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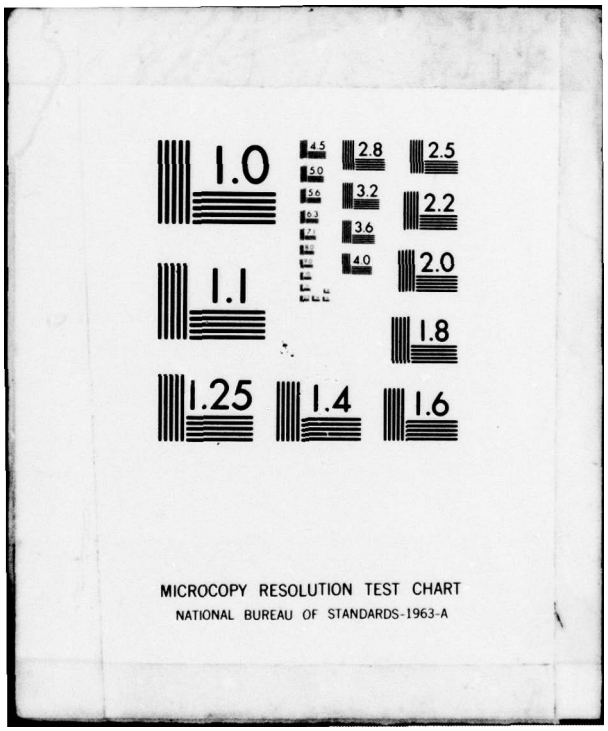
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THE ARMOR DEVELOPMENT PLAN.

VOLUME II.

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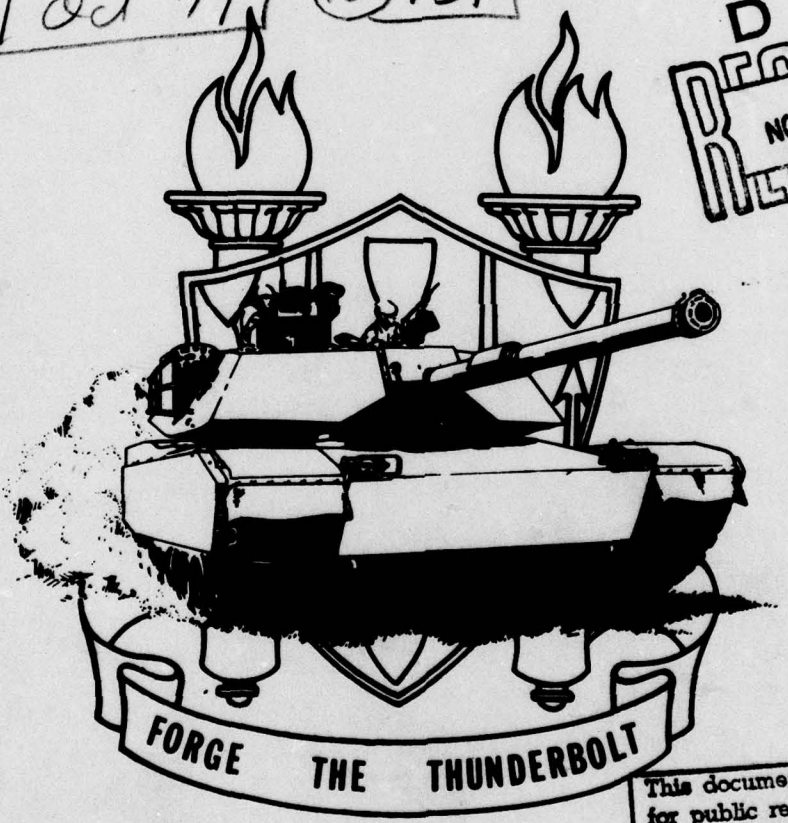

US ARMY ARMOR CENTER

1 October 1979

FORWARD

This volume of the Armor Development Plan is the first edition and presents the Armor Center's positions on and priorities for Armor training at both the training base and unit levels. The scope extends from Armor training currently being conducted through training development activities which are evolving as technological materiel advances are achieved - from now to 1985 and beyond.

This plan serves to make the Armor community's training requirements known as early as possible and presents our perceptions and recommendations without external constraints such as budget or TRADOC, DA, DOD positions. While the views presented are solely those of the Armor Center, they are the result of considerable feedback and other communications with both Armor training developers and Armor field units.

The dynamics of the future battlefield, the actions of our potential enemies, the inherent realities of the world in which Armor must operate, and the modernization of the Armor Force require frequent re-evaluation of our training needs. Thus, the positions in this plan will change as new training needs, technology, information, doctrine, tactics, and organizational structures evolve.

Comments and recommendations are welcomed in order to improve upon the plan and should be forwarded to the Directorate of Training Developments ATTN: ATSB-TD, Fort Knox, Kentucky 40121.

THOMAS P. LYNCH
Major General, USA
Commanding

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CHAPTER 1 - ARMOR TRAINING AND THE COMBINED ARMS BATTLEFIELD - AN OVERVIEW

SECTION I - INTRODUCTION

1-1. INTRODUCTION. Volume I of the Armor Development Plan presents the Armor Center's position and priorities for research and development on a large variety of Armor and Armor-related systems and materiel. It speaks to the present and the future of the evolution of Armor, the modern battlefield, Armor organization, Armor proponent materiel systems, and the requirement for total system integration. It also makes a strong excursion into technological efforts of interest to the Armor community, assesses and compares the most promising concepts with the technological capabilities of the Threat, and recommends approaches and describes the impact of implementing new materiel technologies. Finally, Volume I presents the Armor Center's priorities for future research, development, and materiel acquisition; notes voids and weaknesses in research and development; and identifies research and development efforts which should be increased or decreased. Out of necessity, Volume I speaks to the present, but its primary thrust is in the future--from now to 1985 and beyond.

a. This volume, Army Training, expands on Volume I. It presents a plan--a roadmap--for the future of training in Armor. Armor training in the future will not be what it is today, nor will it simply take care of itself; therefore, the Armor Center can ill afford to maintain a reactive posture which is forced by unplanned events or unanticipated influences. The Armor Center must maintain a proactive posture that is guided by both strong anticipatory conviction and as much knowledge as possible of what the future holds for Armor Training and that is armed with a plan that significantly influences its direction. Following this theme of proaction, the Armor Center plans to generate the Armor training missions, programs, and strategies of the future. Through this plan, the Armor Center, in effect, will indicate the future consequences of present training decisions, policies, and products; anticipate the future; and explore and select alternatives for future training. This will allow more options and wiser choices and will reduce or eliminate the constraints of problems in training and training management which descend unnoticed and demand immediate response. It will eliminate any propensity to procrastinate until the full weight of a training problem has fallen. The time has come to anticipate the challenges of training in Armor early enough to take the initiative to get something done in a constructive manner. The Armor Center has, therefore, dedicated and organized efforts for a more rational attack on future problems through the development of an early-warning system in training--a proactive training plan.

b. This plan is not intended to be a futuristic fantasy, nor is it intended to provide highly visible "quickie" approaches which create the illusion of progress in solving Armor training problems of the future. The Armor Center recognizes the uncertainty of the future. This plan does not assume that training will remain as it is or that it will change, proceeding in a smooth projection; therefore, this plan rejects surprise-free projections or system breaks and builds in allowances for uncertainty and discontinuity through the use of contingency points and alternatives.

c. Realistically, planning comes before doing. This plan is, therefore, concerned only with what is to be achieved in Armor training in the future. (Practical implementing decisions will be made later.) This plan determines where Armor training must go and identifies alternatives and requirements for getting there in the most efficient and effective way possible. The substance of this plan is built around the following:

(1) Identification of training needs.

(2) Selection of training needs with sufficient priority for action.

(3) Specification of outcome or accomplishments to be achieved for each selected training need.

(4) Identification of requirements for meeting each selected training need, including specification for eliminating the need by problem solving.

(5) Identification of the sequence of outcomes required to meet the identified training needs.

(6) Identification of possible alternative strategies and tools (methods and means) for accomplishing each requirement for meeting each need, including advantages and disadvantages.

d. Training is the number one mission of the Army today. The Army, with all its forces, must be prepared to go to war immediately. To be prepared, the Army must get the most out of what it has available to train today and must look forward to how it will train in the future. This chapter provides the reader, the trainer, and the planner with an overview of the interactive political, social, and technological forces which impact upon the Armor Force and the combined arms battlefield. It sets the stage, through a general assessment of Armor philosophy, organizations, materiel systems, interests in non-proponent areas, perception of the modern battlefield, and approach to Armor training, for a look at the future of training in Armor, which unfolds in succeeding chapters.

1-2. RECOGNITION OF REALITIES. The most important mission of the peacetime Armor Force is to train soldiers to meet the challenges of the modern battlefield and to win despite being outnumbered in both materiel and personnel. In preparing for the next war, we must assess the impact of both present and future realities. The following are some of the more obvious and pressing realities with which Armor must cope, now and in the future. Directly or indirectly each affects the soldier's ability to be trained to survive modern battle.

a. The Next War. Our nation's current foreign and national defense policy, international pressures, and the imperious actuality of nuclear confrontation indicate that any major conflict between major powers will be relatively short, intense, and destructive. The greatest threat to international peace is the Warsaw Pact forces, which oppose NATO in Europe. The Warsaw Pact forces are all well-equipped, well- trained, numerous, technologically sophisticated and well-prepared for either conventional or NBC warfare. The likelihood of war and US commitment to war in other areas of the world may be greater than in Europe. Thus, the Armor Force must also maintain contingency plans to train the force for commitment to other areas of the world. Nevertheless, the consequences of war with the Warsaw Pact affect the survival of established Western allies and is our greatest threat. It is towards this threat that Armor training should be geared. Underlying the next war's importance are the following additional realities:

(1) Total Force Concept. Our Army does not depend upon the draft. The nation's defense is based on a strong meshing of active and Reserve forces, which will have to fight the next war with those soldiers already on hand. The training of this armed force is critical to national security.

(2) Strategic Mobility Training. The shortfalls in strategic mobility capability have been pointed out in Volume I, Materiel. Not only is the Army's capability to deploy limited, the availability of trained troop units is also limited. The Armor Force must be trained to deploy men and equipment rapidly by sea or air before war starts.

(3) Numerical Superiority and Qualitative Parity of the Threat. It is readily understood that the Army's potential enemies possess numerical superiority in manpower, tanks, aircraft, and ships. Threat technology is comparable to that of the US Army, and Threat forces gain the benefit of a substantially faster method of fielding technology and incorporating technology into ongoing programs. Armor Force training must be imaginative, exploiting the Army's purported technological superiority to ensure victory on the battlefield with minimal losses. The training standard must guarantee that we win the first and subsequent battles of the next war.

b. Dwindling Defense Dollars. The critical impact of fewer defense dollars and higher costs for training are forcing the military to use better methods and means of training and training management. Research in Armor training technology and technique must ensure that Armor gets the most out of each training dollar.

c. Energy and Resources Constraints. The nation continues to experience an energy crisis. The recent OPEC oil price increases, the revolution in Iran, and inflation continue to drive the costs of fuel higher. The concern over the disruption of clean air, water, and other environmental questions has placed constraints on training activities. To overcome these constraints and still maintain a highly trained Armor Force, additional training methodology and technology must be developed. Management of energy and resources must be taught to the leadership structure. We must develop Armor training and combined arms training which can be conducted with less fuel consumption and lower proliferation of pollution. Congress has legislated that certain military vehicles meet EPA standards, and this trend toward reinforcement of energy conservation and environmental protection programs will continue.

d. Technology and Training. This century has seen unparalleled technological achievements and advancements. History clearly illustrates that for every weapon or weapon system developed and fielded, an effective countermeasure is rapidly developed. The invincible weapon system probably never will be developed. The Armor Force must remain flexible to exploit technological breakthroughs and discard older systems and concepts without time lags due to parochialism and emotion.

(1) Technological advancement in warfare is not decisive until the equipment is fielded in quantity and the soldiers are trained to use it. Currently, the materiel acquisition cycle takes 5 to 10 years. This process is too long; often, the newly fielded item is met by countermeasures shortly after being fielded.

(2) Human engineering aspects have not been totally considered in materiel development. Today's equipment is more complex; but, it has not been designed to the level required to enable our common recruit to operate the equipment without a very difficult and time-consuming training program. As more highly complex equipment enters the Armor Force, the training developers must design training programs which emphasize hands-on training in order to maintain and operate the new equipment and exploit its technological advantages. Training which is challenging and job satisfaction are critical factors which will allow the Armor Force to maintain the required quantity and quality of combat-ready soldiers.

(3) The development community, when designing new system technology, must consider the soldier and his tasks. The critical man-machine interface must be considered at the beginning of system design, not as an afterthought upon completion of development. Training developers must begin by working closely with materiel developers, insisting upon a system that contributes not only to the tank, but to the combined arms team as a whole. Development of any system must be simple, reliable, and maintainable. Above all, soldiers must be trained rapidly in system use to exploit the advantages.

e. National and International Policy. Training developers and trainers must perceive national and international policies more accurately than in the past because these policies may inhibit the manner in which warfare is to be conducted. More importantly, these policies must be assessed rapidly and accurately to determine their effects on military doctrine, training, and materiel acquisition. The Armor Force must be prepared for low-, mid-, and high-intensity warfare, which may erupt at any time and in any location. Training must include preparation of the Armor Force to operate in a nuclear, as well as a non-nuclear, environment.

SECTION II - WHAT IS ARMOR?

1-3. DEFINITION OF ARMOR. In conjunction with Volume I, Materiel, Armor is defined as "a concept of employing the characteristics of mobility, firepower, and shock effect to defeat an enemy force by a combined arms team characterized by a predominance of mounted combat." The dominant member of the combined arms team is the tank, and it will remain so against projected threats in both the near- and long-term time frames. The philosophy of flexible organization, Armor-protected firepower, mobility, shock effect, and teamwork is fully expressed by the combined arms team. Tanks, armored cavalry, air cavalry, and attack helicopters are the Armor proponent units of the combined arms team. Armor components are integrated with mechanized infantry, artillery, engineers, air defense, and an extensive communications network, and they are supported by tactical air forces and a mobile logistical system. By definition, Armor "conducts decisive, highly mobile warfare, in a ground environment through the use of both ground vehicles and aircraft." Armor proponent units include armored divisions, brigades, and cavalry regiments; the air cavalry combat brigade (ACCB); and armored battalions/squadrons of mechanized infantry, infantry, air assault, and airborne divisions. Materiel found in Armor proponent units includes not only tanks, but helicopters (scout and attack), scout vehicles, armored mortars, recovery vehicles, wheeled and tracked supply vehicles, and self-propelled artillery. Thus, Armor proponency training includes tank, scout, track mechanic, and turret mechanic training. Armor training developers must work closely with service schools who furnish elements to the combined arms team. This will ensure that Armor/combined arms training is compatible in terms of doctrine, tactics, equipment, personnel, and environment.

1-4. MAJOR ARMOR ORGANIZATIONS.

a. Where We Are. Since World War II, the organization of Armor and ground cavalry units has remained relatively stable with minor internal changes. Comparatively recently, however, significant changes have occurred. Armored cavalry was equipped with tanks and M113A1s in lieu of the thin skin and smaller M551s and M114s. The thrust was to upgrade it to a fighting unit capable of surviving on the modern armor battlefield in covering force or economy of force roles. Air cavalry and attack helicopter units, relatively new additions to the Armor Force, represent an extension into the third dimension to more effectively accomplish traditional Armor and cavalry roles and missions. Organizational design has been, and should remain, keyed toward providing the correct mix of proper types and numbers of people, units, and weapon systems for mission accomplishment. Armor training developers must continuously interface with organization developers to ensure that Armor Force individual and collective training, both at the institution and unit,

keep pace with the organizational changes. Training developers play a key role in the synergistic interfaces of equipment, doctrine, tactics, personnel, and environment in which Armor units operate. Training technology must be considered during organizational restructuring if the new organization is to accomplish specific missions and perform specific roles and functions. It is through training in the form of tactical exercises that Armor sees whether or not the organization can accomplish its combat mission. Armor proponent units should be organized and should train in peacetime as they would fight in combat.

b. Where Are We Going? The long-range Division Restructure Study (DRS) goal in new organizational design is to provide a totally integrated combined arms force for the battlefield, supported by a streamlined and responsive logistical system.

(1) Maneuver Battalions. In the future, combined arms battalions may be composed of a tank/mechanized infantry company mix, possibly with other combat and combat service support units. Future Armor Force training will be broadened in order to train the leaders of the new maneuver battalions to exploit the combined arms team concept. Armor training developers must work closely with the training developers at other service schools to coordinate training efforts which support the doctrine, tactics, equipment, personnel, environment, and training of the combined arms team. Under the combined arms battalion concept, Armor will remain the dominant force within the structure.

(2) Armor Cavalry Units. Armor cavalry troops, organized under a new TOE, will continue to be part of all armored cavalry squadrons in armored and mechanized divisions and armored cavalry regiments. The need for specially trained personnel and units to perform reconnaissance and security missions under all conditions of weather and visibility will not diminish in the future. Training developers must continue to improve training technology and materials which exploit weapons systems, doctrinal changes, tactics, individual training programs, and collective training programs.

(3) Armor Aerial Maneuver Units. It is anticipated that the Air Cavalry Attack Troop (ACAT) will be the one Armor aerial maneuver unit found in all divisions, armored cavalry regiments, and the ACCB. This unit will be capable of performing missions currently performed by air cavalry and attack helicopter units. Armor training developers must keep abreast of doctrine, tactics, and equipment associated with the ACAT to produce training technology, programs, and materials which exploit the advantages of the organization/unit. Aerial gunnery, tactics, and logistical support will be of particular interest to Armor training developers.

(4) Combat Service Support (CSS) Units. As the new maneuver force structure evolves, new weapon systems are introduced, and logistical efforts are streamlined, Armor training developers must stress the CSS system, as well as the chain of command that depends upon the system for battlefield survival. Training the Armor Force to be more responsive to CSS needs must focus on the following areas:

(a) Mobile supply points must be established well forward to furnish ammunition and fuel directly to the maneuver battalions.

(b) Direct support maintenance and repair capabilities must be accomplished well forward, with maintenance contact teams going down to battalion level.

(c) Rearm, refuel, and redistribution drills must be emphasized to ensure that an Armor unit can accomplish its mission.

(d) Vehicle recovery techniques must be emphasized to ensure maximum combat power to the Armor Force.

1-5. MAJOR ARMOR MATERIEL SYSTEMS.

a. Where We Are.

(1) The Tank Fleet. The basic task of the tank is to provide the necessary firepower, mobility, and protection needed to destroy the enemy by offensive actions. Currently the tank fleet is composed of M60s, M60A1s, M60A2s, M60A3s, and M48-series tanks. Training materials must maintain a high state of training readiness in the active Army and Reserve components during this fleet modernization period.

(2) The Ground Scout Fleet. The present fleet of ground scout vehicles consists of M114s, M113s, and 1/4-ton trucks. These vehicles do not: provide mobility equal to that of the main battle tank (MBT), afford protection against 152-mm artillery fragments and 14.5 AP rounds, nor provide surveillance through observation out to 3,000 meters and beyond, deliver suppressive fires out to 2,000 meters, have the capability to defeat lightly armored vehicles nor can they transport a five-man scout team and their equipment. Under the most recent armored cavalry unit TOE, M551s are replaced with the MBT. Other vehicles in the armored cavalry platoon are two improved TOW vehicles (ITV) and three M113s with .50 caliber machineguns. The mortar formerly organic to each platoon is now consolidated at troop level to facilitate training. Training developers must constantly monitor this conversion and update individual and collective training materials as required.

(3) The Helicopter Fleet. The Armor aerial fleet consists of OH-58A, OH-6A, AH-1G, AH-1Q, AH-1S, UH-1C, UH-1H, and UH-1M helicopters. The air scout fleet (OH-58A in active forces and OH-6A in Reserve components) is deficient in three major areas: target acquisition and hand-off, the ability to hover out of ground effect (HOGE), and the capability of night flight in the nap-of-the-earth (NOE) environment. The attack helicopter fleet currently is a mix of AH-1G, AH-1Q, and AH-1S models in the active force and a mix of UH-1C, UH-1H, and UH-1M models in the Reserve force. All of these attack helicopters have a limited munitions-carrying capability and are deficient in night and limited visibility operations. As fleet modernization occurs, Armor aviation training developers must work hand-in-hand with aviation equipment developers to ensure that the human engineering aspects are considered while equipment technology is developed and the helicopter fleet is improved.

(4) Combat Service Support Fleet. The major items of interest in the support equipment fleet are wheeled vehicles for cargo and transportation and tracked vehicles for cargo, recovery operations, and bridging. The combat service support fleet is also a mix of several types of wheeled and tracked vehicles. Training developers must keep abreast of the product improvements made to these vehicles and ensure that training programs and materials are kept current.

b. Where Are We Going? More than ever, Armor training programs must exploit the capabilities of newly introduced weapon systems. Present and future training must:

(1) Focus on continuous 24-hour operations under all visibility/climatic conditions.

(2) Provide better ranges and gunnery training to exploit target acquisition.

(3) Provide realistic casualty and equipment assessments during tactical training periods to emphasize survivability and stress the logistics system.

(4) Improve gunnery techniques which stress the delivery of more accurate firepower.

(5) Improve target servicing capability.

(6) Exploit increased mobility.

(7) Reduce required logistical support and training costs.

(8) Provide for the integration of tactical nuclear weapons on the battlefield.

The introduction of the XM1 tank, the cavalry fighting vehicle (CFV), the advanced scout helicopter (ASH), advanced attack helicopter (AAH), the expandable mobility tactical truck (EMTT), the armored forward rearm vehicle (AFARV), the maintenance assistance vehicle (MAV), and the medical evacuation vehicle (MEV) will challenge training developers to produce mobile training teams, unit training packets consisting of individual and collective training materials, and institutional programs of instruction. Training technology and methodology must be available when vehicles are fielded. Training developers must not confine themselves to previous design parameters at the risk of not considering new and innovative training technology.

