FINAL REPORT

FOR

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) COST AND TRAINING EFFECTIVENESS ANALYSIS (CTEA)

OCTOBER 1988

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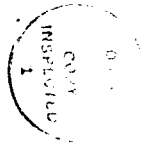

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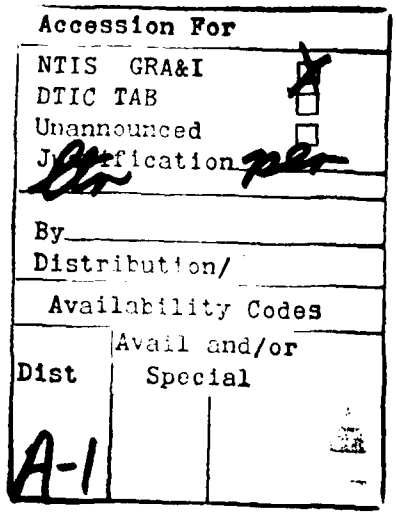

PREFACE

This report characterizes the first cost and training effectiveness analysis (CTEA) conducted on the training effort required to support US Army Air Defense deployment of the Joint Tactical Information Distribution System (JTIDS). The study was conducted to provide information for training and manning requirements decision makers.

The study quantifies the information required to cast the Instructional System Design (ISD) process in a decision analytic framework. A viable and probable training program was synthesized by resolving training design decisions to support cost-effectiveness. Then, the program was used as a base for identifying major training resource requirements, addressing manning concerns, and conducting trade-off analyses.

The project effort was authorized under Office of Personnel Management Contract No. OPM 87-9037 and a subsequent Communications Technology Applications, Inc. (CTA) contract to Research Analysis and Maintenance (RAM), Inc. The government contract monitor was Mr. Edwin Kutschat, Team Chief C^3I for Forward Air Defense, US Army Air Defense School. Mr. Ed Connelly was the CTA contract manager. The work on this project was performed by members of the Integrated Logistic Support Department, RAM, Inc., under the direction of Mr. Leroy Faulkner. The project manager was David H. Stephens. The principal analyst was Edward D. Dawdy and the supporting analyst was Francis J. Kane. Administrative support was provided by Jessie McGrane, Terrance Morgan, Rick Alarcon, and Cecy Castro.

The success of this project was enhanced by the cooperation of a number of government organizations which provided support and assistance, but bear no responsibility for the results of this study. RAM is particularly appreciative of the assistance provided by the New Systems Office, JTIDS TRADOC System Manager

Office, and JTIDS Instructional Team at Fort Gordon, Georgia; and, the Directorate of Training and Doctrine, Office of Chief ADA, US Army Training Center, Materiel and Logistics Systems Division Directorate of Combat Developments at Fort Bliss, Texas.

TABLE OF CONTENTS

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) COST AND TRAINING EFFECTIVENESS ANALYSIS (CTEA)

CHAPTER 1
INTRODUCTION

1.1 PURPOSE

This summary presents an overview of the Joint Tactical Information Distribution System (JTIDS) Cost and Training Effectiveness Analysis (CTEA). This analysis was performed by Research Analysis and Maintenance (RAM), Inc. in support of the US Army Air Defense Artillery School's training mission associated with the fielding of JTIDS in the Air Defense environment (AD-JTIDS).

1.2 BACKGROUND

1.2.1 JTIDS. The Joint Tactical Information Distribution System (JTIDS) is a secure and jam resistant data communications system. Thousands of users can participate in a single communications network. The system enables the exchange of real-time tactical information between friendly Joint Forces. The information exchange includes command and control data and force identification and location data. For example, data from E-3A AWACS aircraft, with a field of view over hundreds of miles, can be instantly shared with fighter aircraft in the air and with friendly ground forces. This enables a fighter to "see" an enemy beyond visual range and air defense sites to immediately distinguish between hostile and friendly aircraft. A single message might contain information about position, track and altitude of hostile aircraft. Other messages on the same network from the same or other sources could contain information such as fuel and ordnance reserves. Another network could be providing command and control, mission status or voice messages.

The basic architecture of JTIDS provides for distribution of

varied types of information to many tactical elements on a real-time basis. JTIDS information is broadcast omnidirectionally at many thousands of bits each second and can be received by any terminal within range. Information flows directly from many transmitters to many receivers using a frequency-hopped, time-sequenced transmission scheme. Each terminal, ground or airborne, can select or reject each message according to its information needs. JTIDS employs a communications method called Time Division Multiple Access (TDMA) which permits new updated messages to be sent from numerous terminals in a specific network on a time-sequenced basis.

The TDMA method contains a unique propagation guard period which assures that the TDMA system will provide data throughput over a 300 nautical mile range without other subscriber's transmissions causing self-interference. This is especially important in tactical environments where a high concentration of JTIDS communications network nodes exists, such as in the coordinated ground and air combat environment. Another important feature of JTIDS built into the terminal equipment allows a passive mode of operation which permits the subscriber to maintain radio silence while still receiving updated mission and threat information.

JTIDS uses spread spectrum techniques and fast frequency hopping to distribute the transmitted data over a frequency band of several hundred megahertz to provide jam resistant communications. Additional protection against jamming is accomplished through the use of a Reed-Solomon Forward Error correction code. This code permits reconstruction of the information content of a message even if up to fifty percent of the pulses are lost.

JTIDS communications networks are comprised of information input and/or user nodes, a network control node, and network relay nodes. Figure 1-1 presents a typical Air Defense (AD) application. The core of the communications nodes is the JTIDS Radio Terminal Set (Figure 1-2). The ground based 2M terminal

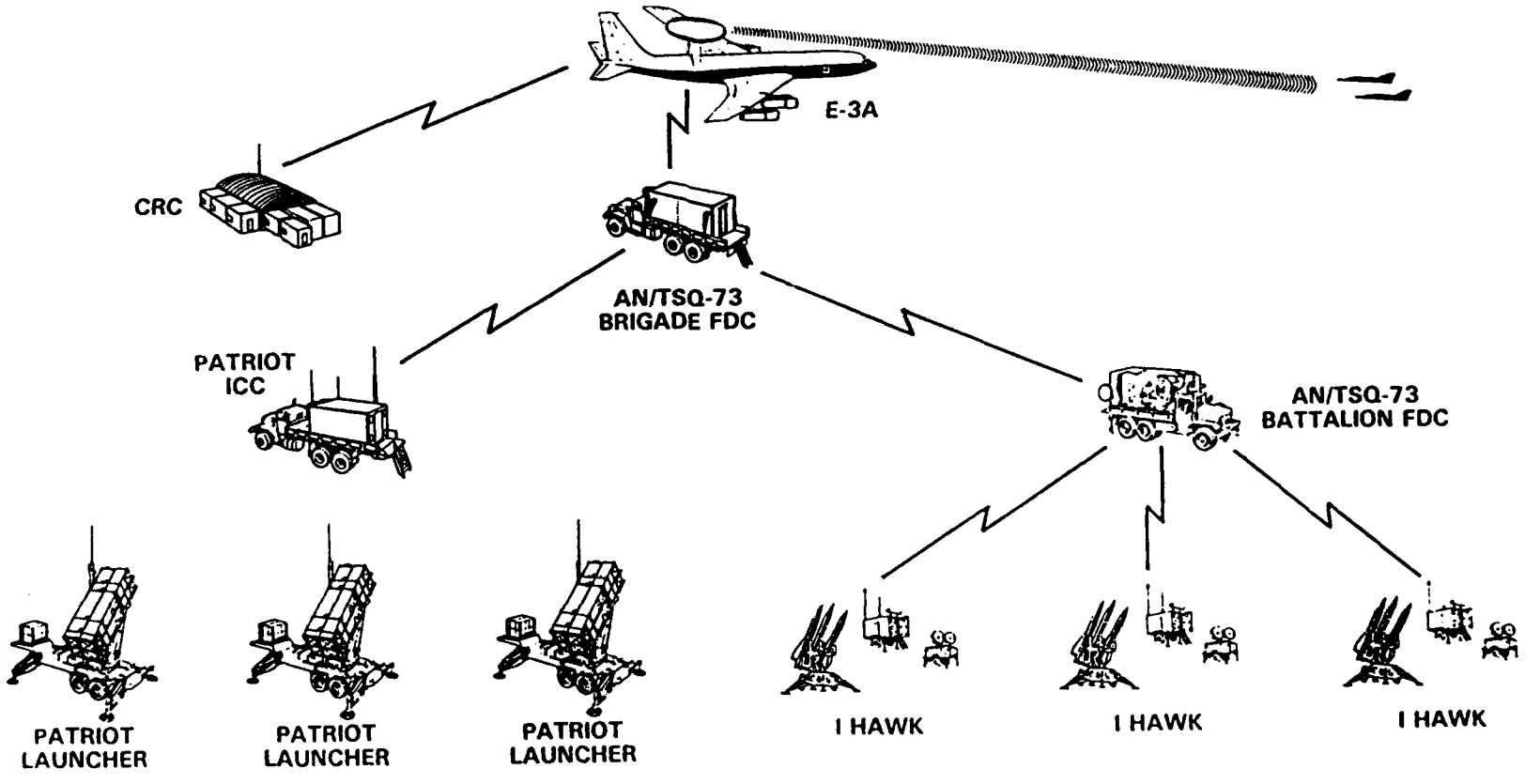

FIGURE 1-1. TYPICAL AIR DEFENSE APPLICATION

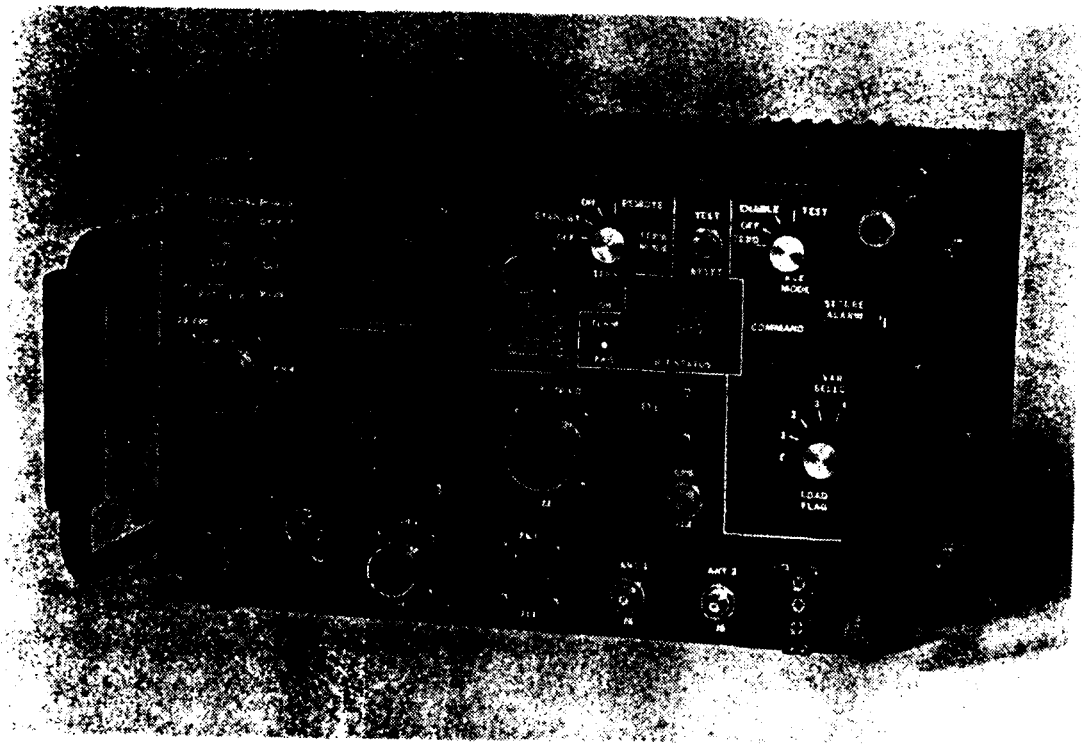

FIGURE 1-2. JTIDS CLASS 2M TERMINAL

set can be initialized to operate in all three network nodes. The 2M terminal set coupled with a complementary antenna set, a crypto device, a shelter, and an ancillary power source comprise the essential elements of the JTIDS communications nodes (Figure 1-3). The network central node is supplemented by a computer to facilitate establishing a network.

1.2.2 **CTEA.** Most scenarios describing a full-scale confrontation between the United States and its major potential adversaries indicate that the majority of Army units will have to be prepared to fight immediately without the luxury of a lengthy mobilization and "train up" period. Studies of the comparative military strengths of the US and its allies versus the Warsaw Pact countries also indicate that friendly forces are likely to be heavily outnumbered. This potential situation has been termed a "come as you are war", with the added requirement of "winning the first battle outnumbered."

To have any hope of success in such an engagement, the Army must maintain an exceptionally high level of individual and unit combat readiness at all times. Acquiring and maintaining a high level of combat readiness will require effective institutional training in combination with rigorous, realistic, combat-referenced unit training programs. Previously, the development and implementation of effective institutional and unit training programs presented no special difficulties. Recently, however, the complex nature of many systems plus the high cost of their support has tended to render traditional training-related equipment usage concepts unacceptable, for reasons of cost alone. Additionally, improvements in training technology many times makes the traditional use of equipment desirable.

The Army's response to the increasing sophistication and cost of training systems had been to implement the concept of a cost-effectiveness analysis performed on training programs. Cost-effectiveness analysis applied to materiel systems is a well

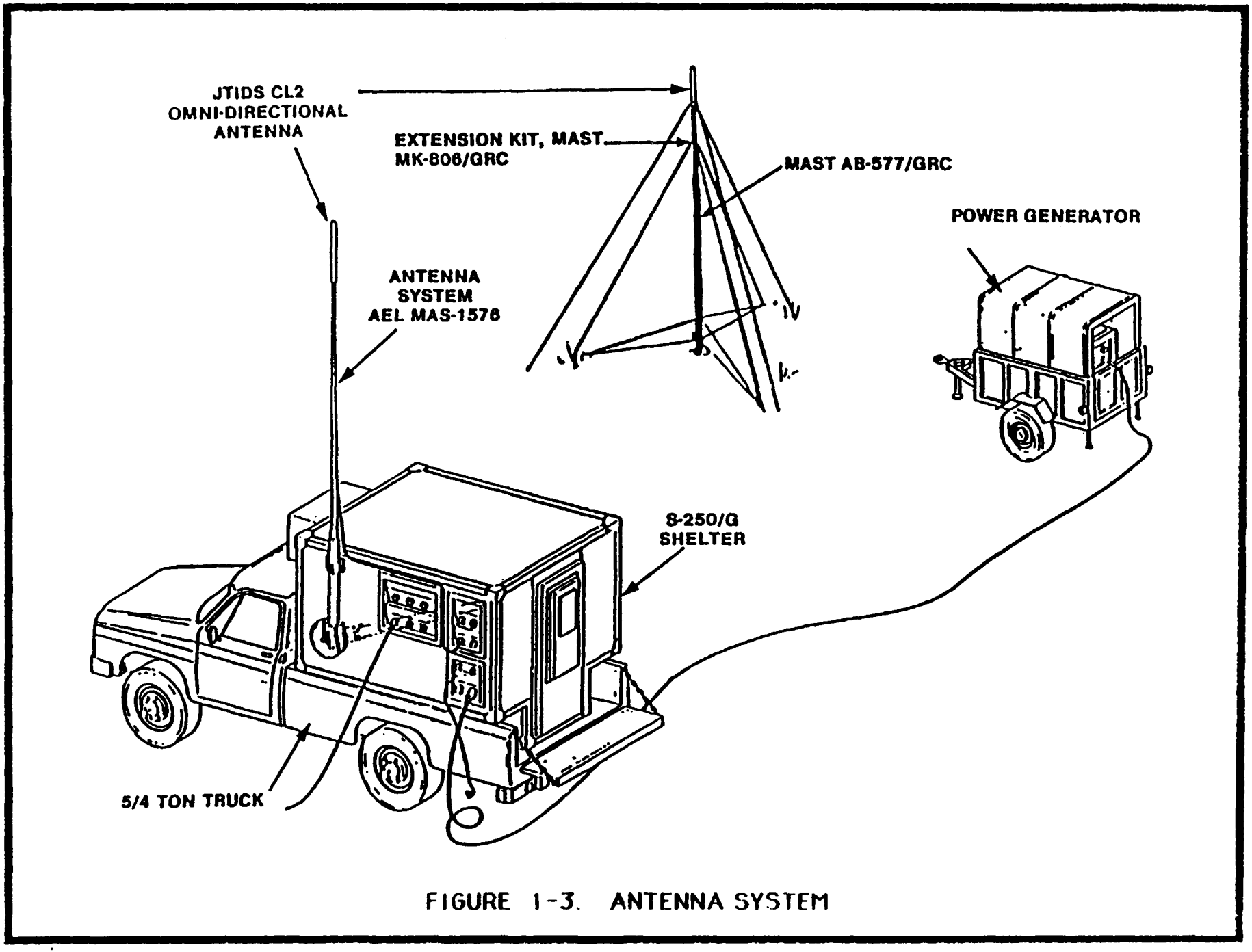

FIGURE 1-3. ANTENNA SYSTEM

established procedure and has a record of relative success. As applied to training programs, the concept and methodology are somewhat newer.

Cost and Training Effectiveness Analysis (CTEA) is a methodology for formalizing the collection, analysis, and integration of training program cost, impact, and effectiveness data. Part of the analysis and integration of training-related data concerns the comparative cost and effectiveness of alternative training programs for meeting pre-defined training objectives. Within a specific training program, CTEA also involves the cost and training efficiencies of alternative training methods/media for addressing a particular performance objective.

The specific nature of CTEA often is dependent upon the state of development of the materiel system under study. For conceptual materiel systems, the lack of performance data requires that CTEA be used to forecast training resource requirements and to indicate training-related issues that may require special examination during later field testing. As prototypes of the materiel system become available, CTEA involves updating and validating cost and resource impact projections and empirical investigations of training program effectiveness. Following the field deployment of a materiel system, the emphasis of CTEA shifts to the cost-effectiveness of: (1) training "fixes" designed to address recognized training deficiencies, or (2) training modifications designed to meet an altered threat scenario or to accommodate evolutionary hardware modifications.

1.2.3 **Problem.** The US Army has planned the acquisition of JTIDS for deployment with HAWK, PATRIOT, AN/TSQ-73 and FAADS C^2I systems. Air Defense Artillery personnel must be able to perform JTIDS operator and maintainer tasks to support the planned AD fielding of JTIDS. Since both personnel and dollar resources are limited, the problem is how to provide effective JTIDS training at an affordable cost. Therefore, this training analysis was

conducted to:

- Identify an acceptable and affordable cost-effective training program.

- Identify major training resource requirements.

- Provide confidence that personnel expected to be available to ADA for manning the JTIDS can be cost-effectively trained to perform required JTIDS tasks.

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) COST AND TRAINING EFFECTIVENESS ANALYSIS (CTEA)

CHAPTER 2
APPROACH

2.1 CTEA OBJECTIVES

The overall goal of this study is to identify an effective training strategy that is cost-effective for training soldiers to operate, maintain, and repair the JTIDS in the Air Defense environment (AD-JTIDS). To achieve this goal, the following objectives will be attained:

- Provide assurance that personnel who are qualified for training in Air Defense Military Occupational Specialties/Areas of Concentration (MOSs/AOCs) affected by fielding AD-JTIDS can be cost-effectively trained to perform required JTIDS tasks.

- Specify and recommend JTIDS training programs to be incorporated into resident training for Air Defense MOSs/AOCs affected by fielding JTIDS.

- Specify and recommend a realistic and cost-effective approach for providing JTIDS training to personnel already qualified in Air Defense MOSs/AOCs affected by fielding AD-JTIDS.

- Estimate the resource requirements for supporting the recommended training programs.

- Specify and recommend the general characteristics of any major training devices required to implement the recommended cost-effective (C-E) training programs.

2.2 SCOPE

The scope of this study is limited to the AD user team operation and maintenance duties directly related to deploying the AD-JTIDS with the PATRIOT, HAWK, AN/TSQ-73 and FAADS C^2I.

2.3 ESSENTIAL ELEMENTS OF ANALYSIS

The essential elements of analysis, provided by the US Army Air Defense School for the JTIDS CTEA follow. This CTEA analysis is:

- Based on current air defense operational, maintenance and manning concepts: what are the critical tasks required for operating and maintaining the JTIDS?

- Based on alternative employment/deployment concepts: how are the critical tasks distributed when the JTIDS is employed by or deployed with the PATRIOT, HAWK, AN/TSQ-73 and FAADS C^2I systems?

- Based on the skills presently required to perform tasks associated with Air Defense MOSs/AOCs affected by the air defense fielding of JTIDS and the skills required to perform critical JTIDS tasks: Are there trainability problems associated with current manning concepts? If so, what are the recommended training solutions?

- Based on the trainability assessment: are there more appropriate Air Defense MOSs/AOCs for personnel who must operate and maintain the JTIDS, or could the operation of the JTIDS be designated as a common task for all relevant ADA MOSs?

- Based on the most appropriate AD MOSs/AOCs and training cost-effectiveness considerations: what is the optimum AD MOS structure (MOS and skill levels) for operator and maintainer duties?

- Based on task criticality, training continuity requirements and training cost-effectiveness: what is the recommended training strategy?

- Based on the recommended training strategy: what is the most cost-effective, yet realistic Program of Instruction (POI) configuration for each required POI?

- Based on the cost-effective POIs and a cost-efficient blend of tactical equipment and training devices: what is the optimal instructional strategy to be recommended for JTIDS training?

- Based on the AD-JTIDS Fielding Plan, System Training Plan, AD-JTIDS POIs, instructional facilities and media requirements: what is a cost-efficient approach for training the present Air Defense MOS/AOC holders affected by fielding JTIDS?

2.4 CONSTRAINTS

The following conditions placed constraints on the areas and methods of analysis used in this CTEA.

2.4.1 ROC. The only approved Required Operational Capability (ROC) document for the Air Defense (AD) deployment of JTIDS available, at the time of this study, was for Forward Area Air Defense Systems (FAADS) Command, Control and Intelligence (C^2I) deployment.

2.4.2 Maintenance and Manning Concepts. Air defense maintenance and manning concepts for JTIDS were not available at the time of this study.

2.4.3 Skill Analyses. Skill analyses for Air Defense Military Occupational Specialties (MOS) impacted by fielding JTIDS were not available in a form compatible with the study requirements.

2.4.4 **Signal Issues.** The TRADOC Analysis Command (TRAC) was assigned to address JTIDS CTEA issues that pertain to the US Army Signal School.

2.4.5 **Fielding Plans.** The only approved Fielding Plan for fielding JTIDS within Air Defense was to support FAADS C^2I.

2.4.6 **Deployment Training.** Current plans require the JTIDS contractor provide training to Air Defense unit personnel in the field as JTIDS equipment is fielded.

2.5 ASSUMPTIONS

The following assumptions are significant assumptions upon which the CTEA is based.

2.5.1 **Equipment.** The task lists upon which the proposed Course of Instruction is based assume the AD-JTIDS Class 2M Terminal will be deployed in a shelter, mounted in a 5/4 ton truck. A trailer containing a mounted twin 10kW Generator Set will be towed by a truck the capability of which is to be determined (TBD). An optional configuration involves installation of the Terminal in a Host Unit (AN/TSQ-73, HAWK PCP or PATRIOT ICC/ECS).

