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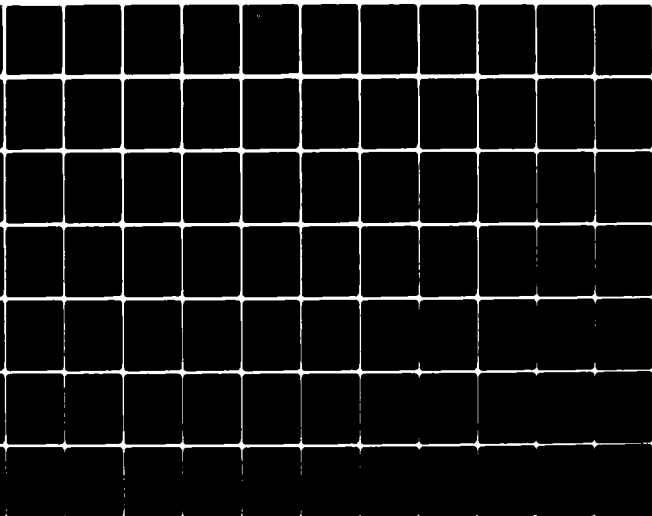
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STUDY REPORT
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IMPLEMENTATION OF CHANGE (IC)

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REQUIREMENTS DIRECTORATE

US ARMY CONCEPTS ANALYSIS AGENCY

8120 WOODMONT AVENUE

BETHESDA, MARYLAND 20014

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Commander
US Army Concepts Analysis Agency
ATTN: Director of Requirements
8120 Woodmont Avenue
Bethesda, MD 20014

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The current system that is used to generate TOE changes and apply them to the force structure is described in Chapter 3. Chapter 4 discusses alternative systems that have been formulated and analyzed. Prescriptive measures that appear to have the potential of improving certain management procedures are presented in Chapter 5. The final chapter presents the major observations of the study team pertaining to the implementation of organizational changes into the US Army force structure.

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IMPLEMENTATION OF CHANGE
(IC)

June 1980

Prepared by

Requirements Directorate

US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20014



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
WASHINGTON, D.C. 20310

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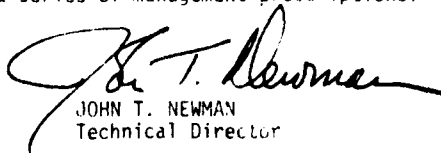
26 June 1980

SUBJECT: Implementation of Change Study

Deputy Chief of Staff for
Operations and Plans
Department of the Army
ATTN: DAMO-FD
Washington, DC 20310

1. Reference letter, DAMO-FD, 17 Sep 79, SAB. That letter directed the US Army Concepts Analysis Agency (CAA) to conduct a study of the Army procedures for directing, programing, and implementing organizational changes to tactical units.
2. Attached is the final report that documents our analysis of Army management systems for promulgating TOE changes, allocating resources to effect the changes, and incorporating the changes in the force structure. This study report discusses the current systems; suggests seven alternative procedures; and proposes an evaluation technique to quantify the benefits and costs of each alternative. Application of this technique by the study team indicated that two of the alternatives appear worthy of further consideration:
 - a. Modify the current system so that changes in requirements are entered into authorization documents within six months.
 - b. Revise the system so that change actions are coordinated with force structure management actions prior to publication.
3. Certain measures can be taken immediately to improve the operation of those processes that change and provide resources for tactical units. These measures are presented as a series of management prescriptions.

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JOHN T. NEWMAN
Technical Director

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IMPLEMENTATION OF CHANGE (IC)

SUMMARY

1. PURPOSE. The purpose of the study as stated in the 17 September 1979 directive (Appendix B) is to:

- a. Analyze the processes used to control organizational changes to tactical units.
- b. Suggest improvements and prescriptive measures that will synchronize the changes with the resource allocation processes.

2. BACKGROUND

a. The organizational configuration of each US Army tactical unit is based on a document called the Modification Table of Organization and Equipment (MTOE). The MTOE for each unit specifies the personnel and equipment that a unit needs to perform its combat mission and the personnel and equipment which it is currently authorized to have on hand. The configuration of these MTOE is based on a standardized requirements document prepared for each type organization (e.g., mechanized infantry battalion, tank battalion) called the Table of Organization and Equipment (TOE). The TOE identifies the mission, capabilities, and organizational structure for that particular type unit. It further serves as the standard on which MTOEs are based. Changes to TOEs are published semiannually as a product of the combat development process. These changes must be applied to the appropriate MTOEs to insure that the configuration of actual Army units reflects the latest doctrinal and equipment developments. The Planning, Programming and Budgeting System (PPBS) must react to these changes to unit MTOEs by providing the resources necessary implement those changes in operational units.

b. The Implementation of Change (IC) Study was initiated as a result of concern that the processes by which changes to TOEs become changes to MTOEs are not synchronized effectively with the PPBS to generate the resources needed. The TOE is linked to the Army's resource allocation process, the PPBS, through its relationship to the MTOE. The TOE changes are promulgated twice a year to the Major Army Commands (MACOMs) by a document called the Consolidated Change Table (CCT). Any change to the resource levels specified by the TOE should, as a minimum, be reflected as a change to the MTOE resource levels needed to perform the unit's combat mission. To the extent that available MACOM resources (personnel, equipment, and dollars) allow, these changes may also

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be reflected as changes to the resource levels that the unit is currently authorized. Inability to provide resources at the level required for combat results in a decreased readiness posture of the affected units. While it is often necessary to make a conscious decision to accept a decreased readiness posture due to increased requirements and fixed levels of resources, the situation is exacerbated by the lack of an effective management system for synchronizing TOE changes with MTOE changes and the PPBS.

c. The MACOMs frequently defer the application of TOE changes to MTOE, selecting for implementation only those changes which are affordable within assigned resource levels. Since there is no guidance as to the priority of changes being published, MACOMs select from the total number of changes based on their own evaluation of importance. This procedure has an adverse impact on HQDA policy to standardize similar type units based on the TOE. Selective deferral of the application of TOE changes to the MTOE due to a lack of resources results in a growing deviation between the TOE and the MTOE and leads to the "hollow Army" referred to by General E. C. Meyer, Army Chief of Staff, in his remarks to the Congress on 29 May 1980.

d. The lack of synchronization between TOE, MTOE, and the PPBS, together with the high volume of TOE changes being published for implementation, was brought to the attention of HQDA by the commanders of DARCOM and FORSCOM late in 1978. As a result, the ODCSOPS tasked the US Army Concepts Analysis Agency (CAA) to conduct the Implementation of Change Study.

3. SCOPE. This study places analytic emphasis on the causes of TOE changes, the MACOM response to the promulgation of those changes, and resource programming and distribution that result from the changes. The IC Study consisted of an analysis of HQDA and MACOM policies, regulations, procedures, and automated systems involved in the review, approval, and resourcing of changes to organizational requirements. While the processes were studied from HQDA to unit level, the analysis focused on HQDA and MACOM actions.

4. APPROACH. Three key phases of the current system for integrating requirements changes into the force structure were identified. The three phases and key elements of each were defined in detail through fact finding visits to HQDA and MACOMs and a literature search of applicable documents. Descriptive models of the processes and their interrelationships were then constructed using automated techniques. These descriptive models were analyzed, in conjunction with personal interviews, to assess the impact of the problem on various organizations, the sufficiency of relationships between processes, the efficiency of the system for resourcing TOE changes, and the adequacy of time phasing. The three phases are:

a. Development through promulgation of TOE changes. The key elements analyzed in this phase of the system were:

- (1) Types and sources of change
- (2) Review and approval processes
- (3) Promulgation of changes

b. MACOM response to the promulgation of TOE changes. Key elements identified and analyzed in this phase were:

- (1) Integration of TOE changes with other force structure actions
- (2) MACOM analysis of costs and affordability
- (3) MACOM implementation procedures
- (4) Requests for additional resources to implement TOE changes

c. Resource programing, procurement, and distribution. Key elements identified and analyzed in this phase were:

- (1) HQDA resource programing activities in response to MACOM requests for additional resources
- (2) The Structure and Composition System (SACS)
- (3) Personnel and equipment procurement and distribution activities

5. PROBLEMS. The analysis of the present TOE change process confirms the basic problem outlined in the study directive. The Army presently has no effective management system for controlling the implementation of approved TOE changes into the force structure. A summary of problems inherent in the current system is shown below. The degree to which these problems are alleviated become key elements in the evaluation of alternatives to the current system.

a. TOE changes are approved on an individual basis. As a result, the aggregate semiannual change caused by a CCT is not synchronized with force structure management.

b. The CCT represents a large volume of change to the Army.

c. Full affordability of the CCT is not determined at any time.

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d. Each MACOM determines how they will implement TOE changes; standardization of like units is not attained.

e. Valid wartime requirements are not incorporated fully in MTOE.

f. There is a built-in divergence between the TOE and MTOE. Undocumented requirements accumulate, and the SACS (which provides the information to drive the personnel and equipment acquisition processes) does not reflect all valid requirements.

g. Readiness is not reported against the intended standard.

6. ALTERNATIVES. The analysis of the current system provided a detailed understanding of the processes, their interrelationships, and the time-phasing of key events. Weaknesses, inefficiencies, and other problem areas were identified and served as the basis for development of alternatives. Eight alternatives were developed, including retention of the current system without change. These alternatives are based on the modification of the TOE change system to improve the time-phasing of events, data flow between processes, and relationships between processes. The eight alternatives considered are listed in Table 1. Chapter 4 discusses the alternatives in detail.

Table 1. Alternatives

-
1. Current system - no change
 2. Require that TOE changes be documented as requirements in the MTOE within 6 months of publication
 3. Document TOE changes within 6 months plus change readiness standards to encourage more accurate reporting
 4. Add a third column to the MTOE (Required for Combat, Currently Required, and Authorized)
 5. Compute acquisition requirements from SACS products based on TOE rather than MTOE
 6. Approve only affordable TOE changes
 7. Coordinate the review and approval of TOE changes with other force structuring decisions at HQDA
 8. Coordinate approval of TOE changes with force structuring plus add third column to the MTOE as in Alternative 4
-

7. EVALUATION OF ALTERNATIVES (SUMMARY)

a. Prior to selecting a preferred alternative, the benefits that each provides, together with a measure of the costs incurred by implementing that alternative, should be evaluated. Investigation of the current system led to the identification of the 11 benefits and costs for evaluating alternatives which are shown in Table 2. These benefits and costs are discussed in detail in Chapter 4.

Table 2. Benefits and Costs

Benefits
Timely identification of resource and readiness impacts
Identification of all minimum essential wartime requirements in TOE and in MTOE
Reduction of volume of change/turbulence
Enhancement of MTOE standardization
Synchronization of TOE change management with force structure management
Costs
Difficulty of implementation
Impact on HQDA Staff workload
Impact on MACOM workload
Impact on MACOM flexibility
Impact on other management systems

b. An evaluation of the eight alternatives was conducted in accordance with the study directive. This evaluation revealed that two of the alternatives are especially deserving of further consideration by the study sponsor. These are Alternatives 2 and 7. Other alternatives do not appear to provide as much benefit as these, or do so only at higher cost.

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c. Key elements of Alternatives 2 and 7 are summarized in Tables 3 and 4, respectively.

Table 3. Alternative 2, Document Requirements Changes Within 6 Months

Intent: Make current systems function as intended

- Rescind the HQDA message which removed the requirement to implement changes within six months of promulgation
 - Revise AR 310-31/AR 310-49 to require that:
 - TOE changes be documented in the MTOE required column within 6 months of promulgation
 - MTOE which result in an Authorized Level of Organization (ALO) change should be submitted as proponent proposed and be accompanied by a request for ALO change
 - HQDA must take one of three actions in response:
 - Approve the proposed MTOE and ALO change, or
 - Disapprove the MTOE and ALO change and provide resources to document the change as an authorization in the MTOE, or
 - Disapprove the MTOE and ALO change and direct the MACOM to provide resources from their own assets
-

Table 4. Alternative 7, Coordinate Management of TOE Changes with Force Structure Management

Intent: Apply to the TOE and publish in the CCT only those changes for which resource/ALO/readiness implications are acceptable.

- Proposed TOE changes must be:
 - Categorized (already resourced or unresourced)
 - Unresourced TOE changes must be:
 - Costed (resource/ALO/readiness implications)
 - Prioritized (three groups: to be resourced, required, marginal)
 - HQDA:
 - Allocates resources to the highest priority changes
 - Directs the highest priority changes be implemented in MTOE required and authorized columns
 - Directs other approved changes be implemented in the MTOE required column only
 - MTOE must be submitted within 6 months
 - Changes deemed marginal are returned to TRADOC for reconsideration
-

8. MANAGEMENT PRESCRIPTIONS. In developing and refining the description of current management processes and identifying the systemic problems listed above, four management actions were defined which could help improve the overall procedures. The four actions are prescriptive in nature and would apply more discipline to the system than is currently evident. The prescriptions are summarized below and discussed in detail in Chapter 5.

a. Maintain all TOE under which units are actually organized. This prescription addresses the fact that TRADOC updates only the latest version of the TOE, while over 10 percent of Active Army units are organized under earlier versions of the TOE.

b. Review all TOE change actions with equipment implications prior to publication of the change. This prescription will reduce the number of equipment errors promulgated in TOE changes by holding a thorough review by the Equipment Authorization Review Activity of DARCOM.

c. Develop automated procedures for simultaneous application of Manpower Authorization Criteria (MACRIT) to all TOE. This prescription addresses the problem of inconsistent scheduling of MACRIT application to TOE.

d. Measure the effective date of MTOEs from the close of The Army Authorization Documents System (TAADS) update window. This prescription synchronizes the effective date of an MTOE with MILPERCEN.

9. ESSENTIAL ELEMENTS OF ANALYSIS. The answers to the essential elements of analysis (EEA) specified in the study directive are summarized below. They are discussed in greater detail in Chapter 6.

a. What are the various types of TOE changes and the sources and approval authorities for those various types of TOE changes? When do they occur? This study identified two generic types of TOE changes: (1) substantive changes or those which create a change in resource levels and (2) nonsubstantive changes or those changes which do not create a change in resource levels. The bulk of the TOE changes result from the six processes discussed in Appendix E, i.e., MACRIT, Basis of Issue Plans (BOIP), doctrinal studies, scheduled review of TOE, changes to Supply Bulletin 700-20, and changes to Military Occupational Specialties (MOS). All substantive changes generated through these six processes which would result in increased resource levels are approved by the appropriate HQDA proponent. TOE changes occur on a continuous, day-to-day basis and are promulgated in April and October.

b. When and where are resources identified to support the various types of TOE changes? Each MACOM headquarters analyzes TOE changes to determine resource requirements. The MACOM then implements those changes for which it has resources. Requests for resources to implement the remaining unresourced change requirements are submitted to HQDA as Program Development Increment Packages (PDIP) during the next Program Objective Memorandum (POM) development cycle.

c. What is the DA system for resourcing TOE changes? Is it efficient? Where are the weak areas?

(1) The HQDA system for resourcing TOE changes is the PPBS POM development process. As discussed above, the current system requires that MACOMs perform the affordability analysis and submit PDIPs to HQDA requesting resources to implement unresourced change requirements. Historically, PDIPs requesting resources to implement TOE changes have not been funded; thus the changes directed by HQDA were not funded.

(2) This study identified six major weaknesses in the current system for resourcing TOE changes:

(a) TOE changes are approved on an individual basis. As a result, the aggregate semiannual change is not synchronized with force structure management.

(b) Full affordability of the CCT is not determined at any time.

(c) Each MACOM determines how TOE changes will be implemented, thus standardization of like units is not attained.

(d) Valid wartime requirements are not fully documented in MTOE.

(e) There is a built-in divergence between the TOE and MTOE. Undocumented requirements accumulate and the SACS does not reflect all valid requirements.

(f) Readiness is not reported against the intended standard.

d. How do the MACOM, with large quantities of MTOE, manage the implementation of TOE changes to foster DA policy of a standard force structure? Is that efficient? Do they have adequate management tools? The current system for implementation of TOE changes fails to support the HQDA goal of a standard force structure. The MACOMs, without HQDA guidance or resources, determine how much change is affordable, then implement those changes independent of other MACOMs. These independent actions cause dissimilarities between like type units assigned to different MACOMs. From an Army-wide standpoint, such a system is inefficient and MACOMs lack adequate management tools to foster standardization throughout the force structure.

e. What additional synchronization is required between the processes for generating TOE changes and those for managing resources? Who should be responsible?

(1) Presently, each substantive change is reviewed and approved by HQDA as an individual action. Management of the force structure and the processes for review and approval of TOE changes are neither integrated nor synchronized. To provide order and efficiency to the TOE change system, several of the alternatives presented in Chapter 4 propose that there should be synchronization of the TOE review and approval process, the force structure management process, and the costing, prioritization, and

affordability analysis of the collective TOE changes. The resource allocation process should be synchronized with the above processes in order to provide adequate implementation guidance to the MACOM at the same time that changes are directed.

(2) HQDA, ODCSOPS, should be responsible for synchronizing these processes to insure that resources are provided to implement the directed changes.

f. What impact would revised processes have on HQDA and MACOM ability to manage the force through the SACS? The impact of revised processes depends totally upon the revisions which constitute any improvement to the current system. A revised system to provide synchronization as discussed in the previous paragraph would enhance the force management capability. It would insure that individual changes are evaluated relative to the force structure and that resources/guidance are provided to insure early documentation. Early documentation would insure early entry of resource requirements into SACS for enhanced force management.

10. OBSERVATIONS. The major observations resulting from this study are presented in the following material:

a. The HQDA system for review and approval of changes to TOE considers each change action as an individual action. Approved change actions are forwarded to HQTRADOC where they are accumulated in automated files until April and October of each year when they are printed and published as the CCT. While each change action may be costed at HQDA, the CCT is not costed and full affordability of the CCT is not determined prior to promulgation. Each MACOM determines CCT affordability relative to that MACOM only; therefore, full affordability of the total CCT is never determined.

b. TOE changes may be initiated by a myriad of processes, agencies, and organizational levels. Most TOE changes are generated by the six processes discussed in Appendix E. None of those processes are synchronized with the Total Army Analysis (TAA) or other force structure management processes which also dictate changes to requirements.

c. The TOE changes accumulated over a 6-month period and published in a CCT represent a large volume of change. Chapter 3, paragraph 3-2, provides a detailed discussion of the volume of change occurring in selected TOE and CCT. Published changes may be:

- (1) Administrative - require no resource change
- (2) Resource reducing - delete resource requirements
- (3) Already resourced - increase personnel/equipment requirements for which resources have been programed through PPBS
- (4) Unresourced - increase personnel/equipment requirements but no resources are identified/provided to implement the change

d. Each MACOM conducts affordability analyses and determines how to implement the CCT actions in subordinate units. Administrative, resource reducing, and already resourced changes may be readily applied. Unresourced changes must, if implemented, be resourced from implemented reductions or other trade-offs. Some directed changes cannot be implemented because of limited resources. The goal of Army-wide standardization of like units is detrimentally impacted because the MACOMs, through independent analyses and decisions, choose to implement different changes.

e. Because resources are not available to implement changes, requirements are not documented in MTOE. Failure to document TOE changes in MTOE creates a divergence between the unit and the best wartime organization--the TOE on which the MTOE is modeled. Further, failure to document valid requirements in MTOE prevents their entry into the SACS and ultimately results in failure to procure resources.

f. The Unit Status Reporting System is designed to compare the in-being MTOE unit to the model TOE unit. The MTOE required column should reflect the minimum essential wartime requirement specified in the TOE; unit status is computed based on the MTOE required column. When TOE changes are not documented in the MTOE required column, unit status is reported against other than the intended standard and provides a false picture.

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IMPLEMENTATION OF CHANGE (IC)

CHAPTER 1

INTRODUCTION

1-1. STUDY PURPOSE. The Implementation of Change (IC) Study resulted from concern that the processes which cause change to the organizational configuration of US Army tactical units are not fully synchronized with the Planning, Programming, and Budgeting System (PPBS). A change in the actual configuration of a tactical unit is brought about by a change to that unit's authorization document--its Modification Table of Organization and Equipment (MTOE). Since the PPBS is the means for securing resources needed to effect changes in operational units, a lack of proper synchronization can delay or preclude realization of whatever benefits were to accrue as a result of the change. The purpose of the IC Study is to:

a. Analyze processes used to control organizational changes to tactical units.

b. Suggest improvements and prescriptive measures aimed at synchronizing change processes with resource allocation processes.