1-6. ARMOR INTEREST IN NON-PROPONENT AREAS. Since Armor is the decisive member of the combined arms team, training developers must keep abreast of non-proponent organization, training programs, and materiel acquisition activities to ensure that these activities do not have a derogatory impact on the overall capability of the combined arms team. Training of non-proponent team members, including service support and combat service support elements, is vitally important to Armor training developers in terms of impact on doctrine, tactics, and support of the combined arms team. Training developers must view combined arms training in terms of total systems integration, which will guarantee relative success on the battlefield.

SECTION III - THE BATTLEFIELD

1-7. INTRODUCTION.

a. The development of Armor training and, for that matter, any combat arms training, is very difficult because only a relatively small number of men under arms personally experience combat. Yet, it is through the actions of all members of a well-trained unit that success is achieved. Training must accurately reflect current combat doctrine and anticipated tactical operation on the battlefield based on Armor's understanding of what it will be like and how Armor units will operate in that environment. Battlefield success is the ultimate test of all tactics, organizations, materiel, and training. Three critical facts will affect the training of the Armor/Combined Arms Force. These facts are:

(1) The battlefield will be dominated by long-range, high- velocity tank cannons and long-range antiarmor systems. Weapon system range capabilities are such that anything that can be seen can be taken under fire, hit, and killed.

(2) Likewise, the air above the forward battle area will be dominated by long-range missile and gun systems. The effectiveness of these missile and gun systems can deny forward-fighting elements effective close air support and can severely affect the operating profile of low, slow-flying platforms of the Armor aircraft fleet.

(3) Armor's success on the battlefield will depend on highly trained, well-led, well-equipped soldiers operating in combined arms teams (tanks, mechanized infantry, attack helicopters, engineers, and air defense artillery) supported by artillery, close air support, and a mobile, flexible, responsive logistical system.

b. Critical facts have been identified which are critical to Armor Force survivability, and require the establishment of priorities in training. These tasks are:

(1) Detection and identification of enemy at maximum possible distance.

(2) Firing first and firing accurately in combat engagements (Target Servicing).

(3) Delivery of suppressive fires from overwatch positions.

(4) Operating in a continuous land combat environment.

(5) Operating at night and during periods of reduced visibility.

(6) Conducting warfare in a low-, mid-, and high-intensity battlefield environment to include operations in an NBC arena and electronic warfare (EW) environment.

(7) Rapid resupply, sustainability, and replacement of materiel and personnel.

c. In order to take advantage of technological breakthroughs and to offset countermeasures, the Armor community must remain flexible in its thinking. Armor training must positively answer the question: Can the average soldier be trained to employ and maintain his weapon system to accomplish the mission and survive on the battlefield?

1-8. CRITICAL ASPECTS OF THE BATTLEFIELD. The modern battlefield in which the combined arms team will operate has several critical aspects which must be understood by trainers and developers. The following are some, and by no means all, of these aspects.

a. Threat. The primary Threat facing NATO in Europe is the Warsaw Pact forces. The Threat is well-equipped with modern, technically sophisticated materiel and well-trained, with doctrine and tactics centering on fast-moving mechanized combined arms teams supported by massive artillery fires and a very capable logistical system. Armor training will be designed primarily to defeat the European Threat. Armor soldiers must know their potential adversary in order to exploit his weaknesses. Therefore, the Armor community must work hand-in-hand with the intelligence community and others to develop effective training programs that will be flexible enough to counter any changes in Threat materiel, doctrine, or tactics.

b. Combined Arms Operations. A major goal in the implementation of tactical doctrine is the combined arms team acceptance and employment, which is dictated by the very nature of the modern battlefield. These combined arms teams must include not only tank and mechanized infantry, but attack helicopters, artillery, engineers, air defense, and tactical air. The combined arms teams are an integration of all these elements at the lowest organizational level possible to maximize capabilities and minimize vulnerabilities. The tactical thrust of Armor/combined arms doctrine and training must be aggressively executed in battle. This thrust emphasizes the espirit of the offense and focuses on destroying the enemy, whether Armor/combined arms forces are in the offense or defense. Consequently, combined arms operations must make use of night and limited visibility operations and exploit our weapon systems' capabilities. Above all, training in the combined arms mode must occur frequently in order that all elements of the team know and understand each other's capability, limitations, methods of

operation, and so forth. The combined arms team must champion the idea that units which compose the team can ill afford to train as separate entities through the training year. In addition, trainers and training developers must provide confidence, initiative, imagination, and realism. Combined arms training must strive constantly to raise established ARTEP standards whenever possible.

c. Command and Control. More than ever before, command and control is challenged by units operating over extended distances, by rapid and frequent displacement, mission type orders and the interoperability of NATO elements. Rapid and accurate communication is critical to command and control. The radio can no longer be consistently relied upon as the primary means of communications because of the Threat's electronic warfare capabilities. The Armor Force must train to operate with reduced radio traffic and to displace frequently to preclude the interception of electronic signatures, the pin-pointing of locations, and the destruction of command posts, units, and individual vehicles by enemy artillery. The dispersed nature of operations will further hamper command and control. The Armor Force must place more reliance on fragmentary orders and decisions made at lower levels. Centralized planning and decentralized execution will be the norm.

d. Distances. Current tactical doctrine stipulates the coverage of greater distances by fewer forces. This is particularly true in active defense. Closely related subjects are:

(1) Mobility. A critical component to success in battle continues to be mobility, both on and over the battlefield. The commander's ability to execute doctrine is dependent upon his ability to rapidly mass forces to counter an enemy breakthrough or to attack an enemy weak area. Although this is not new, it is imperative that this task be accomplished more rapidly than in the past, under all types of weather conditions, during day or night, with fewer forces covering greater distances. Rapid movement of Armor forces, including aircraft, poses a challenge to trainers. Armor aviation units also must move and live in a ground battlefield environment, employing the movement and displacement techniques set forth in tactical doctrine. Armor training must continue to emphasize agility, the ability of ground and aerial vehicles to move rapidly to cover or take evasive action, as a vital factor in survivability.

(2) Engagement Ranges. Sophisticated weapon systems which have extended range capabilities and offer a high probability of hit at ranges out to 3 kilometers may result in a trend toward engagement ranges at increasingly greater distances. The challenge to Armor trainers is the ability to "see" at these extended ranges and to determine the optimum target servicing ranges and rates. Armor soldiers must be trained to integrate

carefully the available weapon systems so that the various maximum range advantages are optimized. This is especially true during operations in which aerial weapon platforms are employed in conjunction with ground weapon systems.

(3) Detection and Identification. Detection and identification of enemy forces at maximum distances from the main body during offensive or defensive operations allows the main body to receive early warning, to begin early attrition of the enemy force, to prevent the main body from being engaged when not in the most advantageous fighting position, to provide time for friendly forces to mass and attack the enemy's weakest area, and to permit the momentum of the battle to shift to offensive operations. Armor training must include detection and identification training whereby the soldier is taught to use his available equipment to detect and identify the enemy. This training works toward exploiting the weapon systems available to destroy the enemy with minimum friendly casualties.

e. Survivability. Armor Force survivability on the battlefield is of utmost importance. The lethality of modern weapons, anticipated intensity of combat, need for continuous operations, and stress placed upon the operational and logistical systems of Armor units will involve actions and measures that will affect survivability. Survivability can be broken down into either active or passive measures. Active measures include the use of camouflage and concealment, proper movement techniques, and occupation of the defilade firing positions. Examples of passive measures are camouflage painting of vehicles, armor protection, and exploitation of equipment capabilities. The key to Armor Force battlefield survival is to take advantage of all inherent passive measures, while at the same time employing other active measures. But, neither active nor passive measures by themselves, will provide battlefield survival. Armor training must be conducted in such a manner as to induce active and passive survivability measures during realistic training which stresses all systems of the force being trained.

f. Night Operations. The lethality of modern weapons, coupled with technological advances in night vision devices, allows the Armor Force to conduct operations at night and during periods of reduced visibility. Threat doctrine directs its forces to continue their operations around-the-clock; night is not an obstacle. To counteract Threat doctrine Armor troops must be trained to take maximum advantage of the hours of darkness and to exploit the capabilities of their night vision devices and weapon systems. For the most part night training has been rather limited and shabbily conducted. Survivability of the force may well depend on how well Armor can fight at night or during periods of reduced visibility.

g. Logistics. Logistical support may be the most challenging aspect leading to success on the modern combined arms battlefield. Logistical support for Armor Force success is critical in the areas of timely ammunition and fuel resupply, the rapid evacuation/repair and return of damaged equipment to the battle, and evacuation of casualties. Tactical operations will be conducted on a more decentralized basis. This will increase distances and dispersion of units involved. Coupled with frequent displacements, operations will demand a flexible logistical system located farther forward than now. Battalions, squadrons, and brigades will operate more independently and must have considerable logistical support either organic, attached, or OPCON in order to sustain operations. The successful Armor Force is dependent upon a more compact, mobile, and responsive logistical system. Armor training must emphasize preventive maintenance procedures conducted before, during, and after operations. Supply discipline and economy must be stressed as training resources become more tightly managed. Armor trainers must work more closely with logistical support units to ensure a better understanding of how Armor emphasizes offensive actions in terms of firepower and mobility, which in turn is dependent upon the logistical support provided.

h. Nuclear, Biological, and Chemical (NBC) Operations. Threat training, equipment, and doctrine emphasize NBC operations. Threat technology in toxic chemicals, collective and individual protective equipment and materiel, and capability for decontamination of personnel and materiel far exceeds anything in the US Army inventory. Threat doctrine and training emphasize operating in an integrated NBC environment for extended periods of time. Armor trainers must view combat under an NBC environment as probable. The Armor Force must be trained to operate successfully in an extended NBC environment.

1-9. TOTAL INTEGRATION OF COMBINED ARMS. The critical aspects of modern warfare compel a complete integration of the combined arms team on the battlefield. More than ever before, tanks, mechanized infantry, artillery, engineers, helicopters, and tactical aircraft must be employed and truly integrated to maximize their capabilities. Combat support and combat service support elements must be more closely affiliated and knowledgeable of combined arms operations. Armor, which will continue to be the dominant force within the combined arms team, must train and lead all combined arms forces toward the ultimate goal--success on the battlefield.

SECTION IV - ARMOR TRAINING

1-10. INTRODUCTION. Training is the most important peacetime activity. Training is an instructional process that can be defined as the systematic acquisition of skills, rules, concepts, or attitudes that result in improved performance in another environment. A good Armor Force has three essential characeristics: training, discipline, and maintenance. Discipline and maintenance are derived from good training. Armor training is more than "move, shoot, and communicate"; it includes such areas as personnel and administrative procedures, logistical activities, and safety. When prepared and conducted properly, training is the one activity which enables a unit to accomplish its mission.

1-11. A SYSTEMATIC APPROACH TO ARMOR TRAINING. Armor training critics have noted continual changes in the training base and educational curricula. There has been constant disagreement among trainers about the separation of training and education, as well as the objectives to be achieved from the training conducted at the institutional level. Training and education are instructional processes designed to modify human behavior, and both have basic foundations that are dependent on learning and transfer processes. In the past, Armor trainers emphasized differences between training and education based on the specificity of their program objectives; i.e., training with its focus on nuts-and-bolts, hands-on performance; and education focusing on setting minimum acceptable levels of performance, resulting in a greater degree of uniformity. Armor recognizes that training and education are part of the same instructional process, and that each has similar problems related to the specifications of objectives, design of environment, and evaluation of the instructional process. Each discipline profits from research that reduces the deplorable gulf between the basic psychology of learning and the understanding of how learning variables affect performance in complex instructional settings. Armor training will improve because trainers and educators are working together through the exchange of research rather than emphasizing uniqueness of each program. Armor training is being developed using a systematic approach through instructional technology.

a. Instructional technology emphasizes the specification of instructional objectives, precisely controlled learning experiences to achieve these objectives, criteria for performance, and evaluation information. Other characteristics are discussed below.

(1) Armor training programs are never finished products; they continually use feedback to determine whether the program is meeting its stated objectives.

(2) The Armor training system consists of complex interaction among components. For example, one particular medium, television,

might be effective in achieving one set of objectives. Similar instructions could involve learning variables and specific individual characteristics of the trainee. The systems view stresses a concern with the total system rather than with objectives of any single component.

(3) Systematic analysis provides a frame of reference for planning and for remaining on target. In this framework, a research approach to Armor training is necessary to determine which of the Armor-proponent programs are meeting their objectives.

(4) The instructional systems view is just one of a whole set of interacting systems. Armor training programs interact with and are directly affected by a larger system involving corporate policies (for example, selection and acquisition of materiel). Similarly, Armor educational programs like the Drug and Alcohol Abuse TV Program are affected by the social values of the Armor Force.

b. Assessment Phase. In past Armor training programs, there has always been the temptation to begin training without a thorough analysis of unit needs or a complete assessment of tasks, behaviors, and environment. Goals and objectives are the key steps in determining a training environment. Unless those steps are specified, there is no way to measure success. Armor trainers must determine the unit needs before they can determine what training techniques will meet those needs. The need-assessment phase consists of organizational, task and person analyses.

(1) Organizational Analysis. Organizational analysis begins with an examination of the short- and long-term training goals of the organization (the Armor community as a whole, Armor units, the Armor Center etc.), as well as the trends (e.g., doctrinal and tactical changes) and equipment acquisitions that are likely to affect these goals. This analysis requires that each level of management examine and express its own views to the Armor Center concerning Armor training programs. Armor training designed to produce proficient tank crewmen, scouts, and mechanics must be structured differently from programs designed to train Armor leaders (officers and NCOs), who are technically proficient and capable of coping with considerable challenge. When organizational analysis is ignored or conducted in a haphazard manner, planning difficulties abound. Another aspect of the Armor organizational analysis focuses on training programs of other Service schools which provide elements to the combined arms team and on supporting systems (e.g., the materiel acquisition system, human engineering research, weapon systems design, etc.).

(2) Task Analysis. The second part of the Armor needs- assessment program is a careful analysis of the misisions/tasks to be performed by Armor trainees upon completion of various Armor training programs. Task analysis is divided into two separate procedures. The first step, the job description, is written in behavioral terms. The job description specifies the individual's duties, by grade, and the special conditions under which the job is performed. The second procedure, most commonly referred to as task specification, further denotes all the tasks required of an Armor soldier on the job, by grade level, so that eventually the particular skills, knowledge, and attitudes required to perform on the job become clear. These statements supply information about the behaviors required, regardless of the individual performing the mission/task.

(3) Person Analysis. Human engineering experts must translate into human attributes those behaviors required of an individual who will be part of a specific Armor training program. This difficult, but necessary, job must be based on inferences drawn from the analysis of the organizational and task components. The determination of the training/learning environment, training technology to be used, and instructional media required directly depends on the particular types of behavior necessary to perform the various Armor proponent tasks. Furthermore, person analysis is the examination of performance standards and capabilities of the target population. It is important to determine which necessary behavioral characteristics have already been learned by the prospective trainee. Too many institutional and unit training programs are exercises in boredom; they focus on skills already acquired by the trainee. Determining the target population is also necessary. Some Armor training programs are designed for individuals already in the system, while others are designed for relatively new trainees not yet part of the Armor Force. In any case, Armor training environment and program design must acknowledge the characteristics of the groups to be trained.

c. Training-Development Phase. Behavioral objectives provide input for the design of specific Armor training programs as well as for measures of criteria that will be used to judge the program's adequacy. Well-written behavioral objectives specify what the trainee will be able to accomplish when he successfully completes the training program. They also indicate the conditions under which the performance must be maintained and the standards by which the trainee will be evaluated. Thus, objectives communicate the goals of the training program to both the trainee and the training designer. Using these goals, designers determine the appropriate training environment and the criterion for examining the achievement of objectives.

(1) The Training Environment. Designing the training environment is a delicate process that requires a blend of learning principles and media selection based on the mission/task that the Armor trainee is expected to perform. From the assessment of training needs, the designer selects the skills and knowledge necessary to train the soldier to perform the duties of the position for which he is being trained. The designer then matches the performance required for each mission/task with the characteristics of the various subjects the soldier is being trained to accomplish. Training designers next choose devices, simulations, or games that will add or create realism during training.

(2) Learning Principles. In training environments, the instructional process involves the acquisition of skills, concepts, and attitudes that are transferred to a second setting (for example, during unit training or in other classrooms). Armor training designers and educators are continuing to research the subject of transfer of learning to a second setting in order that the training base provide the field with a more combat-ready soldier.

d. Evaluation Phase. Since the development of Armor training programs involves an assessment of needs and a careful design of the training program, the trained Armor soldier is expected to perform his job at acceptable criterion levels. Unfortunately, the assessment of the training need might have omitted important task components, or the mission/task itself might have changed since the training program was designed. In order to improve upon training, Armor trainers continually evaluate the product of Armor training programs and provide feedback to training designers and developers. The Armor training programs at the institutional and unit levels should be a closed-loop system in which the evaluation process provides for continual modification of the programs to satisfy the needs of the Armor Force.

1-12. LEVELS OF ARMOR TRAINING.

a. Initial Entry Level Training. Initial entry level Armor and Armor-related training is conducted by the US Army Armor Center, Fort Knox, Kentucky. The training program now provides the field with entry level Armor soldiers who are technically qualified for initial duties in a specific tank weapon system and a discreet duty position. Armor-related initial entry level training is provided through Basic Armor Training (BAT), Basic Reconnaissance Training (BRT), the Track Vehicle Mechanic Course (TVM), the Tank Turret Mechanic Course (TTM), and the Armor Officer Basic Course (AOB).

b. Professional Development Training. Armor professional development training is designed to produce highly trained, technically competent Armor leaders capable of assuming greater responsibilities in the command or staff structure of the Armor Force. Armor-related professional development courses conducted at Fort Knox are the Basic Noncommissioned Officer Course/Combined Arms (BNCOC/CA), NCO Advanced Course (NCOA), Master Gunner Course, Motor Officer Course (MO), Armor Officer Advance Course (AOAC), and the Pre-Command Course designed for senior Armor officers selected for TOE battalion and brigade level command assignments.

c. Unit Training. Perhaps the most critical Armor training area, unit training, consists of individual, collective, and sustainment training. The commander must determine the training needs of his unit and establish training programs to ensure that the needs are met. Armor training conducted at unit level is much more flexible than institutional training and is decentralized as much as possible, yet still focuses on the unit's ability to accomplish its mission. Small-unit training focuses on the quality of individual and small-unit collective skills; its importance cannot be overemphasized. The Armor unit commander has a large share of the responsibility for individual training to provide sustainment training to maintain the quality of learned individual and collective skills.

1-13. TRAINING SUPPORT FOR ARMOR TRAINING. In any future war, Armor cannot count on having time to "peak" active Armor units or to conduct lengthy training programs to prepare Reserve component Armor units for deployment. Armor's goal must be to achieve and maintain training proficiency readily transferable to combat proficiency. Armor soldiers and units must be prepared to perform their combat missions continuously. Much effort and many resources are being devoted to provide training support materials to assist the unit commander in his year-round training mission. Training the individual in all required skills is beyond the capability of the institutional training program because adequate time and resources are not available. The soldier must acquire many of the individual skills in his unit's training program. Sustainment training must be provided in the unit to ensure that soldiers retain proficiency in those skills learned in earlier training. To support the goal-unit readiness, Armor is committed to a decentralized training program with training support materials as the nucleus. Such materials now being produced by the US Army Armor Center run the gamut from literature to audiovisual aids to hands-on simulators and devices for training facilities.

SECTION V - SUMMARY

1-14. SUMMARY. This chapter has presented a brief overview of the challenge to the Armor Force in terms of interactive political, social, and technological forces and their effects on Armor weapon systems, personnel, logistics, and training. This chapter correlates closely with the thoughts expressed in Volume I - Materiel. The need for total systems integration becomes apparent when one considers the multitude of areas which have direct and indirect bearing on training. Hopefully, the stage has been set for the reader whereby an evaluation of Armor training, both current and future, can be presented. The following chapters will assess Armor training today and present the Armor Center views of where we are headed in the future. Armor trainers and training developers must meet the challenges of a complex world head-on. Armor, the combat arm of decision, must move forward and meet the goal of the Army to have a well prepared force capable of going to war today.

CHAPTER 2 - THE ASSESSMENT

SECTION I - INTRODUCTION

2-1. INTRODUCTION. This chapter provides the foundation for Volume II, Training, of the Armor Development Plan. It identifies the training needs or provides discrepancy analyses that identify the two polar positions of:

Where is Armor training now?

Where is Armor training to be?

Thus it specifies the discrepancy (or distance) between these two poles. It describes where Armor training should be going based upon where it is now and is central to the planning of Armor training for the future. The data and expert judgment for marking these poles and, hence, arriving at this assessment, are as valid and representative as possible of the future training needs of the Armor soldier. The Armor Center recognizes that the mere stating of needs does not endow them with validity. Identification of discrepancies can be an endless process and still fail to deal with the training that the Armor soldier needs to survive on the battlefield. To preclude such a failure this assessment has three characteristics:

a. It is representative of the actual world of Armor soldiers as it exists now and as it will, could, and should exist in the future.

b. It is not final and complete because any assessment is tentative and its validity should be questioned constantly.

c. It identifies discrepancies or needs in terms of products, outcomes, or behaviors (ends); it does not identify needs in terms of processes (means).

2-2. PARAMETERS. This assessment is delimited by two factors: the level or scope of the assessment and the conditions of time--how far into the future one can look realistically. The primary thrust of this assessment, the needs of soldiers up to the company/team level, points out the preponderance of Armor training responsibilities. A strong excursion, however, is made into the training needs of soldiers at battalion/task force level. As for time, this assessment does not attempt to identify training needs beyond 1986--the year of the advent of Division 86. Maintenance of this plan will allow progressive assessment beyond that time.

2-3. RELATED PLANS AND DOCUMENTS. Though this assessment has been made to support what has been described as a proactive training plan, it has not been done without consideration of related plans and documents. A bibliography of those related plans and documents is at Appendix A.

SECTION II - METHODOLOGY

2-4. METHODOLOGY. Data for this assessment were collected from agencies within the Armor Center whose primary interests are training analysis, design, development, implementation, and control. Each agency was asked to identify and document needs--measurable discrepancies or gaps between the current conditions of Armor training and the required conditions--of Armor training in the future. It was requested that the data for each Armor training need be provided as two discrete elements: first, data-based documentation of the "what is" or current condition in Armor training and, second, data-based documentation of the "what should be" or required condition in Armor training. Further, it was requested that felt or perceived needs be provided only in as much as they would lead to descriptions of measurable discrepancies or gaps in Armor training that could be documented.

a. The input from this request resulted in the receipt of 306 needs statements. To determine the usability of the needs statements for planning purposes each needs statement was evaluated against the fixed criteria on a scale specifically devised to rate needs assessments. The criteria on the scale were based on the criterion for a data-based, fully descriptive needs statement. The statement, based on hard data and the current conditions, described what is to be acheived, by whom, under what condition, and to what standard. The resultant rating scale and associated values are shown in Figure 2-1.

