	137.0 65.2 231.2	
01 HOSTILE TACTIC COMPLETION	1.1 10.0 10.0 WCS 1.1 1.1 A	14.0 10.0 20.0 A	43.4 11.0 102.0 A	2.3 1.7 2.0 17	10.0 10.0 14.0 17	23.0 17.0 40.6 A	3.4 2.5 5.0 30	14.0 10.0 14.0 30	53.2 25.0 70.0 30	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	119.6 53.0 212.6	
02 COMMUNICATIONS IN THE FIELD	4.0 10.0 10.0 WCS 4.0 4.0 7	17.0 14.0 20.0 A	48.0 7.0 140.0 A	2.4 1.8 3.4 15	10.0 10.0 14.0 14	24.0 14.0 53.2 A	3.4 2.4 5.2 32	10.0 10.0 14.0 24	34.0 24.0 72.0 24	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	134.0 49.0 276.0	
03 BATTLE POSITIONS	10.4 10.0 21.0 WCS 10.4 10.0 7	14.0 10.0 20.0 A	145.4 9.0 44.0 A	3.1 2.4 3.7 15	10.0 10.0 14.0 14	31.0 24.0 51.0 A	5.0 3.4 6.1 20	14.0 10.0 17.0 24	70.0 34.0 103.7 24	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	246.6 55.0 591.5	
04 HUMAN OBSTACLES AND OBSTACLES	2.2 10.0 10.0 WCS 2.2 2.2 A	10.0 7.0 14.0 A	22.0 10.0 42.0 A	1.0 1.4 2.2 11	10.0 7.0 14.0 17	14.0 11.0 22.0 A	2.7 2.2 3.2 31	10.0 10.0 14.0 27	27.0 22.0 44.0 27	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	64.0 43.7 108.8	
05 EMPLOY ORGANIC WEAPONS	2.2 10.0 10.0 WCS 2.2 2.2 A	7.0 0.0 14.0 A	15.4 0.0 40.0 A	3.0 2.4 5.4 17	10.0 7.0 14.0 17	34.0 17.0 51.0 A	2.2 1.7 2.7 24	10.0 10.0 14.0 24	22.0 17.0 37.0 24	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	76.4 34.5 160.8	
06 RECONNAISSANCE	1.1 10.0 10.0 WCS 1.1 1.1 A	10.0 10.0 14.0 A	31.0 14.0 41.4 A	2.4 1.0 3.2 14	10.0 7.0 14.0 14	24.0 13.0 44.0 A	3.3 2.4 4.2 31	14.0 10.0 17.0 20	46.2 24.0 71.0 20	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	103.2 55.3 177.8	
07 LEAD/COMMANDED WILL	2.2 10.0 10.0 WCS 2.2 2.2 A	17.0 10.0 20.0 A	145.4 0.0 240.0 A	4.4 2.4 6.1 14	20.0 14.0 27.0 17	44.0 34.4 140.7 A	3.4 2.4 5.0 24	27.0 14.0 37.0 24	102.4 36.4 145.0 24	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	0.0 0.0 0.0 0	206.0 72.8 549.7	

TABLE 1

UNIT	COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	MOS	FREQ	MOS	FREQ	MOS	FREQ	MOS	FREQ	MOS	FREQ	MOS	FREQ	
311 MAINTENANCE	1.4	16	3-3.6	6.1	139	947.9	5.4	163	940.2	0.0	0	0.0	2041.7
	2.4	14	14.4	6.7	41	192.7	4.2	75	315.0	0.0	0	0.0	471.3
	2.6	51	11.3.4	7.6	238	1761.2	6.7	248	1661.6	0.0	0	0.0	4616.2
		4		14	15		30	24		0	0		
TOTAL SUM OF HOURS			1516.0			1491.3			2028.6			0.0	5095.7
			14.0			527.0			315.2			0.0	1677.0
			1450.7			2015.9			3609.6			0.0	6666.6

(BLANK)

TABLE III-A. SET VI ADJUSTMENTS TO ADDED MISSION TIME AND FREQUENCY

10 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER													
15 WEEK BATT GRADUATES													
COMBINATION--													
TACTIC	ATTACHMENT				COMPANY				PLATOON				YEAR TOTAL HOURS
	HQS	EXP	WDD	WDS	HQS	EXP	WDD	WDS	HQS	EXP	WDD	WDS	
01 MOVEMENT TO CONTACT	YEAR	4.4	2.0	4.4	4.3	3.0	12.0	4.4	3.0	1.2	1.2	1.2	37.3
	104	3.3	1.0	3.3	3.4	2.0	6.8	4.1	3.0	0.6	0.0	0.0	22.4
	WTD	5.5	2.0	11.2	5.1	3.0	15.3	5.5	4.0	1.8	1.0	1.8	50.3
02 HASTY ATTACK	YEAR	4.1	1.0	4.1	4.1	3.0	12.3	3.8	3.0	0.6	0.0	0.0	28.4
	104	2.0	1.0	2.0	3.2	2.0	6.8	3.2	3.0	0.3	0.0	0.0	18.9
	WTD	5.2	2.0	10.6	5.0	3.0	15.0	4.5	4.0	1.0	0.0	1.0	44.6
03 DELIBERATE ATTACK	YEAR	5.1	2.0	10.2	5.1	3.0	15.3	4.0	3.0	0.8	0.0	0.0	41.0
	104	4.8	1.0	3.0	4.0	2.0	4.0	4.1	3.0	0.3	0.0	0.0	24.1
	WTD	6.3	2.0	12.6	6.2	3.0	18.6	5.7	4.0	1.2	0.0	1.2	55.2
04 EXPLOITATION	YEAR	4.8	1.0	3.3	3.1	2.0	6.2	3.4	3.0	0.5	0.0	0.0	20.2
	104	2.0	1.0	2.0	2.3	2.0	4.6	2.5	2.0	0.0	0.0	0.0	12.5
	WTD	4.7	2.0	9.4	3.0	3.0	11.7	4.3	3.0	0.0	0.0	0.0	34.0
05 NIGHT ATTACK	YEAR	4.0	2.0	9.8	5.3	3.0	17.4	5.2	3.0	1.2	1.2	1.2	44.0
	104	3.7	1.0	3.7	4.5	2.0	9.0	4.4	3.0	0.6	0.6	0.6	26.5
	WTD	6.2	2.0	12.6	7.1	3.0	21.3	6.1	4.0	1.8	2.0	3.4	61.7
06 DEFENSE	YEAR	5.6	2.0	11.2	5.4	3.0	16.2	5.4	3.0	1.4	1.4	1.4	45.0
	104	4.3	1.0	4.3	4.2	2.0	4.4	4.5	3.0	0.9	0.9	0.9	27.1
	WTD	6.2	2.0	13.4	6.5	3.0	14.5	6.2	4.0	1.0	2.0	3.8	61.9
07 DELAY	YEAR	4.8	2.0	7.0	4.4	3.0	12.2	4.4	3.0	1.1	1.1	1.1	36.3
	104	2.4	1.0	2.0	3.5	2.0	7.0	4.1	3.0	0.6	0.6	0.6	22.7
	WTD	6.4	2.0	9.4	5.3	3.0	15.4	5.5	4.0	1.6	2.0	3.2	50.7
08 MISCEANEOUS	YEAR	3.0	1.0	3.0	3.6	2.0	7.2	4.2	3.0	1.0	1.0	1.0	24.7
	104	2.0	1.0	2.0	2.9	2.0	5.4	3.4	3.0	0.5	0.0	0.0	18.9
	WTD	4.0	2.0	9.4	6.4	3.0	13.2	4.3	4.0	1.4	1.0	1.4	43.8

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	WDS	FWO	PMO	PMO	HWS	FWO	PMO	PMO	HWS	FWO	PMO	PMO	HWS	FWO	PMO	PMO	
01 OFFENSE OF BATTLEFIELD AREA	1.5	1.0	3.5	3.5	3.5	2.0	7.0	7.0	4.0	3.0	12.0	1.1	1.1	1.0	1.1	23.6	
	2.6	1.0	2.6	2.6	2.7	2.0	5.4	5.4	3.4	3.0	10.2	.6	.6	1.0	.6	18.8	
	4.0	2.0	4.0	4.0	4.2	3.0	12.6	12.6	4.7	3.0	14.1	1.5	2.0	2.0	3.0	38.3	
	5.1	4.4	5.5	5.5	5.5	5.5			5.4	5.4		4.7	4.5				
010 PROTRUDE STANDING POINT	1.0	1.0	3.0	3.0	3.0	2.0	7.2	7.2	4.2	3.0	12.6	1.2	1.0	1.0	1.2	24.0	
	2.3	1.0	2.3	2.3	2.3	2.0	5.6	5.6	3.5	3.0	10.5	.7	1.0	.7	.7	19.1	
	4.7	2.0	7.6	7.6	4.3	3.0	12.9	12.9	4.9	4.0	19.4	1.7	2.0	3.4	3.4	43.3	
	4.0	4.1	5.5	5.5	5.5	5.6			5.1	5.1		4.5	4.5				
011 REAR CROSSING	3.4	1.0	3.4	3.4	3.2	2.0	6.4	6.4	3.4	3.0	10.8	1.1	1.0	1.0	1.1	21.7	
	2.4	1.0	2.4	2.4	2.4	2.0	4.0	4.0	2.9	2.0	5.8	.6	0.0	0.0	0.0	13.4	
	4.3	1.0	4.3	4.3	4.0	2.0	4.0	4.0	4.2	3.0	12.6	1.5	1.0	1.5	1.5	26.4	
	4.0	3.4	5.6	5.6	5.6	5.4			5.4	5.2		4.7	4.0				
012 PASSAGE OF LINE	2.4	1.0	2.4	2.4	2.4	2.0	4.2	4.2	3.3	3.0	9.9	.9	1.0	.9	.9	18.4	
	1.0	1.0	1.0	1.0	2.1	2.0	4.2	4.2	2.7	3.0	8.1	.5	1.0	.5	.5	14.6	
	4.0	2.0	4.0	4.0	3.2	3.0	9.6	9.6	3.8	3.0	11.4	1.3	1.0	1.3	1.3	28.3	
	4.0	4.5	5.5	5.5	5.5	5.4			5.2	5.7		4.2	4.3				
TOTAL SUM OF PRODUCTS			71.7	124.5			124.5				154.9			11.6			364.6
			45.1	74.2			74.2				123.0			3.9			239.0
			115.5	173.6			173.6				224.2			26.1			519.4

TABLE III-B. SET VI ADJUSTMENTS TO ARTFP MISSION TIME AND FREQUENCY

15 PER CENT DEPLACEMENT OF T O F STRENGTH PER QUARTER

15 WEEK RAY GRADUATES

CONDITION--

TANK	ATTACK	COMPANY										SQUAD			YEAR TOTAL	
		BATTALION		HRS		PROD		FREQ		PROD		HRS		FREQ		
		WKS	FREQ	WKS	PROD	WKS	PROD	WKS	FREQ	WKS	PROD	WKS	FREQ	WKS	FREQ	HOURS
01 MOVEMENT TO CONTACT	MEAN	4.4	3.0	13.2	4.3	4.0	17.2	4.3	4.0	19.2	1.2	1.2	1.0	1.2	1.0	50.8
	LOW	3.3	1.0	3.3	3.4	3.0	10.2	4.1	4.0	16.4	.6	.6	0.0	0.0	0.0	29.9
	HIGH	5.6	3.0	16.0	5.1	4.0	20.4	5.5	5.0	27.5	1.8	1.8	1.0	1.8	1.8	66.5
		52	40		54	56		54	54			38	34			
02 WASTY ATTACK	MEAN	4.1	1.0	4.1	4.1	4.0	16.4	3.8	4.0	15.2	.6	.6	1.0	.6	.6	36.3
	LOW	2.9	1.0	2.3	3.2	3.0	9.6	3.2	4.0	12.8	.3	.3	0.0	0.0	0.0	25.3
	HIGH	5.3	3.0	15.0	5.0	4.0	20.0	4.5	5.0	22.5	1.0	1.0	1.0	1.0	1.0	59.4
		52	42		57	56		55	56			47	34			
03 DELIBERATE ATTACK	MEAN	5.1	3.0	15.3	5.1	4.0	20.4	4.9	4.0	19.4	.8	.8	1.0	.8	.8	56.1
	LOW	3.8	1.0	3.8	4.0	3.0	12.0	4.1	4.0	16.4	.3	.3	0.0	0.0	0.0	32.2
	HIGH	6.3	3.0	18.0	6.2	4.0	24.8	5.7	5.0	28.5	1.2	1.2	1.0	1.2	1.2	73.4
		54	52		56	55		54	52			36	34			
04 EXPLOITATION	MEAN	3.8	1.0	3.8	3.1	3.0	9.3	3.4	4.0	13.6	.5	.5	0.0	0.0	0.0	24.7
	LOW	2.0	1.0	2.0	2.3	3.0	6.9	2.5	3.0	7.5	.2	.2	0.0	0.0	0.0	17.3
	HIGH	4.7	3.0	14.1	3.9	4.0	15.6	4.3	4.0	17.2	.8	.8	1.0	.8	.8	47.8
		51	43		43	44		33	34			35	32			
05 NIGHT ATTACK	MEAN	4.9	3.0	14.7	5.8	4.0	23.2	5.2	4.0	20.8	1.2	1.2	1.0	1.2	1.2	59.9
	LOW	3.7	1.0	3.7	4.5	3.0	13.5	4.4	4.0	17.6	.6	.6	1.0	.6	.6	35.4
	HIGH	6.2	3.0	19.4	7.1	4.0	29.4	6.1	5.0	30.5	1.8	1.8	1.0	1.8	1.8	82.9
		49	52		55	55		53	53			40	41			
06 DEFENSE	MEAN	3.6	3.0	16.8	3.4	4.0	21.6	5.4	4.0	21.6	1.4	1.4	1.0	1.4	1.4	61.4
	LOW	2.3	1.0	4.3	4.2	3.0	12.6	4.5	4.0	14.0	.9	.9	1.0	.9	.9	35.8
	HIGH	5.0	3.0	20.7	6.5	4.0	26.0	6.2	5.0	31.0	1.9	1.9	1.0	1.9	1.9	83.4
		53	51		53	54		53	54			46	47			
07 FLAY	MEAN	3.8	3.0	11.4	4.4	4.0	17.6	4.8	4.0	19.2	1.1	1.1	1.0	1.1	1.1	49.3
	LOW	2.8	1.0	2.4	3.5	3.0	10.5	4.1	4.0	16.4	.6	.6	1.0	.6	.6	30.3
	HIGH	4.8	3.0	14.6	5.3	4.0	21.2	5.5	5.0	27.5	1.6	1.6	1.0	1.6	1.6	67.9
		48	53		53	54		54	54			42	45			
08 DEFENSE	MEAN	4.0	1.0	3.0	3.4	3.0	10.8	4.2	4.0	16.8	1.0	1.0	1.0	1.0	1.0	32.5
	LOW	2.0	1.0	2.0	2.3	4.0	4.7	3.4	4.0	13.6	.5	.5	0.0	0.0	0.0	25.2
	HIGH	5.0	3.0	14.4	4.4	4.0	17.6	4.0	5.0	24.5	1.4	1.4	1.0	1.4	1.4	57.9
		53	42		53	54		53	57			41	34			

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	MDS	FREQ	PMON	MHS	FRFO	PMON	MHS	FRFO	PMON	MHS	FRFO	PMON	MHS	FRFO	PMON	MHS	
LOW OFFICE OF MILITARY ADJ. A	WEAT	3.5	1.	3.5	3.5	3.	10.5	4.0	4.	16.0	1.1	1.	1.1	1.	1.1	31.1	
	LOW	2.4	1.	2.4	2.7	3.	8.1	3.4	4.	13.6	.5	1.	.5	1.	.6	24.9	
	HIGH	4.3	3.	12.9	4.2	4.	14.8	4.7	4.	18.8	1.5	3.	1.5	3.	4.5	53.0	
	N	51	44	55	55	55		54	54			47	47	45			
OIL BRIDGE STOPS POINT	WEAT	3.0	1.	3.0	3.4	3.	10.8	4.2	4.	14.8	1.2	1.	1.2	1.	1.2	31.8	
	LOW	2.3	1.	2.3	2.9	3.	8.4	3.5	4.	14.0	.7	1.	.7	1.	.7	25.4	
	HIGH	3.7	3.	11.1	4.3	4.	17.2	4.9	5.	24.5	1.7	3.	1.7	3.	5.1	57.9	
	N	40	43	55	55	54		51	51			45	45	45			
OIL RIVER CROSSING	WEAT	3.4	1.	3.4	3.2	3.	9.6	3.6	4.	14.4	1.1	1.	1.1	1.	1.1	28.5	
	LOW	2.6	1.	2.6	2.5	3.	7.5	2.0	3.	8.7	.6	0.	.6	0.	0.0	18.8	
	HIGH	4.3	1.	4.3	4.0	3.	12.0	4.2	4.	16.8	1.5	1.	1.5	1.	1.5	34.6	
	N	40	34	55	55	54		54	54			47	47	40			
OIL PASSAGE OF LINE	WEAT	2.4	1.	2.4	2.4	3.	7.8	3.3	4.	13.2	.9	1.	.9	1.	.9	24.1	
	LOW	1.8	1.	1.8	2.1	3.	6.3	2.7	4.	10.8	.5	1.	.5	1.	.5	19.4	
	HIGH	4.0	3.	9.0	3.2	4.	12.8	3.8	4.	15.2	1.3	1.	1.3	1.	1.3	34.3	
	N	40	45	55	55	54		52	52			42	42	43			
TOTAL SUM OF PRODUCTS	WEAT	35.5		35.5	175.2		175.2	206.4		206.4	11.6		11.6		11.6	0.0	
	LOW	35.0		35.0	114.3		114.3	145.8		145.8	3.9		3.9		3.9	319.9	
	HIGH	171.1		171.1	232.8		232.8	284.5		284.5	34.6		34.6		34.6	723.0	

TABLE III-C. SET VI ADJUSTMENTS TO ARTFP MISSION TIME AND FREQUENCY

20 PER CENT REPLACEMENT OF 1 OF E STRENGTH PER QUARTER

15 WEEK RAY GRADUATES

COMBINATION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB		
Q1 MOVEMENT TO CONTACT	MEAN	4.4	3.	13.2	4.3	5.	21.5	4.8	5.	24.0	5.	24.0	1.2	2.	2.4	61.1	
	HIGH	4.3	2.	6.6	3.4	3.	10.2	4.1	3.	20.5	5.	20.5	.6	0.	0.0		37.3
Q2 MASTY ATTACK	MEAN	4.6	3.	16.8	5.1	5.	25.5	5.5	5.	38.5	5.	38.5	1.8	2.	3.4	84.6	
	HIGH	4.2	4.	5.	5.	5.	25.0	5.5	5.	37	5.	37	3.0	3.	2.0		74.4
Q3 INFLUENT ATTACK	MEAN	4.1	2.	9.2	4.1	5.	24.5	3.8	5.	19.0	5.	19.0	.6	2.	1.2	48.9	
	HIGH	2.9	2.	5.4	3.2	3.	9.6	3.2	3.	16.0	5.	16.0	.3	0.	0.0		31.4
Q4 EXPLOITATION	MEAN	4.3	3.	15.0	5.0	5.	25.0	4.5	5.	31.5	5.	31.5	1.0	2.	2.0	74.4	
	HIGH	4.2	4.	5.	5.	5.	25.0	5.5	5.	37	5.	37	3.0	3.	2.0		74.4
Q5 NIGHT ATTACK	MEAN	4.9	3.	15.3	5.1	5.	25.5	4.9	5.	24.5	5.	24.5	.8	2.	1.6	66.9	
	HIGH	2.9	2.	7.6	4.0	3.	12.0	4.1	3.	20.5	5.	20.5	.3	0.	0.0		40.1
Q6 DEFENSE	MEAN	4.7	3.	14.1	3.9	5.	14.5	5.7	5.	39.0	5.	39.0	1.2	2.	2.4	92.2	
	HIGH	4.7	4.	5.	5.	5.	25.0	5.5	5.	37	5.	37	3.0	3.	2.0		74.4
Q7 DELAY	MEAN	4.9	3.	14.7	5.8	5.	29.0	5.2	5.	26.0	5.	26.0	1.2	2.	2.4	72.1	
	HIGH	2.7	2.	7.4	4.5	3.	13.5	4.4	3.	22.0	5.	22.0	.6	2.	1.2		44.1
Q8 DEFENSE	MEAN	4.2	3.	14.6	5.5	5.	15.5	5.3	5.	42.7	5.	42.7	1.8	3.	5.4	102.2	
	HIGH	4.0	4.	5.	5.	5.	25.0	5.5	5.	37	5.	37	3.0	3.	2.0		74.4
Q9 DEFENSE	MEAN	4.6	3.	16.9	5.4	5.	27.0	5.4	5.	27.0	5.	27.0	1.4	2.	2.8	73.6	
	HIGH	2.3	2.	8.6	4.2	3.	12.6	4.5	3.	22.5	5.	22.5	.9	2.	1.8		45.5
Q10 DEFENSE	MEAN	4.9	3.	14.4	5.3	5.	15.5	5.3	5.	43.4	5.	43.4	1.9	3.	5.7	102.3	
	HIGH	4.0	4.	5.	5.	5.	25.0	5.5	5.	37	5.	37	3.0	3.	2.0		74.4
Q11 DEFENSE	MEAN	4.9	3.	11.4	4.4	5.	22.0	4.8	5.	24.0	5.	24.0	1.1	2.	2.2	59.6	
	HIGH	2.9	2.	5.6	3.5	3.	10.5	4.1	3.	20.5	5.	20.5	.6	2.	1.2		37.8
Q12 DEFENSE	MEAN	4.9	3.	14.4	5.3	5.	15.5	5.3	5.	43.4	5.	43.4	1.9	3.	4.8	84.2	
	HIGH	4.0	4.	5.	5.	5.	25.0	5.5	5.	38.5	5.	38.5	4.2	4.5	2.9		73.5
Q13 DEFENSE	MEAN	4.9	3.	11.4	4.4	5.	22.0	4.8	5.	24.0	5.	24.0	1.1	2.	2.0	41.6	
	HIGH	2.9	2.	5.4	2.9	3.	8.7	3.6	3.	17.0	5.	17.0	.5	0.	0.0		31.5
Q14 DEFENSE	MEAN	4.9	3.	14.4	5.3	5.	15.5	5.3	5.	43.4	5.	43.4	1.9	3.	2.8	73.5	
	HIGH	4.3	4.	5.	5.	5.	22.0	5.3	5.	34.3	5.	34.3	4.1	2.	2.9		73.5

TASK

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	HRS	FREQ	WDS	HRS	FREQ	WDS	HRS	FREQ	WDS	HRS	FREQ	WDS	HRS	FREQ	WDS		
Q0 OFFICE OF MILITARY AFFAIRS	1.5	2.0	7.0	1.5	3.0	10.5	4.0	5.0	20.0	2.0	2.0	1.1	2.0	2.2	39.7		
	2.6	2.0	4.2	2.7	3.0	8.1	3.4	5.0	17.0	2.0	2.0	1.6	2.0	1.2	31.5		
	1.3	3.0	12.0	4.2	5.0	21.0	4.7	5.0	23.5	2.0	2.0	1.5	2.0	4.5	61.9		
	51	44		55	55		54	54				47	45				
Q10 BOMBING STATION POINT	1.0	2.0	6.0	3.6	3.0	10.8	4.2	5.0	21.0	2.0	2.0	1.2	2.0	2.4	40.2		
	2.3	2.0	4.6	2.8	3.0	8.4	3.5	5.0	17.5	2.0	2.0	1.7	2.0	1.4	31.9		
	1.7	3.0	11.1	4.3	5.0	21.5	4.9	7.0	34.3	2.0	2.0	1.7	2.0	5.1	72.0		
	40	43		55	56		51	53				45	45				
Q11 RIVER CROSSING	1.6	2.0	6.8	3.2	3.0	9.6	3.6	5.0	18.0	2.0	2.0	1.1	2.0	2.2	36.6		
	2.6	2.0	5.2	2.5	3.0	7.5	2.9	3.0	8.7	2.0	2.0	1.6	2.0	0.0	21.4		
	1.3	2.0	4.4	4.0	3.0	12.0	4.2	5.0	21.0	2.0	2.0	1.5	2.0	3.0	44.6		
	40	34		54	54		54	52				47	40				
Q12 PASSAGE OF LINE	2.4	2.0	4.8	2.6	3.0	7.8	3.3	5.0	16.5	2.0	2.0	1.9	2.0	1.8	30.9		
	1.8	2.0	3.6	2.1	3.0	6.3	2.7	5.0	13.5	2.0	2.0	1.5	2.0	1.0	24.4		
	1.0	3.0	3.0	3.2	5.0	16.0	3.8	5.0	19.0	2.0	2.0	1.3	2.0	2.6	46.6		
	49	45		55	58		52	57				42	43				
TOTAL SUM OF PRODUCTS	110.6			204.3			258.0					23.2				0.0	
	71.4			114.3			203.2					7.8				397.1	
	1/5.6			284.0			388.1					43.7				895.2	