1-2. BACKGROUND. This study effort was requested by the Deputy Chief of Staff for Operations and Plans (DCSOPS) after correspondence relating to the problem had been received from the Commander of the US Army Materiel Development and Readiness Command (DARCOM) and the Commander of the US Army Forces Command (FORSCOM). That correspondence discussed some of the difficulties created by changes to MTOE.

a. In a 22 November 1978 letter to the DCSOPS, HQDA, the Commander, DARCOM, stated that "massive changes of MTOE's are creating serious problems in the effective management of our POMCUS stocks" and suggested "that the Department of the Army seek to attain maximum uniformity of MTOE's consistent with mission requirements and establish strong controls limiting changes and variations."

b. In an 11 December 1978 letter to Commander, DARCOM, the Commander, FORSCOM responded, "I wholeheartedly agree with you on the need for MTOE standardization, as the lack thereof, in our

view, results in many other management problems in addition to POMCUS." The letter went on to state that the vast majority of MTOE changes resulted from changes made to the basic requirements documents (TOE) on which the MTOE are modeled. A staff paper prepared at FORSCOM accompanied the letter and described the problems created at FORSCOM as a result of changes made to TOE. The major tenet of the paper was that the implementation of TOE changes in unit authorization documents created a demand for resources that had not been programmed. Thus, HQDA approval of changes to TOE without due consideration of the funds and personnel spaces required for MTOE implementation amounted to the assignment of a mission without provision of the required resources.

c. The DCSOPS, HQDA, replied to the correspondence in a letter to the Commander, FORSCOM, dated 29 March 1979. In part, he stated:

"In the past, implementation of TOE changes has been by DA directing that MACOMs reorganize units within six months after receipt. This required you to absorb the cost--which we assumed to be relatively minor. Major systems were handled through the planning, programing, and budgeting processes and, if approved, were re-sourced. However, what we considered to be minor often required more in resources than some 'major' systems. When the MACOMs began to complain, the six month requirement to reorganize units under new revised TOE was deleted from AR 310-31.

"It is obvious that we must go further and get expensive TOE changes into the PPBS also. Otherwise, a valid requirement may never be resourced. I am not convinced that we need a new system beyond the TAA/POM/PARR to do that. However, the Concepts Analysis Agency will study the problem to either reinforce the way we do business or develop an improved method."

d. The US Army Concepts Analysis Agency (CAA) was officially directed to study the problem in a tasking directive from the DCSOPS dated 17 September 1979 (Appendix B). The study directive provided for "establishment of a study group to analyze the processes used to control organizational changes to tactical units and to suggest improvements and prescriptive measures that will synchronize the changes with the resource allocation process." It established a study schedule requiring a final report by 30 June 1980.

1-3. THE PROBLEM. The various processes for generating changes to unit authorization documents--Modification Tables of Organization and Equipment (MTOE)--do not appear to be linked in effective or timely ways to the processes for generating and allocating resources. As will be discussed in Chapter 3, MTOE changes are caused when changes are made to Tables of Organization and Equipment (TOE). The IC study directive defines the problem as follows:

(1) The Army lacks an effective management system to synchronize the approval of TOE and MTOE changes, to secure resources for the changes, and to provide guidance for the timely, prioritized implementation of these changes to the force structure.

(2) Where assets are not readily available, MACOMs implement TOE changes by reallocating resources, generating concept plans to implement changes outside the current force structure program, or defer the implementation of changes to preclude lowering of unit status reports (C-rating). These command unique implementation processes have adverse impact on DA policy to standardize same type units in the force structure based on the latest doctrine and organization as reflected in approved TOE.

1-4. OBJECTIVES. The objectives of this study are to:

a. Analyze the HQDA processes for approving and resourcing TOE changes and MACOM processes for incorporating new TOE and TOE changes into the force structure.

b. Analyze how HQDA and MACOM use the TOE change guidance, the BOIP, and actual revised MTOE for programing and budgeting resources.

c. Analyze the use of the TOE (Level 1) and MTOE required and authorized columns in the requirements, distribution, and unit status reporting processes.

d. Identify the Army management processes for generating, reviewing, and approving MTOE changes and suggest improvements as appropriate.

e. Prescribe alternative measures to improve the synchronization of TOE change implementation and resource allocation processes.

f. Formulate candidate controls that would limit the frequency, quantity, and redundancy of TOE changes.

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1-5. SCOPE. This study required that a large number of major Army management processes be studied, understood, and documented to the degree that significant relationships could be defined and analyzed. The processes analyzed ranged from HQDA to unit level; however, the analysis was focused on processes at HQDA and MACOM level and their management information system (MIS) links. Detailed descriptions of the processes and their interrelationships were necessary for the development of a model suitable for analysis of the problem and evaluation of the impacts of alternative prescriptive measures. These descriptions are included in this report. They provide a useful reference for explaining the complex relationships between the processes involved in developing, approving, funding, and implementing changes to organizational requirements and authorizations.

1-6. ASSUMPTIONS. The following major assumptions were established:

- a. Administrative staffs cannot be augmented based on the results of this study; administrative staffing may be redistributed.

- b. The selective implementation of TOE changes can be scheduled over time, based on the availability of resources and MTOE unit priorities.

- c. The TOE, as approved by HQDA, accurately depicts the minimum essential wartime requirements for a unit organization.

1-7. ESSENTIAL ELEMENTS OF ANALYSIS (EEA). As stated in the tasking directive, the EEA are:

- a. What are the various types of TOE changes, and the sources and approval authorities for those various types of TOE changes? When do they occur?

- b. When and where are resources identified to support the various types of TOE changes?

- c. What is the DA system for resourcing TOE changes? Is it efficient? Where are the weak areas?

- d. How do the MACOM, with large quantities of MTOE, manage the implementation of TOE changes to foster DA policy of a standard force structure? Is that efficient? Do they have adequate management tools?

1-4

e. What additional synchronization is required between the processes for generating TOE changes and those for managing resources? Who should be responsible?

f. What impact would revised processes have on HQDA and MACOM ability to manage the force through the Structure and Composition System (SACS)?

1-8. CONTENTS OF THE REPORT. The following chapters, supported by appendices, present the results of this management study. Chapter 2 contains a discussion of how the study was conducted. The current system that is used to generate TOE changes and apply them to the force structure is described in Chapter 3. Chapter 4 discusses alternative systems that have been formulated and analyzed. Each of the objectives listed in paragraph 1-4 is addressed in Chapters 3 and 4. Prescriptive measures that appear to have the potential of improving certain management procedures are presented in Chapter 5. The final chapter presents the major observations of the study team pertaining to the implementation of organizational changes into the US Army force structure.

CHAPTER 2

STUDY METHODOLOGY

7

2-1. INTRODUCTION. This chapter describes the work flow and methodology of the IC study process. Figure 2-1 depicts the major procedures, analyses, and data flows from initiation of the study to publication of this study report.

2-2. EXECUTION OF THE STUDY METHODOLOGY. The study was conducted in five phases, as indicated in Figure 2-1. During the first phase the problem was defined, data were collected to define the current system and the methodology for the study was developed. Phase II efforts provided the computer assisted analytic tool for developing and analyzing the current system and its integral processes. The processes which create or cause changes to TOE were studied and entered into an automated data base during this time. The third phase consisted of analysis and description of the current Army processes that provide resources and entry of that data into the automated model. Toward the end of Phase III, sufficient insight into the current system and its inherent problems had been gained to allow development of candidate alternative systems. Knowledge of the current system also allowed development of candidate prescriptive measures designed to alleviate problems by the use of management actions. The fourth phase was devoted to analysis of alternatives and analysis of management prescriptions. To facilitate the analyses, descriptive models of the alternative systems were developed using the adopted computer assisted tool. From the analyses, alternative systems and management prescriptions were prepared for presentation in this study. To insure satisfactory completion of each of the first four phases, a formal in-process review (IPR) was conducted with representatives of the HQDA Staff agencies and major Army commands in attendance. These IPRs provided direction and continuing guidance to the study effort. The study report was finalized and published during Phase V.

a. Phase I. The purpose of the first phase was to explore the current processes and define the problem more completely. This was accomplished through literature search and interviews with personnel who were involved in the direction and implementation of changes. Problem definition was necessary to determine the precise nature of the problem and its impact on various organizations. The literature search, principally a study of related analytic efforts, correspondence relative to the problem, and Army regulations, was conducted to provide background information and a thorough understanding of the current system.

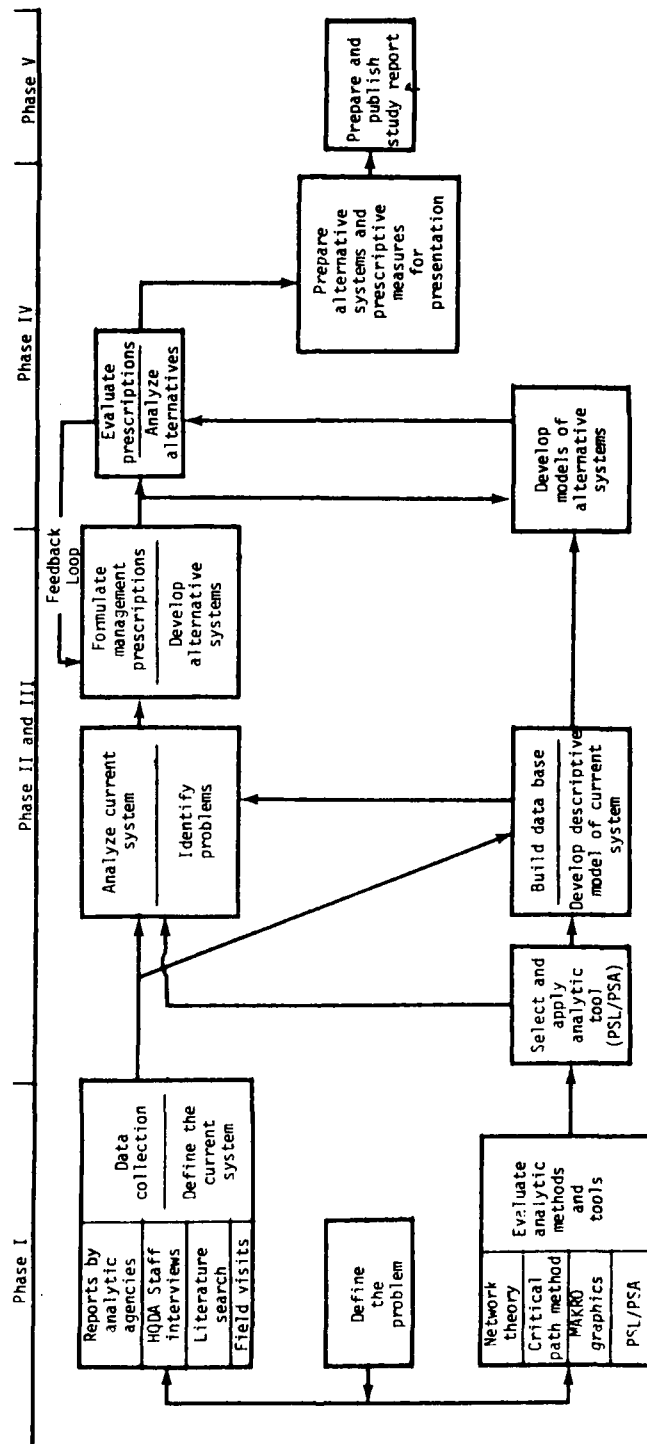


Figure 2-1. Study Methodology

Visits were made to FORSCOM, TRADOC, DARCOM, MILPERCEN, and numerous HQDA staff agencies during this phase of the study. Information gained during these visits provided basic knowledge to better understand the nature of the problem and the environment which surrounds the change process. With this understanding of the problem and processes, it was determined that network theory techniques would be appropriate for use in subsequent analyses. The data obtained during this phase of the study were retained for incorporation into network models for analysis. The considerable quantity of data and the number of processes associated with the change problem and its environment made it apparent that a computer based analytic process would be required. An initial evaluation of potentially suitable computer assisted models and methods was conducted. The objective of this review was to identify an automated means which would facilitate data handling and produce process diagrams and/or models.

b. Phase II. The objective of this phase was to describe the major processes which cause changes in TOE documents and analyze their interaction with one another.

(1) Six processes were identified as being the most instrumental in causing change to TOEs. This portion of the study was devoted to developing descriptions of those processes to include the purpose of the process, agencies with critical responsibilities relative to the processes, important milestones during the process, and network flow diagrams to represent the process. The networks were designed to indicate inputs, integral processes and interfaces, linkages to other processes, and the outputs or final products of each process. Describing the processes and developing the network models required detailed information about the processes. Obtaining that information entailed a continuation of the research and interviews conducted during Phase I. Personal interviews were conducted at TRADOC, DARCOM, MILPERCEN, and ODCSOPS, HQDA. On-site interviews were followed by almost daily telephone conversations with points of contact at various organizations and staff agencies. These follow-ups were essential for resolution of day-to-day questions concerning event sequences, relationships between processes, and clarification of the roles and responsibilities of various organizations and staff agencies involved in the processes.

(2) To better understand the volume and types of changes that occur in TOE and MTOE, a detailed study of changes which had occurred in seven TOE from November 1970 to October 1978 was conducted. Those seven TOE were randomly selected to represent the

three functions of combat, combat support, and combat service support. An analysis of the October 1979 CCT was also performed. The results of these studies were combined and analyzed to provide the necessary quantitative information concerning the volume and types of TOE changes that are promulgated each year. These studies were of value in categorizing TOE changes and identifying those change-producing processes which would require analysis in greater detail.

(3) Phase I of the study had provided detailed information concerning the problem of implementing changes in MTOE and information on the environment of the change process. During Phase II a detailed study of the six major processes which cause change was conducted. The change processes were analyzed using network models developed by an automated technique, Problem Statement Language/Program Statement Analyzer (PSL/PSA). PSL/PSA is described in paragraph 2-4. Those change producing processes were developed and analyzed within the change environment and the manner in which they affect each other was documented. These data were input to the automated data base by way of the PSL/PSA. The PSL/PSA provided descriptive network models of the current system processes which cause changes to occur in TOE and in MTOE. After thorough analysis of the models and the processes which cause change, it was possible to postulate alternatives which could potentially improve the current system.

c. Phase III. The purpose of the third phase of the study was to define and analyze those processes which interact together to procure and distribute resources in accordance with the computed authorizations and requirements. After these processes were developed and analyzed, it was necessary to integrate them with the processes which cause change. That integration allowed a determination of how the current system provides MTOE units with resources to implement the changes directed by HQDA.

(1) This phase was largely the analysis and description of various processes which provide the resources to implement changes in MTOE units. The HQDA process for computing and transforming MTOE authorizations and requirements into Army-wide authorizations and requirements was analyzed. Understanding of these processes was necessary because authorizations and requirements drive the procurement and distribution process which ultimately provide personnel and equipment resources to implement MTOE changes. To fully understand how resources are obtained to fill computed requirements, it was necessary to analyze the processes for procurement of personnel and equipment. That analysis was followed by

description and analysis of the processes for distributing resources.

(2) To insure that a complete system investigation had been conducted the Unit Status Reporting System was analyzed in conjunction with the procurement and distribution processes. The Unit Status Report provides feedback to HQDA on how well the system has provided the resources required by and authorized in MTOE units.

(3) The processes which provide resources for changes were entered into the data base, allowing PSL/PSA to produce a descriptive network model of the entire current change system. That model depicted the processes which cause change and their interaction with the processes which determine requirements and provide resources. Analysis of the current system model and modifications to that model using PSL/PSA facilitated further development of the alternative systems. Using the current system model and modifications thereto, initial analyses of the alternative systems were conducted. Through these analyses it was determined that some previously formulated alternatives were infeasible due to time-phasing difficulties and that others were impractical because they provided no apparent measurable improvement over the current system. Infeasible and impractical alternatives were eliminated from further consideration. New alternatives were formulated as analysis of the descriptive models and modifications to those models provided new, feasible ways to improve the system for implementing change.

d. Phase IV. The purpose of this phase was to refine and evaluate the alternatives. The analytic effort was facilitated by modifying the current system data base and descriptive model to create models of each alternative system being considered. The network models of alternative systems created by PSL/PSA were analyzed for system completeness and logical sequencing of work flow. They were also used for analysis of alternatives to insure that each was distinguishable and to assess the relative value of each alternative. Procedures, discussed in paragraph 2-4, were developed for evaluating each alternative versus all other stated alternatives. Each alternative was also analyzed to ascertain how it might be implemented and what potential impacts should be expected.

e. Phase V. The study report was finalized and published during this phase.

2-3. PRESENTATION OF MANAGEMENT PRESCRIPTIONS. During the study, various problems of the present system were identified. Prescriptive measures were recommended for alleviating these problems through management actions. A detailed discussion of this effort, to include the problems for which prescriptions were developed and the recommended prescriptive measures, is found in Chapter 5 of this report. The management prescriptions are discussed separately from the system alternatives presented in Chapter 4 because they address procedural inadequacies which are independent of the alternatives. Also, the management prescriptions relate to specific processes rather than the overall system for implementing changes.

2-4. ANALYTIC TOOLS AND METHODS

a. PSL/PSA. The IC Study's principal analytic tool was PSL/PSA. PSL/PSA is an automated technique which allows the user to develop descriptive models of the processes under study. The descriptive models are printed as network flow diagrams, and are capable of depicting relationships between processes and between data. They can also provide the flow of data into, between, and out of the interacting processes. As indicated earlier, the analysis of such relationships and flows was perceived as a major task of this study; PSL/PSA was the most suitable technique available to use in performing this analysis.

(1) The PSL/PSA technique has the following capabilities:

(a) Capability to describe information systems, whether manual or computerized, whether existing or proposed, regardless of application area.

(b) Ability to record such descriptions in a computerized data base.

(c) Ability to incrementally add to, modify, or delete from the description in the data base.

(d) Ability to produce "hard copy" documentation for use by the analyst or other user.

(2) The capability to describe systems in computer processible form results from the use of the system description language, PSL. The ability to record such a description in a data base, incrementally modify it, and on demand perform analysis and produce

reports comes from the software package called the Problem Statement Analyzer (PSA).^{*} The technique was primarily used in the study to store, organize, and display data in structured formats; and to develop a progressive refinement in system definition through automated production of descriptive network models. The technique was used in this way to facilitate current system definition and to identify problem areas. Further, it was used to develop, modify, and refine models of proposed alternative systems for analysis and presentation. Appendix G of this report provides a detailed discussion of PSL/PSA.

b. Consolidated Change Table (CCT) Cost Analysis. During the study, questions arose concerning dollar and personnel costs to implement changes to MTOE, as directed in published CCTs. Each CCT directs that all TOE changes made during the previous six months be implemented in MTOE units. As costing is necessary to determine affordability, and ultimately, whether or not directed changes can be accomplished, it was determined that the feasibility of a computerized routine for costing CCTs should be researched. This effort resulted in the development of a computer program which will determine aggregate costs. Assuming that all units are at TOE Level 1 and all previously directed changes have been implemented, the program provides, by unit, by command, the aggregate personnel additions and deletions, the value of all procurement funded equipment added and the value of that deleted, and the value of Operation and Maintenance, Army (OMA) funded equipment added and the value of that deleted. The program was used in the study to look at the resource implications of requirements changes resulting from a given CCT. This procedure is discussed in detail in Appendix G of this report.

c. Evaluation of Alternatives. The effort to develop feasible alternatives resulted in eight distinguishable alternative systems including the current system. An evaluation method was devised to compare the eight systems. The evaluation was performed by a manual technique which used an 88-cell matrix to compare each of the 8 alternatives with each of 11 evaluation factors. Upon completion of the matrix, sensitivity analyses were performed using a variety of weighting techniques. The weights and values were also

^{*}Teichroew, Daniel and Hershey, Ernest A., III., PSL/PSA: A Computer-Aided Technique for Structured Documentation and Analysis of Information Processing Systems, TUTORIAL: Automated Tools for Software Engineering, IEEE Computer Society and IEEE, Inc., Nov 79

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varied based on perceived probable organizational bias. An illustration of the evaluation process developed during this study is provided in Chapter 4.

2-5. QUALITY ASSURANCE. The major process for assuring the quality and reliability of this study was the conduct of frequent in-process reviews (IPR). IPRs were conducted at the completion of each of the first four phases of this study. Each IPR was attended by key personnel from the major organizations and agencies which cause or direct change; act to obtain or allocate resources; or implement changes in MTOE units. At each IPR, detailed briefings were presented to include:

- a. The research and analyses conducted during the most recent phase of the study.
- b. Network diagrams representing the operation and interaction of key processes which had been described and analyzed.
- c. Problems and potential problems related to the described processes.
- d. The work program and methodology for the succeeding phase of the study.

Active and open discussion during the IPRs assured that all pertinent processes had been defined accurately and analyzed correctly. Prior to each IPR the Concepts Analysis Agency convened a Technical Review Board to receive briefings and evaluate the interim study procedures and results. Study reliability was also enhanced by continuous coordination of interim study results with knowledgeable points of contact in HQDA staff agencies, MACOM, and operating agencies.