RATING SCALE - NEEDS STATEMENT

CRITERION	VALUE
FULL DATA-BASED DESCRIPTION; ALL ELEMENTS PRESENT	1
PARTIAL DATA-BASED DESCRIPTION; 1 OR MORE ELEMENTS MISSING.	2
NON-DATA-BASED DESCRIPTION; 1 OR MORE ELEMENTS MISSING.	3
TOTALLY NON-DESCRIPTIVE; DOES NOT EXPRESS A NEED IN ANY SENSE.	4
A FELT/PERCEIVED NEED CENTER MANAGEMENT PROBLEM.	5

Figure 2-1.

b. The application of the scale to the 306 needs statements is summarized in Figure 2-2. Each needs statement was independently rated by members of the Armor Development Plan (Volume II) Training task force. The results were derived through a consensus. Examination of the summarized results shows that 252 of the needs statements had a value of 1 to 3 and were considered useful for planning purposes; 54 were not.

SUMMARY TABLE
RATING OF NEEDS STATEMENT

VALUE	NUMBER MEETING CRITERION
1	6
2	28
3	218
4	33
5	21
TOTAL	306

Figure 2-2.

c. The next step in the procedure was to separate related needs into generic categories. Each member of the task force was allowed to define his own generic categories and to separate the 252 needs statements into those categories. Through a consensus, the generic categories and the placement of needs into those categories were derived. In addition, each member purged the list of needs to eliminate redundancy. Via consensus, the purging process was completed. The generic categories and the numbers of needs in each category are shown in Figure 2-3. Note that this procedure resulted in a significant reduction in the number of needs statements; the 252 needs statements were reduced to 86 practical, usable needs statements. These statements were then revised or rewritten to ensure that each was product or outcome oriented.

TABLE OF CATEGORIES

Generic Needs Category	Number of Needs
Individual Training	21
Collective Training	14
Doctrine	10
Training Effectiveness Analysis	10
Standardization/Mobilization	8
Training Support	6
Reserve Training	4
Officer Training	4
Parallel Materiel/Training Systems Development	4
Instructional Staff	3
Training Facilities	2
TOTAL NEEDS	86

Figure 2-3.

d. The last step in the procedure required that the needs statements be arranged according to priorities. Several procedures were examined and a decision was made to select priorities both within and across categories. This was achieved by, first, rank ordering each need within each category and, second, by rank ordering the top twenty most critical needs and the bottom twenty least critical needs across or without regard to the categories. The rank ordering of these statements was based upon the best judgments of the task force and arrived at through consensus.

2-5. LIMITATIONS OF THE ASSESSMENT. Though this assessment reflects the characteristics of a solid assessment, it has the following limitations:

a. The sources for identification of needs were limited to USAARMC agencies. Therefore, input to the assessment from Armor elements or agencies worldwide was limited to formal and informal evaluative feedback previously received or gathered from those agencies.

b. The needs statements provided for the assessment were based primarily upon "soft" data: expert opinion which is characteristically subjective and qualitative. This tends to make the assessment somewhat arbitrary and biased.

c. The level of specificity at which the needs statements are written varies. Therefore, the broader, less specific statements increase the probability that missions originating from those needs will not be identified completely.

d. The limited number of personnel (3-5) involved in reducing, revising, categorizing, and determining needs and need priorities for

the assessment increased both bias and the probability of misinterpretation of the intent of some of the "soft" data-based need statements.

e. The method for selecting priorities may lead the reader to believe that only the top twenty priorities are sufficiently critical to be pursued as missions, that the bottom twenty are unimportant, and that the middle group of needs may be ignored. This is certainly not the intent of this assessment. Each of the needs statements is considered either sufficiently critical or sufficiently important to serve as a basis for a mission and will be treated in that way in the overall plan. Remember, the key consideration in planning is to determine what ought to be achieved. Needs assessment is the foundation of that consideration.

SECTION III - THE ASSESSMENT

2-6. THE ASSESSMENT. Regardless of its limitations, the assessment which follows provides a strong foundation for planning the future of Armor training. To serve the purpose of this plan, the assessment is organized and elaborated upon as follows:

a. The category of needs which contains the largest number of top-twenty priorities is addressed first. This is followed by the category of needs which contains the next largest number of top-twenty priorities and so on. For generic categories which had an equal number of top-twenty priorities, the appearance of one category before another was simply based upon whichever category contained the single highest top-twenty priority number and has no other particular significance. Though this approach means that the top-priority needs may not be addressed in sequence, be cautioned that their adjudged criticality is in no way lessened.

b. Each category of needs is introduced briefly and followed by its respective summary table. Each summary table of categorized needs is organized to show the priorities <u>within</u> categories in descending order and, further, to show the top-twenty or bottom-twenty priority number which each needs statement received. Needs statements which show no priority number, though critical and important, constitute the middle group of needs.

2-7. COLLECTIVE TRAINING NEEDS. Collective training in the institution is aimed at training individuals to <u>conduct</u> collective training. Therefore, in the truest sense, collective training is the primary training responsibility of units and organizations in the field. The field, however, is dependent upon the institution for support of its collective training efforts. Based upon the numbers and priorities of needs identified in Table 2-1, there are considerable gaps or discrepancies in that support and, therefore, in the field's collective training efforts.

TABLE 2-1. SUMMARY OF COLLECTIVE TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Combined arms training under simulated combat conditions is not a worldwide reality. Combat, combat support, and combat service support units more often than not train separately.	Combined arms training under simulated combat conditions requires combat, combat support, and combat service support units worldwide to train together constantly.	2
ARTEP does not contain events which adequately measure the organizational commander's ability to integrate air defense, CAS, FS, C&C, maintenance personnel, and support management.	ARTEP contains events which measure the organizational commander's ability to integrate air defense, CAS, FS, C&C, maintenance, personnel, and support management.	3
Collective training programs do not provide for force sustainability. Continuous operation at significantly reduced strengths, both in personnel and equipment, during prolonged training is not required.	Collective training programs provide for force sustainability and require units to continue to operate as significantly reduced strengths, both in personnel and equipment, during prolonged training.	4
No ARTEP is available to measure a commander's ability to make full use of CSS during sustained operations.	ARTEP event(s) measure a commander's ability to make full use of CSS during sustained operations.	5
Evaluation of company level ARTEP events does not provide for formal identification of individual tasks which are not performed to standard and thus result in a NO-GO for the event. Therefore, formal feedback which identifies individual training needs is lacking.	Evaluation of company level ARTEP events provides for formal identification of individual tasks which are not performed to standard and result in a NO-GO for the event. Formal feedback which identifies individual training needs is provided.	6

TABLE 2-1. SUMMARY OF COLLECTIVE TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Battle drills are not included in gunnery manuals or in collective gunnery training programs?	Gunnery and tactics manuals and concomitant training programs include battle drills.	
Collective training programs do not stress the need to eliminate/reduce signatures.	Collective training programs evaluate the elimination/reduction of signatures.	
"How-to-Fight" and "How-to-Support" manuals are not complemented by comprehensive, single-source "How- to-Train" manuals.	"How-to-Fight" and "How-to-Support" manuals are complemented by comprehensive, single-source "How-to- Train" manuals.	13
The effects of crew turbulence on gunnery proficiency is very high. Typical crews have been together only 1-2 months when firing Table VIII. Typical tank commander/ gunner pairs have been together only 1-3 months.	Training eliminates or significantly reduces the effects of tank crew turbulence on gunnery proficiency.	
Median target engagement times exceed doctrinal guidance by as much as 100% for certain types of engagements.	Median target engagement times approximate those set forth in current Armor doctrine.	
Transitional training materials/ programs are not available worldwide to units which deploy, draw, and train on tanks different from their own during off-station training exercises.	Transitional training materials are available to units which deploy, draw, and train on tanks different from their own during off-station training exercises.	

TABLE 2-1. SUMMARY OF COLLECTIVE TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
"Flying Squads" of training troubleshooters from the Armor Center are not available to the field on short notice.	"Flying Squads" of training troubleshooters are available to the field on call.	67
No 24-hour training "hot-line" is available. Units in the field cannot ask training questions, request assistance, or provide input from new lessons learned to the USAARMC.	A 24-hour training "hot-line" is available which allows the field to ask training questions, request assistance, or provide input from new lessons learned to the USAARMC.	69
There is no methodology for accurately assessing the effects of distractions and personnel turbulence on unit training readiness.	A methodology for accurately assessing the effects of distractions and personnel turbulence on unit training readiness is available to commanders.	81

2-8. INDIVIDUAL TRAINING NEEDS. Though individual training is a responsibility which is shared by the institution and the field, the field, with both individual and collective training responsibilities, has far more and far greater training needs than the institution. No individual training need should be identified, however, without consideration of the universality of that need. The emphasis is not upon where training needs exist, but upon ensuring that those needs are identified (and attended to) wherever they exist. Therefore, no attempt has been made to segregate the individual training needs identified in Table 2-2 on the basis of where the need occurs.

TABLE 2-2. SUMMARY OF INDIVIDUAL TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
BAT and BRT Gate II & III test results consistently reveal first time NO-GO rates of 30-80% of certain tasks. Additionally, studies (ARI, ARTS) show an appreciable decay in the learning retention of BAT/BRT graduates for certain tasks.	First time NO-GO rate for all the tasks tested on BAT and BRT Gate II & III exams does not exceed 20%. The quality of training provided during BAT/BRT and the initiation of reinforcement/ sustainment training for BAT/BRT graduates immediately on their arrival at their initial unit ensures sustained high (80% or above) SL 1 task proficiency rates.	14
Armor Army Correspondence Course Program is limited primarily to training individuals in an individual or self-study setting.	Armor Army Correspondence Course Program is expanded for use in both individual and group settings; for institutional and unit training and for self-study.	15
The ACCP is not meeting the total training needs of the Armor Force due to the development/revision requirements necessary to ensure that the courses are current.	The ACCP is reviewed and the manpower is allocated ensure that the courses are current.	
The Armor Army Correspondence Course program is self-contained and limited in application for training with other types of training materials.	The Armor Army Correspondence Course Program produces courses, lessons and other training materials as part of "packages" which train through use of a wide variety of methods, means, modes, and techniques.	
The Master Gunner Course has graduated a large number of master gunners, still in service, who received system specific training on systems that have been or soon will be replaced by the M60A3, XM1 and CFV systems. Presently, no effort is being made to develop a formal transition training program for the master gunners trained on old systems to qualify them on new/ emerging systems.	Master gunners receive formal transition training on new/emerging systems as required. Master gunners assigned to units scheduled to receive new systems receive transition training on the new system before it is issued to the unit.	16

TABLE 2-2. SUMMARY OF INDIVIDUAL TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Junior officers and NCOs receive inadequate training in how-to-train and training management techniques.	Training programs and materials for officers and NCOs must improve proficiency in how-to-train and training management.	18
Institutional courses provide inadequate training in a number of critical areas. Inadequately trained graduates hamper unit mission performance.	All institution course POIs are developed from field validated analyses of individual/unit job and mission requirements. Courses provide proficiency training in all critical areas. Course graduates enhance unit mission performance.	
There is no established, formal training program for MOS 19D soldiers serving or selected to serve as aerial scouts. USAARMC provides no institutional instruction and exportable training materials have not been finalized. Unit training programs for aerial scouts are developed independently, are not standardized, and vary significantly in their training effectiveness.	The 19D personnel who are to be assigned as aerial scouts following BRT are identified prior to the 9th week of BRT. These personnel receive add-on training (Aerial Scout Basic Course) immediately following BRT. Additionally, USAARMC has a full range of exportable training materials to assist field commanders in conducting effective, standardized reinforcement/sustainment training for MOS 19D2F.	19
The extent of transfer of training from subcaliber gunnery on scaled ranges to the use of main gun ammunition on full-scale ranges is not known. The best subcaliber devices for achieving this transfer of training have not been identified, and no decision has been made on whether those devices should be tank-mounted.	The extent of transfer of training from subcaliber gunnery and scaled ranges to the use of main gun ammunition on full-scale ranges is determined. The best devices for achieving this transfer of training have been identified and purchased, and scaled ranges have been constructed.	
Target detection performance averages approximately 20% of optimum.	Target detection performance approximates 100% of optimum.	
Target identification performance approximates 50% of optimum. Certain allied vehicles are mistaken for Threat vehicles by a large proportion of armor crewmen.	Target identification performance approximates 100% on a friend/foe basis.	

TABLE 2-2. SUMMARY OF INDIVIDUAL TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
The accurate determination of tank-to-target range is a prerequisite for attaining a first-round hit in precision tank gunnery. In order to meet engagement time standards, tank commanders of tanks equipped with the coincidence rangefinders too often do not range on targets. As a result of this omission, an important procedure is not practiced and targets are missed. There appear to be two reasons why tank commanders do not range: They are not confident in their ability to determine range accurately, and they have not had sufficient practice in moving to the rangefinder during a crew drill.	The requirements to practice ranging and to use the rangefinder in crew drills receive more emphasis in training and in training literature. Training prior to main gun ranges places greater emphasis on correct and complete crew drills rather than the attainment of time standards until the time standards can be met using correct crew drills. Tank commanders are confident of their ability to use the rangefinder in precision gunnery.	
Table VII data indicates that second-round hit probabilities after a first-round miss are 10-30% below first-round hit probabilities. Current fire adjustment training does not ensure that a specified level of skill is reached.	Weapon systems analyses indicate that fire adjustment techniques should produce probabilities (given a first-round miss) that are 10-25% higher than first-round hit probabilities. Standards for fire adjustment skill are set and adhered to in training.	
Observations taken on OSUT Table VI indicate that a tank commander observing through the tank rangefinder can correctly sense only 50% of the rounds as a hit or a miss. Trainees who are placed away from the tank obscuration correctly sense 74% of the rounds with the aid of binoculars. Scoring is not accurate, and feedback is not immediate. (Both tank commanders and trainee sensings were compared to long-lens, video-tape records of round trajectories.)	OSUT 19E trainees are provided with accurate feedback reflecting their actual results in tank gunnery. Necessary instrumentations and personnel are provided to ensure that 99% of the rounds are scored correctly, and that immediate feedback is provided after each round.	

TABLE 2-2. SUMMARY OF INDIVIDUAL TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Maintenance costs to operate tanks are over 25 cents per mile. Although it cannot be quantified now, observations of tank driver performance suggest that a meaningful portion of this cost results from improper driving techniques. Both institutional and unit training do not present the full range of required techniques nor does the training ensure mastery of driving skills.	Means are found to identify driver actions (and conditions leading to such actions) that overly stress or wear tank automotive and suspension components. Means enable the contribution of the driver's performance to maintenance costs to be quantified providing sound justification for the development of training devices and improved driver training programs.	
Hit probabilities for moving platform tank and aerial gunnery average approximately 30-50% below the stationary platform hit probability.	The hit probability average for moving platform gunnery should approximate more closely with that of the stationary platform.	
BAT training is weapon system specific, seat specific. Adequate cross-seat training is not provided.	BAT training is weapon system specific. Students receive proficiency training in all crew positions except TC.	
Field comments and local reviews of materials indicate discrepancies in the interface between Soldier's Manuals, Commander's Manuals, and course POI's particularly in the areas of tasks taught, location, and competency levels attained.	Soldier's Manuals, Commander's Manuals and course POIs are mutually supporting and consistent in content.	
Majority of PNCOC/CA graduates are not given an opportunity to use newly acquired skills upon returning to their unit.	PNCOC/CA graduates are used to teach entry level soldiers common crew subjects not taught during Initial Entry training.	
Currently, the tasks, conditions, and standards of CMF 19E/F skills are identified in SQT, TCGST, and ARTEP, but are not consistent in some skill areas.	Consistency in tasks, conditions, and standards ensures training to one standard.	73
The capabilities and limitations of the NG and RC are not included in the training of active Army officers and NCO's at the USAARMC.	Training programs for active Army officers and NCOs trained at the USAARMC include training on the capabilities and limitations of the NG and RC.	83

2-9. TRAINING EFFECTIVENESS ANALYSES NEEDS. The need to define the impact of quality training on combat effectiveness is clearly recognized. However, mere articulation of such a need, no matter how eloquently stated, falls far short of its attainment. Nevertheless, if the need is not articulated, that which is ultimately required to meet that need will not be achieved. The first need articulated in Table 2-3 below identifies that need, rank orders it as the number one need in the training effectiveness analyses category, and rank orders or establishes it as the number one priority of all Armor training needs. Need for a methodology for training effectiveness analyses is a wholly pervasive need that touches all that is achieved in training. It warrants the priority which it has been accorded and an examination of its subordinate needs in this category.

TABLE 2-3. SUMMARY OF TRAINING EFFECTIVENESS ANALYSES NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
A disciplined methodology which is capable of being implemented by multidisciplinary teams and which identifies the most cost effective ways to train for combat effectiveness does not exist.	A disciplined methodology which is capable of being implemented by multidisciplinary teams identifies the most cost effective ways to train for combat effectiveness.	1
Current feedback procedures are not obtaining the desired results.	Frequent and clear feedback is obtained (ARTEP, initial entry training, AOB, Master Gunner, etc.).	9
Controversy exists on the amount of repetitive training required to sustain critical gunnery skills; the frequency at which crews and platoons should fire the main gun and ammunition costs to ensure effective gunnery training are of particular concern.	A cost and training effectiveness analysis is conducted and a sustainment tank gunnery program is published which insures maintenance of critical gunnery skills through the use of devices and trade-off of ammunition.	20
Crew gunnery training is conducted sequentially with no allowance for flexibility or concentration of ammunition and other resources based upon training needs. No technique exists for determining whether certain tables can be eliminated or reduced or expanded in number for selected crews.	Crew gunnery training allows for flexibility and concentration of ammunition and other resources based upon training needs. Techniques to determine which tables can be eliminated or reduced or expanded in number for selected crews are applied.	
Tank gunnery training doctrine includes subcaliber firing as a means of training crews and platoons who have limited facilities, without the expenditure of costly main gun ammunition. To date, however, the Armor Center has been unable to quantify the transfer of training from subcaliber firing to main gun firing.	Investigations are conducted to determine which skills improve through subcaliber firing and to what extent, and to determine if artificialities inherent to the method provide negative training and to what extent.	

TABLE 2-3. SUMMARY OF TRAINING EFFECTIVENESS ANALYSES NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
In the event of fuel stoppages and the absence of training devices, no alternate training strategies exist to train on those tasks which typically require an expenditure of fuel.	Alternative training strategies are available in the event of fuel stoppages and/or the lack of sophisticated devices.	
No effective means exists presently for determining which tasks or which particular task conditions and standards have significant direct impacts on combat effectiveness. Therefore, high-cost training simulators are being developed to train a large number of tasks with the highest degree of simulation fidelity obtainable. This is documented in the training device requirements for training simulators, but does not spell out specific objectives for the device.	Means for assessing the impact of training on combat effectiveness ensures that only those device capabilities needed to produce a measurable increment in force effectiveness will be developed. Linkage between device capabilities and training effectiveness ensures that trade-offs among devices and device characteristics are evaluated.	
The Battalion Training Model (BTM), a first generation research tool, requires additional developmental effort to reach full potential.	Extended developmental effort is expended and BTM reaches its full potential.	68
Resource data on training programs and performance data on personnel going through these programs is not kept as a permanent record; this is true for both institutional and unit training. In order to answer questions about current training programs, whether concerning cost or trainee performance, requires a special study or test and takes months, sometimes years, before an answer can be given.	Data on Armor training programs, both institutional and unit, is kept on file for at least 5 years. This data includes a list of the resources required to conduct the training, a record of the performance of personnel who have gone through the training program, and a brief description of the training program. This data is kept in a computer data bank. With such a data bank at its disposal, the USAARMC is able to suport training effectiveness analyses.	82
Armor retention is far too low. Typical gunners have worked on M60 tanks only 2 years, while typical drivers and loaders have worked on M60 tanks only 1 year. Only 17% of the gunners in a USAREUR armor division had more than 36 months on M60 tanks.	Retention of armor crewmen is increased so that the crewmen have the time to become proficient in their jobs and training costs aren't constantly lost when crewmen ETS.	85

2-10. STANDARDIZATION/MOBILIZATION TRAINING NEEDS. The needs of this category are grouped together simply because some of the needs address both standardization and mobilization and cannot be readily or realistically separated. The rest of the needs in Table 2-4 speak to either standardization or mobilization. Of particular significance is the first need in this category. It has a very high priority in the overall assessment and, if attended to, will have the most significant impact upon the philosophy of training in a decade.

TABLE 2-4. SUMMARY OF STANDARDIZATION/MOBILIZATION TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Peacetime and mobilization training programs in the institution differ with respect to tasks, conditions, and standards. The former produces apprentices who are trained on a wide variety of tasks, under wide variety of conditions, to a wide variety of standards. The latter, theoretically at least, produces journeymen who are trained on combat critical tasks, under combat conditions, to combat standards, and may be at war 24-48 hours after joining a combat unit. Units are required to train to specified standards both combat critical tasks and tasks which are not combat critical.	There are no "peacetime" programs for training in the institution. All training is mobilization training, and the tasks, conditions, and standards are combat critical. Tasks which are not combat critical are trained on a time available basis.	7
Detailed plans for mobilization training are insufficient or nonexistent.	Detailed plans for mobilization training are complete and ready for immediate implementation.	8
A standard examination is not available to periodically validate the qualifications of master gunners.	A standardized examination, developed by the USAARMC, validates biennially the qualifications of master gunners worldwide.	17
New technology and changes in training doctrine have combined to provide system specific and position specific training versus generalist training; self-pacing of Drill Sergeant Schools; selection criteria of 19E/F that is difficult to substantiate; and "shadow" schools at installations with varying degrees of quality and standardization.	The evaluation and training development agencies conduct reviews and evaluations internally and externally to determine the effectiveness of new training strategies. Armor proponent training conducted in "shadow" schools is evaluated and/or certified by the Armor Center.	71

TABLE 2-4. SUMMARY OF STANDARDIZATION/MOBILIZATION TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
ARTEP standards vary between the levels required for the active Army and those required for Reserve components. The events required are the same, but the standards differ.	ARTEP standards are the same for both active Army and Reserve components; events differ, but the level one standard is required for all.	
Currently, there are a variety of zero panels being used for boresighting and zeroing.	Standardized zero panels are used throughout the Army.	
An Armor Center sanctioned dry-fire crew drills program does not exist currently; hence, training problems are exacerbated by turbulence inasmuch as crews develop idiosyncratic operating procedures.	A dry-fire crew drills program ensures that all crewmen are trained to a specified standard and need not rely on counterproductive idiosyncratic methods.	
A National Training Center (NTC) is being established presently, but training packageas for the units and organizations that will deploy to the NTC do not exist.	Total training packages are available for the units and organizations that deploy to the NTC.	71

2-11. TRAINING SUPPORT NEEDS. The needs in this category may appear to be extremely limited in number, but that is no cause for concern. Virtually every need identified in the overall assessment has a support requirement embedded in it. The needs appear in Table 2-5 because they do not fit conveniently into other categories.