2.5.2 **Antenna Configuration.** Antenna configurations to be considered include: an antenna mounted on the side of the shelter; the same antenna remotely erected and a separate 34 meter high antenna (TBD).

2.5.3 **Employment and Support Maintenance.** FAADS C^2I Air Defense Artillery usage will be similar to that envisioned for the Signal Corps operated Dedicated Joint Relay Units (DJRUs) and Net Control Stations (NCSs). Direct Support/General Support Maintenance functions will be furnished by the Signal Corps.

2.5.4 **Manning.** The air defense manning will be similar to that envisioned for the Signal Corps operated DJRUs.

2.5.5 **AD Maintenance Concept.** The Air Defense maintenance concept is reflected in the draft JTIDS Technical Manuals current at the time of this study.

2.6 MEASURES OF EFFECTIVENESS

The focus of this CTEA is to generate and evaluate data upon which recommendations can be made concerning the pursuit of one course of training action over another. Such action required that the CTEA be cast in a decision analytic framework. Without an analytical framework, the rationale for recommendations would have been ambiguous.

A decision analytic framework is structured to proceed, in a systematic fashion, from the generation of alternatives to the selection of a preferred alternative (Keeney and Raiffa, 1976). The resulting study recommendations are based on cost-effectiveness and result from analyzing alternative benefits received from competing training and manning options. Training benefit trade-offs between alternative course contents are investigated. Course content is defined as the set of selected critical tasks which will be included in the resident training. Also investigated, are training efficiency trade-offs between alternative task training contexts. Task training context is defined as, the training time allowed, the balance between instruction and exercise/practice, and the media/methods used to support the instruction and exercise/practice.

The measures of estimated effectiveness described below quantify both the worth of training any given task and the efficiencies of different task-training contexts. These two metrics are integrated to provide the Training Program Alternative (TPA) measures of training effectiveness necessary for performing the cost-effectiveness trade-off analyses.

The measure of training efficiency used in this study is the estimated percent of students who will achieve the task performance standard on any given task at the completion of task training, given a particular task training context.

Each task is assigned a relative training worth value based on the benefit of placing a soldier in the field with the ability to perform more critical tasks compared with his ability to perform other less critical tasks specified by his JTIDS duties.

The measure of a TPA's effectiveness is the sum, over tasks to be trained, of each tasks training value weighted by the efficiency of the training context to be used.

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) COST AND TRAINING EFFECTIVENESS ANALYSIS (CTEA)

CHAPTER 3
METHODOLOGY AND ANALYSIS

3.1 METHODOLOGY

This study is the initial Air Defense JTIDS Cost and Training Effectiveness Analysis. No AD-JTIDS training programs exist. Methods traditionally used to determine training effectiveness require data that are not available. Therefore, a training effectiveness forecasting method is required. Such a method should combine the development of viable training program strategies and alternatives, the estimation of individual task training efficiency, the estimation of training program effectiveness, and the integration of cost data to determine the most cost effective training approach. Additionally, the method must allow for assessing the trainability of alternate manning concepts and provide information for developing training plans. The general methodology adopted for this study has been successfully demonstrated in two CTEAs: one for the operators and maintainers of the Army's Remotely Monitored Battlefield Sensor System (REMBASS), and another for the aircrew positions on the AH-64 Advanced Attack Helicopter. The method is documented in the Proceedings of the Human Factors Society - 26th Annual Meeting - 1982 (Dawdy, Edward D., and Hawley, J.K.).

The approach used for this CTEA consisted of seven major processes and five subprocesses (refer to Figure 3-1):

- o Review of JTIDS literature.
- o Training development.
  - Identification of tasks through analyses of missions

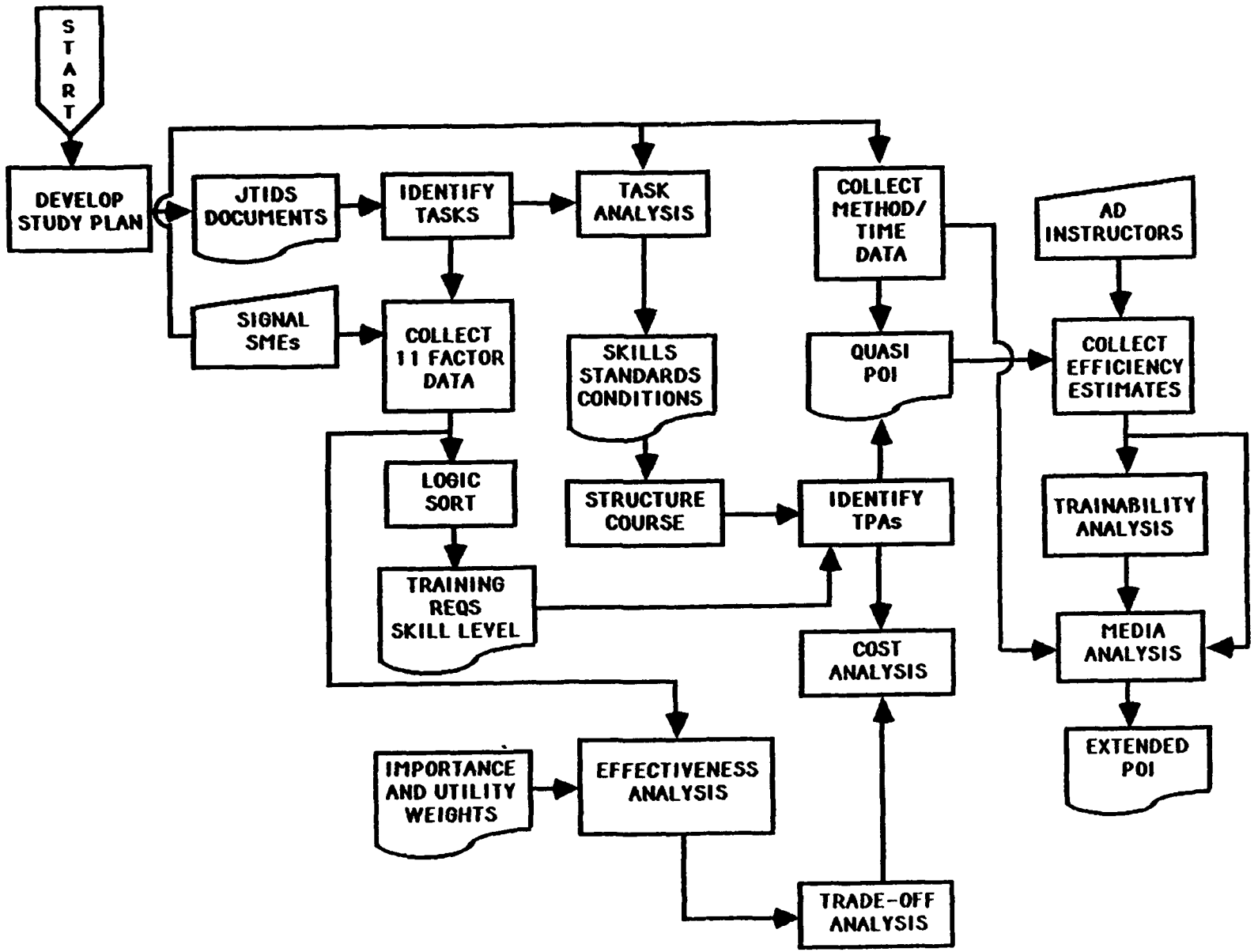

FIGURE 3-1. CTEA FUNCTIONAL METHODOLOGY FLOWCHART

and functions.
  - Task analysis.
  - Generation of a course structure.
  - Development of Training Program alternatives.
  - Development of an Extended POI.

- Analysis of training effectiveness.

- Trainability assessment.

- Training device requirements analysis.

- Determination of training program costs.

- Cost and training effectiveness trade-off analysis.

3.2 ANALYSIS

This section presents the execution of the CTEA methodology processes and subprocesses.

3.2.1 Review of JTIDS Literature. An initial list of requested JTIDS documentation was compiled and forwarded to the Contracting Officer's Representative (COR). The documents listed in Table 3-1 were received and reviewed by CTEA analysts.

3.2.2 Training Development. It was absolutely essential to the training effectiveness and cost analyses to synthesize a plausible and effective training program to provide a base for obtaining data. The training development (TD) process used consisted of six subprocesses.

3.2.2.1 Identification of Tasks. The first CTEA subprocess accomplished was the specification of job tasks. This activity began with a review of JTIDS documentation to identify missions. The missions were analyzed to identify functions and finally, functions were analyzed to determine specific tasks. The tasks

SINGER JTIDS INVESTIGATIVE OPS ASSESSMENT	
JTIDS CORRECTTIVE ACTION SCHEDULE MATRIX	
FAADS DEPLOYMENT SCHEDULE	
S-250 SHELTER COMMON CONFIGURATION	
JTIDS System Operations Manual VOL I, II & III	January 1984
FAADS C^2I TESTBED PHASE I UNIT TRAINING SCHEDULE	
FAADS (BRIEFING NOTES) Road to Success	
JTIDS 2M/FAADS C^2I IOT&E TESTING	
SIGNAL CENTER JTIDS CONCERNS	
LTR USA SIG CTR, JTIDS Limited, Ft. Gordon, Ops Testing	18 December 1985
DF JTIDS CLASS 2MAINT COURSE	May 1984
OTEA TEST DIV JTIDS Lot Test Readiness Requirements	
SINGER - ARMY JTIDS/HIV ORG/DS MAINTENANCE	
ARMY/AF JTIDS FAMILIARIZATION	
PLRS/JTIDS PJH SYSTEM REV	27 March 1986
FT. GORDON - ORG & SUPPORT MAINT CRS (JTIDS)(OT)	
TRAINING SUPPORT PACKAGE FOR JTIDS	
FT. GORDON - O&O PLAN FOR MSE	24 February 1986
O&O PLAN PLRS/JTIDS HYBRID	9 June 1986
PATRIOT JTIDS PIP Requirements	11 February 1985
SINGER-ROCKWELL JTIDS CLASS 2 TERMINAL	

TABLE 3-1

required to establish JTIDS operations and maintain JTIDS equipment in an operational state are presented in Table 3-2 and Table 3-3. An initial list of tasks compiled by analysts was refined after review by the Signal School, Fort Gordon, Georgia. The personnel who performed the review were JTIDS and battlefield communication systems subject matter experts (SMEs). See Annex A.

3.2.2.2 **Selection of Tasks for Training.** Since training time and resources are costly, only critical job-related tasks should be included in formal resident training. The task selection process used is based upon guidelines adapted from the Instructional Systems Development (ISD) process and automated in ARI's Training Developers Decision Aids (Fredericson, et al 1983). This second CTEA process provided selected tasks for training and specified the level of training required. These decisions were made on the basis of the criticality of each task. Task criticality ratings were assigned by Signal School SME on the basis of eleven factors.

- o Learning difficulty.
- o Performance difficulty.
- o Time delay tolerance.
- o Importance to mission.
- o Immediacy of performance.
- o Civilian acquired skill.
- o Importance to survival.
- o Frequency of performance.
- o Wartime task.
- o Task decay rate.
- o Degree of dependence.

SME assessed each task on eleven factors by answering each of the Eleven Factor Task Assessment questions using a three-level scale. The Eleven Factor Task Assessment Questions and three-level answers are presented in Table 3-4. Annex B contains the

TASKS REQUIRED TO ESTABLISH JTIDS OPERATIONS

- Operate Generator Set.
- Power Up/Down Shelter.
- Condition Shelter Environmental Control System.
- De-energize Class 2M Terminal.
- Assemble/Install/Disassemble Antenna on Shelter.
- Assemble/Disassemble Antenna at Remote Site.
- Unload/Load Shelter.
- Unpack/Pack Shelter.
- Set Up and Operate Local Communications.
- Inspect Shelter.
- Pack/Unpack Generator Set.
- Connect/Disconnect External Cables.
- Remote the Indicator Control.
- Load Crypto Variables.
- Initialize Class 2M Terminal.
- Operate and Monitor JTIDS Operations.
- Assemble/Disassemble 34 Meter Antenna.
- Select Site and Emplace Equipment.

TABLE 3-2

TASKS REQUIRED TO MAINTAIN JTIDS EQUIPMENT IN AN OPERATIONAL STATE

- Perform PMCS on Generator Set.
- Perform Preventive Maintenance on Shelter.
- Perform Preventive Maintenance on Environmental Control System.
- Perform Preventive Maintenance on JTIDS Subsystems (Class 2M Terminal and Indicator Control).
- Unpack/Pack Shop Replaceable Units.
- Perform Preventive Maintenance on JTIDS Subsystems (Antennas).
- Unpack/Pack JTIDS Subsystems.
- Remote/Install Class 2M Terminal and Indicator Control from/into Shelter or Host System.
- Perform Preventive Maintenance on Local Communication System.
- Fault Isolate Local Communication System.
- Fault Isolate Generator Set.
- Repair Generator Set.
- Fault Isolate Class 2M Terminal.
- Repair Class 2M Terminal.
- Fault Isolate Indicator Control.
- Repair Indicator Control.

TABLE 3-3

ELEVEN FACTOR TASK ASSESSMENT QUESTIONS

1. LEARNING DIFFICULTY - Is the task hard to learn?

   L = Easy to learn - can be self-trained.
   M = Some difficulty in learning - requires some assistance to learn.
   H = Hard to learn - requires supervision, extensive practice, or special equipment or environment to learn.

2. PERFORMANCE DIFFICULTY - Is the task hard to perform?

   L = Easy to perform - can probably be performed correctly on initial effort and each repetition - includes only simple skills.
   M = Some difficulty in performing - may need more practice and assistance to perform in field unit - moderate level skills.
   H = Hard to do - probably requires additional practice and assistance to perform in field unit. High probability of some performance failures - includes complex skills.

3. TIME DELAY TOLERANCE - What is the time allowed between receiving the task initiating cue and starting the performance?

   L = No need to start task at any specific time.
   M = Task start can be delayed from several minutes to a few hours.
   H = Task performance must begin immediately or within a few minutes after cue.

4. IMPORTANCE TO MISSION - How serious is the effect of improper performance or non-performance on the unit or individual mission?

   L = Has little or no effect on individual or unit mission.
   M = Could degrade or delay mission performance.
   H = Could result in mission failure.

5. IMMEDIACY OF PERFORMANCE - How soon after arrival in field unit could task performance be required?

   L = Not for several months.
   M = Within the first few weeks (1-3 months).
   H = Within the first one or two weeks.

TABLE 3-4 (1 OF 3)

6. CIVILIAN ACQUIRED SKILL - What is the probability that the task requires new skill not generally available in the target population?

   L = All skills are usually civilian acquired by time of initial entry.
   M = All skills may be available for most of the target population.
   H = Some or all of the required skills are not usually present.

7. IMPORTANCE TO SURVIVAL - Is the task important to the survival of personnel and equipment?

   L = Failure or non-performance would have little or no effect on survival of personnel or equipment.
   M = Failure or non-performance could endanger personnel or equipment.
   H = Task must be performed for survival of personnel or equipment.

8. FREQUENCY OF PERFORMANCE - How often is the task called for?

   L = Infrequently - once a month or less.
   M = Moderate frequency - once every one to three weeks.
   H = Frequently - more often than once a week.

9. WARTIME TASKS - Is the task oriented towards wartime operations?

   L = Peacetime Only - task is not performed during wartime.
   M = War and Peace - task is performed both in peace and in war.
   H = Wartime Only - task is never performed until wartime.

   NOTE: Wartime tasks that are practiced during field training exercises or simulated combat are war and peace type tasks.

10. TASK DECAY RATE - How frequently must the task be performed to assure that skills are not reduced below task standards?

    L = Task skills require little or no practice to retain.
    M = Task requires infrequent practice - once every one to three months.
    H = Frequent practice required - more often than once a month.

TABLE 3-4 (2 OF 3)

11. DEGREE OF DEPENDENCE - To what extent is the outcome of task performance dependent on the individual soldier?

L = Rarely would the outcome of the task depend on the individual.

M = Although the individual must perform the task, there is usually someone available to guide or assist.

H = The individual is the only one available, during his tour of duty, that can perform the task.

TABLE 3-4 (3 OF 3)

SME's input. Ratings were then analyzed using the logical sorting procedure presented at Table 3-5. As a result of the logical sort, tasks were tentatively classified into one of the following categories (see Table 3-6):

- o Requires performance certification.
- o Requires cyclic training to maintain performance proficiency.
- o Requires qualification training.
- o Candidate for minimum training time.
- o Candidate for training in the unit.
- o Candidate for elimination from formal training.
- o Mastery degree '2'.
- o Mastery degree '3'.

The task classifications resulting from the logic sort are not absolute, they only provided insight for the analysts to consider during training program design.

3.2.2.3 **Analysis of Tasks.** Tasks considered for training were next reviewed by SMEs and CTEA analysts to provide task content and job context information. Five categories of information were obtained: performance standards, unusual job conditions, stimuli

LOGIC SORT

- IF Degree of Dependence = H, AND Time Delay Tolerance = H, AND Importance to Mission OR Importance to Survival = H, THEN Certify Training.

- IF Decay Rate = H, AND Frequency of Performance ≠ H, AND Importance to Mission or Importance to Survival ≠ L, THEN Address in Unit Training to Maintain Proficiency.

- IF Performance Difficulty ≠ L, AND Importance to Survival ≠ L, AND Immediacy of Performance ≠ L, THEN Train to Qualification.

- F Learning Difficulty = L, AND Performance Difficulty = L, AND Civilian Acquired Skill ≠ H, THEN Task Is A Candidate for Reduced Training Time.

- IF Immediacy of Performance = L, AND Learning Difficulty and Performance Difficulty ≠ H, THEN Task Is a Candidate for Being Trained in Unit.

- IF Learning Difficulty = L, AND Performance Difficulty ≠ H, AND Importance to Mission and Importance to Survival = L, THEN Consider Eliminating Task from Training.

- IF Performance Difficulty = H; OR Performance Difficulty = M and Learning Difficulty = H; OR Performance Difficulty and Learning Difficulty = M, and Degree of Dependence = H, and Importance to Mission or Survival = H, THEN Task is Not a Mastery degree ONE Task.

TABLE 3-5

TASK CLASSIFICATION

- TASKS THAT REQUIRE PERFORMANCE CERTIFICATION

  Assemble/Disassemble the 34 Meter Antenna
  Load Crypto Variables
  Initialize 2M Terminal
  Operate and Monitor AD-JTIDS
  Remove/Install the 2M Terminal
  Remove/Install the Indicator Control
  Fault Isolate the 2M Terminal
  Fault Isolate the Indicator Control
  Repair the 2M Terminal
  Repair the Indicator Control
  Fault Isolate the Generator
  Repair the Generator

- TASKS THAT REQUIRE CYCLIC TRAINING IN THE UNIT TO MAINTAIN PERFORMANCE PROFICIENCY

  Initialize the 2M Terminal

- TASKS THAT REQUIRE QUALIFICATION TRAINING

  Unload/Load the Shelter
  Select Site and Emplace Equipment
  Inspect the Shelter
  Condition the Shelter for Power
  Assemble/Install/Disassemble the Antenna on Shelter
  Assemble/Install/Disassemble the Antenna at Remote Site
  Connect/Disconnect External System Cables
  Perform PMCS on Generator Set
  Operate Generator Set
  Power Up/Down Shelter

TABLE 3-6 (1 OF 3)

Set-up and Operate Local Communications
De-energize Class 2M Terminal
Power Down Shelter
Pack/Unpack Generator Set
Remove/Install Class 2M Terminal and Indicator Control from/into Shelter or Host System
Perform Preventive Maintenance on Shelter
Fault Isolate Local Communication System
Pack/Unpack Shop Replaceable Units (SRUs)
Fault Isolate Class 2M Terminal

- CANDIDATE TASKS - FOR MINIMUM TRAINING TIME

Unpack/Secure the Shelter
Condition Shelter Environmental Control System (ECS)
Remote Indicator Control

- CANDIDATE TASKS - FOR FOLLOW-ON UNIT TRAINING

Load/Unload Shelter
Remote Indicator Control

- CANDIDATE TASKS - FOR ELIMINATION FROM FORMAL TRAINING

Condition the Shelter Environmental Control System (ECS)
Perform PMCS on JTIDS Subsystems
Perform PMCS on Local Communications Systems
Perform Preventive Maintenance on Environmental Control System (ECS)

- MASTERY DEGREE '2' TASKS

Fault Isolate Generator Set
Repair Generator Set

TABLE 3-6 (2 OF 3)

Load Crypto Variables
Initialize Class 2M Terminal
Fault Isolate Class 2M Terminal
Repair Class 2M Terminal
Fault Isolate Indicator Control
Repair Indicator Control
Operate and Monitor JTIDS Operations
Assemble/Disassemble 34 Meter Antenna

- MASTERY DEGREE '3' TASKS

Select Site and Emplace Equipment

TABLE 3-6 (3 OF 3)

that must be monitored during task performance, skills required for performing the task, and the training time required to teach task performance. The products of this effort were used to identify task training context and standards.

3.2.2.4 Generating the Course Structure. The next CTEA training development subprocess performed required analysts to develop a recommended task training sequence. Following are seven general methods of sequencing instruction cited on pp. 277-8, TRADOC Pamphlet 350-3D Phase II Development.

- Job Performance Order. In this method, the learning sequence is the same as the job sequence.

- Chronological Order. The content of instruction flows from topic to topic on the basis of the order in which the events covered occur in time.

- Cause and Effect Order. Learning objectives are sequenced from cause to effect.

- o Critical Sequence. Learning objectives are ordered in terms of their relative importance.

- o Simple to Complex. Learning objectives may be sequenced in terms of increasing complexity.

- o Comparative Sequence. Familiar topics are considered before unfamiliar ones.

- o Reward Sequence. Unpleasant activities should precede more pleasant activities.

The above sequencing methods were analyzed considering the tasks involved in operating and maintaining a JTIDS Class 2M Terminal and its supporting equipment. Consequently, a combination of Job Performance Order, Simple to Complex, and Critical Sequence methodologies was selected as the most appropriate method for sequencing the operational and maintenance tasks within a formal course of JTIDS instruction. SMEs identified tasks that logically or sequentially precede the performance of other tasks and analysts determined inter-task dependency and task complexity. Table 3-7 presents the recommended task training sequence. The tasks to be taught are clustered by function then sequenced in the order they are performed modified by their relative importance and progress from less difficult to difficult. These considerations are important to the trainee and subsequent operator/maintainer as performance on the actual job site will depend on knowledge of job performance order tied to knowledge of critical sequence criteria. The instructional structure is based on the assumption that a soldier assigned AD-JTIDS duties will be required to perform both operator and maintainer tasks.