CHAPTER 3

THE CURRENT SYSTEM

3-1. ENVIRONMENT OF THE PROBLEM. The Implementation of Change (IC) Study resulted from concern that the processes which cause change to the organizational configuration of US Army tactical units are not fully synchronized with the Planning, Programing, and Budgeting System (PPBS). A change in the actual configuration of a tactical unit is brought about by a change to that unit's authorization document--its Modification Table of Organization and Equipment (MTOE). Since the PPBS is the means for securing resources needed to effect changes in operational units, a lack of proper synchronization can delay or preclude realization of whatever benefits were to accrue as a result of the change. The problem discussed in this report is complex in that it involves complicated interrelationships between major Army management processes used to define requirements, develop force structure, and allocate resources. To appreciate fully the nature of the problem and the events that caused this study to be conducted, it is useful to discuss briefly what a Table of Organization and Equipment (TOE) is, how an MTOE is related to a TOE, and how the MTOE is used in the resource allocation process.

a. Table of Organization and Equipment (TOE). The US Army force structure is comprised of a mix of type organizations such as armor battalions, mechanized infantry battalions, 155mm towed field artillery battalions, or infantry division engineer battalions. Each type organization has an associated requirements document called the TOE which identifies the standard mission, capability, and structure for that particular type organization. It also identifies the types and quantities of personnel and equipment that the unit requires to perform its mission. Personnel and equipment listings are provided in the TOE for different "levels" of organization. As discussed in paragraph 1-4 of Army Regulation (AR) 310-31, Level 1 of the TOE represents full personnel and equipment requirements; those assets which enable the unit to perform its mission in sustained combat. The regulation further specifies that Levels 2 and 3 provide balanced organizational structures reflecting reduced capabilities in terms of staying power in combat, or ability to perform given workloads. The TOE is a product of the combat development process; it provides the doctrinal standard or basis for the development of MTOE which are the authorization documents for specific tactical units. If a change is made to a TOE, all MTOE based on that TOE should change accordingly.

b. Modification Table of Organization and Equipment (MTOE). Each tactical unit in the Army force structure has an associated MTOE. Whereas the TOE identifies requirements for a type organization, e.g., an infantry battalion, an MTOE identifies requirements and authorizations for a particular organization, e.g., the 1/27 Infantry Battalion. Each MTOE has a required and an authorized column. The personnel and equipment that are needed for the unit to perform fully its combat mission are listed in the required column of its MTOE. The personnel and equipment that the unit is currently allowed to have on hand are listed in the authorized column. Because available assets, Army-wide, are less than the sum of all wartime requirements for the force structure, the authorized column of an MTOE frequently lists quantities that are less than those found in the required column. This is because total authorizations are based on total available assets.

c. Uses of MTOE. The MTOE, through inclusion in The Army Authorization Document System (TAADS), is used in a variety of ways to support the PPBS. The uses of the MTOE that are particularly significant to this study are: (1) to provide a basis for requisition and distribution of assets, (2) to project requirements for the purpose of asset acquisition; and (3) to determine the readiness posture of a unit.

(1) The MTOE provides a basis for unit requisition and distribution of personnel and equipment assets. As mentioned above, Level 1 of the TOE is the basic authority for inclusion of personnel and equipment in the required column of the MTOE. The Major Army Command (MACOM) with MTOE proponentcy determines authorized column entries based upon the latest resource allocation guidance from HQDA. The authorized column thus lists the personnel and equipment which HQDA is expected to provide and furnishes a unit with basic requisitioning authority. In processing requisitions, personnel and equipment managers compare unit authorization reports from TAADS to status reports that depict on-hand quantities for each force structure unit. Requisitions deemed valid are then continued through the personnel or logistic system to affect the necessary transfer. When a reduction in authorizations results in excess personnel or equipment on hand in the unit, a procedure similar to that described above is followed to effect redistribution. The relationship between TOE, MTOE, and the distribution process is depicted in Figure 3-1. As indicated, Level 1 of the TOE is directly related to the required column of the MTOE which acts as an upper bound for the MTOE authorized column. The MTOE authorized column provides the unit with requisitioning authority, and unit requisitions place demands on personnel and logistics systems and assets.

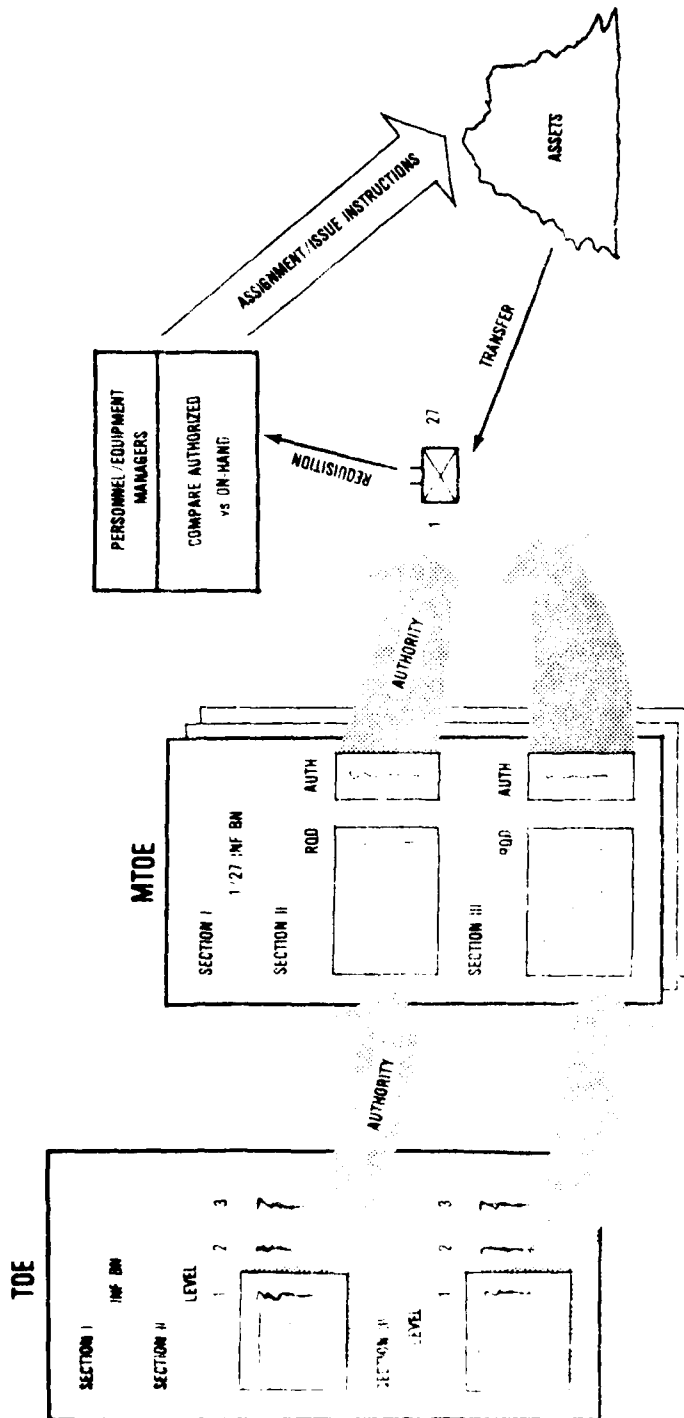


Figure 3-1. Relationship between TOE, MTOE, and Distribution Process

It should be recognized that a TOE change which results in an increase in requirements, if applied to the required and authorized columns of all MTOE documents based on that TOE, will result in requisitions from each unit of each MTOE for which the TOE is the standard. As an example, the TOE for the headquarters and headquarters company (HHC) of a mechanized infantry battalion is TOE 07046H020. A February 1980 extract from TAADS indicated there were 17 current MTOE documents for mechanized infantry battalions which included an HHC element based upon TOE 07046H020. Each of the 17 MTOE documents was applicable to specific mechanized infantry battalions in the force structure; the number of battalions per MTOE actually ranged from a low of 1 to a high of 20. There were a total of 104 battalions organized under the 17 MTOE. Organizationally, each battalion has one HHC. Therefore, there are a total of 104 units for which TOE 07046H020 is the organizational model. An incremental change, Δ , to that TOE creates 104 Δ demands for available assets when the change is applied to the required and authorized columns of applicable MTOE documents.

(2) Whereas the authorized column of the MTOE affects distribution of available assets, the required column is used in planning, programing, and budgeting for acquisition of future assets.

(a) Materiel requirements for equipping the force structure are computed and reported by the Logistical Structure and Composition System (LOGSACS). A principal input to LOGSACS is the TAADS file which contains all MTOE documents. Equipment requirements for the force structure are computed from the required columns of MTOE documents except where future plans or lack of MTOE documentation dictate use of other source data. The LOGSACS is the key input to PPBS processes which develop procurement programs for materiel. In general, a change in equipment requirements for a unit in the force structure is reflected initially in a change to the TOE for that type unit. The change is then applied to the required column of all MTOE for which that TOE is the standard. The revised MTOE enter TAADS and are used for LOGSACS computations. The LOGSACS results eventually impact upon procurement programs by affecting the Initial Issue Quantity (IIQ), the Authorized Acquisition Objective (AAO), and the Army Materiel Plan (AMP).^{*} Recalling the example of the HHC of a mechanized infantry battalion, the change to the TOE is translated into a change to each of 17 MTOE. The revised MTOE are entered into TAADS and

^{*}See Appendix D for definition of terms.

arrayed against the force structure as part of the LOGSACS computational process. LOGSACS computations sum the actual 104 Δ changes to force structure requirements. To the extent that resource constraints allow, the 104 Δ changes to requirements will be reflected in future procurement programs.

(b) Personnel requirements for manning the force structure are computed and reported by the Personnel Structure and Composition System (PERSACS). The PERSACS is similar to LOGSACS with regard to use of the MTOE as a computational source. Personnel requirements data detailed in PERSACS are used to support mobilization planning efforts and development of future manpower programs.

(3) The MTOE document also provides each organization in the force structure with a basis for reporting Unit Status (formerly Unit Readiness). The Unit Status Reporting System is described in AR 220-1 which states that a major objective of the system is to provide the Department of the Army with indicators that:

- (a) Identify problems which degrade unit status.
- (b) Assist the Department of the Army and intermediate commands to allocate resources.
- (c) Identify the differences between current personnel/equipment assets in units and full wartime requirements.
- (d) Determine Army-wide readiness conditions and trends.

An overall unit status for each organization is determined through somewhat involved personnel and equipment comparisons; MTOE authorized to MTOE required, on hand to MTOE required, operationally ready to MTOE required, etc. For the purpose of understanding this study report, the impact on unit status of a change in the ratio (MTOE authorized quantity)/(MTOE required quantity) is important. Basically, increasing MTOE requirements without increasing authorizations tends to reduce the ratio and lower the unit's status for reporting purposes. AR 220-1 describes how the various comparisons mentioned above should be made and used to determine an "overall" C-1, C-2, C-3, C-4, or C-5 status rating. These ratings reflect the degree to which the unit is ready to perform its combat mission; ascending numerical order reflects decreasing readiness posture. As mentioned previously, the Unit Status Reporting System is designed to serve as a control mechanism allowing HQDA and intermediate commanders to assess the adequacy of resources currently being provided to units. The resources provided to a unit affect the degree to which the authorized column of the MTOE matches the required column. This, in turn, has significant

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impact on the status of the unit. The Unit Status Report, in this way, provides information to the resource allocation process that is used to authorize asset distribution that will improve the readiness posture of the unit. This feedback process is depicted in Figure 3-2.

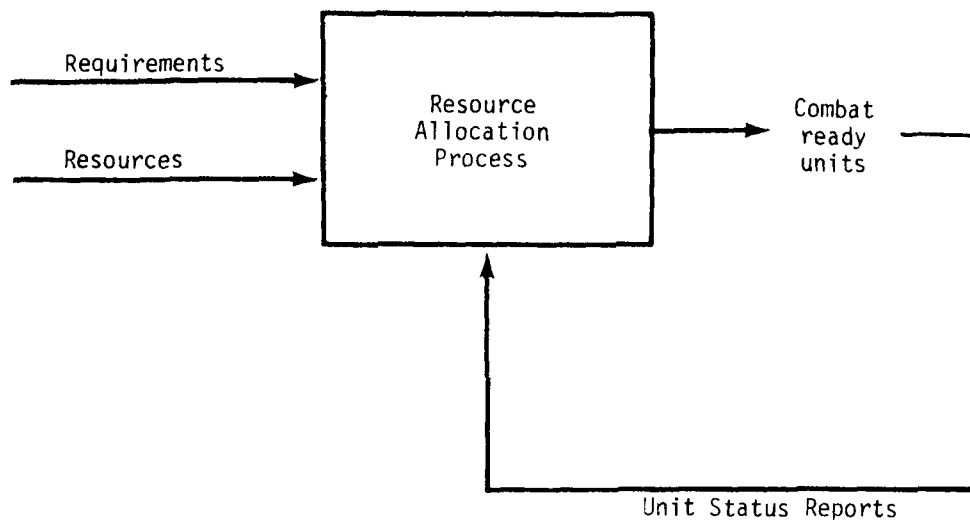


Figure 3-2. The Unit Status Report and the Resource Allocation Process

d. Recapitulation. The TOE is linked to the Army's resource allocation process through its relationship to the MTOE. Any change to resource levels in a TOE should, as a minimum, be reflected in changes to the required columns of related MTOE. To the extent that priorities for use of available resources allow, the TOE change may also be reflected in the authorized column of the MTOE. Changes to MTOE required amounts will result in changes to total requirements for equipping or manning the force structure as computed in SACS. The SACS outputs, through interaction with other PPBS processes, will cause changes to future manpower or materiel acquisition programs. Changes to MTOE authorized quantities will result in redistribution of available assets since the changes provide units with authority for requisition or turn-in

actions. Because the MTOE is the basis for determining the readiness status of a unit, TOE changes that result in MTOE changes can impact on unit status. The Unit Status Report, in turn, affects resource allocation which impacts upon asset distribution. In simplified fashion, the links between TOE and the resource allocation process are depicted in Figure 3-3. The TOE is a product of the Army's combat development process and provides a doctrinal standard for the MTOE. The MTOE required columns reflect TOE Level 1 quantities and, through entry into TAADS and SACS, impact upon acquisition programs. MTOE authorized columns provide force structure units with authority to place demands on personnel and logistic systems. Finally, the ratio of authorized to required quantities in the MTOE is significant in compiling Unit Status Reports that are designed to provide feedback on the adequacy of current resource authorizations.

3-2. DEVELOPMENT AND APPROVAL OF TOE CHANGES. Key to understanding the problem addressed in this report is an awareness of the types of TOE changes, the volume of change actions produced, and the methods by which they are approved and promulgated.

a. The Nature of Change

(1) The result of analyzing TOE changes and interviewing personnel at various commands and staff agencies indicates that TOE changes are generated by any of six processes.

(a) Application of manpower criteria (MACRIT) (See Annex I of Appendix E).

(b) Development of Basis of Issue Plans (BOIP) (see Annex II of Appendix E).

(c) Changes to doctrine (see Annex III of Appendix E).

(d) Scheduled review of TOEs (see Annex IV of Appendix E).

(e) Changes to SB 700-20 (see Annex V of Appendix E).

(f) Changes to MOS structure (MOS, grade, branch, and description) (see Annex VI of Appendix E).

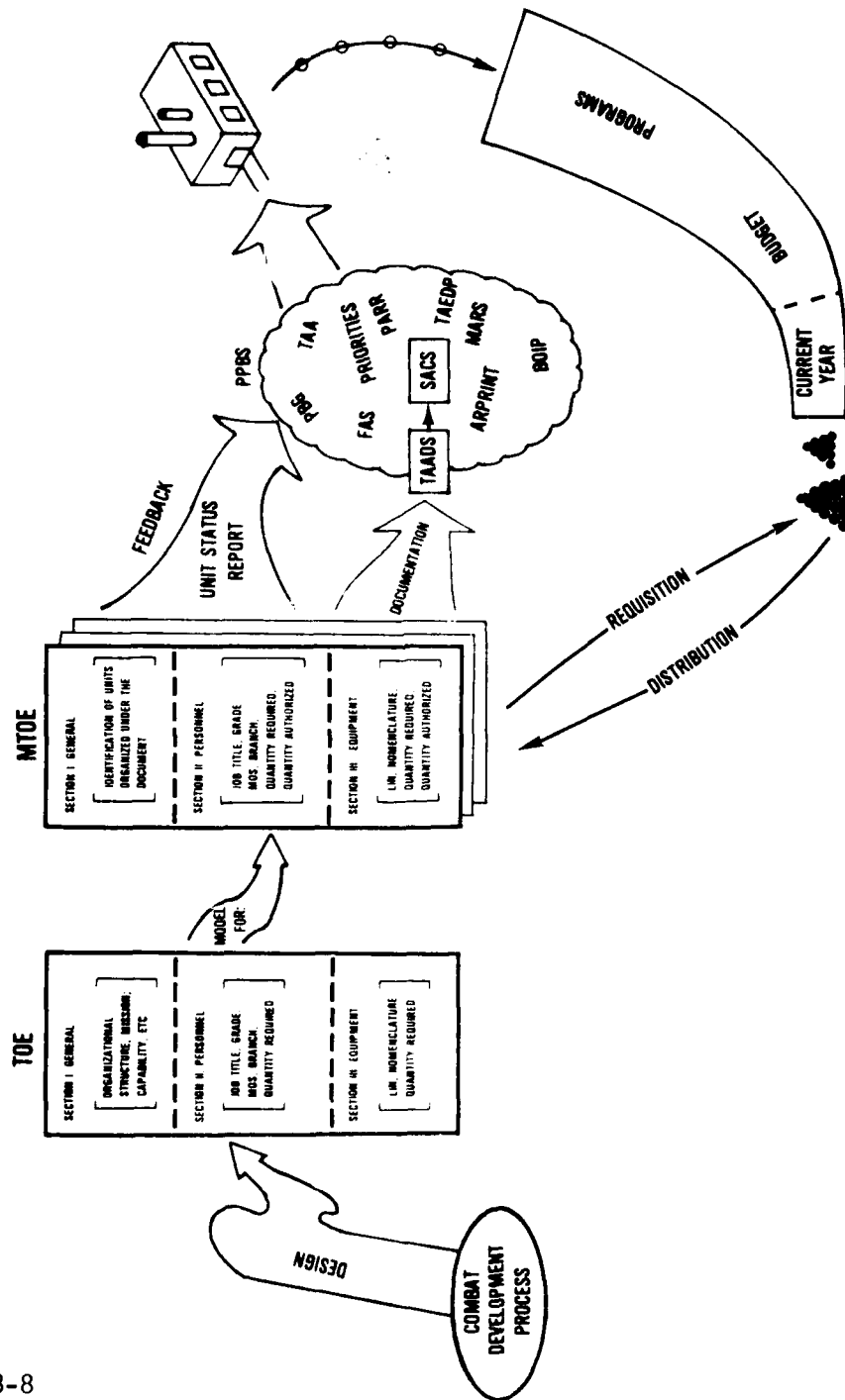


Figure 3-3. How the TOE Impacts Upon the Resource Allocation Process

(2) These six categories represent the sources of change to the requirements published in the TOE. The genesis of changes to TOE requirements can occur almost anywhere throughout the Army. They have resulted from studies conducted within HQDA, TRADOC, DARCOM, MILPERCEN, and elsewhere. MACRIT changes result from the need to update personnel requirements based on changes in workload, e.g., requirements for maintenance positions change whenever equipment changes dictate a revision in maintenance workload. BOIP changes result from the continuing process of equipment modernization. Doctrinal changes represent organizational modifications resulting from the many studies and improvements generated both within TRADOC and other Army agencies and commands. This source of change also includes HQDA directed improvements to TOE organizations. Scheduled reviews are conducted for each TOE every 3 years to insure that the organization is consistent with other changes. MOS and SB 700-20 changes result from modifications to personnel and materiel management systems. While there are other sources of change, they are infrequent and not as significant.

(3) Prior to examining the review, approval, and promulgation processes, it is important to understand the types of changes being generated and the volume of change being approved. The study team first selected seven TOEs and analyzed all changes applied during the period November 1970 to October 1978. The TOEs were selected randomly, but both combat and support units were included. TOEs analyzed were:

(a) 05-147, Engineer Company, Engineer Battalion (Mechanized/Armor Division).

(b) 06-366, Headquarters and Headquarters Battery, Field Artillery Battalion, 155mm, Self-Propelled.

(c) 06-367, Firing Battery, Field Artillery Battalion, 155mm, Self-Propelled.

(d) 07-047, Rifle Company, Infantry Battalion, Mechanized.

(e) 17-037, Tank Company, Tank Battalion, 105mm.

(f) 29-208, Maintenance Company, Rear, Direct Support.

(g) 55-084, Transportation Motor Transport Company (Mechanized Division).

(4) During that period of time, 18 change documents were applied to these TOE (four CCTs were published in 1972). The changes included such major actions as:

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(a) The Enlisted Personnel Management Study (EPMS), which changed the MOS structure for all enlisted spaces in every TOE (MOS change process).

(b) The Officer Personnel Management Study (OPMS), which changed the MOS structure for all officer spaces in every TOE (MOS change process).

(c) The Fire Support Team Concept (FIST), which affected fire direction functions in many TOEs (Doctrinal change process).

(d) The Special Analysis of Net Radios (SPANNER), which impacted on communications equipment in many TOEs (Doctrinal change process).

(e) The Consolidation of Administration at Battalion Level (CABLE), which reorganized administrative functions in battalion TOEs (Doctrinal change process).

(f) Numerous Basis of Issue Plans (BOIP), which impacted on many TOEs depending on the equipment being fielded (BOIP process).

(5) As a result of these and many other actions during the timeframe examined, there were 1,845 changes made to the personnel sections of the seven TOEs; an analysis shows the types of change distributed as shown in Table 3-1.

Table 3-1. Distribution of Personnel Changes
(seven selected TOE)

	Percent
Personnel lines added or deleted	10.8
Grade change	3.8
Level 1 strength change	7.2
Level 2 strength change	7.8
Level 3 strength change	7.7
Augmentation strength change	1.2
Cadre strength change	2.0
MOS change	26.6
Title change	14.6
Remarks change	16.1
Branch change	2.2

During the same timeframe 4,439 changes to the equipment sections of the seven TOEs were identified as shown in Table 3-2.