TABLE III-D. SFT VI ADJUSTMENTS TO ARTFP MISSION TIME AND FREQUENCY

...10 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

14 WEEK RPT GRADUATES

CONDITION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB		
Q1 MOVEMENT TO CONTACT	YEAR	4.4	3.0	13.2	4.3	5.0	21.5	4.8	5.0	24.0	1.2	2.0	2.4	61.1			
	100	4.3	2.0	6.6	3.4	3.0	10.2	4.1	5.0	20.5	.6	0.0	0.0	37.3			
	WEEK	5.6	3.0	16.4	5.1	5.0	25.5	5.5	6.0	33.0	1.8	2.0	3.6	78.9			
Q2 REACT ATTACK	YEAR	4.1	2.0	8.2	4.1	5.0	20.5	3.8	5.0	19.0	.6	2.0	1.2	48.9			
	100	3.9	2.0	5.4	3.2	3.0	9.6	3.2	5.0	16.0	.3	0.0	0.0	31.4			
	WEEK	5.3	3.0	15.0	5.0	5.0	25.0	4.5	6.0	27.0	1.0	2.0	2.0	69.9			
Q3 HELICOPTER ATTACK	YEAR	5.1	3.0	15.3	5.1	5.0	25.5	4.9	5.0	24.5	.8	2.0	1.6	66.9			
	100	4.9	2.0	7.5	4.0	3.0	12.0	4.1	5.0	20.5	.3	0.0	0.0	40.1			
	WEEK	6.3	3.0	18.9	6.2	5.0	31.0	5.7	6.0	34.2	1.2	2.0	2.4	86.5			
Q4 EXPLOITATION	YEAR	5.4	5.2	5.2	5.6	5.5		5.4	5.2		.6	3.4	0.0	33.9			
	100	5.0	2.0	5.4	3.0	3.0	6.9	2.5	3.0	7.5	.2	0.0	0.0	20.2			
	WEEK	6.7	3.0	14.1	3.9	5.0	14.5	4.3	5.0	21.5	.9	2.0	1.8	56.9			
Q5 NIGHT ATTACK	YEAR	4.9	3.0	14.7	5.8	5.0	29.0	5.2	5.0	26.0	1.2	2.0	2.4	72.1			
	100	4.7	2.0	7.4	4.5	3.0	13.5	4.4	5.0	22.0	.6	2.0	1.2	44.1			
	WEEK	6.2	3.0	18.6	7.1	5.0	35.5	6.1	6.0	36.6	1.8	3.0	5.4	96.1			
Q6 OFFENSE	YEAR	5.6	3.0	16.4	5.4	5.0	27.0	5.4	5.0	27.0	1.4	2.0	2.8	73.6			
	100	4.3	2.0	8.6	4.2	3.0	12.6	4.5	5.0	22.5	.9	2.0	1.8	45.5			
	WEEK	5.3	3.0	20.7	6.5	5.0	32.5	6.2	6.0	37.2	1.9	3.0	5.7	96.1			
Q7 DEFENSE	YEAR	4.4	3.0	11.4	4.4	5.0	22.0	4.4	5.0	24.0	1.1	2.0	2.2	59.6			
	100	4.0	2.0	5.6	3.5	3.0	10.5	4.1	5.0	20.5	.6	2.0	1.2	37.8			
	WEEK	4.8	3.0	14.4	5.3	5.0	26.5	5.5	6.0	33.0	1.6	3.0	4.8	78.7			
Q8 DISPERSED	YEAR	4.0	2.0	7.4	3.4	3.0	10.8	4.2	5.0	21.0	1.0	2.0	2.0	41.6			
	100	3.9	2.0	5.4	2.9	3.0	9.7	3.4	5.0	17.0	.5	0.0	0.8	31.5			
	WEEK	4.8	3.0	14.4	4.4	5.0	22.0	4.4	6.0	29.4	1.4	2.0	2.4	68.6			

TASK	BATTALION				COMPANY				PLATOON				SECTION				YEAR TOTAL
	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	FREQ	PROD	HRS	
OO DEFENSE OF BUILT-UP AREA	MEAN	3.5	2.0	7.0	3.5	10.5	4.0	5.0	20.0	1.1	2.0	2.2	39.7				
	LOW	2.6	2.0	5.2	2.7	8.1	3.4	5.0	17.0	.6	2.0	1.2	31.5				
	HIGH	4.3	3.0	12.0	4.2	21.0	4.7	5.0	23.5	1.5	3.0	4.5	61.9				
		51	44	55	55		54	54		47	45						
OLD PRELUDE STORMS POINT	MEAN	3.0	2.0	6.0	3.6	10.8	4.2	5.0	21.0	1.2	2.0	2.4	40.2				
	LOW	2.3	2.0	4.6	2.9	8.4	3.5	5.0	17.5	.7	2.0	1.4	31.9				
	HIGH	3.7	3.0	11.1	4.3	21.5	4.9	6.0	29.4	1.7	3.0	5.1	67.1				
		40	43	55	55		51	51		45	45						
OLD RIVER CROSSING	MEAN	3.4	2.0	6.8	3.2	9.6	3.6	5.0	18.0	1.1	2.0	2.2	36.6				
	LOW	2.6	2.0	5.2	2.5	7.5	2.9	3.0	8.7	.6	0.0	0.0	21.4				
	HIGH	4.3	2.0	8.6	4.0	12.0	4.2	5.0	21.0	1.5	2.0	3.0	44.6				
		40	34	54	54		54	52		47	40						
OLD PASSAGE OF LINE	MEAN	2.4	2.0	4.8	2.6	7.8	3.3	5.0	16.5	.9	2.0	1.8	30.9				
	LOW	1.8	2.0	3.6	2.1	6.3	2.7	5.0	13.5	.5	2.0	1.0	24.4				
	HIGH	3.0	3.0	6.0	3.2	16.0	3.8	5.0	19.0	1.3	2.0	2.6	46.6				
		40	45	55	55		52	57		42	43						
TOTAL SUM OF PRODUCTS	MEAN			113.4		204.3			258.0			23.2					0.0
	LOW			71.8		114.3			203.2			7.8					397.1
	HIGH			175.4		288.0			104.8			43.7					851.9

PAGE

NO	OFFICE OF ORIGIN	BATTALION				COMPANY				PLATOON				COIAN				YEAR TOTAL
		POS	FRFQ	PRFH	MHS	FRFQ	PRFH	MHS	FRFQ	PRFH	FRFQ	PRFH	MHS	FRFQ	PRFH	MHS	FRFQ	
010	OFFICE OF ORIGIN	1.5	2.	7.0	3.5	4.	14.0	4.0	4.0	4.	4.	24.0	1.1	2.	2.2	47.2		47.2
		2.5	2.	5.2	2.7	4.	1.8	3.4	6.	6.	6.	20.4	.6	2.	1.2	37.6		
		4.3	4.	17.2	4.2	4.	25.2	4.7	4.	4.	4.	28.2	1.5	4.	4.0	76.6		
		51	44		55	55		54		54			47	45				
010	OFFICE OF ORIGIN	3.0	2.	4.0	3.4	4.	14.4	4.2	4.	4.	4.	25.2	1.2	2.	2.4	48.0		48.0
		2.3	2.	4.4	2.8	4.	11.2	3.5	6.	6.	6.	21.6	.7	2.	1.4	34.2		
		4.3	4.	14.4	4.3	4.	25.8	4.9	4.	4.	4.	30.2	1.7	4.	6.4	44.6		
		40	43		55	54		51		52			45	45				
011	OFFICE OF ORIGIN	3.4	2.	4.4	3.2	4.	12.8	3.4	4.	4.	4.	21.4	1.1	2.	2.2	43.4		43.4
		2.4	2.	5.2	2.5	4.	10.0	2.9	4.	4.	4.	11.4	.4	0.	0.0	24.8		
		4.3	2.	8.4	4.0	4.	16.0	4.2	4.	4.	4.	25.2	1.5	2.	3.0	52.8		
		40	34		54	54		54		52			47	40				
012	OFFICE OF ORIGIN	2.4	2.	4.4	2.4	4.	11.4	3.3	4.	4.	4.	19.8	.9	2.	1.8	34.8		34.8
		1.8	2.	3.4	2.1	4.	4.4	2.7	4.	4.	4.	16.2	.5	2.	1.0	20.2		
		2.0	4.	12.0	3.2	4.	19.2	3.4	4.	4.	4.	22.8	1.3	2.	2.4	54.6		
		44	45		55	54		52		57			42	43				
TOTAL SUM OF PRODUCTS				143.4			253.0					304.4						0.0
				11.8			152.4					244.0						478.0
				231.0			347.2					448.4						1078.8

TABLE III-F. SET VI ADJUSTMENTS TO ADREP MISSION TIME AND FREQUENCY

20 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

14 WEEK RAT GRADUATES

COMMISSION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	HRS	FREQ	PRDN	MRS	FREQ	PRDN	MRS	FREQ	HRS	PRDN	MRS	FREQ	HRS	PRDN	MRS	FREQ	HOURS
Q1 MOVE-UP TO CONTACT	MEAN	4.4	5	22.0	4.3	34.4	4.4	34.4	38.4	38.4	1.2	3	1.2	3	3.4	3	94.4
	LOW	3.3	3	9.4	3.4	17.0	4.1	17.0	32.4	32.4	.6	0	.6	0	0.0	0	44.7
	MEAN	5.6	5	24.0	5.1	40.4	5.1	40.4	45.0	45.0	1.4	3	1.4	3	5.4	3	129.7
	HIGH	5.2	4		5	56	56	56	54	54		54		54		54	
Q2 WEST ATTACK	MEAN	4.1	3	12.3	4.1	32.4	3.4	32.4	30.4	30.4	.4	3	.4	3	1.4	3	77.3
	LOW	2.9	3	8.7	3.2	16.0	3.2	16.0	25.5	25.5	.3	0	.3	0	0.0	0	50.3
	MEAN	4.3	5	24.5	4.5	40.0	4.5	40.0	45.0	45.0	1.0	3	1.0	3	3.0	3	114.5
	HIGH	4.2	4		5	56	56	56	54	54		54		54		54	
Q3 DELIBERATE ATTACK	MEAN	7.1	5	25.5	5.1	40.4	4.9	40.4	39.2	39.2	.4	3	.4	3	2.4	3	107.9
	LOW	4.4	3	11.4	4.0	20.0	4.1	20.0	32.4	32.4	.3	0	.3	0	0.0	0	64.2
	MEAN	4.3	5	31.5	4.2	40.4	4.2	40.4	47.0	47.0	1.2	3	1.2	3	3.4	3	141.7
	HIGH	4.4	5		5	55	55	55	54	54		54		54		54	
Q4 DELIBERATE	MEAN	3.4	3	11.4	3.1	14.5	3.4	14.5	27.2	27.2	.5	0	.5	0	0.0	0	54.1
	LOW	2.9	3	8.7	2.7	11.5	2.5	11.5	12.5	12.5	.2	0	.2	0	0.0	0	32.7
	MEAN	4.7	5	23.5	3.9	31.2	4.3	31.2	34.4	34.4	.9	3	.9	3	2.7	3	91.4
	HIGH	5.1	4		4	44	44	44	33	33		33		33		33	
Q5 NIGHT ATTACK	MEAN	1.0	5	24.5	5.4	46.4	5.2	46.4	41.4	41.4	1.2	3	1.2	3	3.4	3	116.1
	LOW	4.7	3	11.1	4.5	22.5	4.4	22.5	35.2	35.2	.6	3	.6	3	1.4	3	70.5
	MEAN	4.2	5	31.0	7.1	56.4	6.1	56.4	61.0	61.0	1.4	5	1.4	5	9.0	5	157.4
	HIGH	4.9	5		55	55	55	55	53	53		53		53		53	
Q6 WEEK CE	MEAN	3.4	5	24.0	5.4	43.2	5.4	43.2	43.2	43.2	1.4	3	1.4	3	4.2	3	114.4
	LOW	2.3	3	12.0	4.2	21.0	4.5	21.0	36.0	36.0	.9	3	.9	3	2.7	3	72.6
	MEAN	4.0	5	34.5	6.5	52.0	6.2	52.0	62.0	62.0	1.9	5	1.9	5	9.5	5	154.0
	HIGH	4.3	5		53	53	53	53	54	54		54		54		54	
Q7 FIVE	MEAN	4.0	5	19.0	4.4	35.2	4.4	35.2	34.4	34.4	1.1	3	1.1	3	3.3	3	95.9
	LOW	2.9	3	8.4	4.5	17.5	4.1	17.5	32.4	32.4	.4	3	.4	3	1.4	3	60.5
	MEAN	4.3	5	24.0	5.3	42.4	5.5	42.4	55.0	55.0	1.6	5	1.6	5	4.0	5	129.4
	HIGH	4.4	5		52	52	52	52	55	55		55		55		55	
Q8 FIVE	MEAN	4.0	3	11.7	3.4	14.0	4.2	14.0	33.6	33.6	1.0	3	1.0	3	3.0	3	66.3
	LOW	2.9	3	8.7	2.9	14.5	3.4	14.5	27.2	27.2	.5	0	.5	0	0.0	0	50.4
	MEAN	4.3	5	24.0	4.4	35.2	4.9	35.2	49.0	49.0	1.4	3	1.4	3	4.2	3	112.4
	HIGH	4.4	5		53	53	53	53	57	57		57		57		57	

TASK	BATTALION			COMPANY			PLATOON			SQUAD			YEAR TOTAL
	MRS	FREQ	PRUN	MRS	FREQ	PRUN	MRS	FREQ	PRUN	MRS	FREQ	PRUN	
ON REFERENCE OF MULTITASKING ANAL	MEAN	4.5	30	10.5	3.5	50	17.5	4.0	80	32.0	1.1	30	63.3
	LOW	2.5	30	7.5	2.7	50	13.5	3.5	80	27.5	.5	30	50.3
	HIGH	4.5	50	21.5	4.2	50	33.5	4.7	80	37.5	1.5	50	100.2
	ALL	50	40		55			50	50		47	45	
ON PRODUCE STANDING ON ME	MEAN	1.0	30	9.0	3.5	50	14.0	4.2	80	33.5	1.2	30	64.2
	LOW	2.3	30	4.0	2.8	50	14.0	3.5	80	28.0	.7	30	51.0
	HIGH	1.7	50	18.5	4.3	50	16.0	4.0	100	49.0	1.7	50	110.4
	ALL	40	43		55			51	53		45	45	
ON OTHER / OTHERS	MEAN	1.4	30	10.2	3.2	50	15.0	3.6	80	28.8	1.1	30	58.3
	LOW	1.4	30	7.4	2.5	50	12.5	2.9	80	18.5	.6	30	34.8
	HIGH	4.3	30	12.0	4.0	50	21.0	4.2	80	33.5	1.5	30	71.0
	ALL	49	30		50			50	53		47	40	
ON PASSAGE OF TIME	MEAN	2.4	30	7.2	2.6	50	13.0	3.3	80	26.4	.9	30	49.3
	LOW	1.4	30	5.6	2.1	50	10.5	2.7	80	21.4	.5	30	30.0
	HIGH	4.0	50	15.0	3.2	50	25.6	3.8	80	30.4	1.3	40	74.9
	ALL	40	45		55			52	57		42	43	
TOTAL SUM OF COUNTS	MEAN			121.7			330.8			412.9			969.7
	LOW			107.7			193.5			326.2			636.1
	HIGH			210.9			461.6			549.0			1391.3
	ALL												

TABLE

	BATTALION				COMPANY				PLATOON				SECTION				YEAR TOTAL
	MPS	FREQ	WPM	WMS	MPS	FREQ	WPM	WMS	MPS	FREQ	WPM	WMS	MPS	FREQ	WPM	WMS	
Q1 OFFICE OF MILITARY AUX	1.5	2.0	7.0	1.5	17.5	5.0	17.5	4.0	7.0	28.0	1.1	2.0	2.2	2.0	7.2	1.1	54.7
	2.4	2.0	5.2	2.7	13.5	5.0	13.5	3.4	7.0	21.0	.4	2.0	1.2	2.0	4.3	.4	43.7
	5.3	5.0	21.0	4.2	24.4	7.0	24.4	4.7	7.0	12.0	1.5	5.0	7.5	5.0	7.5	1.5	91.1
	51	44		55				54	54				47	45			
Q10 PREPARE STORING PRINT	4.0	2.0	4.0	3.4	18.0	5.0	18.0	4.2	7.0	29.4	1.2	2.0	2.4	2.0	7.4	1.2	55.8
	2.3	2.0	4.4	2.4	14.0	5.0	14.0	3.5	7.0	24.5	.7	2.0	1.4	2.0	1.4	.7	44.5
	1.7	5.0	14.5	4.3	31.1	7.0	31.1	4.0	9.0	44.1	1.7	5.0	8.5	1.7	8.5	1.7	101.2
	40	44		54				51	55				45	45			
Q11 WILDER COUNTRYS LINE	1.4	2.0	4.0	3.2	14.0	5.0	14.0	3.4	7.0	25.2	1.1	2.0	2.2	2.0	7.2	1.1	59.2
	2.6	2.0	5.2	2.5	12.5	5.0	12.5	2.9	5.0	14.5	.6	0.0	0.0	0.0	0.0	.6	32.2
	4.3	2.0	4.4	4.0	20.0	5.0	20.0	4.2	7.0	29.4	1.5	2.0	3.0	1.5	3.0	1.5	61.0
	40	14		54				54	55				47	40			
Q12 PASSAGE OF LINE LINE	2.4	2.0	4.0	2.4	13.0	5.0	13.0	3.3	7.0	23.1	.9	2.0	1.8	2.0	1.8	.9	42.7
	1.8	2.0	3.4	2.1	10.5	5.0	10.5	2.7	7.0	18.9	.5	2.0	1.0	2.0	1.0	.5	34.0
	1.8	5.0	14.0	3.2	22.4	7.0	22.4	3.4	7.0	26.4	1.3	2.0	2.6	1.3	2.6	1.3	46.6
	40	45		55				52	57				47	43			
TOTAL SUM OF CONDUCTS LINE	147.2				301.7					341.2			23.2				853.3
	71.8				190.5					288.4			7.4				558.9
	244.4				404.4					508.7			40.7				1262.4

TABLE III-H. SET VI A. ADJUSTMENTS TO ARTFP MISSION TIME AND FREQUENCY

15 PER CENT REPLACEMENT OF T O F STRENGTH PER QUARTER

12 WEEK RAT GRADUATES

COMPUTATION--

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	MEAN	LOW	HIGH	MIN	MEAN	LOW	HIGH	MIN	MEAN	LOW	HIGH	MIN	MEAN	LOW	HIGH	MIN	
Q1 MOVEMENT TO CONTACT	4.4	3.0	5.8	4.4	4.3	3.4	5.2	4.3	34.7	26.4	42.0	4.8	9.0	43.2	1.2	3.0	111.9
	LOW	3.0	5.8	4.4	3.4	5.2	4.3	34.7	26.4	42.0	4.8	9.0	43.2	1.2	3.0	111.9	67.2
	HIGH	5.8	4.4	3.0	5.2	4.3	3.4	42.0	43.2	1.2	3.0	4.8	9.0	43.2	1.2	3.0	150.9
	MIN	4.4	3.0	5.8	4.3	3.4	5.2	4.3	34.7	26.4	42.0	4.8	9.0	43.2	1.2	3.0	
Q2 HOSTILE ATTACK	4.1	3.0	5.2	4.1	4.1	3.2	5.0	4.1	36.9	28.8	44.8	4.8	9.0	43.2	1.2	3.0	85.2
	LOW	3.0	5.2	4.1	3.2	5.0	4.1	36.9	28.8	44.8	4.8	9.0	43.2	1.2	3.0	85.2	54.7
	HIGH	5.2	4.1	3.0	5.0	4.1	3.2	44.8	44.8	1.2	3.0	4.8	9.0	43.2	1.2	3.0	131.8
	MIN	4.1	3.0	5.2	4.1	3.2	5.0	4.1	36.9	28.8	44.8	4.8	9.0	43.2	1.2	3.0	
Q3 HELICOPTER ATTACK	4.1	3.0	5.2	4.1	4.1	3.2	5.0	4.1	36.9	28.8	44.8	4.8	9.0	43.2	1.2	3.0	123.0
	LOW	3.0	5.2	4.1	3.2	5.0	4.1	36.9	28.8	44.8	4.8	9.0	43.2	1.2	3.0	123.0	72.3
	HIGH	5.2	4.1	3.0	5.0	4.1	3.2	44.8	44.8	1.2	3.0	4.8	9.0	43.2	1.2	3.0	165.6
	MIN	4.1	3.0	5.2	4.1	3.2	5.0	4.1	36.9	28.8	44.8	4.8	9.0	43.2	1.2	3.0	
Q4 EXPLOITATION	4.8	3.0	6.6	4.8	4.8	3.9	5.7	4.8	30.6	24.0	37.2	5.2	9.0	46.8	1.2	3.0	68.6
	LOW	3.0	6.6	4.8	3.9	5.7	4.8	30.6	24.0	37.2	5.2	9.0	46.8	1.2	3.0	68.6	37.5
	HIGH	6.6	4.8	3.0	5.7	4.8	3.9	37.2	37.2	1.2	3.0	5.2	9.0	46.8	1.2	3.0	104.7
	MIN	4.8	3.0	6.6	4.8	3.9	5.7	4.8	30.6	24.0	37.2	5.2	9.0	46.8	1.2	3.0	
Q5 HIGH ATTACK	4.9	3.0	6.8	4.9	4.9	4.0	5.8	4.9	32.2	27.0	39.4	5.2	9.0	46.8	1.2	3.0	132.0
	LOW	3.0	6.8	4.9	4.0	5.8	4.9	32.2	27.0	39.4	5.2	9.0	46.8	1.2	3.0	132.0	79.5
	HIGH	6.8	4.9	3.0	5.8	4.9	4.0	39.4	39.4	1.2	3.0	5.2	9.0	46.8	1.2	3.0	185.1
	MIN	4.9	3.0	6.8	4.9	4.0	5.8	4.9	32.2	27.0	39.4	5.2	9.0	46.8	1.2	3.0	
Q6 DEFENSE	4.6	3.0	5.6	4.6	4.6	3.7	5.5	4.6	34.6	25.2	44.0	5.4	9.0	48.4	1.4	3.0	135.0
	LOW	3.0	5.6	4.6	3.7	5.5	4.6	34.6	25.2	44.0	5.4	9.0	48.4	1.4	3.0	135.0	81.3
	HIGH	5.6	4.6	3.0	5.5	4.6	3.7	44.0	44.0	1.4	3.0	5.4	9.0	48.4	1.4	3.0	185.7
	MIN	4.6	3.0	5.6	4.6	3.7	5.5	4.6	34.6	25.2	44.0	5.4	9.0	48.4	1.4	3.0	
Q7 REFLAY	4.8	3.0	6.6	4.8	4.8	3.9	5.7	4.8	30.6	24.0	37.2	5.2	9.0	46.8	1.2	3.0	108.9
	LOW	3.0	6.6	4.8	3.9	5.7	4.8	30.6	24.0	37.2	5.2	9.0	46.8	1.2	3.0	108.9	68.1
	HIGH	6.6	4.8	3.0	5.7	4.8	3.9	37.2	37.2	1.2	3.0	5.2	9.0	46.8	1.2	3.0	152.1
	MIN	4.8	3.0	6.6	4.8	3.9	5.7	4.8	30.6	24.0	37.2	5.2	9.0	46.8	1.2	3.0	
Q8 REPOSITION	4.9	3.0	6.8	4.9	4.9	4.0	5.8	4.9	32.2	27.0	39.4	5.2	9.0	46.8	1.2	3.0	74.1
	LOW	3.0	6.8	4.9	4.0	5.8	4.9	32.2	27.0	39.4	5.2	9.0	46.8	1.2	3.0	74.1	56.7
	HIGH	6.8	4.9	3.0	5.8	4.9	4.0	39.4	39.4	1.2	3.0	5.2	9.0	46.8	1.2	3.0	131.4
	MIN	4.9	3.0	6.8	4.9	4.0	5.8	4.9	32.2	27.0	39.4	5.2	9.0	46.8	1.2	3.0	