3.2.2.5 **Generation of Training Program Alternatives.** Once the general course structure was developed the next subprocess conducted was identifying training program alternative variables

SEQUENCE FOR TASKS - USE FOR ASSIGNING SKILLS TO NEW SKILLS OR PRACTICE SKILLS

1.	**POWER UP/POWER DOWN SYSTEM - 'MODULE'**
M-1001	Perform PMCS on Generator Set
O-1001	Operate Generator Set
M-2001	Fault Isolate Generator Set
M-2002	Repair Generator Set
M-1002	Perform Preventive Maintenance on Shelter
O-1002	Power Up/Down Shelter
M-1003	Perform Preventive Maintenance on Environmental Control System
O-1003	Condition Shelter Environmental Control System
M-1004	Perform Preventive Maintenance on JTIDS Subsystems (Class 2M Terminal and Indicator Control)
2.	**OPERATE/MAINTAIN - 'MODULE'**
O-2001	Load Crypto Variables
O-2002	Initialize Class 2M Terminal
O-1004	De-energize Class 2M Terminal
M-2003	Fault Isolate Class 2M Terminal
M-1005	Unpack/Pack Shop Replaceable Units
M-2004	Repair Class 2M Terminal
M-2005	Fault Isolate Indicator Control
M-2006	Repair Indicator Control
O-2003	Operate and Monitor JTIDS Operations
3.	**ANTENNA - 'MODULE'**
M-1006	Perform Preventive Maintenance on JTIDS Subsystems (Antennas)
O-1005	Assemble/Install/Disassemble Antenna on Shelter
O-1006	Assemble/Disassemble Antenna at Remote Site
O-2004	Assemble/Disassemble 34 Meter Antenna
4.	**MARCH ORDER AND EMPLACE - 'MODULE'**
O-3001	Select Site and Emplace Equipment
O-1007	Unload/Load Shelter
O-1008	Unpack/Secure Shelter
M-1007	Unpack/Pack JTIDS Subsystems
5.	**PACKAGE TRAINING/FIELD TRAINING EXERCISE/FOLLOW-ON UNIT TRAINING - 'MODULE'**
M-1008	Remove/Install Class 2M Terminal and Indicator Control from/into Shelter or Host System
M-1009	Remove/Install Local Communication Systems from/ into Shelter
M-1010	Perform Preventive Maintenance on Local Communication System
O-1009	Set Up and Operate Local Communications

TABLE 3-7

M-1011	Fault Isolate Local Communication System
O-3001	Select Site and Emplace Equipment
O-1007	Unload/Load Shelter
O-1008	Unpack/Secure Shelter
O-1010	Inspect Shelter
O-1011	Pack/Unpack Generator Set
O-1012	Connect/Disconnect External Cables
O-1013	Remote Indicator Control (IC)
O-2003	Operate and Monitor JTIDS Operation

TABLE 3-7 (2 OF 2)

that significantly affect cost-effectiveness for further analysis. Variables identified for use in subsequent analysis included:

- o Instructional method.
  - Hands-on (HO) practical exercise.
  - Demonstration (DM).
  - Combination (HO + DM).
- o Media.
  - Actual equipment.
  - Training device.
  - Video tape.
- o Training time.
- o Candidate student types characteristics.

These alternatives were used to specify training contexts and student types for obtaining the training efficiency estimates used in subsequent analyses. The efficiency estimate activity is covered under Section 3.2.3, Training Effectiveness Analysis.

3.2.2.6 **Extended Program of Instruction Development (POI).** The last of the course development activities was the development of an Extended POI. The Extended POI is the primary document upon which all the remaining analyses are based. The Extended POI development was a two stage process. The first step, the Quasi POI, is a documentation of the former analysis and it provided information that was necessary for SME to make training efficiency estimates. The information documented included:

- o Task titles.
- o Task statements.
- o Enabling tasks.
- o Subtask.
- o New skills trained.
- o Learned skills practiced.
- o Conditions.
- o Standards.

Annex C contains the Quasi POI and Table 3-8 presents an extract.

The second stage, the Extended POI, was completed after the training efficiencies were obtained and analyzed with respect to training contexts and prospective student types. The efficiency estimates were studied to identify the following information:

- o Proposed training methods.
- o Proposed training times.
- o Proposed training media.

The results of analysis identifying proposed training times, methods and media is presented in Table 3-9 and incorporated in the Extended POI. The Extended POI upon which further analysis is based is contained in Annex D and an example extract is presented in Table 3-10. To compare Table 3-9 with Annex D,

EXAMPLE QUASI POI TASK SHEET

TASK: O-2002

TASK TITLE: Initialize Class 2M Terminal

TASK STATEMENT: Apply power, follow menus and initialization procedures in Operator TM.

SUBTASK 1: Energize the Class 2M Terminal
SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system components using locational diagrams.	Recall damage criteria and recognize unsatisfactory conditions.
Execute written instructions on electrical device.	
Communicate via symbols.	
Interpret fault indicators.	

CONDITION/S: Given an Operating Class 2M Terminal with crypto variables loaded, indicator control, initialization instructions and TAMMS Forms.

STANDARD/S: Class 2M Terminal must be initialized with the correct variables. Any deficiencies identified on the Class 2M Terminal or indicator control must be recorded on a DA form 2404.

TABLE 3-8

there are two facts that must be considered. First, Annex D is organized by training modules and some tasks that appear in Module Five appear in a preceding module. The recommended training times for training these tasks presented in Table 3-9 are a total of the training times recommended in Annex D Module Five and the preceding modules. Therefore, where a task appears in more than one module in Annex D, the training times must be totaled to equal the time recommended in Table 3-9. Additionally, the media recommended in Table 3-9 for training a task is for Module Five plus any preceding module. Second, some places mock equipment is the media recommended in Annex D. Mock equipment is a further subclassification of Training Device resulting from the Training Device Requirements Analysis. The Training Device Requirements Analysis was conducted subsequent to the analysis that produced Table 3-9, therefore, Table 3-9 does not indicate mock equipment.

TRAINING CONTEXT RECOMMENDATIONS

TASK NUMBER	RECOMMENDED METHOD	TRAINING TIME	ALTERNATIVE MEDIA	RECOMMENDED MEDIA
M-1001	DEMONSTRATION AND PRACTICAL EXERCISE	120 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-1001	DEMONSTRATION AND PRACTICAL EXERCISE	45 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
M-2001	DEMONSTRATION AND PRACTICAL EXERCISE	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
M-2002	PRACTICAL EXERCISE	90 MINUTES	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
M-1002	DEMONSTRATION AND PRACTICAL EXERCISE	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-1002	PRACTICAL EXERCISE	60 MINUTES	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
M-1003	DEMONSTRATION	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE
O-1003	DEMONSTRATION	15 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE
M-1004	DEMONSTRATION AND PRACTICAL EXERCISE	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT

TABLE 3-9 (1 OF 4)

TASK NUMBER	RECOMMENDED METHOD	TRAINING TIME	ALTERNATIVE MEDIA	RECOMMENDED MEDIA
0-2001	DEMONSTRATION AND PRACTICAL EXERCISE	180 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
0-2002	DEMONSTRATION AND PRACTICAL EXERCISE	720 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE (1) ACTUAL EQUIPMENT (2) TRAINING DEVICE
0-1004	DEMONSTRATION AND PRACTICAL EXERCISE	120 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
M-2003	DEMONSTRATION AND PRACTICAL EXERCISE	150 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE (1) ACTUAL EQUIPMENT (2) TRAINING DEVICE
M-1005	DEMONSTRATION AND PRACTICAL EXERCISE	120 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE (1) ACTUAL EQUIPMENT (2) TRAINING DEVICE
M-2004	DEMONSTRATION AND PRACTICAL EXERCISE	90 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE (1) ACTUAL EQUIPMENT (2) TRAINING DEVICE
M-2005	DEMONSTRATION AND PRACTICAL EXERCISE	90 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE (1) ACTUAL EQUIPMENT (2) TRAINING DEVICE
M-2006	DEMONSTRATION AND PRACTICAL EXERCISE	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE (1) ACTUAL EQUIPMENT (2) TRAINING DEVICE
0-2003	CONFERENCE, DEMONSTRATION AND PRACTICAL EXERCISE	460 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT

TABLE 3-9 (2 OF 4)

TASK NUMBER	RECOMMENDED METHOD	TRAINING TIME	ALTERNATIVE MEDIA	RECOMMENDED MEDIA
M-1006	DEMONSTRATION AND PRACTICAL EXERCISE	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-1005	DEMONSTRATION AND PRACTICAL EXERCISE	180 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-1006	DEMONSTRATION AND PRACTICAL EXERCISE	250 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-2004	DEMONSTRATION AND PRACTICAL EXERCISE	480 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-3001	CONFERENCE, DEMONSTRATION AND PRACTICAL EXERCISE	300 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-1007	DEMONSTRATION AND PRACTICAL EXERCISE	150 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
O-1008	DEMONSTRATION AND PRACTICAL EXERCISE	80 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT
M-1007	DEMONSTRATION	15 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE
M-1008	DEMONSTRATION AND PRACTICAL EXERCISE	60 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	VIDEO TAPE ACTUAL EQUIPMENT

TABLE 3-9 (3 OF 4)

TASK NUMBER	RECOMMENDED METHOD	TRAINING TIME	ALTERNATIVE MEDIA	RECOMMENDED MEDIA
M-1009	DEMONSTRATION AND PRACTICAL EXERCISE	45 MINUTES	VIDEO TAPE ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
M-1010	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
O-1009	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
M-1011	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
O-1010	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
O-1011	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
O-1012	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT
O-1013	PRACTICAL EXERCISE	AS REQUIRED	ACTUAL EQUIPMENT TRAINING DEVICE	ACTUAL EQUIPMENT

TABLE 3-9 (4 OF 4)

EXAMPLE EXTENDED POI TASK SHEET

TASK: O-2002

TASK TITLE: Initialize Class 2M Terminal

TASK STATEMENT: Apply power, follow menus and initialization procedures in Operator TM.

SUBTASK 1: Energize the Class 2M Terminal
SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system components using locational diagrams.	Recall damage criteria and recognize unsatisfactory conditions.
Execute written instructions on electrical device.	
Communicate via symbols.	
Interpret fault indicators.	

CONDITION/S: Given an Operating Class 2M Terminal with crypto variables loaded, indicator control, initialization instructions and TAMMS Forms.

STANDARD/S: Class 2M Terminal must be initialized with the correct variables. Any deficiencies identified on the Class 2M Terminal or indicator control must be recorded on a DA form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 720

PROPOSED MEDIA: Video Tape and Actual Equipment/Training Device Qualification

TABLE 3-10

3.2.3 Training Effectiveness Analysis. The primary requirement in conducting a CTEA is determining the effectiveness of TPAs of interest. It was noted earlier that under ideal conditions training effectiveness is established empirically. This ideal is rarely possible, usually because of time and resources or, as in this case, impossible because no formal training program yet exists. The lack of a training program, and consequently empirical data, required the use of a forecasting method to conduct this CTEA. The forecasting method used involved obtaining a task by task estimation of the training benefit to be received from training a given task plus the training efficiency of alternative training contexts. Training context is the method and training time used for training the task. The efficiency ratings are based upon judgments by experts possessing a

knowledge of antecedent systems, like tasks and specific student learning abilities. Individual task ratings were aggregated, during trade-off analysis, to produce an index of expected training effectiveness for each TPA (see Section 3.2.6).

This phase is based on earlier analysis and it produced a metric for quantifying training effectiveness. The measure used to define training program effectiveness in this study is: for all tasks, prescribed to be trained by a TPA, the sum of each task's training worth weighted by the efficiency value of using the training context specified by the TPA for training the task. Using this metric required both the training efficiencies of alternative training contexts and the expected benefit received from training be defined for all critical tasks.

3.2.3.1 **Training Efficiency.** The first step was to forecast training efficiency. Training efficiencies were established by obtaining efficiency estimates from Air Defense School instructors. In order to obtain reasonable estimates, instructor groups having specific knowledge about the learning ability of student types that are currently trained in the 25L, 16H, 16R and 16S MOSs were used (see Annex F). The rationale for selecting these MOSs is presented in Section 3.2.4, Trainability Analysis. Additionally, the instructors were provided, via the Quasi POI and analysts, the task and technical information necessary to make the requested estimates. The instructors were required to provide nine efficiency estimates for each task. Combinations of three times and three methods were used (Figure 3-2). The training times were established using SMEs. The three times used are a base training time, a minimum training time and a maximum training time. Base time is the time the SMEs estimated would be required to train the task. Minimum time is the time SMEs estimated would be required to accomplish any worthwhile training. Maximum time is the time SMEs estimated beyond which no further worthwhile gain in training would be received by increasing the training time. The AD instructors were allowed to

METHOD VARIABLES

DEMONSTRATION AND HANDS ON (DM + HO)

HANDS ON (HO)

DEMONSTRATION (DM)

TIME VARIABLES

BASE TIME (BT)

MINIMUM TIME (MNT)

MAXIMUM TIME (MXT)

	BT	MNT	MXT
DM + HO	90	80	95
DM	35	20	-
HO	70	60	75

FIGURE 3-2. EFFICIENCY ESTIMATES

adjust the times where they thought it was appropriate. The three training methods used are demonstration (DM), hands-on (HO) and a combination of the two methods (DM+HO). For example, the instructors were asked: Considering the task information presented on the Quasi POI task sheet and using a combination of demonstration and hands-on to train students with whom you are familiar, what percent of the students would you expect to achieve the performance standard after two hours of training?

Their efficiency estimate responses are contained in Annex G and an extract example is presented at Table 3-11.

3.2.3.2 **Estimate Training Worth.** The second step in the effectiveness analysis was to estimate the worth of training each task that might be specified for training by a given TPA. These training worth estimates are used along with the estimates of training efficiency to form figures of merit and used in determining the effectiveness of a TPA. To determine the worth of training a task, a subset of the task criticality eleven factor data noted earlier was used. Capitalizing on a task worth scaling effort conducted as part of the TRASANA-TEA-56-82

EXAMPLE TRAINING EFFICIENCY ESTIMATES (25L)

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD DM+HO	HO	DM	NOTES
O-1006	BASE TIME	180	60	50	30	
	MIN TIME	90	--	--	--	
	MAX TIME	240	85	75	40	
O-2004	BASE TIME	480	90	--	--	WOULD NOT TRAIN HO
	MIN TIME	360	75	--	--	ONLY (SAFETY) DM
	MAX TIME	520	95	--	--	ONLY NOT APP. METHOD
O-3001	BASE TIME	240	70	40	--	WOULD NOT USE DM
	MIN TIME	180	--	--	--	ONLY, EXCEPT FOR
	MAX TIME	360	85	65	--	FAMILIARIZATION
O-1007	BASE TIME	60	60	40	40	30 MINUTES IS TOO
	MIN TIME	30	10	--	--	SHORT A TIME FOR
	MAX TIME	90	85	50	50	OTHER THAN DEMO
O-1008	BASE TIME	45	95	90	90	
	MIN TIME	30	80	75	75	
	MAX TIME	60	95	95	95	
M-1007	BASE TIME	40	80	75	80	20 MINUTES IS TOO
	MIN TIME	20	--	--	50	SHORT A TIME FOR
	MAX TIME	60	90	85	90	OTHER THAN DEMO
M-1008	BASE TIME	60	85	60	60	
	MIN TIME	30	--	--	--	
	MAX TIME	120	95	90	90	
M-1009	BASE TIME	20	70	50	60	BASICS WELL
	MIN TIME	10	25	--	--	COVERED IN MOS
	MAX TIME	30	85	70	80	TRAINING
M-1010	BASE TIME	30	90	80	85	BASICS WELL
	MIN TIME	15	--	--	40	COVERED IN MOS
	MAX TIME	60	95	90	95	TRAINING
M-1011	BASE TIME	60	95	95	95	BASICS WELL
	MIN TIME	30	80	70	80	COVERED IN MOS
	MAX TIME	90	95	95	95	TRAINING

TABLE 3-11

Multiple Launch Rocket System (MLRS) CTEA, the following factors were selected (see Annex E):

- Importance to Mission.
- Importance to Survival.
- Learning Difficulty.
- Immediacy of Performance.
- Degree of Dependence.
- Frequency of Performance.
- Performance Difficulty.
- Time Delay Tolerance.

Each of these criticality factors was assigned a relative importance weight denoted R_j and each of the allowable responses to each criticality factor was assigned a utility rating denoted U_{ij} (see Table 3-12). The task utility values were multiplied by their respective importance weights to obtain partial worth values denoted $U_{ij}R_j$. The sum of the partial worth values provided the index of task training worth denoted W_i:

CRITICAL FACTOR WEIGHTS AND RESPONSE UTILITIES

FACTORS	RELATIVE IMPORTANCE WEIGHT (R_j)	UTILITY WEIGHTS CATEGORIES (U_{ij}) L	M	H
IMPORTANCE TO MISSION	36.84	1.25	61.25	100.00
IMPORTANCE TO SURVIVAL	19.47	2.50	62.50	100.00
LEARNING DIFFICULTY	10.24	10.00	42.50	82.50
IMMEDIACY OF PERFORMANCE	9.92	3.75	35.00	71.25
DEGREE OF DEPENDENCE	7.82	6.25	31.25	97.50
FREQUENCY OF PERFORMANCE	6.48	13.75	41.25	68.75
PERFORMANCE DIFFICULTY	5.11	7.50	32.50	81.25
TIME DELAY TOLERANCE	4.04	2.50	17.50	95.00

TABLE 3-12

$$W_i = \sum_{j=1}^{n} U_{ij} R_j$$

Example -

Compute task training worth (W_i) for Task M-1001.

From Table 3-13, use the SME responses as an index to select the appropriate values from Table 3-12.

FACTOR	R_j		U_{ij}		$U_{ij}R_j$
Importance to Mission	36.84	x	61.25 (M)	=	2256.45
Importance to Survival	19.47	x	62.50 (M)	=	1216.87
Learning Difficulty	10.24	x	42.50 (M)	=	435.20
Immediacy of Performance	9.92	x	71.25 (H)	=	706.80
Degree of Dependence	7.82	x	31.25 (M)	=	244.38
Frequency of Performance	6.48	x	41.25 (M)	=	267.30

SIGNAL SCHOOL SME RESPONSES
TO 11 FACTOR DATA USED FOR
TASK WORTH COMPUTATION

TASK #	1 IMP. TO MISSION	2 IMP. TO SURVIVAL	3 LEARN DIFFI-CULTY	4 IMMED. OF PERFORM	5 DEGREE OF PERFORM	6 FRQ. OF PERFORM	7 PERFORM DIFFI-CULTY	8 TIME DELAY TOLER.
M-1001	M	M	M	H	M	M	L	H
O-1001	H	M	M	H	M	L	M	H
M-2001	H	H	M	H	H	H	M	H
M-2002	H	H	M	H	H	H	M	H
M-1002	M	M	M	M	M	M	L	H
O-1002	H	H	M	H	M	M	M	H
M-1003	L	L	M	H	H	M	L	H
O-1003	L	L	L	M	L	L	L	M
M-1004	L	L	M	H	H	M	L	H
O-2001	H	L	H	H	H	H	H	H
O-2002	H	M	H	H	H	M	H	H
O-1004	H	H	M	H	H	L	M	H
M-2003	H	H	M	H	H	M	M	H
M-1005	M	H	M	H	M	L	L	M
M-2004	H	H	H	H	H	L	M	H
M-2005	H	H	H	H	H	L	H	H
M-2006	H	H	M	H	H	L	M	H
O-2003	H	L	H	H	H	H	H	H
M-1004	L	L	M	H	H	M	L	H
O-1005	H	M	M	H	M	L	M	H
O-1006	H	M	M	H	M	L	M	H
O-2004	H	M	H	H	H	L	M	H
O-3001	H	H	H	H	M	L	H	H
O-1007	H	M	M	L	M	L	L	L
O-1008	H	M	L	H	M	L	L	H
M-1007	M	H	M	H	M	L	L	M
M-1008	H	L	M	H	H	L	L	H
M-1009	M	L	M	H	H	L	L	H
M-1010	L	L	M	H	H	M	L	H
O-1009	H	L	M	H	M	H	L	H
M-1011	M	M	M	H	M	L	M	H
O-1010	M	M	L	H	M	M	L	L
O-1011	M	L	L	H	L	L	L	H
O-1012	H	M	M	H	M	L	L	H
O-1013	M	L	L	L	L	L	L	M

TABLE 3-13

Performance Difficulty	5.11	x	7.50 (L)	=	38.33
Time Delay Tolerance	4.04	x	95.00 (H)	=	383.80
$(W_i = \Sigma U_{ij}R_j)$	TASK WORTH				5549.13
				OR	5549.00

Table 3-14 presents the task worths for JTIDS tasks. These values are used for computing TPA effectiveness in Section 3.6, Trade-Off Analysis.

3.2.4 Training Assessment. The training assessment phase of the CTEA is directed at evaluating the trainability of possible JTIDS trainees. Insight concerning whether trainees selected by alternative selection criteria and already trained in AD operator or maintenance MOSs can be trained by a reasonable JTIDS training program is of great importance. This information can be used to moderate decisions concerning JTIDS manning options and to highlight any training concerns for further analysis. Ideally, JTIDS training should be provided to groups of students chosen by alternative selection criteria and the training effects studied to determine group trainability. Since this was not possible, there were two possible methods available for evaluating trainability. One method was skill comparability, the other was evaluating the efficiency estimates obtained as part of the training effectiveness analysis. The first method, skill comparability, requires a comparison between skills presently being trained and those skills that must be learned to support JTIDS. Although skills currently trained in relevant MOS training courses were made available for this study, they were not available in a format compatible with the study requirements. Since conducting skill analyses on other than the JTIDS is beyond the scope of this effort, the alternative method based on efficiency estimates was used.