Table 3-2. Distribution of Equipment Changes
(seven selected TOE)

	Percent
Equipment lines added/deleted	41.1
Level 1 quantity change	9.4
Level 2 quantity change	10.6
Level 3 quantity change	10.6
Equipment Readiness Code (ERC) change	26.0
Description only change	0.7
Remarks change	1.6

It should be noted that there are 434 company level units organized under these seven TOEs in the Active Army alone. Thus, the 6,284 total changes for those seven TOEs generated a large volume of change to MTOE units.

(6) TOE changes which have been approved by HQDA are accumulated for 6 months and published by TRADOC in a CCT. To get another perspective of change, the study team analyzed the volume of change impacting upon the entire Army from publication of a single CCT. CCT 300-65 was published in October 1978 and changed 647 out of 827 TOE. This corresponds to a total of 19,000 lines (both personnel and equipment) being affected. This CCT, if fully implemented, would have resulted in a net personnel strength increase to FORSCOM of about 3,400 spaces. The volume of change represented in CCT 300-65 is not unusual. CCT 300-64 affected 655 TOE with a total of 30,000 lines changed. CCT 300-63 affected 709 TOE with a total of 88,000 lines changed. Similarly, since CCT are published twice annually, the number of TOE lines changed in 1978, when CCT 300-64 and CCT 300-65 were issued, totaled 49,000

b. Review, Approval, and Promulgation of Change. Once the mechanism for change is started, a review process occurs, terminating in publication of the CCT.

(1) A generalized view of the system for approval and promulgation of changes to requirements is shown in Figure 3-4. The six types of changes discussed above are shown to the left (MOS and SB 700-20 changes are combined for simplicity). Illustrated here is the key point that a given change action is reviewed on

its own merits as an individual action by the approval authority. A change is approved for application to the TOE and publication in the CCT without consideration of other types of changes which may be applied to the force structure in the same CCT. HQDA is the approval authority for all changes which would result in a change to resource requirements (substantive changes). All changes approved by HQDA are returned to TRADOC where the TOE proponent agencies, generally the appropriate service schools, apply these changes to all affected TOEs. These TOE changes are accumulated by HQTRADOC and published twice a year, in April and October, in a CCT. Actions which have been directed or approved by HQDA, or are administrative in nature (no resource requirements), need not be resubmitted to HQDA for approval after they have been applied to the TOE. For example, the TOE changes that result from an approved BOIP need not be resubmitted for HQDA approval. There is one exception to this procedure as shown in Figure 3-4 in that certain approved MACRIT changes are held by TRADOC for application during the next scheduled TOE review. (See Chapter 5 for a discussion of MACRIT application.) The CCT, then, is the means by which approved TOE changes are promulgated to the MACOMs. It is a directive for the MACOMs to change their MTOE to implement those changes.

(2) The net impact of a CCT on the MACOMs and on the Army is not determined prior to the time the CCT is promulgated. As was pointed out earlier, changes to requirements in TOE generate demands for resources and while the review of a particular requirements change may consider the costs of making that change, there is no procedure for assessing the resource cost and affordability of all the changes incorporated in a CCT. All changes are reviewed and approved individually, returned to TRADOC for application to TOEs, accumulated by TRADOC over a 6-month period, and published in a CCT. HQDA does not review the CCT itself prior to publication. Thus, the resources needed to apply the TOE changes in a CCT have not been determined at the time the changes are published and the MACOMs are directed to implement them. Nor is there any attempt to integrate the review and approval of changes to TOE requirements with the processes used to manage the force structure. Changes to the number and type of units required in the force structure are determined by the Total Army Analysis process. These changes also generate demands for resources. Since the resources available to implement changes, particularly personnel, cannot be significantly expanded, these two separate decision processes result in two sets of approved requirements which must then compete with each other for the same inadequate resources. Detailed information on the review and approval process and the responsible agencies are found in Appendix E.

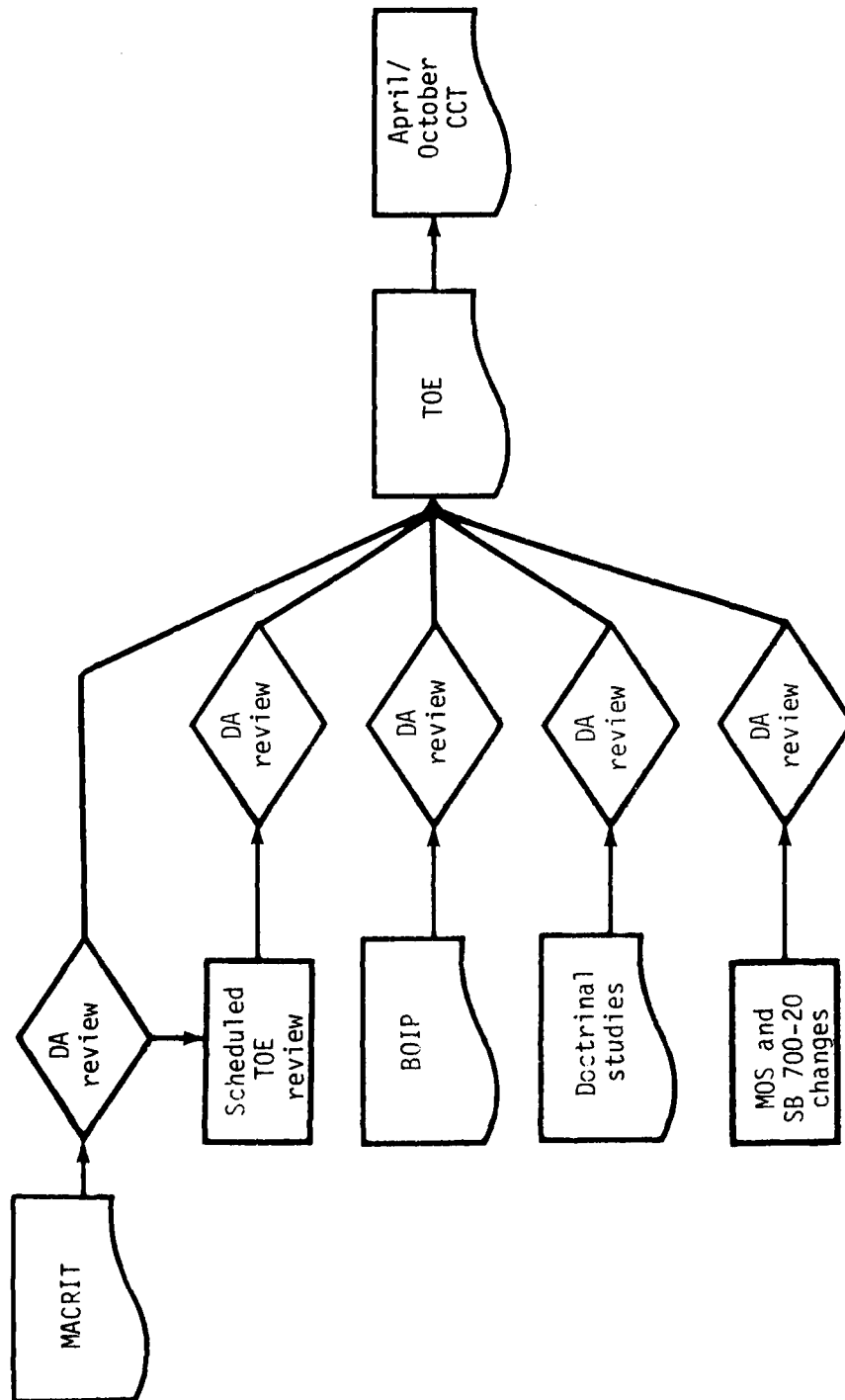


Figure 3-4. Current System for Approval and Promulgation of Changes

3-3. MACOM RESPONSE TO THE CCT. The procedures outlined in this paragraph represent a generalized view of MACOM actions on receipt of a CCT. Basically, the MACOM must estimate the cost of the changes, prioritize them, and determine affordability without guidance from HQDA. Responses to the April and October CCTs are discussed separately below, since the timing of events in the PPBS cycle dictate different activities by the MACOM at those points in time.

a. Response to the April CCT. Figure 3-5 illustrates the MACOM response to the CCT published in April of each year. Figure 3-5 is keyed to subparagraph numbers in the discussion below. Upon receipt of the April CCT, the MACOM determines which changes apply to units in that command, what is the cost to the MACOM (personnel and GMA dollars), and which changes can be implemented within assigned resource levels.

(1) TOE changes in the CCT must compete with other resources demanding actions for the same fixed resource levels. An increase of personnel spaces caused by revision of a MACRIT, for example, must now compete against changes requested by unit commanders of that MACOM for authorized spaces set at fixed levels by the Program and Budget Guidance (PBG). Resource levels for the budget year and first program year have already been allocated to the MACOM via the January PBG. Although some actions, such as those published in the Troop Program Guidance, have resources specifically designated in the PBG for implementation, others, such as TOE changes contained in the CCT, do not.

(2) As can be seen in Figure 3-5, some actions in the CCT, particularly BOIP and high visibility doctrinal actions, have already been resourced by virtue of having gone through the resource allocation process of POM development. Thus, there are both unresourced and already resourced actions in the CCT. In fact, the CCT is a mixture of several different types of actions with regard to resource requirements. There are changes which do not affect resource levels; changes which reduce resource levels; changes which have already been through the resource allocation process (primarily high visibility actions); and changes which demand additional resources which are undetermined and unallocated. However, the category in which a particular change falls is not always readily discernible to the recipients of the CCT. The CCT is organized according to TOE sequence in such a way that all changes being applied to a specific TOE are assembled in one place. One change may apply to several TOE and one TOE may have several changes applied. While each change is coded by TRADOC to indicate that the change is a result of a BOIP or a doctrinal study, there is no indication of which BOIP or which study caused that change.

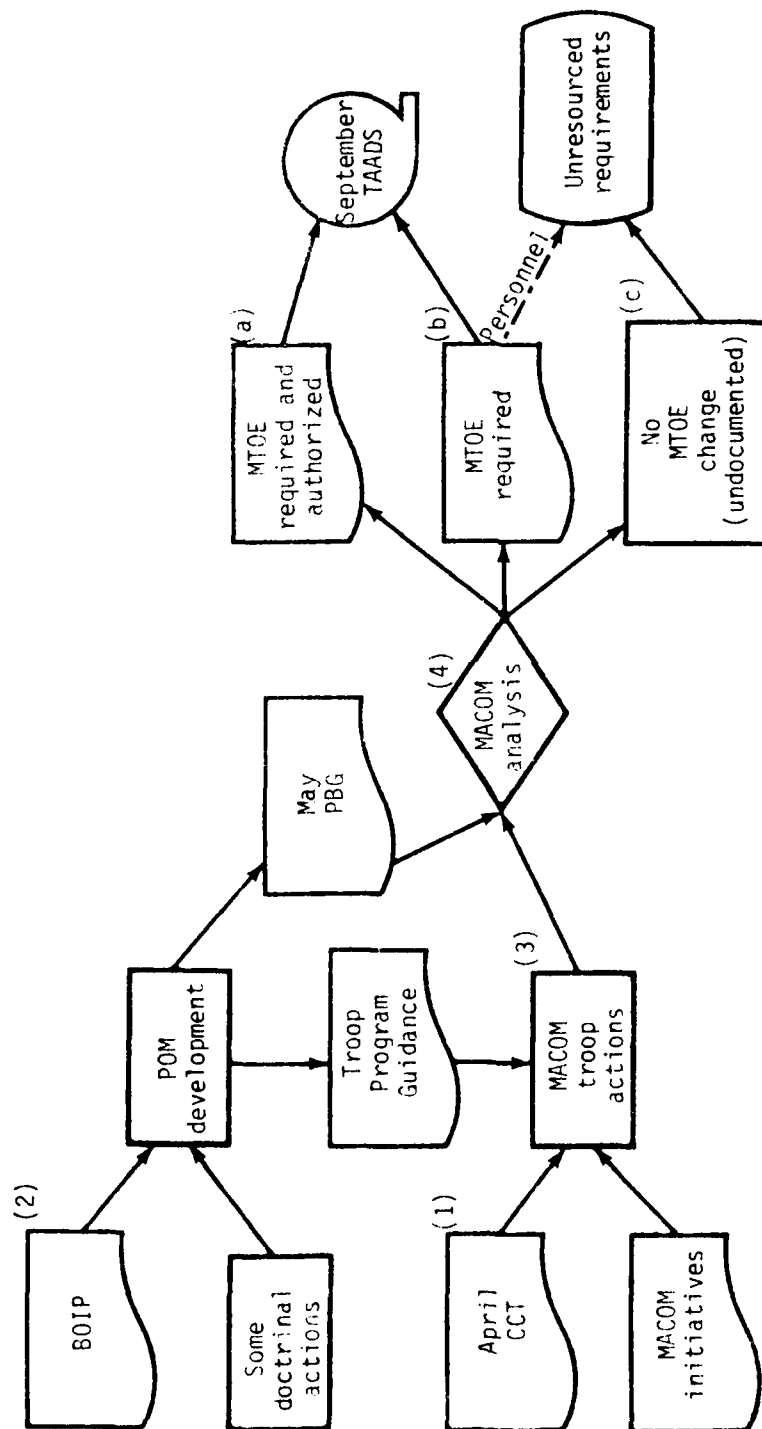


Figure 3-5. Current System MACOM Analysis -- April CCT

Thus, it is difficult to identify the reason for many changes, and so the degree to which that change may be resourced is also unclear.

(3) The MACOM must integrate all of these changes along with any initiatives they deem appropriate into their Troop Actions Program, a time-phased program of force structure changes.

(4) The MACOM must therefore make one of three decisions on each TOE change.

(a) First, if it is assessed as an affordable action within the resource levels provided, the MACOM may decide to implement the change in both the required and authorized columns of the appropriate MTOEs, meaning they must have the personnel spaces and OMA dollars available for the increased authorization. The MACOM, in the absence of any HQDA guidance on priorities, selects those which it will implement. Since each CCT usually contains some changes which reduce personnel and equipment levels, some changes which increase resource levels can be implemented utilizing those assets. This process results in preparation of MTOE and submission to TAADS by the following September. Thus, affordable changes can enter the resource procurement and distribution processes conducted by DARCOM and MILPERCEN through SACS computations 6 months after publication of the April CCT (see Appendix F for a discussion of SACS and the resource procurement and distribution processes).

(b) Second, if the change is deemed essential but not affordable, the MACOM can decide to implement the TOE change in the required column of the MTOE, but not in the authorized column. This results in equipment changes being computed for procurement purposes in the LOGSACS (which is based on the MTOE required column). No personnel changes will appear in the PERSACS (which is based on the MTOE authorized column). In any event, this decision is seldom made since readiness and Authorized Level of Organization (ALO) considerations mitigate against it. Raising the required strength in an MTOE while maintaining the authorized strength constant results in a larger deviation between requirements and authorizations. Since available personnel are a function of the authorized strength, any increase in that deviation could cause a reduction in the readiness condition reported in the Unit Status Report. FORSCOM MTOE submissions in early 1980 made an attempt, however, to incorporate personnel and equipment changes in the required column of the MTOE without changing the authorization. Many of these MTOE are pending approval based on a request for ALO change for units whose ALO level would be decreased by this action. The overall effect on unit readiness has not yet been determined, but some decreases can be expected to result.

(c) The third decision regarding TOE changes which can be made is to do nothing, i.e., make no changes to the MOC. This decision is made whenever the change is determined by the MACOM to be not affordable within the resource levels allocated to the MACOM. In fact, this decision has been the prevalent response to the CCT for reasons discussed in the preceding paragraph. Fixed resource levels, a continuing increase in requirements for combat units generated by TOE changes, and the need to maintain combat units at ALO levels specified by HQDA create increased pressures to reduce resource allocations to support units. These support units have already been reduced to minimally acceptable levels through transfer of resources to combat units. There are, as a result, few sources of assets internally available to the MACOM for unresourced changes. The CCT thus results in a set of unresourced and undocumented actions which the MACOM has been directed to implement but cannot afford. Moreover, after the April CCT, there is no vehicle by which the MACOM can immediately request the resources needed to accomplish those changes. A Program Development Increment Package (PDIP), which the MACOM may prepare as part of the Program Analysis and Resource Review (PARR) process, cannot be submitted until the following January for resolution in the next Program Objective Memorandum (POM) development cycle. No decision on that January PDIP will be published until after the close of the January-March TAADS update cycle, commonly referred to as a "MOC window." Thus, unaffordable April CCT changes cannot be documented in TAADS until September the following year, 17 months after the CCT was published directing the change.

b. Response to the October CCT. MACOM response to the October CCT publication is shown in Figure 3-6 which is keyed to subparagraph numbers in the discussion below.

(1) When the subsequent CCT is published in October, the MACOM receives another set of changes to TOE which it must implement in accordance with AR 310-31. As before, the actions contained in the CCT have not been analyzed by HQDA to determine which changes are affordable nor is there any HQDA guidance on priorities. The changes contained in the October CCT must again compete with other requirements for resources allocated to the MACOM. The October PBG provides a new set of resource levels but again those resource levels have been provided without consideration of the CCT requirements.

(2) Compounding the problem there is also that pool of unresourced requirements which has been carried over from the April CCT.

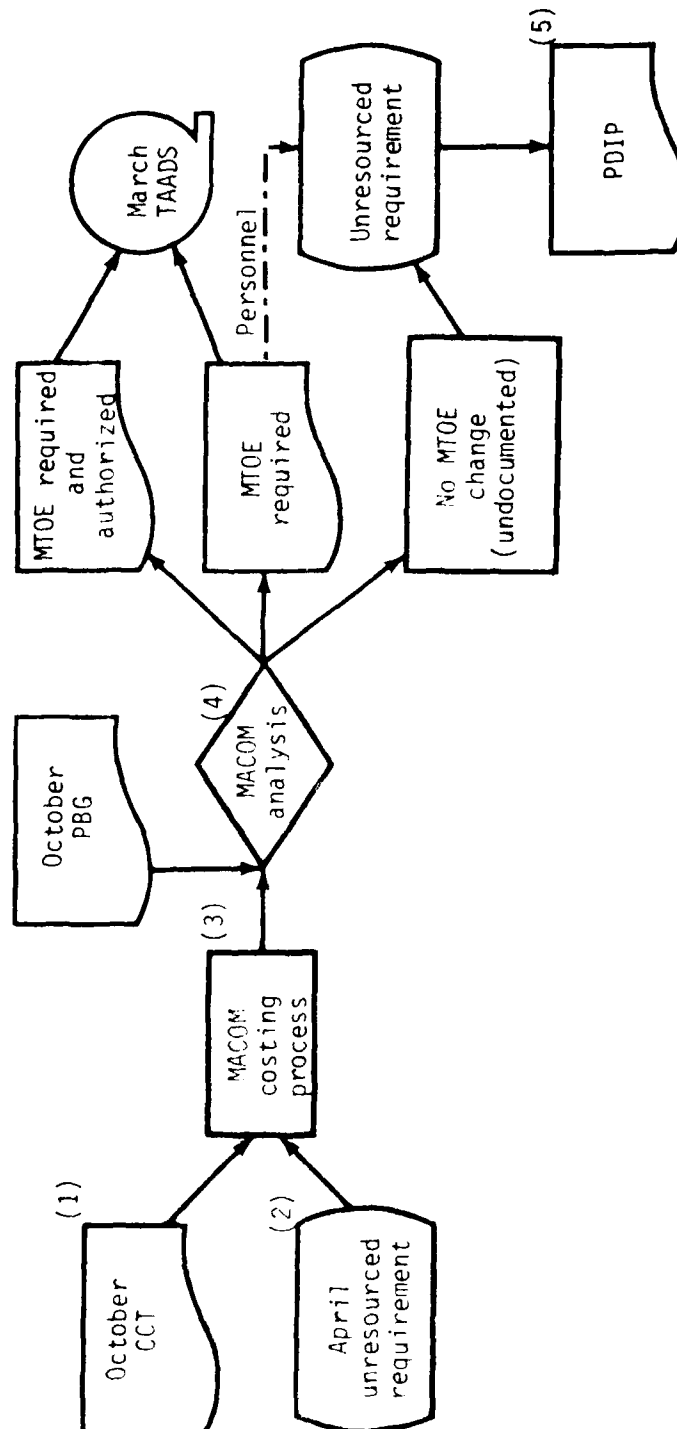


Figure 3-6. Current System MACOM Analysis - October CCT

(3) MACOM analysis, however, now must include a detailed costing of all requirements which result from the CCT since the vehicle to request resources, the PDIP submission in January, will be prepared shortly. The PDIP must reflect accurately the additional personnel spaces and OMA dollars needed to implement unaffordable changes from the CCT. HQDA will decide from among competing PDIPs in the POM development process whether or not to allocate additional resources to the MACOM.

(4) As a result of this costing and another analysis of priorities to determine which changes are affordable and will be implemented, the same three kinds of decisions can be made by the MACOM as were made in April. The MACOM can implement the change in the MTOE required and authorized columns, the MTOE required column only, or not implement them at all. Since resource allocations do not accompany the CCT changes, the last decision--no MTOE change--is again the prevalent choice, and the pool of unresourced and undocumented TOE changes from April is increased.