TABLE

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	405	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB	HRS	FREQ	PROB		
01 DEPT OF MILITARY AREA	1.5	30	10.5	3.5	60	21.0	4.0	90	36.0	1.1	30	3.3	70.8				
	2.5	30	7.5	2.7	15.0	15.0	3.4	90	30.6	.6	30	1.8	56.4				
	4.1	60	25.2	4.2	50	37.8	4.7	90	42.3	1.5	60	9.0	114.9				
	51	44		55	55		54	54		47	45						
01 DECADE STUDY POINT	3.0	30	9.0	3.6	60	21.6	4.2	90	37.8	1.2	30	3.6	72.0				
	2.3	30	6.9	2.8	60	16.8	3.5	90	31.5	.7	30	2.1	57.3				
	1.7	60	22.2	4.3	90	38.7	4.9	120	58.8	1.7	60	10.2	129.9				
	49	43		55	56		51	51		45	45						
01 PIVOT CROSSING	3.4	30	10.2	3.2	60	19.2	3.4	90	32.4	1.1	30	3.3	65.1				
	2.6	30	7.8	2.5	60	15.0	2.9	60	17.4	.4	00	0.0	40.2				
	4.3	30	12.9	4.0	60	24.0	4.2	90	37.8	1.5	30	4.5	79.2				
	49	39		56	54		54	52		47	40						
01 PASSAGE OF LINES	2.4	30	7.2	2.4	60	15.6	3.3	90	29.7	.9	30	2.7	55.2				
	1.8	30	5.4	2.1	60	12.6	2.7	90	24.3	.5	30	1.5	43.8				
	3.0	60	18.0	3.2	90	28.8	3.8	90	34.2	1.3	30	3.9	96.9				
	40	45		55	58		52	57		42	43						
TOTAL SUM OF COMMENTS			215.1			374.5			644.4			1093.8					
			107.7			224.6			269.0			717.0					
			144.5			520.8			672.6			1618.2					

TABLE III-1. SFT VJ ADJUSTMENTS TO ARTFP MISSION TIME AND FREQUENCY

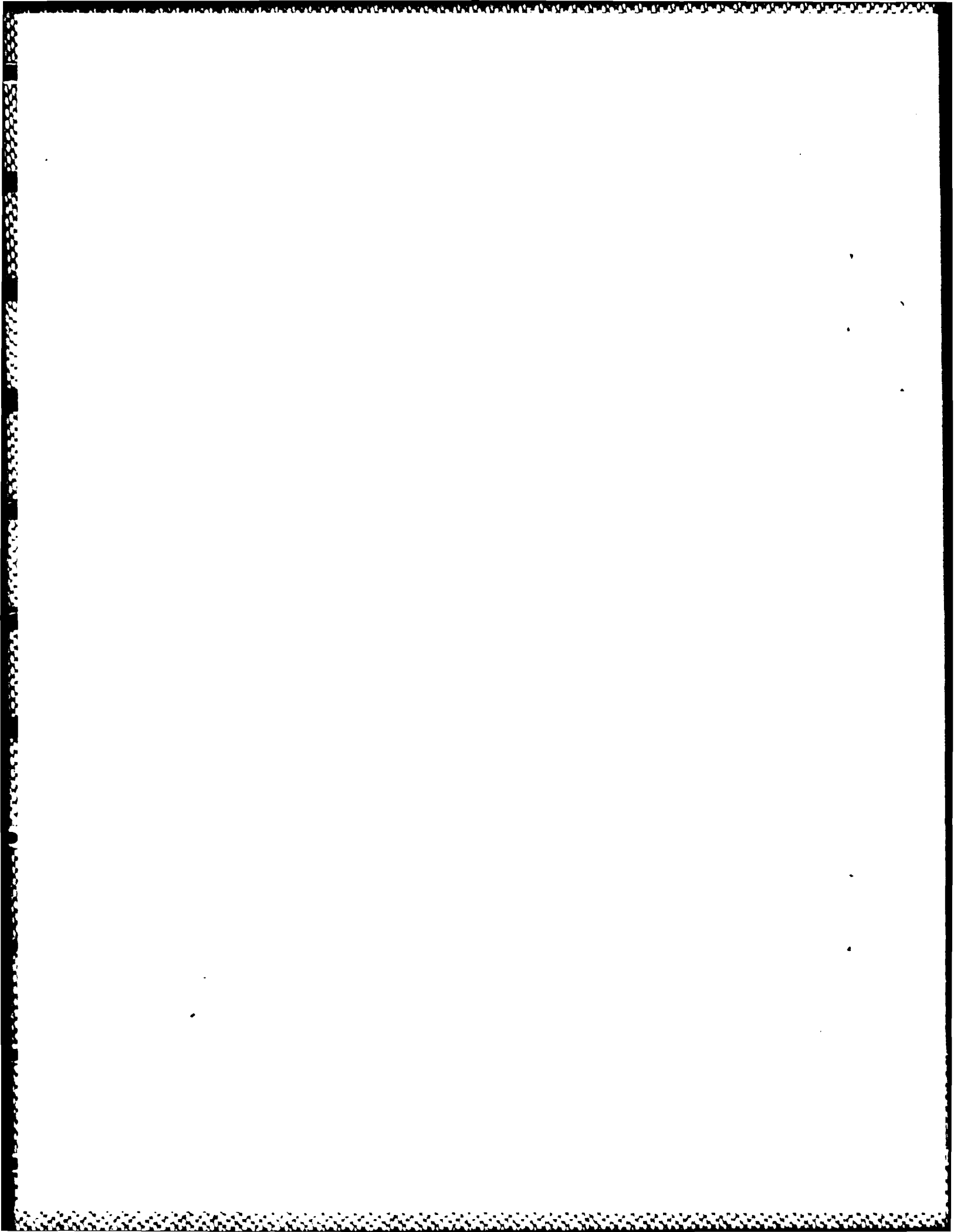
20 NEW CFMT REPLACEMENT OF 1 OF STRENGTH PER QUARTER

CONDITION--

12 WEEK HAT GRADUATES

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL HOURS
	MRS	FREQ	PROD	MRS	FREQ	PROD	MRS	FREQ	PROD	MRS	FREQ	PROD	MRS	FREQ	PROD		
Q1 MOVEMENT TO CONTACT	MEAN	4.4	7.0	10.8	4.7	10.0	43.0	4.8	10.0	48.0	1.2	3.0	1.2	3.0	3.6	125.4	
	LOW	3.3	3.0	9.9	3.4	7.0	23.8	4.1	10.0	41.0	.6	0.0	.6	0.0	0.0	74.7	
	HIGH	5.6	7.0	10.2	5.1	10.0	51.0	5.5	14.0	77.0	1.8	3.0	1.8	3.0	5.4	172.6	
Q2 HOSTILE ATTACK	MEAN	4.1	3.0	12.3	4.1	10.0	41.0	3.8	10.0	38.0	.6	3.0	.6	3.0	1.8	93.1	
	LOW	2.9	3.0	8.7	3.2	7.0	22.4	3.2	10.0	32.0	.3	0.0	.3	0.0	0.0	63.1	
	HIGH	5.3	7.0	17.1	5.0	10.0	50.0	4.5	14.0	63.0	1.0	3.0	1.0	3.0	3.0	153.1	
Q3 OFFENSIVE ATTACK	MEAN	7.1	7.0	15.7	5.1	10.0	51.0	4.9	10.0	49.0	.8	3.0	.8	3.0	2.4	138.1	
	LOW	4.8	3.0	11.2	4.0	7.0	28.0	4.1	10.0	41.0	.3	0.0	.3	0.0	0.0	88.4	
	HIGH	5.3	7.0	24.1	6.2	10.0	62.0	5.7	14.0	79.0	1.2	3.0	1.2	3.0	3.6	189.5	
Q4 EXPEDITION	MEAN	3.8	3.0	11.4	3.1	7.0	21.7	3.4	10.0	34.0	.5	0.0	.5	0.0	0.0	67.1	
	LOW	2.0	3.0	9.7	2.3	7.0	16.1	2.5	7.0	17.5	.2	0.0	.2	0.0	0.0	42.3	
	HIGH	5.7	7.0	32.0	3.3	10.0	39.0	4.3	10.0	43.0	.9	3.0	.9	3.0	2.7	117.6	
Q5 HIGH ATTACK	MEAN	4.9	7.0	14.3	4.4	10.0	44.0	5.2	10.0	52.0	1.2	3.0	1.2	3.0	3.6	147.9	
	LOW	1.7	3.0	11.1	4.5	7.0	31.5	4.4	10.0	44.0	.6	3.0	.6	3.0	1.8	88.4	
	HIGH	7.2	7.0	43.4	7.1	10.0	71.0	6.1	14.0	85.4	1.8	7.0	1.8	7.0	12.6	212.4	
Q6 DEFENSE	MEAN	3.6	7.0	19.2	5.4	10.0	54.0	5.4	10.0	54.0	1.4	3.0	1.4	3.0	4.2	151.4	
	LOW	2.3	3.0	12.3	4.2	7.0	29.4	4.5	10.0	45.0	.9	3.0	.9	3.0	2.7	90.0	
	HIGH	4.9	7.0	48.3	6.5	10.0	65.0	6.2	14.0	86.8	1.9	7.0	1.9	7.0	13.1	213.4	
Q7 REFLAY	MEAN	1.8	7.0	24.4	4.4	10.0	44.0	4.8	10.0	48.0	1.1	3.0	1.1	3.0	3.3	121.9	
	LOW	2.8	3.0	8.4	3.5	7.0	24.5	4.1	10.0	41.0	.6	3.0	.6	3.0	1.8	75.7	
	HIGH	4.9	7.0	13.6	5.3	10.0	53.0	5.5	14.0	77.0	1.6	7.0	1.6	7.0	11.2	174.8	
Q8 INTERFERENCE	MEAN	1.9	3.0	11.7	3.4	7.0	25.2	4.2	10.0	42.0	1.0	3.0	1.0	3.0	3.0	81.9	
	LOW	2.0	3.0	8.7	2.9	7.0	21.3	3.4	10.0	34.0	.5	0.0	.5	0.0	0.0	63.0	
	HIGH	4.4	7.0	13.6	4.6	10.0	46.0	4.4	14.0	48.4	1.4	3.0	1.4	3.0	4.2	150.4	

TASK	BATTALION				COMPANY				PLATOON				SQUAD				YEAR TOTAL
	INOC	FWF	PRIN	MRS	FWF	PRIN	MRS	FWF	PRIN	MRS	FWF	PRIN	MRS	FWF	PRIN	MRS	
01) REFERENCE OF BUILT-UP AREA	3.5	3.0	10.5	3.5	7.0	24.5	4.0	10.0	40.0	1.1	3.0	3.3	78.3				
AREA	10.0	2.6	7.8	2.7	7.0	18.9	3.6	10.0	34.0	.5	3.0	1.8	52.5				
W/TH	4.0	7.0	30.1	4.0	10.0	42.0	4.7	10.0	47.0	1.5	7.0	10.5	129.6				
	5	46		55	55		54	54		47	45						
01) PROPOSED STANDING POINT	3.0	3.0	9.0	3.6	7.0	25.2	4.2	10.0	42.0	1.2	3.0	3.6	79.8				
AREA	10.0	2.2	6.0	2.8	7.0	19.6	3.5	10.0	35.0	.7	3.0	2.1	63.6				
W/TH	3.7	7.0	25.0	4.0	10.0	43.0	4.0	14.0	68.6	1.7	7.0	11.0	140.4				
	40	43		55	56		51	53		45	45						
01) RTV P. CLOSING	3.4	3.0	10.2	3.2	7.0	22.4	3.6	10.0	36.0	1.1	3.0	3.3	71.9				
AREA	10.0	2.6	7.8	2.5	7.0	17.5	2.3	7.0	20.3	.4	0.0	0.0	45.6				
W/TH	4.0	7.0	12.9	4.0	7.0	28.0	4.2	10.0	42.0	1.5	3.0	4.5	87.6				
	40	38		56	56		54	52		47	40						
01) PASSAGE OF TIME	2.6	3.0	7.2	2.6	7.0	14.2	3.3	10.0	33.0	.9	3.0	2.7	61.1				
AREA	10.0	1.9	5.4	2.1	7.0	14.7	2.7	10.0	27.0	.5	3.0	1.5	40.6				
W/TH	3.0	7.0	21.0	3.2	10.0	32.0	3.8	10.0	38.0	1.3	3.0	3.0	94.9				
	40	45		55	58		52	57		42	43						
TOTAL SUM OF COORDINATE	210.9			424.2					516.0				1217.9				
AREA	107.7			266.7					411.8				797.9				
W/TH	602.1			580.0					776.2				1945.1				



PART III

THE EFFECTS OF TANK CREW TURBULENCE ON TANK GUNNERY PERFORMANCE

Technical Paper 350

THE EFFECTS OF TANK CREW TURBULENCE ON TANK GUNNERY PERFORMANCE

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Army Project Number
2Q762717A767

Technology for Increasing
Soldier Productivity

THE EFFECTS OF TANK CREW TURBULENCE ON TANK GUNNERY PERFORMANCE

BRIEF

REQUIREMENTS:

To determine the degree of tank crew turbulence in armor units and to evaluate the effects of turbulence on M60A1 gunnery performance on Tank Table VIII.

PROCEDURE:

In the first phase of this research a questionnaire was developed to evaluate existing crew turbulence. It was administered to crewmen in 5 battalions of the 1st Armor Division - USAREUR. Those crewmen were undergoing tank gunnery training, including the Table VIII qualification course, at the 7th Army Training Center, Grafenwoehr, FRG. Questionnaire responses were correlated with Table VIII scores to determine the relationship between various crew turbulence variables and gunnery performance.

In the second phase of the research personnel from the 4th Infantry Division (MECH) participated in a four-group experiment to determine the effects of artificially created crew turbulence on Table VIII gunnery performance. A control group was comprised of armor crewmen firing in their normal positions with their normal crews on their assigned tanks. A second group (Unfamiliar Crews) included armor crewmen working in their normal positions but assigned to different crews and different M60A1 tanks. A third group (Unfamiliar Crews and Positions) of armor crewmen included tank commanders who were normally gunners and gunners who were normally loaders. They were assigned to different crews and tanks as in Group 2. A fourth group (Non-Armor Replacements) included armor tank commanders and drivers, and non-armor gunners and loaders assigned from combat support units. Non-armor personnel underwent three days of training specifically designed to permit them to perform gunner and loader duties.

FINDINGS:

There was considerable turbulence in the battalions evaluated. Complete crews had normally been together 1-2 months, while typical tank commander/gunner pairs had been together 1-3 months. Typical tank commanders, gunners, drivers, and loaders had held their positions 12-42, 5-12, 5-9, and 2-6 months, respectively. Variation was great on both variables: length of time crewmen had worked together, and had been assigned to their positions.

In Phase I both the experience of the tank commander in his position and the experience of the gunner in his position were related to gunnery performance. More experienced tank commanders had shorter opening times, and more experienced gunners had more main gun hits. Neither the time the whole crew had been together nor the experience of the driver or loader was related to Table VIII performance. The longer the tank commander and his gunner had trained together, however, the shorter were their opening times.

In Phase II the Control Group and the Unfamiliar Crews Group performed equally well, indicating minimal effects of familiarity with specific crewmembers or specific tanks. The Unfamiliar Crews and Positions Group performed much more poorly than the Control or Unfamiliar Crews Group, indicating a need for the tank commander and gunner to be familiar with their duties to insure satisfactory gunnery performance. The performance of the Non-Armor Replacements Group was about equal to that of the Control Group. This indicated that non-armor combat support personnel with brief intensive training can be integrated into crews with trained armor tank commanders and drivers and yield Table VIII performance comparable to that of armor crewmen.

UTILIZATION OF FINDINGS:

These findings suggest that emphasis be placed on the training and retention of tank commanders and gunners in their respective positions.

The research also indicated the need for emphasis on cross-training gunner and loader personnel to permit them to assume tank commander and gunner positions as required. A brief intensive hands-on training program like that used with the non-armor personnel could be developed for that purpose.

Finally, the research suggested that with the 3 day training program, non-armor personnel could perform as well as gunners and loaders in tank crews with experienced tank commanders and drivers. Thus, such personnel could serve as a readily available source of replacement personnel in the event of combat.

THE EFFECTS OF TANK CREW TURBULENCE ON TANK GUNNERY PERFORMANCE

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THE EFFECTS OF TANK CREW TURBULENCE ON TANK GUNNERY PERFORMANCE .

INTRODUCTION

Tank crew turbulence, i.e. movement of crewmen to unfamiliar surroundings, occurs frequently in both training and combat situations. Loss of personnel resulting in crew turbulence has long been a concern of armor commanders in terms of the possible effects on training efficiency and gunnery performance. Crew turbulence is particularly important in combat units where personnel must be reassigned to replace combat losses. While it is generally accepted in the armor community that turbulence has a degrading effect on tank crew performance, the specific effects of different types of crew turbulence have not yet been determined empirically.

In assessing the potential effects of crew turbulence, three variables should be considered. These are position familiarity, personnel familiarity, and equipment familiarity. Position familiarity is related to the time an individual has to learn the duties associated with his duty position in the tank crew. Position turbulence can occur due to attrition of crewmen in combat situations, as well as to reassignment of personnel to new duty positions for periodic training during noncombat situations. Personnel familiarity is related to the time individuals trained in their specific duties are assigned to a particular crew. Personnel turbulence often results in crews who are together for only short periods of time prior to training exercises or combat missions. Finally, equipment familiarity is related to the time crewmen are assigned to their particular tanks. Of course, these variables are not independent. They can, and in the field usually do, occur in combination.

A review of the literature on tank crew turbulence revealed a study which investigated both the degree of crew turbulence in armor units and the effects of position familiarity on crew performance. Data on the degree of turbulence in 6 armor battalions (4 CONUS, 2 USAREUR) were presented by Larson, Earl, and Henson (1976). They found high levels of turbulence in terms of changes in duty position, and changes in personnel assigned to particular tank crews. Tank commanders typically changed duty position least (0-20% over 4-6 months), while drivers, gunners, and loaders changed duty positions quite often (33-88% over 4-6 months). Changes in personnel assigned to positions in specific tank crews was high for all positions (53-95% over 4-6 months). These findings are consistent with those from the Report of the Task Forces on Training Technology (1975) as given in Wagner, Hibbits, Rosenblatt, and Schulz (1977). The report indicated a 40% turnover in tank crews every 90 days. Larson et al. also reported a positive relation between Tank Crew Qualification Course (Table VIII) scores and time in position for tank commanders, gunners, and drivers.

The Tank Forces Management Group (1977) has identified turbulence as a consistent problem in armor training and suggested that tank crew turbulence "degrades armor unit combat readiness." The individual replacement system, centralized promotions, and position changes within the battalion were identified as the primary sources of turbulence.

Speculation about the effects of tank crew turbulence on gunnery performance to some extent depends on whether one conceptualizes a crew as consisting of a collection of individuals performing specific individual duties, or as a team of people whose performance depends more heavily on crew interaction. Wagner et al. (1977) indicated that structured team performance depended primarily on the skill levels of individual team members, and the effects of personnel turbulence were minimal. A series of studies by Eggerman (Eggerman, 1966, Eggerman, Klaus, and Glaser, 1962; Eggerman, Glaser, and Klaus, 1963; and Glaser, Klaus, and Eggerman, 1962) supports this position. Wagner et al. suggest, however, that performance of tank crews in operational (low structure) settings may be affected by personnel turbulence.

The most widely utilized measure of tank gunnery is performance on a Tank Crew Qualification Course, Table VIII. Because a moderate degree of structure is involved on Table VIII, one would expect personnel turbulence to have a modest effect on gunnery performance. A Table VIII which requires movement of a firing tank from station to station to engage single and multiple targets would seem to be about midway in structure between a highly-structured, static range situation, such as Table VI, and a more freely structured unit training exercise, such as Table IX or an ARTEP.

The degree of formal job structure varies with duty position on a Table VIII. The loader and driver have highly structured duties; loading and maintaining the tank main gun and coax machine gun, and moving the tank from location to location. The gunner and tank commander have a greater variety of stimuli to which they must respond on Table VIII, and a greater degree of interaction is required. The tank commander, for example, must identify targets in a way the gunner can understand, and provide subsequent fire commands which lead to the desired gunner behavior.

Based on the premise that the effect of personnel turbulence is related to the degree of structure associated with the overall task requirements and with the degree of required crew member interaction, one might predict a moderate effect of crew turbulence on Table VIII performance. Also, tank commander/gunner turbulence would be expected to have a greater effect than driver/loader turbulence.

SPECIFIC OBJECTIVES

To determine current levels of tank crew turbulence, and to identify relationships between the various aspects of crew turbulence and gunnery performance, two research projects were executed. The first phase was conducted with a relatively large sample and utilized a correlational design. Its primary purpose was to determine current turbulence levels and explore a wide variety of potential turbulence-performance relationships. The second phase included a smaller sample under much more controlled conditions and utilized an experimental design. Its primary purpose was to explore the causal relationships between the three aspects of crew turbulence and tank gunnery performance.

PHASE I

The primary source of turbulence data presently available is that provided by Larson et al. In that report, a fairly comprehensive view of the degree of crew turbulence is presented, but the data was collected several years ago and may not represent today's armor forces. Also, the relationship of crew turbulence to gunnery performance was not fully explored.

Concern over the magnitude and effects of crew turbulence on tank gunnery training were expressed to ARI by numerous individuals in 1977, and research involving experimental manipulation of several degrees of turbulence (Phase II) was planned. In the interim this correlational research was designed and conducted in conjunction with tank crew assignment research ongoing with five armor battalions in USAREUR.

METHOD

RESEARCH PARTICIPANTS

Research participants were crewmen in the 255 tank crews from five armor battalions in a USAREUR armor division. Crewman in 211 crews completed a tank crew stability questionnaire and were included in the sample.

QUESTIONNAIRE

A Tank Crew Stability Questionnaire (PT 5188) was constructed to provide various measures of crew and crewman stability. The questionnaire included 22 questions. The tank commander was asked to answer the following questions about the crew:

1. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader?

2. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader, on the tank you used, or will use, to fire Table VIII?

3. How many months have you and your complete crew actually been able to train together, with you as TC, your current gunner as gunner, your current driver as driver, and your current loader as loader?

He was also asked to answer the following questions about himself and his gunner:

1. How many months have you and your current gunner been assigned together, with you as TC and your current gunner as gunner?

2. How many months have you and your current gunner been assigned together, with you as TC and your current gunner assigned as your gunner, on the tank you used, or will use, to fire Table VIII?

3. How many months have you and your current gunner actually been able to train together, with you as TC, and your current gunner as gunner?

Each tank commander was then asked to answer the following questions about himself:

1. How many months have you been assigned as the TC on the tank you used, or will use, to fire Table VIII?

2. How long have you been assigned the duties of TC, regardless of the tank, crew, or company you may have been in?

3. How long have you actually had to train in the duties of TC, regardless of the tank, crew, or company you may have been in?

4. How long have you served in M60 tanks, regardless of the duty position you held?

Then each gunner, driver, and loader were asked to answer the same four questions (which were rephrased to make them appropriate for the position). The Tank Crew Stability Questionnaire is included in Appendix A.