TABLE 2-5. SUMMARY OF TRAINING SUPPORT NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Tactical events in the battalion level ARTEP do not provide for a realistic degradation of combat strength, nor do they provide immediate objective feedback concerning how, when, where, and why the degradation occured.	Tactical events in the battalion level ARTEP provide for a realistic degradation of combat strength and immediate objective feedback through the use of MILES or other objective systems.	10

TABLE 2-5. SUMMARY OF TRAINING SUPPORT NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Training personnel (NCO, AOB, AOAC, BCC) receive little formal instruction on the use of training devices. Consequently, these devices (e.g., REALTRAIN) are not being exploited to add training realism.	Trainers and supervisors receive formal instruction during professional development courses in the operation and use of training devices and simulators. This ensures the use of those devices and simulators in collective training activities to obtain realism and objective evaluations.	11
The current system of providing training materials and programs to the field is primarily a "pull" system.	Training materials and programs are provided to the field through a "push" system.	12
Thermal targets are not fully designed and ready for the implementation of XM1 training.	Thermal targets are readily available to support training on weapon systems which employ the thermal sight.	
Aerial training is munitions dependent, and scoring is very subjective.	Aerial gunnery training employs simulators and instrumented ranges, minimizes use of ammunition, and provides for accurate, objective scoring.	
The combat training theater concept limits training to one or two crews at a time.	The combat training theater provides for multiplatoon training.	70

2-12. DOCTRINAL NEEDS. In compiling this assessment, numerous doctrinal needs were identified. Though none of them received a top-twenty priority, the criticality of their resolution, as that resolution impinges upon training missions for the future, is obvious.

TABLE 2-6. SUMMARY OF DOCTRINAL NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Current doctrine on the use of smoke and smoke systems is given lip service but needs to be clarified in terms of integration, who carries what, and what is done if smoke is not available.	The use of smoke on the battlefield is clearly defined as doctrine.	
Battlefield illumination is still an unsettled area in terms of strengths/weakness, direct/indirect, and integration with conventional passive and thermal sighting system.	Battlefield illumination problems are addressed, and guidance is furnished to the field.	
Criticality of boresight and zero procedures has been examined by a DCD study completed recently. Results are inconclusive.	Criticality of boresight and zero procedures is established clearly.	
Battlesight vs. precision gunnery (aiming points) is controversial due to the results of a boresight and zero test conducted by DCD.	The preferred method of engagement (battlesight vs. precision gunnery) is determined and published.	
The ability to hit targets at 500 meters is questionable when current battlesight doctrine is used.	Determine the cause of lack of accuracy at 500 meters and publish the adjusted battlesight doctrine.	
A follow-on study of boresight and zero, and battlesight vs. precisison gunnery raises the question of whether or not sensing methods and gunnery standard adjustment procedures as taught are valid.	Clear sensing methods and gunner's standard adjustment procedures are established and taught.	

TABLE 2-6. SUMMARY OF DOCTRINAL NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
The application of burst on target (BOT) has been the primary method of adjusting fire in tank gunnery. The advent of high speed ammunition raises questions concerning the validity of this method. Since some means of adjustment is necessary, must we rely on a second tank sensing or will a gunner's standard adjustment produce the desired results? If a second tank sensing is required, how can that tank best perform the function, and what will be the effect on platoon firepower?	An investigation is conducted to determine the capability of a second tank to sense accurately and to adjust the fire of a firing tank; the effects on platoon firepower are published.	
The shoot-on-the-move capability of XM1 is significantly improved and will affect doctrine dealing with stabilized gunnery.	Stabilized gunnery doctrine is established for the XM1 to bring it in line with XM1 fire control capability.	
Stabilized gunnery techniques, as outlined in FM 17-12, are too brief, giving the impression that stabilized is the preferred mode of engagement.	The stabilized gunnery techniques contained in FM 17-12 are explained in more detail.	
Tank commanders using tanks equipped with the laser rangefinder must become proficient at evaluating multiple range returns. The proficiency can best be attained through practice with the rangefinder at full-scale ranges on natural terrain. The hazard to the eyes inherent in the nature of the laser beam, both real and perceived, will severely restrict the area available to train in this vital skill.	An educational program fully informs commanders of the realities and myths of laser safety requirements. This ensures that areas where laser rangefinder training can be conducted safely are made available for that purpose. At the same time, development of eye-safe laser trainers/ filters continues, and laser ranging is integrated into other training wherever possible.	

2-13. PARALLEL MATERIEL/TRAINING SYSTEMS DEVELOPMENT NEEDS. These needs are associated with Life Cycle Systems Management and reinforce the necessity to ensure total parallel systems development. The advent of the XM1 has lent emphasis to the necessity for total package delivery, but, as the needs in Table 2-7 indicate, there are still discrepancies in parallel systems development.

TABLE 2-7. SUMMARY OF PARALLEL MATERIEL/TRAINING SYSTEMS DEVELOPMENT NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Under the Life Cycle Systems Management Model process, man-machine interface is starting to occur at the onset of the material acquisition cycle and new equipment is beginning to be fielded as a package (e.g., NETT, maintenance, training), but cadre training prior to the introduction of new equipment to the training base requires additional improvements (e.g., FMs, TMs, and training devices).	The LCSMM process is refined and a single POC established for each system. The POC ensures that the new system is introduced to the field and training base as a complete package (e.g., trained cadre, FMs, TMs, devices, training aids, etc.).	
The use of special systems (e.g., laser designators, vehicle smoke launchers, heading reference systems) in the training base is yet to be addressed in terms of applicability to the training program, requisitions, and required TDA changes.	The training base POI is adjusted, and TDA changes for the introduction of special systems are completed prior to receipt of equipment.	75
Gunnery training gaps (e.g., LRF, target acquisition, battlesight) are developing as new weapon systems are being fielded.	Weapon systems are introduced without developing gunnery training gaps.	76
Armor Center training developers who are responsible for publication of SQT and ARTEP documents receive no training on the new system prior to being tasked to design and develop SQT and ARTEP documents. DAMPL priority does not allow for early receipt of new equipment at the training base.	Subject matter experts (SMEs) for new systems (M60A3, XM1, XM2, XM3, ITV) at the USAARMS training development level receive training on the system and are stabilized prior to the design and development of SQT and ARTEP documents. New equipment is available for early design and development of training materials.	77

2-14. RESERVE TRAINING NEEDS. The needs identified in this particular category are few in number, but all of the needs in the total assessment, regardless of category, must be examined within the framework of a total Armor Force concept. The training needs of the Reserve components are manifold to those of the active Army. No training need should be identified or training mission undertaken by the active Army without considering the Reserve components. The rapidity of change in Armor philosophy, doctrine, materiel, personnel management, and training in the last few years has forced Armor trainers and managers into a highly reactive posture. As a result, most of the training effort has been canalized toward the active Army. This cannot continue. Though not articulated as specific needs in the overall assessment, this is a good place to identify two significant needs which should be dealt with in the future. First, the concept of training the total Armor Force needs to become a pervasive philosophy shared by the active Army and the Reserve components. Second, the Reserve components need to define and determine priorties of those Armor training needs, the gaps in Armor training, which can be closed only with assistance from the active Army. The Armor Center cannot plan its future well without that kind of philosophy and without the assistance that a comprehensive Reserve components needs assessment can provide.

TABLE 2-8. SUMMARY OF RESERVE COMPONENTS TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
Premobilization training of Reserve componenets (RC) requires additional work.	A feasible strategy for premobilization training is developed.	74
Training for the Reserve components is constrained by many unique problems, most of which center around a lack of funding, training time, and facilities. As a result, RC units are not able to meet all of the goals/objectives set by FORSCOM Reg 350-2.	Standards for Armor RC units are the same as for active component units; however, realistic goals are set for Armor RC units in terms of premobilization and postmobilization goals that reflect the unique problems and needs of RC and define the training requirements and parameters for individual and unit training in gunnery and ARTEP. Structured training, tailored to the needs and time available to Armor RC, is provided in the areas of AOAC, AOB, ANCOC, Master Gunner, RC Commander Refresher Training and BNCOC.	84

TABLE 2-8. SUMMARY OF RESERVE COMPONENTS TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
The target population of the ACCP and USAR schools is the same. These students are, for the most part, members of the Reserve components that require this training to meet branch educational requirements or to receive a promotion in Armor. Many officers, because of unit assignments and duties, cannot attend the USAR school classes, especially the 2-week tours of active duty held in the summer. These officers and many others find that they must use the ACCP to accomplish their branch training requirements. Students who cannot take a phase of instruction with a USAR school normally take that phase by correspondence course. The constant shifting of officers from the USAR School into the ACCP and back requires that both courses be phased alike and that the course work be completely interchangeable. This allows the student the flexibility needed to complete his branch courses.	The POIs for the resident, USAR school and Army correspondence courses should be prepared at the same time. The course content of the Resident Armor Officer Basic Course should provide the requirements for the USAR school and ACCP Basic Officer Courses. Once parallel course content has been established, the USAR school and ACCP will use the Resident Advanced Course (Reserve component) as their model. Once course content has been resolved, then the interchangeability between the USAR School and ACCP must be established. The above is required so that Reserve component Officers who transfer from one program to another can do so on a phase basis without loss of academic credit or a gross change in program.	
Reserve component gunnery training is weak in terms of interface with the active Armor community, and ammo allocations are extremely austere.	Improved Reserve component gunnery training is accomplished despite time, materiel, and ammunition resource constraints.	

2-15. TRAINING FACILITY NEEDS. The needs in Table 2-9 are identified in broad, generic terms, but will be fleshed out in the succeeding chapter which will speak to future training missions whose orgins are in this assessment.

TABLE 2-9. SUMMARY OF TRAINING FACILITY NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
In general, existing tank gunnery range and tactical training areas are large enough to support the range and mobility capabilities of existing Armor weapon	As a result of timely research, planning, and budgeting action, ranges, training areas and target systems designed to support training to the full	

TABLE 2-9. SUMMARY OF TRAINING FACILITY NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
potential systems. The target systems used presently do not allow for the full range of target acquisition/engagement possibilities. The improved capabilities (e.g., range, laser/thermal acquisition/engagement, mobility) of emerging Armor weapon systems (M60A3, XM1, CFV) cannot be trained to full potential using today's range/training areas and target systems. The Army is presently doing "too little, too late" in planning and funding the improvements to ranges, training areas, and the target systems necessary to accommodate training to the full potential of new weapons systems as soon as they are issued to the field.	of emerging weapon systems are available at the time these systems are issued to the field. (This includes aerial gunnery/tactical training.)	
Real estate available for ranges and tactical training is in short supply. Yet, current range/training area management practices are characterized by inefficiency, bureaucracy, austere funding, and pragmatic attitudes.	Innovative thinking, progressive planning and aggressive management ensures continuous improvements to and maximum utilization of all available range/training area real estate. (This includes aerial gunnery ranges and tactical training areas.)	

2-16. OFFICER TRAINING NEEDS. In addition to the parameters established in Chapter 1, there was a conscientious effort to direct most of this planning effort toward future training for Armor soldiers in grades E1 through E7. This was prompted by the fact that the official Department of Army position, policy, and decisions concerning the Review of Education and Training for Officers (RETO) was not known when this plan was begun. Therefore, the needs identified in Table 2-10 are limited. This is no cause for concern, however, because elimination of the gaps identified in the overall assessment will have a significant impact on the training of all Armor soldiers—officer and enlisted alike.

TABLE 2-10. SUMMARY OF OFFICER TRAINING NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
The current AOAC is designed to train student officers to be company commanders and battalion staff officers. All students receive essentially the same core of instruction, regardless of their past assignments/experiences, present abilities/proficiencies, or projected assignment/career goals.	AOAC is designed to satisfy the individual training requirements of student officers, in light of their past experience, present abilities, and future assignments.	
Institutional training for Armor officers (AOB, AOAC, MO) is conducted in lockstep fashion. The training objectives of these courses are not universally applicable to all students.	Institutional training for Armor officers consists of self-paced modules wherever possible. The primary training objective of all courses is to train the officer for his next duty assignment. ACCP course modules for the less dense duty positions (e.g., Support Platoon Leader) are available to support this training concept.	
AOAC and AOB graduates are familiar with the employment and utilization of ground systems but not Armor aerial systems.	AOB and AOAC students are provided with instruction regarding the employment of combat aviation systems as another maneuver force.	
The current Pre-Command Course (PCC) devotes too little time to hands-on tank gunnery refresher training.	PCC gunner training is of sufficient scope and duration to enable students to regain proficiency in all crew gunnery tasks.	78

2-17. INSTRUCTIONAL STAFF NEEDS. The needs identified here are limited in application and point primarily at the institution, but, realization of the concept embedded in these needs could contribute significantly to improvement in Armor training in the future.

TABLE 2-11. SUMMARY OF INSTRUCTIONAL STAFF NEEDS

WHAT IS	WHAT SHOULD BE	PRIORITY
There is no centralized selection/recognition process for NCO tank/track commanders assigned to 1st Brigade as trainers.	NCO tank/track commanders are selected for duty as trainers through a process which is similar to the present drill sergeant selection mechanism.	79
The training base is not staffed adequately to allow for a tank commander to be assigned for each tank.	The training base receives priority of NCO fill to allow assignment of a tank commander per tank.	80
There is no centralized selection process for training base commanders. Units are commanded by relatively inexperienced officers who are not familiar with the field needs in terms of the training base product.	Commanders with recent command experience in TOE Armor units are selected to command training base units. The products of the institution are meshed more closely with field needs for a combat ready soldier.	86

SECTION IV - SUMMARY

2-18. **SUMMARY.** This chapter establishes where Armor training ought to be in the future, specifies the future conditions or future outcomes which are required to eliminate discrepancies or close gaps in Armor training, and describes the methodology used to identify, categorize and establish priorities for Armor training needs. It provides the foundation for this volume, and it establishes the basis for the future Armor training missions which are presented in the next chapter.

CHAPTER 3 - THE MISSIONS

SECTION I - INTRODUCTION

3-1. INTRODUCTION. In Chapter 2, training needs with sufficient priority for action were identified and the outcome or product of each training need was specified. This chapter identifies the requirements for meeting each selected need or specifies how a selected need may be eliminated through problem solving.

a. Once an initial needs assessment has been assembled, a series of analyses which must be achieved to arrive at a plan for solving the problems derived from that assessment. These analyses include mission analysis, function analysis, task analysis, and methods and means analysis. These analyses identify the performance requirements necessary to get from the "what is" condition to the "what is to be" condition, the products or outcomes necessary to close training gaps and eliminate discrepancies in Armor training.

b. The analyses identified above are ordinarily applied in sequence with each, in turn, describing smaller and smaller bits of (1) what must be achieved, (2) the desired outcomes or products required, and (3) the advantages and disadvantages to arriving at those outcomes. That is an ideal approach which springs from a needs assessment which is totally based upon, or originates from, hard data. Though solid and representative, the majority of the needs identified in the assessment in Chapter 2 have their origins or base in soft data. Therefore, for this first iteration of Volume II, Training, all of the analyses will not be attempted. This iteration will, however, provide mission analysis and methods and means analysis at the mission level. This chapter is devoted to mission analysis and provides the missions statements and specifies the performance requirements necessary to achieve those missions.

3-2. MISSION OBJECTIVES AND PERFORMANCE REQUIREMENTS. A mission is an overall job - a product, a completed action, or a change in the condition of something or someone - that must be accomplished. Mission analysis is a determination of where we are going, how we know when we've arrived, and what the major steps are to get from here to there. A mission objective is a statement expressed in performance terms which qualifies the outcome of a mission; therefore, it is a kind of performance objective and, at its best, specifies the tasks, conditions, and standards which are required to accomplish the mission. It is apparent that precise measurable criteria for describing and determining outcomes form a critical element in the statement of a mission objective. These criteria are terminal performance requirements. Performance requirements for the mission provide the specifications by which the success or failure of the mission may be measured and include the following:

a. Specifications stating the criteria by which the terminal success of the mission objective or statement may be measured - what the product will look like or do.

b. Specifications stating the "ground rules" under which the product is to be produced such as environment, costs, personnel, and other "givens."

SECTION II - ARMOR TRAINING MISSIONS

3-3. ARMOR TRAINING MISSIONS. The Armor training mission objectives and the associated performance requirements which follow have the same priorities and are organized in the same sequence as the needs statements in Chapter 2. Each mission which has a top-twenty or bottom-twenty priority is identified as such in its respective performance requirements.

3-4. COLLECTIVE TRAINING MISSIONS.

a. Design, develop, and field combined arms collective training programs which require combat, combat support, and combat service support units to train together under combat conditions.

Performance Requirements

(1) Programs must:

(a) Provide guidance on the collective training "mix", that is, how to use all members of the combined arms team to increase combat multipliers.

(b) Be both mission-and geographic location-oriented (Must not train for the wrong war!).

(c) Provide guidance on how work-a-day missions can double as training missions.

(d) Identify implementing resource requirements.

(e) Identify collective training devices which are available.

(f) Exploit local training areas.

(g) Be planned for sufficient duration to employ all elements of the combined arms team.

(2) The form which these programs take will be determined by those who design and develop them.

(3) Programs must be designed, developed, and fielded during the near term (FY 80-82).

(4) This is a top-twenty priority mission (2).

a' Develop a position paper for distribution to Armor organizations worldwide which re-inforces the necessity for combat, combat support, and combat service support units to train consistently as a combined arms force under combat conditions.

Performance Requirement

Position paper must be written, staffed, and distributed in the near term (FY 80-82).

b. Revise and field ARTEPs which contain events that measure the organizational commander's ability to integrate CAS, FS, C&C, maintenance, personnel, and support management.

Performance Requirements

(1) ARTEP must:

(a) Measure a commander's ability to make full use of CAS, FS, C&C, maintenance, personnel, and support management.

(b) Include means for providing formal feedback to the commander.

(c) Consider requirements for additional resources during the evaluation phase.

(2) The length of ARTEP must be extended so that an evaluation of the requirements can be made.

(3) Existing Armor proponent ARTEP documents will be used as base documents.

(4) The ARTEP must be revised in the near term (FY 80-82).

(5) This is a top-twenty priority (3).

c. Design and develop collective training programs which provide for force sustainability and require units to continue to operate at significantly reduced strengths (personnel and equipment).

Performance Requirements

(1) Collective training programs must:

(a) Emphasize operating at reduced strengths for substantial periods of time.

(b) Include the use of devices which "degrade" equipment and personnel strengths thereby causing CSS elements to evacuate personnel and equipment, repair equipment well-forward, and implement personnel and equipment replacement procedures.

(c) Ensure that units conduct training to standards using the troops, time, and equipment available for training.

(d) Be developed for use at the home station or local training area and the major training area.

(2) Evaluation of the training will be accomplished through the use of ARTEP.

(3) The training program must be prepared and fielded in the near term (FY 80-82).

(4) This is a top-twenty priority mission (4).

d. Revise and field ARTEP events which measure a commander's ability to make full use of CSS during sustained operations.

Performance Requirements

(1) ARTEP must:

(a) Measure a commander's ability to make full use of CSS during sustained operations.

(b) Include means for providing formal feedback to the commander.

(c) Consider the requirement for additional resources during the evaluation phase.

(2) To meet the requirement for sustained operations, ARTEP must provide for seven or more constitution days in a simulated combat environment; therefore, the length of the ARTEP must be extended accordingly.

(3) Existing Armor proponent documents will be used as base documents.

(4) The ARTEP must be revised and fielded in the near term (80-82).

(5) This is a top-twenty priority mission (5).

e. Revise and field an ARTEP which identifies individual tasks which are not performed to standards and, therefore, result in NO-GO's for collective training events.

Performance Requirements

(1) ARTEP must include:

(a) Instruments which assure the performance evaluation of individual tasks required for achievement of events.

(b) Instructions for providing formal feedback to soldiers who fail individual tasks during an event.

(c) Instructions for adjusting unit individual training to assure that individual tasks which are failed during collective training are trained to standard.

(2) Existing Armor proponent ARTEPs will be used as base documents.

(3) The ARTEP must be revised and fielded in the near term (FY 80-82).

(4) This is a top-twenty priority mission (6).

f. Design, develop, and field battle drills for inclusion in gunnery and tactical training manuals and unit training programs.

Performance Requirements

(1) Identify collective training tasks which lend themselves to the design and development of battle drills.

(2) Establish "survivability" standards.

(3) Battle drills must be designed:

(a) For use at platoon, company, troop, and company/team levels.

(b) To require the reduction or elimination of signatures.

(c) To be conducted without special facilities.

(d) To be conducted on command or signal at any time.

(4) Battle drills must be designed, developed, and fielded in the near term (FY 80-82).

g. Incorporate the objective of signature reduction into collective training to heighten awareness of the importance of reduction or elimination of signatures.

Performance Requirements

(1) Collective training must stress reduction and/or elimination of signatures (e.g., radio, movement, use of terrain, etc.).

(2) Training must incorporate the use of audio-visuals such as TV tapes showing unit movement or skylining and audio tapes of excessive radio transmissions to provide instant feedback.