3.2.4.1 Instructor Groups Selection. The approach used for obtaining training efficiency estimates based on different

TASK WORTHS

TASK #	1 36.84	2 19.47	3 10.24	4 9.92	5 7.82	6 6.48	7 5.11	8 4.04	TASK WORTH
M-1001	61.25	62.50	42.50	71.25	31.25	41.25	7.50	95.00	5549.00
O-1001	100.00	62.50	42.50	71.25	31.25	13.75	32.50	95.00	6926.00
M-2001	100.00	100.00	42.50	71.25	97.50	68.75	32.50	95.00	8531.00
M-2002	100.00	100.00	42.50	71.25	97.50	68.75	32.50	95.00	8531.00
M-1002	61.25	62.50	42.50	35.00	31.25	41.25	7.50	95.00	5190.00
O-1002	100.00	100.00	42.50	71.25	31.25	41.25	32.50	95.00	7835.00
M-1003	1.25	2.50	42.50	71.25	97.50	41.25	7.50	95.00	2689.00
O-1003	1.25	2.50	10.00	35.00	6.25	13.75	7.50	17.50	791.00
M-1004	1.25	2.50	42.50	71.25	97.50	41.25	7.50	95.00	2689.00
O-2001	100.00	2.50	82.50	71.25	97.50	68.75	81.25	95.00	7470.00
O-2002	100.00	62.50	82.50	71.25	97.50	41.25	81.25	95.00	8281.00
O-1004	100.00	100.00	42.50	71.25	97.50	13.75	32.50	95.00	8174.00
M-2003	100.00	100.00	42.50	71.25	97.50	41.25	32.50	95.00	7917.00
M-1005	61.25	100.00	82.50	71.25	31.25	13.75	7.50	17.50	5788.00
M-2004	100.00	100.00	82.50	71.25	97.50	13.75	32.50	95.00	8584.00
M-2005	100.00	100.00	42.50	71.25	97.50	13.75	81.25	95.00	8833.00
M-2006	100.00	100.00	42.50	71.25	97.50	13.75	32.50	95.00	8174.00
O-2003	100.00	2.50	82.50	71.25	97.50	68.75	81.25	95.00	7291.00
M-1004	1.25	2.50	42.50	71.25	97.50	41.25	7.50	95.00	2689.00
O-1005	100.00	62.50	42.50	71.25	31.25	13.75	32.50	95.00	8926.00
O-1006	100.00	62.50	42.50	71.25	31.25	13.75	32.50	95.00	6926.00
O-2004	100.00	62.50	82.50	71.25	97.50	13.75	32.50	95.00	7854.00
O-3001	100.00	100.00	82.50	71.25	31.25	13.75	81.25	95.00	8315.00
O-1007	100.00	62.50	42.50	3.75	31.25	13.75	7.50	2.50	5755.00
O-1008	100.00	62.50	10.00	71.25	31.25	13.75	7.50	95.00	6466.00
M-1007	61.25	100.00	42.50	71.25	31.25	13.75	7.50	17.50	5788.00
M-1008	100.00	2.50	42.50	71.25	97.50	13.75	7.50	95.00	6148.00
M-1009	61.25	2.50	42.50	71.25	97.50	13.75	7.50	95.00	4721.00
M-1010	1.25	2.50	42.50	71.25	97.50	41.25	7.50	95.00	2689.00
O-1009	100.00	2.50	42.50	71.25	31.25	68.75	7.50	95.00	5987.00
M-1011	61.25	62.50	42.50	71.25	31.25	13.75	32.50	95.00	5499.00
O-1010	61.25	62.50	10.00	71.25	31.25	41.25	7.50	2.50	4843.00
O-1011	61.25	2.50	10.00	71.25	6.25	13.75	7.50	95.00	3674.00
O-1012	100.00	62.50	42.50	71.25	31.25	13.75	7.50	95.00	6798.00
O-1013	61.25	2.50	10.00	3.75	6.25	13.75	7.50	17.50	2692.00

TABLE 3-14

training contexts is discussed in 3.2.3.1, Training Effectiveness. It was noted that to obtain efficiency estimates, it was necessary to use groups of AD instructors familiar with the learning characteristics of the classes of students who might be JTIDS trainees. Presently, there are two general categories of students being trained at the ADA School: operators and maintainers. The US Army uses the Armed Services Aptitude Battery (ASVAB) test scores to select enlisted personnel for training schools (Annex H). Operator students are selected by using an Operator and Food (OF) score of 100 or greater. Maintainer students are selected by using an Electronic Repair (EL) score. However, the EL score is not consistent across maintainer MOSs. Consequently, instructor groups were chosen to provide efficiency estimates with respect to both EL and OF selection criteria. Based on an OF score of 100 two groups were used: a group of 16H instructors and a group of 16R and 16S instructors. A group of 25L instructors was used to represent the EL selection criterion. The criterion for selecting 25L trainees is an EL score of 95 or greater. Personnel selected for training in ner AD Maintainer MOSs must have a slightly higher EL score. It is assumed, for this study, if there are no trainability problems found for trainees selected using an EL of 95, there should be no trainability problems for students selected using a higher EL score.

3.2.4.2 Trainability Assessment. Evaluation of trainability was accomplished using a direct, yet fundamental, approach. The training efficiency estimates, provided with respect to each candidate type student, were reviewed (Annex G). First, the time required for training was defined as the time required to assure eighty-five percent (85%), or greater, of the students would reach the training standard. Next, the required times, for all student groups and all tasks, were identified. Finally, the required times were compared task by task across student groups and with the times provided by JTIDS SMEs. There were no significant differences in times noted. Therefore, there is no

indication of trainability problems associated with training AD operators or maintainers to perform JTIDS tasks.

3.2.5 Training Device Requirements Analysis. Once the Quasi POI was developed and the efficiency estimates were obtained, with respect to alternative training methods, an analysis of the efficiency estimates identified practical exercise requirements (see Table 3-9). After the exercise requirements were identified, how to best provide the training equipment for supporting the exercises was addressed. There were trade-offs between using actual equipment and training devices plus possible simulator requirements to consider. Where training scenarios require input from other systems or the real world, a training simulator is often required to interact with the real equipment and be part of or interact with a training device. This phase of the CTEA surveyed training equipment requirements to identify where training devices and/or simulators:

were needed regardless of their cost.

would obviously cost less to use than actual equipment.

may be more efficient to use than actual equipment.

Where the requirements are tentative, based on possible increased efficiency, a requirement for further analysis was identified.

3.2.5.1 Analysis. While contemplating reasonable exercise scenarios for training each task that requires a practical exercise, analysts conducted a logical analysis to identify training device and simulator requirements. The logic sort used is structured to identify obvious requirements first, therefore, conserving requirements for more intense analysis for identifying additional requirements that are less certain. The following logic sorts were used to identify training device and simulator requirements.

- The first objective was to identify where a training device or simulator is required to train a task regardless of cost. The following logic algorithms were used for this purpose.

  - IF it will be hazardous to personnel or equipment to use real equipment, THEN a training device is required.

  - IF actual equipment will not provide necessary performance feedback to either the student or the instructor, THEN a training device is required.

  - IF real world or other equipment inputs are required and they cannot be made available, THEN a simulator is required.

  - IF actual equipment cannot be made available for required unit training, because of mission requirements, THEN a training device must be provided the input.

  Applying these algorithms produced no requirements.

- The next objective was to identify training device and simulator requirements based on obvious cost reductions. The following logic algorithms were used for this purpose.

  - IF it is obvious that using a training device would result in a reduction in the number of systems required and it is also obvious that the training device would cost less to acquire, operate and maintain, than actual equipment, THEN acquire a training device.

- IF a simulation is required to support the exercise scenario and it is obvious that it would cost significantly less to acquire, operate and maintain a simulator than using personnel and actual equipment, THEN acquire a simulator.

Applying these algorithms produced no requirements.

o The next objective was to identify training device requirements based on obvious benefit at obvious low cost. The following algorithms were used for this purpose.

- IF using a training device would obviously reduce equipment wear and/or reduce the probability of equipment damage and the cost of the device is minimal or the cost will obviously be offset by a reduction in equipment maintenance costs, THEN acquire a training device.

Applying this algorithm produced the following requirements.

- Mock SRUs, cards for the Class 2M Terminal and Indicator Control, should be obtained. They should be used to train the electrostatic discharge equipment safety subtask of Task M-1005 (Pack/Unpack Shop Replaceable Units).

- Mock or non-operational SRUs, cards for the Class 2M Terminal and Indicator Control, should be obtained. They should be used to train Task M-2003 (Fault Isolate Class 2M Terminal) and Task M-2005 (Fault Isolate Indicator Control). NOTE: These cards will not be required if a more elaborate training device that can be used to train these tasks is acquired.

- A mock Class 2M Terminal and a mock Indicator control should be obtained. They should be used to train SRU, card, replacement procedures for Task M-2004 (Repair Class 2M Terminal) and Task M-2006 (Repair Indicator Control).

o The final objective was to identify training device requirements where a training device may be useful; however, the cost-benefit derived from using the device is uncertain. The following logic algorithms were used for this purpose.

  - IF it is obvious that performance feedback, in addition to feedback provided by the actual equipment, will facilitate learning, THEN subject the option of using a training device to trade-off analysis.

  - IF deliberately inserting faults into actual equipment is the only method of simulating equipment faults and this process could cause increased equipment maintenance costs, THEN subject the option of using a training device to trade-off analysis.

  Applying these algorithms produced the following possible requirement.

  - A training device to train Task O-2002 (Initialize Class 2M Terminal), Task M-2003 (Fault Isolate Class 2M Terminal), and Task M-2005 (Fault Isolate Indicator Control).

3.2.5.2 **Training Device Characteristics.** The requirements analysis produced requirements for mock SRUs, Class 2M Terminals, and Indicator Controls. A possible training device requirement for training initialization and fault isolation (I-FAULT Trainer)

was also identified. The functional requirements for the mock equipment are obvious and simplistic and require no definition. However, the functional requirements for the I-FAULT trainer are more complex and major characteristics should be defined. Following are desired functional characteristics for the I-FAULT.

- o Provide for training six students using one instructor.
- o Allow for manual initialization of the 2M.
- o Simulate faults in the 2M Terminal and Indicator Control.
- o Allow for exercising fault isolation procedures.
- o Provide for detection of performance errors and provide feedback to the students and instructor.
- o Provide for controlling performance error feedback from immediate to same-as-system.

3.2.6 Determination of Training Program Costs. This section presents the selection of viable alternative training options and their respective costs.

3.2.6.1 Development of Alternative Training Options. The JTIDS system is fairly early in the Life Cycle Systems Management Model process. Empirical performance data on training programs does not exist. Therefore, synthesis of a training program was one of the first tasks of the analysts. As the program was developed, decision points were resolved in favor of cost-effectiveness. These decisions plus assigned constraints such as, "Initial training in the field will be by the contractor," have limited the Training Program Alternative (TPA) options. The four TPA options in Table 3-15 represent the possible combination of answers to the following two questions asked by the Air Defense School:

TRAINING PROGRAM ALTERNATIVES

- o I-A. The complete Extended POI trained at the Air Defense Artillery School using an I-FAULT Trainer to train tasks O-2002, M-2003 and M-2005.
- o I-B. The complete Extended POI trained at the Air Defense School using actual equipment.
- o II-A. The Extended POI minus Module 5 trained at the Air Defense Artillery School using an I-FAULT Trainer to train tasks O-2002, M-2003 and M-2005.
- o II-B. The Extended POI minus Module 5 trained at the Air Defense Artillery School using actual equipment.

TABLE 3-15

JTIDS TRAINING REQUIREMENT

	FAADS	HIMAD	TOTALS
1993	15	--	15
1994	24	--	24
1995	71	--	71
1996	123	118	241
1997	173	118	291
1998	173	118	291

TABLE 3-16

- o Is it cost-effective for the student to receive training on all JTIDS critical tasks at the US Army Air Defense School, Fort Bliss, Texas?

- o Is it cost-effective for the student to receive training that utilizes identified training devices? (Para 3.2.5)

3.2.6.2 **Costing the Training Program Alternatives.** The first element of costing to be determined was the student population. The number of students needed for attrition replacement drives resource requirements such as the number of instructors and amounts of equipment needed. It has been established by Subject Matter Experts at both Fort Gordon and Fort Bliss that each JTIDS will require a support crew of three individuals for both continuous operation and/or meeting mobility requirements such as the erection of the 34 meter antenna. To support JTIDS fielding, it is presently planned for a contractor to train unit personnel in the field as the units receive JTIDS. Therefore, initial training is not addressed further in this analysis. It is anticipated that no more than 1/3 of the three man crew instructed by contractors will be retained. On average then, only one man of the JTIDS three man crews will be retained with the other two crew members being replaced within two years. Therefore, the demand will be for one trained replacement per year per JTIDS system. Table 3-16 presents the number of systems to be deployed as well as the training requirements. The acquisition scheduling information was provided by MICOM at Redstone Arsenal, Alabama and DCD at Fort Bliss, Texas. It is recognized that the 1993-1995 timeframe will have a slightly larger requirement due to the build up within HIMAD. The costing figures, however, are based on the peak loads of 291 students from 1997. In the TRADOC-FORSCOM RESOURCE FACTOR HANDBOOK dated April 1986 on pages 7 and 8 the composite standard rates for costing military personnel indicates that an E-2 has an annual cost of $18,716, a monthly cost of $1,560, and each day of training costs $72 per student.

Options I-A and I-B both have all critical tasks trained in residence at the US Army Air Defense School, Fort Bliss, Texas. The length of the course would be 2 weeks and 3 days for a total of 13 days. The cost for students then in Option I is equal to 13 (days) times 72 (cost per student per day) times 291 (total student load) or $272,376 (Table 3-17).

COST OF STUDENTS

	OPTIONS IA and IB	OPTIONS IIA and IIB
LENGTH OF COURSE IN DAYS	13	10
COST PER STUDENT PER DAY	72	72
	936	720
NUMBER OF STUDENTS PER YEAR	291	291
	$272,376	$209,520

TABLE 3-17

Options II-A and II-B both have the 3 day practical exercise or field training left for the gaining units to instruct. The cost for students in Option II is equal to 10 (days) times 72 (cost per student per day) times 291 (total student load) or $209,520.

The number of instructors needed and their cost is variable according to the training program alternative selected. Obviously when the class is relatively short in duration, a larger number of classes with fewer students per class will allow for better utilization of instructors and will require less equipment. The number of successful students required is 291 per year. The crew size that will work together will be 3. Efficient utilization of equipment and instructors occurs with 9 students per class with 36 classes each year.

Explicit instructions for determining Instructor Contact Hours (ICH) are provided in PAM 570-558, Appendix C, paragraph C-4, Figure C-2 (computing ICH for a class frequency of one). In Table 3-18 the ICH for Options I-A&B and II-A&B are computed. All conference classes and all PE classes were combined for illustrative purposes. The total for one class was multiplied by 36, the number of classes required each year. The total ICH was divided by 1250 the ICH one instructor can provide per year. The answer was then rounded up to 8 for Option I and 6 for Option II. PAM 570-558, page C-4, states that one instructor/supervisor would be provided for a total of 9 for Option I and 7 for Option II. The TRADOC-FORSCOM RESOURCE FACTOR HANDBOOK indicates that enlisted instructor personnel at the US Army Air Defense School cost $30,789 annually. This cost was multiplied by the number of instructor personnel needed for each option. The results as shown on Table 3-18 are, for Option I instructor costs, $277,101, for Option II instructor costs are $215,523.

The final variable in costing is that of equipment. Equipment is identified on Table 3-19 as either tactical or training. Under training the Isolation Fault (IF) trainer (para 3.2.5.2) price is based on obtaining only two trainers. Each additional trainer costs an additional $150,000. This place includes manuals and spare parts. If a decision was made to field the IF trainer for sustainment training, the individual cost would be significantly reduced. If a decision was reached to utilize more of the IF trainers then the cost effectiveness of Options I-A and II-A would be increased. The discriminator between the A and B systems is only whether the IF trainer should be utilized.

Costing by Training Program Alternatives is found on Table 3-20. This is a compilation of student, instructor and equipment costs.

3.2.7 **Trade-Off Analysis.** The final phase of this CTEA process is to conduct a trade-off analysis between cost and effectiveness that can be used for selecting from the TPAs under consideration.

INSTRUCTOR COST PER OPTION

OPTION I-A&B

SUBJECT	TYPE	HOURS	SECTION	GROUP		ICH	
a	b	c	d	e	=	f	
Conference	c	8	1	1		8	
PE	PE	86	1	3		258	
						266	
						36	Classes
						9576	Total ICH

9576 / 1250 per instructor = 7.66 = 8 instructors
1 supervisor
9 TOTAL

$30,789 annual instructor cost
× 9
$277,101 instructor option cost

OPTION II-A&B

a	b	c	d	e	=	f	
Conference	c	7	1	1		7	
PE	PE	67	1	3		201	
						208	
						36	Classes
						7488	Total ICH

7488 / 1250 per instructor = 5.99 = 6 instructors
1 supervisor
7 TOTAL

$30,789 annual instructor cost
× 7
$215,523 instructor option cost

TABLE 3-18

JTIDS EQUIPMENT COST

A TACTICAL	B COST	C LIFE	D DEPRECIATION	E QUANTITY	F TOTAL	G
2M Terminal	353,000	20 years	17,650	7	123,550	
Indicator Control	70,000	20 years	3,500	7	24,500	
Two 10kW Generator (trailer mounted)	35,000	20 years	1,760	3	5,280	
HMMV 5/4 ton	22,600	20 years	1,130	3	3,390	
Shelter (250 g)	20,200	20 years	1,010	3	3,030	
34 meter Antenna	10,485	20 years	525	3	1,575	OPTI IB an $161
TRAINING						
Isolation Fault Trainer	507,500	20 years	25,375	2	50,750	
Video Tape (Master & 2 copies)	111,006	20 years	5,550	1	5,550	
					56,300	OPTI
		Same tactical equipment costs as IB & IIB			161,325	IA AN $217

TABLE 3-19

PEAK YEAR COSTING OF TRAINING PROGRAM ALTERNATIVES

OPTIONS	IA	IB	IIA	IIB
STUDENTS (TABLE 3-17)	272,376	272,376	209,520	209,520
INSTRUCTORS (TABLE 3-18)	277,101	277,101	215,523	215,523
EQUIPMENT (TABLE 3-19)	217,625	161,325	217,625	161,325
	$767,102	$710,802	$642,668	$586,368

TABLE 3-20

Since the TPA costs were computed in 3.2.6, the next requirement for trade-off analysis is to estimate TPA aggregate effectiveness: training figures-of-merit.

3.2.7.1 **Training Program Alternative Effectiveness.** TPA aggregate effectiveness estimates were obtained by summing the product of the task-level training efficiency estimates and the indices of training worth across tasks:

$$TPE_R = \sum_{i=1}^{n} W_i E_{ik}$$

TPE denotes the estimated effectiveness of the R^{th} TPA.
W_i represents the training worth of the i^{th} task.
E_{ik} is the estimated efficiency of the k^{th} training context for the i^{th} task.

Table 3-21 presents E_{ik}, W_i and W_iE_{ik} for use in computing TPE_R (TPA aggregate effectiveness). The derivation of Task Training Worth (W_i) is presented in the Estimate Training Worth, Section 3.2.3.2 and training context efficiency estimates with respect to alternative trainee groups is presented in the Training Efficiency, Section 3.2.3.1. The Context Efficiencies (E_{ik}) presented in Table 3-21, Weighted Worths, result from integrating the separate efficiency estimates obtained for alternative trainee groups. Once the recommended training times (RTTs) were established, the sets of efficiency estimates were reviewed using the RTTs as an index to extract efficiency estimates from each set of estimates. These extracted efficiencies were then averaged to obtain the E_{ik} presented in Table 3-21.

The TPAs of interest identified in 3.2.6 are:

- o I-A. The complete Extended POI trained at the Air Defense Artillery School using an I-FAULT Trainer to train tasks O-2002, M-2008 and M-2005.

- o I-B. The complete Extended POI trained at the Air Defense School using actual equipment.

- o II-A. The Extended POI minus Module 5 trained at the Air Defense Artillery School using an I-FAULT Trainer to train tasks O-2002, M-2003, and M-2005.

- o II-B. The Extended POI minus Module 5 trained at the Air Defense Artillery School using actual equipment.

The training figure-of-merit (FOM) values for the TPAs of interest are:

TPA	FOM
I-A	194319

WEIGHTED WORTHS

TASK #	CONTEXT EFFICIENCY (E_{ik})	TASK WORTH (W_i)	WEIGHTED WORTH ($W_i E_{ik}$)
M-1001	.90	5549	4994
O-1001	.95	6926	6580
M-2001	.93	8531	7934
M-2002	.93	8531	7934
M-1002	.92	5190	4775
O-1002	.92	7835	7208
M-1003	.90	2689	2420
O-1003	.92	791	728
M-1004	.95	2689	2555
O-2001	.87	7470	6499
O-2002	.88	8281	7287
O-1004	.90	8174	7357
M-2003	.88	7917	6966
M-1005	.90	5788	5209
M-2004	.90	8584	7726
M-2005	.92	8833	8126
M-2006	.92	8174	7520
O-2003	.93	7291	6781
M-1006	.88	2689	2366
O-1005	.92	8926	8212
O-1006	.88	6926	6095
O-2004	.93	7854	7304
O-3001	.80	8315	6652
O-1007	.93	5755	5352
O-1008	.95	6466	6143
M-1007	.85	5788	4920
M-1008	.87	6148	5349
M-1009	.90	4721	4249
M-1010	.95	2689	2555
M-1011	.95	5987	5688
O-1009	.95	5499	5224
O-1010	.88	4843	3874
O-1011	.90	3674	3307
O-1012	.88	6798	5982
O-1013	.92	2692	2477

TABLE 3-21

I-B	194319
II-A	134173
II-B	134173

3.2.7.2 **Training Benefit.** The training program merit scores presented in 3.2.7.1 were next combined with training program cost options to establish the training benefit (TB) of implementing each TPA. An index of training benefit was obtained by dividing training program figures-of-merit (TPE_R) by training program cost (TPC_R). Using the TPA figures-of-merit (FOM) from 3.2.7.1 and costs from 3.2.6.2. The FOMS for the TPAs of concern are:

I-A	194319/$767102	=	.2533
I-B	194319/$710802	=	.2734
II-A	134173/$642668	=	.2088
II-B	134173/$586368	=	.2289

Based on this trade-off analysis, Option I-B, training the complete Extended POI at the Air Defense Artillery School, is the most cost-effective alternative for training replacement JTIDS personnel. However, Option I-B's FOM is based on a comparatively high cost of an I-FAULT compared to the overall low cost of training. The high cost of the I-FAULT is because the low number of projected students used for this study requires a low number of I-FAULTs and this does not allow for distributing I-FAULT design and development costs. If the student throughput increases significantly or I-FAULTs are acquired to support unit training, a follow-on trade-off analysis would show alternative I-A and I-B to have FOMs much closer to each other.

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) COST AND TRAINING EFFECTIVENESS ANALYSIS (CTEA)

CHAPTER 4
ESSENTIAL ELEMENTS OF ANALYSIS (EEA) SUMMARY AND CONCLUSIONS

This CTEA was focused on, but not limited to, the EEAs provided by the US Army Air Defense School. This chapter summarizes the CTEA from the prospective of those EEAs.

4.1 EEA ONE

What are the critical tasks required for operating and maintaining JTIDS?

- Analysis of JTIDS technical documentation, missions and functions yielded the critical tasks presented in Table 3-3. Additionally, Table 3-14 presents the worth of training each of these critical tasks. The worth of training a task approximates the criticality of the task from a training prospective.

4.2 EEA TWO

How does the set of critical tasks vary when JTIDS is employed by or deployed alternatively with PATRIOT, HAWK, AN/TSQ-73 and FAADS C^2I systems?

- The only official, approved Required Operating Capability document for deploying JTIDS with air defense, during the time of this study, was for deployment with FAADS C^2I systems. However, it was found that the FAADS deployment would produce the most extensive task list. Therefore, the FAADS deployment task list was used for this study. Other deployment options may reduce the number of required tasks: primarily shelter and generator related tasks are reduced or eliminated when JTIDS is deployed

with other systems.

4.3 EEA THREE

Are there problems expected with training JTIDS task to personnel that will be selected by the current selection criteria for training in ADA MOSs?

- Required training times and training methods were elicited from SME who were familiar with training signal personnel like tasks on like systems. These times and methods were used to elicit training efficiency estimates, for training ADA personnel, from ADA instructors familiar with ADA student's learning characteristics. Analysis based on these estimates revealed no expected training problems.

4.4 EEA FOUR

Can JTIDS tasks be assigned to all relevant ADA MOSs as common tasks or is there one MOS group that can be more cost effectively trained?

- The trainability assessment was focused on ADA MOS students representative of students currently selected for ADA operator and maintainer training. The assessment indicated that either group can be trained to perform both operator and maintainer tasks. The analysis also indicated that no one group could be more cost effectively trained than another.

4.5 EEA FIVE

What is the optimum MOS structure (MOS and skill levels) for operator and maintainer duties?

- The trainability analysis identified no optimum MOS (See 4.4 above). Skill levels, based on difficulty of performance mastery, were identified by a logic sort and

are presented in Table 3-6 (See 3.2.2.2).

4.6 EEA SIX AND EEA SEVEN

What is the recommended training strategy and a realistic POI configuration?

- The cost-effectiveness trade-off analysis indicates that JTIDS training for training replacement personnel should be conducted as resident training. The recommended POI configuration is the structure and sequence presented by the Extended POI (Annex D).