TANK GUNNERY MEASURES

Criterion data collected on Table VIII were opening time on each engagement and hit/miss data for each main gun round. Opening time was operationally defined as the time which elapsed from the beginning of the fire command by the tank commander until the first round was fired. To help insure completeness and accuracy of Table VIII hit and time data three sources were used. First was data taken from the records maintained by each battalion. These were collected at Grafenwoehr as each battalion fired the Table VIII. Second was data collected by a member of a data collection team during the tank crew's debriefing conducted after Table VIII. Data collection team members were enlisted men detailed by the battalion to assist ARI representatives in data collection. A data collection team member was present during each debriefing to acquire immediate hit/time data from the scorer (usually a platoon leader) and obtain answers to any questions about the conduct of the Table (misfires, targets which did not "pop-up", etc.). The third source was a tape-recording of each Table VIII run. The tape recordings included crew intercom communication, firing tank-to-control tank communication, and tower-to-tank communication. To make the recordings a data collection team member connected a cassette recorder to the firing tank's audio-frequency amplifier (AM 1780/VRC). Recordings were used to verify time measurements, answer questions about any unusual circumstances such as misfires, nonappearance of targets, etc., and to resolve any discrepancies between data collected in debriefings and data taken from battalion score sheets.

RESULTS

DATA HANDLING

Tank Crew Stability Questionnaire. Each questionnaire was checked for completeness upon receipt. Incomplete questionnaires were returned to the crew's company for completion. Using this procedure 211 questionnaires (83% of the questionnaires possible from the sample) were available for analysis. Of these 198 (78%) were complete. Crewmen's responses were converted to months for all items and tabulated for analysis. Because data was tabulated to two digits a maximum of 99 months (8 years 3 months) was permissible on any item. Any respondent answering with more than 8 years 3 months was assigned a score of 99 months.

Tank Gunnery Measures. Gunnery hit/miss and opening time raw scores were tabulated for each tank and cross-checked to insure accuracy by using battalion scoresheets, debriefing scoresheets, and the tape recordings. From these the following summary variables were computed for each tank:

Summary Variables

1. Mean main gun opening time - day.
2. Mean main gun opening time - night.

3. Mean main gun opening time - day and night.
4. Total first round main gun hits - day.
5. Total first round main gun hits - night.
6. Total first round main gun hits - day and night.
7. Total main gun targets hit - day.
8. Total main gun targets hit - night.
9. Total main gun targets hit - day and night.

Because Table VIII gunnery was conducted by each of the five battalions according to slightly different procedures the possibility existed that battalions would exhibit significant differences on the summary gunnery variables above, necessitating use of standardized rather than summary gunnery variables in ensuing analyses. Accordingly, nine ANOVAs were conducted to determine whether significant between-battalion differences existed. An alpha-level of .01 was chosen. Six of the nine analyses (variables 1-4, 6, and 7) yielded significant results. Because of the between-battalion differences, intercorrelation matrices for the nine summary variables were computed overall, and separately by battalion for use in choosing final gunnery criteria. These are provided in Appendix B.

Inspection of these matrices indicated a high correlation between main gun hit measures (variables 4-9), and between opening time measures (variables 1-3), and low correlation between the various hit and time measures. Because of these relationships, and because of their significance to tank gunnery, day and night mean opening time (variable 3) and total main gun targets hit (variable 9) were chosen as the bases for the gunnery criterion measures. To eliminate between-battalion differences indicated by the ANOVAs, standardized time and hit scores were computed for each tank in each battalion. These were used as criteria for all subsequent analyses.

DESCRIPTIVE STATISTICS

Descriptive statistics, including frequency distribution, mean, median, mode, standard deviation, standard error, and semi-interquartile range were computed for all items on the Tank Crew Stability Questionnaire. A summary of these descriptive statistics, including abbreviated item designation, mean, median, standard deviation and semi-interquartile range, is provided in Table 1. Note that due to the two-digit data tabulation, mean and standard deviation statistics are somewhat conservative for items 8, 9, and 10. There were 14-18% of the TCs who answered these items with more than 8 years 3 months and were arbitrarily assigned a maximum score of 99. The median and semi-interquartile range, of course, were unaffected by this procedure. Due to the fact that the distributions for all items were positively skewed, rather than normally distributed, the median and semi-interquartile range may be the more appropriate measures of central tendency and variability. Complete descriptive statistics and frequency distributions are provided in Appendix C.

Table 1

DESCRIPTIVE STATISTICS - PHASE I

Abbreviated Item Designation (N =)	Mean	Median	Standard		Semi Inter-
			Deviation	Quartile	
				Range	
1. Months crew assigned together (211)	2.2	1.2	3.4	1.3	
2. Months crew assigned on Table VIII tank (210)	1.9	1.1	2.7	1.2	
3. Months crew trained together (211)	1.5	.8	2.5	.9	
4. Months TC and GR assigned together (211)	3.5	2.6	3.9	2.1	
5. Months TC and GR assigned on Table VIII tank (211)	3.4	2.5	3.8	2.0	
6. Months TC and GR trained together (211)	2.9	1.9	2.4	1.8	
7. Months TC on Table VIII tank (211)	6.8	4.1	6.9	3.9	
8. Months TC assigned as TC (208)	(36.6)*	24.3	(34.3)*	26.6	
9. Months TC trained as TC (209)	(38.1)*	24.4	(34.6)*	26.1	
10. Months TC on M60 tanks (208)	(47.7)*	45.5	(33.2)*	26.1	
11. Months GR on Table VIII tank (207)	5.3	3.4	6.1	2.9	
12. Months GR assigned as GR (209)	12.6	8.9	12.1	7.9	
13. Months GR trained as GR (209)	13.5	8.4	14.9	9.4	
14. Months GR on M60 tanks (208)	27.4	24.3	16.8	8.6	
15. Months DR on Table VIII tank (200)	5.4	3.2	6.0	3.7	
16. Months DR assigned as DR (204)	11.1	7.7	11.5	7.9	
17. Months DR trained as DR (204)	11.2	7.6	11.6	7.9	
18. Months DR on M60 tanks (199)	16.3	12.5	14.6	9.4	
19. Months LR on Table VIII tank (198)	4.0	2.1	5.1	2.6	
20. Months LR assigned as LR (199)	7.3	4.1	8.1	4.7	
21. Months LR trained as LR (200)	7.4	4.0	8.6	4.9	
22. Months LR on M60 tanks (199)	13.4	9.3	12.2	8.6	

* Due to tabulation procedure mean and standard deviation statistics are conservative for item 8, 9, and 10.

TURBULENCE - GUNNERY RELATIONSHIPS

In order to assess the relationship between crewmen's responses on the Tank Crew Stability Questionnaire and Table VIII performance, correlations were computed between crewmen's responses, in months, and the Table VIII opening time and targets hit criteria described above. The results of these correlations are shown in Table 2. Because of the large number of correlations computed, and the relatively large sample, an alpha level of .01 was chosen for significance.

Responses on many of the turbulence questionnaire items were positively skewed. In addition, a linear relation may not be expected between performance and crew/crewman experience. One might expect greater performance increments associated with experience increments for relatively inexperienced crews/crewmen than with equal experience increments for more experienced crews/crewmen. Therefore, a log transformation was computed for questionnaire responses wherein the transformed score equaled $\log_{10}(\text{raw score} + c)$. The constant (c) was determined by examination of frequency distributions of transformed scores. Various constants from 0.2 to 3.0 were evaluated, and the c which best provided a median transformed score equidistant from the ends of the distribution was chosen. By this procedure more symmetrical distributions were obtained for all variables. Correlations were then computed between the transformed questionnaire responses and the opening time and targets hit criteria. Response-criterion correlations and constants chosen are shown in Table 2. Again an alpha level of .01 was chosen for significance.

Three kinds of relationships proved to be significant. First, the more time a TC and his gunner had trained together the more quickly the crew opened fire. Second, the more experience the TC had, in terms of his assignment as TC on his Table VIII tank, his assignment as TC, and his training as TC, the more quickly the crew opened fire. Third, the more training a gunner received the more targets his tank hit.

DISCUSSION

There were two objectives of this research. First was to determine the degree of tank crew stability in five armor battalions in USAREUR. The second was to determine the relation between tank crew stability and tank gunnery performance on the Tank Crew Qualification Course, Table VIII, at Grafenwoehr, FRG.

The data presented above under Descriptive Statistics indicated that there was considerable turbulence in the battalions observed. While complete crews normally had been together 1-2 months, as shown by mean and median statistics, there was considerable variation. Many had been together more than 2 months while others had been together less than 1 month. The same pattern existed for tank commander/gunner

Table 2

TURBULENCE - GUNNERY RELATIONSHIPS

Abbreviated Item Designation	Analysis of Raw Scores With:			Transformed Scores With:		
	Opening Time	Targets Hit		Opening Time	Targets Hit	c
1. Months crew assigned together	-.07	+.02		-.14	+.03	.2
2. Months crew assigned on Table VIII tank	-.09	-.01		-.12	+.03	.2
3. Months crew trained together	-.09	-.02		-.12	-.01	.2
4. Months TC and GR assigned together	-.11	+.04		-.15	+.02	.3
5. Months TC and GR assigned on Table VIII tank	-.10	+.04		-.14	+.04	.3
6. Months TC and GR trained together	-.12	+.02		-.19*	+.02	.2
7. Months TC on Table VIII tank	-.20*	+.03		-.21*	+.02	.5
8. Months TC assigned as TC	-.15	-.02		-.28**	+.03	.5
9. Months TC trained as TC	-.11	-.03		-.23**	-.01	.5
10. Months TC on M60 tanks	-.10	-.04		-.13	-.06	1.0
11. Months GR on Table VIII tank	-.05	.00		-.12	-.02	.5
12. Months GR assigned as GR	+.03	+.15		.00	+.10	.5
13. Months GR trained as GR	+.07	+.19*		+.05	+.10	1.0
14. Months GR on M60 tanks	+.01	+.14		-.03	+.11	3.0
15. Months DR on Table VIII tank	-.07	+.06		-.10	-.10	.5
16. Months DR assigned as DR	-.13	+.06		-.14	-.02	1.0
17. Months DR trained as DR	-.13	+.07		-.07	-.02	1.0
18. Months DR on M60 tanks	-.16	+.01		-.17	-.01	3.0
19. Months LR on Table VIII tank	-.08	-.04		-.11	-.01	.2
20. Months LR assigned as LR	+.03	-.09		+.03	-.05	.3
21. Months LR trained as LR	+.03	-.05		-.01	-.03	.2
22. Months LR on M60 tanks	-.01	-.04		-.01	-.00	1.0

184 < N < 211

*p < .01

** p < .001

turbulence. Typically, tank commanders and gunners had been together 1-3 months, but variation was great, with many together less than one month and many others together 4 months or more.

The data indicated that most tank commanders had a moderate level of experience as tank commanders, typically 12-42 months. Again, there was great variation in experience. Tank commanders typically had been assigned to their Table VIII tank 3-6 months, but wide variation was evident on this variable also.

Data for remaining crewmembers, gunners, drivers, and loaders, followed the same pattern, but with progressively less experience at each position. Results indicated gunners, drivers, and loaders typically had 5-11, 5-9, and 2-6 months experience, respectively. These crewmen had typically been assigned to their position on their Table VIII tank 1-5 months, depending on position. As with tank commanders, variation was great, with many gunners, drivers, and loaders assigned more than 6 months, and many others less than one month.

Observation of the relation between crew stability measures and gunnery performance was quite instructive. The results indicated no significant relation between gunnery performance and the time the entire crew had been together, but did indicate that the longer the tank commander and gunner had trained together the more rapidly they opened fire on their targets. Thus, while unit commanders may not need to stress whole-crew stability, some emphasis placed on tank commander-gunner stability may yield tank crews which can service targets more rapidly. Of course, these findings are limited by the degree of turbulence observed within the battalions, and would not necessarily generalize to situations where there might be considerably less turbulence. In these battalions, however, the range of crew and tank commander-gunner turbulence was in keeping with the findings of Larson et al. The battalions seemed to fairly represent current US armor battalions. While whole-crews having a significantly greater amount of experience together may indeed perform better than those in this research, such crews do not seem to exist in any sizable numbers.

Tank commanders experience, in that position, was related to gunnery performance. The longer a tank commander had been assigned to his tank, the longer he had been assigned as a tank commander, and the longer he had trained as tank commander, the faster his opening time on Table VIII. These relationships can best be explained in terms of the development of the tank commander's skills. It would seem logical that such relations arise. The tank commander has more control over time-to-fire, in terms of his target acquisition, gun-laying, ranging, and fire command, than any other crewmember.

While no relation was observed between tank commanders variables and number of targets hit, that can probably be explained by the fact that it is the gunner who normally engages targets. He must lay on targets and make adjusted lays based on the various fire adjustment methods. In addition, because the ranges to targets were fairly well known by the tank crews, any effects of differences in tank commanders ranging skills would have been attenuated.

From the discussion one might expect to observe a relation between gunner training and number of targets hit. Such a relation was revealed by the analysis. The longer a gunner had trained as gunner the more targets his tank hit on Table VIII. Although no relation was observed between gunner variables and opening time such a finding may be explained in terms of the tank commanders greater control on that variable.

No significant relationships were observed between driver or loader variables and either time or targets hit on Table VIII. These results may also be readily explained. In most cases the ammunition to be used was announced and loaded prior to the beginning of an engagement, thus limiting the effect a loader could have on opening times. And loaders appeared to be consistent in identifying and loading the ammunition correctly, thus limiting the effect of loader variables on the targets hit criterion. Because engagements did not begin until the tank was in position, the driver's contribution to hits and time was limited.

Overall, the findings for individual crewmembers indicate that position familiarity of tank commanders and gunners plays a small, but significant, part in reducing opening time on Table VIII, and increasing the number of targets hit. Such a finding is, of course, in concurrence with the beliefs of the majority of the armor community. It would seem to underscore the need for emphasizing the training, and retention, of tank commanders and gunners in their respective positions.

PHASE II

The results reported in the Phase I research indicated a relation between tank commander's position familiarity and gunnery performance; and a relation between tank commander/gunner personnel familiarity and gunnery performance. Because of the correlational nature of the research, however, causal relations between these variables were not clearly demonstrated. And the many uncontrolled variables in the correlational research, such as weather, equipment, unit training, unit policies, scoring standards, etc., may have overshadowed smaller effects due to more modest levels of crew turbulence.

The purpose of this research was to delineate causal relationships between gunnery performance and various types of crew turbulence which can occur in operational units. Maximum turbulence conditions were created, thus facilitating the evaluation of the effects of turbulence on gunnery performance.

It was hypothesized that reduced personnel and equipment familiarity would result in reduced gunnery performance. Personnel and equipment familiarity usually change concurrently in operational armor units. When an armor crewman is reassigned it is usually to a different crew and tank, which should lead to immediate reductions in personnel and equipment familiarity for the reassigned crewman. Reassignment of all crewmembers to crews and tanks with which they are unfamiliar should lead to maximal reductions in personnel and equipment familiarity, and show maximal effects of those variables on gunnery performance.

It was also hypothesized that reductions in position familiarity, resulting from changing an individual's position assignment, should lead to reduced gunnery performance. In typical units tank commander replacements are chosen from available gunners, while gunner replacements are chosen from available loaders or drivers. (With the implementation of CMF 19 gunners will be chosen from available loaders). Reduced position familiarity attendant to change in duty position from gunner to tank commander, and loader to gunner, should lead to reduced gunnery performance. The degree of such performance decrements should be a function of the level of cross training provided to gunners and loaders. Reductions in position familiarity, in combination with reduced position and equipment familiarity attendant to reassignment to new crews/tanks should lead to greater reductions in gunnery performance.

Position turbulence could also occur should there be an outbreak of hostilities requiring that replacements for tank crewmen be taken from combat support battalions and include non-armor personnel. Among the personnel selected for these positions may be cooks, clerks, military policemen, etc. Individuals in these occupations exist in most combat divisions world-wide, and could provide a source of personnel to serve in tanks should replacements for tank crews be required before time permits armor crewmen to be provided through normal channels. Preparation for combat would probably consist of a brief training program for crewmen and not more than a day to train with the crews to which they would be assigned. Such replacement personnel would initially experience reduced levels of position, equipment, and personnel familiarity, and probably reduced gunnery performance. The degree to which such reductions in familiarity lead to reduced gunnery performance would depend upon the efficacy of the training given and the time crewmen have to work together.

To evaluate these hypotheses a four-group experiment was designed. One group was a control group while three were experimental groups representing the different turbulence variables. All personnel in Groups 1, 2, and 3 were armor crewmen while non-armor crewmen were included in the 4th Group. Group 2 was comparable to the Control Group in position familiarity, but represented a low degree of personnel and equipment familiarity. Group 3 represented a low degree of position, personnel, and equipment familiarity. Group 4 was a group consisting of armor tank commanders and drivers, and non-armor gunners and loaders who had been given three days training. All were assigned unfamiliar equipment and personnel.

Comparisons of the Control Group and Group 2 permit an evaluation of personnel and equipment familiarity for armor personnel. Comparison of the Control Group with Group 3 was designed to illuminate the combined effects of position, personnel and equipment familiarity for armor personnel, while comparison of Group 3 with Group 2 would permit evaluation of the effects of position familiarity alone. Finally, comparison of the Control Group with Group 4 was designed to evaluate the combined effects of position, personnel, and equipment familiarity for non-armor personnel, while comparisons of Groups 2 and 4 could provide an evaluation of the effects of position familiarity alone.

The primary objectives were to determine the effects of crew turbulence on tank crew gunnery performance and to study the effects of replacing crewmembers with non-armor personnel including the development and evaluation of a training program for non-armor replacements. The secondary objective was to test the relationships between gunnery performance and selected turbulence variables using the Tank Crew Stability Questionnaire.

METHOD

RESEARCH PARTICIPANTS

The research participants were primarily tank crewmen from an operational armor battalion at Ft Carson. Tank crewmen from 44 crews completed the Tank Crew Stability Questionnaire for use in the correlational phase of the research. An additional 22 non-armor personnel were selected from the 4th Infantry Division (Mech) to participate in the experimental phase. These men were excused from their duties to participate in the research. This sample consisted of a Unit Organizational Supplyman, and Administrative Specialist, three Food Service Specialists, a Wheeled Vehicle Mechanic, two Infantrymen, a Telecommunications Center Specialist, six Military Policemen, one Correctional Specialist, one Race-Relations Equal-Opportunity Specialist, a Tracked Vehicle Mechanic, two Tactical Wire Operations Specialists, a Radio Operator, and a Voice Radio Operator.

PROCEDURE

The battalion participating in the research had just completed its annual gunnery season culminating in the Tank Table VIII for crew qualification. Following the Qualification Table VIII, tank crewmen were assigned to one of the four groups included in the research, and fired a second Table VIII. This second, or "turbulence", Table VIII provided scores with which to evaluate the effects of turbulence in the experimental groups.

Gunnery performance measures for both Qualification and Turbulence Table VIII were collected with the cooperation of the 4th Infantry Division (Mech) Tank Gunnery Assistance Team and included Table VIII point scores and time/hit data on individual engagements. A description of the Turbulence Table VIII engagements is provided in Table 3.

Tank Crew Stability Questionnaires (described in Phase I) were completed by tank crewmembers following the first Table VIII and returned to ARI personnel for use in the assignment of crewmen to experimental conditions for the Turbulence Table VIII. This data was also used in the correlational phase of the research.

Qualification Table VIII rosters and Tank Crew Stability Questionnaires were the bases for selecting research participants and assigning crews to experimental groups. Only crews that had remained stable through Tables VII and VIII were considered. The assignments were made for each company immediately following their completion of Table VIII. Fifteen crews from two companies and fourteen crews from a third company were selected. These crews were randomly assigned to experimental conditions to create four groups of 11 crews each, and fired the turbulence Table VIII under the conditions specified by the group to which they were assigned.

The experimental groups were created in the following manner: Group 1 (Control) crews were selected from the sample of complete crews which were available for the study. Each crewman assigned to this group was with his Table VIII crew and maintained his normal duty position. These crews were assigned to their Table VIII tanks. The first group was the control against which the remaining groups were compared.

The men assigned to Group 2 (Unfamiliar Crews) maintained the duty positions in which they had been trained and evaluated during the gunnery season. However, they were assigned to work with personnel with which they had not served during the Qualification Table VIII and were assigned to a tank to which they had not been previously assigned.

The Group 3 (Unfamiliar Crews and Positions) crews also consisted of crewmen who had not been together on Qualification Table VIII, and who were assigned to unfamiliar tanks. The Group 3 tank commanders were excused and replaced by their gunners, and the gunner positions

Table 3
TURBULENCE TABLE VIII

Target	DAY	
	Engagement	Range (Meters)
1. Anti-tank (steel)	Precision, HEP-T	1950
2. Moving tank (panel)	Precision, APDS-T	1750
3. Troops	Coax	300
4. Troops	Cal .50	1400
5. Troops	Coax	450
6. Tank (panel)	Battlesight, HEAT-T	1000
7. Moving truck (panel)	Coax	600
8. Truck (panel)	Cal .50	1600
9. Tank (steel)	Precision, HEAT-T	1750
10. Tank (steel)	Battlesight, APDS-T	900

Target	NIGHT	
	Engagement	Range (Meters)
1. Tank (panel)	Precision, APDS-T	2000
2. Truck (panel)	Cal .50	750
3. Troops	Cal .50	1400
4. Moving tank (panel)	Battlesight, APDS-T	1200
5. Anti-tank (steel)	Battlesight, HEAT-T	900
6. Anti-tank (panel)	Precision, HEAT-T	1500
7. Troops	Coax	200
8. Moving truck (panel)	Coax	500
9. Troops	Coax	450
10. Anti-tank (steel)	Battlesight, HEP-T	700

were filled by the loaders. The driver and loader positions were filled with men who had held those positions during the gunnery season. As with Group 2, the crewmen in Group 3 had not been trained together or worked on the tank to which they were assigned.

In Group 4 (Non-Armor Replacements) tank commanders and drivers were armor crewmen who had served in those positions, but not together, during the gunnery season. They were assigned to a tank they had not used during the Qualification Table VIII. The gunners and loaders were non-armor personnel who were randomly assigned to crews.

The assignment of personnel to experimental groups was random with the restrictions that Group 1 (Control) crews had to work with the same crewmembers and on the same tank they had used on the first Table VIII while crewmen in Experimental Groups 2, 3, and 4 were assigned to completely different crews and tanks. No crewman served in more than one duty position. Due to inoperative equipment it was impossible for a limited number of crews to fire on the tanks to which they had been assigned (familiar tanks for Group 1, and unfamiliar tanks for Groups 2-4). There were 4 such crews from Group 1; 3 from Group 2; 2 from Group 3; and 1 from Group 4. In order to retain these crews in the study, they were reassigned to other (and inappropriate) tanks. Due to movement of personnel within the battalion, drivers and loaders occasionally had to work with more than one crew, but maintained their normal duty positions.

The tank commanders in Groups 1, 2, and 3 were informed of their crews and group assignments one day prior to their firing the second Table VIII. No formal training program was permitted, but the tank commanders were encouraged to meet with their crews for several hours in order to familiarize themselves with each other, their tanks, and their specific crew duties.

The Group 4 tank commanders, drivers, and non-armor men reported to the Ft Carson Table VII where they remained until they fired the turbulence Table VIII. The non-armor personnel were arbitrarily designated as either gunners or loaders, and were assigned to a tank commander/driver pair. A three-day training program was conducted for the non-armor personnel under the supervision of ARI and battalion representatives with the tank commanders and drivers functioning as cadre. The three-day training program was designed to prepare gunners and loaders to fire Table VIII only and did not include training on normal maintenance, tactics, etc. The gunners' program involved safety, preparation for operations, fire commands, identification of targets, adjustment of fire, and tracking. The loaders' program included TEC lessons and hands-on practice. Loader's training emphasized safety, ammunition identification and loading procedures, preparation for operations, M219 disassembly and assembly, replenisher tape reading, preoperation checks and services, and combat loading. The gunners and loaders completed each exercise (day and night) using sub-caliber ammunition on Days 1 and 2, and 10 main gun rounds on Day 3.

On Day 3 the non-armor gunners and loaders were reassigned to a tank commander/driver pair other than the ones with which they trained. This was done to meet the requirements of the combat replacement scenario described above. This also made the familiarity of Group 4 crewmembers comparable to that of Group 2 and 3 crews. The crews fired Table VIII within a day or two following completion of their training.

An outline of the three-day training program is provided in Appendix D. A complete description of the training is given in O'Brien, Crum, and Healy, 1978.