(5) The final action of this phase is the preparation of a PDIP, for submission in the January PARR process, requesting the resources to accomplish the TOE changes. During the last several years, PDIP submissions requesting resources to implement TOE changes have been submitted in the FORSCOM PARR. These requests have generally been denied by HQDA, and few resources have been allocated for this purpose. As a result, few unresourced TOE changes have been documented in MTOEs.

c. MTOE Standardization. The CCT is published as a set of unprioritized actions which must be implemented by the MACOM. The MACOM, since it cannot afford to implement the majority of the changes, must decide which of the changes it will implement. Thus, the MACOM sets its own priorities on implementing TOE changes from the CCT. Since each MACOM may prioritize these actions differently, similar organizations (MTOE units) in different MACOMs can be expected to differ in the way changes are applied. While AR 310-49 states only the objective that standardization of MTOE within a MACOM be attained, recent discussions, particularly with regard to POMCUS, indicate that maximum feasible Army-wide standardization is a desirable goal. A HQDA message to the MACOMs in January 1980 stated the desired objective of developing standard MTOE for Army-wide application. Such a policy would require uniform application of TOE changes to MTOE by all MACOMs. The existing process, characterized by MACOM decisions on what TOE change actions will be applied to the force structure, contributes significantly to the current lack of standardization between like units.

3-4. RESOURCE ALLOCATION PROCESS. The submission of a MACOM PDIP to HQDA for obtaining resources to implement TOE changes is their entry into the resource programming process. This process is shown in Figure 3-7 and is keyed to subparagraph numbers in the discussion below.

a. HQDA analyzes the MACOM PDIP to determine which of the TOE change actions have already been resourced through a previous POM development process. Since the CCT usually contains actions which have already been resourced and since the MACOM cannot identify these actions, there is a possibility of double counting. The appropriate command managers at HQDA must analyze thoroughly the PDIP to prevent this from occurring and modify the PDIP correspondingly.

(1) Decisions are made on which PDIPs will be funded and which will not be funded. Historically, PDIPs requesting the resources to implement TOE changes have not been funded, thus putting HQDA in the position of refusing to provide the means to accomplish actions which HQDA has directed the MACOMs to accomplish.

(2) When the changes are not funded, the pool of unresourced and undocumented actions carries forward at the MACOM level. These changes cannot be ignored because they have been made in the TOE, i.e., the model set of requirements on which MTOE are based.

(3) In the meantime, additional CCTs are published in April and October of each year. Unfunded requirements from the previous CCT are then carried forward and merged into the unresourced actions from the next year's CCTs.

(4) Thus, the pool of unresourced and undocumented actions continues to grow larger each year, and the gap between the best doctrinal organization depicted in the TOE and the actual organization depicted in the MTOE grows larger. To illustrate the problem, a FORSCOM PDIP of January 1979 requested 3,500 spaces to implement TOE changes while the FORSCOM PDIP of January 1980 requested 6,200 spaces. In other words, requirements for 2,700 additional people were levied on FORSCOM in the 1979 CCTs, exacerbating an existing shortfall of 3,500 spaces.

(5) If the PDIP (or parts of it) is funded with both dollars and personnel authorizations, then the additional resource levels are provided to the MACOM in the May PBG. The MACOM is then able to document the TOE changes in MTOE and submit them to TAADS in September.

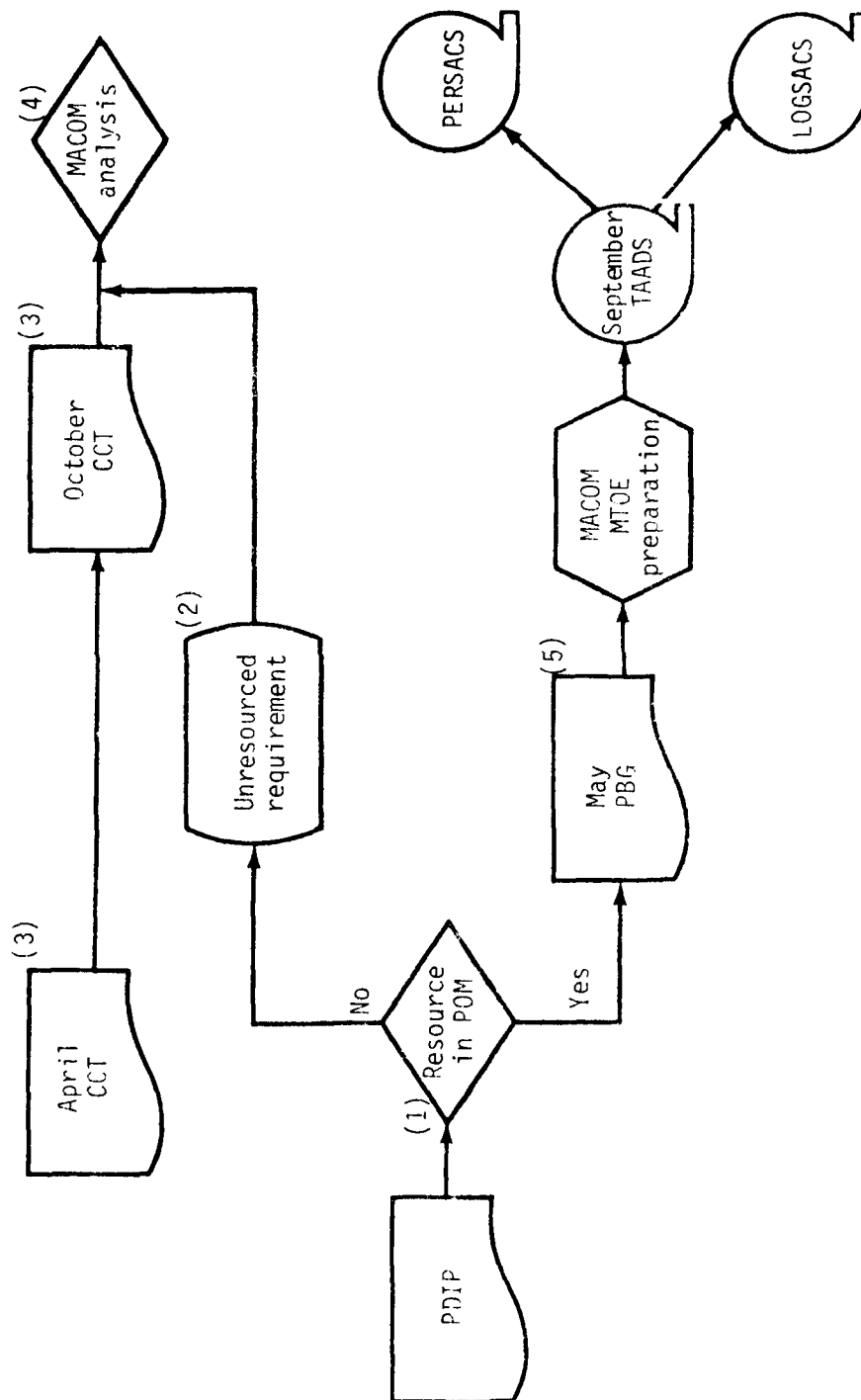


Figure 3-7. Current System Resource Programming

b. The previous discussion indicated that when MTOEs are changed, the adjustments are conveyed to the Army Authorization Documents System (TAADS). This is an important system because the TAADS is the mechanism by which personnel and equipment authorizations and requirements are translated into statements of projected Army resource needs in the Structure and Composition System (SACS). The SACS is really two separate computational systems--the Personnel SACS (PERSACS) and the Logistics SACS (LOGSACS)--which provide a basis for resource procurement and distribution planning within ODCSPER, ODCSLOG, MILPERCEN, DARCOM, and ODCSRDA. The SACS is discussed in detail in Appendix F. Basically, the SACS computations apply the detailed personnel and equipment authorizations and requirements contained in MTOE documents in TAADS and the time-phased force structure of the Army as portrayed in the Force Accounting System (FAS) to project future time-phased demands for personnel and equipment. PERSACS produces time-phased estimates of manpower requirements and authorizations at the grade, branch, and MOS level of detail. PERSACS output data are used by MILPERCEN for development of recruiting plans, training requirements, and distribution of personnel. LOGSACS equipment authorization data are used by DARCOM for developing distribution plans. LOGSACS equipment requirements data are used by ODCSRDA and DARCOM for development of procurement programs. As long as TOE changes remain unresourced and undocumented in MTOE, the changes in requirements will not be reflected in the SACS and thus will not be seen in the key processes that use SACS output data for procurement and distribution of resources.

3-5. SUMMARY OF CURRENT SYSTEM AND IMPACTS. The above discussion leads to a characterization of the current system as being one in which the application of approved doctrinal and organizational changes to the force structure is partially unresourced and the decisions on how to implement those changes in the force structure have been decentralized to the MACOMS.

a. Unresourced Changes. Changes to TOEs are generated, reviewed, and approved on a piecemeal basis and while the resource impact of a specific change may be determined and considered, neither the cost of all of the changes in a particular CCT nor their affordability is determined prior to the promulgation of that CCT. The first time the resource impact of a CCT on a MACOM is determined is when that MACOM analyzes and costs the CCT. Approval of valid doctrinal requirements is not based on peacetime resource availability since the TOE represents minimum essential organizational requirements for combat. However, under current regulations, an approved change to the TOE which increases the demand for resources must incur one of two costs when implemented. Either the change must be authorized by MTOE, which costs

additional resource expenditures, or a cost in readiness (increased gap between authorizations and requirements) will be incurred by implementing the change in the MTOE required column only.

b. Implementation. HQDA does not determine if either of these costs is affordable prior to directing implementation of the TOE changes and provides no guidance to the MACOM regarding which of these two options to select for each change. In practice, a third option becomes necessary and has normally been chosen--make no changes to MTOE until resources are provided to implement the directive. This latter choice results in deferring resource and reported readiness costs (although not the actual readiness cost as measured against the TOE model) over an indeterminate time. In the meantime, the actual organization of Army units as reflected in MTOE grows further and further from the best doctrinal organization specified by the current TOE. As a result, like units such as artillery battalions grow more and more dissimilar both from each other, as a result of differing MACOM priorities, and from the TOE, as a result of deferring resource and readiness costs. Not only is there a lack of standardization of units, but the intended measure of unit readiness, i.e., the deviation from Level 1 of the TOE, decreases even though this is not documented and reported in the Unit Status Report. There are other, more tangible impacts also. Since TOE requirements for equipment are not reflected in the required column of the MTOE, they are not computed in the LOGSACS. Thus, the Initial Issue Quantity (IIQ) and Authorized Acquisition Objective (AAO), key equipment quantities used in developing the procurement program, do not reflect the latest approved doctrinal levels of equipment (See Appendix D for definitions of IIQ and AAO).

c. Findings. The analysis of the present TOE change process confirms the problem outlined in Chapter 1 and the study directive. The Army presently has no effective management system for controlling the implementation of approved TOE changes into the force structure. A capsule summary of problems inherent in the current system is shown below. These problems are key elements in the evaluation of alternatives to the current system.

- (1) TOE changes are approved on an individual basis. As a result, the CCT is not synchronized with force structure management.
- (2) Full affordability of the CCT is not determined at any time.
- (3) The CCT represents a large volume of change to the Army.

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(4) Valid wartime requirements are not fully documented in MTOE.

(5) Each MACOM determines how TOE changes will be implemented, thus standardization of like units is not attained.

(6) There is a built-in divergence between the TOE and MTOE. Undocumented requirements accumulate, and the SACS does not reflect all valid requirements.

(7) Readiness is not reported against the intended standard.

CHAPTER 4

ALTERNATIVES

4-1. INTRODUCTION. The findings discussed in the previous chapter relate to specific problems and inefficiencies in the current system for directing and resourcing TOE changes. These findings are the basis for development and evaluation of alternatives to the current system in that a viable alternative should provide benefits which would alleviate, to some degree, the problems identified in current management procedures. The search for alternative ways to manage the implementation of TOE changes into the force structure was based on finding ways to overcome the problems in the current system. This chapter discusses the alternatives that were developed during the course of the study and presents a quantitative scheme for evaluating each one.

4-2. ALTERNATIVES TO THE CURRENT SYSTEM. During the course of this study, eight alternatives (including retention of the current system without change) were developed and considered. The genesis of several of these alternatives was within the CAA study team, whereas others were suggested by members of the Study Advisory Group. Each of the seven alternatives discussed below is considered feasible to implement, but does not solve the problems of the current system to an equal extent. There are also varying costs associated with implementing these alternatives. Table 4-1 lists the eight alternatives presented in this report and discussed below. Continuing the current system without change is designated as Alternative 1 but will not be discussed further.

Table 4-1. Alternatives

-
1. Current system--no change
 2. Document requirements changes within 6 months
 3. Alternative 2 plus change readiness standards
 4. Add third column to MTOE
 5. Compute requirements SACS based on TOE
 6. Approve only affordable TOE changes
 7. Coordinate management of TOE changes with force structure management
 8. Alternative 7 plus add third column to MTOE
-

a. Alternative 2. Alternative 2 dictates that MACOMs document changes to the TOE in the required column of applicable MTOEs within 6 months after publication of the CCT. The intended purpose of this alternative is to make the current management systems function as they were originally intended. AR 310-31 originally required that MACOMs implement TOE changes in their MTOEs, normally within 6 months of the publication of the TOE change. Exactly what is meant by the term implement is not defined, and the 6-month requirement was eliminated by HQDA message in June 1978. Since that time, there has been a requirement for implementation, but no time constraints are stated.

(1) Implementation. The following steps must be taken to implement this alternative.

(a) Rescind the June 1978 message which removed the 6-month implementation requirement.

(b) Revise AR 310-31 and AR 310-49 to require that TOE changes be documented in the required column of MTOE during the TAADS MOC window following publication of the CCT.

(2) Procedures. The following procedures must be implemented if this alternative is selected.

(a) The MACOM must document all TOE changes in the required column of applicable MTOEs in the MOC window following publication of the CCT. The changes promulgated by the April CCT must be submitted to TAADS by 30 September and the changes promulgated by the October CCT must be documented in TAADS by 31 March.

(b) The MACOM must determine which of the TOE changes are unresourced. They must then determine the cost impacts of the change, i.e., the resource costs if the change is documented in the authorized column and the ALO cost if the change is not documented in the authorized column.

(c) The MACOM must document in the required and authorized column of MTOEs those changes that are deemed affordable and of highest priority. These documents must be submitted in TAADS as proponent approved documents. Those MTOE which document TOE changes in the required column only and do not result in an ALO decrease should also be submitted in TAADS as proponent approved documents. Those MTOE which document TOE changes in the required column only and do result in an ALO decrease should be submitted in TAADS as proponent proposed documents. These latter documents must be accompanied by a request for ALO change for all applicable units.

(d) HQDA must take one of three actions in response to the submission of a proponent proposed document and request for ALO change. First, HQDA can approve the MTOE and the ALO change. In this case, the action is complete although the MACOM may, at a later date, request resources through the PARR process to implement the change in the authorized column if desired. Second, HQDA can disapprove the document and request for ALO change, allocate the resources necessary, and direct the MACOM to resubmit the MTOE with the change implemented in the authorized column. Third, HQDA can disapprove the document and request for ALO change and direct the MACOM to resubmit the MTOE with the change implemented in the authorized column. Additional resources for that purpose are not provided by HQDA (in effect, a directive to the MACOM to apply already owned resources to that change). Table 4-2 summarizes Alternative 2.

Table 4-2. Alternative 2, Document Requirements Changes Within 6 Months

Intent: Make current systems function as intended

- Rescind the HQDA message which removed the 6-month implementation requirement
 - Revise AR 310-31/AR 310-49 to require that:
 - TOE changes be documented in MTOE required column in the MOC window following publication of the CCT
 - MTOE which result in ALO change be submitted as proponent proposed and be accompanied by a request for ALO change
 - HQDA must take one of three actions in response:
 - Approve the proposed MTOE and ALO change, or
 - Disapprove the MTOE and ALO change and provide resources to document the change in authorized column, or
 - Disapprove the MTOE and ALO change and direct the MACOM to provide resources from their own assets
-

b. Alternative 3. Alternative 3 builds on Alternative 2 in that TOE changes would be implemented in MTOE in the MOC window following publication of the CCT. In fact, all actions specified for Alternative 2 would still be required to implement Alternative 3. The intended purpose of this alternative is to remove the unit status report as an inhibitor of change to the required column of MTOE. Alternative 2 would have the effect over time of increasing

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MTOE requirements at a faster rate than the increase in authorizations. The Army's total personnel authorization is constrained and not expandable to any significant degree. The unit status report would reflect this growing deviation between requirements and authorizations in decreased readiness ratings of units. Alternative 3 would lessen the impact of decreased readiness ratings on the unit commander, who may perceive decreased readiness as reflecting negatively on his performance by raising the readiness rating he reports to his commander. It would, however, provide for reporting of unit status by the MACOM against the current standard.

(1) Implementation. The following steps must be taken to implement Alternative 3.

(a) All steps specified for Alternative 2.

(b) Revise AR 220-1 to require that unit commanders report unit status on the basis of available versus authorized resources in lieu of available versus required resources.

(c) Revise AR 220-1 to require that MACOM report unit status on the basis of available versus required (TOE Level 1) resources.

(2) Procedures. The following procedures would be implemented if this alternative is selected.

(a) Unit commanders would compare available resources to authorized resources to determine unit status. Currently, he also compares available to required resources and this comparison normally dictates his unit status or C rating. The available to authorized measurement has an inherent attractiveness in that the unit commander has no control over the required column of his MTOE. Reported unit status would not decrease as increased requirements are dictated for an MTOE without provision for increased authorizations.

(b) At the MACOM level, the unit status would be converted from that reported by the unit commander to the current standard, available versus required resources. This conversion could be automated as follows:

1 Extract available/authorized ratio from the unit status report.

2. Extract unit MTOE required and authorized data from VTAADS.

3. Compute unit status based on the ratio:

$$\frac{\text{Available}}{\text{Required}} = \frac{\text{Available}}{\text{Authorized}} \times \frac{\text{Authorized}}{\text{Required}}$$

4. Forward the newly computed unit status to HQDA.

(c) All other procedures dictated for Alternative 2 would also be followed. Table 4-3 summarizes Alternative 3.

Table 4-3. Alternative 3, Change Readiness Standards

Intent: Remove readiness reporting as an inhibitor of increasing MTOE requirements

- All actions of Alternative 2 are still required
 - Define two levels of unit status reporting
 - Unit commander reports unit status based on the ratio of available resources to authorized resources
 - MACOM reports unit status based on available/required ratio
-

c. Alternative 4. Alternative 4 provides another approach to insuring that all valid wartime requirements are identified in the MTOE. This alternative would remove readiness and ALO considerations as inhibitors of change by adding a third column to the MTOE and redefining the way in which ALO and readiness are measured. The three columns of the MTOE would be TOE Level 1, Required, and Authorized, as described in Table 4-4.

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(1) Implementation. The following steps must be taken to implement this alternative.

(a) Revise AR 310-31 and 310-49 to provide for a three-column MTOE and specify that TOE Level 1 changes must be documented in the MTOE in the MOC window following publication of the CCT.

(b) Revise AR 220-1 to state that unit status will continue to be measured against the required column of the MTOE and not the TOE Level 1 column.

(c) Reprogram TAADS, VTAADS, FAS, SACS, FORDIMS, and associated systems to provide for three resource levels.

(2) Procedures. The following procedures must be implemented if this alternative is selected.

(a) The MACOM must document all requirements changes in the TOE Level 1 column of the MTOE during the MOC window following publication of the CCT.

(b) The MACOM must evaluate all changes to determine if those changes are required for the current mission. If so, the required column of the MTOE must be changed, and, if necessary, resources to implement the change in the authorized column of the MTOE must be requested. This request should follow the procedures of the current system.

(c) ALO management procedures must be revised so that ALO reflects assignment of authorized levels based on the required column of the MTOE rather than TOE Level 1.

(d) Unit status must be reported based on available resources versus required rather than available versus TOE Level 1.

(e) Requirements SACS must be computed based on the TOE Level 1 column of the MTOE, not the required column. Alternative 4 is summarized in Table 4-4.

Table 4-4. Alternative 4, Add Third Column to MTOE

Intent: Get full wartime requirements into the MTOE without impacting on reported ALO or unit status

- Three columns in the MTOE:
 - TOE Level 1. This column duplicates the Level 1 column of the TOE.
 - Required. This column specifies those resources which the MACOM deems required to perform the current mission.
 - Authorized. This column continues to represent resource levels allocated by HQDA.
 - Continue using required and authorized columns to compute ALO/unit status
 - SACS is based on TOE Level 1 column
 - TOE changes are documented in TOE Level 1 column in the MOC window following publication of the CCT
 - MACOM determines if changes are required for current mission; changes required columns as appropriate, requests authorization change if necessary
-

d. Alternative 5. If increasing the accuracy of the requirements SACS computations is the main benefit to be derived from Alternative 4, there is a way to obtain that benefit without incurring the cost. The intent of Alternative 5 is to improve SACS accuracy without the systems changes necessary to implement Alternative 4. This alternative would change only the manner in which the requirements SACS are computed.

(1) Implementation. The following steps must be taken for implementation.

(a) Identify all units with approved deviations of the MTOE required column from Level 1 of the TOE.