4.7 EEA EIGHT

What is the optimal instructional strategy training the JTIDS POI? (media, method)

- The recommended training method and training media is identified in Table 3-9 (Training Context Recommendations). The Training Device Requirements Analysis identified a possible requirement for a I-FAULT Trainer. Trade-off analysis, based on the small throughput of students, does not justify acquiring the trainer. This result is based on the large cost of design and development (D&D) plus a small number of required training devices to distribute the cost D&D over. However, if the student throughput increases and/or more devices are procured and distributed to JTIDS user units, the cost per device is greatly reduced and it should be cost-effective to acquire the I-FAULT.

4.8 EEA NINE

What is a cost-efficient approach for training present Air Defense MOS/AOC holders affected by fielding JTIDS?

- During the course of investigation for this study, it was found that it is planned for the JTIDS contractor to

conduct initial training in the field as JTIDS is fielded. Replacement personnel should be trained by the Air Defense Artillery School.

REFERENCES

TRADOC Training Effectiveness Analysis Handbook, First Draft White Sands Missile Range, US Army TRADOC Systems Analysis Activity, undated.

Dawdy, Edward D., et al. REMBASS TECHNICAL TRADE-OFF ANALYSIS REPORT, (DABT60-80-C-0056) Valencia, Pennsylvania: Applied Science Associates, Inc., March 1981.

Dawdy, Edward D., et al. AH-64 Interim Trade-off Analysis Report, (DABT01-80-C-0322-1). Valencia, Pennsylvania: Applied Science Associates, Inc., April 1981.

Dawdy, Edward D., and Hawley, J.K. A Forecasting Method for Training Effectiveness Analysis. Paper presented at the 26th Annual Meeting of the Human Factors Society, Seattle, Washington, October 1982.

Frederickson, E.W., Hawley, J.K., and Whitmore, P.G. The Training Developer's Decision Aid (TDDA): A Computer-Aided Approach to Training Design (Technical Report). US Army Research Institute for the Behavioral and Social Sciences, Alexandria, Virginia, May 1983.

Keeney, R.L., and Raiffa, H. Decisions with Multiple Objectives: Preferences and Value Trade-offs. John Wiley and Son, Inc., New York, 1976.

Matlick, Richard K., et al. Cost and Training Effectiveness Analysis in the Army Life Cycle Systems Management Model, Springfield, Virginia: Litton Mellonics, July 1980.

TRASANA-TEA-56-82: Multiple Launch Rocket System (MLRS) Cost and Training Effectiveness Analysis (CTEA), December 1982.

ANNEX A

BIOGRAPHICAL INFORMATION ON JTIDS SUBJECT MATTER EXPERTS - US ARMY SIGNAL SCHOOL; FORT GORDON, GEORGIA

SUBJECT MATTER EXPERT #1 - GS-1712 Training Specialist

Team Chief - Army Data Distribution Systems Training EPLRS/JTIDS

32 years Communication Experience in Repair and Operation of Tactical Communications - 24 years Military Experience.

Factory trained IDS/IGTS 6 weeks 1984

Operator/Organizational Maintenance Training at Factory 1985

JTIDS Team Chief 4 years

Worked for DOTD/TSM ADDS and Training Department (MOS 29E)

SUBJECT MATTER EXPERT #2 - GS-1709 Training Specialist

Factory trained as JTIDS Operator 1985

3 years Experience instructing and acting as SME on JTIDS project to include review of new TMs and other publications. Attended NET Management Course 1986

Visited JTIDS Test Bed, Ft. Lewis, Washington

HAWK JTIDS Test at White Sands Missile Range, New Mexico

Participated in OT Test, Eglin AFB, Florida 1987

26 years in Communications Field, Retired USA E9

Training Instructor at Signal School and holds Georgia Teaching Credentials

SUBJECT MATTER EXPERT #3 - Instructor/Writer

11 years US Army, three years on JTIDS

Factory trained on JTIDS 1985

Taught two JTIDS classes at Ft. Bliss, Texas and one at Ft. Huachuca, Arizona 1986-1988

Currently reviewing TMs, CTIs, SS, LPs, and W/Bs prepared by contractor (Singer Kearfott). Writing similar material for Training Test Support Package.

ANNEX B

11 FACTOR DATA

ANNEX B

11 FACTOR DATA

TASK NUMBER M-1001

TASK NAME PERFORM PMCS ON GENERATOR SET

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	H
DEGREE OF DEPENDENCE	M

TASK NUMBER O-1001

TASK NAME OPERATE GENERATOR SET

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER M-2001
TASK NAME FAULT ISOLATE GENERATOR SET

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	H
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER M-2002
TASK NAME REPAIR GENERATOR SET

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	H
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER M-1002
TASK NAME PERFORM PMCS ON SHELTER

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	H
DEGREE OF DEPENDENCE	M

TASK NUMBER O-1002
TASK NAME POWER UP/DOWN SHELTER

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER M-1003

TASK NAME PERFORM PMCS ON ENVIRONMENTAL CONDITIONER SYSTEM (ECS)

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	L
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER O-1003

TASK NAME CONDITION SHELTER ENVIRONMENTAL CONTROL SYSTEM (ECS)

LEARNING DIFFICULTY	L
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	M
IMPORTANCE TO MISSION	L
IMMEDIACY OF PERFORMANCE	M
CIVILIAN ACQUIRED SKILL	L
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	L

TASK NUMBER M-1004

TASK NAME PERFORM PMCS ON JTIDS SUBSYSTEMS (CLASS 2M TERMINAL AND INDICATOR CONTROL)

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	L
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER O-2001

TASK NAME LOAD CRYPTO VARIABLES

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	H
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	H
WARTIME TASKS	M
TASK DECAY RATE	H
DEGREE OF DEPENDENCE	H

TASK NUMBER O-2002

TASK NAME INITIALIZE CLASS 2M TERMINAL

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	H
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	H
DEGREE OF DEPENDENCE	H

TASK NUMBER O-1004

TASK NAME DE-ENERGIZE THE CLASS 2M TERMINAL

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	H

TASK NUMBER M-2003
TASK NAME FAULT ISOLATE CLASS 2M TERMINAL USING BIT (ONLY)

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	H

TASK NUMBER M-1005
TASK NAME PACK/UNPACK SHOP REPLACEABLE UNITS (SRUs)

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	M
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER M-2004
TASK NAME REPAIR CLASS 2M TERMINAL

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	H

TASK NUMBER M-2005
TASK NAME FAULT ISOLATE INDICATOR CONTROL (IC)

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	H
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	H

TASK NUMBER M-2006

TASK NAME REPAIR INDICATOR CONTROL (IC)

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	H

TASK NUMBER O-2003

TASK NAME OPERATE AND MONITOR JTIDS OPERATIONS

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	H
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	H
WARTIME TASKS	M
TASK DECAY RATE	H
DEGREE OF DEPENDENCE	H

TASK NUMBER M-1004

TASK NAME PERFORM PMCS ON AD-JTIDS SUBSYSTEMS (ANTENNAS)

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	L
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER O-1005

TASK NAME ASSEMBLE/INSTALL/DISASSEMBLE ANTENNA ON SHELTER

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER O-1006

TASK NAME ASSEMBLE/DISASSEMBLE ANTENNA AT REMOTE SITE

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER O-2004

TASK NAME ASSEMBLE/DISASSEMBLE 34M ANTENNA

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	H

TASK NUMBER 0-3001
TASK NAME SELECT SITE AND EMPLACE EQUIPMENT

LEARNING DIFFICULTY	H
PERFORMANCE DIFFICULTY	H
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	M

TASK NUMBER O-1007
TASK NAME LOAD/UNLOAD THE SHELTER

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	L
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	L
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	M

TASK NUMBER O-1008
TASK NAME UNPACK/SECURE THE SHELTER

LEARNING DIFFICULTY	L
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	M

TASK NUMBER M-1007
TASK NAME PACK/UNPACK AD-JTIDS SUBSYSTEMS

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	M
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	H
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER **M-1008**

TASK NAME **REMOVE/INSTALL 2M TERMINAL AND IC FROM/IN SHELTER OR HOST SYSTEM**

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER **M-1009**

TASK NAME **REMOVE/INSTALL LOCAL COMMUNICATIONS FROM/IN SHELTER**

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER M-1010

TASK NAME PERFORM PMCS ON LOCAL COMMUNICATION SYSTEM

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	L
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	H

TASK NUMBER O-1009

TASK NAME SET-UP AND OPERATE LOCAL COMMUNICATIONS

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	H
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	M

TASK NUMBER M-1011
TASK NAME FAULT ISOLATE LOCAL COMMUNICATIONS SYSTEM

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	M
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	M

TASK NUMBER 0-1010
TASK NAME INSPECT THE SHELTER

LEARNING DIFFICULTY	L
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	L
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	M
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	M

TASK NUMBER 0-1011

TASK NAME PACK/UNPACK GENERATOR SET

LEARNING DIFFICULTY	L
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	L
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	L

TASK NUMBER 0-1012

TASK NAME CONNECT/DISCONNECT EXTERNAL CABLES

LEARNING DIFFICULTY	M
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	H
IMPORTANCE TO MISSION	H
IMMEDIACY OF PERFORMANCE	H
CIVILIAN ACQUIRED SKILL	H
IMPORTANCE TO SURVIVAL	M
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	M
DEGREE OF DEPENDENCE	M

TASK NUMBER 0-1013

TASK NAME REMOTE INDICATOR CONTROL (IC)

LEARNING DIFFICULTY	L
PERFORMANCE DIFFICULTY	L
TIME DELAY TOLERANCE	M
IMPORTANCE TO MISSION	M
IMMEDIACY OF PERFORMANCE	L
CIVILIAN ACQUIRED SKILL	M
IMPORTANCE TO SURVIVAL	L
FREQUENCY OF PERFORMANCE	L
WARTIME TASKS	M
TASK DECAY RATE	L
DEGREE OF DEPENDENCE	L

ANNEX C

QUASI POI

POWER UP/POWER DOWN
SYSTEM - MODULE

TASK: M-1001

TASK TITLE: Perform Preventive Maintenance Checks and Services on Generator Set.

TASK STANDARD: Perform PMCS per TM Instructions, identifying deficiencies and correct or report as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate generator components using location diagrams.	
Recall criteria and recognize unsatisfactory conditions.	
Verify state indicators are within tolerance.	
Condition generator as required.	

CONDITION/S: Given the Generator Set, organizational tools and spares, TM and TAMMS Forms.

STANDARD/S: All systematic, periodic preventive maintenance checks and services are performed as scheduled or required per appropriate TM. Deficiencies and shortcomings found will be recorded on DA Form 2404 and deficiencies must be corrected.

TASK: O-1001

TASK TITLE: Operate Generator Set.

TASK STATEMENT: Prepare Generator Set for Operation, and Condition Generator Set to Operate, Start-Up and Shut-Down Generator Set.

ENABLING TASK 1: Perform PMCS on Generator Set

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Recall damage criteria and recognize unsatisfactory conditions.	Locate system/equipment components using location diagrams.
Condition switches as required.	Recall criteria and recognize unsatisfactory conditions.
Execute written instructions on electrical/mechanical devices.	Verify state indicators are within tolerance.
	Condition equipment as required.

CONDITION/S: Given a Generator Set, appropriate operator TM and TAMMS Forms.

STANDARD/S: Generator Set must be operating and providing power *for/to* the JTIDS system within X minutes. Any before and after operation deficiencies and shortcomings will be recorded on a DA Form 2404, deficiencies will be corrected and shortcomings will be corrected or correction delayed as appropriate.

TASK: M-2001

TASK TITLE: Fault Isolate Generator Set

TASK STATEMENT: Using Built-in Indicators identify the area where the problem is located.

ENABLING TASK 1: Operate Generator Set

ENABLING TASK 2: Perform PMCS on Generator Set

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on electrical devices.	Locate generator components using location diagrams.
Memorize rules and recall procedures.	Recall criteria and recognize unsatisfactory conditions.
	Verify state indicators are within tolerance.

CONDITION/S: Given a Generator Set, test equipment, TM and TAMMS Forms.

STANDARD/S: All deficiencies must be identified and corrected where possible according to procedures given in appropriate TMs. Deficiencies should be correctly documented on TAMMS Forms (DA Forms 2402, 2404, 2407).

TASK: M-2002

TASK TITLE: Repair Generator Set

TASK STATEMENT: Replace faulty units or sections that have been identified as problem areas. Faulty unit includes fuzes, light bulbs, fuel filter and battery.

ENABLING TASK 1: Fault Isolate Generator Set

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use organizational tools.	Located generator components using location diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on mechanical and electrical devices.
	Memorize rules and recall procedures.

CONDITION/S: Given a Generator Set, organizational tools and spares, TM and TAMMS Forms.

STANDARD/S: All discrepancies noted must be identified and corrected when possible according to appropriate TM procedures. Any deficiencies not corrected will be reported on TAMMS Forms.

TASK: M-1002

TASK TITLE: Perform Preventive Maintenance on JTIDS Shelter

TASK STATEMENT: Perform PMCS per TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system/equipment components using locational diagrams.	
Recall damage criteria and recognize unsatisfactory conditions	

CONDITION/S: Given the Shelter, organizational spares, TM and TAMMS Forms.

STANDARD/S: All systematic, periodic preventive maintenance checks and services are performed as scheduled or as required per appropriate TMs. Those deficiencies not corrected must be identified and correctly reported on DA Form 2404.

TASK: O-1002

TASK TITLE: Power Up/Down Shelter

TASK STATEMENT: Power up/down shelter. Insure all equipment is prepared for application or removal of power to the shelter.

SUBTASK 1: Condition Shelter for Power

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on an electrical device.	Locate shelter system components using locational diagrams.
Verify state indicators are within tolerance.	

CONDITION/S: Given the Shelter with power available, System TM and TAMMS Forms.

STANDARD/S: All components are preset and conditioned for power. The shelter is energized or deenergized per appropriate TM. Those deficiencies and shortcomings found will be recorded on a DA Form 2404 and deficiencies must be corrected.

TASK: M-1003

TASK TITLE: Perform Preventive Maintenance on Environmental Control System

TASK STATEMENT: Perform PMCS per TM instructions, identify deficiencies or shortcomings and correct or report as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate ECS components using location diagrams.	
Recall criteria and recognize unsatisfactory conditions.	
Condition ECS as required.	

CONDITION/S: Given the Shelter with Environmental Control System installed, TM and TAMMS Forms.

STANDARD/S: All deficiencies and shortcomings must be found. Deficiencies and shortcomings found must be recorded on DA Form 2404 and deficiencies corrected.

TASK: O-1003

TASK TITLE: Condition Shelter Environmental System ON or OFF

TASK STATEMENT: Prepare Environmental Conditioner Unit for either heating or cooling as appropriate.

ENABLING TASK 1: Perform PMCS on Environmental Control System

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on ECS.	Locate ECS components using locational diagrams.
Verify state indicators are within tolerance.	

CONDITION/S: *Given* the Shelter with power available, an operational shelter Environmental System, Operator TM and TAMMS Forms.

STANDARD/S: Condition Shelter Environmental System ON of OFF per appropriate TM. Any deficiencies and shortcomings must be identified and correctly reported on DA Form 2404.

TASK: M-1004

TASK TITLE: Perform Preventive Maintenance on JTIDS Subsystems (Class 2M Terminal and Indicator Control)

TASK STATEMENT: Perform PMCS per TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system components using locational diagrams.	
Execute written instructions on electrical devices.	
Recall criteria and recognize unsatisfactory conditions.	

CONDITION/S: Given the Shelter with JTIDS Subsystems (Class 2M Terminal and Indicator Control), TM and TAMMS Forms.

STANDARD/S: All deficiencies and shortcomings must be identified and recorded on a DA Form 2404. Deficiencies must be corrected according to appropriate TMs.

OPERATE/MAINTAIN MODULE

TASK: O-2001

TASK TITLE: Load Crypto Variables

TASK STATEMENT: Using General Purpose Type Reader and an Electronic Transfer Device, key local variables into the Class 2M Terminal.

SUBTASK 1: Energize the Class 2M Terminal

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Install/remove secure data unit KGY-8/TSEC	
Condition Switches as required.	
Communicate via symbols.	
Execute written instructions on electrical device.	

CONDITION/S: Given an operational Class 2M Terminal, electronic transfer device, appropriate crypto code, operator TM and TAMMS Forms.

STANDARD/S: Class 2M Terminal must be encoded with the correct crypto variables. Any deficiencies identified on the Class 2M Terminal or the Electronic Transfer Device must be recorded on a DA Form 2404.

TASK: O-2002

TASK TITLE: Initialize Class 2M Terminal

TASK STATEMENT: Apply power, follow menus and initialization procedures in Operator TM.

SUBTASK 1: Energize the Class 2M Terminal

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system components using locational diagrams.	Recall damage criteria and recognize unsatisfactory conditions.
Execute written instructions on electrical device.	
Communicate via symbols.	
Interpret fault indicators.	

CONDITION/S: Given an Operating Class 2M Terminal with crypto variables loaded, indicator control, initialization instructions and TAMMS Forms.

STANDARD/S: Class 2M Terminal must be initialized with the correct variables. Any deficiencies identified on the Class 2M Terminal or indicator control must be recorded on a DA form 2404.

TASK: O-1004

TASK TITLE: Deenergize Class 2M Terminal

TASK STATEMENT: Position all controls and switches for power down (ensure that initialization and crypto variables are retained).

SUBTASK 1: Load Rapid Load Device

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition switches as required.	Locate system components using locational diagrams. Recall damage criteria and recognize unsatisfactory conditions. Execute written instructions on electrical devices.

CONDITION/S: Operational JTIDS Subsystem, TM and TAMMS Forms.

STANDARD/S: JTIDS Subsystems will be deenergized to ensure retention of initialization data and crypto variables. Any deficiencies must be identified and correctly reported on DA Form 2404.

TASK: M-2003

TASK TITLE: Fault Isolate Class 2M Terminal

TASK STATEMENT: Using BIT and BITE determine the SRU where the fault is located.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on electrical device.	Locate system/equipment components using locational diagrams.
Communicate via words and symbols.	Recall criteria and recognize unsatisfactory conditions.
Memorize rules and recall procedures.	

CONDITION/S: Given the Shelter with Class 2M Terminal, Indicator Control, communications, operating power, TM and TAMMS Forms.

STANDARD/S: Fault Isolation Procedures are used to correctly identify deficiencies when possible according to appropriate TMs.

TASK: M-1005

TASK TITLE: Unpack and Pack Shop Replaceable Units (SRUs) from/into Shipping Containers

TASK STATEMENT: Using proper procedures to include Electro-Static Discharge (ESD) safety procedures remove/replace SRUs from/into containers.

SUBTASK 1: Observe ESD Procedures
SUBTASK 2: Visually Inspect SRUs
SUBTASK 3: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on electrical and mechanical devices.	
Recall specific damage criteria and recognize unsatisfactory conditions.	

CONDITION/S: Given Packaged or Unpackaged Shop Replaceable Units (SRUs), ESD Equipment, TM and TAMMS Forms.

STANDARD/S: All procedures must be done according to TM. Any deficiencies noted on SRUs will be correctly reported on DA Form 2404.

TASK: M-2004

TASK TITLE: Repair Class 2M Terminal

TASK STATEMENT: Replace faulty units or cards that have been identified during fault isolation.

ENABLING TASK 1: Fault Isolate Class 2M Terminal

SUBTASK 1: Prepare TAMMS Forms

SUBTASK 2: Observe ESD Procedures

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.
	Memorize rules and recall procedures.
	Communicate via words and symbols.

CONDITION/S: Given a Class 2M Terminal, SRUs, TM and TAMMS Forms.

STANDARD/S: All deficiencies must be corrected when possible according to appropriate TM procedures. Any deficiencies not corrected will be correctly reported on TAMMS Forms.

TASK: M-2005

TASK TITLE: Fault Isolate Indicator Control (IC)

TASK STATEMENT: Using BIT and BITE determine the areas where the problem is located.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.
	Memorize rules and recall procedures.
	Communicate via symbols.

CONDITION/S: Given an Indicator Control, TM and TAMMS Forms.

STANDARD/S: Fault Isolation Procedures are used to correctly identify deficiencies when possible according to appropriate TMs.

TASK: M-2006

TASK TITLE: Repair Indicator Control (IC)

TASK STATEMENT: Replace faulty units or cards that have been identified during fault isolation.

ENABLING TASK 1: Fault Isolate Indicator Control

SUBTASK 1: Prepare TAMMS Forms

SUBTASK 2: Observe ESD Procedures

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.
	Memorize rules and recall procedures.
	Communicate via words and symbols.

CONDITION/S: Given Indicator Control (IC), required spares, TM and TAMMS Forms.

STANDARD/S: All discrepancies noted must be identified and corrected when possible according to appropriate TM procedures. Any deficiencies not corrected will be correctly reported on TAMMS Forms.

TASK: O-2003

TASK TITLE: Operate and Monitor JTIDS Operation

TASK STATEMENT: Operate Class 2M Terminal and IC, Monitor BITE and maintain commo logs.

ENABLING TASK 1: Initialize Class 2M Terminal

ENABLING TASK 2: Load Crypto Variables

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Interpret fault indicators.	Communicate via symbols and written word.
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.

CONDITION/S: Given an operational JTIDS System, System TM, appropriate LOG sheets and TAMMS Forms.

STANDARD/S: JTIDS is operational, BITE is monitored and faults detected. Normal traffic properly recorded on log sheets. Any system deficiencies noted during operation must be identified and correctly reported on DA Form 2404.

ANTENNA MODULE

TASK: M-1006

TASK TITLE: Perform Preventive Maintenance on JTIDS Subsystem (Antennas)

TASK STATEMENT: Perform PMCS form TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition equipment as required.	
Locate system components using locational diagrams.	
Execute written instructions on electrical/mechanical devices.	
Recall criteria and recognize unsatisfactory conditions.	

CONDITION/S: Given the Shelter with JTIDS Subsystem (Class 2M Terminal, IC and Antennas), TM and TAMMS Forms.

STANDARD/S: All deficiencies and shortcomings must be identified and recorded on DA Form 2404. Deficiencies must be corrected according to appropriate organizational level TMs.

TASK: O-1005

TASK TITLE: Assemble/Install/Disassemble Antenna on Shelter

TASK STATEMENT: Observing normal safety procedures put up and take down the shelter antenna following TM procedures.

ENABLING TASK 1: Perform PMCS on JTIDS Subsystem (Antenna)

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Assemble structural kits/ sets.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter, the Antenna, Operator TM and TAMMS Forms. Task performed in minimal wind conditions.

STANDARD/S: The antenna must be erected within 40 minutes. Signals must be capable of being received to verify operational status of antenna. Disassembly must be done in sequence in 40 minutes and antenna be properly stored. Antenna deficiencies and shortcomings must be recorded on DA Form 2404.

TASK: O-1006

TASK TITLE: Assemble/Disassemble Antenna at Remote Site

TASK STATEMENT: Observing normal safety precautions put up and take down the shelter antenna at a remote site following TM procedures.

ENABLING TASK 1: Perform PMCS on JTIDS Subsystem (Antenna)

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Assemble structural kits/sets.
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the antenna with remote installation kit, Operator TM, installing tools and TAMMS Forms. Performed in minimal wind conditions.