RESULTS

Of the 44 crews identified for participation in the research 40 completed the turbulence Table VIII and were included in the data analysis. These included 11 crews in Group 1 (Control), 10 in Group 2 (Unfamiliar Crews), 9 in Group 3 (Unfamiliar Crews and Duty Positions), and 10 in Group 4 (Non-armor Replacements). The Group 2 tank was disqualified on Table VIII for disciplinary (not gunnery) reasons. One Group 3 tank was disqualified due to a gross (gunnery) safety violation and one failed to complete the night course due to a minor injury sustained during the day course. The Group 4 tank was disqualified due to equipment malfunctions.

DATA HANDLING

Table VIII data was tabulated for each crew for both the qualification Table VIII and the turbulence Table VIII. Variables considered are shown below:

Primary Variables

- Table VIII points
- Main gun targets hit
- Main gun opening time
- Machine gun points

Secondary Variables

- Main gun points
- Stationary battlesight targets hit
- Stationary precision targets hit
- Moving targets hit
- Number of main gun targets hit within time standard (5 sec battlesight or 10 sec precision)
- Stationary battlesight opening time
- Stationary precision opening time
- Moving target opening time

Means were computed for each crew on each variable for Table VIII Day (D), Night (N) and Day and Night (D + N) combined. Point scores were computed using the standard Ft Carson Tank Gunnery Assistance Team (TGAT) procedures. On main gun engagements 75 points were awarded on each engagement where a target was hit within the allotted time (20 seconds on battlesight engagements or 30 seconds on precision engagements). In addition, between 0 and 75 points were awarded for opening time on any engagement wherein a target was hit. Maximum opening time points were awarded when opening times were less than 5 seconds on battlesight engagements, or less than 10 seconds on precision engagements. Longer opening times were awarded fewer points in accordance with the sliding scales for opening time points provided in Appendix E.

Machine gun points were computed on each engagement as follows: When the opening rounds were within the target area 20 points were awarded for opening times of 5 seconds or less. Opening times of longer than 5 seconds were awarded fewer points according to a sliding scale provided in Appendix F. In addition, up to a maximum of 20 points were awarded for target effect (4 points/hit for vehicle engagements or 4 points/each 5th of troop coverage on troop engagements). Finally, up to 10 points were awarded for "technique" based on the judgment of the TGAT NCO who scored the firing tank.

Stability questionnaire data was tabulated and handled just as in the first portion of the research.

EQUIPMENT FAMILIARITY

The unplanned assignment of a few Group 1 crews to unfamiliar tanks, and some Group 2, 3, and 4 crews to tanks on which one or more crewmembers had fired during annual gunnery permitted an evaluation of equipment familiarity which otherwise could not have been made. The planned evaluation of equipment familiarity was to be made in conjunction with an evaluation of personnel familiarity (comparison of Group 1 with Group 2); however, a separate analysis of equipment familiarity was possible.

To evaluate the effects of equipment familiarity crews were designated as "unfamiliar" with equipment if no crewmembers were assigned to the tank during the annual gunnery season, and "familiar" if the tank commander and/or gunner were assigned to the tank during annual gunnery. For each variable (D + N, D, and N), a 3 x 2 unweighted means Analysis of Variance (Winer, 1971, pp. 447) was computed. One factor was equipment familiarity, as defined above, while the second was Group assignment; 1, 2, or 3. There were too few unplanned tank assignments in Group 4 to enter into the analysis.

The results of the 36 Analyses of Variance (ANOVAs) indicated 4 main effects of familiarity: stationary battlesight targets hit ($\bar{N}$), total main gun targets hit (N), total main gun points (N), and moving target opening time (D). In the first three cases crews on unfamiliar tanks performed better than those on familiar tanks. Familiarity interacted with Group assignment in only three cases: moving target opening time ($D + N$), stationary precision targets hit (N), and moving target opening time (D). The first interaction occurred because the three Group 2 crews on familiar tanks performed more slowly than their counterparts on unfamiliar tanks, while the second was due to the two group 3 crews on familiar tanks performing more poorly than their counterparts. Only the relationships with the opening time on the moving target (N) made sense; equipment-familiar crews opened fire more quickly than unfamiliar crews. This was interpreted as a chance occurrence. Consequently, all crews' results were treated according to their nominal group assignments in all further analyses, and equipment familiarity as a variable was given no further consideration. All summary data for analyses are provided in Appendixes G, H, and I.

BETWEEN GROUP DIFFERENCES

In order to determine whether significant group by company interactions existed, two-way unweighted means ANOVAs were computed on each variable. Significant group by company interactions would indicate that the treatment (group assignment) effects observed depended upon the companies from which the crews were drawn. Such a finding would limit the generalizability of the results. The ANOVAs, however, revealed no significant interactions (all $F < 2.40$, $p > .05$, $df = 3,36$). Accordingly, all further analyses were based on one-way ANOVA computations.

In order to evaluate between group differences, Dunnett tests (Winer, 1971, pp. 201) were computed for comparisons of the control group (Group 1) with the three experimental groups. Tukey tests (Steele and Torrie 1960, pp. 109) were computed for differences between experimental groups. Alpha levels were set at $p < .05$, 2 tailed, for all comparisons. The Dunnett and Tukey procedures were chosen as more conservative analyses than the Newman-Keuls.

An overview of the results indicated that numerically, Groups 1, 2, and 4 were comparable, while Group 3 performed more poorly. Typical results are shown in Figure 1 for Table VIII total points ($D + N$), main gun targets hit ($D + N$), main gun opening time ($D + N$), and machine gun points ($D + N$). Statistically significant between group differences were found for total points and opening time. A detailed description of the results is given in the following pages. Means and between-group comparison significance levels are provided in Tables 4 and 5.

Figure 1. Tank Gunnery Performance as a Function of Group Assignment

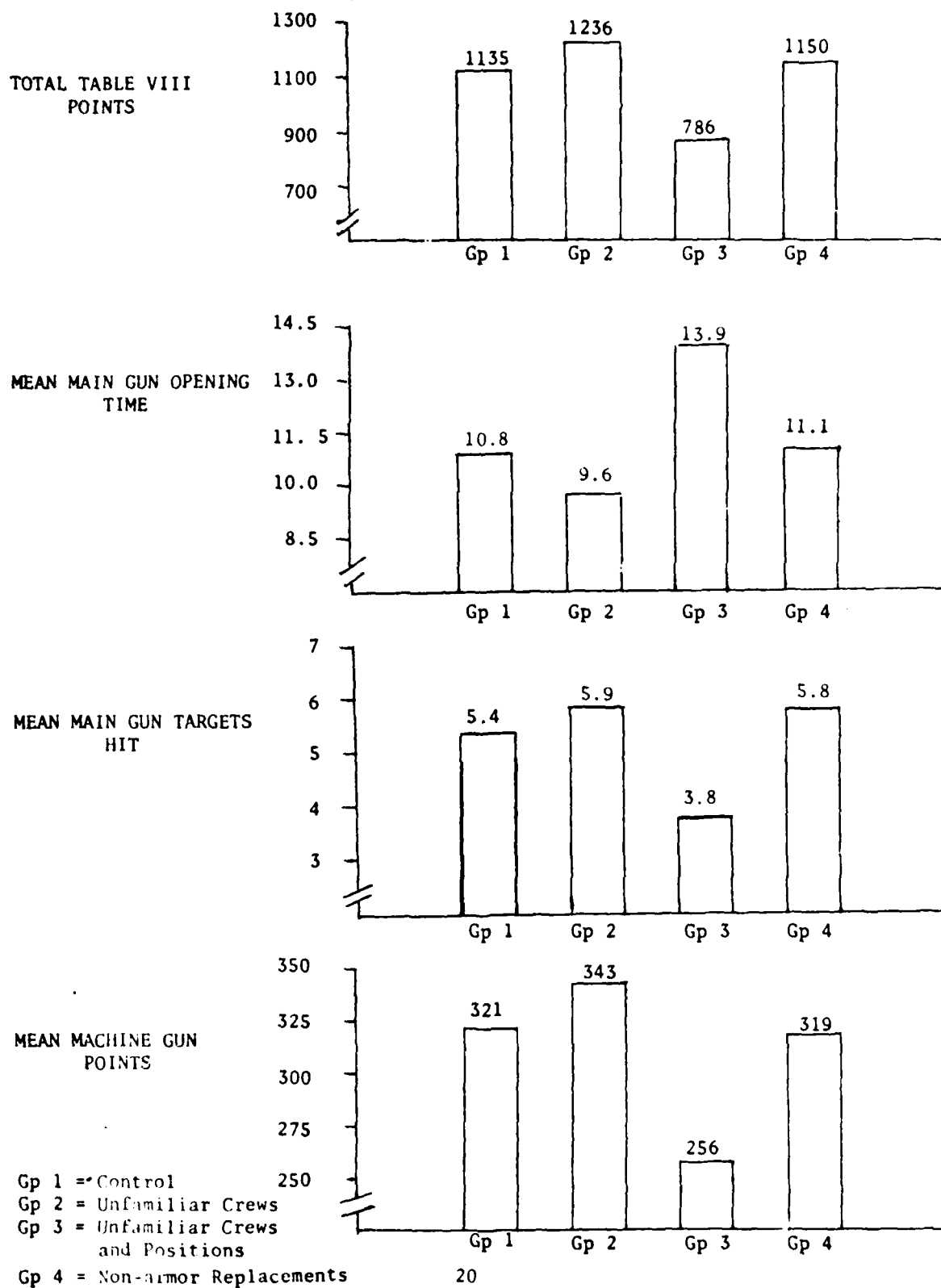


Table 4
GROUP MEANS ON TANK GUNNERY PERFORMANCE VARIABLES

	Day and Night Combined				Day				Night				
	Group:	1	2	3	4	1	2	3	4	1	2	3	4
OPENING TIME													
Stationary battlesight		7.16	6.85	10.47	8.00	6.00	5.85	8.66	7.35	8.32	7.75	12.88	9.15
Stationary precision		14.77	12.17	19.44	14.69	13.95	11.50	17.44	14.70	15.50	12.85	21.44	15.30
Moving target		10.55	10.20	12.55	9.90	12.45	12.50	14.67	11.30	8.73	7.90	10.44	8.50
TOTAL Main Gun		10.77	9.64	13.95	11.06	10.50	9.48	13.36	11.08	11.25	9.82	15.58	11.48
TARGETS HIT													
Stationary battlesight		3.27	3.40	2.11	3.10	1.55	1.40	1.22	1.70	1.73	1.90	0.67	1.40
Stationary precision		1.45	2.00	1.33	1.90	0.55	0.90	0.56	0.80	0.91	1.10	0.78	0.80
Moving		0.64	0.60	0.44	0.60	0.18	0.40	0.22	0.30	0.55	0.20	0.22	0.30
Within time standard		1.45	2.50	0.78	1.10	0.64	1.00	0.33	0.50	0.73	1.50	0.44	0.60
TOTAL Main Gun		5.36	5.90	3.78	5.80	2.27	2.70	2.11	2.80	3.09	3.20	1.78	2.40
TABLE VIII POINTS													
Machine gun points		321.36	342.90	256.33	318.60	156.64	178.60	137.22	165.60	164.73	164.30	108.00	153.00
Main gun points		763.55	845.80	488.11	788.40	328.82	395.40	277.89	400.70	434.73	450.40	210.22	387.70
TOTAL		1134.91	1236.20	786.11	1149.50	510.45	557.30	435.67	572.30	615.36	637.20	351.56	563.20

Table 5

RESULTS OF BETWEEN GROUP COMPARISONS OF TANK GUNNERY PERFORMANCE

	Significance level for:							
	DAY AND NIGHT COMBINED				DAY		NIGHT	
	Dunnett Test of Groups 1&2 1&3 1&4	Tukey Test of Groups 2&3 2&4 3&4	Dunnett Test of Groups 1&2 1&3 1&4	Tukey Test of Groups 2&3 2&4 3&4	Dunnett Test of Groups 1&2 1&3 1&4	Tukey Test of Groups 2&3 2&4 3&4	Dunnett Test of Groups 1&2 1&3 1&4	Tukey Test of Groups 2&3 2&4 3&4
OPENING TIME								
Stationary battlesight	-- .01 --	.05 --	-- .05 --	-- --	-- --	-- --	-- .05 --	-- --
Stationary precision	-- .05 --	.01 --	-- --	-- --	-- --	-- --	-- .05 --	-- .01 --
Moving target	-- -- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TOTAL Main Gun	-- .01 --	-- --	-- --	-- --	-- --	-- --	-- .01 --	-- .05 --
TARGETS HIT								
Stationary battlesight	-- -- --	-- --	-- --	-- --	-- --	-- --	-- .01 --	-- --
Stationary precision	-- -- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Moving	-- -- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Within time Standard	-- -- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TOTAL Main Gun	-- -- --	-- --	-- --	-- --	-- --	-- --	-- .05 --	-- --
TABLE VIII POINTS								
Machine gun points	-- -- --	-- --	-- --	-- --	-- --	-- --	-- .05 --	-- --
Main gun points	-- -- --	-- --	-- --	-- --	-- --	-- --	-- .01 --	-- --
TOTAL	-- .05 --	-- --	-- --	-- --	-- --	-- --	-- .01 --	-- .05 --

.05 - $p < .05$, 2-tailed.01 - $p < .01$, 2-tailedNot significant, $p > .05$, 2-tailed

UNFAMILIAR CREWS

Comparison of Group 1 with Group 2. Group 1 and Group 2 differed in degree of personnel familiarity. Group 1 personnel fired the turbulence Table VIII with the same crewmen and in the same positions as on the qualification Table VIII two weeks previously. Group 2, on the other hand, was composed of crewmen who held the same positions as they held on the qualification Table VIII, but who were working with different crewmen. Thus, any differences between the groups could be attributed to differences in familiarity of crewmembers. Computation of Dunnett's t for comparisons of Group 1 with Group 2 on each of the 12 gunnery variables Day (D), Night (N), and Day and Night combined (D + N), revealed no significant differences between groups. Thus personnel familiarity did not contribute in a significant manner to performance variation on the turbulence Table VIII.

UNFAMILIAR POSITION

Comparison of Group 2 with Group 3. Because both Group 2 and Group 3 were conditions with reduced personnel familiarity, the comparison of Group 2 and 3 is appropriate for evaluating the effects of reduced position familiarity. The Tukey analyses indicated many significant effects. The crews which experienced only personnel changes had significantly more total points (N) and battlesight targets hit (N) and faster main gun opening times (N), precision opening times (N, and D + N), and battlesight opening times (D + N).

UNFAMILIAR CREWS AND POSITIONS

Comparisons of Group 1 and Group 3. Group 3 crews experienced both personnel and duty position turbulence. Because personnel familiarity, evaluated in comparisons of Group 1 and 2, yielded no significant differences, any differences between Group 1 and Group 3 can probably be attributed to unfamiliarity with positions. The Control crews had significantly more Table VIII points (D + N, and N), main gun points (N), main gun targets hit (N), battlesight targets hit (N), and machine gun points (N). In addition, Group 1 opening times were significantly faster over all main gun engagements (D + N, and N), battlesight engagements (D + N, D and N) and precision engagements (D + N, and N). Thus, while personnel differences alone did not lead to significant performance differences between Control Crews and Unfamiliar Crews, Unfamiliar Positions in addition to Unfamiliar Crewmembers led to numerous significant performance decrements.

NON-ARMOR REPLACEMENTS

Comparisons of Group 1 and 4. As with Groups 1 and 3, Groups 1 and 4 differed in personnel and duty familiarity, but involved a different kind of duty position turbulence. The Group 4 crews consisted of armor-trained tank commanders and drivers, and non-armor trained gunners and loaders. Because personnel turbulence did not lead to significant performance differences between Groups 1 and 2, any differences between Groups 1 and 4 could best be attributed to replacing crewmembers with non-armor personnel. The results, however, indicated no significant differences between Groups 1 and 4 on any of the gunnery variables evaluated.

Comparison of Groups 2 and 4. As with the evaluations of job familiarity above, Group 2 provides a control for the evaluation of the type of duty position turbulence created in Group 4. There were no significant differences between Groups 2 and 4 on any of the gunnery variables evaluated.

Comparison of Groups 3 and 4. Comparisons of Group 3 and 4 were used to evaluate the effects of the two different kinds of duty position turbulence. Although the performance of Group 4 was numerically superior to that of Group 3 on all variables, the differences did not reach acceptable levels of significance.

TABLE VIII RELIABILITY

The design of the turbulence research offered a unique opportunity to acquire test-retest data with which to address the reliability of Table VIII. The data was available because the Control crews had completed their qualification Table VIII with the same crewmembers, in the same duty positions, and on the same tanks as used for the turbulence Table VIII. In cases wherein a crew re-ran the Table VIII for qualification, the most recent data was used for analysis. Correlations of +.43 for total points, +.50 for main gun points, +.37 for main gun targets hit, and +.54 for main gun opening time were obtained. Because of the small sample size ($N = 11$) significance tests on the correlations are not particularly meaningful. These correlations are best considered as point estimates of test-retest relationships.

QUESTIONNAIRE RESULTS

Tank Crew Stability Questionnaires and Table VIII results from 44 crews were available for analyses. The questionnaires were handled as they were in Phase I. A summary of descriptive statistics including mean, median, standard deviation, and semi-interquartile range is provided in Table 6. Selected questionnaire variables identified in Phase I as significant were correlated with Table VIII gunnery measures. No significant relationships were indicated by these analyses. This can probably be explained by the smaller sample in Phase II.

Table 6

DESCRIPTIVE STATISTICS - PHASE II

Abbreviated Item Designation (N =)	Mean	Median	Standard Deviation	Semi Inter-Quartile Range
1. Months crew assigned together (52)	1.42	.50	2.93	.53
2. Months crew assigned on Table VIII tank (52)	1.02	.44	2.40	.44
3. Months crew trained together (52)	.77	.41	1.84	.40
4. Months TC and GR assigned together (52)	3.33	2.00	4.25	2.21
5. Months TC and GR assigned on Table VIII tank (52)	2.65	1.50	3.42	1.58
6. Months TC and GR trained together (52)	2.42	1.00	3.84	1.25
7. Months TC on Table VIII tank (52)	4.37	4.50	4.54	4.62
8. Months TC assigned as TC (52)	(16.90)*	12.00	(21.48)*	7.17
9. Months TC trained as TC (52)	(17.57)*	12.00	(22.56)*	7.17
10. Months TC on M60 tanks (52)	(24.08)*	24.00	(28.04)*	9.75
11. Months GR on Table VIII tank (50)	3.94	2.00	5.62	2.08
12. Months GR assigned as GR (50)	12.82	8.50	16.33	8.09
13. Months GR trained as GR (48)	11.04	5.00	17.55	6.34
14. Months GR on M60 tanks (48)	30.31	27.00	18.30	5.63
15. Months DR on Table VIII tank (50)	3.36	1.00	6.34	1.49
16. Months DR assigned as DR (50)	13.40	10.00	14.27	11.17
17. Months DR trained as DR (50)	12.16	11.00	11.81	9.25
18. Months DR on M60 tanks (49)	18.78	22.00	13.30	10.75
19. Months LR on Table VIII tank (48)	2.43	1.00	4.17	1.61
20. Months LR assigned as LR (48)	7.33	3.50	7.45	5.65
21. Months LR trained as LR (48)	7.27	2.00	8.45	6.42
22. Months LR on M60 tanks (48)	16.79	17.00	11.66	9.50

*Due to tabulation procedure mean and standard deviation statistics are conservative for items 8, 9, and 10.

DISCUSSION

The purpose of this research was to determine the effects of personnel, equipment and position familiarity on tank gunnery performance, as indicated by performance on Table VIII. To answer this question four groups of tank crews were assembled. Group 1 served as a control group with typical levels of personnel, equipment and job familiarity. Group 2 (unfamiliar Crews) was a personnel turbulence group in which crewmen served in their normal duty positions, but with different crewmen. Group 3 (Unfamiliar Crew and Duty Position) crews were identical to Group 2 with respect to personnel and equipment familiarity, but unfamiliarity with duty positions was added as a variable for the Group 3 tank commanders and gunners. Group 4 (Non-Armor Replacements) was also a condition of reduced personnel, equipment and position familiarity. Unfamiliarity of duty position was created by replacing the gunner and loader with non-armor personnel.

The results of this research indicate that unfamiliarity with the duties assigned to the tank commander and gunner had a serious effect on Table VIII gunnery performance. On almost every variable evaluated, the performance of Group 3 crews (Unfamiliar Crew and Duty Positions) was worse than that of Groups 1, 2, or 4, and many of the comparisons were statistically significant. The poorer performance of Group 3 crews overall was particularly evident in the night firing scores. Also, it is important to note that the analyses of Group 3 performance excluded 2 crews who were disqualified; therefore, the results presented here represent a conservative estimate of the effects of duty position turbulence. Had minimum scores been entered for disqualified crews, Group 3 means for points and hits would have been lower, and mean opening times would have been longer.

It is apparent that the gunners and loaders did not have sufficient cross training to prepare them for the tank commander and gunner positions. The battalion did provide cross-training for crewmen in classroom settings, but there was not sufficient time to provide hands-on cross training during the gunnery season. The realities of combat utilization of our tank forces, however, suggest that combat losses may necessitate the kinds of replacement procedures evaluated in this research.

The new 19E gunner/loader training implemented at Ft Knox should reduce the problem of replacing the gunner. However, this will not provide crewmembers qualified to replace the tank commander. Thus, serious consideration should be given to cross-training of crewmembers in tank commander's duties. Results from Phase I indicated that length of time tank commander and gunner worked together affected gunnery performance. This suggests that tank commander-gunner interaction is important and should be part of the cross training for tank commander replacements. A brief training program for tank commanders and gunners similar to the one used for Group 4 (Non-Armor Replacements) gunners and loaders may be an efficient way to incorporate cross training into the normal gunnery training.

Although crews in Group 4 (Non-Armor Replacements) also experienced unfamiliarity of personnel, equipment, and position, their overall performance was not significantly different from that of either Group 1 or 2. This can be explained in part by the fact that experienced tank commanders were present on the tanks, and had trained the non-armor personnel on Table VII prior to firing the Table VIII. Also, the non-armor crewmen had just completed three days of training designed specifically to prepare them for firing Table VIII.

The effects of personnel turbulence were evaluated by comparing the performance of the Unfamiliar Crews with that of the Control Crews. There were no statistically significant differences in performance between the Unfamiliar Crews and the Control Crews, indicating that this type of personnel turbulence does not significantly degrade gunnery performance. In fact, on many variables the Unfamiliar Crews had scores that were numerically superior to the Control Crews. The numerical results can be attributed to random rather than systematic group differences.

Although the results indicated that personnel turbulence did not seriously degrade Table VIII performance, the Tank Crew Stability Questionnaires showed that even the Control Crews (Group 1) had relatively little experience together. Thus, the Group 1 and Group 2 crews did not differ greatly in length of time together. Group 1 crews with significantly greater amounts of experience with one another might have performed better, leading to significant Group 1 - Group 2 differences. Such crews were not available in the battalion participating in the research, however. And data presented in Phase I and Larson et al. indicated that such crews are not readily available in today's Army.

The evaluation of equipment familiarity was conducted separately from personnel and position familiarity due to the fact that some crews were not able to fire the appropriate tanks. Of all the ANOVA comparisons run, only for moving target opening times at night did equipment familiar crews perform significantly better than unfamiliar crews. This may or may not reflect a chance occurrence. Based on the comparisons we can conclude that familiarity with a particular tank played only a minor role, if any, in Table VIII performance. Again, equipment familiarity might have been a more important factor if the controls had been assigned to their tanks for a substantially longer time.

The data presented in this research also provided some information on the reliability of Table VIII as a tank gunnery evaluation tool. That information is interesting in its own right, and is helpful in interpretation of the between group differences observed. The correlations considered as point estimates indicated moderate levels of reliability. Overall, the moderate levels of reliability were not surprising. No attempt was made to control for variables associated with weather, ammunition, or time of day/night when firing occurred. And motivational differences may have existed because the first Table VIII was for

qualification and the turbulence Table VIII did not directly affect the status of the crews.