(3) Training must emphasize on-the-spot corrections, e.g., re-doing an exercise to re-inforce the importance of signature reductions.

(4) Evaluation of signature reduction will be measured during ARTEP.

(5) Signature reduction standards must be strengthened in existing ARTEP.

(6) This training must be incorporated into all collective training literature and programs in the near time frame (FY 80-82).

h. Design, develop, and field a comprehensive, single source "How-to-Train" manual which complements "How-to-Fight" and "How-to-Support" manuals.

Performance Requirements

(1) The manual must:

(a) Be designed for use in Armor and mechanized units.

(b) Provide guidance on planning, organizing, conducting, and evaluating both individual and collective training.

(c) Make clear the relationship between individual and collective training.

(d) Include information/instructions on the use of training aids and training devices.

(e) Provide guidance for planning, organizing, conducting, and evaluating training with reduced personnel and equipment strengths and in the face of reduced training time.

(f) Provide guidance for maximizing concurrent training in situations and places of opportunity.

(g) Provide guidance on how to eliminate needlessly repetitive training.

(h) Be written and fielded in the near time frame (FY 80-82).

(2) This is a top-twenty priority mission (13).

i. Design, develop, and implement gunnery and training management techniques which eliminate or significantly reduce the effects of tank crew turbulence of gunnery proficiency.

Performance Requirements

(1) Training must:

(a) Provide for the availability of devices and simulators in garrison so gunnery skills may be practiced/maintained during off-duty hours as well as during normal duty hours.

(b) Include an immediate evaluation of a crewman's individual gunnery skills upon arrival at the unit.

(c) Be provided for new arrivals who have displayed a lack of proficiency on the unit's entrance gunnery examination and for crews or crewmembers who cannot meet established standards of proficiency.

(2) Training managers must consider the intensified management of crewmember-to-tank assignment which correlates with crewmembers ETS/PCS. That is, a unit must assign members with similar ETS/PCS dates to the same tank; thus, a unit would lose an entire crew within a short period of time as opposed to reducing the crew of four tanks by 25% over the same period.

(3) Development of training and training management techniques must begin in the near term (FY 80-82).

j. Design, develop, and implement gunnery training which reduces target engagement time to the point that median target engagement time approximates that set forth in current Armor doctrine.

Performance Requirements

(1) Gunnery training must:

(a) Be designed, developed, and implemented for each tank weapons system in the inventory.

(b) Be written to accommodate target engagement times which are standard for each tank's weapon system.

(c) Consider using a battle-run rather than a typically sterile tank gunnery range approach to practice and qualification runs.

(d) Employ a method for "killing" a crew that does not meet or exceed standard engagement times.

(e) Ensure that 90% of the crews who attempt the qualification run meet the standard engagement times 90% of the time.

(f) Consider the use of devices and scaled ranges to train-up in local training areas prior to deployment to major training areas.

(g) Reduce the expenditure of ammunition by at least 10% through a tradeoff with devices.

(h) Be sufficiently flexible to allow selected crews to eliminate drills and tables in which they are already proficient.

(i) Provide a method to determine or evaluate the proficiency of crews to eliminate unnecessary over-training.

(2) Gunnery training may not increase total instructional program training time by more than 10%.

(3) Data on current engagement times can be obtained from ARI, Field Unit, Fort Knox.

k. Design, develop, and make available the transitional training materials for units which deploy to the National Training Center (NTC), draw training site equipment, and train on tanks different from their own TOE tanks.

Performance Requirements

(1) The transitional training package must:

(a) Include materials which allow training for deployment to an off-station, drawing of prestocked equipment, familiarization with the tank to be used during the training period, turn-in of equipment, and redeployment.

(b) Be furnished to all Armor units that will train at the NTC.

(2) The training package must:

(a) Be tailored for the NTC and the equipment available at the NTC.

(b) Must include training on the use of devices and simulators which will be used at the NTC.

(c) Include instructions pertaining to support facilities and other facilities/services available at the NTC.

(d) Include a training program for the acclimatizations of troops (terrain, weather, personnel clothing requirements, wildlife hazards).

(e) Be prepared and fielded in the near time frame (FY 80-82).

l. Designate "flying squads" of training troubleshooters who are available to the field on call at short notice.

Performance Requirements

(1) The "flying squad" must consist of personnel who can assist in solving or reckoning with problems in specific areas. That is, maintenance training problems would be attended to by maintenance specialists, gunnery training problems by gunnery specialists, collective training problems by collective trainers, etc.

(2) Members of "flying squads" must be recommended at the director/commander level.

(3) Plans for implementing costs and services will be developed, maintained, and evaluated at the end of a 1-year period to determine cost-effectiveness.

(4) "Flying squads" should be designated and a program implemented in the near term (FY 80-82).

(5) This is a bottom-twenty priority mission (67).

m. Provide a 24-hour training "hot-line" at the USAARMC, which allows the field to ask training questions, request assistance, or provide input from new lessons learned.

Performance Requirements

(1) A hot line will be established and will include an answering service after normal duty hours.

(2) The hot line will be established with OAFM as the Armor Forces' central point of contact.

(3) A system will be developed to ensure that answers to questions and requested assistance are provided in the shortest time possible and that input from the field is routed to the responsible activity.

(4) Units will be provided answers or be given the status of their questions or requests for assistance not later than the end of the next duty day following the request.

(5) Resource costs and services rendered by the "hot line" will be maintained and evaluated at the end of a one-year period to determine the cost and effectiveness of the program.

(6) This service must be established in the near time frame (FY 80-82).

(7) This is a bottom-twenty priority mission (69).

n. Design and develop a methodology which provides for an accurate assessment of the effects of distractors and personnel turbulence upon unit readiness.

Performance Requirements

(1) The methodology must provide:

(a) A means for identification of common distractors which result in the loss of training time.

(b) A means for determining the average percentage of training time lost to distractors during prime time training.

(c) A method for evaluating the flexibility or inflexibility of training and support schedules.

(d) A method for forecasting system breaks, unforeseen distractors.

(e) A means for assessing/evaluating degradation in the quality of training due to loss of training time.

(f) A means for evaluating the extent of degradation of training due to personnel turbulence.

(2) Battalion level historical records and previous years training schedules can be obtained from organizations in the field.

(3) This mission should be initiated in the near term (80-82) and completed in the long term (FY 83-85).

(4) This is a bottom-twenty priority (81).

3-5. INDIVIDUAL TRAINING MISSIONS.

a. Revise/refine the BAT/BRT programs to the point that Gate II and Gate III test results reflect a first-time GO rate of at least 80%.

Performance Requirements

(1) Revision of BAT/BRT will be based upon a complete analysis of Gate II and Gate III examination results.

(2) Revision may include the elimination of tasks which are not considered combat critical in favor of increasing the training time, if necessary, for combat critical tasks.

(3) First-time GO rates of 80% for at least 80% of the trainees must be achieved on the Gate II and III tests within 1 year after the revised programs are implemented.

(4) Training standards may not be lowered.

(5) Target audience (trainee population) will not be considered as an acceptable determining factor to achieve the criterion of a first-time GO rate of 80% for 80% of the trainees.

(6) Revision must:

(a) Show a maximum use of concurrent training for the reinforcement of newly acquired skills and for remediation.

(b) Include a plan for providing maximum reinforcement or remedial training during off-duty time. The plan must show how devices, games, simulators, TECs, TCs, etc., will be made available and how they may be used.

(c) Include a plan for providing continuous feedback to training developers. Data on GO/NO-GO rates must be maintained and readily available.

(d) Include a plan for providing unit commanders with data on those tasks for which a trainee did not receive a first-time GO, regardless of the fact that he was provided additional training and ultimately received GO's for those tasks.

(e) Be achieved in the near term (FY 80-82).

(7) This is a top-twenty priority mission (14).

a' Design, develop, and "push" to the field the BAT/BRT training packages which provide for reinforcement/sustainment training in individual combat critical tasks trained in the institution, and which provide for the training of tasks selected for unit instruction.

Performance Requirements

(1) Training packages must be:

(a) Complete, that is, tests and related materials, lessons and related materials, sample training schedules which reflect learning sequences, lists of training aids and devices, lists of equipment and

other resources, and training management plans will be included.

(b) Prepared for both the active Army and Reserve components.

(c) Initiated immediately and completed in the near term (FY 80-82).

(2) A formal system to obtain feedback from the field on the effectiveness and efficiency of the training packages must be included with the training packages.

(3) This is a top-twenty priority mission (14').

b. Redesign the Armor Army Correspondence Course Program (ACCP) so that subcourses and lessons may be used in both individual and group settings for institutional and unit training as well as for self-study.

Performance Requirement

Redesign and implementation of the ACCP must be accomplished during the near term (FY 80-82).

b' Redesign the Armor Army Correspondence Course Program so that its courses, lessons, and other materials may be used as parts of "packages" which incorporate a wide variety of methods, means, models, media, and techniques.

Performance Requirement

Redesign must be completed during the near term (FY 80-82).

c. Design, develop, and implement master gunner transitional training programs on new/emerging systems. Master gunners who are assigned to organizations scheduled to receive new weapon systems receive formal transitional training prior to the organizations' receipt of the new system.

Performance Requirements

(1) Programs must be ready for implementation at the 7th Army Training Center for master gunners in Europe, and at the USAARMC for master gunners in CONUS 60-90 days in advance of the receipt of weapons systems by organizations in those locations.

(2) Standardization programs/materials which are provided to the master gunner to implement training for which he is responsible must maximize "How to Train", i.e., how to use materials, aids, devices, equipment, etc.

(3) This is a top-twenty priority mission (16).

d. Review and revise Armor training programs and materials to assure increased officer and NCO proficiency in "How-to-Train" and training management.

Performance Requirements

(1) Review and revision of training programs and materials must:

(a) Be based upon accurate front-end analyses and must consider shifts in training responsibility from the institution to the unit or organization.

(b) Be achieved to meet both active Army and Reserve components needs.

(c) Consider adequacy/inadequacy of measuring officer and NCO abilities to train, or to manage training.

(2) Revised programs and materials must include methods and means for assessing officer and NCO abilities to train and to manage training. The full question of accountability must be addressed.

(3) Review and revision must be initiated in the near term (FY 80-82) and completed in the long term (FY 83-85).

(4) This is a top-twenty priority mission (18).

e. Periodically revise, develop, and implement POI changes for all institutional courses, based on the results of field analysis of individual/unit job and mission requirements which identify critical areas needing additional proficiency training to enhance unit mission performance.

Performance Requirements

(1) Develop a plan for systematic review and revision of all institutional and extension training programs and materials. The plan must provide for system breaks or revisions which require immediate attention.

(2) The plan must be implemented within the near term (FY 80-82).

e' Review procedures for gathering external feedback; design and develop a system that assures objective feedback from the field in the quantity necessary to make accurate decisions concerning the revision of training programs and materials.

Performance Requirements

(1) The system must provide for objective, quantitative feedback (hard data) that can be used by multidisciplinary teams.

(2) The system must increase to 95% the return rate of graduate and other questionnaires sent to the field.

(3) The system must provide for long-term storage of feedback.

(4) All requests for feedback from the field will emanate from a single agency.

(5) Current procedures will be reviewed and revised; the system will be implemented in the near term (FY 80-82).

f. Design, develop, and implement an add-on training program for the 19D personnel who are identified for assignment as aerial scouts. Provide the field with an exportable training package which will assist commanders in conducting effective, standardized reinforcement/sustainment training for MOS 19D2F.

Performance Requirement

(1) Training must standardize 19D2F training throughout the Armor force.

(2) Exportable training package must:

(a) Be prepared for both active Army and Reserve components.

(b) Provide self-study materials for use after normal duty hours.

(3) Training must provide for certification for ASI 2F.

(4) The Soldier's Manual, Commander's Manual, and SQT must include 19D2F.

(5) The entire training program must be completed in the near term (FY 80-82).

g. Conduct a study to determine the extent of transfer of training from the use of subcaliber gunnery devices on scaled ranges to the use of main gun ammunition on full-scale ranges.

Performance Requirement

The study must be initiated and completed during the near term (FY 80-82).

h. Revise and implement target detection training which produces a test performance rate that approximates 100% of the optimum target detection rate.

Performance Requirements

(1) Target detection training must:

(a) Produce a first-time detection rate in which 90% of the students detect 90% of the targets.

(b) Improve the target detection rate by 30% each year during the 2 years following implementation.

(c) Provide programs/materials for self-paced, self-study training after normal duty hours.

(d) Provide media/materials which employ both static and dynamic displays.

(2) Target detection training must be implemented in the near term (FY 80-82).

i. Revise and implement target identification training which produces a performance test rate of 100% on a friendly/foe basis.

Performance Requirements

(1) Target identification training must:

(a) Produce a first-time target identification rate in which 90% of the students identify 90% of the targets as friend or foe.

(b) Improve target identification by 20% each year during the 2 years following implementation.

(c) Provide programs/materials for self-paced, self-study training after normal duty hours.

(d) Provide media/materials which employ dynamic, rapidly developing situations in motion rather than mere static displays.

(2) Target identification training must be implemented in the near term (FY 80-82).

j. Review and revise training programs and training literature to assure that practice in ranging with the coincidence rangefinder is emphasized and maximized.

Performance Requirements

(1) The program and literature must emphasize the necessity for providing the tank commander with the opportunity to practice ranging during crew drills and to become confident that he can use the rangefinder in precision gunnery before he is required to meet specified engagement times.

(2) Current programs and literature must be reviewed to assure that standards are realistic. The tank commander must be able to fire upon and hit the target within the time specified; but, time must not take precedence over the tank commander's ability to range to the target.

(3) The program must evaluate whether additional training in ranging significantly increases the first-round hit probability.

(4) Training time may be increased.

(5) Revisions must be completed in the near term (FY 80-82).

k. Design and develop gunnery training which ensures, given a first round miss, that second-round hit probabilities are 10-25% higher than first-round hit probabilities.

Performance Requirement

(1) Specific standards for fire adjustment procedures must be established and adhered to in training.

(2) Training must ensure that 90% of the gunners achieve a second-round hit probability that is 10-25% greater than the first-round hit probability. This must occur within 6 months after the training is implemented.

(3) Training must be implemented within the near term (FY 80-82).

l. Revise tank gunnery training and scoring procedures to ensure that 99% of the rounds fired are scored correctly and that OSUT 19E trainees receive immediate feedback after firing each round.

Performance Requirements

(1) Training may not increase training time.

(2) Revision must be completed within the near term (FY 80-82).

m. Conduct an analysis of the USAARMC driver training program to identify driver actions which overly stress or wear tank automotive and suspension components and increase maintenance costs.

Performance Requirements

(1) Analysis requires the development of a plan which will allow data to be gathered but will minimize interference with training support.

(2) Analysis must:

(a) Consider both maintenance data and live-drive procedures.

(b) Be longitudinal; data must be retained. Any meaningful results must be supplied to the training and material developers.

(c) Begin in the near term (FY 80-82).

n. Submit a justification for the development of training devices which will improve the proficiency of the drivers trained at USAARMC, support the improved/revised driver training programs, and are cost-effective.

Performance Requirements

(1) An analysis of the driver tasks selected for training must be accomplished to determine which tasks provide equally effective training and with greater efficiency through the use of a training device.

(2) The current driver trainer development contract must be continued; but, subsequent actions must be derived from the proper analysis, including the further development of devices now under contract and any modification of existing trainers.

(3) Driver training programs will be revised to assure that driver trainers are designed and developed at the training medium only for those tasks found suitable for such training.

(4) A CTEA must be conducted to determine the cost and training effectiveness of any new development or modification action.

(5) This action must be initiated in the near time frame (FY 80-82) and completed in the far term (FY 83-85).

o. Design, develop, and implement moving platform gunnery training which produces a hit probability comparable to stationary platform gunnery.

Performance Requirements

(1) Training design must:

(a) Be based upon an accurate identification of the reasons for disparity between the stationary and moving platform hit probability.

(b) Consider both tank and aerial gunnery.

(2) Training must improve the moving platform hit probability to 15-25% for the first year after implementation of training and 15-25% in the subsequent year. Improvement must be documented through the use of valid, reliable qualification tests.

(3) Training must employ targets that are displayed in a threat array.

(4) Training must be designed and developed for both institutional and field use.

(5) Training must be designed, developed and implemented in the near term (FY 80-82).

p. Conduct a study to determine whether Basic Armor Training should continue to train weapons system, seat specific soldiers or whether it should train weapons system specific generalists.

Performance Requirements

(1) The study must include input from throughout the Armor community.

(2) The study must be completed in the near term (FY 80-82).

q. Establish procedures to assure that soldier's manuals, commander's manuals, and programs of instruction are mutually supporting and consistent in content.

Performance Requirements

(1) Procedures must assure that every task performed by a soldier within a particular MOS at a particular skill level is linked or may be tracked through the soldier's and commander's manuals, and approved programs of instruction.

(2) Procedures must be established, reviews completed, and the necessary changes made in the near term (FY 80-82).

r. Prepare a letter to the "world" to urge that PNCOC/CA graduates be employed as trainers of common subjects in unit training programs.

Performance Requirements

(1) The letter must highlight the necessity to allow graduates to apply newly acquired skills immediately upon arrival in the unit.

(2) The letter must be written, staffed, and distributed to Armor organizations worldwide in the near term (FY 80-82).

s. Conduct a review of the tasks, conditions, and standards of CF 19E/F skills which are identified in the current Skill Qualification Test, Soldier's Manual, Tank Commanders Gunnery Skills Test, and Army Training and Evaluation Program documents to ensure a consistency of tasks, conditions, and standards.

Performance Requirements

(1) The review must be completed within the near term (FY 80-82).

(2) This is a bottom-twenty priority mission (73).

t. Design, develop, and implement, as appropriate, instruction for active Army officers and NCOs who are trained at USAARMC. This includes instruction on the capabilities and limitations of National Guard and Reserve component units.

Performance Requirements

(1) Training must be implemented in all officer and NCO professional development courses.

(2) Capabilities and limitations must address both training and fighting.

(3) Training materials must be designed and developed in conjunction with the Reserve components.

(4) Training must be designed and developed for export to active Army organizations that will deploy with Reserve component organizations as part of the combat package.

(5) Training must be implemented in the near term (FY 80-82).

(6) This is a bottom-twenty priority mission (83).

3-6. TRAINING-EFFECTIVENESS ANALYSIS MISSIONS.

a. Design, develop, and implement a disciplined methodology capable of being utilized by multidisciplinary teams who will be responsible for identifying the most cost-effective ways to train for combat-effectiveness.

Performance Requirements

(1) The methodology must:

(a) Identify criteria or factors which significantly influence training cost and effectiveness.

(b) Assign relative weights to the criteria or factors in proportion to their respective contributions to effectiveness and cost.

(c) Establish formulas for computing relative training cost and effectiveness.

(d) Provide or establish a set of ground rules for determining cost and effectiveness. These ground rules must be used in the training, decision-making process.

(e) Provide for an analysis of existing training programs to determine if those programs are as cost-effective as they are purported to be.

(f) Invite constructive criticism which will promote improvement in the quality of the methodology.

(2) Related studies must be identified and studied; and, the opinions of relative experts in the field must be gathered.

(3) Efforts to design, develop, and implement the methodology must be initiated in the near term and continued for as long as required to achieve the mission.

Note. With the exception of the last two missions, no attempt has been made to identify performance requirements except for the priority for the remainder of the missions in this category. Though explicit, these missions are, in effect, subordinate to and dependent upon the achievement of the singular mission to design, develop, and implement a methodology for determining the most cost-effective ways to train, all training, for combat-effectiveness. The missions which follow, therefore, serve to highlight the importance of having the methodology to do a valid and reliable training-effectiveness analysis.

b. Develop the method and framework for obtaining frequent, clearly stated feedback on unit and institutional training (ARTEP, initial entry training, AOB, Master Gunner, etc.) for the purpose of revising course content, training literature, and programs.

Performance Requirement

This is a top-twenty priority mission (9).

c. Conduct an analysis to determine the amount of repetitive gunnery training (i.e., frequency of main gun firing by crews and platoons, integration of devices, and ammunition expenditure), required to sustain critical gunnery skills.

Performance Requirement

This is a top-twenty priority mission (20).

d. Develop techniques for determining which crew gunnery tables could be eliminated and reduced, or expanded in number for selected crews, to permit flexibility and concentration of ammunition and other resources based on training need.

e. Analyze and adjust tank gunnery training in terms of skills that are improved through training programs which include subcaliber firing as a means of training and which account for any artificialities and the extent of negative training inherent in the method.

f. Analyze, design, and develop alternate Armor training strategies that can be implemented immediately by the training base or the field in the event of fuel stoppages and/or lack of training devices.

g. Conduct an analysis which assesses the impact of training devices' capabilities on force combat effectiveness. Develop a plan which can be used to document training device requirements *and which includes specific training objectives for the device.* Analyze, design, develop, and publish a tank gunnery program which ensures sustainment of critical gunnery skills through the use of devices and the trade-off of ammunition.

h. Finalize the development of the Battalion Training Model.

Performance Requirement

This is a bottom-twenty priority mission (68).

i. Design and implement a computer-based data system to support the training-effectiveness analysis.

Performance Requirements

(1) The system must:

(a) Be capable of obtaining and storing large volumes of data for relatively long periods of time (at least 5 years).

(b) Obtain and store data from both institutional and unit training sources.

(c) Parallel the design, development and implementation of the methodology for training effectiveness.

(2) This is a bottom-twenty priority mission (82).

j. Conduct studies to determine what must be achieved to increase the retention (decrease ETS rate) of the Armor crewman.

Performance Requirements

(1) Studies must determine the relationship or correlation between job proficiency and retention, tangible rewards and retention, job assignment and retention, geographic assignment and retention, disciplinary actions and retention, SQT results and retention, and others.

(2) Studies must be initiated in the near term (FY 80-82).

(3) This is a bottom-twenty priority mission (85).

3-7. STANDARDIZATION/MOBILIZATION MISSIONS.

a. Design, develop, and implement institutional training which is "mobilization training", i.e., all tasks, conditions, and standards are combat critical. Identify all tasks which are not combat critical and which are to be trained on a time-available basis in the unit.

Performance Requirements

(1) All combat critical tasks must be identified.

(2) Institutional, initial entry training must be designed and developed on the basis of the combat-critical task list.

(3) Tasks which are not combat critical but should be trained are identified for training at the unit.