(b) Code the appropriate data element in the FAS to insure those units identified will have SACS requirements computed based on MTOE.

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(c) Code the FAS and revise the SACS to compute requirements for all other units based on the TOE Level 1 column.

(2) Procedures. No special procedures are required to implement this alternative other than continued maintenance of the FAS coding specified above. Table 4-5 summarizes Alternative 5.

Table 4-5. Alternative 5, Compute Requirements SACS Based on TOE

Intent: Accomplish the same result as Alternative 4 without changing automated systems
• Continue current procedures for implementing TOE changes in MTOE • Identify all units in FAS/TAADS with special or unique requirements in MTOE
--Compute SACS for those units based on MTOE --Compute SACS for all other units based on the TOE

e. Alternative 6. This is the first of three alternatives which would eliminate MACOM costing and prioritization of TOE changes and centralize those functions at HQDA. These alternatives provide for costing, determination of affordability, and prioritization of changes prior to approval of TOE changes and publication of the CCT. Alternative 6 would, after this costing and prioritization, allow only those changes which will be re-sourced to be approved for application to the TOE and promulgation in the CCT.

(1) Implementation. The following steps must be taken to implement this alternative.

(a) Develop an automated costing program for use at HQDA to cost TOE changes (see Appendix G).

(b) Establish organizational responsibility at HQDA for accomplishing the procedures listed below. Some additional spaces or transfer of spaces may be required.

(c) Revise AR 310-31 and AR 310-49 to specify that TOE changes be implemented in MTOE required and authorized columns in the MOC window following publication of the CCT.

(2) Procedures. The following procedures must be implemented if this alternative is selected.

(a) TRADOC must submit substantive requirements to HQDA as complete packages required to implement a change, i.e., all TOEs affected and the requirements changes for each must be submitted as an entirety. The personnel, equipment procurement dollar costs, and OMA dollar costs for each TOE should be included.

(b) HQDA must categorize these change packages as either already resourced in the POM or not resourced.

(c) Changes categorized as already resourced may be approved and returned to TRADOC for inclusion in the next CCT together with those nonresource demanding changes which are approved by HQTRADOC.

(d) Those changes which are unresourced must be costed to determine the full personnel and OMA dollar impact to the force structure.

(e) Since resourcing through the POM process is accomplished only once a year, unresourced changes must be accumulated to be synchronized with other force structuring decisions in the fall of each year. At that time, TOE changes must be prioritized into two groups--those which will be resourced and those which are not currently affordable.

(f) A PDIP must be prepared for resourcing those changes which are approved, and the necessary resources must be allocated to MACOMs in the May PBG.

(g) MACOMs will implement all CCT changes in the required and authorized columns of appropriate MTOEs in the MOC window following publication of the CCT.

(h) Nonaffordable changes are returned to TRADOC, where they may be discarded or reformulated, rejustified, and resubmitted to HQDA. Table 4-6 summarizes Alternative 6.

Table 4-6. Alternative 6, Approve Only Affordable Changes

Intent: Apply to TOE and publish in CCT only those changes which will be implemented in authorized column of MTOE

- Proposed TOE changes must be:
 - Categorized (already resourced or unresourced)
 - Costed
 - Prioritized (into two groups--to be resourced, to be deferred)
 - HQDA disapproves only those TOE changes which will not be resourced
 - CCT is a directive to include changes in required and authorized columns of MTOE in the next MOC window
 - Deferred changes are returned to TRADOC for reconsideration
-

f. Alternative 7. This alternative also requires that HQDA categorize, cost, and prioritize TOE changes prior to their approval and promulgation in the CCT. This alternative, however, avoids one of the main drawbacks of Alternative 6 in that TOE changes are not disapproved simply because resource costs are not affordable. Alternative 7 requires that costing include an assessment not only of the resource impact of the change but also its impact on ALO and readiness. The intent of this alternative is to synchronize TOE change management with force structure management in such a way that resource, ALO, and readiness impacts are assessed in conjunction with other force structuring decisions prior to approval of TOE changes and publication of the CCT.

(1) Implementation. The steps required to implement Alternative 7 are the same as specified for Alternative 6.

(2) Procedures. The following procedures must be implemented if this alternative is selected.

(a) TRADOC must submit TOE change packages with costs specified in Alternative 6.

(b) HQDA must categorize these change packages as either already resourced in the POM or not resourced.

(c) Those changes categorized as already resourced may be approved and returned to HQTRADOC for inclusion in the next CCT together with those changes which are approved by HQTRADOC. This is advantageous in that many high visibility, high priority actions have already been resourced and need not be delayed while the remainder of the proposed changes are considered.

(d) Those changes which are unresourced must be costed to determine the full personnel and OMA dollar impact on the force structure (see Appendix G). Further, the ALO and readiness impacts, if the change is approved but not resourced, must be assessed. This assessment could be automated by calculating, as a percent, the change in the ratio of authorized to required resources if the MTOE requirement is increased and the authorization remains constant. This data can be obtained from the TAADS data base for each MTOE. Conversely, a rough manual assessment of the amount of change as submitted in the TOE change package may be adequate for this purpose.

(e) Again the unresourced changes must be accumulated to be synchronized with other force structuring decisions for POM development. TOE changes must be prioritized into three groups.

1. The highest priority group of changes will be resourced by HQDA.

2. The second priority will be approved for application to the TOE but will not be resourced. The ALO and readiness cost for these changes has been deemed acceptable.

3. The lowest priority changes will not be approved for application to the TOE.

(f) A PDIP must be prepared for resourcing the highest priority changes, and the necessary resources are allocated to the MACOMs in the May PBG. Required ALO changes must also be transmitted to the MACOM.

(g) Guidance (the results of the prioritization) must be provided to the MACOM specifying which changes to be promulgated in the CCT will be resourced.

(h) MACOMs will implement TOE changes in the MOC window following publication of the CCT. MTOE changes will be developed in accordance with the CCT and the guidance from HQDA. Those

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changes published in the CCT and which HQDA will resource are applied to both required and authorized columns of the MTOE. Those CCT changes for which HQDA will not allocate resources are applied by the MACOM only to the required column of the MTOE.

(i) Changes which are deemed nonaffordable in terms of both resources and ALO/readiness are returned to HQTRADOC for reconsideration. Table 4-7 summarizes Alternative 7.

Table 4-7. Alternative 7, Coordinate Management of TOE Changes with Force Structure Management

Intent: Apply to TOE and publish in CCT only those changes for which resource/ALO/readiness implications are acceptable

- Proposed TOE changes must be:
 - Categorized (already resourced or unresourced)
 - Unresourced TOE changes must be:
 - Costed (resource/ALO/readiness implications)
 - Prioritized (three groups--to be resourced, required, marginal)
 - HQDA:
 - Allocates resources to highest priority
 - Directs highest priority changes be implemented in MTOE required and authorized columns
 - Directs other approved changes be implemented in MTOE required column only
 - MTOE are submitted in the next MOC window
 - Changes deemed marginal are returned to TRADOC for reconsideration
-

g. Alternative 8. Alternative 8 is an extension of Alternative 7 which provides for the addition of a third column to the MTOE. This alternative is actually a combination of Alternatives 4 and 7 and is intended to provide for centralized costing and prioritization without impacting adversely on reported ALO and unit status.

(1) Implementation. The following steps must be taken for implementing the alternative.

(a) All steps necessary to implement Alternative 4.

(b) All steps necessary to implement Alternative 7.

(2) Procedures. The following procedures must be implemented if this alternative is selected.

(a) TRADOC must submit TOE change packages with costs as specified in Alternative 6.

(b) HQDA must categorize these change packages as either already resourced in the POM or not resourced.

(c) Those changes categorized as already resourced may be approved and returned to HQTRADOC for inclusion in the next CCT together with those changes which are approved by HQTRADOC. MACOMs will include these changes in all three columns of the MTOE; TOE Level 1, Required, and Authorized.

(d) Those changes which are unresourced must be costed to determine the full personnel and OMA dollar impact on the force structure (see Appendix G). ALO and readiness impacts need not be addressed.

(e) Again, the unresourced changes must be accumulated for annual consideration in the POM development process. These changes must be prioritized into three groups.

1. The highest priority group will be allocated resources.

2. The second priority will be approved for application to the TOE but will not be resourced.

3. The lowest priority changes will not be approved for application to the TOE.

(f) A PDIP must be prepared for resourcing the highest priority changes, and the necessary resources are allocated in the May PBG.

(g) Guidance specifying which changes will be resourced must be provided to the MACOMs.

(h) MACOMs will implement TOE changes in the MOC window following publication of the CCT in accordance with guidance furnished by HQDA. Those changes which HQDA will resource are applied to all three columns of the MTOE. Those changes which are not resourced will be applied to the TOE level 1 column of the MTOE. Unresourced changes which the MACOM deems essential for the current mission may also be applied to the required column of the MTOE and if necessary, the MACOM may submit a PDIP to obtain resources for that change.

(i) ALO and unit status are measured, as in Alternative 4, against the required column of the MTOE, not the TOE level 1 column. Requirements SACS are computed against the TOE level 1 column.

(j) Changes which are deemed nonaffordable by HQDA are returned to TRADOC for reconsideration. Table 4-8 summarizes Alternative 8.

Table 4-8. Alternative 8, Alternative 7 Plus Add Third Column to MTOE

Intent: Get full wartime requirements into MTOEs without impacting on ALO/readiness

- All actions in Alternative 7 are still required
 - Three levels in MTOE--TOE Level 1, Required, Authorized
 - ALO/unit status are determined based on the MTOE required column
 - HQDA:
 - Allocates resources to highest priority changes
 - Directs highest priority changes be implemented in MTOE required and authorized columns
 - Directs other approved changes be implemented in TOE Level 1 column only
 - MACOM determines if unresourced changes are required for current mission and:
 - Changes required column as appropriate
 - Requests authorization change if necessary
 - Submits MTOE in next MOC window
 - Systems changes are the same as Alternative 4
-

4-3. KEY FACTORS FOR EVALUATING ALTERNATIVES. A significant portion of the effort applied to this study was spent in the investigation, definition, and analysis of the current system for implementing TOE changes into the Army force structure. This analysis led to an identification of the problems and inefficiencies which were presented in Chapter 3 and in turn, led to the definition of several alternatives to the current system. Prior to selecting a preferred alternative, the benefits that each alternative provides, together with a measure of the costs incurred by implementing that alternative, should be evaluated. Key benefits (Table 4-9) and costs (Table 4-10) against which each alternative should be judged are discussed below.

a. Benefits. Benefits to be derived by the Army from implementation of an alternative management system are specifically derived from the findings presented in Chapter 3. Benefits, which are considered to be enhancements to the current system, are shown in Table 4-9. These benefits are not listed in order of importance since importance is relative depending on the objectives of various organizations and individuals.

Table 4-9. Benefits

-
1. Timely identification of resource and readiness impacts
 2. Identification of all minimum essential wartime requirements in TOE and in MTOE
 3. Reduction of volume of change/turbulence
 4. Enhancement of MTOE standardization
 5. Timely implementation of TOE changes in MTOE
 6. Synchronization of TOE change management with force structure management
-

(1) One of the problems identified in the current system is that full affordability of the CCT is not being assessed at any time. In this sense, affordability is not limited to the resource impact of TOE changes, but includes the impact on ALO and readiness if that change is approved but not resourced. Every substantive TOE change may result in either a resource or a readiness cost. Thus a benefit is derived if an alternative provides for a determination of these costs and an assessment of their affordability. Further, timeliness of this determination is important. If neither of these costs--resources or readiness--is acceptable, this fact should be known before the change is approved. Therefore, timely identification of the resource and readiness impact of each change to the TOE is considered beneficial.

(2) Another finding is that full wartime requirements, i.e., Level 1 of the TOE, are not fully documented in MTOEs. As discussed in Chapter 3, the current system discourages the application of TOE changes to the required column of the MTOE when resources are not available to document the changes in the authorized column. Yet it is very important that all TOE changes be documented in the required column of the MTOE so that equipment requirements can be accurately projected in the LOGSACS and mobilization requirements for personnel can be accurately projected in the PERSACS. In order to accomplish this, it is important that all minimum essential wartime requirements be identified in both the TOE and the MTOE.

(3) The large volume of change occurring as a result of the CCT was also discussed in Chapter 3. This large volume of change has several detrimental impacts. It creates turbulence in the personnel and equipment requirements computed in the SACS and makes management of the force structure, and particularly POMCUS, more difficult. Thus, it would be considered beneficial if an alternative resulted in a reduction of the volume of change. The degree by which volume can be reduced is limited, however, by the necessity to make truly minimum essential improvements to Army organizations.

(4) Another finding of Chapter 3 is that attaining the goal of Army-wide standardization of like units is inhibited by the current procedures which require the MACOMs to decide how to implement TOE changes in their MTOEs. The CCT is not accompanied by any guidance to the MACOM from HQDA on the priority of TOE changes or the way in which limited resources are to be applied to those changes. An alternative which provides guidance to the MACOMs on how to implement TOE changes in MTOE would enhance Army-wide standardization and thus would be beneficial.

(5) The built-in divergence between the TOE and MTOE was demonstrated in the previous chapter. The time lag between the publication of the CCT and documentation of the changes in MTOE depends on the availability of resources which may never be allocated. Yet early identification in MTOE of the changes contained in the CCT is very important. The sooner changes are identified in MTOE, the sooner personnel and equipment requirements are identified for procurement and distribution in the SACS. The earlier that changes are implemented in the MTOE, and thus the SACS, the earlier those changes are visible to MILPERCEN, DARCOM, and ODCSRDA for resource planning. Thus, timely implementation of TOE changes in MTOE is considered beneficial.

(6) Another finding regarding the current system is that TOE change management is not synchronized with force structure management. TOE changes are approved on an individual basis and the CCT thus contains approved changes to organizational requirements which have accumulated over a 6-month period. But concurrently, the Total Army Analysis (TAA) process is producing changes to the number and type of units required in the force structure. There is no interplay between the processes so changes to requirements are not coordinated with the set of unit requirements derived from the TAA process. It would be beneficial for these two sets of requirements to be considered simultaneously by the HQDA staff and coordinated to produce one set of approved changes.

b. Costs. While the benefits discussed above are key to assessing the relative value of proposed alternatives, they are not the only considerations in selecting an alternative. The negative impacts of implementing alternatives, i.e., the costs incurred, must also be considered. The factors listed in Table 4-10 are considered costs and are discussed below:

Table 4-10. Costs

-
1. Difficulty of implementation
 2. Impact on HQDA staff workload
 3. Impact on MACOM workload
 4. Impact on MACOM flexibility
 5. Impact on other management systems
-

(1) Difficulty of implementation is a cost which must be assessed. This factor includes such elements as regulatory procedures and documents to be revised, changes that must be made in management organizations, the number and extent of changes to management information systems and the personnel workload required to implement the alternative.

(2) Impact on HQDA staff workload is a factor which must be considered due to the current constraints on the size of the staff and the continuing pressure to reduce the size of that staff. A requirement to increase the size of the HQDA staff in order to perform additional functions is considered to be a key cost.

(3) MACOM workload generally has an inverse relationship to HQDA staff workload since the same management functions are normally performed with any alternative. HQDA staff workload increases and MACOM workload decreases as management functions are transferred from the MACOM to HQDA. Impact on MACOM workload is a cost which can be combined with HQDA staff workload to obtain a total workload impact caused by implementation of an alternative.

(4) Impact on MACOM flexibility also has an inverse relationship with another factor, enhancement of standardization. As the degree of standardization is increased, MACOM flexibility is decreased. It should be emphasized, however, that this cost refers only to the flexibility of the MACOM in regard to implementation of TOE changes into the force structure. A cost in terms of the flexibility of the MACOM to manage its overall force structure within established constraints should not be inferred.

(5) The final cost to be considered is the impact on other management systems. The system most heavily impacted besides the SACS, as discussed above, is the Unit Status Reporting System. The intent of the Unit Status Report is to compare the actual

condition of a unit, as measured by assets available to perform the mission, against the standard of minimum essential wartime requirements. Any subversion of this intent by changing the standard against which unit status is measured (minimum essential wartime requirement) is considered to be a cost.

4-4. EVALUATION OF ALTERNATIVES. While the selection of a preferred alternative is not a requirement of this study, the study directive for the Implementation of Change Study requests that CAA provide an evaluation of alternatives presented in the study report. This study considered the eight alternatives previously described and developed 11 factors by which those alternatives should be judged. Each alternative is evaluated against the 11 factors on a relative basis (i.e., relative to the other seven alternatives). This methodology involves a weighted decision matrix technique which is most applicable when there are a large number of comparisons to be made. This technique is described briefly below along with an illustration of how the alternatives may be evaluated.

a. Alternatives versus Costs and Benefits. The following discussion presents the impact of each alternative on the benefits and costs shown in Table 4-9 and Table 4-10.

(1) Implementation of Alternative 2 would provide the most benefit in factors 2 and 5, identification of all minimum essential wartime requirements in TOE and MTOE, and timely implementation of TOE changes in the MTOE. This alternative would not constrain changes to TOE any more than the current system but would require that all TOE changes be documented in the MTOE as soon as possible after publication of those changes in the CCT. This would significantly improve the accuracy of the requirements SACS in computing wartime requirements. It would provide some benefit to standardization in that the required columns of MTOE would be changed in the same way by all MACOMs. Impact on the other benefit factors would be slight. This alternative would have the greatest cost impact in the area of MACOM workload in that functions performed by the MACOM would increase slightly over the current system. Impact on other cost factors would be minimal. This alternative, then, would result in increased accuracy of requirements computation in the SACS.

(2) Benefits provided by Alternative 3 with regard to the factors shown in Table 4-9 would be roughly the same as for Alternative 2. The cost of implementing Alternative 3 is, however, significantly higher than Alternative 2 in that unit status reporting procedures would have to be revised.

(3) Alternative 4 also provides roughly the same benefits as Alternative 2 in that it insures documentation of requirements changes in the MTOE and increases SACS accuracy. This alternative, however, has higher costs than either Alternative 2 or 3. Alternative 4 would be difficult and costly to implement in that many procedures and automated systems must be revised. This alternative has the added cost of distorting readiness measurement to the extent that the real intent of the unit status report, measuring a unit's actual status against its combat requirement to assist in resource allocation decisions, is subverted. Thus, while Alternative 4 provides benefits compared to the current system, it does so at a high cost.

(4) While Alternative 5 has the benefit of increased SACS accuracy at the least cost, it does not provide the benefit of keeping MTOE requirements synchronized with the TOE and thus has less overall benefit than Alternatives 2, 3, or 4.

(5) Alternative 6 provides maximum benefit in many of the factors shown in Table 4-9. Affordability of TOE changes is determined prior to publication of the CCT. Standardization is enhanced since all MACOMs apply the changes uniformly to MTOEs, and they do so at the first possible time after publication of the CCT. Moreover, the decision process is synchronized at HQDA with other force structuring decisions prior to POM development. This alternative, however, provides no benefit with regard to applying all minimum essential wartime requirements to the TOE. In fact, decisions on what is essential for combat are made on the basis of peacetime affordability. While benefits are high, costs are also high. This alternative is not easy to implement; there would be more workload to be performed at HQDA as the classification, costing, and prioritization functions are shifted from the MACOM. There is also an impact on other management systems since again, as in Alternative 4, the intended standard against which readiness is measured becomes what the Army can afford rather than what it needs for wartime.

(6) Alternative 7 provides significant benefits in all of the factors listed in Table 4-9. TOE changes are costed and affordability is assessed early in the process. Both resource affordability and readiness impacts are assessed. The process of TOE change management is coordinated with other force structuring decisions and guidance is provided to the MACOMs for early implementation in MTOEs. Resources are allocated in the May PBG to accomplish the highest priority changes one month after publication of the CCT. Standardization is also enhanced by the provision of HQDA guidance on how to implement the changes in MTOE. Finally, the main drawback of Alternative 6 is overcome in that TOE changes

are not rejected on the basis of peacetime affordability. This fits well with the definition of minimum essential wartime requirement, since if a change is truly minimum essential, the readiness cost that it incurs must be deemed acceptable. While Alternative 7 addresses each of the factors in Table 4-9 with high benefits, it also has some high costs, especially in the area of HQDA workload. Again the functions currently being performed at the MACOM would be shifted to HQDA to be performed prior to publication of the CCT. One cost of Alternative 6, distortion of unit readiness measurement standards, would not be incurred by adoption of this alternative.

(7) Alternative 8 provides roughly the same benefits as Alternative 7 but at higher cost. It is more difficult to implement in that several automated systems must be reprogramed, and it also distorts the intended standards by which readiness for combat is measured.

b. The Weighted Decision Matrix. It is not necessary to know the absolute cost or benefit of each alternative in order to evaluate the alternatives. Only the relative value of benefits and costs need be judged. The previous discussion of alternatives pointed out where each alternative was strong or weak with regard to each of the 11 factors by which they were evaluated. The 8 alternatives and the 11 costs and benefits are summarized in Table 4-11.