The questionnaire data was used primarily as a tool for crew assignment. The descriptive statistics were useful, however, in evaluating the comparability of turbulence in the Ft Carson battalion with turbulence in the five USAREUR battalions observed in Phase I. The correlations between questionnaire variables and gunnery performance which yielded significant effects in Phase I did not produce the same results from the Ft Carson data. This apparent inconsistency is not surprising since the results obtained in the USAREUR study included data from approximately 200 crews, while complete data from only 44 crews were available at Ft Carson. Small effects of turbulence which could have been observed with the large sample could easily go unnoticed with the small sample.

GENERAL DISCUSSION AND CONCLUSIONS

The results of the research in Phase I revealed considerable levels of turbulence in 5 USAREUR battalions. These results were consistent with those of Larson et al. (1976) and Report of Tank Forces on Training Technology (1975). Personnel turbulence was most apparent with complete crews, which had typically been together only 1-2 months. There was less personnel turbulence among tank commander/gunner pairs, which had usually been together 1-3 months. There was a great deal of variation in the degree of personnel turbulence observed, however. Some crews, and tank commander/gunner pairs, had been together less than a month, while others had been together four months or more. The results suggest that stable crew assignments were far from a reality in the battalions observed.

Position turbulence was not as great as personnel turbulence. Most loaders had served in their position longer than three months. And tank commanders, gunners, and drivers had typically held their positions more than six months. Variation was also great on these position turbulence variables. Thus, while most crewmen had a reasonable degree of experience with their duty positions, a number of them were quite new to their positions when firing Table VIII.

The research indicated that whole crew personnel familiarity did not have a significant effect on gunnery performance. Neither the Stability Questionnaire results from Phase I, nor the Group 1 and 2 comparisons from Phase II, suggested any evidence that entire crews which had been together for a moderate period of time fired better than those together a shorter time. The results are tempered by two factors. First, few crews which had been together a long time, even one year, were available. Such crews might perform better than the typical crews in today's armor forces. Second, the Stability Questionnaire results did indicate a small but significant relation between gunnery performance

and the time tank commanders and gunners trained together. Thus, tank commander and gunner turbulence may be an important factor in predicting gunnery performance.

The major findings of this research were related to duty position familiarity. In both phases of the research experience in a particular position appeared as a significant factor in gunnery performance. Both tank commander and gunner experience in their positions were related to gunnery performance in Phase I, and Phase II crews which included men in unfamiliar crew positions performed much more poorly than those in comparable crews who were familiar with their duties. Both Phase I and Phase II results speak strongly for emphasis on the training and retention of armor crewmen, particularly tank commanders and gunners, in their positions.

When the results were used to address the problem of how to replace armor crewmen, either by changing positions or by incorporating non-armor personnel, two findings were revealed. First, changing a crewman's duty position without training him for his new duties, leads to markedly reduced performance. The armor crewmen were not adequately cross-trained to assume their new positions, even though they had just completed annual gunnery and cross training in classroom subjects was provided as part of the gunnery program. The second finding was that incorporation of non-armor personnel into crews as gunners and loaders did not significantly degrade gunnery performance. However, the non-armor men were given three days intensive hands-on training specifically designed to prepare crewmen to fire Table VIII. Such personnel, given a short training package such as used in this research, may provide adequate replacement personnel in emergency situations. The same type of training packages could also be developed and incorporated into unit gunnery training to assist in cross-training armor crewmen.

Equipment familiarity appeared to have only a limited impact on gunnery performance. Only one relationship between increased equipment familiarity and improved performance (for tank commanders) was noted in Phase I, and only one (for moving target opening time at night) was observed in Phase II. Thus, if equipment familiarity played any role at all in the Table VIII performance observed, it was probably only a very small part.

Questions which remain unanswered address the degree to which turbulence factors affect performance on more structured tasks, such as Table VI gunnery, and less structured tasks, such as Table IX and ARTEP performance. Following the position of Wagner et al. expressed in the introduction, it appears reasonable to assume that neither personnel nor equipment familiarity would play a significant role on more structured tasks, and the effects of position familiarity would be reduced. On more unstructured tasks, however, personnel, and perhaps equipment familiarity, along with position familiarity, may play important roles in modulating crew performance.

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APPENDIXES

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APPENDIX A

TANK CREW STABILITY QUESTIONNAIRE (PT 5188)

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TANK CREW STABILITY QUESTIONNAIRE

TCs, please fill in your name, tank, company, Bn, gunner's name, driver's name, and loader's name. Then complete questions #1-10.

Have your gunner complete questions #11-14, your driver complete questions #15-18, and your loader complete questions #19-22.

When you and your gunner, driver, and loader have all completed their questions check the questionnaire to insure that all 22 questions have been answered. Then give questionnaire to the platoon sergeant who should give it to the company first sergeant.

Thank you for completing the questionnaire.

TC name _____ Tank _____ Company _____ Bn _____

What is your Table VIII gunner's name _____

What is your Table VIII driver's name _____

What is your Table VIII loader's name _____

In answering the following questions count only time in armor companies. Do not count time in 11E AT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

1. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

2. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader, on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

3. How many months have you and your complete crew actually been able to train together, with you as TC, your current gunner as gunner, your current driver as driver, and your current loader as loader? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

4. How many months have you and your current gunner been assigned together, with you as TC and your current gunner as gunner? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

5. How many months have you and your current gunner been assigned together, with you as TC and your current gunner assigned as your gunner, on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

6. How many months have you and your current gunner actually been able to train together, with you as TC, and your current gunner as gunner? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

7. How many months have you been assigned as the TC on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16 17 18 19 20 21 22 23 24 or more

8. How long have you been assigned the duties of TC, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

9. How long have you actually had to train in the duties of TC, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

10. How long have you served in M60 tanks, regardless of the duty position you held?

_____ YEARS _____ MONTHS

HAVE YOUR GUNNER FILL OUT THE NEXT FOUR QUESTIONS.

GUNNER'S QUESTIONS

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

11. How many months have you been assigned as the gunner on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24 or more

12. How long have you been assigned the duties of gunner, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

13. How long have you actually had to train in duties of gunner, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

14. How long have you served on M60 tanks, regardless of the duty position you held?

_____ YEARS _____ MONTHS

HAVE YOUR DRIVER FILL OUT THE NEXT FOUR QUESTIONS.

DRIVER'S QUESTIONS

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

15. How many months have you been assigned as the driver on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24 or more

16. How long have you been assigned the duties of tank driver, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

17. How long have you actually had to train in duties of tank driver, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

18. How long have you served on M60 tanks, regardless of the duty position you held?

_____ YEARS _____ MONTHS

HAVE YOUR LOADER FILL OUT THE NEXT FOUR QUESTIONS.

LOADER'S QUESTIONS

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

19. How many months have you been assigned as the loader on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month . 1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24 or less

20. How long have you been assigned the duties of loader, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

21. How long have you actually had to train in duties of loader, regardless of the tank, crew, or company you may have been in?

_____ YEARS _____ MONTHS

22. How long have you served on M60 tanks, regardless of the duty position you held?

_____ YEARS _____ MONTHS

Loader - When you have completed questions #19-22 return the questionnaire to your TC.

Thank you.

APPENDIX B

CORRELATION MATRIX OF SUMMARY CRITERION VARIABLES

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SUMMARY CRITERION VARIABLES

<u>Variable Code</u>	<u>Description</u>
302	Mean Main Gun Opening Time (Day)
303	Mean Main Gun Opening Time (Night)
304	Mean Main Gun Opening Time (Day and Night)
305	1st Round Main Gun Hits (Day)
306	1st Round Main Gun Hits (Night)
307	1st Round Main Gun Hits (Day and Night)
308	Main Gun Hits (Day)
309	Main Gun Hits (Night)
310	Main Gun Hits (Day and Night)
311	Standardized Measure of Opening Time (Day and Night)
312	Standardized Measure of Hits (Day and Night)

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 29 DEC 77)

	C O E F F I C I E N T S											
	VAR302	VAR303	VAR304	VAR305	VAR306	VAR307	VAR308	VAR309	VAR310	VAR311		
VAR302	1.0000 (184) S= .001	.2607 (184) S= .001	.7578 (184) S= .001	-.1308 (196) S= .034	-.1160 (194) S= .054	-.1631 (193) S= .012	-.1126 (196) S= .058	-.1510 (194) S= .018	-.1603 (193) S= .013	.6686 (184) S= .001		
VAR303	.2607 (184) S= .001	1.0000 (184) S= .001	.8274 (184) S= .001	-.2494 (191) S= .001	-.1081 (189) S= .069	-.2546 (188) S= .001	-.0904 (191) S= .107	-.1718 (189) S= .009	-.1582 (188) S= .015	.6419 (184) S= .001		
VAR304	.7578 (184) S= .001	.8274 (184) S= .001	1.0000 (183) S= .001	-.2520 (183) S= .001	-.1164 (181) S= .034	-.2682 (180) S= .001	-.1440 (183) S= .026	-.1874 (181) S= .006	-.2051 (180) S= .003	.6227 (184) S= .001		
VAR305	-.1308 (196) S= .034	-.2494 (191) S= .001	-.2520 (183) S= .001	1.0000 (183) S= .001	.0699 (207) S= .158	.6118 (207) S= .001	.6060 (210) S= .001	.1201 (207) S= .042	.5200 (207) S= .001	-.1843 (183) S= .006		
VAR306	-.1160 (194) S= .054	-.1081 (189) S= .069	-.1164 (181) S= .034	.0699 (207) S= .158	1.0000 (183) S= .001	.6392 (207) S= .001	.1895 (207) S= .003	.6746 (206) S= .001	.4454 (207) S= .001	-.0296 (181) S= .346		
VAR307	-.1631 (193) S= .012	-.2546 (188) S= .001	-.2682 (180) S= .001	.6118 (207) S= .001	.6392 (207) S= .001	1.0000 (183) S= .001	.5773 (207) S= .001	.4869 (207) S= .001	.6908 (207) S= .001	-.1594 (180) S= .016		
VAR308	-.1126 (196) S= .058	-.0904 (191) S= .107	-.1440 (183) S= .026	.6060 (210) S= .001	.1895 (207) S= .003	.6746 (206) S= .001	1.0000 (183) S= .001	.1970 (207) S= .002	.8586 (207) S= .001	-.1811 (183) S= .007		
VAR309	-.1510 (194) S= .018	-.1718 (189) S= .009	-.1874 (181) S= .006	.1201 (207) S= .042	.6746 (206) S= .001	.4454 (207) S= .001	.5773 (207) S= .001	1.0000 (183) S= .001	.6718 (207) S= .001	-.0636 (181) S= .197		
VAR310	-.1603 (193) S= .013	-.1582 (188) S= .015	-.2051 (180) S= .003	.5200 (207) S= .001	.4954 (207) S= .001	.6908 (207) S= .001	.8586 (207) S= .001	.6718 (207) S= .001	1.0000 (183) S= .001	-.1753 (180) S= .009		
VAR311	.6686 (184) S= .001	.6419 (184) S= .001	.8274 (184) S= .001	-.1843 (183) S= .006	-.0296 (181) S= .346	-.1594 (180) S= .016	-.1811 (183) S= .007	-.0636 (181) S= .197	-.1753 (180) S= .009	1.0000 (180) S= .001		
VAR312	-.1135 (193) S= .058	-.1217 (188) S= .048	-.1545 (180) S= .019	.4978 (207) S= .001	.4664 (207) S= .001	.6567 (207) S= .001	.8532 (207) S= .001	.6287 (207) S= .001	.9734 (207) S= .001	-.1801 (180) S= .008		

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 97.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Battalion 1

	VAR302	VAR303	VAR304	VAR305	VAR306	VAR307	VAR308	VAR309	VAR310	VAR311
VAR302	1.0000 (.45) S=.001	-.0427 (.45) S=.390	.5705 (.45) S=.001	-.0208 (.45) S=.446	-.0840 (.45) S=.292	-.0706 (.45) S=.322	-.2096 (.45) S=.084	-.0467 (.45) S=.380	-.1746 (.45) S=.126	.5705 (.45) S=.001
VAR303	-.0427 (.45) S=.390	1.0000 (.45) S=.001	.7962 (.45) S=.001	-.1030 (.46) S=.248	-.1600 (.46) S=.144	-.1810 (.46) S=.114	-.0518 (.46) S=.366	-.1285 (.46) S=.197	-.0946 (.46) S=.266	.7962 (.45) S=.001
VAR304	.5705 (.45) S=.001	.7962 (.45) S=.001	1.0000 (.45) S=.001	-.0996 (.45) S=.258	-.1814 (.45) S=.117	-.1921 (.45) S=.103	-.1666 (.45) S=.137	-.1322 (.45) S=.193	-.1811 (.45) S=.117	1.0000 (.45) S=.001
VAR305	-.0208 (.45) S=.446	-.1030 (.46) S=.248	-.0996 (.45) S=.258	1.0000 (.46) S=.001	.0316 (.46) S=.418	.7501 (.46) S=.001	.5848 (.46) S=.001	.1792 (.46) S=.117	.5072 (.46) S=.001	-.0996 (.45) S=.258
VAR306	-.0840 (.45) S=.292	-.1600 (.46) S=.144	-.1814 (.45) S=.117	.0316 (.46) S=.418	1.0000 (.46) S=.001	.6847 (.46) S=.001	.3265 (.46) S=.013	.6181 (.46) S=.001	.5116 (.46) S=.001	-.1814 (.45) S=.117
VAR307	-.0706 (.45) S=.322	-.1810 (.46) S=.114	-.1921 (.45) S=.103	.7501 (.46) S=.001	.6847 (.46) S=.001	1.0000 (.46) S=.001	.6424 (.46) S=.001	.5396 (.46) S=.001	.7084 (.46) S=.001	-.1921 (.45) S=.103
VAR308	-.2096 (.45) S=.084	-.0518 (.46) S=.366	-.1666 (.45) S=.137	.5848 (.46) S=.001	.3265 (.46) S=.013	.6424 (.46) S=.001	1.0000 (.46) S=.001	.4171 (.46) S=.002	.9162 (.46) S=.001	-.1666 (.45) S=.137
VAR309	-.0467 (.45) S=.380	-.1285 (.46) S=.197	-.0946 (.46) S=.266	.1792 (.46) S=.117	.6181 (.46) S=.001	.5396 (.46) S=.001	.7463 (.46) S=.001	1.0000 (.46) S=.001	.7463 (.46) S=.001	-.1322 (.45) S=.193
VAR310	-.1746 (.45) S=.126	-.0946 (.46) S=.266	-.1811 (.45) S=.117	.5072 (.46) S=.001	.5116 (.46) S=.001	.7084 (.46) S=.001	.9162 (.46) S=.001	.7463 (.46) S=.001	1.0000 (.46) S=.001	-.1811 (.45) S=.117
VAR311	.5705 (.45) S=.001	.7962 (.45) S=.001	1.0000 (.45) S=.001	-.0996 (.45) S=.258	-.1814 (.45) S=.117	-.1921 (.45) S=.103	-.1666 (.45) S=.137	-.1322 (.45) S=.193	-.1811 (.45) S=.117	1.0000 (.45) S=.001
VAR312	-.1746 (.45) S=.126	-.0946 (.46) S=.266	-.1811 (.45) S=.117	.5072 (.46) S=.001	.5116 (.46) S=.001	.7084 (.46) S=.001	.9162 (.46) S=.001	.7463 (.46) S=.001	1.0000 (.46) S=.001	-.1811 (.45) S=.117

(COEFFICIENT / (CASFS) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Battalion 2

	C O E F F I C I E N T S									
	VAR302	VAR303	VAR304	VAR305	VAR306	VAR307	VAR308	VAR309	VAR310	VAR311
VAR302	1.0000 (.40) S=.001	.1727 (.40) S=.143	.7074 (.40) S=.001	-.0466 (.39) S=.369	.2508 (.37) S=.067	.0894 (.36) S=.302	-.1332 (.39) S=.209	.2273 (.37) S=.088	.0148 (.36) S=.466	.7074 (.40) S=.001
VAR303	.1727 (.40) S=.143	1.0000 (.40) S=.001	.6184 (.40) S=.001	-.0984 (.39) S=.276	.0857 (.37) S=.307	-.0361 (.36) S=.413	-.1161 (.39) S=.241	.1920 (.37) S=.128	.0059 (.36) S=.486	.6184 (.40) S=.001
VAR304	.7074 (.40) S=.001	.6184 (.40) S=.001	1.0000 (.40) S=.001	-.0978 (.39) S=.277	.2002 (.37) S=.117	.0221 (.36) S=.449	-.1603 (.39) S=.165	.2618 (.37) S=.059	.0123 (.36) S=.472	99.0000 (.40) S=*****
VAR305	-.0466 (.39) S=.369	-.0984 (.39) S=.276	-.0978 (.39) S=.277	1.0000 (.40) S=.001	-.1524 (.36) S=.187	.8018 (.36) S=.001	.5656 (.39) S=.001	.0171 (.36) S=.461	.4573 (.36) S=.003	.0978 (.39) S=.277
VAR306	.2508 (.37) S=.067	.0857 (.37) S=.307	.2002 (.37) S=.117	-.1524 (.36) S=.187	1.0000 (.40) S=.001	.4684 (.36) S=.002	.3245 (.36) S=.444	.6937 (.37) S=.001	.4494 (.36) S=.003	.2002 (.37) S=.117
VAR307	.0894 (.36) S=.302	-.1332 (.39) S=.209	.2273 (.37) S=.088	.0148 (.36) S=.466	.7074 (.40) S=.001	1.0000 (.40) S=.001	.5284 (.36) S=.001	.4346 (.36) S=.004	.6805 (.36) S=.001	.0221 (.36) S=.449
VAR308	-.1332 (.39) S=.209	.2273 (.37) S=.088	.0148 (.36) S=.466	.7074 (.40) S=.001	.6184 (.40) S=.001	.5284 (.36) S=.001	1.0000 (.40) S=.001	.0109 (.36) S=.475	.7843 (.36) S=.001	-.1603 (.39) S=.165
VAR309	.2273 (.37) S=.088	.0148 (.36) S=.466	.7074 (.40) S=.001	.6184 (.40) S=.001	.5284 (.36) S=.001	.4346 (.36) S=.004	.0109 (.36) S=.475	1.0000 (.40) S=.001	.6289 (.36) S=.001	.2618 (.37) S=.059
VAR310	.0148 (.36) S=.466	.7074 (.40) S=.001	.6184 (.40) S=.001	.5284 (.36) S=.001	.4346 (.36) S=.004	.0109 (.36) S=.475	1.0000 (.40) S=.001	.6289 (.36) S=.001	1.0000 (.40) S=.001	.0123 (.36) S=.472
VAR311	.7074 (.40) S=.001	.6184 (.40) S=.001	99.0000 (.40) S=*****	-.0978 (.39) S=.277	.2002 (.37) S=.117	.0221 (.36) S=.449	-.1603 (.39) S=.165	.2618 (.37) S=.059	.0123 (.36) S=.472	1.0000 (.40) S=.001
VAR312	.0148 (.36) S=.466	.7074 (.40) S=.001	.6184 (.40) S=.001	.5284 (.36) S=.001	.4346 (.36) S=.004	.0109 (.36) S=.475	1.0000 (.40) S=.001	.6289 (.36) S=.001	99.0000 (.40) S=*****	.0123 (.36) S=.472

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Battalion 3

	PEARSON CORRELATION COEFFICIENT	VAR302	VAR303	VAR304	VAR305	VAR306	VAR307	VAR308	VAR309	VAR310	VAR311
VAR302	1.0000 (.38) S=.001	.1966 (.38) S=.118	.7664 (.38) S=.001	-.3029 (.38) S=.032	-.1909 (.38) S=.125	-.2096 (.38) S=.039	-.3308 (.38) S=.021	-.2096 (.38) S=.039	-.2079 (.38) S=.105	-.3420 (.38) S=.010	.7664 (.38) S=.001
VAR303	.1966 (.38) S=.118	1.0000 (.38) S=.001	.7603 (.38) S=.001	-.3907 (.41) S=.006	.1163 (.41) S=.234	-.4023 (.41) S=.005	-.2436 (.41) S=.062	-.4023 (.41) S=.005	.2160 (.41) S=.087	-.2733 (.41) S=.042	.7603 (.38) S=.001
VAR304	.7664 (.38) S=.001	.7603 (.38) S=.001	1.0000 (.38) S=.001	-.4729 (.38) S=.001	-.0415 (.38) S=.402	-.4746 (.38) S=.001	-.3796 (.38) S=.009	-.4746 (.38) S=.001	.0002 (.38) S=.500	-.4201 (.38) S=.004	99.0000 (.38) S=*****
VAR305	-.3029 (.38) S=.032	-.3907 (.41) S=.006	-.4729 (.38) S=.001	1.0000 (.38) S=.001	.1020 (.41) S=.263	.6514 (.41) S=.001	.8409 (.41) S=.001	.6514 (.41) S=.001	-.0069 (.41) S=.483	.5838 (.41) S=.001	-.4729 (.38) S=.001
VAR306	.1966 (.38) S=.118	.1163 (.41) S=.234	-.0415 (.38) S=.402	.1020 (.41) S=.263	1.0000 (.38) S=.001	.0528 (.41) S=.372	.6242 (.41) S=.001	.0528 (.41) S=.372	.7687 (.41) S=.001	.3643 (.41) S=.010	-.0415 (.38) S=.402
VAR307	-.3308 (.38) S=.021	-.2436 (.41) S=.062	-.3796 (.38) S=.009	.8409 (.41) S=.001	.6242 (.41) S=.001	.5403 (.41) S=.001	1.0000 (.38) S=.001	.5403 (.41) S=.001	.4127 (.41) S=.004	.6567 (.41) S=.001	-.3746 (.38) S=.009
VAR308	-.2896 (.38) S=.039	-.4023 (.41) S=.005	-.4746 (.38) S=.001	.6514 (.41) S=.001	.0528 (.41) S=.372	1.0000 (.38) S=.001	.5403 (.41) S=.001	1.0000 (.38) S=.001	.0256 (.41) S=.417	.9112 (.41) S=.001	-.4746 (.38) S=.001
VAR309	-.2079 (.38) S=.105	.2160 (.41) S=.087	.0002 (.38) S=.500	-.0069 (.41) S=.483	.7687 (.41) S=.001	.0256 (.41) S=.437	.4127 (.41) S=.004	.0256 (.41) S=.437	1.0000 (.38) S=.001	.4352 (.41) S=.002	.0002 (.38) S=.500
VAR310	-.3420 (.38) S=.010	-.2733 (.41) S=.042	-.4201 (.38) S=.004	.5838 (.41) S=.001	.3643 (.41) S=.010	.9112 (.41) S=.001	.4352 (.41) S=.001	.9112 (.41) S=.001	.4352 (.41) S=.002	1.0000 (.38) S=.001	-.4201 (.38) S=.004
VAR311	.7664 (.38) S=.001	.7603 (.38) S=.001	99.0000 (.38) S=*****	-.4729 (.38) S=.001	-.0415 (.38) S=.402	-.4746 (.38) S=.001	-.3796 (.38) S=.009	-.4746 (.38) S=.001	.0002 (.38) S=.500	-.4201 (.38) S=.004	1.0000 (.38) S=.001
VAR312	-.3420 (.38) S=.010	-.2733 (.41) S=.042	-.4201 (.38) S=.004	.5838 (.41) S=.001	.3643 (.41) S=.010	.9112 (.41) S=.001	.4352 (.41) S=.001	.9112 (.41) S=.001	.4352 (.41) S=.002	1.0000 (.38) S=.001	-.4201 (.38) S=.004