(4) Training packages are developed for use at the unit to train basic and common tasks, but not combat-critical tasks.

(5) Institutional, initial entry training is designed to ensure that those soldiers reporting directly to a unit are able to accomplish combat-critical tasks without additional training.

(6) Training is suitable for members of both the Active Army and Reserve components.

(7) Training must be implemented in the near term (FY 80-82).

(8) This is a top-twenty priority mission (7).

b. Prepare detailed plans for the immediate implementation of mobilization training.

Performance Requirements

(1) The training plan for initial entry training must focus on training a combat ready soldier who has mastered his combat-critical skills.

(2) The training plan must:

(a) Be coordinated with mobilization planners to ensure that immediate implementation is smooth and that there is minimal interruption of ongoing training.

(b) Address the procedures to train up Reserve component units in minimal time.

(c) Include a standard training package which has been coordinated between the training base and Reserve component training developers.

(d) Establish training responsibilities for the training base and Armor Reserve component organizations and units.

(e) Consider the requirements, locations, and procedures for the immediate procurement of resources.

(f) Address the requirement for additional medical facilities and personnel during mobilization.

(g) Address methods and means of evaluating Reserve component units prior to mobilization training to ensure that Reserve component Armor organizations and units receive training in critical missions/tasks.

(h) Include a post-training evaluation of the units, prior to deployment.

(i) Be prepared and implemented during the near term (FY 80-82) and be reviewed/revised continuously.

(3) This is a top-twenty priority mission (8).

c. Design and develop a standardized examination to validate, biennially, the qualifications of master gunners worldwide.

Performance Requirements

(1) The Master Gunner Examination will be weapons system specific.

(2) The examination will:

(a) Include alternate forms.

(b) Orient purely upon master gunner proficiencies.

(3) The development of the examination will include a system for updating the examination to parallel revisions of the Master Gunner courses.

(4) Approval to administer the test biennially must be obtained from DA.

(5) Proficiency on at least 50% of the examination problems will be demonstrated by hands-on performance.

(6) The examination will:

(a) Include administrative requirements and instructions.

(b) Be implemented in the near term (FY 80-82).

(7) This is a top-twenty priority mission (17).

d. Design and develop total training packages for units and organizations which deploy to the National Training Center (NTC).

Performance Requirements

(1) Total training packages must be tailored to the facilities of the NTC.

(2) The training package will:

(a) Include all information required on base support.

(b) Be designed to implement combined arms training, training in conjunction with other combat arms, combat service, and combat service support units undergoing training at the NTC.

(c) Be designed and developed during the near term (FY 80-82).

(3) This is a bottom-twenty priority mission (71).

e. Revise ARTEPs so that the standard for any given event is the same standard for both the active Army and Reserve components.

Performance Requirements

(1) ARTEPs must be revised so that events require the same standard for both active Army and Reserve components.

(2) ARTEPs for both Active and Reserve units differ only in the type and quantity of exercises. The Reserve units concentrate on the types of actions most often found in combat.

(3) ARTEPs must be revised in the near term (FY 80-82).

f. Design a standardized, tank gunnery zero panel for use throughout the Armor force.

Performance Requirements

(1) Research must be conducted to determine the optimum size, shape, and markings for a zero panel.

(2) The zero panel must be standardized for use throughout the Armor community.

(3) To ensure both availability and uniformity, the zero panel must be centrally manufactured and distributed.

(4) The zero panel must be ready for distribution in the near term (FY 80-82).

g. Design, develop, and field a dry-fire crew drills program that assures that all crewmen are trainied to a specified standard.

Performance Requirements

(1) Standard dry-fire crew drills must be designed, developed and published to supersede locally devised programs.

(2) The drills must feature training that is designed to sustain crew skills at the level needed for combat readiness.

(3) Separate drills must be designed for each weapons system.

(4) To enable Reserve Components to train at their armory, the drills must be designed for use without ranges.

(5) The drills must be implemented in the near term (FY 80-82).

h. Review and evaluate, internally and externally, the effectiveness of new training strategies to determine whether or not they are sound.

Performance Requirements

(1) The total Armor Force training strategy for both unit and institutional training will be studied by a single, Armor agency.

(2) The various components of the total strategy will be examined for effectiveness, coverage, and integration.

(3) Review and evaluation must be constant.

(4) This is a bottom-twenty priority (72).

h' Evaluate and/or certify the Armor proponent training conducted in "shadow" schools.

Performance Requirements

(1) A survey must be conducted of all battalion sized or larger organizations responsible for training to determine the existence and location of "shadow" schools.

(2) The type and quality of the training received at these schools must be determined.

(3) A study must be conducted to determine:

(a) If these schools duplicate efforts, if they provide an efficient method of training, and if they should have a place in the total Armor force training strategy.

(b) How best to certify these schools and how to recognize their product formally, if they are found to be desirable.

(4) Evaluation must be completed in the near term (FY 80-82).

(5) This is a bottom-twenty priority mission.

3-8. TRAINING SUPPORT MISSIONS.

a. Design, develop, and field a battalion level ARTEP which integrates the use of MILES or other objective systems which provide for a realistic degradation of combat strength and immediate, objective feedback.

Performance Requirements

(1) New or revised ARTEPs incorporating MILES must be produced for the combined arms team and each type of combat and combat support unit.

(2) All engagement exercises in the ARTEPs must provide for:

(a) Realistic degradation of combat strength when the unit under evaluation is exposed to opposing force action.

(b) Immediate, objective feedback to the evaluated unit or troops during the course of opposing force action.

(3) ARTEP must be fielded in the near term (FY 80-82).

(4) This is a top-twenty priority mission (10).

b. Provide training in professional development courses on the operation and use of training devices and simulators.

Performance Requirements

(1) Professional development courses must be revised to include training in the operation and use of existing training devices and an overview of ongoing, development projects.

(2) Training may be developed for an individual learning or a self-paced, self-study mode.

(3) Training must be provided in the near term (FY 80-82).

(4) This is a top-twenty priority mission (11).

c. "Push" training materials and programs to units in the field through an automatic distribution system which is based on unit type rather than unit demand.

Performance Requirements

(1) An automatic distribution system for training materials must be developed to identify units by type and to provide each unit with appropriate materials in the quantity required without the necessity of ordering them.

(2) The "push" system must be implemented in the near term (FY 80-82).

(3) This is a top-twenty priority mission (12).

d. Design, develop, and field thermal signature targets to support training on weapons systems which employ the thermal sight.

Performance Requirements

(1) An immediate solution must be provided for the thermal sight target.

(2) Design and development of long-term, standard thermal targets for the Armor Remoted Target System must continue.

(3) Thermal targets must be:

(a) Realistic and representative of threat targets.

(b) Adaptable to moving target carriers and pop-up systems.

(c) As economical as possible in terms of support personnel and cost.

(4) Standard thermal targets must be fielded in the near term (FY 80-82).

e. Design, develop, and field simulators and instrumented ranges for aerial gunnery training which minimize the use of ammunition and provide for accurate, objective scoring.

Performance Requirements

(1) Simulators for aerial gunnery must be developed in order that aerial gunnery training be accomplished realistically with a significantly reduced expenditure of ammunition.

(2) Instrumented ranges which permit accurate, objective scoring of aerial gunnery must be developed for both ground and aerial use.

(3) A Training Device Letter of Agreement (TDLOA) for an aerial gunnery simulator must be drafted to enable DARCOM to start exploratory development work.

(4) A list of training objectives must be prepared for the tasks to be trained by the aerial gunnery simulator.

(5) A preliminary CTEA on the aerial gunnery simulator must be accomplished and submitted with the TDLOA.

(6) Simulators and instrumented ranges should be fielded in the far term (FY 83-85).

f. Design, develop, and field a combat training theater which has the capability for multiplatoon training.

Performance Requirements

(1) All, known, current, combat training theater concepts must be examined for their potential as multiplatoon theaters.

(2) A TDLOA must be drafted to enable DARCOM to get started on exploratory development work.

(3) A list of training objectives must be prepared for those tasks that are to be trained by the multiplatoon, combat training theater.

(4) A study must be accomplished to measure the impact of a multiplatoon, combat training theater on a using unit in terms of facilities, maintenance, and operating personnel.

(5) A preliminary CTEA on the multiplatoon, combat training theater must be accomplished prior to submission of the TDLOA.

(6) Research for this effort should be initiated in the far term (FY 83-85).

(7) This is a bottom-twenty priority mission (70).

3-9. DOCTRINAL MISSIONS. Performance requirements for these missions are similar and limited; therefore, they are provided at the end of this group of mission statements rather than immediately following each mission statement.

a. Establish the doctrine for the use of smoke on the battlefield, and incorporate that doctrine into the Armor Proponent Army Training Literature Program and into appropriate Armor programs of instruction.

b. Establish the doctrine for the use of battlefield illumination, and incorporate that doctrine into the Armor Proponent Army Training Literature Program and into Armor programs of instruction.

c. Establish the criticality of boresight and zero procedures and ensure that it is reflected in the Armor Proponent Army Training Literature Program and in the appropriate Armor programs of instruction.

d. Determine the preferred method of engagement (battlesight and precision gunnery), and incorporate that method into the Armor Proponent Training Literature Program and into appropriate Armor programs of instruction.

e. Determine the cause for the lack of accuracy at 500 meters when using battlesight gunnery; publish the adjusted battlesight doctrine, and incorporate that doctrine into gunnery training.

f. Establish and validate clearly defined, gunnery sensing methods and standard adjustment procedures, and incorporate those methods and procedures into the Armor Proponent Army Training Literature Program and into appropriate Armor programs of instruction.

g. Investigate the capability of a second tank to sense accurately and to adjust the fire of a firing tank, as compared to a gunner's standard adjustment. Determine the effects of that capability upon platoon firepower; publish the findings in appropriate Armor publications, and incorporate them into appropriate Armor training programs.

h. Develop doctrine for XM1, tank-stabilized gunnery in line with the capability of the XM1, fire control system, and incorporate that doctrine into appropriate Armor publications and Armor training programs.

i. Develop detailed, stabilized gunnery techniques, and incorporate these techniques in FM 17-12, Tank Gunnery.

j. Develop a laser safety doctrine as it applies to gunnery training and incorporate it into appropriate training literature and professional development courses to set forth the realities and myths of laser safety and to aid in the integration of laser rangefinder training in all appropriate training programs.

j' Continue to develop training devices or filters to permit eye-safe laser rangefinder training in normally restricted areas.

Performance Requirements

(1) No particular priority has been established for the achievement of these missions, but inherent in the doctrinal gaps which led to these missions are training gaps which must be closed; therefore, priority for achieving all of these missions must be considered high.

(2) A rigid milestone schedule for the achievement of these missions must be established in the near term (FY 80-82).

(3) All doctrine which pertain to tank gunnery and which evolve from these missions must be coordinated/approved by the USAARMC Tank Gunnery Committee.

3-10. PARALLEL MATERIEL/TRAINING SYSTEMS DEVELOPMENT MISSIONS.

a. Reexamine and refine the Life Cycle System Management Model (LCSMM) process, and establish a single POC for each system to ensure that each new system that is introduced to the field and to the training base is introduced as a complete materiel/training package.

Performance Requirements

(1) To ensure that USAARMC actions for the development of new combat systems are centrally managed, a single POC for both training developments and combat developments must be established for each system.

(2) The USAARMC system POC must work in close harmony with the TRADOC POC, the TRADOC Systems Manager.

(3) The charter of the USAARMC system POC must ensure that when the system is introduced to the field it is accompanied by a complete training package.

(4) The LCSMM must be examined for each system to determine which steps are mandatory for the USAARMC and refined to eliminate those which can be skipped without harm to system development.

(5) To prevent discrepancies between system capability and training material, both combat developers and training developers must submit their products for review to the USAARMC system POC.

a' Establish an improved cadre training program for new equipment at the USAARMC to include training material packages (e.g., FMs, TMs, training devices, TCs).

Performance Requirements

(1) The cadre training program for the introduction of new equipment must ensure that the cadre are fully capable of training the first students on the new equipment.

(2) To ensure compatibility, complete, new equipment, cadre training packages must be developed concurrently with the development of institutional training programs.

(3) The training package must include:

(a) All pertinent materials.

(b) An evaluation system to ensure that cadre meet the standards set by training developers.

(4) Cadre training packages must be produced in concert with materiel systems, beginning in the near term (FY 80-82).

b. Design and develop a system which assures that the training base POI is ready for the introduction of special systems (e.g., laser designators, vehicle smoke launcher, heading reference system), prior to receipt of the equipment in the training base.

Performance Requirements

(1) The system must be:

(a) Fail-safe.

(b) Designed and developed in the near term (FY 80-82).

(2) This is a bottom-twenty priority mission (75).

b' Design and develop a system which assures that TDA changes that are required to support POI which introduce new systems are submitted for approval prior to receipt of the new equipment.

Performance Requirements

(1) The system must be:

(a) Fail-safe.

(b) Designed and developed in the near term (FY 80-82).

(2) This is a bottom-twenty priority mission (75).

c. Analyze, design, and develop gunnery training for new weapons systems to eliminate gunnery training gaps prior to the introduction of the weapons system.

Performance Requirements

(1) Training must incorporate the lessons learned from current and emerging systems. (For example, the absence of an azimuth indicator on the XM1 prevented the preparation of range cards as prescribed by doctrine and was not "discovered" until months after the early operational tests.)

(2) Prior to publication, tank gunnery training for emerging systems must be reviewed and approved by the USAARMC Tank Gunnery Committee.

(3) Training must be designed and developed to emerge simultaneously with the weapons system.

(4) This is a bottom-twenty priority mission (76).

d. Establish a new equipment training program which will train USAARMC individual and collective training developers who will be responsible for the analysis, design, and development of training programs and materials that will be implemented at the training base and the units.

Performance Requirements

(1) The program must provide for the training of teams that consist of analysts, designers, and developers for both individual and collective training.

(2) A new equipment training program must be established before the next, new weapons system emerges.

(3) This is a bottom-twenty priority mission (77).

d' Request that DA establish a policy for stabilizing training development personnel (who are subject matter experts for new systems and will be responsible for the analysis, design, and development of individual and collective training programs) for the duration of new materiel/training systems development.

Performance Requirements

(1) A request must be accompanied by a study of the lessons learned from the lack of stabilization of training design and development personnel associated with recently emerging systems such as the XM1, IFV, CFV, ITC, etc.

(2) A request for policy establishment must be forwarded in the near term (FY 80-82).

(3) This is a bottom-twenty priority mission (77).

d'' Request that DAMPL priority be reviewed to assure that USAARMC receives new equipment as soon as available to allow for the early analysis, design, and development of training programs and training materials required to train the personnel who will operate and maintain the new system upon its introduction to the Armor force.

Performance Requirements

(1) Request that the DAMPL priority be revised in the near term (FY 80-82).

(2) This is a bottom-twenty priority mission (77).

3-11. RESERVE TRAINING MISSIONS.

a. Develop a premobilization training plan of Armor Reserve components.

Performance Requirements

(1) The premobilization training plan for Reserve component Armor units must:

(a) Include a standard training package which is coordinated between the training base and Reserve component training developers.

(b) Establish the training responsibilities for the training base and Armor Reserve units.

(c) Ensure that mobilized Armor units can be rapidly trained at Fort Knox with minimal interruption to ongoing training programs.

(d) Be limited to those critical missions and tasks that are necessary to increase the survivability of the unit on the modern battlefield.

(e) Consider the resource constraints experienced by Reserve component units.

(f) Ensure maximum training achievements within the training time available to Reserve component units during their training year.

(g) Make use of maximum hands-on training and criterion-referenced testing.

(h) Stress individual physical readiness as well as material and training readiness.

(i) Identify those individuals within each unit who would not deploy with the unit in the event of mobilization.

(j) Identify active Army advisors who can fill critical positions in the event of mobilization and who would deploy with the unit to the training base and to the theater of combat operations.

(k) Be designed, developed, and implemented in the near term (FY 80-82).

(2) Premobilization training received:

(a) At local Reserve component armories and training areas must be evaluated on an annual basis.

(b) At the Reserve component unit level must achieve the same standards that are established for active Army units.

(c) At the Reserve component unit level must not duplicate the training which will be received at the training base in the event of mobilization.

(3) This is a bottom-twenty priority mission (74).

b. Develop a training plan which has realistic goals for Armor Reserve component units, based on the same standards as those used in active Army component units and stated in terms of premobilization and postmobilization goals that reflect the unique problems and needs of the Reserve component. Define the training requirements and parameters for individual and unit training in gunnery and ARTEP; and address professional development training that is tailored to the needs and time available to Armor Reserve component members in the areas of AOAC, AOB, ANCOC, master gunnery, Reserve component commander refresher training, and BNCOC.

Performance Requirements

(1) The training plan must:

(a) Be applicable to all Armor organizations and units that compose the Reserve component force.

(b) Focus on the critical missions/tasks to be achieved during the normal Reserve component training year.

(c) Address unit collective training, unit individual training, sustainment training, and Reserve component professional development training.

(d) Provide standards for physical fitness and weight control.

(e) Address the use of training devices, TEC, and audio-visual and other aids.

(f) Be supported by exportable training packages.

(g) Address the training of Reserve component organizations and units giving consideration to the equipment mixes found in those units.

(h) Be designed, developed, and implemented during the near term (FY 80-82), revised continuously, and updated in the long term.

(3) The exportable training package must be designed for training at the armory or meeting place.

(4) This is a bottom-twenty priority mission (84).

c. Establish parallel course content and interchangeability for the resident, US Army Reserve School and the Army Correspondence Course Programs versions of the Armor Officer Basic and Advanced Courses to enable Reserve component officers to transfer from one program to another without a loss of academic credit or a major change in course content.

Performance Requirements

(1) A Reserve component officer education program must establish a system:

(a) That ensures that the curriculum and content of Armor Officer Basic (AOB) and the Armor Officer Advanced Course (AOAC) for the resident, reserve training base are the same as in ACCP instruction.

(b) Which will allow Reserve component officers to enroll in either reserve, school instruction or ACCP instruction and, if selected for resident instruction, receive credit for courses previously completed.

(c) Which will allow Reserve component officers to receive credit for the ACCP courses completed prior to attendance at the Reserve school.

(2) The Reserve component officer training program must be established and implemented during the near term (FY 80-82).

d. Design, develop, and field training programs that permit the accomplishment of improved, Reserve component gunnery training despite the limited resources of time, materiel, and ammunition.

Performance Requirements

The Reserve component gunnery program must:

(a) Ensure that Reserve component Armor units can be trained to standards rapidly during mobilization.

(b) Ensure the maximum use of devices and other media to accomplish training.

(c) Emphasize gunnery tables which can be accomplished throughout the Reserve component training year.

(d) Be designed to be accomplished at the armory, in local training areas, and in Reserve component major training areas.

(e) Be designed to accomplish training on the range facilities available without major changes in range design.

(f) Be performed to the same standards required of active Army Armor units.

(g) Eliminate those tasks which are learned or performed by rote learning to prevent overtraining.

(h) Ensure that 90% of the crews qualify during firing exercises.

(i) Include lists of concurrent training, facilities requirements, target requirements, and devices and training aids.

(j) Be designed, developed, and implemented in the near term (FY 80-82).

3-12. TRAINING FACILITY MISSIONS.

a. Organize a central facilities office which is charged with the responsibilities of conducting timely research, planning and budgeting actions that support Armor range, training area, and target systems needs for both ground and aerial weapons systems and which is designed to support training to the full potential of the weapon system prior to its introduction to the field.

Performance Requirement

The office must be organized in the near term (FY 80-82).

b. Design, develop, and implement a range/training area real estate program which evolves around innovative thinking, progressive planning, and aggressive management practices and procedures, and which ensures maximum utilization of all available range/training area real estate by Armor ground and air units.

Performance Requirement

The program must be implemented in the near term (FY 80-82).

c. Organize a committee which participates in the planning and design of all institutional buildings in which instruction will be conducted.

Performance Requirements

The committee must be organized in the near term (FY 80-82).

3-13. OFFICER TRAINING MISSIONS.

a. Design, develop, and implement an AOAC training program which considers individual proficiency requirements based on the student's past experience, present abilities, and his future assignment.

Performance Requirements

(1) The revised AOAC training program must:

(a) Consider the past experience of the student, his present individual proficiency, and his forecasted future assignment.

(b) Emphasize combined arms doctrine and the conduct of mechanized warfare.

(c) Include a catalog for the student to select his personalized course of instruction.

(d) Include a faculty advisor program which ensures that each student receives academic counseling and guidance prior to registering for courses, as well as guidance throughout the period of attendance.

(e) Allow those students who excel to take advanced level training or to graduate and move to their next assignment upon completion of graduation requirements.

(f) Use the criterion-referenced grading system (GO/NO-GO).

(g) Be sufficiently flexible to allow an officer to enter the program at anytime in order to preclude command of units by officers who are not AOAC graduates.

(h) Consider the requirements of the Review of Education and Training for Officers (RETO).

(2) Revision of the AOAC training program must begin immediately; the program must be implemented in the near time frame.

b. Design and implement an institutional training program for Armor officers that consists of self-paced and institutionally taught modules which focus on preparing the officer for his next duty assignment (i.e., company command, battalion staff, support platoon leader, mortar platoon leader).

Performance Requirements

(1) The training program must:

(a) Prepare the officer for his next assignment and for projected assignments in alternate specialties.

(b) Include instruction in core subjects to ensure that Armor officers are proficient in their primary MOSs.

(c) Be modular and include self-paced instruction which incorporates the use of audio-visual and other materials.

(2) If an officer is pretested and found to be proficient in certain tasks or groups of tasks, the training program must allow for advanced studies in Armor/Combined Arms tactics and doctrine.

(3) The training program will:

(a) Retain the criterion-referenced grading system (GO/NO-GO).

(b) Include a plan which will address the role and responsibilities of the faculty advisor as the "on-campus" academic advisor who will counsel the student about enrollment in the various modules which are available.

(c) Include a student registration which is similar to civilian colleges for various modules offered by the Armor School.

(4) The training program must:

(a) Include the design, development and fielding of a catalog which explains to the student the goals and objectives of the school, the core curriculum, grading system, and the recommended courses of instruction to allow proficiency in both the primary MOS and the most common alternate MOSs. This catalog would be similar to civilian college catalogs and would be pushed to all active and reserve units, the sources for commissioned officers, and be sent to students upon notification to attend school.