Table 4-11. Evaluation of Alternatives: Alternatives, Benefits, and Costs

Alternatives	Benefits and Costs
1. Current system	1. Timely identification of impact
2. Document within 6 months	2. All requirements in TOE/MTOE
3. Change readiness	3. Reduction in volume
4. Three-column MTOE	4. Standardization
5. Change SACS	5. Timely implementation
6. Affordable changes only	6. Synchronize TOE/force management
7. Synchronize TOE/TAA	7. Implementation
8. Alt 7 + three-column MTOE	8. HQDA workload
	9. MACOM workload
	10. MACOM flexibility
	11. Impact on other systems

(1) The first step necessary for this evaluation was to develop an 88-cell matrix which arrayed the 8 alternatives as rows of the matrix and the 11 costs and benefits as columns. This matrix is shown in Figure 4-1. For any one column, each cell should be filled with a numerical value which represents the relative benefit or cost of each alternative when compared with all of the other alternatives. Several different scoring techniques may be used. The CAA study team chose to rate benefits on a scale of 0 (lowest benefit) to +5 (most benefit). Costs are rated on a scale of 0 (lowest cost) to -5 (highest cost). If the range of this scale (+5 to -5) is not adequate for the decisionmaker to express his judgments, it can be expanded as needed. Figure 4-2 shows the decision matrix as filled in with values by the study team. These cell values represent the judgment of the study team with regard to the relative benefits and costs of each alternative. They are based on discussion of the alternatives as presented in the preceding paragraph. For example, against enhancement of standardization, the current system is rated at 0 since it actually promotes nonstandardization. Alternatives 6 and 7 are rated at 5 since they provide the highest degree of MTOE standardization. Other alternatives are rated at intermediate values since they provide for some increased standardization but not as much as Alternatives 6 and 7. A discussion of the relative merit and the reasons why alternatives score well or poorly was presented in the preceding paragraph.

(2) The next step recognizes that every factor is not of equal importance to the decisionmaker. In fact, each evaluator may feel differently about which factors are most and least important in deciding between the alternatives. Therefore, each column of the matrix can be weighted by the decisionmaker's judgment of the relative importance of the factors. The CAA study team consisted of four analysts, each of which made his own independent judgment of relative importance, rating each factor as being of high, medium, or low importance. All four ratings were quite different, emphasizing the fact that the study sponsor, not the study team, should make that judgment. An example of the matrix when weighted is shown at Figure 4-3. The judgment of high (H), medium (M), and low (L) importance is listed across the bottom of the matrix. If a scale of $L = 1$, $M = 2$, $H = 3$ is then applied to each column of the matrix the cell values are each multiplied by that number to produce the weighted matrix shown. Again, if a scale of three to one weighting does not adequately express the range of the decisionmaker's feeling regarding relative importance, the scale can be expanded. Once the matrix cell values have been weighted, the sum of all values across the rows of the matrix can be computed for each alternative. The sums for this example are shown to the right of the matrix. These sums represent the

relative value of each alternative to the decisionmaker whose weights are shown on the bottom of the matrix. This hypothetical decisionmaker, then, would feel that Alternative 7 is the best, Alternative 2 is next best, and so on, with Alternatives 1 and 5 being the least favorable.

c. Evaluation Results

(1) Figure 4-4 shows the relative ranking of alternatives which was produced by the four separate evaluations of the CAA study team in columns W1 through W4. The numbers in this figure represent the relative rank of each alternative, 1 through 8, resulting from these evaluations. UW is the ranking that results if the matrix is unweighted, i.e., all factors are of equal importance. It is interesting to note the central tendency shown. Alternative 7 is the highest ranking alternative in each case. Alternative 2 is always the highest ranked of the alternatives characterized as decentralized. Alternatives 5 and 1 rank the lowest in every case. The only real differences in ranking are for those alternatives which are ranked in the middle.

(2) The reasons why Alternatives 2 and 7 appear to be the best of the alternatives can be explained by referring to Figure 4-2, the unweighted decision matrix. This figure shows that Alternatives 5 and 1 do badly in a relative comparison to Alternative 2 because they do not provide nearly as many benefits as does Alternative 2. Alternatives 3 and 4 provide roughly the same benefits as Alternative 2 but have a much higher cost of implementation and, in the case of Alternative 4, distorts the intent of unit status reporting. Thus, of all the alternatives which retain the features of making implementation decisions at the MACOM level, Alternative 2 appears clearly superior. Alternative 6 has roughly the same benefits and costs as Alternative 7 except that TOE changes are approved on the basis of peacetime affordability and the intent of unit status reporting is distorted. Alternative 8 has roughly the same benefits as Alternative 7 but is more difficult to implement and also impacts unfavorably on the unit status reporting system. Therefore, of all the alternatives which centralize implementation decisions at HQDA, Alternative 7 appears clearly superior.

Alternative	Timely identification of impact	All requirements in TOE/MTOE	Reduction in volume	Standardization	Timely implementation	Synchronize TOE/force management	Implementation	HQDA workload	MACOM workload	MACOM flexibility	Impact on other systems
Current system											
Document within six months											
Change readiness											
Three-column MTOE											
Change SACS											
Affordable changes only											
Synchronize TOE/JAA											
Alternative 7 + three-column MTOE											

Figure 4-1. Evaluation of Alternatives: The Decision Matrix

Alternative	Benefits						Costs			
	Timely identification of impact	Reduction in volume	Standardization	Timely implementation	Synchronize TOE/force management	Implementation	HQDA workload	MACOM workload	MACOM flexibility	Impact on other systems
Current system	0	3	2	0	0	0	-1	-4	-1	-2
Document within six months	1	5	1	2	5	1	-1	0	-5	-3
Change readiness	1	5	0	2	5	1	-4	-1	-3	-2
Three-column MTOE	1	5	1	2	5	2	-4	-1	-2	0
Change SACS	0	5	2	0	0	0	-1	0	-4	-1
Affordable changes only	5	0	5	5	5	5	-3	-5	0	-5
Synchronize TOE/TAA	5	3	3	5	5	5	-3	-5	0	-5
Alternative 7 + three-column MTOE	5	4	2	3	5	5	-5	-5	-2	-4

*No benefit = 0; most benefit = 5; no cost = 0; cost cost = -5.

Figure 1-2. Evaluation of Alternatives: Illustrative Relative Benefit and Cost Values

Figure 4-3. Evaluation of Alternatives: Illustrative Weighted Decision Matrix

Alternative	Weighted Relative Ranking				
	UW	W1	W2	W3	W4
1	8	8	8	8	8
2	3	2	4	2	2
3	4	3	5	4	4
4	4	6	6	6	5
5	7	7	7	7	7
6	2	4	2	3	3
7	1	1	1	1	1
8	6	4	3	4	6

(See Table 4-10 for definition of alternatives)
 UW indicates unweighted ranking, while W1 through W4 indicates weighted rankings assigned by the four separate study team members.

Figure 4-4. Evaluation of Alternatives: Illustrative Weighted Relative Rankings

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4-5. SUMMARY. The above discussion suggests that two alternatives are preferable to all others:

a. Alternative 2 which makes existing management systems function as originally intended

b. Alternative 7 which requires centralized costing and prioritization of TOE changes in synchronization with other force structure management decisions

The other alternatives considered in the study do not do well in this evaluation illustrated here because they attack symptoms of the problem rather than addressing the TOE change management system described in Chapter 3. Figure 4-5 shows an unweighted decision matrix for Alternatives 2 and 7 only. Clearly Alternative 7 provides the highest degree of benefit but does so at a higher cost. Alternative 7 provides for greater standardization of MTOE and better synchronization with force structure management processes at HQDA. It is, however, more difficult to implement and transfers workload from the MACOMs to HQDA to cost, prioritize, and decide how to implement TOE changes into the force structure. The decision as to which of these alternatives should be the preferred alternative is sensitive to the scoring and weighting scheme employed. This chapter has presented the quantitative approach used by the study team and illustrates a mechanism which can be used to evaluate several alternatives against a large number of important factors. The value of this approach is its feature of applying quantitative measures which result in a numeric rather than a totally subjective ranking of alternatives.

Alternative	Benefits						Costs				
	Timely identification of impact	All requirements in TOE/MTOE	Reduction in volume	Standardization	Timely implementation	Synchronize TOE/force management	Implementation	HQDA workload	MACOM workload	MACOM flexibility	Impact on other systems
Document within six months	1	5	1	2	5	1	-1	0	-5	-3	-0
Synchronize TOE/TAA	5	3	3	5	5	5	-3	-5	0	-5	0

No benefit = 0; most benefit = 5; no cost = 0; most cost = -5.

Figure 4-5. Comparison of Alternatives 2 and 7

CHAPTER 5

MANAGEMENT PRESCRIPTIONS

5-1. INTRODUCTION. During the course of this study, problems were identified within the current processes for controlling and resourcing changes to TOEs and MTOEs which were amenable to correction by management action at HQDA or MACOM. These problems are actually sub-problems in the sense that they relate to specific processes rather than to the overall system that is described in this report. Each was analyzed and management prescriptions which suggest means for correcting the problem were formulated. The management prescriptions are discussed separately from the system alternatives presented in Chapter 4 because they address procedural inadequacies that are independent of the alternatives. Their implementation will promote efficiencies in the management of processes that are essential to all of the system alternatives. This chapter provides management prescriptions for the following problems:

- a. TOE for at least 10 percent of MTOE units in the Active Army are no longer updated.
- b. Published CCT contain correctable errors in equipment requirements.
- c. Approved doctrinal manpower requirements are not reflected in all TOE.
- d. Personnel requisitions resulting from MTOE changes are not filled by the effective date (EDATE).

Narrative discussions of these problems and associated management prescriptions are provided in the following paragraph. The chapter concludes with tabular summaries of each discussion.

5-2. DISCUSSION. The presentation that follows focuses on the cause and effect of each problem, prescriptive measure(s) recommended, and impacts that might result from a decision to apply the prescriptive measure(s).

- a. Problem: TOE for at least 10 percent of MTOE units in the Active Army are no longer updated. Approximately 10 percent of Active Army MTOE units are organized under TOE which have been superseded.

(1) Cause. Due to the workload involved in maintaining a large number of TOE documents, a decision was made in 1973 to require that TRADOC update only the current TOE for a particular type unit. This meant, for example, that the G series TOE for a rifle company, infantry battalion would not be revised after the H series TOE for that type unit was published. For a number of reasons, principally a lack of resources required to make the conversions, more than 10 percent of units in the Active Army force structure are still organized under TOE that have been superseded; TRADOC does not prepare TOE changes to those documents.

(2) Effects. A significant effect of the current policy is that TRADOC, the US Army agency responsible for combat developments, is not applying the latest doctrinal or HQDA directed changes to organizational models used by more than 10 percent of Active Army MTOE units. To some extent, these changes are made directly to MTOE documents maintained at the major command level, but this is a "stop-gap" measure at best. The MACOM has neither the information base nor the staff personnel necessary for analyzing the impact of latest doctrinal developments on unit organizations. Were these available at MACOM level, it would still be desirable for reasons of uniformity and efficiency, to have TRADOC perform the Army-wide function. This decentralized method of determining how organizations should be modified to reflect changes in doctrine leads to increasingly "non-standard" MTOE. The MTOE for a particular type unit in one MACOM will be dissimilar to those of another MACOM, and, to the extent efforts are made at MACOM level to keep the organizations current, all MTOE will be dissimilar to the TOE. Since procedures for keeping the organizational documents current with respect to trends and advances in combat developments are neither comprehensive nor uniform, resultant MTOE will contain something other than a proper mix of personnel and equipment. This will cause improper data to be used as input to SACS computations and unit status to be measured against an inappropriate standard.

(3) Prescription. The policy decision made in 1973 should be rescinded; i.e., TRADOC should be assigned responsibility for maintaining and making necessary revisions to all TOE documents which have known current or future impact on the Army force structure. In order to reduce the workload increases at TRADOC that would result from this increased mission, HQDA should make a concerted effort to insure that MACOM organize MTOE units under the latest applicable TOE document.

(4) Impact. The prescriptive measures described would serve to solve this problem and correct the effects previously mentioned. There are, however, two costs (i.e., negative impacts) incurred. First, there will be an increased workload at HQTRADOC and at schools and integrating centers responsible for maintaining TOE documents. Currently, there are 222 TOE documents with force structure implications that are not updated by TRADOC. This addition would increase by 20 percent the total number of TOE documents maintained and updated by TRADOC. The second cost would be in terms of the resources required to convert units to the configuration required by current TOE documents. These conversions will serve to increase the degree of unit standardization in the Army while reducing the number of TOL documents in the TRADOC file.

b. Problem: Published CCT contains correctable errors in equipment requirements. The present policy of conducting a DARCOM review of TOE for correctness of equipment allocation appears neither adequate nor efficient.

(1) Cause. The present TOE change process does not provide for a DARCOM review of all equipment change actions prior to publication in a CCT. To insure appropriate equipment and associated support equipment allocations, the US Army Equipment Authorizations Review Activity (EARA), in support of HQDARCOM, is tasked to review and analyze all TOE as well as all TAADS documents. EARA however, receives only selected TOE change actions prior to publication in the CCT; all other changes are reviewed by EARA after the CCT is published. Generally, this means that EARA reviews only certain major equipment changes prior to CCT publication. Nonmajor equipment changes receive only post-publication EARA review. It is these low-visibility change actions that will normally result in allocation errors.

(2) Effect. Equipment errors published in the CCT ultimately cause errors in the equipment types and quantities that units are required and authorized to requisition and have on hand. Any error promulgated in a CCT must be corrected in a later CCT; MTOE changes reflecting the error will also require subsequent correction. This creates turbulence in the documents system and that turbulence may be transmitted to the logistics system in the form of requisition, issue, and/or turn-in of equipment. In addition to increased turbulence and workload in units, equipment errors documented in MTOE are input to TAADS and SACS. Through these processes, equipment errors may be perpetuated into the IIQ, AAO, AMP, and the procurement process causing overstated or

understated procurement objectives and procurement funding requirements. Finally, actual procurement of erroneous quantities of equipment has an adverse readiness impact.

(3) Prescription. EARA should systematically review all TOE changes with equipment implications prior to publication in a CCT. The review should consider each individual change for resource allocation accuracy and compatibility and also analyze the collective resource requirements of related changes.

(4) Impact. Review of all change actions prior to CCT publication by EARA will improve the accuracy of equipment requirements and authorizations. This will reduce turbulence for the MACOMs and for units. A reduction in turbulence will reduce workload through reduced requisitions, issues, and turn-ins in reaction to erroneous changes in equipment authorization. More accurate statement of equipment requirements and authorizations may favorably affect unit readiness through improvements in procurement and distribution programing. A potential adverse impact of this prescription may be borne by EARA as practicality may require that a prepublication review be performed in less time than is presently allowed. The total workload should not increase appreciably but may occur over a shorter time period.

c. Problem: Approved doctrinal manpower requirements are not reflected in all TOE. The manpower criteria (MACRIT) as published in AR 570-2 are not applied in timely fashion to personnel requirements in TOE documents.

(1) Cause. The MACRIT, which form an important basis for determining personnel requirements of TOE organizations are reviewed once every 3 years according to a schedule published by TRADOC. After a study of a particular MACRIT is completed, it is forwarded to HQDA and, if approved, that MACRIT is published in a change to AR 570-2 and becomes the basis for analysis to determine the personnel requirements for an organization. As TOE documents are reviewed (on a 3-year cyclic basis) MACRIT are applied but subsequent MACRIT updates may not be reflected in a TOE until that organization is reviewed again (every 3 years). This deficiency exists because the mechanism currently does not exist to apply all approved MACRIT to the entire TOE file in a timely fashion.

(2) Effect. The net effect of this problem is that TOE documents, which serve as the models for MTOE unit configuration, are not always in consonance with published regulations regarding manpower utilization. There is a significant time lag between

publication of HQDA approved manpower criteria and the updates of TOE to reflect the criteria. As a consequence, the TOE do not accurately depict the "best" doctrinal organizations.

(3) Prescription. An automated routine for application of MACRIT to all TOE should be developed and used at HQTRADOC. The program should be designed to perform centrally the computations currently being done at schools having TOE proponentcy.

(4) Impact. The principal effect of this prescription would be to cause all TOE to conform with MACRIT published in AR 570-2. The workload at HQTRADOC would increase, but the workload at schools having TOE proponentcy would decrease. Overall, an automated routine for MACRIT application would result in a lesser TRADOC workload and provide TOE and MTOE which reflect the latest workload criteria.

d. Problem: Personnel requisitions resulting from MTOE changes are not filled by the EDATE. There is a significant time delay between a personnel change entry in TAADS and the notification to MILPERCEN. Consequently, personnel are not assigned until after the EDATE.

(1) Cause. Current HQDA policy requires that an MTOE change for a unit be entered in TAADS a minimum of 180 days prior to the EDATE of the change. Other HQDA policy stipulates that MTOE documents may only be entered into TAADS during two separate 3-month periods each year; the January through March and July through September MOC windows. PERSACS computations, the results of which provide personnel managers with information needed to make assignments, are made at the close of each window. Approximately one month is required for preparing files, performing computations, and forwarding PERSACS reports to MILPERCEN. Assignments personnel at MILPERCEN project assignments 6 months out from PERSACS; the 6 months allows for processing assignment instructions, providing sufficiently early notification to the individual being transferred, and providing the individual with adequate leave and travel time prior to scheduled reporting date at the new station. Thus, MILPERCEN projects an assignment approximately 7 months out from the time the MOC window closes.

(2) Effect. An MTOE document submitted during a MOC window will be in TAADS for 1 to 4 months by the time MILPERCEN receives a PERSACS report reflecting the change. If the document was submitted with a minimum (i.e., 6 months) leadtime to EDATE, MILPERCEN may have as little as 2 months leadtime for assignment processing.

The normal 6-month assignment projection results in a scheduled personnel arrival at new station 1 to 4 months after EDATE of the new MTOE. After the EDATE, the new MTOE becomes the basis for submission of the Unit Status Report. Personnel changes that are not accomplished in a timely fashion can adversely impact on a unit's overall status.

(3) Prescription. In order to provide MILPERCEN with a 6 month leadtime for assignment processing, the following changes to AR 310-49 should be made:

(a) The leadtime to EDATE of new MTOE documents should be measured from the close of the MOC window in which the document is submitted rather than from the date of TAADS entry.

(b) The minimum leadtime to EDATE should be increased from 6 to 7 months.

(4) Impact. This will cause force structuring actions to conform better with the ability of MILPERCEN to make personnel re-distributions. To the extent that MTOE change actions will occur within normal assignment projections, they will not require exception-type management by MILPERCEN. This will result in reducing turbulence and frustration throughout the personnel system. Force structure managers will be somewhat more constrained in adjusting end strength due to the increased leadtime requirement. The actions allowed under this policy should, however, be more realistic and achievable.

5-3. SUMMARY. The appropriateness and utility of the management prescriptions contained in this chapter were verified through coordination with HQDA and MACOM points of contact. Summaries of each problem and prescription are provided in Tables 5-1 through 5-4. These tables, arrayed in order of presentation, indicate, in abbreviated form, the problem, its cause and effect, the prescription, and the probable impact of the prescription. These management prescriptions complement the alternatives discussed in Chapter 4. The results of the analyses expressed in Chapters 4 and 5, used in conjunction, can significantly enhance the Army's implementation of change environment.

