ARMY PROGRAMS AND PROCUREMENT

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Army Participation Group

The Army Participation Group was organized in 1950 as a result of a joint Army-Navy Secretarial Agreement. By utilizing the resources of the Naval Training Device Center, we provide for the Army a specialized capability in the development of training devices, thus performing a mission in the training area similar to the mission of major subordinate commands in other areas.

Figure 1 shows three major commands under the Department of Army and the Army Participation Group organization in the chain of command.

The Combat Developments Command is charged with the responsibility of formulating and documenting current doctrine pertaining to the Army in the field and in anticipation of the nature of land warfare in the future, to determine the kind of forces and materiel needed and how these forces and materiel should be employed. Put more simply, it is to provide the Chief of Staff, U.S. Army, with the answers to the questions:

a. How should the Army fight?

b. How should it be equipped?

c. How should it be organized?

The Continental Army Command (CONARC) is charged with the training responsibility and organizing and equipping units and individual replacements for deployment overseas.

The Army Materiel Command (AMC):

a. Manages the wholesale materiel activities of the Army.

b. Provides supply and maintenance support to the Army and to other customers.

c. Assists in the formulation of the Army materiel program and implements the program.

Coming under the Army Materiel Command are the major Commodity Commands responsible for developing, testing procuring, supplying and maintaining materiel for the Army. The Army Participation Group maintains continuous liaison with the designated Commodity Commands during the development cycle of training devices. The Commodity Commands are:

Weapons Command
Electronics Command
Missile Command
Munitions Command
Test and Evaluation Command
Aviation Materiel Command
Tank-Automotive Command
Mobility Equipment Command

The Director of Personnel and Training at AMC is responsible for military and civilian personnel management and manpower training. The Army Participation Group is a field agency of the Director of Personnel and Training.

Figure 2 shows the organization of the Army Participation Group.

Colonel Vollendorff is the Commanding Officer, Army Participation Group and Associate Director, Army, at the Naval Training Device Center.

The Procurement Management and Support Office of the Army Participation Group:

a. Reviews procurement packages and monitors Army contracts.

b. Maintains inventory and distribution control of all non-type classified training devices in the field, stocks repair parts and maintains non-type classified devices in the field.

A non-type classified device is one that only limited procurement has been made and the items have not been introduced into the Army Supply System. The Procurement Management and Support Office has several field technicians located throughout the United States at major Training Aid Centers charged with the responsibility of maintaining non-type classified devices. There are approximately seven thousand non-type classified devices presently in the inventory.

A type classified device is normally one which has Army-wide application, is procured in a large quantity, is included in the Army Supply System and is supported by Army Personnel just as any piece of operational equipment.

The Army Plans and Programs Office is responsible for planning, programming and funding for Army training devices.

The Army Requirements Office:

a. Directs and administers the operations of the four branches shown.

b. Assigned to the branches are Project Officers representing the various branches of the service - - Artillery, Armor, Infantry, Aviation, Signal and Ordnance.

c. Project Officers are assigned to monitor and expedite as required, fulfillment of Army sponsored training device development and procurement projects.

Figure 3 shows the functions of the Army Participation Group:

a. Conduct R&D of training devices and training aids.

b. Provide technical assistance to Using Agencies, as required in preparation of Small Development Requirement (SDR). The SDR is the tool used to generate a requirement for a training device. It is prepared by the user or can be generated at any Command level and is submitted through channels to Department of Army for final approval. For example, an SDR prepared by the Armor School would be submitted through CONARC to Combat Development Command. Combat Development Command would prepare a draft proposed SDR and solicit comments from all interested agencies. The Army Participation Group would comment on the SDR as to feasibility and cost and lead time. After final review and approval by Combat Development Command, they prepare the proposed SDR and submit to Department of Army, Chief of Research and Development, for approval. Once approved by DA, it is turned over to AMC and in turn to the Army Partici pation Group for development. The SDR is a general statement of the requirement outlining what the device must simulate and what the performance characteristics should be. The Engineering personnel at the Center prepare technical specifications based on the SDR.