STANDARD/S: The antenna must be erected within 60 minutes. Signals must be received to verify operational status of antenna. Disassembly must be done in sequence in 60 minutes and antenna and remote kit be properly stored. Antenna deficiencies and shortcomings must be recorded on DA Form 2404.

TASK: O-2004

TASK TITLE: Assemble/Disassemble 34M Antenna

TASK STATEMENT: Observing normal safety precautions, put up and take down the 34M antenna following TM procedures.

ENABLING TASK 1: Perform PMCS on JTIDS Subsystem (Antenna)

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Assemble structural kits/sets.	Locate system components using locational diagrams.
Execute written instructions on mechanical devices.	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the 34M antenna, operator TM, installing tools and TAMMS Forms. Performed in minimal wind conditions.

STANDARD/S: The antenna must be erected within 120 minutes. Signals must be received to verify operational status of antenna. Disassembly must be done in sequence within 120 minutes and antenna properly stored. Antenna deficiencies and shortcomings must be recorded on DA Form 2404.

MARCH ORDER AND EMPLACE MODULE

TASK: O-3001

TASK TITLE: Select Site and Emplace Equipment

TASK STATEMENT: Choose a location within tolerance of given grid coordinates that reflect adherence to physical security, line of sight (LOS) and cabling requirements.

SUBTASK 1: Correlate Site Position to Grid Reference Map

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instruction on electro-mechanical devices.	General Map Reading.
Communicate via graphic symbology.	Preparation of Terrain Profile (LOS).
	Locate system equipment components using locational diagrams.

CONDITION/S: Given a complete JTIDS (Shelter mounted Class 2M Terminal Set with power plant and antennas) and mission statement.

STANDARD/S: Employment Team must be provided grid coordinates for site. Site must have LOS to another site. Local security requirements based upon enemy threat must be provided for.

TASK: O-1007

TASK TITLE: Unload/Load Shelter

TASK STATEMENT: Observing normal safety precautions, remove/install the shelter from/into a truck. Document any deficiencies.

SUBTASK 1: Operate Truck

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Communication by hand and arm signals.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use special tools (sling assembly).

CONDITION/S: Given a Shelter mounted on a 5/4 truck, wrecker, sling assembly, TM and TAMMS Forms. (Minimum of 2 personnel required plus wrecker operator.)

STANDARD/S: Shelter will be unloaded/loaded from/into truck.

TASK: O-1008

TASK TITLE: Unpack/Secure Shelter

TASK STATEMENT: Unpack Shelter for emplacement/secure Shelter for movement.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition shelter equipment as required.	Locate system components using locational diagrams. Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a Shelter mounted on 5/4 truck, TM and TAMMS Forms.

STANDARD/S: Shelter mounted in 5/4 T vehicle is unpacked/secured in accordance with appropriate TM. Any deficiencies must be identified and correctly recorded on DA Form 2404.

TASK: M-1007

TASK TITLE: Unpack/Pack JTIDS Subsystems

TASK STATEMENT: Remove and/or replace JTIDS Subsystems from and/or into protective container(s).

SUBTASK 1: Prepare TAMMS Forms

SUBTASK 2: Visually Inspect Subsystems

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Assemble/disassemble containers.	Locate system/equipment components using locational diagrams.
	Execute written instructions on mechanical devices.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a packed or unpacked JTIDS Subsystem and appropriate TMs and TAMMS Forms.

STANDARD/S: All discrepancies must be identified as JTIDS Subsystems and unpacked or packed. Any deficiencies found must be properly reported on DA Form 2404.

EXTENDED PRACTICAL TRAINING EXERCISE

OR

UNIT TRAINING

TASK: M-1008

TASK TITLE: Remove and/or Install Class 2M Terminal and Indicator Control (IC) from/into Shelter or Host System

TASK STATEMENT: Disconnect/connect all auxiliary equipment to include mounting hardware.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use mechanical hand tools to connect/disconnect cables and hardware.

CONDITION/S: Given the Shelter with JTIDS Subsystem components (Class 2M Terminal and IC), organizational tools, TM and TAMMS Forms.

STANDARD/S: Removal and/or installation will be performed as required by appropriate TMs. Any deficiencies and/or shortcomings must be correctly reported on a DA Form 2404.

TASK: M-1009

TASK TITLE: Remove and/or Install Local Communications System from/into Shelter.

TASK STATEMENT: Disconnect/connect all telephone and intercom equipment using proper procedures.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Use mechanical hand tools to connect/disconnect and adjust commo components.
	Locate system/equipment components using locational diagrams.
	Execute written instructions on electrical devices.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter with Local Communication System, organizational tools, TM and TAMMS Forms.

STANDARD/S: Task is performed when the Telephone Set, TA-312/PT and Intercom Set are to be removed/installed in accordance with TM procedures. Any deficiencies and/or shortcomings found must be recorded in DA Form 2404.

TASK: M-1010

TASK TITLE: Perform Preventive Maintenance on Local Communications System

TASK STATEMENT: Perform PMCS per TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate local communications components using locational diagrams.
	Execute written instructions on common devices.
	Recall criteria and recognize unsatisfactory conditions.
	Condition commo equipment as required.

CONDITION/S: Given the shelter with local Communications System installed, TM and TAMMS Forms.

STANDARD/S: Task is performed correctly when all PMCS measures have been completed in accordance with TM procedures. Deficiencies and shortcomings are recorded on DA Form 2404. Deficiencies are corrected and shortcomings are corrected or scheduled for corrective action.

TASK: O-1009

TASK TITLE: Set Up and Operate Locate Communication Facilities

TASK STATEMENT: Disconnect/connect all telephone and intercom equipment. Use proper TM procedures for operational details.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use mechanical hand tools to connect/disconnect cables.	Locate system components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on commo devices.

CONDITION/S: Given operational local communications equipment, operator's tool kit, power source, TM and TAMMS Forms.

STANDARD/S: Communications facilities must operate properly as required by appropriate TM. Any deficiencies and/or shortcomings must be identified and correctly reported on a DA Form 2404.

TASK: M-1011

TASK TITLE: Fault Isolate Local Communications System

TASK STATEMENT: Using test equipment, identify the area, possibly cables, and wires where the problem is located.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use electrical hand tools to adjust and monitor inputs/outputs.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.

CONDITION/S: Given the local communications system, organizational tools and test equipment, TM and TAMMS Forms.

STANDARD/S: Task is performed correctly when the TM procedures have been completed and all deficiencies and faults not corrected are properly recorded on TAMMS Forms.

TASK: O-3001

TASK TITLE: Select Site and Emplace Equipment

TASK STATEMENT: Choose a location within tolerance of given grid coordinates that reflect adherence to physical security, line of sight (LOS) and cabling requirements.

SUBTASK 1: Correlate Site Position to Grid Reference Map

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instruction on electro-mechanical devices.	General Map Reading.
Communicate via graphic symbology.	Preparation of Terrain Profile (LOS).
	Locate system equipment components using locational diagrams.

CONDITION/S: Given a complete JTIDS (Shelter mounted Class 2M Terminal Set with power plant and antennas) and mission statement.

STANDARD/S: Employment Team must be provided grid coordinates for site. Site must have LOS to another site. Local security requirements based upon enemy threat must be provided for.

TASK: O-1007

TASK TITLE: Unload/Load Shelter

TASK STATEMENT: Observing normal safety precautions, remove/install the shelter from/into a truck. Document any deficiencies.

SUBTASK 1: Operate Truck
SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Communication by hand and arm signals.	Locate system/equipment components using locational diagrams.
Use special tools (sling assembly).	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a Shelter mounted on a 5/4 truck, wrecker, sling assembly, TM and TAMMS Forms. (Minimum of 2 personnel required plus wrecker operator.)

TASK: O-1008

TASK TITLE: Unpack/Secure Shelter

TASK STATEMENT: Unpack Shelter for emplacement/secure Shelter for movement.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition shelter equipment as required.	Locate system components using locational diagrams. Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a Shelter mounted on 5/4 truck, TM and TAMMS Forms.

STANDARD/S: Shelter mounted in 5/4 T vehicle is unpacked/secured in accordance with appropriate TM. Any deficiencies must be identified and correctly recorded on DA Form 2404.

TASK: O-1010

TASK TITLE: Inspect Shelter

TASK STATEMENT: Determine the serviceability of the shelter after march order.

ENABLING TASK 1: Perform Preventive Maintenance on JTIDS Shelter

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter, Shelter TM, and appropriate TAMMS Forms.

STANDARD/S: All Shelter deficiencies and shortcomings must be identified and correctly recorded on DA Form 2404. Proper procedures required to initiate any required corrective action must be initiated.

TASK: O-1011

TASK TITLE: Pack/Unpack Generator Set

TASK STATEMENT: Prepare Generator Set for transportation following correct TM procedures.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate Generator components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on mechanical devices.

CONDITION/S: Given a Generator Set, TM and TAMMS Forms.

STANDARD/S: Generator Set will be prepared for movement in accordance with appropriate TM. Any deficiencies and shortcomings must be identified and correctly recorded on DA Form 2404.

TASK: O-1012

TASK TITLE: Connect/Disconnect External Cables

TASK STATEMENT: Physically connect/disconnect external cables. Insure that cables are connected/disconnected as required by TM.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use mechanical hand tools to connect/disconnect cables.	Locate system/equipment components using locational diagrams.
Verify state indicators are within tolerance.	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter, external power; power, data and commo cables and operator TM and TAMMS Forms.

STANDARD/S: CONNECTION: After cables are connected all power, data and commo signals and indicators are within the desired ranges. DISCONNECTION: All cables are removed and properly stored. Any deficiencies and shortcomings must be identified and correctly reported on a DA Form 2404.

TASK: O-1013

TASK TITLE: Remote Indicator Control (IC)

TASK STATEMENT: Connect/Disconnect cable to/from remote IC.

SUBTASK 1: Energize/Deenergize the Indicator Control

SUBTASK 2: Remove/Replace IC from Shelter

SUBTASK 3: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use mechanical hand tools to connect/disconnect cables and hardware.

CONDITION/S: Given the Shelter with operational Class 2M Terminal and Indicator Control, remote cable, TM and TAMMS Forms.

STANDARD/S: AD-JTIDS Shelter components are remoted in accordance with appropriate TMs. Any deficiencies and/or shortcomings must be identified and correctly reported on DA Form 2404.

TASK: O-2003

TASK TITLE: Operate and Monitor JTIDS Operation

TASK STATEMENT: Operate Class 2M Terminal and IC, Monitor BITE and maintain commo logs.

ENABLING TASK 1: Initialize Class 2M Terminal

ENABLING TASK 2: Load Crypto Variables

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Interpret fault indicators.	Communicate via symbols and written word.
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.

CONDITION/S: Given an operational JTIDS System, System TM, appropriate LOG sheets and TAMMS Forms.

STANDARD/S: JTIDS is operational, BITE is monitored and faults detected. Normal traffic properly recorded on log sheets. Any system deficiencies noted during operation must be identified and correctly reported on DA Form 2404.

ANNEX D

EXTENDED POI

POWER UP/POWER DOWN
SYSTEM - MODULE

TASK: M-1001

TASK TITLE: Perform Preventive Maintenance Checks and Services on Generator Set.

TASK STANDARD: Perform PMCS per TM Instructions, identifying deficiencies and correct or report as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate generator components using location diagrams.	
Recall criteria and recognize unsatisfactory conditions.	
Verify state indicators are within tolerance.	
Condition generator as required.	

CONDITION/S: Given the Generator Set, organizational tools and spares, TM and TAMMS Forms.

STANDARD/S: All systematic, periodic preventive maintenance checks and services are performed as scheduled or required per appropriate TM. Deficiencies and shortcomings found will be recorded on DA Form 2404 and deficiencies must be corrected.

PROPOSED METHOD: Demonstation and practical exercise.

PROPOSED TIME (Minute): 120

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: O-1001

TASK TITLE: Operate Generator Set.

TASK STATEMENT: Prepare Generator Set for Operation, and Condition Generator Set to Operate, Start-Up and Shut-Down Generator Set.

ENABLING TASK 1: Perform PMCS on Generator Set

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Recall damage criteria and recognize unsatisfactory conditions.	Locate system/equipment components using location diagrams.
Condition switches as required.	Recall criteria and recognize unsatisfactory conditions.
Execute written instructions on electrical/mechanical devices.	Verify state indicators are within tolerance.
	Condition equipment as required.

CONDITION/S: Given a Generator Set, appropriate operator TM and TAMMS Forms.

STANDARD/S: Generator Set must be operating and providing power for/to the JTIDS system within __ minutes. Any before and after operation deficiencies and shortcomings will be recorded on a DA Form 2404, deficiencies will be corrected and shortcomings will be corrected or correction delayed as appropriate.

PROPOSED METHOD: Demonstration and practical exercise.

PROPOSED TIME (Minutes): 45

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: M-2001

TASK TITLE: Fault Isolate Generator Set

TASK STATEMENT: Using Built-in Indicators identify the area where the problem is located.

ENABLING TASK 1: Operate Generator Set

ENABLING TASK 2: Perform PMCS on Generator Set

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on electrical devices.	Locate generator components using location diagrams.
Memorize rules and recall procedures.	Recall criteria and recognize unsatisfactory conditions.
	Verify state indicators are within tolerance.

CONDITION/S: Given a Generator Set, test equipment, TM and TAMMS Forms.

STANDARD/S: All deficiencies must be identified and corrected where possible according to procedures given in appropriate TMs. Deficiencies should be correctly documented on TAMMS Forms (DA Forms 2402, 2404, 2407).

PROPOSED METHOD: Demonstration and practical exercise.

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: M-2002

TASK TITLE: Repair Generator Set

TASK STATEMENT: Replace faulty units or sections that have been identified as problem areas. Faulty unit includes fuzes, light bulbs, fuel filter and battery.

ENABLING TASK 1: Fault Isolate Generator Set

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use organizational tools.	Located generator components using location diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on mechanical and electrical devices.
	Memorize rules and recall procedures.

CONDITION/S: Given a Generator Set, organizational tools and spares, TM and TAMMS Forms.

STANDARD/S: All discrepancies noted must be identified and corrected when possible according to appropriate TM procedures. Any deficiencies not corrected will be reported on TAMMS Forms.

PROPOSED METHOD: Practical exercise

PROPOSED TIME (Minutes): 90

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: M-1002

TASK TITLE: Perform Preventive Maintenance on JTIDS Shelter

TASK STATEMENT: Perform PMCS per TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system/equipment components using locational diagrams.	
Recall damage criteria and recognize unsatisfactory conditions	

CONDITION/S: Given the Shelter, organizational spares, TM and TAMMS Forms.

STANDARD/S: All systematic, periodic preventive maintenance checks and services are performed as scheduled or as required per appropriate TMs. Those deficiencies not corrected must be identified and correctly reported on DA Form 2404.

PROPOSED METHOD: Demonstration and practical exercise.

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: O-1002

TASK TITLE: Power Up/Down Shelter

TASK STATEMENT: Power up/down shelter. Insure all equipment is prepared for application or removal of power to the shelter.

SUBTASK 1: Condition Shelter for Power

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on an electrical device.	Locate shelter system components using locational diagrams.
Verify state indicators are within tolerance.	

CONDITION/S: Given the Shelter with power available, System TM and TAMMS Forms.

STANDARD/S: All components are preset and conditioned for power. The shelter is energized or deenergized per appropriate TM. Those deficiencies and shortcomings found will be recorded on a DA Form 2404 and deficiencies must be corrected.

PROPOSED METHOD: practical exercise.

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: M-1003

TASK TITLE: Perform Preventive Maintenance on Environmental Control System

TASK STATEMENT: Perform PMCS per TM instructions, identify deficiencies or shortcomings and correct or report as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate ECS components using location diagrams.	
Recall criteria and recognize unsatisfactory conditions.	
Condition ECS as required.	

CONDITION/S: Given the Shelter with Environmental Control System installed, TM and TAMMS Forms.

STANDARD/S: All deficiencies and shortcomings must be found. Deficiencies and shortcomings found must be recorded on DA Form 2404 and deficiencies corrected.

PROPOSED METHOD: Demonstration

PROPOSED TIME: 60

PROPOSED MEDIA: Video Tape

Qualification

TASK: O-1003

TASK TITLE: Condition Shelter Environmental System ON or OFF

TASK STATEMENT: Prepare Environmental Conditioner Unit for either heating or cooling as appropriate.

ENABLING TASK 1: Perform PMCS on Environmental Control System

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on ECS.	Locate ECS components using locational diagrams.
Verify state indicators are within tolerance.	

CONDITION/S: Given the Shelter with power available, an operational shelter Environmental System, Operator TM and TAMMS Forms.

STANDARD/S: Condition Shelter Environmental System ON of OFF per appropriate TM. Any deficiencies and shortcomings must be identified and correctly reported on DA Form 2404.

PROPOSED METHOD: Demonstration

PROPOSED TIME (Minutes): 15

PROPOSED MEDIA: Video Tape

Qualification

TASK: M-1004

TASK TITLE: Perform Preventive Maintenance on JTIDS Subsystems (Class 2M Terminal and Indicator Control)

TASK STATEMENT: Perform PMCS per TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system components using locational diagrams.	
Execute written instructions on electrical devices.	
Recall criteria and recognize unsatisfactory conditions.	

CONDITION/S: Given the Shelter with JTIDS Subsystems (Class 2M Terminal and Indicator Control), TM and TAMMS Forms.

STANDARD/S: All deficiencies and shortcomings must be identified and recorded on a DA Form 2404. Deficiencies must be corrected according to appropriate TMs.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

OPERATE/MAINTAIN MODULE

TASK: O-2001

TASK TITLE: Load Crypto Variables

TASK STATEMENT: Using General Purpose Type Reader and an Electronic Transfer Device, key local variables into the Class 2M Terminal.

SUBTASK 1: Energize the Class 2M Terminal

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Install/remove secure data unit KGY-8/TSEC	
Condition Switches as required.	
Communicate via symbols.	
Execute written instructions on electrical device.	

CONDITION/S: Given an operational Class 2M Terminal, electronic transfer device, appropriate crypto code, operator TM and TAMMS Forms.

STANDARD/S: Class 2M Terminal must be encoded with the correct crypto variables. Any deficiencies identified on the Class 2M Terminal or the Electronic Transfer Device must be recorded on a DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 180

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: O-2002

TASK TITLE: Initialize Class 2M Terminal

TASK STATEMENT: Apply power, follow menus and initialization procedures in Operator TM.

SUBTASK 1: Energize the Class 2M Terminal

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Locate system components using locational diagrams.	Recall damage criteria and recognize unsatisfactory conditions.
Execute written instructions on electrical device.	
Communicate via symbols.	
Interpret fault indicators.	

CONDITION/S: Given an Operating Class 2M Terminal with crypto variables loaded, indicator control, initialization instructions and TAMMS Forms.

STANDARD/S: Class 2M Terminal must be initialized with the correct variables. Any deficiencies identified on the Class 2M Terminal or indicator control must be recorded on a DA form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 720

PROPOSED MEDIA: Video Tape and Actual Equipment/Training Device

Qualification

TASK: O-1004

TASK TITLE: Deenergize Class 2M Terminal

TASK STATEMENT: Position all controls and switches for power down (ensure that initialization and crypto variables are retained).

SUBTASK 1: Load Rapid Load Device

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition switches as required.	Locate system components using locational diagrams. Recall damage criteria and recognize unsatisfactory conditions. Execute written instructions on electrical devices.

CONDITION/S: Operational JTIDS Subsystem, TM and TAMMS Forms.

STANDARD/S: JTIDS Subsystems will be deenergized to ensure retention of initialization data and crypto variables. Any deficiencies must be identified and correctly reported on DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 1[illegible]

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: M-2003

TASK TITLE: Fault Isolate Class 2M Terminal

TASK STATEMENT: Using BIT and BITE determine the SRU where the fault is located.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on electrical device.	Locate system/equipment components using locational diagrams.
Communicate via words and symbols.	Recall criteria and recognize unsatisfactory conditions.
Memorize rules and recall procedures.	

CONDITION/S: Given the Shelter with Class 2M Terminal, Indicator Control, communications, operating power, TM and TAMMS Forms.

STANDARD/S: Fault Isolation Procedures are used to correctly identify deficiencies when possible according to appropriate TMs.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 150

PROPOSED MEDIA: Video Tape/Practical Demo and Actual Equipment/ Training Device

Qualification

TASK: M-1005

TASK TITLE: Unpack and Pack Shop Replaceable Units (SRUs) from/ into Shipping Containers

TASK STATEMENT: Using proper procedures to include Electro-Static Discharge (ESD) safety procedures remove/replace SRUs from/into containers.

SUBTASK 1: Observe ESD Procedures
SUBTASK 2: Visually Inspect SRUs
SUBTASK 3: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instructions on electrical and mechanical devices.	
Recall specific damage criteria and recognize unsatisfactory conditions.	

CONDITION/S: Given Packaged or Unpackaged Shop Replaceable Units (SRUs), ESD Equipment, TM and TAMMS Forms.

STANDARD/S: All procedures must be done according to TM. Any deficiencies noted on SRUs will be correctly reported on DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 120

PROPOSED MEDIA: Video Tape and Mock Equipment

Qualification

TASK: M-2004

TASK TITLE: Repair Class 2M Terminal

TASK STATEMENT: Replace faulty units or cards that have been identified during fault isolation.

ENABLING TASK 1: Fault Isolate Class 2M Terminal

SUBTASK 1: Prepare TAMMS Forms

SUBTASK 2: Observe ESD Procedures

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.
	Memorize rules and recall procedures.
	Communicate via words and symbols.

CONDITION/S: Given a Class 2M Terminal, SRUs, TM and TAMMS Forms.

STANDARD/S: All deficiencies must be corrected when possible according to appropriate TM procedures. Any deficiencies not corrected will be correctly reported on TAMMS Forms.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 90

PROPOSED MEDIA: Video Tape and Mock Equipment

Qualification

TASK: M-2005

TASK TITLE: Fault Isolate Indicator Control (IC)

TASK STATEMENT: Using BIT and BITE determine the areas where the problem is located.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.
	Memorize rules and recall procedures.
	Communicate via symbols.

CONDITION/S: Given an Indicator Control, TM and TAMMS Forms.

STANDARD/S: Fault Isolation Procedures are used to correctly identify deficiencies when possible according to appropriate TMs.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 90

PROPOSED MEDIA: Video Tape and Actual Equipment/Training Device

Qualification

TASK: M-2006

TASK TITLE: Repair Indicator Control (IC)

TASK STATEMENT: Replace faulty units or cards that have been identified during fault isolation.

ENABLING TASK 1: Fault Isolate Indicator Control

SUBTASK 1: Prepare TAMMS Forms

SUBTASK 2: Observe ESD Procedures

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.
	Memorize rules and recall procedures.
	Communicate via words and symbols.

CONDITION/S: Given Indicator Control (IC), required spares, TM and TAMMS Forms.

STANDARD/S: All discrepancies noted must be identified and corrected when possible according to appropriate TM procedures. Any deficiencies not corrected will be correctly reported on TAMMS Forms.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Video Tape and Mock Equipment

Qualification

TASK: O-2003

TASK TITLE: Operate and Monitor JTIDS Operation

TASK STATEMENT: Operate Class 2M Terminal and IC, Monitor BITE and maintain commo logs.

ENABLING TASK 1: Initialize Class 2M Terminal

ENABLING TASK 2: Load Crypto Variables

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Interpret fault indicators.	Communicate via symbols and written word.
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.