(b) Include a procedure whereby data pertaining to each student is furnished by the student and his current commander prior to the student's arrival. This will allow faculty advisors and school administrators to plan a recommended course of instruction.

(c) Allow those students who excel to take additional courses of instruction or to graduate earlier and move to their next duty assignment.

(d) Satisfy the officer training needs of both the active Army and Reserve components.

(5) Planning must begin as soon as possible; the training program must be implemented in the near term (FY 80-82).

c. Revise the POI for AOB and AOAC to include the employment of combat aviation systems as another maneuver force.

Performance Requirements

(1) The revised POI for AOB and AOAC must include instruction in evaluation of employment of Armor aviation as a maneuver force on the combined arms battlefield.

(2) Revision and implementation must satisfy both active Army and Reserve component POIs for AOB and AOAC.

(3) Revision of AOB/AOAC POIs must begin as soon as possible and be implemented during the near term (FY 80-82).

d. Design, develop, and implement a tank gunnery refresher training program for Pre-Commander Course (PCC) attendees to enable students to regain their proficiency in all crew gunnery tasks.

Performance Requirements

(1) The tank gunnery refresher training program must include self-paced instruction which can be completed by PCC attendees prior to beginning the course.

(2) Gunnery refresher training conducted at Fort Knox must contain maximum hands-on training.

(3) Gunnery refresher training must:

(a) Be vehicle specific and must satisfy the unit assignment of the future commander.

(b) Include instruction and hands-on training in the use of current gunnery devices and simulators.

(c) Satisfy the needs of the active Army and the Reserve component.

(d) Include instruction on planning, conducting, and evaluating the unit gunnery training program.

(e) Must produce a future commander who is proficient in gunnery tasks for the weapon system which he will be responsible for employing.

(f) Include a criterion-referenced grading system (GO/NO-GO).

(g) Provide for the integration of PCC students with students in other ongoing courses.

(4) Design and development of PCC tank gunnery refresher training must begin immediately for implementation in the near term (FY 80-82).

(5) This is a bottom-twenty priority (78).

3-14. INSTRUCTIONAL STAFF MISSIONS.

a. Establish a procedure and implement a selection process which is similar to the present drill sergeant selection process to improve the quality of NCO/trainer personnel, including track and tank commanders, assigned to the training base.

Performance Requirements

(1) A selection process and procedure must be established to ensure that quality NCOs are furnished to the training base.

(2) Procedures must be established and implemented during the near term (FY 80-82).

(3) This is a bottom-twenty priority mission (79).

b. Implement an assignment procedure which ensures that the training base receives priority of NCO fill and is maintained at 100% strength.

Performance Requirements

(1) Assignment procedures must ensure that the training base receives priority of NCO fill and that strength is maintained as near to 100% as possible.

(2) Assignment procedures which establish priority of fill for the training base must be implemented during the near term (FY 80-82).

(3) This is a bottom-twenty priority mission (80).

c. Request approval of a command selection process which ensures that commanders (LT through COL) of training base units have had recent experience in TOE Armor units and have first hand knowledge of the field's need for a combat-ready soldier.

Performance Requirements

(1) A request must be:

(a) Accompanied by an appropriate study which clearly shows the advantages of such selection and assignment.

(b) Forwarded in the near term (FY 80-82).

(2) This is a bottom-twenty priority mission (86).

SECTION III - SUMMARY

3-15. SUMMARY.

a. This chapter has identified the missions which must be achieved to bridge the training gaps that were identified in the needs assessment in Chapter 2. It has also described what the products of these missions must look like or do, and has laid out certain ground rules for achieving these missions. These missions contain some minor redundancy and some minor overlap. However, these discrepancies pale in the face of the potential improvement in Armor training which the achievement of these missions promise.

b. These missions implicate the entire Armor community, and the entire Armor community stands to benefit from their achievement. Most significant, however, is the implication which these missions hold for the US Army Armor Center. They specify the actions which must be taken to make this a genuinely proactive rather than reactive Armor Center training plan. These missions charge this Center to take the initiative to move Armor training from where it is now, to where it ought to be rather than to await direction. They also provide the strong beginning of the map.

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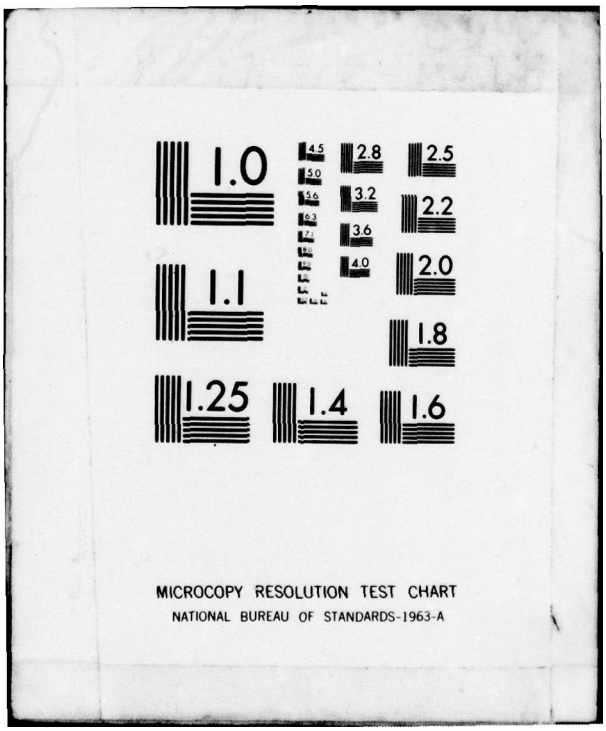
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CHAPTER 4 - THE METHODS AND MEANS

SECTION I - INTRODUCTION

4-1. INTRODUCTION. Thus far, Volume II has identified the gaps in Armor training and identified the training missions which must be achieved to close those gaps. This chapter identifies, where practical and reasonable, alternative methods and means - alternative strategies and tools - by which those missions may be accomplished. It also identifies the advantages and disadvantages of those alternative methods and means and recommends from among them the best approach for achieving the training mission.

4-2. LEVEL OF METHODS AND MEANS ANALYSIS. Ideally, each performance requirement for each mission, function, and task should be matched with alternative methods and means and every requirement should be met. For this first iteration of Volume II, methods and means analyses are supplied for specific missions or are generalized across missions at the mission level. Intermediate and final methods and means analyses must be supplied by users or implementers of this plan. Each subsequent analysis will provide a progressively smaller and more precise determination of what functions and tasks must be achieved to accomplish the missions.

SECTION II - TABLES OF METHODS AND MEANS ANALYSES

4-3. ORGANIZATION OF THE TABLES. The tables of methods and means which follow are organized so that they may be cross-referenced to the mission statements which appear in Chapter 3. The alphanumeric mission numbers identified in the mission numbers column of the tables are taken directly from the paragraph and subparagraph numbers in which the missions appear in Chapter 3. For example, mission number 3-4a in Table 4-2 is simply mission a in paragraph 3-4 of Chapter 3. The methods and means statement which is recommended as the best course of action is denoted by an asterisk.

TABLE 4-1. MISSION LEVEL METHODS AND MEANS ANALYSES - COLLECTIVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-4-a 3-4-b 3-4-c 3-4-d 3-4-e 3-4-g	Armor Center: (1) Applies existing design and development models to expand or modify existing ARTEPS to include desired collective training.*	1. Minimal interruption to ATLP. 2. Design and development procedures are established. 3. No significant increase in cost to produce. 4. Can be accomplished in near term. 5. Reliability criteria can be satisfied. 6. Allows retention of valid/reliable material in existing ARTEP. 7. Promotes ease of use. 8. Organization to complete exists. 9. Equipment, facilities, and target audience for validation are readily available.	1. Sufficient Armor personnel are authorized but not on hand. 2. CS/CSS personnel required but not authorized (may require interface/coordination with other service schools). 3. Promotes overlooking better approach to collective training. 4. Breeds familiarity. 5. Will increase training costs, time, and evaluator personnel. 6. Necessitates reestablishment of priorities.
	(2) Examines and selects new design and development models not now available to the Armor community to expand or modify existing ARTEPS to include desired collective training.	1. Same as 3-4-a(1)-1, 3-4-a(1)-4, 3-4-a(1)-6, 3-4-a(1)-7, 3-4-a(1)-8, and 3-4-a(1)-9 above. 2. Provides opportunity to exploit new technology.	1. Same as 3-4-a(1)-1, 3-4-a(1)-2, 3-4-a(1)-4, 3-4-a(1)-5, and 3-4-1(1)-6 above. 2. Increases production time. 3. Procedures for implementing new model not established. 4. Design and development personnel would require training. 5. Availability of new models unknown.
	(3) Applies existing design and development models to design and develop new ARTEPS for the desired collective training.	1. Same as 3-4-a(1)-2, 3-4-a(1)-3, 3-4-a(1)-4, 3-4-a(1)-5, 3-4-a(1)-8, and 3-4-a(1)-9 above. 2. Allows design and development for new doctrine, equipment, devices, and organization. 3. Eliminates familiarity. 4. Allows for an overall "fresh look" at the product.	1. See 3-4-a(1)-1, 3-4-a(1)-2, 3-4-a(1)-6, and 3-4-a(2)-2 above. 2. Risks elimination of valid/reliable materials. 3. Requires educating users.

TABLE 4-1. MISSION LEVEL METHODS AND MEANS ANALYSES - COLLECTIVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(4) Examines and selects new design and development models or new models not now available to the Armor community to design and develop new ARTEPS for the desired collective training.	1. Same as 3-4-a(1)-8, 3-4-a(1)-9, 3-4-a(2)-1, 3-4-a(2)-2, 3-4-a(3)-2, 3-4-a(3)-3, and 3-4-a(3)-4 above.	1. Same as 3-4-a(1)-1, 3-4-a(1)-2, 3-4-a(1)-6, 3-4-a(2)-2, 3-4-a(2)-3, 3-4-a(2)-5, 3-4-a(3)-1, and 3-4-a(3)-3 above. 2. Cost of production is unknown. 3. Production time unknown. 4. Risks failure to achieve mission during near term.
	(5) Applies existing design and development models to produce new collective training programs, other than ARTEPS, for the desired collective training.	1. See 3-4-a(1)-2, 3-4-a(1)-8, 3-4-a(1)-9, 3-4-a(2)-1, 3-4-a(3)-3, and 3-4-a(3)-4 above.	1. See 3-4-a(1)-1, 3-4-a(1)-2, 3-4-a(2)-1, 3-4-a(3)-2, 3-4-a(3)-3, 3-4-a(4)-1, and 3-4-a(4)-4 above. 2. Interrupts current ATLP schedule. 3. Reliability criteria unknown. 4. Existing procedure may be incompatible with program other than ARTEP.
	(6) Examines and selects new design and development models or models not now available to the Armor community to produce new collective training programs other than ARTEPS for the desired collective training.	1. See 3-4-a(1)-8, 3-4-a(1)-9, 3-4-a(2)-1, 3-4-a(3)-2, 3-4-a(3)-3, and 3-4-a(3)-4 above.	1. See 3-4-a(1)-1, 3-4-a(1)-2, 3-4-a(1)-6, 3-4-a(2)-1, 3-4-a(2)-2, 3-4-a(2)-3, 3-4-a(2)-5, 3-4-a(3)-2, 3-4-a(3)-3, 3-4-a(4)-2, 3-4-a(4)-4, 3-4-a(5)-3, and 3-4-a(5)-4 above.

TABLE 4-1. MISSION LEVEL METHODS AND MEANS ANALYSES - COLLECTIVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	Armor Center contracts with civil industry to:		
	(7) Apply civil design and development models to expand or modify existing ARTEPS to include desired collective training.	1. See 3-4-a(1)-6 and 3-4-a(2)-1. 2. Eliminates parochialism/bias. 3. Eliminates requirement to reestablish priorities. 4. Reduces production times. 5. Dollars are more available than personnel. 6. Competing industries are established. 7. Allows Armor Center to deal directly with industry.	1. Procedures/organization for direct contracting not clearly defined. 2. Could require new government furnished materials to contractor. 3. Explicit program requirements difficult to identify and clarify for industry. 4. Equipment, facilities, and target audience for validation not readily available to contractor.
	(8) Apply civil design and development models to design and develop new ARTEPs for the desired collective training.	1. Same as 3-4-a(2)-2, 3-4-a(3)-4, and 3-4-a(7)-1 thru 3-4-a(7)-7 above.	1. Same as 3-4-a(7)-1 thru 3-4-a(7)-4 above.
	(9) Produce new, collective training programs for the desired collective training.	1. Same as 3-4-a(3)-4 and 3-4-a(7)-1 thru 3-4-a(7)-7 above.	1. Same 3-4-a(3)-2, 3-4-a(3)-3, and 3-4-a(7)-1 thru 3-4-a(7)-4 above.
3-4-f	Armor Center:		
	(1) Designs, develops, and fields battle drills.*	1. Same as 3-4-a(1)-1, 3-4-a(1)-4, 3-4-a(1)-8, 3-4-a(1)-9, 3-4-a(3)-2, and 3-4-a(3)-4 above. 2. Knowledge base present.	1. Same as 3-4-a(1)-1 and 3-4-a(1)-6 above. 2. Requires educating users.

TABLE 4-1. MISSION LEVEL METHODS AND MEANS ANALYSES - COLLECTIVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(2) Examines and adopts battle drills of allied armies for US Armor use.	1. Same as 3-4-a(1)-4, 3-4-a(1)-8, 3-4-a(1)-9, 3-4-a(3)-2, 3-4-a(3)-4, and 3-4-f-(1) above. 2. Exploits best drills of allied armies. 3. Reduces parochialism/bias. 4. Material readily available. 5. Proven reliability. 6. Allows for selection of drills for multiple environments. 7. Allows for comparison of drills being developed for emerging systems.	1. Same as 3-4-a(1)-1, 3-4-a(1)-6, and 3-4-f(1)-2 above. 2. May reduce initiative of Armor Center personnel to develop better drills.
	(3) Contracts with civil industry to design, develop, and field battle drills.	1. Same as 3-4-a(1)-1, 3-4-a(3)-2, 3-4-a(3)-4, 3-4-a(7)-2, 3-4-a(7)-3, 3-4-a(7)-4, 3-4-a(7)-5, 3-4-a(7)-6, 3-4-a(7)-7, and 3-4-f(1)-2 above. 2. Independent of ATLP.	1. Same as 3-4-a(3)-3, 3-4-a(7)-2, 3-4-a(7)-3, and 3-4-a(7)-4 above. 2. Procedures/organization for direct contracting not clearly defined.
3-4-i 3-4-j	Armor Center: (1) Uses current design and development models and extant performance data to develop tank gunnery training which eliminates or reduces the effects of crew turbulence and which reduces engagement times.	1. Design and development procedures are established. 2. Can be accomplished in near time frame. 3. Reliability criteria can be satisfied. 4. Allows retention of valid/reliable materials. 5. Organization to complete project exists. 6. Facilities, equipment, and target audience readily available for validation.	1. Sufficient qualified personnel may not be on hand. 2. Necessitates reestablishment of priorities. 3. Extant data may be unreliable and invalid. 4. Reliability/validity of extant data may be difficult to prove. 5. Data may be difficult to generalize across population. 6. Permits parochialism/bias.

TABLE 4-1. MISSION LEVEL METHODS AND MEANS ANALYSES - COLLECTIVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
		7. Provides opportunity to review and incorporate results of previous studies which are related to this problem. 8. Allows for design/development for new doctrine, equipment, devices, and organization. 9. Knowledge base present. 10. Allows for use of existing performance.	
	(2) Uses current design and development models and collects and uses new performance data to design and develop tank gunnery training which eliminates or r luces the effects of crew turbulence and which reduces engagement times.*	1. Same as 3-4-i(1)-2, 3-4-i(1)-5, 3-4-i(1)-6, 3-4-i(1)-7, 3-4-i(1)-8, and 3-4-i(1)-9 above. 2. Performance data more valid and reliable.	1. Same as 3-4-i(1)-1, 3-4-i(1)-2, and 3-4-i(1)-7 above. 2. May not be completed in near term. 3. Methodology for assessing crew turbulence and its effects on tank gunnery has not been developed.
	(3) Contracts with civil industry to design and develop tank gunnery training which eliminates or reduces the effects of crew turbulence and which reduces engagement time.	1. Same as 3-4-a(1)-4, 3-4-a(1)-5, 3-4-a(2)-2, 3-4-a(3)-2, 3-4-a(3)-3, 3-4-a(3)-4, 3-4-a(7)-3, 3-4-a(7)-4, 3-4-a(7)-5, 3-4-a(7)-6, 3-4-a(7)-7, and 3-4-a(8)-2 above.	1. Same as 3-4-a(4)-2, 3-4-a(7)-1, 3-4-a(7)-2, 3-4-a(7)-3, 3-4-a(7)-4, and 3-4-i(2)-3 above. 2. Difficult access to data by contractor. 3. May require extensive government input.
3-4-k	Armor Center provides transitional training materials:		
	(1) To units who will deploy to the NTC. Units in turn, tailor materials to fit NTC requirements.	1. Same as 3-4-a(1)-3, 3-4-a(1)-4, 3-4-a(1)-9, and 3-4-a(7)-4 above. 2. Allows for use of existing valid/reliable training materials.	1. Same as 3-4-a(1)-1 above. 2. Does not allow training package to be tailored to fit NTC requirements.

TABLE 4-1. MISSION LEVEL METHODS AND MEANS ANALYSES - COLLECTIVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(2) Which fit both the needs of units who will deploy to the NTC and the requirements of the NTC.*	1. Same as 3-4-i(1)-3, 3-4-a(1)-4, 3-4-i(1)-5, 3-4-i(1)-8, and 3-4-i(1)-9 above. 2. Reduces unit planning time. 3. Standardizes total training package.	1. Same as 3-4-a(1)-1 and 3-4-a(1)-2. 2. Available data and information about NTC are relatively limited to developers.
3-4-n	(1) Armor Center designs and develops methodology for assessing effects of distractors and turbulence on unit readiness.	1. Same as 3-4-a(1)-8, 3-4-i(1)-7, and 3-4-i(1)-10 above. 2. Provides ease of gathering and requesting data from the field.	1. Same as 3-4-i(1)-1, 3-4-i(1)-3, 3-4-i(1)-4, and 3-4-i(1)-5 above.
	(2) Army Research Institute, at the request of the Armor Center, designs and develops a methodology for assessing effects of distractors and turbulence on unit readiness.	1. Same as 3-4-a(1)-8, 3-4-a(7)-2, 3-4-i(1)-7, 3-4-i(1)-9, and 3-4-i(1)-10 above. 2. ARI personnel more familiar with Armor training problems than other agencies outside Armor. 3. ARI field unit at Ft Knox would permit direct interface. 4. ARI field units already established to collect data worldwide.	1. Same as 3-4-a(4)-2, 3-4-i(1)-3, 3-4-i(1)-4, and 3-4-i(1)-5 above.
	(3) Consortium of representatives from the Armor Center, Armor organizations worldwide, and Army Research Institute designs and develops methodology for assessing effects of distractors and turbulence on unit readiness.*	1. All advantages listed under 3-4-n(1) and 3-4-n(2) above.	1. Same as 3-4-a(4)-3 above. 2. Increase cost. 3. Increase time.
3-4-a' 3-4-h 3-4-l 3-4-m	Methods and means analyses are not necessary for the level of performance required by these missions.		

TABLE 4-2. MISSION LEVEL METHODS AND MEANS ANALYSES - INDIVIDUAL TRAINING

MISSON	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-5-a 3-5-a' 3-5-c 3-5-d 3-5-e 3-5-f 3-5-t	No alternative methods and means for achieving these missions are identified. The methodology, organization, and personnel required to achieve these missions are available in the Armor Center and the magnitude of the missions is such that it is unrealistic to suggest that any strategy other than application of the ISD model by personnel within Armor Center organizations be employed to achieve them.		
3-5-b 3-5-b'	Armor Center:		
	(1) Develops a model for redesign of ACCP and submits to TRADOC for approval.*	1. Personnel are on hand who are familiar with Armor ACCP training problems. 2. Can be accomplished in the near term. 3. Validation audience, both active and reserve, are available. 4. Allows for overall "fresh look" at the product. 5. Allows for exploitation of new training technology. 6. Organization to complete the mission exists. 7. Increases versatility of ACCP. 8. Current ACCP materials are available for baseline.	1. No model for redesign exists. 2. Sufficient personnel authorized but not on hand. 3. Cost and time to produce model are unknown. 4. Allows parochialism/bias to become a factor.
	(2) Requests that USATC, TRADOC redesigns the ACCP.	1. Requires limited Armor Center resources. 2. Performance data on current program readily available. 3. USATC, TRADOC is in better position to contract with civil industry.	1. Might not be suited to Armor training needs. 2. Ready access to validation personnel not available. 3. More time consuming. 4. Not likely to produce a "fresh look."

TABLE 4-2. MISSION LEVEL METHODS AND MEANS ANALYSES - INDIVIDUAL TRAINING

MISSON	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-5-e'	Armor Center:		
	(1) Conducts review of current feedback procedures and makes changes as necessary.	1. Same as 3-5-b(1)-2, 3-5-b(1)-4, and 3-5-b(1)-6 above. 2. Exploits new techniques for gathering and interpreting feedback. 3. Baseline for gathering and using feedback is established. 4. Allows more efficient use of evaluation personnel. 5. Allows for more accurate decisions on revision of on-going training programs. 6. Allows for cross fertilization with other service schools.	1. Promotes bias.
	(2) Requests ARI conduct a review of current USAARMC feedback procedures and recommend changes as necessary.*	1. Same as 3-5-b(1)-6 and 3-5-b(2)-1 above. 2. A fresh unbiased look at problem. 3. Opportunity to exploit latest techniques. 4. Does not interfere with on-going priority projects. 5. Relationship throughout the Army is established.	1. Baseline material and data must be provided. 2. Cost and production time unknown.
	(3) Contracts with civil industry to conduct a review of current USAARMC feedback procedures and recommend changes as necessary.	1. Same as 3-5-e'(2)-1, 3-5-e'(2)-2, and 3-5-e'(2)-3 above. 2. Eliminates requirement to reestablish priorities. 3. Dollars more available than personnel. 4. Competing industry is established. 5. Allows USAARMC to deal directly with industry.	1. Same as 3-5-e'(2)-1 and 3-5-e'(2)-2 above. 2. Procedures/organization for direct contract not clearly defined.