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Battalion 4

	P L A R S O N		C O R R E L A T I O N		C O E F F I C I E N T S					
	VAR302	VAR303	VAR304	VAR305	VAR306	VAR307	VAR308	VAR309	VAR310	VAR311
VAR302	1.0000 (0) S= .001	.0427 (42) S= .394	.0490 (42) S= .001	.1513 (43) S= .166	.0438 (43) S= .390	.1377 (43) S= .189	.0268 (43) S= .432	-.0627 (43) S= .345	-.0055 (43) S= .446	.0490 (42) S= .001
VAR303	.0427 (42) S= .394	1.0000 (0) S= .001	.5643 (42) S= .001	-.3788 (42) S= .007	.0620 (42) S= .346	-.2528 (42) S= .053	-.1478 (42) S= .175	-.2958 (42) S= .029	-.2571 (42) S= .050	.5643 (42) S= .001
VAR304	.0490 (42) S= .001	.5643 (42) S= .001	1.0000 (0) S= .001	-.0713 (42) S= .327	.0648 (42) S= .342	-.0195 (42) S= .451	-.0549 (42) S= .356	-.2018 (42) S= .100	-.1399 (42) S= .188	1.0000 (42) S= .001
VAR305	.1513 (43) S= .166	-.3788 (42) S= .007	-.0713 (42) S= .327	1.0000 (0) S= .001	.1812 (43) S= .122	.8525 (43) S= .001	.7028 (43) S= .001	.2949 (43) S= .027	.7295 (43) S= .001	-.0713 (42) S= .327
VAR306	.0438 (43) S= .390	.0620 (42) S= .346	.0648 (42) S= .342	.1812 (43) S= .122	1.0000 (0) S= .001	.6666 (43) S= .001	.2762 (43) S= .037	.4969 (43) S= .001	.4587 (43) S= .001	.0648 (42) S= .342
VAR307	.1377 (43) S= .189	-.2528 (42) S= .053	-.0195 (42) S= .451	.8525 (43) S= .001	.6666 (43) S= .001	1.0000 (0) S= .001	.6783 (43) S= .001	.4871 (43) S= .001	.7954 (43) S= .001	-.0195 (42) S= .451
VAR308	.0268 (43) S= .432	-.0627 (43) S= .345	-.2958 (42) S= .029	-.2571 (42) S= .050	.0549 (42) S= .356	.6783 (43) S= .001	1.0000 (0) S= .001	.0946 (43) S= .263	.4587 (43) S= .001	-.0549 (42) S= .356
VAR309	-.0627 (43) S= .345	-.2958 (42) S= .029	-.2571 (42) S= .050	.0549 (42) S= .356	.6783 (43) S= .001	1.0000 (0) S= .001	.0946 (43) S= .263	1.0000 (0) S= .001	.5360 (43) S= .001	-.2018 (42) S= .100
VAR310	-.0055 (43) S= .486	-.2571 (42) S= .050	-.1399 (42) S= .188	.7295 (43) S= .001	.4587 (43) S= .001	.4871 (43) S= .001	.0946 (43) S= .263	.5360 (43) S= .001	1.0000 (0) S= .001	-.1399 (42) S= .188
VAR311	.0490 (42) S= .001	.5643 (42) S= .001	1.0000 (0) S= .001	-.0713 (42) S= .327	.0648 (42) S= .342	-.0195 (42) S= .451	-.0549 (42) S= .356	-.2018 (42) S= .100	-.1399 (42) S= .188	1.0000 (42) S= .001
VAR312	-.0055 (43) S= .486	-.2571 (42) S= .050	-.1399 (42) S= .188	.7295 (43) S= .001	.4587 (43) S= .001	.4871 (43) S= .001	.0946 (43) S= .263	.5360 (43) S= .001	1.0000 (0) S= .001	-.1399 (42) S= .188

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Battalion 5

	VAR302	VAR303	VAR304	VAR305	VAR306	VAR307	VAR308	VAR309	VAR310	VAR311
VAR302	1.0000 (0) S= .001	.5704 (19) S= .005	.8390 (19) S= .001	-.1880 (31) S= .156	-.2533 (31) S= .085	-.2785 (31) S= .065	.0042 (31) S= .491	-.2218 (31) S= .109	-.1366 (31) S= .232	.8390 (19) S= .001
VAR303	.5704 (19) S= .005	1.0000 (0) S= .001	.9255 (19) S= .001	-.3287 (23) S= .061	-.1678 (23) S= .222	-.3121 (23) S= .074	.0425 (23) S= .424	-.2906 (23) S= .089	-.1607 (23) S= .232	.9255 (19) S= .001
VAR304	.8390 (19) S= .001	.9255 (19) S= .001	1.0000 (0) S= .001	-.4704 (19) S= .021	-.2483 (19) S= .153	-.4326 (19) S= .032	.0243 (19) S= .461	-.2492 (19) S= .107	-.1741 (19) S= .233	99.0000 (19) S= *****
VAR305	-.1880 (31) S= .156	-.3287 (23) S= .061	-.4704 (19) S= .021	1.0000 (0) S= .001	-.0106 (41) S= .474	.7364 (41) S= .001	.4614 (41) S= .001	-.0592 (41) S= .356	.2495 (41) S= .056	-.4704 (19) S= .021
VAR306	-.2533 (31) S= .085	-.1678 (23) S= .222	-.2483 (19) S= .153	-.0106 (41) S= .474	1.0000 (0) S= .001	.6665 (41) S= .001	.1251 (41) S= .216	.7868 (41) S= .001	.5623 (41) S= .001	-.2483 (19) S= .153
VAR307	-.2785 (31) S= .065	-.3121 (23) S= .074	-.4526 (19) S= .032	.7364 (41) S= .001	.6665 (41) S= .001	1.0000 (0) S= .001	.4432 (41) S= .002	.4865 (41) S= .001	.5767 (41) S= .001	-.4526 (19) S= .032
VAR308	.0042 (31) S= .491	.0425 (23) S= .424	.0243 (19) S= .461	.4614 (41) S= .001	.1251 (41) S= .216	.4432 (41) S= .002	1.0000 (0) S= .001	.2940 (41) S= .031	.7873 (41) S= .001	.0243 (19) S= .461
VAR309	-.2218 (31) S= .109	-.2906 (23) S= .089	-.2492 (19) S= .107	-.0592 (41) S= .356	.7868 (41) S= .001	.4865 (41) S= .001	.2940 (41) S= .031	1.0000 (0) S= .001	.6208 (41) S= .001	-.2992 (19) S= .107
VAR310	-.1366 (31) S= .232	-.1607 (23) S= .232	-.1741 (19) S= .233	.2495 (41) S= .056	.5823 (41) S= .001	.5767 (41) S= .001	.7873 (41) S= .001	.8208 (41) S= .001	1.0000 (0) S= .001	-.1741 (19) S= .233
VAR311	.8390 (19) S= .001	.9255 (19) S= .001	99.0000 (19) S= *****	-.4704 (19) S= .021	-.2483 (19) S= .153	-.4326 (19) S= .032	.0243 (19) S= .461	-.2906 (23) S= .107	-.1741 (19) S= .233	1.0000 (0) S= .001
VAR312	-.1366 (31) S= .232	-.1607 (23) S= .232	-.1741 (19) S= .233	.2495 (41) S= .056	.5823 (41) S= .001	.5767 (41) S= .001	.7873 (41) S= .001	.8208 (41) S= .001	1.0000 (0) S= .001	-.1741 (19) S= .233

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

(BLANK)

APPENDIX C

COMPLETE DESCRIPTIVE STATISTICS AND FREQUENCY DISTRIBUTIONS

(BLANK)

TANK CREW STABILITY QUESTIONNAIRE ITEMS

<u>Variable code</u>	<u>Description</u>
185	Months crew assigned together
186	Months crew assigned together on tank used for Table VIII
187	Months crew trained together
188	Months Tank Commander and Gunner assigned together
189	Months Tank Commander and Gunner assigned together on tank used for Table VIII
190	Months Tank Commander and Gunner trained together
191	Months Tank Commander on Table VIII tank
192	Months assigned as Tank Commander
193	Months trained as Tank Commander
194	Months Tank Commander was on M60 tanks
195	Months Gunner on Table VIII tank
196	Months assigned as Gunner
197	Months trained as Gunner
198	Months Gunner was on M60 tanks
199	Months Driver on Table VIII tank
200	Months assigned as Driver
201	Months trained as Driver
202	Months Driver on M60 tanks
203	Months Loader on Table VIII tank
204	Months assigned as Loader
205	Months trained as Loader
206	Months Loader on M60 tanks

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR185

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.	79	37.4	37.4	37.40
	1.	37	17.5	17.5	55.00
	2.	31	14.7	14.7	69.70
	3.	27	12.8	12.8	82.50
	4.	7	3.3	3.3	85.80
	5.	8	3.8	3.8	89.60
	6.	8	3.8	3.8	93.40
	7.	4	1.9	1.9	95.30
	8.	1	.5	.5	95.70
	9.	1	.5	.5	96.20
	10.	2	.9	.9	97.20
	12.	3	1.4	1.4	98.60
	19.	1	.5	.5	99.10
	24.	2	.9	.9	100.00
		-----	-----	-----	
	TOTAL	211	100.0	100.0	

MEAN	2.199	STD ERR	.236	MEDIAN	1.216
MODE	.000	STD DEV	3.429	VARIANCE	11.760
KURTOSIS	16.836	SKEWNESS	3.537	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR186

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.	80	37.9	38.1	38.10
	1.	41	19.4	19.5	57.60
	2.	32	15.2	15.2	72.90
	3.	26	12.3	12.4	85.20
	4.	5	2.4	2.4	87.60
	5.	8	3.8	3.8	91.40
	6.	5	2.4	2.4	93.80
	7.	3	1.4	1.4	95.20
	8.	3	1.4	1.4	96.70
	9.	1	.5	.5	97.10
	10.	2	.9	1.0	98.10
	12.	3	1.4	1.4	99.50
	19.	1	.5	.5	100.00
	9999.	1	.5	MISSING	100.0
		-----	-----	-----	
	TOTAL	211	100.0	100.0	

MEAN	1.914	STD ERR	.185	MEDIAN	1.110
MODE	.000	STD DEV	2.685	VARIANCE	7.208
KURTOSIS	9.599	SKEWNESS	2.624	RANGE	19.000
MINIMUM	.000	MAXIMUM	19.000		

VALID CASES 210 MISSING CASES 1

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR187

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.	93	44.1	44.1	44.10
	1.	45	21.3	21.3	65.40
	2.	32	15.2	15.2	80.60
	3.	18	8.5	8.5	89.10
	4.	5	2.4	2.4	91.50
	5.	4	1.9	1.9	93.40
	6.	3	1.4	1.4	94.80
	7.	5	2.4	2.4	97.20
	8.	1	.5	.5	97.60
	10.	2	.9	.9	98.60
	12.	2	.9	.9	99.50
	19.	1	.5	.5	100.00
		-----	-----	-----	
	TOTAL	211	100.0	100.0	

MEAN	1.550	STD ERR	.170	MEDIAN	.778
MODE	.000	STD DEV	2.463	VARIANCE	6.068
KURTOSIS	14.521	SKEWNESS	3.214	RANGE	19.000
MINIMUM	.000	MAXIMUM	19.000		
VALID CASES	211	MISSING CASES	0		

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR188

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	47	22	22	6.	14	7	85	12.	6	3	98
1.	29	14	36	7.	3	1	86	15.	2	1	99
2.	26	12	48	8.	5	2	89	19.	2	1	100
3.	34	16	64	9.	5	2	91	24.	1	0	100
4.	18	9	73	10.	6	3	94				
5.	11	5	78	11.	2	1	95				

MEAN	3.536	STD ERR	.269	MEDIAN	2.603
MODE	.000	STD DEV	3.900	VARIANCE	15.212
KURTOSIS	4.983	SKEWNESS	1.931	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		
VALID CASES	211	MISSING CASES	0		

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR189

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	47	22	22	6.	14	7	85	12.	5	2	98
1.	31	15	37	7.	5	2	88	15.	2	1	99
2.	28	13	50	8.	4	2	90	18.	1	0	99
3.	33	16	66	9.	4	2	91	19.	1	0	100
4.	17	8	74	10.	6	3	94	24.	1	0	100
5.	10	5	79	11.	2	1	95				

MEAN	3.431	STD ERR	.264	MEDIAN	2.482
MODE	.000	STD DEV	3.830	VARIANCE	14.665
KURTOSIS	5.371	SKEWNESS	1.995	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR190

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	54	26	26	6.	12	6	90	15.	1	0	98
1.	41	19	45	7.	4	2	91	16.	1	0	99
2.	29	14	59	8.	4	2	93	17.	1	0	99
3.	26	12	71	9.	2	1	94	19.	1	0	100
4.	15	7	78	10.	3	1	96	24.	1	0	100
5.	12	6	84	12.	4	2	98				

MEAN	2.919	STD ERR	.250	MEDIAN	1.862
MODE	.000	STD DEV	3.626	VARIANCE	13.151
KURTOSIS	8.050	SKEWNESS	2.441	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR191

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	26	12	12	7.	9	4	67	14.	3	1	87
1.	20	9	22	8.	8	4	71	15.	3	1	88
2.	18	9	30	9.	7	3	74	17.	1	0	89
3.	28	13	44	10.	9	4	78	19.	2	1	90
4.	21	10	54	11.	3	1	80	20.	3	1	91
5.	5	2	56	12.	11	5	85	21.	2	1	92
6.	14	7	63	13.	1	0	85	24.	17	8	100

MEAN	6.839	STD ERR	.478	MEDIAN	4.143
MODE	3.000	STD DEV	6.943	VARIANCE	48.212
KURTOSIS	.747	SKEWNESS	1.304	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR192

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	9	4	4	21.	1	0	47	51.	1	0	72
1.	6	3	7	22.	1	0	47	54.	1	0	72
2.	7	3	11	23.	1	0	48	56.	2	1	73
3.	13	6	17	24.	6	3	50	57.	1	0	74
4.	10	5	22	26.	2	1	51	58.	1	0	74
5.	5	2	24	27.	4	2	53	60.	7	3	77
6.	2	1	25	28.	1	0	54	62.	1	0	78
7.	3	1	26	30.	1	0	54	64.	1	0	78
8.	3	1	28	31.	1	0	55	66.	2	1	79
9.	1	0	28	32.	1	0	55	68.	1	0	80
10.	3	1	30	33.	1	0	56	72.	3	1	81
11.	3	1	31	34.	1	0	56	80.	1	0	82
12.	10	5	36	35.	3	1	58	84.	3	1	83
13.	4	2	38	36.	7	3	61	87.	1	0	84
14.	1	0	38	38.	3	1	63	91.	1	0	84
15.	3	1	40	39.	1	0	63	94.	1	0	85
16.	4	2	42	41.	1	0	63	96.	2	1	86
17.	2	1	43	42.	3	1	65	98.	1	0	86
18.	3	1	44	43.	3	1	66	99.	29	14	100
19.	2	1	45	48.	7	3	70				
20.	2	1	46	50.	3	1	71				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	3				

MEAN	36.649	STD ERR	2.381	MEDIAN	24.333
MODE	99.000	STD DEV	34.339	VARIANCE	1179.166
KURTOSIS	-.847	SKEWNESS	.745	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES 208 MISSING CASES 3

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR193

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	7	3	3	18.	5	2	44	51.	1	0	71
1.	6	3	6	19.	1	0	44	54.	1	0	71
2.	7	3	10	20.	1	0	45	56.	1	0	72
3.	9	4	14	21.	1	0	45	60.	7	3	75
4.	7	3	17	22.	2	1	46	62.	1	0	76
5.	7	3	21	24.	8	4	50	64.	2	1	77
6.	4	2	22	25.	1	0	51	65.	1	0	77
7.	2	1	23	26.	2	1	52	66.	1	0	78
8.	4	2	25	27.	5	2	54	72.	5	2	80
9.	2	1	26	32.	1	0	55	80.	1	0	80
10.	3	1	28	36.	12	6	60	84.	2	1	81
11.	3	1	29	38.	1	0	61	87.	1	0	82
12.	13	6	35	40.	1	0	61	91.	1	0	82
13.	4	2	37	41.	1	0	62	96.	3	1	84
14.	2	1	38	42.	5	2	64	97.	2	1	85
15.	4	2	40	43.	2	1	65	98.	1	0	85
16.	2	1	41	48.	8	4	69	99.	31	15	100
17.	1	0	42	50.	3	1	70				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	2				

MEAN	38.057	STD ERR	2.418	MEDIAN	24.437
MODE	99.000	STD DEV	34.951	VARIANCE	1221.545
KURTOSIS	-.969	SKEWNESS	.702	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES	209	MISSING CASES	2

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR194

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	2	1	1	23.	4	2	28	59.	1	0	61
1.	3	1	2	24.	12	6	34	60.	11	5	66
2.	2	1	3	25.	2	1	35	62.	1	0	67
3.	8	4	7	26.	3	1	37	64.	2	1	68
4.	8	4	11	27.	2	1	38	65.	2	1	69
5.	3	1	13	30.	5	2	40	66.	4	2	71
6.	2	1	13	32.	3	1	41	67.	3	1	72
7.	1	0	14	34.	1	0	42	69.	2	1	73
8.	4	2	16	35.	1	0	42	71.	1	0	74
9.	1	0	16	36.	9	4	47	72.	5	2	76
10.	1	0	17	37.	1	0	47	74.	1	0	76
12.	3	1	18	38.	2	1	48	75.	1	0	77
13.	3	1	20	41.	2	1	49	78.	1	0	77
14.	1	0	20	42.	1	0	50	79.	1	0	78
15.	1	0	21	45.	1	0	50	84.	4	2	80
16.	1	0	21	48.	9	4	54	85.	1	0	80
17.	3	1	23	49.	2	1	55	89.	2	1	81
18.	3	1	24	50.	2	1	56	91.	1	0	82
19.	1	0	25	54.	4	2	58	96.	1	0	82
20.	2	1	25	55.	1	0	59	99.	37	18	100
22.	2	1	26	57.	4	2	61				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	3				

MEAN	47.673	STD ERR	2.304	MEDIAN	45.500
MODE	99.000	STD DEV	33.225	VARIANCE	1103.892
KURTOSIS	-1.246	SKEWNESS	.263	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES 208 MISSING CASES 3

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR195

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	31	15	15	7.	7	3	77	17.	1	0	92
1.	28	14	29	8.	10	5	82	18.	1	0	93
2.	25	12	41	9.	6	3	85	19.	1	0	93
3.	21	10	51	10.	5	2	87	20.	2	1	94
4.	17	8	59	11.	4	2	89	22.	1	0	95
5.	14	7	66	12.	5	2	91	24.	11	5	100
6.	16	8	73	15.	1	0	92				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	4				

MEAN	5.348	STD ERR	.422	MEDIAN	3.429
MODE	.000	STD DEV	6.069	VARIANCE	36.830
KURTOSIS	2.887	SKEWNESS	1.830	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES	207	MISSING CASES	4

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR196

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	7	3	3	13.	2	1	67	27.	1	0	89
1.	18	9	12	14.	2	1	67	28.	2	1	89
2.	16	8	20	15.	2	1	68	29.	1	0	90
3.	13	6	26	16.	5	2	71	30.	4	2	92
4.	12	6	32	17.	2	1	72	33.	3	1	93
5.	13	6	38	18.	6	3	75	36.	6	3	96
6.	12	6	44	19.	1	0	75	37.	1	0	97
7.	6	3	46	20.	2	1	76	39.	1	0	97
8.	6	3	49	21.	1	0	77	48.	4	2	99
9.	4	2	51	22.	3	1	78	60.	1	0	100
10.	6	3	54	24.	17	8	86	61.	1	0	100
11.	6	3	57	25.	3	1	88				
12.	18	9	66	26.	1	0	88				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	2				

MEAN	12.627	STD ERR	.835	MEDIAN	8.875
MODE	1.000	STD DEV	12.076	VARIANCE	145.831
KURTOSIS	1.952	SKEWNESS	1.401	RANGE	61.000
MINIMUM	.000	MAXIMUM	61.000		

VALID CASES 209 MISSING CASES 2

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR197

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	6	3	3	14.	1	0	67	30.	2	1	91
1.	20	10	12	15.	2	1	67	31.	1	0	91
2.	17	8	21	16.	2	1	68	33.	1	0	92
3.	11	5	26	17.	1	0	69	35.	1	0	92
4.	18	9	34	18.	6	3	72	36.	4	2	94
5.	12	6	40	19.	2	1	73	38.	1	0	95
6.	14	7	47	20.	2	1	74	39.	1	0	95
7.	3	1	48	21.	2	1	75	48.	4	2	97
8.	4	2	50	22.	1	0	75	55.	1	0	98
9.	3	1	52	24.	26	12	88	60.	2	1	99
10.	4	2	54	26.	1	0	88	61.	1	0	99
11.	4	2	56	27.	2	1	89	84.	1	0	100
12.	21	10	66	28.	1	0	89	99.	1	0	100
13.	1	0	66	29.	1	0	90				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ

9999. 2

MEAN	13.526	STD ERR	1.029	MEDIAN	8.375
MODE	24.000	STD DEV	14.874	VARIANCE	221.250
KURTOSIS	7.349	SKEWNESS	2.261	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES 209 MISSING CASES 2

AD-A106 324

ARMY TRAINING STUDY: TRAINING EFFECTIVENESS ANALYSIS
(TEA) SUMMARY VOLUME 2 ARMOR(U) ARMY TRAINING AND
DOCTRINE COMMAND FORT MONROE VA F J BROWN 08 AUG 78

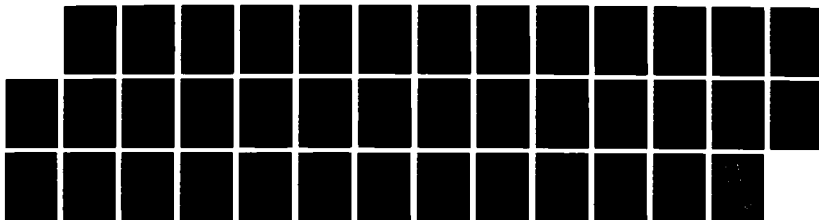
5/5

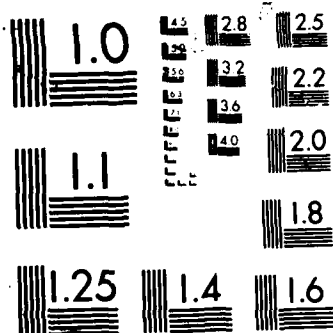
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR198

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	2	1	1	22.	2	1	33	41.	2	1	87
1.	2	1	2	23.	4	2	35	42.	2	1	88
2.	3	1	3	24.	37	18	53	44.	1	0	88
3.	2	1	4	25.	7	3	56	45.	1	0	89
4.	4	2	6	26.	7	3	60	46.	1	0	89
6.	8	4	10	27.	7	3	63	48.	5	2	92
8.	2	1	11	28.	3	1	64	56.	1	0	92
10.	2	1	12	29.	2	1	65	59.	2	1	93
11.	2	1	13	30.	6	3	68	60.	6	3	96
12.	8	4	17	32.	5	2	71	66.	1	0	97
14.	4	2	19	33.	1	0	71	68.	1	0	97
15.	4	2	21	34.	6	3	74	70.	1	0	98
16.	2	1	22	35.	3	1	75	72.	1	0	98
17.	2	1	23	36.	15	7	83	78.	1	0	99
18.	10	5	27	37.	3	1	84	92.	1	0	99
19.	4	2	29	38.	1	0	85	96.	1	0	100
20.	4	2	31	39.	2	1	86	99.	1	0	100
21.	2	1	32	40.	1	0	86				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	3				

MEAN	27.447	STD ERR	1.167	MEDIAN	24.338
MODE	24.000	STD DEV	16.834	VARIANCE	283.369
KURTOSIS	3.240	SKEWNESS	1.390	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES	208	MISSING CASES	3

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR199

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	43	21	21	8.	10	5	77	16.	5	2	93
1.	27	13	35	9.	5	2	79	18.	2	1	94
2.	20	10	45	10.	6	3	82	19.	1	0	95
3.	15	7	52	11.	5	2	85	20.	2	1	96
4.	8	4	56	12.	8	4	89	21.	2	1	97
5.	7	3	60	13.	1	0	89	24.	6	3	100
6.	18	9	69	14.	2	1	90				
7.	6	3	72	15.	1	0	91				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	11				

MEAN	5.410	STD ERR	.427	MEDIAN	3.167
MODE	.000	STD DEV	6.035	VARIANCE	36.424
KURTOSIS	1.430	SKEWNESS	1.403	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES	200	MISSING CASES	11

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR200

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	14	7	7	12.	7	3	69	27.	4	2	92
1.	24	12	19	13.	1	0	69	28.	1	0	92
2.	21	10	29	14.	3	1	71	29.	1	0	93
3.	14	7	36	15.	2	1	72	30.	2	1	94
4.	3	1	37	16.	2	1	73	32.	2	1	95
5.	2	1	38	18.	12	6	78	33.	1	0	95
6.	15	7	46	19.	3	1	80	36.	5	2	98
7.	6	3	49	20.	3	1	81	41.	1	0	98
8.	13	6	55	21.	2	1	82	42.	1	0	99
9.	8	4	59	22.	1	0	83	44.	1	0	99
10.	8	4	63	23.	2	1	84	60.	1	0	100
11.	5	2	65	24.	12	6	90	68.	1	0	100