c. Initiate Training Device Development early in the design stage. The ideal situation is to develop the device along with the operational hardware and most desirable to deliver the trainer to the field in advance of release of operational hardware to insure

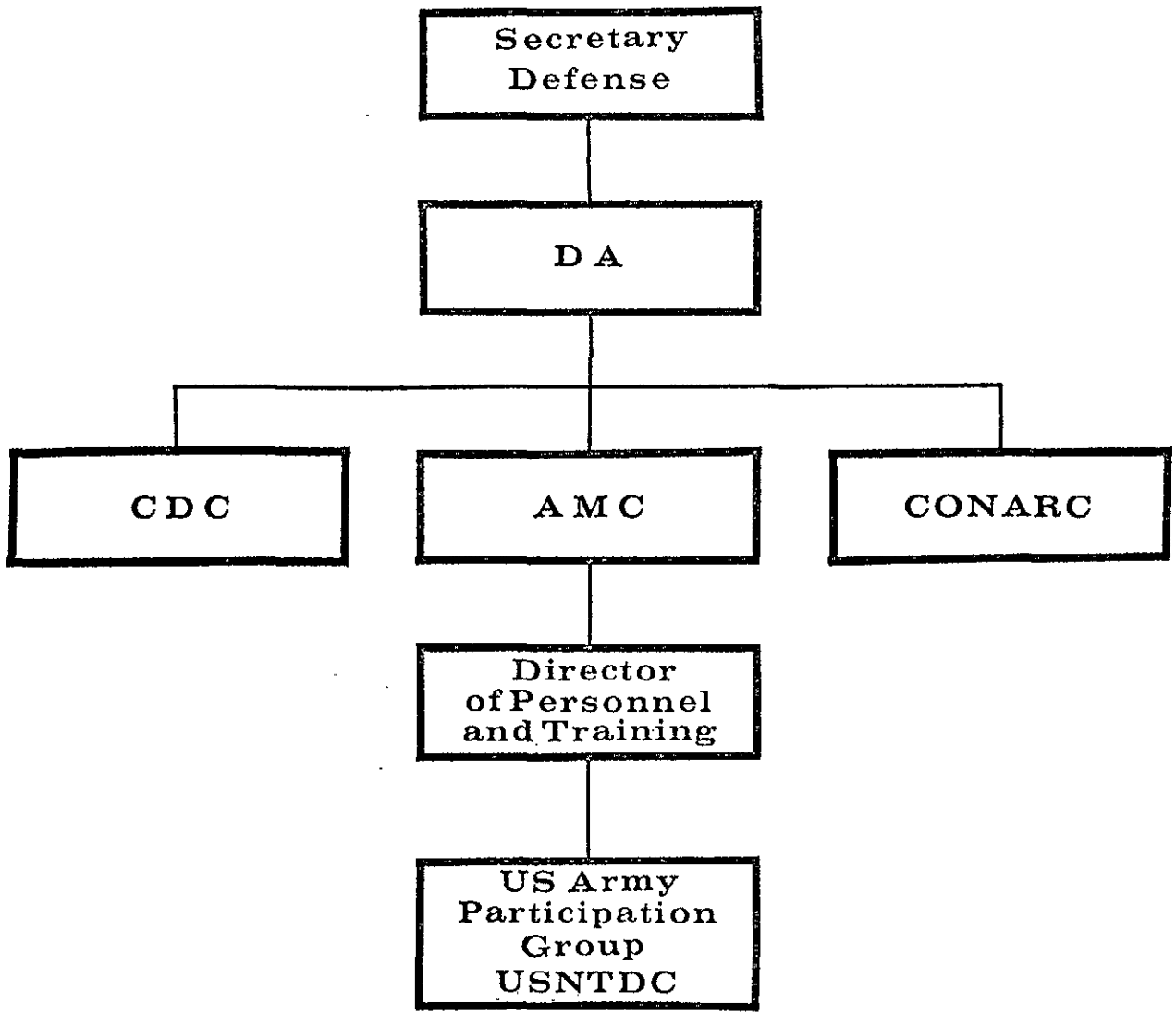

Figure 1. Army Participation Group Organization in the Chain of Command

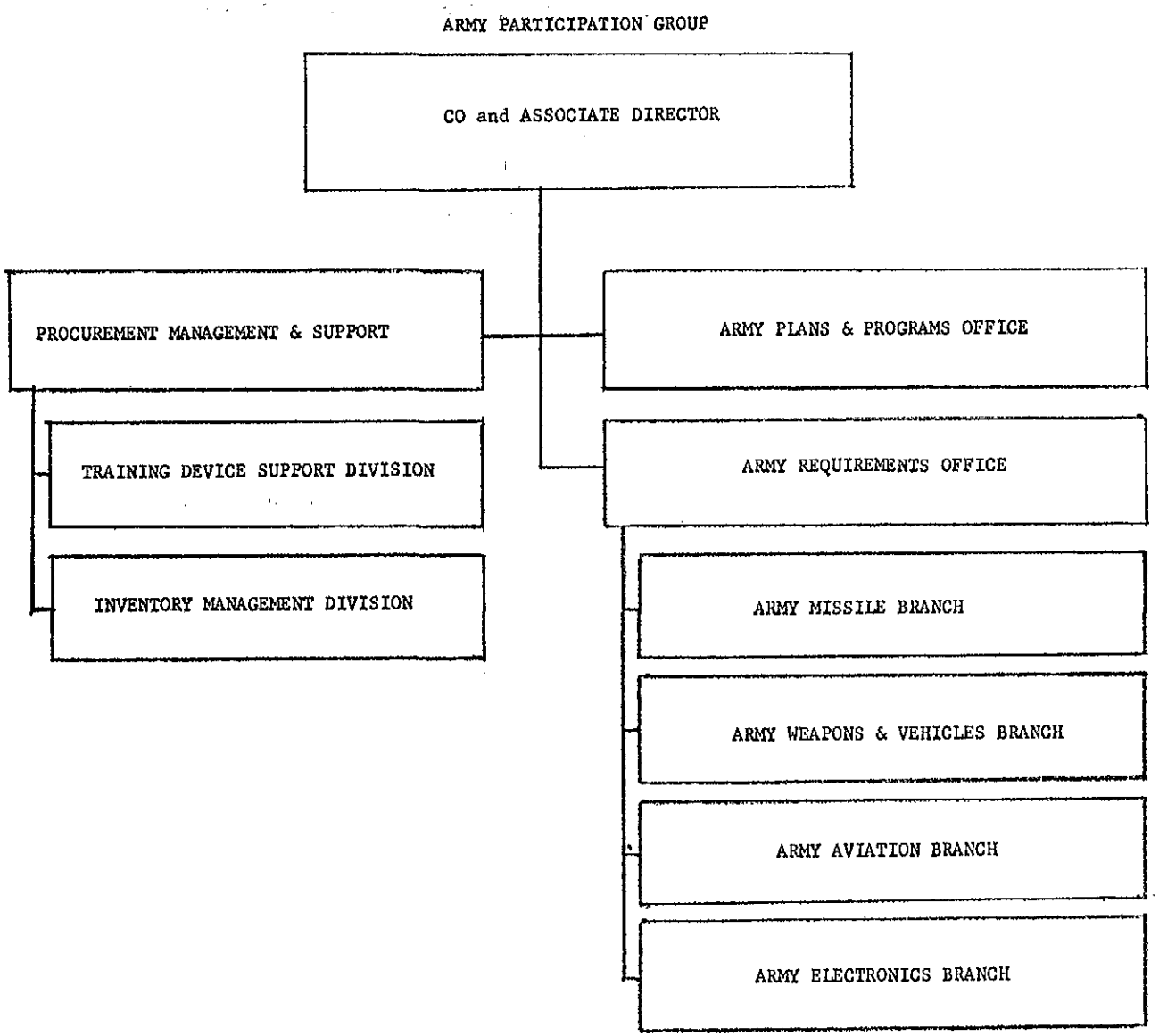

Figure 2. Organization of the Army Participation Group

FUNCTIONS OF THE
ARMY PARTICIPATION GROUP

1. Conduct R&D of Training Devices and Training Aids.
2. Provide Technical Assistance to Using Agencies, as required in preparing of SDR.
3. Initiate Training Device Development early in the design stage.
4. Establish and maintain liaison with appropriate agencies.
5. Assist U.S. Army Test and Evaluation Command in testing of training devices.
6. Insure, upon completion of development, that a suitable procurement package is available.
7. Prepare budget estimates.
8. Procure Nontype-Classified Items when directed by AMC.
9. Maintain master copies of drawings of Nontype Classified Devices.
10. Maintenance and Inventory Control of Nontype Classified Devices.
11. Procure Type Classified Items when directed by AMC.

Figure 3. Functions of Army Participation Group

trained personnel in the field.

d. Establish and maintain liaison with appropriate agencies. Our Project Officers maintain continuous liaison with the schools, Commodity Commands and training agencies.

e. Assist the Army Test and Evaluation Command in testing of training devices. All devices prior to becoming type classified for Army-wide use must undergo engineering test and service test conducted by the Test and Evaluation Command. For example an Infantry training device would normally be given service test by the Infantry Board at Fort Benning and engineering test would be conducted by Development and Proof Services at Aberdeen Proving Grounds.