TABLE 4-2. MISSION LEVEL METHODS AND MEANS ANALYSES - INDIVIDUAL TRAINING

MISSON	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-5-n 3-5-p 3-5-q 3-5-r 3-5-s	Methods and means analyses are not necessary for the levels of performance required by these missions and it is expected that the Armor Center will accomplish them.		
3-5-h 3-5-i 3-5-j 3-5-k 3-5-l 3-5-o	Armor Center: (1) Applies existing instructional systems design model to revise design, develop, and implement required gunnery training.*	1. Same as 3-5-b(1)-2, 3-5-b(1)-6, and 3-5-b(2)-2 above. 2. Equipment, facilities and target audience are readily available. 3. No significant increase in cost to produce. 4. Minimal interruption to ATLP. 5. Design and development procedures are established. 6. Allows retention of existing reliable materials. 7. Allows design and development for new doctrine, equipment, devices, and organization. 8. Knowledge base present. 9. Allows for selection of gunnery training conducted in multiple environments. 10. Baseline program established. 11. Provides opportunity to review and incorporate results of previous studies which are related to gunnery training. 12. Allows for continuous feedback and revision.	1. Same as 3-5-b(1)-2, 3-5-b(1)-4, and 3-5-b(2)-4 above. 2. Risks design of program that does not address "trade-offs" (ammo and devices) in toto.

TABLE 4-2. MISSION LEVEL METHODS AND MEANS ANALYSES - INDIVIDUAL TRAINING

MISSON	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(2) Contracts with civil industry to revise, design, develop, and implement the required gunnery training.	1. Same as 3-5-b(1)-2, 3-5-b(1)-4; 3-5-b(1)-5; 3-5-b(2)-1; 3-5-e'(2)-3; 3-5-e'(3)-2; 3-5-e'(3)-3; 3-5-e'(3)-4; and 3-5-e'(3)-5 above. 2. Eliminates familiarity. 3. Eliminates parochialism/bias.	1. Same as 3-5-b(1)-3; 3-5-e'(2)-1, and 3-5-e'(3)-2 above. 2. Could require new government furnished materials to contractor. 3. Explicit program requirements difficult to identify and clarify to industry. 4. Equipment, facilities, and target audience not readily available for validation. 5. Does not provide for long-time refinement.
	(3) Examines and adapts allied gunnery training for US Army Armor use.	1. Same as 3-5-b(1)-2, 3-5-b(1)-4, 3-5-b(1)-5, 3-5-b(1)-6, 3-5-h(1)-8, 3-5-h(1)-9, 3-5-h(1)-11, and 3-5-h(1)-12 above. 2. Exploits best allied techniques. 3. Reduces parochialism/bias. 4. Material readily available.	1. Same as 3-5-b(1)-2, 3-5-e'(2)-2, and 3-5-h(1)-2 above. 2. May reduce initiative of Armor Center personnel to develop better drills.
3-5-g	Armor Center:		
	(1) Conducts the required study.	1. Same as 3-5-b(1)-1, 3-5-b(1)-6, 3-5-e'(1)-5, 3-5-h(1)-2, 3-5-h(1)-12, and 3-5-h(3)-4 above. 2. Personnel on hand are familiar with the Armor gunnery training problem.	1. Qualified personnel to conduct study may not be available. 2. Allows parochialism and bias to become a factor. 3. May not produce a fresh look.
	(2) Requests ARI conduct the required study.*	1. Same as 3-5-b(1)-2, 3-5-b(1)-4, 3-5-b(1)-6, 3-5-b(2)-1, 3-5-b(2)-2, 3-5-e'(1)-5, 3-5-e'(2)-3, and 3-5-e'(2)-5 above.	1. Same as 3-5-e'(2)-2.

TABLE 4-2. MISSION LEVEL METHODS AND MEANS ANALYSES - INDIVIDUAL TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(3) Contracts with civil industry or civil research organizations to conduct required study.	1. Same as 3-5-e'(2)-1, 3-5-e'(2)-2, and 3-5-e'(2)-3 above. 2. Eliminates requirement to reestablish priorities. 3. Dollars are more available than personnel. 4. Competing industries and research organizations are established. 5. Allows USAARMC to deal directly with industry.	1. Same as 3-5-b(2)-2, 3-5-e'(2)-1, 3-5-e'(2)-2, 3-5-e'(3)-2, 3-5-h(2)-3, and 3-5-h(2)-5 above.
3-5-m	Same as 3-5-g above.		

TABLE 4-3. MISSION LEVEL METHODS AND MEANS ANALYSES - TRAINING EFFECTIVENESS ANALYSIS

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-6-a	Armor Center:		
	(1) In conjunction with one or more of the major funding, research, testing and analytical resources (agencies) available within military channels, develops a methodology which applies an empirical approach for determining the most cost-effective ways to train.	1. Personnel resources are on hand. 2. Though impractical the empirical approach to TEA does exist. 3. Allows USAARMC to control, direct and develop methodology over a long term time frame. 4. Methodology will place training developers on an even keel with materiel developers during future endeavors. 5. Allows USAARMC to build upon previous errors. 6. Experience on past Armor training is available. 7. Would allow for multi-disciplinary development of the methodology which would better allow for multi-disciplinary implementation. 8. Provides opportunity to review and incorporate results of previous studies which relate to this need.	1. Considered impractical because it is not cost and time effective. 2. Would require formation of task force which would pull key people out of critical jobs. 3. Don't know if the empirical approach to TEA is not cost and time effective for some Armor systems. 4. Distinct lack of performance data available. 5. No system available for quickly gathering and storing performance data.
	(2) Requests that one or more of the major funding, research, testing, and analytical resources (agencies) available within military channels, develop a methodology which applies an empirical approach for determining the most cost effective ways to train.	1. Same as 3-6-a(1)-2, 3-6-a(1)-4, 3-6-a(1)-7, and 3-6-a(1)-8 above. 2. Agencies exist. 3. Allows for "fresh" unbiased look. 4. Independent of USAARMC personnel problems. 5. Would not require adjustment of USAARMC priorities.	1. Same as 3-6-a(1)-1, 3-6-a(1)-3, 3-6-a(1)-4, and 3-6-a(1)-5 above. 2. Does not allow USAARMC to direct, control and develop methodology. 3. Risks development of methodology without consideration of Armor peculiar needs. 4. Explicit methodology requirements difficult to identify and clarify. 5. Would not contain a mechanism to refine methodology over the long term.

TABLE 4-3. MISSION LEVEL METHODS AND MEANS ANALYSES - TRAINING EFFECTIVENESS ANALYSIS

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(3) In conjunction with one or more of the major funding, research, testing and analytical resources (agencies) available within military channels develops a methodology which applies a computational approach for determining the most cost effective ways to train.*	1. Same as 3-6-a(1)-1, 3-6-a(1)-3, 3-6-a(1)-4, 3-6-a(1)-5, 3-6-a(1)-6, 3-6-a(1)-7, and 3-6-a(1)-8 above. 2. More practical approach than empirical approach.	1. Same as 3-6-a(1)-2, 3-6-a(1)-4 and 3-6-a(1)-5 above.
	(4) Requests that one or more of the major funding, research, testing, and analytical resources (agencies) available within military channels develop a methodology which applies a computational approach for determining the most cost effective ways to train.	1. Same as 3-6-a(1)-4, 3-6-a(1)-7, 3-6-a(1)-8, 3-6-a(2)-2, 3-6-a(2)-3, 3-6-a(2)-4, 3-6-a(2)-5; and 3-6-a(3)-2 above.	1. Same as 3-6-a(1)-4, 3-6-a(1)-5, 3-6-a(2)-2, 3-6-a(2)-3, 3-6-a(2)-4, and 3-6-a(2)-5 above.
3-6-b 3-6-c 3-6-d 3-6-e 3-6-f 3-6-g 3-6-g' 3-6-g" 3-6-h 3-6-i 3-6-j	Achievement of the remainder of the missions in this category are primarily dependent upon the achievement of the mission above; therefore, no separate methods and means are identified for them. If, however, a decision is made to pursue any of these subordinate missions independently, the advantages and disadvantages described above are considered appropriate at mission level.		

TABLE 4-4. MISSION LEVEL METHODS AND MEANS ANALYSES - STANDARDIZATION/MOBILIZATION

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-7-a	See Table 4-2, mission number 3-5-a.		
3-7-b	See Table 4-1, mission numbers 3-4-a', 3-4-1, and 3-4-m.		
3-7-c	See Table 4-2, mission number 3-5-a.		
3-7-d	See Table 4-1, mission number 3-4-k.		
3-7-e	See Table 4-1, mission number 3-4-a.		
3-7-f	See Table 4-1, mission numbers 3-4-a', 3-4-1 and 3-4-m.		
3-7-g	See Table 4-1, mission number 3-4-i and 3-4-j.		
3-7-h	See Table 4-2, mission number 3-5-a.		
3-7-h'	See Table 4-2, mission number 3-5-a.		

TABLE 4-5. MISSION LEVEL METHODS AND MEANS ANALYSES - TRAINING SUPPORT

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-8-a	See Table 4-1, Mission number 3-4-a.		
3-8-b	See Table 4-2, Mission number 3-5-a.		
3-8-c	See Table 4-1, mission number 3-4-a', 3-4-1, and 3-4-m.		
3-8-d 3-8-e 3-8-f	Methods and means analyses are not necessary for the level of performance required by these missions.		

TABLE 4-6. MISSION LEVEL METHODS AND MEANS ANALYSES - DOCTRINE

MISSION NO.	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
All 3-9 Doctrine Missions	Armor Center: (1) In conjunction with one or more of the major funding, research, testing and analytical resources (agencies) available within military channels, develops doctrine which meets the requirement of the doctrinal missions.*	1. Personnel resources/organization are on hand. 2. Allows for USAARMC to maximize responsiveness to doctrinal needs. 3. Allows USAARMC to correct and build upon previous errors. 4. Current doctrine is readily available. 5. Provides opportunity to review and incorporate results of previous studies which relate to this need. 6. Design and development procedures are established. 7. No significant increase in cost to produce. 8. Can be accomplished on a continuous basis. 9. Reliablity criteria can be satisfied. 10. Allows retention of valid/reliable material. 11. Equipment, facilities and target audience for validation are readily available.	1. CS/CSS personnel required may not be on hand. 2. Breeds familiarity. 3. Permits parochialism/bias.

TABLE 4-6. MISSION LEVEL METHODS AND MEANS ANALYSES - DOCTRINE

MISSION NO.	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
(2)	Requests that one or more of the major funding, research, testing, and analytical resources (agencies) available within military channels, develops doctrine which meets the needs of the doctrinal mission.	1. See 3-9(1)-5, 3-9(1)-9, and 3-9-(1)-10 above. 2. Agencies exist. 3. Allows for "fresh" unbiased look. 4. Independent of USAARMC personnel commitment. 5. Would not require USAARMC priority adjustment. 6. Eliminates familiarity. 7. Eliminate parochialism/bias.	1. Does not allow USAARMC to direct, control and develop doctrine. 2. Risks development of doctrine without consideration of Armor peculiar needs. 3. Equipment, facilities, and target audience for validation may not be readily available.

TABLE 4-7. MISSION LEVEL METHODS AND MEANS ANALYSES - PARALLEL MATERIEL/TRAINING SYSTEMS

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-10-a 3-10-a' 3-10-b' 3-10-d 3-10-d' 3-10-d"	See Table 4-1, Mission numbers 3-4-a', 3-4-1, 3-4-m.		
3-10-b	See Table 4-2, Mission number 3-5-a.		
3-10-c	See Table 4-2, Mission numbers 3-5-h, 3-5-i, 3-5-j, 3-5-l, and 3-5-o.		

TABLE 4-8. MISSION LEVEL METHODS AND MEANS ANALYSES - RESERVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-11-a	Armor Center:		
3-11-b	(1) In conjunction with the Readiness Regions and Armor Reserve Component units develops a premobilization training plan.	1. Personnel on hand. 2. Organization exists. 3. Design and development procedures are established. 4. No significant increase in cost to produce. 5. Can be accomplished in near term. 6. Allows retention of valid/reliable procedures/materials. 7. Equipment, facilities and target audience for validation are readily available. 8. Provides opportunity to incorporate new training methods and techniques. 9. Allows for design and development for new doctrine, equipment, devices and organization. 10. Increases awareness of RC training readiness status. 11. Knowledge base present. 12. Eliminates RC complacency. 13. Materials readily available. 14. Provides opportunity to review and incorporate results of previous studies and efforts. 15. Allows for use of existing performance data. 16. Allows for continuous update of plan.	1. Risks development of RC training which does not optimize RC unit capability. 2. Suitable interface with RC units may be difficult to obtain and maintain.

TABLE 4-8. MISSION LEVEL METHODS AND MEANS ANALYSES - RESERVE TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
	(2) Supervises and provides guidance to a Reserve Component task force at the USAARMC which is charged to develop a premobilization training plan for Armor units.*	1. Same as 3-11-a(1)-3, 3-11-a(1)-5, 3-11-a(1)-6, 3-11-a(1)-7, 3-11-a(1)-8, 3-11-a(1)-9, 3-11-a(1)-10, 3-11-a(1)-13, 3-11-a(1)-14, and 3-11-a(1)-15 above.	1. Same as 3-11-a(1)-1 above. 2. Qualified task force personnel may be difficult to obtain for the time and qualification required. 3. Permits parochialism/bias. 4. Would not permit continual refinement of published plan.
3-11-c	See Table 4-2, Mission number 3-5-a.		
3-11-d	See Mission numbers 3-11-a above and Table 4-2, Mission numbers 3-5-h, 3-5-i, 3-5-j, 3-5-k, 3-5-l, and 3-5-o.		

TABLE 4-9. MISSION LEVEL METHODS AND MEANS ANALYSES- TRAINING FACILITY

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-12-a 3-12-b 3-12-c	See Table 4-1, Mission number 3-4-a' for all these missions.		

TABLE 4-10. MISSION LEVEL METHODS AND MEANS ANALYSES - OFFICER TRAINING

MISSION	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-13-a 3-13-b 3-13-c 3-13-d	See Table 4-2, Mission number 3-5-a for all missions.		

TABLE 4-11. MISSION LEVEL METHODS AND MEANS ANALYSES - INSTRUCTIONAL STAFF

MISSION NO.	METHODS/MEANS	ADVANTAGES	DISADVANTAGES
3-14-a	See Table 4-1, Mission number 3-4-a', 3-4-h, 3-4-l and 3-4-m.		
3-14-b			
3-14-c			

SECTION III - SUMMARY

4-4. SUMMARY. To bring this plan to its most comprehensive level, it is necessary to make methods and means analysis an ongoing function. Methods and means analysis at the mission level serves to answer whether it is feasible to pursue analyses beyond the mission level or whether constraints are so great that a mission should be discarded. None of the missions identified in Chapter 3 and further analyzed in this chapter are considered infeasible. Each of them can be achieved. Final feasibility - final cost-benefit - is, however, a spin-off of function and task analyses and their respective methods and means analyses. It is the responsibility of the users or implementers of this plan to determine that final feasibility.

CHAPTER 5 - THE CHALLENGE

SECTION I - INTRODUCTION

5-1. INTRODUCTION. This plan, like any other systematic training plan, has dealt with the feasible "whats" that are required to improve Armor training in the future. It has dealt with answering the following questions:

What are the Armor training needs?

What are the Armor training needs or training problems of highest priority?

What are the missions which must be achieved to meet the training needs, or solve highest priority and other priority problems?

What are the possible strategies and tools that can be used to achieve the required missions, and what are the advantages and disadvantages of each?

What alternative strategies and tools - what methods and means are considered best for achieving the missions?

This plan, therefore is only concerned with what is to be done to improve Armor training. It does not deal with the "how" or practical implementing decisions which must spring from this plan.

5-2. LIMITATIONS OF THE PLAN. This plan by no means deals with all the "whats" - all the analyses - that are required to make final implementing decisions for improving Armor training. As a result, this plan has certain limitations. No attempt is made to identify those limitations here, however, because they can be overcome by achieving the requirements necessary to implement this plan. Those rquirements are identified in the section which follows.

SECTION II - THE CHALLENGE

5-3. THE CHALLENGE. The most singular challenge arising from this plan is the challenge to implement. In order to implement this plan the following requirements will be met:

a. To attain and maintain the full responsiveness of this plan, Armor training needs will be constantly questioned, revised, updated, corrected or discarded. This will ensure that this plan remains viable and relevant and that it, and the Armor training materials, programs and other products which derive from it, are based upon current documented needs. The key here is the word constantly. Needs assessment will be an everyday occurrence. Periodic questioning, revising,

updating, correcting and discarding of documented needs or any other part of this plan is insufficient and will prohibit achievement of the improvement in Armor training for the future which this plan purports to achieve. Looking at this plan with the intent to revise it every six months to a year, will not get the job done.

b. The users and implementers of this plan will complete the successive analyses necessary to establish final feasibility for full implementation. This plan does not complete the analyses that must be achieved to put a training product in the hands of the Armor trainers. It does not provide such decisions as whether hands-on practice, interactive learning strategies, certain audio-visual media, self-pacing, group pacing, scaled ranges, trainers, devices, reduction of the use of ammunition, and fuel, or any other factor such as these, will be employed in specific training materials and programs which evolve from this plan. These decisions will be arrived at through the analyses necessary to achieve the training missions described in Chapter 3. These analyses and therefore the analyses required to systematically plan are shown in Figure 5-1 below.

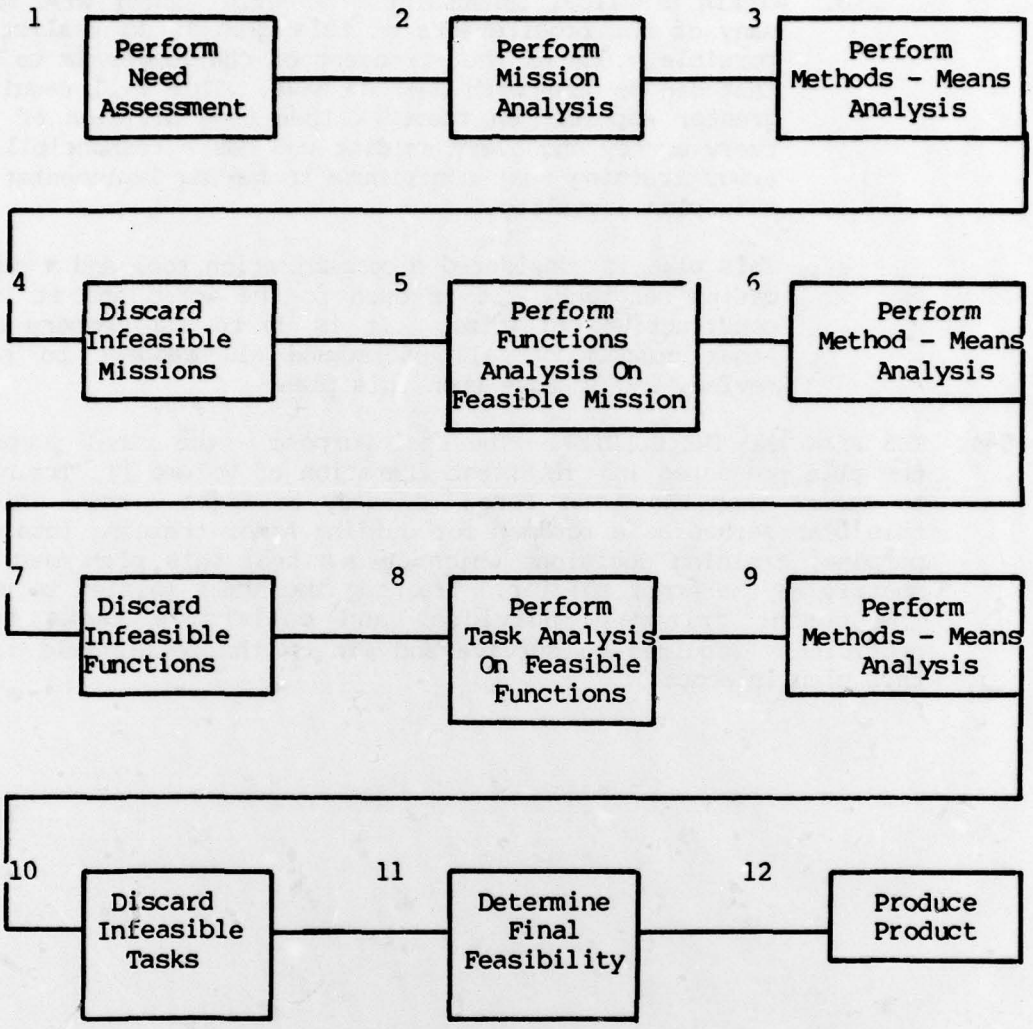

Figure 5-1.

To make this plan viable and to derive the products which this plan requires, the analysis which begin at block 5 in the figure above will be completed.

c. The extent to which each mission identified in the plan is completed or implemented will be constantly evaluated and the highest level of accountability for mission achievement will be maintained. This requires that orderly systematic planning, beginning with a data based needs assessment and progressing to production of training materials and programs, or other related products, becomes a way of life for Armor trainers.

d. Within practical constraints the Armor Center will meet as many of the requirements of this plan as is realistically possible. One of the strongest of challenges is to do all that can be done with what we have. This will require for greater emphasis on teamwork than upon division of labor. Every agency and every soldier who has a responsibility to Armor training must contribute to making implementation of this plan a reality.

e. This plan is considered a communication tool and a communication referent. It is open to the world and it invites constructive criticism. It is up to all members of the Armor community, all users and all readers to review, revise, and improve upon this plan.

5-4. THE PLAN AND THE SOLDIER. The real purpose - the final purpose of the plan presented in this first iteration of Volume II, Training is to assure that the Armor Force is ready to fight - now. Although this plan serves as a roadmap for guiding Armor training toward that purpose, training decisions which derive from this plan must focus sharply on the Armor soldier. Training the Armor soldier to perform the combat critical individual and collective tasks to the proficiency required to survive and win on the battlefield is what this plan is about.

APPENDIX A

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