CONDITION/S: Given an operational JTIDS System, System TM, appropriate LOG sheets and TAMMS Forms.

STANDARD/S: JTIDS is operational, BITE is monitored and faults detected. Normal traffic properly recorded on log sheets. Any system deficiencies noted during operation must be identified and correctly reported on DA Form 2404.

PROPOSED METHOD: Conference and Demonstration

PROPOSED TIME (Minutes): 100

PROPOSED MEDIA: Video Tape

Familiarization - Practice in Package Training

ANTENNA MODULE

TASK: M-1006

TASK TITLE: Perform Preventive Maintenance on JTIDS Subsystem (Antennas)

TASK STATEMENT: Perform PMCS form TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition equipment as required.	Locate system components using locational diagrams.
Execute written instructions on electrical/mechanical devices.	
Recall criteria and recognize unsatisfactory conditions.	

CONDITION/S: Given the Shelter with JTIDS Subsystem (Class 2M Terminal, IC and Antennas), TM and TAMMS Forms.

STANDARD/S: All deficiencies and shortcomings must be identified and recorded on DA Form 2404. Deficiencies must be corrected according to appropriate organizational level TMs.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: O-1005

TASK TITLE: Assemble/Install/Disassemble Antenna on Shelter

TASK STATEMENT: Observing normal safety procedures put up and take down the shelter antenna following TM procedures.

ENABLING TASK 1: Perform PMCS on JTIDS Subsystem (Antenna)

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Assemble structural kits/ sets.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter, the Antenna, Operator TM and TAMMS Forms. Task performed in minimal wind conditions.

STANDARD/S: The antenna must be erected within 40 minutes. Signals must be capable of being received to verify operational status of antenna. Disassembly must be done in sequence in 40 minutes and antenna be properly stored. Antenna deficiencies and shortcomings must be recorded on DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 180

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: O-1006

TASK TITLE: Assemble/Disassemble Antenna at Remote Site

TASK STATEMENT: Observing normal safety precautions put up and take down the shelter antenna at a remote site following TM procedures.

ENABLING TASK 1: Perform PMCS on JTIDS Subsystem (Antenna)
SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Assemble structural kits/sets.
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the antenna with remote installation kit, Operator TM, installing tools and TAMMS Forms. Performed in minimal wind conditions.

STANDARD/S: The antenna must be erected within 60 minutes. Signals must be received to verify operational status of antenna. Disassembly must be done in sequence in 60 minutes and antenna and remote kit be properly stored. Antenna deficiencies and shortcomings must be recorded on DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 250

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: O-2004

TASK TITLE: Assemble/Disassemble 34M Antenna

TASK STATEMENT: Observing normal safety precautions, put up and take down the 34M antenna following TM procedures.

ENABLING TASK 1: Perform PMCS on JTIDS Subsystem (Antenna)

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Assemble structural kits/sets.	Locate system components using locational diagrams.
Execute written instructions on mechanical devices.	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the 34M antenna, operator TM, installing tools and TAMMS Forms. Performed in minimal wind conditions.

STANDARD/S: The antenna must be erected within 120 minutes. Signals must be received to verify operational status of antenna. Disassembly must be done in sequence within 120 minutes and antenna properly stored. Antenna deficiencies and shortcomings must be recorded on DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 480

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

MARCH ORDER AND EMPLACE MODULE

TASK: O-3001

TASK TITLE: Select Site and Emplace Equipment

TASK STATEMENT: Choose a location within tolerance of given grid coordinates that reflect adherence to physical security, line of sight (LOS) and cabling requirements.

SUBTASK 1: Correlate Site Position to Grid Reference Map

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instruction on electro-mechanical devices.	General Map Reading.
Communicate via graphic symbology.	Preparation of Terrain Profile (LOS).
	Locate system equipment components using locational diagrams.

CONDITION/S: Given a complete JTIDS (Shelter mounted Class 2M Terminal Set with power plant and antennas) and mission statement.

STANDARD/S: Employment Team must be provided grid coordinates for site. Site must have LOS to another site. Local security requirements based upon enemy threat must be provided for.

PROPOSED METHOD: Conference and Demonstration

PROPOSED TIME (Minutes): 100

PROPOSED MEDIA: Video Tape

Familiarization Only - PE in Package Training

TASK: O-1007

TASK TITLE: Unload/Load Shelter

TASK STATEMENT: Observing normal safety precautions, remove/install the shelter from/into a truck. Document any deficiencies.

SUBTASK 1: Operate Truck

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Communication by hand and arm signals.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use special tools (sling assembly).

CONDITION/S: Given a Shelter mounted on a 5/4 truck, wrecker, sling assembly, TM and TAMMS Forms. (Minimum of 2 personnel required plus wrecker operator.)

STANDARD/S: Shelter will be unloaded/loaded from/into truck.

PROPOSED METHOD: Demonstration

PROPOSED TIME (Minutes): 30

PROPOSED MEDIA: Video Tape

Familiarization - PE in Package Training

TASK: O-1008

TASK TITLE: Unpack/Secure Shelter

TASK STATEMENT: Unpack Shelter for emplacement/secure Shelter for movement.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition shelter equipment as required.	Locate system components using locational diagrams. Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a Shelter mounted on 5/4 truck, TM and TAMMS Forms.

STANDARD/S: Shelter mounted in 5/4 T vehicle is unpacked/secured in accordance with appropriate TM. Any deficiencies must be identified and correctly recorded on DA Form 2404.

PROPOSED METHOD: Demonstration

PROPOSED TIME (Minutes): 30

PROPOSED MEDIA: Video Tape

Familiarization - PE in Package Training

TASK: M-1007

TASK TITLE: Unpack/Pack JTIDS Subsystems

TASK STATEMENT: Remove and/or replace JTIDS Subsystems from and/or into protective container(s).

SUBTASK 1: Prepare TAMMS Forms

SUBTASK 2: Visually Inspect Subsystems

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Assemble/disassemble containers.	Locate system/equipment components using locational diagrams.
	Execute written instructions on mechanical devices.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a packed or unpacked JTIDS Subsystem and appropriate TMs and TAMMS Forms.

STANDARD/S: All discrepancies must be identified as JTIDS Subsystems and unpacked or packed. Any deficiencies found must be properly reported on DA Form 2404.

PROPOSED METHOD: Demonstration

PROPOSED TIME (Minutes): 15

PROPOSED MEDIA: Video Tape

Familiarization - PE in Package Training

EXTENDED PRACTICAL TRAINING EXERCISE

OR

UNIT TRAINING

TASK: M-1008

TASK TITLE: Remove and/or Install Class 2M Terminal and Indicator Control (IC) from/into Shelter or Host System

TASK STATEMENT: Disconnect/connect all auxiliary equipment to include mounting hardware.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use mechanical hand tools to connect/disconnect cables and hardware.

CONDITION/S: Given the Shelter with JTIDS Subsystem components (Class 2M Terminal and IC), organizational tools, TM and TAMMS Forms.

STANDARD/S: Removal and/or installation will be performed as required by appropriate TMs. Any deficiencies and/or shortcomings must be correctly reported on a DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 60

PROPOSED MEDIA: Video Tape and Actual Equipment

Qualification

TASK: M-1009

TASK TITLE: Remove and/or Install Local Communications System from/into Shelter.

TASK STATEMENT: Disconnect/connect all telephone and intercom equipment using proper procedures.

SUBTASK-1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Use mechanical hand tools to connect/disconnect and adjust commo components.
	Locate system/equipment components using locational diagrams.
	Execute written instructions on electrical devices.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter with Local Communication System, organizational tools, TM and TAMMS Forms.

STANDARD/S: Task is performed when the Telephone Set, TA-312/PT and Intercom Set are to be removed/installed in accordance with TM procedures. Any deficiencies and/or shortcomings found must be recorded in DA Form 2404.

PROPOSED METHOD: Demonstration and Practical Exercise

PROPOSED TIME (Minutes): 45

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: M-1010

TASK TITLE: Perform Preventive Maintenance on Local Communications System

TASK STATEMENT: Perform PMCS per TM and correct deficiencies as appropriate.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate local communications components using locational diagrams.
	Execute written instructions on common devices.
	Recall criteria and recognize unsatisfactory conditions.
	Condition commo equipment as required.

CONDITION/S: Given the shelter with local Communications System installed, TM and TAMMS Forms.

STANDARD/S: Task is performed correctly when all PMCS measures have been completed in accordance with TM procedures. Deficiencies and shortcomings are recorded on DA Form 2404. Deficiencies are corrected and shortcomings are corrected or scheduled for corrective action.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Taught in MOS Training

TASK: O-1009

TASK TITLE: Set Up and Operate Locate Communication Facilities

TASK STATEMENT: Disconnect/connect all telephone and intercom equipment. Use proper TM procedures for operational details.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use mechanical hand tools to connect/disconnect cables.	Locate system components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on commo devices.

CONDITION/S: Given operational local communications equipment, operator's tool kit, power source, TM and TAMMS Forms.

STANDARD/S: Communications facilities must operate properly as required by appropriate TM. Any deficiencies and/or shortcomings must be identified and correctly reported on a DA Form 2404.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Taught in MOS Training

TASK: M-1011

TASK TITLE: Fault Isolate Local Communications System

TASK STATEMENT: Using test equipment, identify the area, possibly cables, and wires where the problem is located.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use electrical hand tools to adjust and monitor inputs/outputs.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.

CONDITION/S: Given the local communications system, organizational tools and test equipment, TM and TAMMS Forms.

STANDARD/S: Task is performed correctly when the TM procedures have been completed and all deficiencies and faults not corrected are properly recorded on TAMMS Forms.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Taught in MOS Training

TASK: O-3001

TASK TITLE: Select Site and Emplace Equipment

TASK STATEMENT: Choose a location within tolerance of given grid coordinates that reflect adherence to physical security, line of sight (LOS) and cabling requirements.

SUBTASK 1: Correlate Site Position to Grid Reference Map

SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Execute written instruction on electro-mechanical devices.	General Map Reading.
Communicate via graphic symbology.	Preparation of Terrain Profile (LOS).
	Locate system equipment components using locational diagrams.

CONDITION/S: Given a complete JTIDS (Shelter mounted Class 2M Terminal Set with power plant and antennas) and mission statement.

STANDARD/S: Employment Team must be provided grid coordinates for site. Site must have LOS to another site. Local security requirements based upon enemy threat must be provided for.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): 300

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-1007

TASK TITLE: Unload/Load Shelter

TASK STATEMENT: Observing normal safety precautions, remove/install the shelter from/into a truck. Document any deficiencies.

SUBTASK 1: Operate Truck
SUBTASK 2: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Communication by hand and arm signals.	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use special tools (sling assembly).

CONDITION/S: Given a Shelter mounted on a 5/4 truck, wrecker, sling assembly, TM and TAMMS Forms. (Minimum of 2 personnel required plus wrecker operator.)

STANDARD/S: Shelter will be unloaded/loaded from/into truck.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): 120

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-1008

TASK TITLE: Unpack/Secure Shelter

TASK STATEMENT: Unpack Shelter for emplacement/secure Shelter for movement.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Condition shelter equipment as required.	Locate system components using locational diagrams. Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given a Shelter mounted on 5/4 truck, TM and TAMMS Forms.

STANDARD/S: Shelter mounted in 5/4 T vehicle is unpacked/secured in accordance with appropriate TM. Any deficiencies must be identified and correctly recorded on DA Form 2404.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): 50

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-1010

TASK TITLE: Inspect Shelter

TASK STATEMENT: Determine the serviceability of the shelter after march order.

ENABLING TASK 1: Perform Preventive Maintenance on JTIDS Shelter

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter, Shelter TM, and appropriate TAMMS Forms.

STANDARD/S: All Shelter deficiencies and shortcomings must be identified and correctly recorded on DA Form 2404. Proper procedures required to initiate any required corrective action must be initiated.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-1011

TASK TITLE: Pack/Unpack Generator Set

TASK STATEMENT: Prepare Generator Set for transportation following correct TM procedures.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate Generator components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on mechanical devices.

CONDITION/S: Given a Generator Set, TM and TAMMS Forms.

STANDARD/S: Generator Set will be prepared for movement in accordance with appropriate TM. Any deficiencies and shortcomings must be identified and correctly recorded on DA Form 2404.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-1012

TASK TITLE: Connect/Disconnect External Cables

TASK STATEMENT: Physically connect/disconnect external cables. Insure that cables are connected/disconnected as required by TM.

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Use mechanical hand tools to connect/disconnect cables.	Locate system/equipment components using locational diagrams.
Verify state indicators are within tolerance.	Recall damage criteria and recognize unsatisfactory conditions.

CONDITION/S: Given the Shelter, external power; power, data and commo cables and operator TM and TAMMS Forms.

STANDARD/S: CONNECTION: After cables are connected all power, data and commo signals and indicators are within the desired ranges. DISCONNECTION: All cables are removed and properly stored. Any deficiencies and shortcomings must be identified and correctly reported on a DA Form 2404.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-1013

TASK TITLE: Remote Indicator Control (IC)

TASK STATEMENT: Connect/Disconnect cable to/from remote IC.

SUBTASK 1: Energize/Deenergize the Indicator Control

SUBTASK 2: Remove/Replace IC from Shelter

SUBTASK 3: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
	Locate system components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Use mechanical hand tools to connect/disconnect cables and hardware.

CONDITION/S: Given the Shelter with operational Class 2M Terminal and Indicator Control, remote cable, TM and TAMMS Forms.

STANDARD/S: AD-JTIDS Shelter components are remoted in accordance with appropriate TMs. Any deficiencies and/or shortcomings must be identified and correctly reported on DA Form 2404.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): As Required

PROPOSED MEDIA: Actual Equipment

Qualification

TASK: O-2003

TASK TITLE: Operate and Monitor JTIDS Operation

TASK STATEMENT: Operate Class 2M Terminal and IC, Monitor BITE and maintain commo logs.

ENABLING TASK 1: Initialize Class 2M Terminal

ENABLING TASK 2: Load Crypto Variables

SUBTASK 1: Prepare TAMMS Forms

NEW SKILLS TRAINED	LEARNED SKILLS PRACTICED
Interpret fault indicators.	Communicate via symbols and written word.
	Locate system/equipment components using locational diagrams.
	Recall damage criteria and recognize unsatisfactory conditions.
	Execute written instructions on electrical devices.

CONDITION/S: Given an operational JTIDS System, System TM, appropriate LOG sheets and TAMMS Forms.

STANDARD/S: JTIDS is operational, BITE is monitored and faults detected. Normal traffic properly recorded on log sheets. Any system deficiencies noted during operation must be identified and correctly reported on DA Form 2404.

PROPOSED METHOD: Practical Exercise

PROPOSED TIME (Minutes): 360

PROPOSED MEDIA: Actual Equipment

Qualification

ANNEX E

ASSESSMENT OF TASK WORTH

ANNEX E

ASSESSMENT OF TASK WORTH

1.0 ATTRIBUTE WORTHS

The information contained in Annex E was extracted from a TRASANA Training Effectiveness Analysis Report. For a detailed explanation, see TRASANA-TEA-56-82, December 1982-Annexes B and C. Table E-1, Attribute Worths, was produced as a result of the following task worth scaling effort.

TABLE E-1

ATTRIBUTE WORTHS

ATTRIBUTE	RELATIVE WORTH OF ATTRIBUTE	PARTIAL WORTH OF CATEGORIES		
		L	M	H
Importance to Mission	36.84	1.25	61.25	100.00
Importance to Survival	19.47	2.50	62.50	100.00
Learning Difficulty	10.24	10.00	42.50	82.50
Immediacy of Performance	9.92	3.75	35.00	71.25
Degree of Dependence	7.82	6.25	31.25	97.50
Frequency of Performance	6.48	13.75	41.25	68.75
Performance Difficulty	5.11	7.50	32.50	81.25
Time Delay Tolerance	4.04	2.50	17.50	95.00

2.0 TASK WORTH SCALING

Assume that you command a military unit that has a shortage of school trained personnel in a given MOS. The school that trains solders in the MOS is about to graduate a class and you will have first choice to select graduates to fill your unit vacancies. You are faced with the problem of how to select the best soldiers for your unit: those of most value to your unit mission.

The school will provide a list of performance scores, for each

graduate, on those tasks which have been identified as part of the soldier's specific job. If all job related tasks were of equal significance to the job, the best soldiers could be picked by totaling the performance scores for each soldier and then selecting the top scorers. However, rarely will all tasks that depict a job be of equal worth within the defined job. A more appropriate indicator of a soldier's potential value to your unit can be obtained by determining a worth weight for each task, multiplying the worth weight times the performance score, totaling the weighted performance scores, and then selecting the top scorers.

Your task is to participate in an effort to obtain task worth weights. Relevant questions about identified task attributes have been constructed for providing information about the possible dimensions of each attribute. This information can be used for determining task worth. First you will determine the information utility of each attribute and then you will weigh dimensions. Once these values are obtained they can be used to obtain partial task worths by multiplying the attribute weight by its dimension weight, as prescribed by actual answers, and then the task worth will be derived by aggregating the partial worths.

An example of how similar utility scores, once obtained, can be used to select which of two cars one would prefer to purchase follows. The attributes of importance and their utility weights are:

Make	.4
Body Style	.3
Transmission	.2
Color	.1

The attributes dimension weights are:

Make

Ford	.5
Chevrolet	.3
Plymouth	.15
AMC	.05
Body Style	
4 dr	.5
2 dr	.3
3 dr	.2
Transmission	
5-speed	.5
4-speed	.3
Automatic	.2
Color	
Red	.4
Blue	.35
Green	.25

The two cars are available at equal price: Alternative 1 is a red Ford 2 door with a 4-speed transmission and Alternative 2 is a blue Chevrolet 4 door with an automatic transmission.

Partial worth values are:

ALTERNATIVE 1

Make (.4) x Ford (.5)	= .20
Body Style (.3) x 2 dr (.3)	= .09
Color (.1) x Red (.4)	= .04
Transmission (.2) x 4-speed (.3)	= .06
AGGREGATE WORTH	= .39

ALTERNATIVE 2

Make (.4) x Chevrolet (.3)	= .12
Body Style (.3) x 4 door (.5)	= .15

Color (.1) x Blue (.35) = .035
Transmission (.2) x Automatic (.2) = .04

AGGREGATE WORTH = .345

Based on this method the example, the purchaser will be happier buying alternative 1 because is has greater worth for him.

Following are the identified task attributes and the methods for assigning utility values.

ATTRIBUTES:

Learning Difficulty - Is the task hard to learn?

Performance Difficulty - Is the task hard to perform?

Time Delay Tolerance - What is the time allowed between receiving a cue that the task must be performed and starting the performance?

Importance to Mission - How serious is the effect of improper perforamnce or non-performance on the unit or individual mission?

Immediacy of Performance - How soon after arrival in the unit could the individual be required to perform the task?

Importance to Survival - Is the proper performance of the task important to the survival of personnel or equipment?

Frequency of Performance - How often is the task required?

Degree of Dependence - To what extent is the outcome of task performance dependent on the individual soldier?

To establish the utility of the attributes use the following procedure:

1. Rank the attributes in their order of importance.

2. Rate the attributes on their importance, preserving ratios.

   a. Assign the least important attribute and importance of 10.

   b. Consider the next-least-important atribute. How much more important is it than the least important? Assign it a number that reflects that ratio. For example, if the *second-least important attribute* is assigned a score of 40, this means that the second dimension is judged to be four times as important as the first. Continue up the list of attributes, checking each set of ratios as each new judgment is made.

   c. Sum the resulting importance scores, divide each by the sum, and multiply by 100.

3. Reevaluate importance ratings to improve reliability.

   a. List the attribute in descending order of importance.

   b. Compare the first (most important) attribute with the remaining ones put together. Is it more important, equally important, or less important than all the others put together?

   c. If the first attribute is more important than all of the

others put together, see if its importance rating is greater than the sum of the importance ratings of all of the other attributes. If not, change the importance rating of the first attribute so that it is greater than the sum of the others.

d. If the first attribute is of **equal** importance to all the others summed together, see if its importance rating is equal to the sum of the importance ratings of all the other attributes. If it is not, change the importance rating of the first attribute so that it is equal to the sum of the others.

e. If the first attribute is **less** important than all the others put together, see if its importance rating is less than the sum of the importance ratings of all of the other attributes. If it is not, change the importance rating of the first attribute so that is is less than the sum of the others.

f. If the first attribute was considered **more** important or **equally** important than all the others put together, apply the above procedure to the second-most-important attribute on the list. Is it more important, equally important, or less important than all the others further down the list summed together? Then, proceeed as in (c), (d), and (e) above, applying the revision procedure to the second attribute instead of the first.

g. If the first attribute was considered **less** important than all the others summed together, compare the first attribute with all the remaining ones put together except the lowest rated one. Is the first attribute more important, equally important, or less important than all of the others further down the list except the lowest one summed together? Then proceeed as in (c), (d), and (e)

above. If (c) or (d) are applicable, proceed to (f) after applying (c) or (d). If (e) is applicable, proceed as in this paragraph (g) again, comparing the first attribute with all the remaining ones summed together except the lowest two. As long as (e) is applicable, the procedures of this paragraph (g) are repeated until the first attribute is compared with the second and third attribute put together. Then, even if (e) is still applicable, proceed to (f).

h. Continue the above procedure until the third-from-the-lowest dimension has been compared with the two lowest attributes on the list.

4. Repeat step (2-c) on the revised importance ratings produced in step (3). Do not multiply by 100. The results of this step are the importance weights for each attribute.

Next weigh the dimensions by assigning values to the question answers. Look at the following eight questions and the three possible answers categories for each question. You must assign a weight of 0 to 100 to each of the three possible answers to each question. Ask yourself, within the question context, how you would rate the value to your unit of an individual being able to adequately perform a task that meets each category and assign the appropriate weight.

WEIGHTS

1. **LEARNING DIFFICULTY** - Is the task hard to learn?

L = Easy to learn - can be self-trained.
M = Some difficulty in learning - requires some assistance to learn.
H = Hard to learn - requires supervision, extensive practice, special equipment, or environment to learn.

2. **PERFORMANCE DIFFICULTY** - Is the task hard to perform?

   L = Easy to perform - can probably perform correctly on initial effort and each repetition - includes only simple skills.
   M = Some difficulty in performing - may need more practice and assistance to perform in field unit - moderated level skills.
   H = Hard to do - probably requires additional practice and assistance to perform in field unit. High probability of some performance failures - includes complex skills.

3. **TIME DELAY TOLERANCE** - What is the time allowed between receiving the task initiating cue and starting the performance?

   L = No need to start task at any specific time.
   M = Task start can be delayed for several minutes to a few hours.
   H = Must begin immediately or within a few minutes after cue.

4. **IMPORTANCE TO MISSION** - How serious is the effect of improper performance or non-performance on the unit or individual mission?

   L = Has little or no effect on mission of individual or unit.
   M = Could degrade or delay mission performance.
   H = Could result in mission failure.

5. **IMMEDIACY OF PERFORMANCE** - How soon after arrival in field unit could task performance be required?

   L = Not for several months.
   M = Within the first few weeks (1-3 months).
   H = Within the first one or two weeks.

6. **IMPORTANCE TO SURVIVAL** - Is the task important to the survival of personnel and equipment?