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	7				

MEAN	11.088	STD ERR	.804	MEDIAN	7.731
MODE	1.000	STD DEV	11.483	VARIANCE	131.854
KURTOSIS	3.656	SKEWNESS	1.656	RANGE	68.000
MINIMUM	.000	MAXIMUM	68.000		
VALID CASES	204	MISSING CASES	7		

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH • RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR201

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	14	7	7	13.	2	1	67	27.	1	0	90
1.	25	12	19	14.	3	1	69	28.	1	0	91
2.	20	10	29	15.	6	3	72	29.	1	0	91
3.	12	6	35	16.	2	1	73	30.	4	2	93
4.	9	4	39	17.	2	1	74	31.	1	0	94
5.	3	1	41	18.	10	5	78	32.	3	1	95
6.	13	6	47	19.	3	1	80	33.	1	0	96
7.	5	2	50	20.	3	1	81	36.	4	2	98
8.	13	6	56	21.	1	0	82	38.	1	0	98
9.	4	2	58	23.	2	1	83	42.	1	0	99
10.	4	2	60	24.	9	4	87	44.	1	0	99
11.	4	2	62	25.	3	1	89	60.	1	0	100
12.	9	4	66	26.	2	1	90	68.	1	0	100

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	7				

MEAN	11.216	STD ERR	.811	MEDIAN	7.577
MODE	1.000	STD DEV	11.585	VARIANCE	134.219
KURTOSIS	3.316	SKEWNESS	1.581	RANGE	68.000
MINIMUM	.000	MAXIMUM	68.000		

VALID CASES 204 MISSING CASES 7

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR202

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	6	3	3	17.	2	1	59	34.	1	1	89
1.	15	8	11	18.	12	6	65	36.	4	2	91
2.	14	7	18	19.	4	2	67	37.	2	1	92
3.	8	4	22	20.	2	1	68	38.	2	1	93
4.	3	2	23	21.	3	2	70	42.	2	1	94
5.	4	2	25	22.	2	1	71	43.	1	1	95
6.	10	5	30	23.	1	1	71	44.	2	1	96
7.	9	5	35	24.	9	5	76	48.	1	1	96
8.	12	6	41	25.	3	2	77	50.	1	1	97
9.	4	2	43	26.	3	2	79	56.	1	1	97
10.	3	2	44	27.	5	3	81	59.	1	1	98
11.	2	1	45	28.	3	2	83	60.	1	1	98
12.	10	5	50	29.	2	1	84	61.	1	1	99
13.	5	3	53	30.	4	2	86	72.	1	1	99
14.	1	1	53	31.	2	1	87	80.	1	1	100
15.	6	3	56	32.	3	2	88				
16.	4	2	58	33.	1	1	89				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	12				

MEAN	16.286	STD ERR	1.036	MEDIAN	12.450
MODE	1.000	STD DEV	14.619	VARIANCE	215.721
KURTOSIS	2.438	SKEWNESS	1.398	RANGE	80.000
MINIMUM	.000	MAXIMUM	80.000		

VALID CASES	199	MISSING CASES	12

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR203

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	49	25	25	7.	6	3	83	15.	1	1	95
1.	36	18	43	8.	7	4	86	16.	2	1	96
2.	25	13	56	9.	3	2	88	19.	1	1	97
3.	12	6	62	10.	6	3	91	20.	1	1	97
4.	15	8	69	11.	5	3	93	24.	5	3	100
5.	9	5	74	12.	2	1	94				
6.	12	6	80	14.	1	1	95				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	13				

MEAN	3.955	STD ERR	.361	MEDIAN	2.060
MODE	.000	STD DEV	5.086	VARIANCE	25.871
KURTOSIS	4.890	SKEWNESS	2.112	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES	198	MISSING CASES	13

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR204

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	14	7	7	11.	7	4	77	24.	7	4	95
1.	37	19	26	12.	9	5	82	25.	2	1	96
2.	25	13	38	13.	2	1	83	26.	1	1	97
3.	14	7	45	14.	1	1	83	29.	1	1	97
4.	16	8	53	15.	2	1	84	30.	1	1	98
5.	6	3	56	16.	2	1	85	32.	1	1	98
6.	14	7	63	18.	8	4	89	33.	1	1	99
7.	6	3	66	19.	2	1	90	36.	1	1	99
8.	8	4	70	20.	1	1	91	38.	1	1	100
9.	2	1	71	21.	1	1	91				
10.	5	3	74	23.	1	1	92				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	12				

MEAN	7.317	STD ERR	.571	MEDIAN	4.094
MODE	1.000	STD DEV	8.060	VARIANCE	64.965
KURTOSIS	1.945	SKEWNESS	1.560	RANGE	38.000
MINIMUM	.000	MAXIMUM	38.000		

VALID CASES	199	MISSING CASES	12

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR205

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	15	7	7	11.	6	3	76	25.	2	1	95
1.	40	20	27	12.	12	6	82	26.	1	0	96
2.	26	13	40	14.	2	1	83	29.	2	1	97
3.	13	6	47	15.	2	1	84	30.	1	0	97
4.	13	6	53	16.	4	2	86	32.	1	0	98
5.	8	4	57	18.	9	4	90	35.	1	0	98
6.	9	4	62	19.	1	0	91	36.	1	0	99
7.	9	4	66	20.	1	0	91	38.	1	0	99
8.	2	1	67	21.	1	0	92	48.	1	0	100
9.	7	3	71	23.	1	0	92				
10.	4	2	73	24.	4	2	94				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	11				

MEAN	7.425	STD ERR	.605	MEDIAN	3.962
MODE	1.000	STD DEV	8.558	VARIANCE	73.241
KURTOSIS	3.491	SKEWNESS	1.803	RANGE	48.000
MINIMUM	.000	MAXIMUM	48.000		

VALID CASES	200	MISSING CASES	11

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR206

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	8	4	4	13.	1	1	62	27.	2	1	86
1.	14	7	11	14.	2	1	63	28.	3	2	87
2.	17	9	20	15.	2	1	64	29.	2	1	88
3.	8	4	24	16.	5	3	66	30.	3	2	90
4.	9	5	28	18.	10	5	71	32.	2	1	91
5.	5	3	31	19.	2	1	72	33.	1	1	91
6.	16	8	39	20.	4	2	74	36.	9	5	96
7.	9	5	43	21.	3	2	76	37.	1	1	96
8.	8	4	47	22.	1	1	76	39.	1	1	97
9.	7	4	51	23.	2	1	77	41.	2	1	98
10.	5	3	53	24.	12	6	83	43.	1	1	98
11.	5	3	56	25.	1	1	84	48.	2	1	99
12.	11	6	61	26.	2	1	85	71.	1	1	100

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	12				

MEAN	13.447	STD ERR	.866	MEDIAN	9.286
MODE	2.000	STD DEV	12.221	VARIANCE	149.360
KURTOSIS	1.788	SKEWNESS	1.251	RANGE	71.000
MINIMUM	.000	MAXIMUM	71.000		

VALID CASES 199 MISSING CASES 12

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APPENDIX D
OUTLINE OF THREE DAY TRAINING PROGRAM

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OUTLINE OF THREE DAY TRAINING PROGRAM

PRETRAINING CONDITIONS: Given soldiers who are properly motivated and possess the physical and mental aptitudes required of MOS 11E and qualified tank commanders and drivers, gunners and loaders can be trained to perform the following operations in three days of training:

OBJECTIVES:

DAY 1

GUNNER. The gunner will be able to perform the following operations in an M60A1 during day or night.

1. Given an operational CVC helmet, the gunner will connect it to the Gunner's Control Box in an M60A1, adjust the volume of the incoming signal and communicate on intercom.
2. Given a protective mask, the gunner will mask, connect to the Gunner's M3 Heater in an M60A1 and check operation of the heater.
3. Given a direction from the commander to prepare the gunner's station for operation, the gunner will:
 - a. Manually elevate and depress the main gun.
 - b. Manually traverse the turret.
 - c. Prepare the Gunner's Telescope for operation with the HEP reticle.
 - d. Prepare the Gunner's Periscope for operation.
 - e. Place the turret in power operation.
 - f. Turn the Ballistic Computer on and adjust the illumination of the dials.
 - g. Operate the Azimuth Indicator.
 - h. Operate the Elevation Quadrant.
4. Given a direction from the Tank Commander to prepare-to-fire, the gunner will perform the gunner's duties in the Prepare-to-Fire checks.
5. Given a precision fire command for SABOT or HEAT from a stationary tank to a stationary target, the gunner will:
 - a. Turn main gun switch ON.
 - b. Identify the target and announce, IDENTIFIED.
 - c. Index the proper ammunition in the Ballistic Computer.
 - d. Take up the proper sight picture in the Gunner's Periscope within 10 seconds during daylight and 15 seconds at night.
 - e. Announce ON THE WAY and squeeze an appropriate trigger after receiving the command to fire.

6. Given a battlesight fire command from a stationary tank to a stationary target, the gunner will:
 - a. Identify the target and announce, IDENTIFIED.
 - b. Take up the proper sight picture in the Gunner's Periscope within 8 seconds during daylight and 12 seconds at night.
 - c. Announce, ON THE WAY and squeeze an appropriate trigger after receiving the command to fire.
7. Given a fire command and an unidentified target, the gunner will announce, CANNOT IDENTIFY within 8 seconds.
8. Given a HEP fire command and a range, the gunner will:
 - a. Identify the target and announce, IDENTIFIED.
 - b. Take up the proper sight picture in the Gunner's Telescope within 10 seconds during daylight and 15 seconds at night.
 - c. Announce ON THE WAY and squeeze an appropriate trigger after receiving the command to fire.
9. Given a fire command for range card lay to direct fire and range card data with no ammunition charge, the gunner will be able to fire a round within 45 seconds.

DAY 2

10. Given a SABOT or HEAT fire command to a moving target, the gunner will apply the appropriate lead, track the target and fire from the gunner's Periscope when given the command.
11. Given a HEP fire command to a moving target, the gunner will apply the appropriate lead, track the target and fire from the Gunner's Telescope when given the command.
12. Given a first round miss the gunner will sense the round, announce his sensing and apply BOT to stationary and moving targets.
13. Given a subsequent fire command, the gunner will apply the mil change and the target form methods of adjustment with the periscope and the range technique with the telescope.
14. Given a fire command to conduct area point or suppressive fire with the coax to a stationary target from a stationary or moving tank, the gunner will:

- a. Index HEP on the Ballistic Computer.
 - b. Turn the coax switch ON.
 - c. Identify the target and announce IDENTIFIED.
 - d. Take up the proper sight picture and fire a burst within 5 seconds during daylight and 10 seconds at night.
 - e. Walk fire onto the target.
 - f. Execute the "Z" pattern of fire for area coverage.
15. Given a misfire of a 105mm round, the gunner will perform the gunner's portion of misfire procedures.
 16. Given a stoppage of the coax, the gunner will perform the gunner's portion of the stoppage procedures.
 17. Given a 105mm round, the gunner will hand it from the ground to a crew member standing on the tank.

DAY 3

18. Table VII Modified (subcaliber and main gun). Six main gun rounds were fired during the day and 4 were fired at night.

DAY 1

LOADER. The loader will be able to perform the following operations in an M60A1 during daylight or darkness.

1. Given a direction from the tank commander, the loader will turn the tank communications system ON or OFF at the AM 1780.
2. Given a CVC helmet, the loader will attach it to the Loader's Radio Control Box, adjust the volume of the incoming signal and transmit on the tank intercom system.
3. Given a protective mask, the loader will mask, attach to the tank gas particulate filter system and check operation of the M3 Heater in response to or direction from the tank commander.
4. Given one HEP, SABOT and HEAT round, the loader will identify each round by shape and color.
5. Given one belt of 7.62mm and one belt of .50 caliber ammunition, the loader will be able to identify the 7.62mm ammunition.
6. Given a direction from the tank commander, the loader will dismount the M219 machine gun from the tank.

7. Given a M219 machine gun and a direction from the tank commander, the loader will mount the coax in the tank.
8. Given a M219 machine gun and a direction from the tank commander, the loader will perform immediate action on coax.
9. Given two belts of 7.62mm ammunition and direction from the tank commander, the loader will link the belts together.
10. Given a belt of 7.62mm ammunition and a direction from the tank commander, the loader will fill the banana box.
11. Given a belt of 7.62mm ammunition and a direction from the tank commander, the loader will load the coax machine gun.
12. Given a loaded coax machine gun and a direction from the tank commander, the loader will unload and clear the machine gun.
13. Given a direction from the tank commander, the loader will ground guide the driver.
14. Given 105mm rounds through the loader's hatch, the loader will properly stow the ammunition in all stowage areas.
15. Given the command to prepare-to-fire from the tank commander, the loader will perform the loader prepare-to-fire procedures.

DAY 2

16. Given a direction from the tank commander, the loader will manually open the main gun breech.
17. Given a fire command for a main gun battlesight engagement, the loader will within 3 seconds:
 - a. Clear the path of recoil.
 - b. Place the main gun safety switch to Fire and announce UP.
 - c. Secure another round of the same type and reload as required until commanded to cease fire.
18. Given an empty open breech, and a main gun fire command from the tank commander, the loader will within 5 seconds:
 - a. Select the proper type of ammunition.
 - b. Load the round into the breech.
 - c. Clear the path of recoil.
 - d. Place the Main Gun Safety Switch to Fire and announce, UP.
 - e. Secure another round of the same type and reload as required until commanded to cease fire.

19. Given an announcement of MISFIRE from the gunner, the loader will perform the loader misfire procedures.

20. Given a coax fire command, the loader will:

a. Insure that the coax is loaded, the safety is in the fire position and announce UP.

b. Standby the coax prepared to apply immediate action.

21. Given direction from the tank commander, the loader will change barrels on the coax within 15 seconds.

22. Given the announcement of STOPPAGE by the gunner, the loader will perform immediate action on the coax.

23. Given a direction by the tank commander, the loader will fire the coax manually.

24. Given a loaded main gun and a direction from the tank commander to load a different type of ammunition, the loader will unload, restow and reload the new type of ammunition within 20 seconds.

25. Given a direction by the tank commander, the loader will scan the loader's area of responsibility and identify targets by type, direction and range within 400 meters.

26. Given a direction by the tank commander, the loader will operate the turret vent blower.

27. Given a direction by the tank commander, the loader will dispose of coax brass.

DAY 3

28. Table VII

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APPENDIX E
MAIN GUN OPENING TIME/POINT TABLE

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MAIN GUN OPENING TIME/POINT TABLE

Battlesight Scale

Points	75	72	69	66	63	60	55	50	45	40	35	28	21	14	7	0
Time	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Precision Scale

Points	75	72	69	66	63	60	56	52	48	44	40	35	39	25	20	17	14	11	8	5	0
Time	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

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APPENDIX F
MACHINE GUN OPENING TIME/POINT TABLE

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MACHINE GUN OPENING TIME/POINT TABLE

Machine Gun Opening Time/Point Table

Suppressive Fire

Points	20	19	18	17	16	15	12	9	6	3	0
Seconds	5	6	7	8	9	10	11	12	13	14	15

Points	10		9		8	7	6	4	2	1	0
Seconds	5	6	7	8	9	10	11	12	13	14	15

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APPENDIX G

SUMMARY DATA FOR ANALYSIS OF EQUIPMENT FAMILIARITY

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SUMMARY DATA FOR ANALYSIS OF EQUIPMENT FAMILIARITY

	Means Familiar Tank Group			Means Unfamiliar Tank Group			Equipment Effect	Equipment X Group Interaction
	1 n=7	2 n=3	3 n=2	1 n=4	2 n=7	3 n=7	df = 1, 24	df = 2, 24
OPENING TIME								
Stationary battlesight	7.32	8.00	10.63	6.80	6.36	10.43	0.61	0.41
Stationary precision	12.53	13.42	23.35	14.31	11.64	18.61	2.19	0.80
Moving target	9.93	11.16	8.75	11.63	9.65	13.65	1.85	4.04
TOTAL Main Gun	10.93	10.80	14.95	10.80	9.16	14.34	0.87	0.55
TARGETS HIT								
Stationary battlesight	3.14	3.33	1.50	3.50	3.43	2.14	0.64	0.24
Stationary precision	1.14	2.33	1.00	2.00	1.86	1.43	0.39	1.69
Moving	0.57	0.66	0.50	0.75	0.57	0.43	0.0001	0.16
Within time standard	1.57	1.67	0.00	1.00	3.00	1.14	1.00	1.64
TOTAL Main Gun	4.86	6.33	3.00	5.50	5.71	4.00	0.27	0.92
TABLE VIII POINTS								
Machine gun points	319.71	360.33	334.50	325.00	335.43	234.00	1.39	1.74
Main gun points	685.57	871.33	402.00	900.00	834.86	512.71	0.75	0.86
TOTAL	1054.86	1281.67	786.50	1250.00	1216.71	644.57	0.0008	1.15

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APPENDIX H

SUMMARY DATA FOR ANALYSIS OF EQUIPMENT FAMILIARITY - DAY

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SUMMARY DATA FOR ANALYSIS OF EQUIPMENT FAMILIARITY - DAY

	Means Familiar Tank			Means Unfamiliar Tank			Equipment Effect df = 1,24	Equipment X Group Interaction df = 2,24	
	1 n=7	2 n=3	3 n=2	1 n=4	2 n=7	3 n=7			
OPENING TIME									
Stationary battlesight	6.21	5.50	8.25	5.62	6.14	8.78	.04	.36	
Stationary precision	14.42	12.16	22.50	13.12	11.21	16.71	2.57	1.73	
Moving target	11.85	12.33	8.00	13.50	12.57	16.57	3.51*	3.83*	
TOTAL Main Gun	10.68	9.53	13.90	10.20	9.45	13.22	.18	.06	
TARGETS HIT									
Stationary battlesight	1.57	1.66	1.50	1.75	1.28	1.14	.35	.68	
Stationary precision	.42	1.66	1.00	.75	1.28	.42	.38	1.29	
Moving	.14	.66	.00	.25	.28	.28	.00	2.21	
Within time standard	.71	1.33	.00	.75	1.57	.14	.14	.05	
TOTAL Main Gun	2.00	3.33	2.50	2.75	2.42	2.00	.14	1.48	
TABLE VIII POINTS									
Machine gun points	139.14	206.66	166.50	187.25	166.57	143.14	.04	2.56	
Main gun points	287.85	484.00	334.50	400.50	357.42	261.71	.13	1.74	
TOTAL	460.00	576.66	526.00	598.75	549.00	409.85	.00	1.10	

*p ≤ .05, 2-tailed.

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APPENDIX I

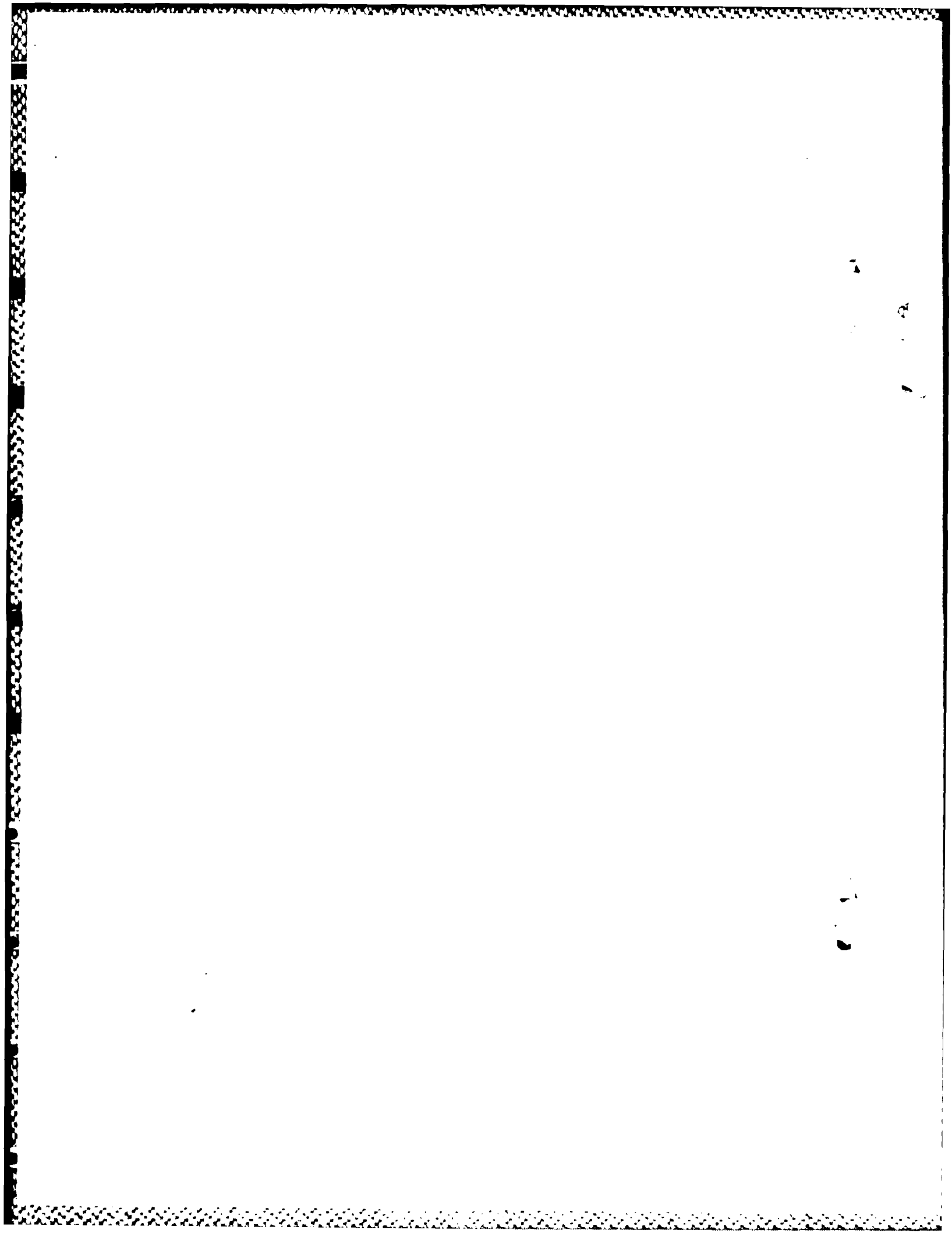
SUMMARY DATA FOR ANALYSIS OF EQUIPMENT FAMILIARITY - NIGHT

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SUMMARY DATA FOR ANALYSIS OF EQUIPMENT FAMILIARITY - NIGHT

	Means Familiar Tank Group			Means Unfamiliar Tank Group			Equipment Effect df = 1,24	Equipment X Group Interaction df = 2,24
	1 n=7	2 n=3	3 n=2	1 n=4	2 n=7	3 n=7		
OPENING TIME								
Stationary battlesight	8.42	10.50	13.00	8.12	6.57	12.07	1.36	1.15
Stationary precision	16.66	14.66	22.25	16.50	12.07	21.21	.40	.25
Moving target	8.00	10.00	9.50	10.00	7.00	10.71	.00	1.88
TOTAL Main Gun	11.17	12.06	16.00	11.40	8.85	15.45	.79	1.25
TARGETS HIT								
Stationary battlesight	1.71	1.66	0.00	1.75	2.00	.85	4.18*	2.88
Stationary precision	.71	1.33	0.00	1.25	1.00	1.00	2.59	4.93*
Moving	.42	.00	.50	.50	.28	.14	.00	1.85
Within time standard	1.14	.00	.00	.25	1.42	.42	.32	2.86
TOTAL Main Gun	2.85	3.00	.50	3.50	3.28	2.00	4.73*	1.87
TABLE VIII POINTS								
Machine gun points	172.14	153.66	168.00	151.75	168.85	105.14	1.36	2.70
Main gun points	397.71	387.33	67.50	499.50	463.50	251.00	4.12*	.59
TOTAL	594.85	566.00	260.50	651.25	667.71	377.57	2.00	.15

* p ≤ .05, 2-tailed.



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