f. Insure upon completion of development that a suitable procurement package is available. Army device developed for Army-wide use by Army Participation Group is normally turned over to a Commodity Command after engineering test and service test for type classification action and procurement. We are required to turn an adequate technical data package over to the Commodity Command to permit competitive procurement.

g. Prepare budget estimates.

h. Procure non-type classified items when directed by AMC.

i. Maintain master copies of drawings of non-type classified devices.

j. Maintenance and inventory control of non-type classified devices.

k. Procure type classified items when directed by AMC.

To give you a better understanding of the types of training devices which the Army is interested in, the below lists show types of Army training devices by Branch.

a. Aviation Branch

Basic Instrument Trainers

Aircraft Maintenance Trainers

Helicopter Trainers

Fixed Wing Trainers

Ejection Seat Trainers

Air Gunnery Ranges

The need for training devices in the Aviation field is obvious. In that there is no room for error in flying, by using good training devices we provide a safe environment for training, we save wear and tear on operational equipment, and we have a system that is available 24 hours a day. The cost of maintaining aircraft in the air for training will easily neutralize the cost of the device.

b. Artillery Branch

Rocket Handling and Checkout Trainers

Missile Handling and Checkout Trainers

Warhead Trainers

Subcaliber Devices

Artillery Observer Trainers

Fire Control Simulators

The assembly, checkout and handling of Artillery rockets, missiles and warheads require a great deal of training and teamwork. Our trainers which are similar in external dimension, weight and configuration as the operational equipment enable our artillery units to maintain a high state of readiness and save wear and tear on operational equipment. Artillery observer trainers enable our observers to maintain proficiency in adjustment of fire in the classroom.

c. Infantry Branch

Working Models of Weapons

Animated Transparencies of Weapons

Target Systems

Small Arms Simulators

Artillery, Demolition Simulators

Subcaliber Devices

Hit Indicator System

Target Material

Conduct of Fire Trainers

Working models of weapons, normally 2 : 1 scale, effectively improve our training in teaching nomenclature and functioning of weapon systems. Remotely controlled target systems which fall down when hit provide an excellent training tool for the Infantry soldier. Devices which simulate the sound of enemy small arms fire and artillery fire add a great deal of realism to the training situation. Hit Indicator Systems are designed to simulate the firing of operational weapon systems such as the rifle and enable Infantry units to conduct opposing forces exercises. Such a device will reduce the need for training ammunition, reduce the need for umpires, eliminate the need for large areas of real estate for impact areas, and provide an excellent means for determining the proficiency of a unit.

d. General

Map Reading Trainers

First Aid Training Devices

Tactics Trainers

CBR Trainers

In the General Category we have listed some types of trainers which are applicable to all units and branches.