   L = Failure or non-performance would have little or no effect on survival of personnel or equipment.
   M = Failure or non-performance could endanger personnel or equipment.
   H = Task must be performed for survival of personnel or equipment.

7. **FREQUENCY OF PERFORMANCE** - How often is the task called for?

   L = Infrequently - once a month or less.
   M = Moderate frequency - once every one to three weeks.
   H = Frequently - more often than once a week.

8. **DEGREE OF DEPENDENCE** - To what extent is the outcome of task performance dependent on the individual soldier?

   L = Rarely would the outcome of the task depend on the individual.
   M = Although the individual must perform the task, there is usually someone available to guide or assist.
   H = The individual is the only one available, during his tour of duty, that can perform the task.

ANNEX F

BIOGRAPHICAL INFORMATION ON AIR DEFENSE SYSTEMS INSTRUCTORS: STUDENT LEARNING CHARACTERISTICS SUBJECT MATTER EXPERTS - US ARMY AIR DEFENSE ARTILLERY SCHOOL; FORT BLISS, TEXAS

25L SUBJECT MATTER EXPERTS

SUBJECT MATTER EXPERT #1 - 225B
Command and Control Maintenance Technician

19 years experience in Automatic Data Processing, Air Defense Artillery and Electronics Maintenance

Military Schooling:

24U Nike Hercules Missile Electronics Maintenance Repairman

34H Automatic Digital Message System Equipment Repairman (AUTOPIN)

34K IBM 360 Repairman

287A Automated Data Processing Technician

287A IBM 360/132

225B AN/TSQ-73 Repair Course

Net Quantiful - USAF Operators Class 1 Terminal, Kessler AFB, MS (12 wks)

SUBJECT MATTER EXPERT #2

PMOS 25L 4H
SMOS 16H 4D
AMOS 63B 4D

Previously held MOS 52B3D, 25H3D, 25G, 3D and 72B20

Site Experience:

1969-72 A Co 123rd Sig Bn, 3rd ID, MOS 52B30, 72B20

1975-78 Hq 11th Gp MCC, MOS 25G 30, 25H30

1982-83 Hq 2/2 ADA, MOS 25L3D

Instructor - 1983 to Present, MOS Instructor for 14D, 14G, 14GX, 25L10, 25L30. 25L40X

SUBJECT MATTER EXPERT #3

Instructor 1972-1973 and 1985 to Present

Experience:

MOS 26H Radar/IFF Repairer

26T Television Equipment Repairer

23W Nike Hercules Shop Supervisor (2 yrs)

25L AN/TSQ-73 Operator/Repairer, 1980 to Present

SUBJECT MATTER EXPERT #4

Current MOS 25L 3R AN/TSQ-73 Operator/Repairer, 8 yrs experience

MOS 16H ADA Operations and Intelligence Assessment (8 years)

6 years experience in field locations

5 months experience as 25L Instructor

16H SUBJECT MATTER EXPERTS

SUBJECT MATTER EXPERT #1

Chief 16H Training Section Battery B, 4/56 ADA
This unit conducts Advanced Individual Training at Ft. Bliss, Texas.

Extensive experience with SHORAD, HAWK, AN/TSQ-73, FAAR Radar and AN/GSS-1 Radar. Duties involved command/control, NBC and Airspace Management. Acted as Section and Platoon Chief.

SUBJECT MATTER EXPERT #2

Assigned with 16H Training Section Battery B, 4/56 ADA, Fort Bliss, Texas

10 years experience with communications equipment, e.g., telephone central officer, teletype and radios.

6 years experience as Instructor 16J (Radar Operations) and 16H (ADA Operations and Intelligence Assistant)

3 years experience as HAWK BOC NCOIC

SUBJECT MATTER EXPERT #3

Assigned with 16H Training Section Battery B, 4/56 ADA, Fort Bliss, Texas

Service from 1983 t0 February 1988 - 16H in ADA units

Service as an Instructor 8 months.

Specialty Radio Communications

16R AND 16S SUBJECT MATTER EXPERTS

SUBJECT MATTER EXPERT #1

MOS 16S MANPADS Crew Member

Total US Army Service 12 years

Qualified with REDEYE and STINGER

Platoon Sgt - 3rd Armored Cav Regt. Participated in 3 REFORGER Exercises

Instructor with US Army Training Center for 2 years

Helped develop course for 16S MANPAD Crewmember Course (Advanced Individual Training)

Helped prepare Annual SQT tests for Skill Levels 3 & 4 MOS 16S

Currently assigned to S-3 Section Hq 4/56 ADA

ANNEX G

EFFICIENCY ESTIMATES

16H MOS INSTRUCTOR

EFFICIENCY ESTIMATES

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
M-1001	BASE TIME	90	80	75	40	
	MIN TIME	60	75	70	20	
	MAX TIME	120	95	95	50	
O-1001	BASE TIME	30	95	95	75	45 MINUTE DEMO
	MIN TIME	15	50	25	25	WOULD BE TOO
	MAX TIME	45	100	100	65	LONG
M-2001	BASE TIME	60	90	65	40	
	MIN TIME	45	80	60	30	
	MAX TIME	120	100	100	55	
M-2002	BASE TIME	60	90	90	85	
	MIN TIME	45	80	80	75	
	MAX TIME	90	100	100	90	
M-1002	BASE TIME	60	90	90	90	
	MIN TIME	30	70	70	70	
	MAX TIME	90	95	95	95	
O-1002	BASE TIME	30	95	95	95	15 MINUTES IS TOO
	MIN TIME	15	--	--	85	SHORT A TIME FOR
	MAX TIME	60	100	100	100	OTHER THAN DEMO
M-1003	BASE TIME	30	70	70	65	
	MIN TIME	15	--	--	--	
	MAX TIME	60	100	100	100	
O-1003	BASE TIME	30	95	95	95	
	MIN TIME	15	95	95	95	
	MAX TIME	45	100	100	100	
M-1004	BASE TIME	30	50	50	70	
	MIN TIME	15	25	0	50	
	MAX TIME	60	100	100	100	
O--2001	BASE TIME	240	85	80	--	WOULD NOT TRAIN
	MIN TIME	180	85	80	--	WITH DEMO ONLY
	MAX TIME	360	95	90	--	

TASK NUMBER	TIME	MIN	TRAINING METHOD			NOTES
			PERCENT OBTAINING STANDARD			
			DM+HO	HO	DM	
O-2002	BASE TIME	720	85	65	--	WOULD NOT TRAIN
	MIN TIME	600	75	40	--	WITH DEMO ONLY
	MAX TIME	900	90	75	--	
O-1004	BASE TIME	120	90	75	35	DEMO LIMITED
	MIN TIME	90	75	50	35	
	MAX TIME	180	95	85	35	
M-2003	BASE TIME	180	95	85	30	DEMO LIMITED
	MIN TIME	120	80	70	30	
	MAX TIME	240	95	90	30	
M-1005	BASE TIME	120	85	85	65	
	MIN TIME	90	80	75	70	
	MAX TIME	180	90	90	75	
M-2004	BASE TIME	90	90	80	70	
	MIN TIME	60	75	60	50	
	MAX TIME	120	95	80	70	
M-2005	BASE TIME	90	95	85	60	DEMO LIMITED
	MIN TIME	60	70	65	60	
	MAX TIME	120	95	95	60	
M-2006	BASE TIME	90	90	80	70	
	MIN TIME	60	85	75	60	
	MAX TIME	120	95	80	70	
O-2003	BASE TIME	360	90	80	40	DEMO LIMITED
	MIN TIME	300	85	75	40	
	MAX TIME	480	100	90	40	
M-1006	BASE TIME	45	75	75	40	DEMO LIMITED
	MIN TIME	30	25	30	40	
	MAX TIME	60	90	80	45	
O-1005	BASE TIME	120	80	--	40	WOULD NOT TRAIN
	MIN TIME	60	65	--	40	WITHOUT DEMO AND
	MAX TIME	180	90	--	55	DEMO LIMITED

TASK NUMBER	TIME	MIN	TRAINING METHOD			NOTES
			PERCENT OBTAINING STANDARD			
			DM+HO	HO	DM	
O-1006	BASE TIME	240	85	--	75	WOULD NOT TRAIN
	MIN TIME	180	65	--	65	WITHOUT DEMO AND
	MAX TIME	300	90	--	80	DEMO LIMITED
O-2004	BASE TIME	360	80	--	--	DEMO USEFUL FOR
	MIN TIME	300	75	--	--	FAMILIARIZATION
	MAX TIME	480	95	--	--	ONLY
O-3001	BASE TIME	360	80	65	--	DEMO USEFUL FOR
	MIN TIME	240	65	40	--	FAMILIARIZATION
	MAX TIME	420	90	70	--	ONLY
O-1007	BASE TIME	90	80	--	60	WOULD NOT TRAIN
	MIN TIME	60	25	--	60	WITHOUT DEMO AND
	MAX TIME	120	90	--	60	DEMO LIMITED
O-1008	BASE TIME	60	90	90	90	
	MIN TIME	30	50	50	50	
	MAX TIME	90	95	95	95	
M-1007	BASE TIME	30	80	80	80	15 MINUTES IS TOO
	MIN TIME	15	--	--	50	SHORT A TIME FOR
	MAX TIME	60	95	90	85	OTHER THAN DEMO
M-1008	BASE TIME	60	90	90	90	
	MIN TIME	45	80	80	80	
	MAX TIME	120	95	95	95	
M-1009	BASE TIME	20	--	--	--	BASICS WELL
	MIN TIME	10	--	--	--	COVERED IN MOS
	MAX TIME	30	--	--	--	TRAINING
M-1010	BASE TIME	30	--	--	--	BASICS WELL
	MIN TIME	15	--	--	--	COVERED IN MOS
	MAX TIME	60	--	--	--	TRAINING
M-1011	BASE TIME	60	--	--	--	BASICS WELL
	MIN TIME	30	--	--	--	COVERED IN MOS
	MAX TIME	90	--	--	--	TRAINING

TASK NUMBER	TIME	MIN	TRAINING METHOD			NOTES
			PERCENT OBTAINING STANDARD			
			DM+HO	HO	DM	
O-1009	BASE TIME	45	--	--	--	BASICS WELL
	MIN TIME	30	--	--	--	COVERED IN MOS
	MAX TIME	60	--	--	--	TRAINING
O-1010	BASE TIME	30	90	90	90	
	MIN TIME	15	75	70	70	
	MAX TIME	45	95	95	95	
O-1011	BASE TIME	60	90	90	90	
	MIN TIME	30	70	70	70	
	MAX TIME	90	95	95	95	
O-1012	BASE TIME	45	95	95	90	
	MIN TIME	30	85	85	80	
	MAX TIME	60	95	95	95	
O-1013	BASE TIME	30	90	90	90	15 MINUTES IS TOO
	MIN TIME	15	--	--	85	SHORT A TIME FOR
	MAX TIME	45	95	95	95	OTHER THAN DEMO

16R AND 16S MOS INSTRUCTOR

EFFICIENCY ESTIMATES

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
M-1001	BASE TIME	90	80	75	40	
	MIN TIME	60	75	70	20	
	MAX TIME	120	95	95	50	
O-1001	BASE TIME	30	95	95	75	45 MINUTE DEMO
	MIN TIME	15	50	25	25	WOULD BE TOO
	MAX TIME	45	100	100	65	LONG
M-2001	BASE TIME	60	90	65	40	
	MIN TIME	45	80	60	30	
	MAX TIME	120	100	100	55	
M-2002	BASE TIME	60	90	90	85	
	MIN TIME	45	80	80	75	
	MAX TIME	90	100	100	90	
M-1002	BASE TIME	60	90	90	90	
	MIN TIME	30	70	70	70	
	MAX TIME	90	95	95	95	
O-1002	BASE TIME	30	95	95	95	15 MINUTES IS TOO
	MIN TIME	15	--	--	85	SHORT A TIME FOR
	MAX TIME	60	100	100	100	OTHER THAN DEMO
M-1003	BASE TIME	30	70	70	65	
	MIN TIME	15	--	--	--	
	MAX TIME	60	100	100	100	
O-1003	BASE TIME	30	95	95	95	
	MIN TIME	15	95	95	95	
	MAX TIME	45	100	100	100	
M-1004	BASE TIME	30	50	50	70	
	MIN TIME	15	25	0	50	
	MAX TIME	60	100	100	100	
O-2001	BASE TIME	240	85	80	--	WOULD NOT TRAIN
	MIN TIME	180	85	80	--	WITH DEMO ONLY
	MAX TIME	360	95	90	--	

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
O-2002	BASE TIME	720	85	70	60	
	MIN TIME	600	70	60	50	
	MAX TIME	900	95	80	70	
O-1004	BASE TIME	60	90	90	95	
	MIN TIME	45	80	80	90	
	MAX TIME	90	90	90	95	
M-2003	BASE TIME	180	95	90	75	
	MIN TIME	120	80	60	50	
	MAX TIME	240	95	95	85	
M-1005	BASE TIME	90	90	(90)	90	WOULD NOT TRAIN W/HO
	MIN TIME	60	80	(80)	80	ONLY, IF SERVICEABLE
	MAX TIME	120	95	(95)	95	EQUIPMENT USED
M-2004	BASE TIME	50	90	90	85	
	MIN TIME	30	80	75	65	
	MAX TIME	60	95	95	90	
M-2005	BASE TIME	180	95	95	90	
	MIN TIME	120	80	80	70	
	MAX TIME	240	95	95	95	
M-2006	BASE TIME	45	90	90	85	
	MIN TIME	30	80	75	70	
	MAX TIME	60	95	80	80	
O-2003	BASE TIME	300	90	80	--	WOULD NOT USE DM
	MIN TIME	180	70	60	--	ONLY, EXCEPT FOR
	MAX TIME	450	95	95	--	FAMILIARIZATION
M-1006	BASE TIME	30	70	40	25	
	MIN TIME	15	--	--	--	
	MAX TIME	60	90	75	55	
O-1005	BASE TIME	150	75	50	50	
	MIN TIME	90	50	40	30	
	MAX TIME	180	90	80	60	

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
O-1006	BASE TIME	240	85	--	75	WOULD NOT TRAIN
	MIN TIME	180	65	--	65	WITHOUT DEMO AND
	MAX TIME	300	90	--	80	DEMO LIMITED
O-2004	BASE TIME	360	80	--	--	DEMO USEFUL FOR
	MIN TIME	300	75	--	--	FAMILIARIZATION
	MAX TIME	480	95	--	--	ONLY
O-3001	BASE TIME	360	80	65	--	DEMO USEFUL FOR
	MIN TIME	240	65	40	--	FAMILIARIZATION
	MAX TIME	420	90	70	--	ONLY
O-1007	BASE TIME	90	80	--	60	WOULD NOT TRAIN
	MIN TIME	60	25	--	60	WITHOUT DEMO AND
	MAX TIME	120	90	--	60	DEMO LIMITED
O-1008	BASE TIME	60	90	90	90	
	MIN TIME	30	50	50	50	
	MAX TIME	90	95	95	95	
M-1007	BASE TIME	30	80	80	80	15 MINUTES IS TOO
	MIN TIME	15	--	--	50	SHORT A TIME FOR
	MAX TIME	60	95	90	85	OTHER THAN DEMO
M-1008	BASE TIME	60	90	90	90	
	MIN TIME	45	80	80	80	
	MAX TIME	120	95	95	95	
M-1009	BASE TIME	20	--	--	--	BASICS WELL
	MIN TIME	10	--	--	--	COVERED IN MOS
	MAX TIME	30	--	--	--	TRAINING
M-1010	BASE TIME	30	--	--	--	BASICS WELL
	MIN TIME	15	--	--	--	COVERED IN MOS
	MAX TIME	60	--	--	--	TRAINING
M-1011	BASE TIME	60	--	--	--	BASICS WELL
	MIN TIME	30	--	--	--	COVERED IN MOS
	MAX TIME	90	--	--	--	TRAINING

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
O-1009	BASE TIME	45	--	--	--	BASICS WELL
	MIN TIME	30	--	--	--	COVERED IN MOS
	MAX TIME	60	--	--	--	TRAINING
O-1010	BASE TIME	30	90	90	90	
	MIN TIME	15	75	70	70	
	MAX TIME	45	95	95	95	
O-1011	BASE TIME	60	90	90	90	
	MIN TIME	30	70	70	70	
	MAX TIME	90	95	95	95	
O-1012	BASE TIME	45	95	95	90	
	MIN TIME	30	85	85	80	
	MAX TIME	60	95	95	95	
O-1013	BASE TIME	30	90	90	90	15 MINUTES IS TOO
	MIN TIME	15	--	--	85	SHORT A TIME FOR
	MAX TIME	45	95	95	95	OTHER THAN DEMO

25L MOS INSTRUCTOR

EFFICIENCY ESTIMATES

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
M-1001	BASE TIME	60	95	95	95	
	MIN TIME	30	80	70	80	
	MAX TIME	120	95	95	95	
O-1001	BASE TIME	30	85	85	85	
	MIN TIME	15	60	60	60	
	MAX TIME	45	95	95	95	
M-2001	BASE TIME	60	95	90	90	
	MIN TIME	30	75	65	75	
	MAX TIME	90	95	95	95	
M-2002	BASE TIME	90	90	85	85	
	MIN TIME	60	80	70	70	
	MAX TIME	120	95	95	95	
M-1002	BASE TIME	60	95	95	95	
	MIN TIME	30	80	50	60	
	MAX TIME	90	95	95	95	
O-1002	BASE TIME	45	95	90	85	
	MIN TIME	30	85	80	70	
	MAX TIME	60	95	95	95	
M-1003	BASE TIME	30	40	35	50	
	MIN TIME	15	--	--	--	
	MAX TIME	60	85	80	90	
O-1003	BASE TIME	30	95	95	95	
	MIN TIME	15	90	85	85	
	MAX TIME	45	95	95	95	
M-1004	BASE TIME	30	70	40	25	
	MIN TIME	15	--	--	--	
	MAX TIME	60	90	75	55	
O-2001	BASE TIME	180	85	70	70	
	MIN TIME	120	75	60	50	
	MAX TIME	240	95	80	80	

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
O-2002	BASE TIME	720	85	70	60	
	MIN TIME	600	70	60	50	
	MAX TIME	900	95	80	70	
O-1004	BASE TIME	60	90	90	95	
	MIN TIME	45	80	80	90	
	MAX TIME	90	90	90	95	
M-2003	BASE TIME	180	95	90	75	
	MIN TIME	120	80	60	50	
	MAX TIME	240	95	95	85	
M-1005	BASE TIME	90	90	(90)	90	WOULD NOT TRAIN W/HO
	MIN TIME	60	80	(80)	80	ONLY, IF SERVICEABLE
	MAX TIME	120	95	(95)	95	EQUIPMENT USED
M-2004	BASE TIME	50	90	90	85	
	MIN TIME	30	80	75	65	
	MAX TIME	60	95	95	90	
M-2005	BASE TIME	180	95	95	90	
	MIN TIME	120	80	80	70	
	MAX TIME	240	95	95	95	
M-2006	BASE TIME	45	90	90	85	
	MIN TIME	30	80	75	70	
	MAX TIME	60	95	80	80	
O-2003	BASE TIME	300	90	80	--	WOULD NOT USE DM
	MIN TIME	180	70	60	--	ONLY, EXCEPT FOR
	MAX TIME	450	95	95	--	FAMILIARIZATION
M-1006	BASE TIME	30	70	40	25	
	MIN TIME	15	--	--	--	
	MAX TIME	60	90	75	55	
O-1005	BASE TIME	150	75	50	50	
	MIN TIME	90	50	40	30	
	MAX TIME	180	90	80	60	

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
O-1006	BASE TIME	180	60	50	30	
	MIN TIME	90	--	--	--	
	MAX TIME	240	85	75	40	
O-2004	BASE TIME	480	90	--	--	WOULD NOT TRAIN HO
	MIN TIME	360	75	--	--	ONLY (SAFETY) DM
	MAX TIME	520	95	--	--	ONLY NOT APP. METHOD
O-3001	BASE TIME	240	70	40	--	WOULD NOT USE DM
	MIN TIME	180	--	--	--	ONLY, EXCEPT FOR
	MAX TIME	360	85	65	--	FAMILIARIZATION
O-1007	BASE TIME	60	60	40	40	30 MINUTES IS TOO
	MIN TIME	30	10	--	--	SHORT A TIME FOR
	MAX TIME	90	85	50	50	OTHER THAN DEMO
O-1008	BASE TIME	45	95	90	90	
	MIN TIME	30	80	75	75	
	MAX TIME	60	95	95	95	
M-1007	BASE TIME	40	80	75	80	20 MINUTES IS TOO
	MIN TIME	20	--	--	50	SHORT A TIME FOR
	MAX TIME	60	90	85	90	OTHER THAN DEMO
M-1008	BASE TIME	60	85	60	60	
	MIN TIME	30	--	--	--	
	MAX TIME	120	95	90	90	
M-1009	BASE TIME	20	70	50	60	BASICS WELL
	MIN TIME	10	25	--	--	COVERED IN MOS
	MAX TIME	30	85	70	80	TRAINING
M-1010	BASE TIME	30	90	80	85	BASICS WELL
	MIN TIME	15	--	--	40	COVERED IN MOS
	MAX TIME	60	95	90	95	TRAINING
M-1011	BASE TIME	60	95	95	95	BASICS WELL
	MIN TIME	30	80	70	80	COVERED IN MOS
	MAX TIME	90	95	95	95	TRAINING

TASK NUMBER	TIME	MIN	TRAINING METHOD PERCENT OBTAINING STANDARD			NOTES
			DM+HO	HO	DM	
O-1009	BASE TIME	45	95	90	90	BASICS WELL
	MIN TIME	30	85	80	80	COVERED IN MOS
	MAX TIME	60	95	95	95	TRAINING
O-1010	BASE TIME	20	70*	50	60	85% COULD OBTAIN
	MIN TIME	15	25	--	--	STANDARD IN 20 MIN,
	MAX TIME	30	85	70	80	IF TAUGHT W/M-1002
O-1011	BASE TIME	60	95	90	90	
	MIN TIME	45	85	80	80	
	MAX TIME	90	95	95	95	
O-1012	BASE TIME	60	85	80	70	
	MIN TIME	30	60	35	50	
	MAX TIME	120	95	90	85	
O-1013	BASE TIME	45	80	70	60	
	MIN TIME	30	75	60	50	
	MAX TIME	60	90	75	65	

ANNEX H

SUMMARY DESCRIPTION OF THE ARMED SERVICES

VOCATIONAL APTITUDE BATTERY (ASVAB)

ANNEX H

SUMMARY DESCRIPTION OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB)

This battery yields composite scores designed to measure general aptitude areas which are related to certain military occupational fields. The US Army uses these scores to select enlisted personnel for training schools. Table H-1 gives the titles and abbreviations of the aptitude composites. Composite scores are standard scores with a mean of 100 and a standard deviation of 20. Technically the AFQT score is not one of the aptitude area composites. Given as a percentile score, it is intended to convey a broad measure of intellectual ability.

TABLE H-1

ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) COMPOSITES AND ABBREVIATIONS

ABBREVIATION	TITLE
CO	Combat
FA	Field Artillery
EL	Electronics Repair
OF	Operators and Food
SC	Surveillance-Communications
MM	Mechanical Maintenance
GM	General Maintenance
CL	Clerical
ST	Skilled Technical
GT	General Technical
AFQT	Armed Forces Qualification Test