e. Armor Branch

Tank Turret Trainers

Maintenance Trainers

Target Systems

Conduct of Fire Trainers

Hit Indicator Trainers

Tank Gunfire Simulators

Subcaliber Devices

Armor Leader Trainer

Tank Driver Trainers

Our Tank Turret Trainers, Maintenance Trainers and Conduct of Fire Trainers enable our tank crews to perform gun drill, maintain proficiency in firing and learn proper maintenance procedures. Firing simulators eliminate the need for large impact areas and provide a great savings in not firing live ammunition. Our Tank Gunfire Simulators and Hit Indicator Devices enable tank units to realistically conduct opposing forces exercises.

f. Electronics Communications

Computer Demonstrators

Switchboard Operator Trainers

Radar Trainers

Radiac Survey Trainers

Mortar Locating Radar Target Simulators

Training devices which can simulate flying aircraft to our air defense radar operators and simulate firing of mortar or artillery ammunition to our mortar locating radar operators,provide an excellent tool which saves a great deal of money and enables our operators to remain proficient.

The list of types of training devices is certainly not all inclusive. We are interested in any training device which will improve the effectiveness of our training programs and enable our trained personnel and units to remain proficient. Good training devices can save time and money and in some cases save lives and contribute to the ultimate goal of maintaining a combat ready force. As time goes on, the equipment used in the Army becomes increasingly complex and costly. Because of this the requirements for training devices will increase to overcome the inherent cost and risk of utilizing operational equipment in the training situation. The problem is twofold; first, that of attaining proficiency, and second, that of maintaining a constant state of readiness. The trained soldier is the key to success in battle, regardless of the complexity or efficiency of the machine he is required to operate. The training situation must appear real, the trainee must be motivated, and above all, the elements must be present that will permit transfer of learning. These are the requirements the training device is designed to fulfill.

Our present workload here at the Center involves development of training devices for missile systems, aircraft, tanks, and weapon systems. Last year the Army Group budget was in excess of $11,000,000. Looking into the future, you can anticipate training device requirements for our new generation of weapon systems, such as Main Battle Tank 1970, Advanced Aerial Fire Support System, and new Air Defense and Anti-tank Missile Systems.

The Army Group, recognizing the wealth of experience and R&D facilities provided by the Navy and our close working relationship with the Navy and industry, are confident that we can continue to satisfy the needs of the Army in the Training Device area as we have in the past.

PREDICTION OF COST AND LEAD TIME

Mr. G. V. Amico
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The task of looking into the future and predicting or forecasting always has some element of risk or unknown. Reducing the risk element to a manageable tolerance requires a positive and concerted effort on the part of the estimator. The crystal ball cannot be given credence in the estimating process. How then do you take the element of risk out of estimating?

Today I would like to develop the techniques which are employed in preparing budget cost and lead time estimates within NTDC and how these techniques can also be applied to contractor cost estimating.

The development of sound techniques is more important today because of the advanced type of incentive contracting and the high risk associated with poor estimating. The older type cost contracts condoned poor estimating both with respect to cost and time. Figures of 350 percent overrun in cost and 150 percent overrun in time are reported as DOD averages. The key to sound estimating requires two basic conditions: first, that there be a complete and thorough understanding of all elements of the project. And second, that the project consist of development within the current state of the art, i.e., that significant advancement in the state of the art or invention is not a significant element of the project.

Before it is possible for anyone to estimate the cost or lead time on a project, it is essential that he have a thorough understanding of the requirement or the intended use of the equipment. It is only placing one's self in the shoes of the user that the various elements of the project can be realistically evaluated and balanced. The tactical environment that is to be simulated should be recognized as highly complex, and not susceptible to a completly rigorous mathematical analysis. But one must know its complexities and anomalies in order to consider the training equipment design features required in a particular training device. The tactical environment consists of three basic elements: own ship (aircraft, surface ship, submarine or tank), the media (ocean, air, beach or terrain) and the threat or target (fixed, moving). In a tactical trainer the entire simulation problem can be stated in mathematical terms (Math Model). If the development of the math model is to be valid, it must be based on a rigorous statement of the physical phenomenon of the tactical environment. The meaningful