Table 5-1. Incomplete Update of TOE

PROBLEM: TOE for at least 10 percent of MTOE units in the Active Army are no longer updated

Cause	Effect	Description	Impact of prescription
TRADOC updates only the latest published TOE for any type unit	Readiness not measured against accurate standard	TRADOC should maintain all TOE under which a unit is organized in active and reserve components	Additional workload at TRADOC to maintain TOE file
Not all units organized under latest available TOE	Valid requirements not computed in SACS	MACOM should organize all MTOE units under latest series TOE unless approved by HQDA	One time demand for resources to convert MTOE units to latest TOE configuration
	Latest doctrine/directed changes not applied to all units		Increased standardization of MTOE units
	Standardization decreased		MTOE units will have latest doctrinal/directed changes applied

Table 5-2. Equipment Errors in CCT

PROBLEM: Published CCT contains correctable errors in equipment requirements

Cause	Effect	Prescription	Impact of prescription
DARCOM (EARA) does not conduct complete prepublication review of CCT actions	Errors in equipment requirements/authorizations Extra workload on units and logistics system	DARCOM (EARA) should review all TOE change actions with equipment implications prior to publication of CCT	Increased accuracy of equipment requirements Reduced authorization turbulence Reduced workload on units, logistics system DARCOM (EARA) time to review change actions compressed

Table 5-3. Time Delay in Applying Approved Doctrine to TOE

PROBLEM: Approved doctrinal manpower requirements are not reflected in all TOE

Cause	Effect	Description	Impact of prescription
MACRIT revisions occur each year	MACRIT reaction time not accurately reflected	Develop automated procedure for simultaneous MACRIT application to all TOE	Total personnel requirements depicted
No procedure exists for simultaneous MACRIT application to all TOE	Ultimate effects of MACRIT never fully identified		TOE analysis workload
May require up to 3 years for TOE application			- Increase at HQ TRADOC - Decrease at schools doing TOE revision

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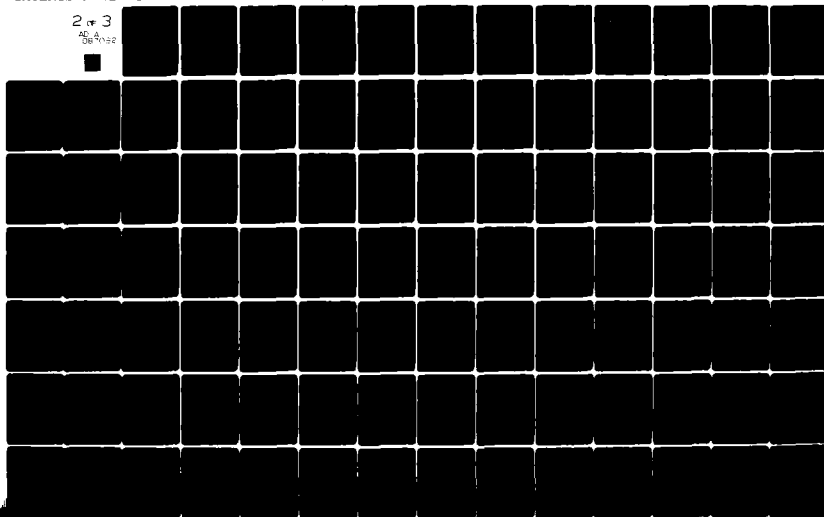


Table 5-4. Inadequate Lead Time for Personnel Requisitions

PROBLEM: Personnel requisitions resulting from MTOE changes are not filled by the EDATE

Cause	Effect	Prescription	Impact of prescription
Policy requires 180 day minimum lead time to EDATE	Normal procedures result in personnel arrival 30-120 days after EDATE	Measure EDATE from close of MOC window	EDATE synchronized with MILPERCEN assignment objectives
Lead time measured from TAADS entry	Personnel shortfall impacts unit status	Provide minimum of 210 days lead time to EDATE	Reduced turbulence in assignment actions
PERSACS computed at close of MOC window			Fewer exceptions for MILPERCEN management
Begins 0-90 days after new MTOE entry in TAADS			Adequate notification lead time to individual reassigned
Computations require about 30 days			Increased lead time required for MTOE change
PERSACS to MILPERCEN 60-150 days prior to EDATE			- Less responsive - More realistic
MILPERCEN projects assignments 180 days out from PERSACS			

CHAPTER 6

SUMMARY AND OBSERVATIONS

6-1. INTRODUCTION. The Implementation of Change (IC) Study provides an analysis of the major Army management processes which are intended to control the implementation of TOE changes in MTOE units. The essential elements of analysis (EEA) provided in the tasking directive focused the study on the processes which cause or direct changes and those processes which provide resources. The efficiency of the processes and synchronization, or lack thereof, among processes was analyzed critically. The analytic effort developed several observations which state or connote deficiencies in the current system. In several instances, management prescriptions were developed to alleviate some of the problems (see Chapter 5). Also, an understanding of the problems associated with the current system led to the development of alternatives exhibiting varying degrees of benefit when compared with current operations (see Chapter 4). This chapter summarizes the efforts of the IC Study by specifically addressing the EEA required by the tasking directive. The chapter concludes by presenting the seven major observations of the study.

6-2. ESSENTIAL ELEMENTS OF ANALYSIS. The EEA which were required during the study and which guided the conduct of the study are stated and discussed below:

a. What are the various types of TOE changes, and the sources and approval authorities for those various types of TOE changes? When do they occur? This study identified two generic types of TOE changes: (1) substantive changes or those which create a change in resource levels; and (2) nonsubstantive changes or those changes which do not create a change in resource levels. Sources of change to TOE are innumerable because changes may be initiated by individuals or organizations at any level of the Army structure. Most TOE changes, however, result from the six processes discussed in Appendix E, i.e., MACRIT, BOIP, doctrinal studies, scheduled review of TOE, changes to SB 700-20, and MOS changes. All changes generated through these six processes which would result in increased resource levels must be approved by the appropriate HQDA proponent. All nonsubstantive changes and changes which result in resource reductions may be approved by HQTRADOC and are applied to TOEs as appropriate. TOE changes occur continuously. They are accumulated for 6 months and then are promulgated to MACOMs via the CCT in April and October. While the MOS structure and the SB 700-20 change processes are continuous, these changes are applied to the TOE file semiannually as discussed in

Appendix E. Scheduled TOE review occurs on a 3-year cyclic basis; every TOE is reviewed sometime during the 3-year cycle. In summary, TOE changes are always occurring.

b. When and where are resources identified to support the various types of TOE changes? The nonsubstantive changes require no resources for implementation. Substantive changes are approved by HQDA as individual actions (i.e., each TOE change is reviewed on its own merits) and are applied by TRADOC to TOE as appropriate. The costs associated with these changes are not determined until after the April or October CCT directs that the changes be implemented in MTOE units. Each MACOM headquarters analyzes the CCT to determine resource requirements. The MACOM then implements those changes for which it has resources. Requests for resources to implement the remaining unresourced changes are submitted to HQDA as Program Development Increment Packages (PDIP) during the next POM development cycle. If the decision is made at HQDA to resource part or all of the PDIP, those resources will be identified through the POM process and provided to the MACOM via the PBG. All of these costing and resourcing actions are accomplished after the MACOM is directed to implement the changes and may result in delays of two years or more pending receipt of resources.

c. What is the DA system for resourcing TOE changes? Is it efficient? Where are the weak areas?

(1) The HQDA system for resourcing TOE changes is the PPBS POM development process. As discussed above, the current system requires that MACOMs perform the affordability analyses and then submit PDIPs to HQDA requesting resources to implement unresourced change requirements. HQDA determines if any TOE changes reflected in the PDIPs have been resourced through previous POM development processes. Decisions are then made at HQDA relative to which remaining PDIPs will be funded and which will not. Historically, PDIPs requesting resources to implement TOE changes have not been funded; thus many changes which were directed by HQDA are not funded by HQDA and are not affordable within MACOM resources.

(2) The current system for resourcing changes is not efficient. Efficiency would imply that resources would be made available so that changes could be implemented in the same timeframe that the change is directed. The current system requires the cumbersome MACOM analysis and justification, via PDIP, of resources to implement the changes which have been directed by HQDA. It is inefficient in terms of documenting requirements in MTOE. A full discussion of these processes (Chapter 3) points out that certain unresourced and unaffordable (by the MACOM) changes cannot be documented until 17 months after the CCT is published.

(3) This study identified six major weaknesses in the current system for resourcing TOE changes:

(a) TOE changes are approved on an individual basis. As a result, the CCT is not synchronized with force structure management.

(b) Full affordability of the CCT is not determined at any time.

(c) Each MACOM determines how TOE changes will be implemented, thus standardization of like units is not attained.

(d) Valid wartime requirements are not fully documented in MTOE.

(e) There is a built-in divergence between the TOE and MTOE. Undocumented requirements accumulate, and the SACS does not reflect all valid requirements.

(f) Readiness is not reported against the intended standard.

d. How do the MACOM, with large quantities of MTOE, manage the implementation of TOE changes to foster DA policy of a standard force structure? Is that efficient? Do they have adequate management tools?

(1) Each MACOM has developed command unique processes and procedures to implement the TOE changes which are determined to be affordable. Standardization within the MACOM is one objective of those procedures. The current Army-wide system for implementation of TOE changes fails to support the HQDA goal of a standard force structure. The MACOMs, without HQDA guidance or resources, determine how much change is affordable, then implement those changes independent of other MACOMs. These independent actions cause large dissimilarities between like type units assigned to different MACOMs.

(2) These command unique processes are not supported by overall HQDA management of standardization in the area of TOE changes. Lack of HQDA guidance and resources, and the resultant MACOM unique decisions fosters nonstandardization. Much of the MACOM analysis is done through manual procedures. Inefficiency also exists in that much of the analytic process is replicated by each MACOM.

e. What additional synchronization is required between the processes for generating TOE changes and those for managing resources? Who should be responsible?

(1) Presently each substantive change is reviewed and approved by HQDA as an individual action. This review and approval process considers the resource cost of that action in isolation, i.e., without regard for related changes or force structure management processes. The change generating and resource management process synchronization could be enhanced by review of each change with respect to the synergistic impact of that change and related changes. Management of the force structure and the processes for review and approval of TOE changes are not integrated or synchronized. There is no procedure to assess the resource cost or affordability of all changes incorporated in a CCT, therefore, management of resources to implement changes in a timely manner is not possible. To provide order and efficiency to the TOE change system, several of the alternatives presented in Chapter 4 propose that there should be synchronization of the TOE review and approval process, the force structure management process, and the costing, prioritization and affordability analysis of the collective TOE changes published in the CCT. Finally, the resource allocation process should be synchronized with the above processes, in order to provide adequate implementation guidance to the MACOM at the same time that changes are directed.

(2) HQDA, ODCSOPS, should be responsible for synchronizing those processes to insure that resources are provided to implement the directed changes.

f. What impact would revised processes have on HQDA and MACOM ability to manage the force through the Structure and Composition System (SACS)? The impact of revised processes depends totally upon the revision made in any process of the current system. A revised system to provide synchronization as discussed in the previous paragraph would enhance the force management capability. It would insure that individual changes are evaluated relative to the force structure and that resources/guidance are provided to insure early documentation. Early documentation would insure early entry of resource requirements into SACS for enhanced force management.

6-3. OBSERVATIONS. The major observations resulting from this study are presented in the following material:

a. The HQDA system for review and approval of changes to TOE considers each change action as an individual action. Approved change actions are forwarded to HQTRADOC where they are accumulated in automated files until April and October of each year when they are printed and published as the CCT. While each change action may be costed at HQDA, the CCT is not analyzed for cost and affordability prior to promulgation. Each MACOM determines CCT affordability relative to that MACOM only; therefore, full affordability of the total CCT is never determined.

b. Most TOE changes are generated by the six processes discussed in Appendix E. None of those processes are synchronized with the Total Army Analysis or other force structure management processes which also dictate changes to requirements.

c. The TOE changes accumulated over a 6-month period and published in a CCT represent a large volume of change. Chapter 3 paragraph 3-2 provides a detailed discussion of the volume of change occurring in selected TOE and CCT. Published changes may be:

- (1) Administrative--require no resource change
- (2) Resource reducing--delete resource requirements
- (3) Already resourced--increase personnel/equipment requirements for which resources have been programed through PPBS
- (4) Unresourced--increase personnel/equipment requirements but no resources are identified/provided to implement the change

d. Each MACOM conducts affordability analysis and determines how to implement the CCT actions in subordinate units. Administrative, resource reducing, and already resourced changes may be applied readily. Unresourced changes must, if implemented, be resourced from reductions or other trade-offs. Some changes directed in the CCT cannot be implemented because of limited resources. The goal of Army-wide standardization of like units is impacted detrimentally because the MACOMs, through independent analyses and decisions, choose to implement changes differently.

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e. When resources are not available to implement changes, requirements are not documented in MTOE. Failure to document TOE changes in MTOE creates a divergence between the unit and the best wartime organization (the TOE on which the MTOE is modeled). Further, failure to document valid requirements in MTOE prevents their entry into the SACS and ultimately results in failure to procure resources.

f. The Unit Status Reporting System is designed to compare the actual MTOE unit with the model (TOE Level 1) unit. Unit status is reported against the MTOE required column which should reflect the TOE Level 1 column. When TOE changes are not documented in the MTOE required column, unit status is reported against other than the intended standard and provides a false picture.

APPENDIX A
STUDY CONTRIBUTORS

1. STUDY TEAM

a. Study Director

LTC Leroy A. Babbitt, Requirements Directorate

b. Team Members

LTC Samuel M. Burney, Jr., Methodology and Computer
Support Directorate

LTC Jerry W. Mangrum, Systems Force Mix Directorate

MAJ Harry J. Bartosik, Joint Forces and Strategy Directorate

c. Other Contributors

Mr. Jack M. Meyerowitz, Methodology and Computer Support
Directorate

Ms Cynthia S. Pullo, Methodology and Computer Support
Directorate

d. Support Personnel

SP5 Rowen G. Ambery, Graphic Arts Branch

Ms Carrie Allen, Word Processing Center

Mr. Stanford W. Dennis, Graphic Arts Branch

Mr. Raymond Finkleman, Word Processing Center

Ms Julia A. Fuller, Word Processing Center

Ms Joyce W. Garris, Word Processing Center

Ms Bobbie Carol Guenthner, Word Processing Center

Ms Rosaline A. Hill, Word Processing Center

Ms Thelma L. Laufer, Requirements Directorate

Ms Nancy M. Lawrence, Word Processing Center

Ms Judy L. Rosenthal, Graphic Arts Branch

2. PRODUCT REVIEW BOARD

Mr. David A. Hurd, Chairman, Methodology and Computer Support
Directorate

MAJ John C. Kuntzman, Joint Forces and Strategy Directorate

MAJ Robert A. Wilkinson, Jr., Requirements Directorate

APPENDIX B
STUDY DIRECTIVE



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
WASHINGTON, D.C. 20310

REPLY TO
ATTENTION OF: DAMO-FDU

17 SEP 1979

SUBJECT: Implementation of Change (IC) Study

Commander
US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20014

1. PURPOSE OF STUDY DIRECTIVE. This directive provides for the establishment of a study group to analyze the processes used to control organizational changes to tactical units and to suggest improvements and prescriptive measures that will synchronize the changes with the resource allocation processes.

2. STUDY TITLE (Category 3, Operations and Force Structure). Implementation of Change.

3. BACKGROUND. A generic type-organization document is developed and maintained for every combat-oriented unit in the Army; the document is called the Table of Organization and Equipment (TOE). The TOE stipulates the minimum essential personnel and equipment to accomplish the unit's wartime mission. Changes to TOE documents are published semi-annually to reflect the most current organization in terms of doctrine, personnel, and equipment. The TOE are models for organizing every actual tactical unit under a specific authorization document called a Modification Table of Organization and Equipment (MTOE). The MTOE identifies both the requirements and the authorizations for the unit. The required column specifies the personnel and equipment required for a wartime capability. The authorized column reflects the personnel and equipment the unit should have on hand. The implementation in MTOE of TOE changes which add organizational elements, personnel positions, and/or equipment impacts on Army resources in terms of capital investment, operational costs and manpower/equipment redistribution. In addition to TOE changes, changes to component items of equipment in MTOE documents frequently cost the Army resources; e.g., changes to components of sets, kits and outfits (SKO). On the other hand, failure to implement TOE changes results in units not being organized at the latest wartime design capability. There are no effective management processes for generating and distributing resources in conjunction with the TOE or component changes

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provided to the major Army commands (MACOM).

4. STUDY SPONSOR. Deputy Chief of Staff for Operations and Plans (DCSOPS).

5. STUDY AGENCY. US Army Concepts Analysis Agency (CAA).

6. TERMS OF REFERENCE.

a. Problem. The various processes for generating changes to the MTOE are not linked in effective or timely ways to the processes for generating and allocating resources.

(1) The Army lacks an effective management system to synchronize the approval of TOE and MTOE changes, to secure resources for the changes, and to provide guidance for the timely, prioritized implementation of these changes to the force structure.

(2) Where assets are not readily available, MACOMs implement TOE changes by reallocating resources, generating concept plans to implement changes outside the current force structure program, or defer the implementation of changes to preclude lowering of unit status reports (C-rating). These command unique implementation processes have an adverse impact on DA policy to standardize same type units in the force structure based on the latest doctrine and organization as reflected HQDA approved TOE.

b. Objectives.

(1) Analyze the processes at HQDA for approving and resourcing TOE changes and at MACOM for incorporating new TOE and TOE changes into the force structure.

(2) Analyze how HQDA and MACOM use the TOE change guidance, the BOIP and actual revised MTOE for programing and budgeting resources.

(3) Analyze the use of the TOE ALO 1 and MTOE required and authorized columns in the determination of requirements, distribution, and unit status reporting processes.

(4) Identify the Army management processes for generating, reviewing and approving MTOE changes and suggest improvements as appropriate.

(5) Prescribe alternative measures to improve the synchronization of TOE change implementation and resource allocation processes.

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(6) Formulate candidate controls that would limit the frequency, quantity, and redundancy of the TOE changes.

c. Scope. The study will examine--

(1) The processes for managing implementation of TOE changes from HQDA to unit (battalion/separate company) level.

(2) The personnel, equipment and funding processes for securing and distributing resources to implement the TOE changes.

(3) The processes for generating component item changes to sets, kits, and outfits and for providing resources to incorporate the changes.

d. Limitations. The study will--

(1) Focus on the uses of management information systems (MIS) rather than on the internal system operations.

(2) Research the activities of only selected MACOM.

(3) Identify and analyze key processes associated with the implementation of new and revised TOE.

(4) Characterize all systems involved and systems interfaces that are present or lacking.

(5) Formulate and prescribe suggested improvements and alternative information flow processes; staff coordination of the study report and implementation of prescriptions will be the responsibility of the study sponsor.

e. Time Frame. FY 79 - FY 80.

f. Assumptions.

(1) Administrative staffs cannot be augmented based on the results of this study; administrative staffing may be redistributed.

(2) The selective implementation of TOE changes can be scheduled over time based on the availability of resources and MTOE unit priorities.

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g. Essential Elements of Analysis (EEA).

(1) What are the various types of TOE changes, and the sources and approval authorities for those various types of TOE changes? When do they occur?

(2) When and where are resources identified to support the various types of TOE changes?

(3) What is the DA system for resourcing TOE changes? Is it efficient? Where are the weak areas?

(4) How do the MACOM, with large quantities of MTOE, manage the implementation of TOE changes to foster DA policy of a standard force structure? Is that efficient? Do they have adequate management tools?

(5) What additional synchronization is required between the processes for generating TOE changes and those for managing resources? Who should be responsible?

(6) What impact would revised processes have on HQDA and MACOM ability to manage the force through the Structure and Composition System (SACS)?

7. RESPONSIBILITIES.

a. The DCSOPS will--

(1) Appoint a study coordinator.

(2) Control HQDA and MACOM membership in a study advisory group, and convene meetings of that group.

(3) Provide a list of POC at HQDA and MACOM.

b. The HQDA staff, specified MACOM and other selected agencies will--

(1) Participate in study advisor group meetings.

(2) Designate a POC.

(3) Provide information on existing processes, associated problem areas and on-going improvement projects (e.g., FORDIMS, TAEDP).

(4) Participate in quality assurance reviews to support the study efforts.

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c. The CAA will--

(1) Designate a study director, prepare a study plan, and establish a full-time study group.

(2) Communicate directly with HQDA, MACOM, and all other agencies associated with this study effort.

(3) Provide IPR as scheduled (or as appropriate) and provide a study report documenting the findings and alternatives.

8. LITERATURE SEARCH.

a. All POC identified by HQDA and MACOM will be contacted for background information.

b. Extensive interviews will be scheduled with representatives of organizations associated with the TOE change related processes.

c. The following studies should be examined during the research effort:

(1) Study Report, CAA-SR-77-7, dated June 1977, subject: Management of Change (MOC).

(2) Study Report, CAA-SR-79-6, dated March 1979, subject: Management Analysis of Key Resource Operations (MAKRO).

(3) Study Report, to be completed by ODCSPER, subject: Manpower Management.

(4) Study Report, to be completed by General Research Corporation for ODCSOPS, subject: Analysis to Determine Functional and Systems Requirements for an On-Line Structure and Composition System (SACS).

9. REFERENCES.

a. AR 1-1, 25 May 1976, Planning, Programing, Budgeting with the Army.

b. AR 310-31, 2 September 1974, Management System for Tables of Organization and Equipment (The TOE System).

c. AR 310-49, 10 June 1975, The Army Authorization Documents System (TAADS).

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- d. AR 71-2, Basis of Issue Plans, 19 April 1976.
- e. AR 310-34, Equipment Authorization Policies and Criteria, and Common Tables of Allowances, 24 February 1975.
- f. AR 570-2, Organization and Equipment Authorization Tables: Personnel, 22 July 1969.
- g. AR 611-1, Military Occupational Classification Structure Development and Implementation, 27 April 1976.
- h. CSR 11-1, The Planning, Programing, and Budgeting System, 25 November 1974.
- i. CSR 11-3, Army Five Year Defense Program, 21 February 1978.
- j. CSR 11-6, Program and Budget Guidance, 25 August 1979.
- k. CSR 11-9, Policy for Resource Support of DA Directed Program Changes, 26 April 1976.
- l. CSR 11-16, Program and Budget Support Guard and Reserve Forces, 11 January 1974.
- m. CSR 11-23, Total Force Analysis, 9 July 1975.
- n. CSR 11-24, Force Structure Procedures, 1 October 1975.
- o. CSR 310-44, The Army Authorization Documents System, 11 June 1979.
- 10. ADMINISTRATION.
 - a. SUPPORT.
 - (1) Funding for TDY associated with the study effort will be the responsibility of the participating organization.
 - (2) ADPE support will be accomplished using CAA computer resources.
 - b. MILESTONE SCHEDULE. See Inclosure. Delivery of final report: 30 June 1980.

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c. CONTROL PROCEDURES. The ODCSOPS study coordinator will provide guidance to the study and satisfy reporting requirements of AR 5-5, The Army Study System.

d. ACTION DOCUMENT. A final study report will be published.

e. This directive has been coordinated with CAA in accordance with AR 10-38.

2 Incl
as



GLENN K. OTIS
Lieutenant General, GS
Deputy Chief of Staff
for Operations and Plans

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STUDY

Implementation of New and Revised TOE

POINTS OF CONTACT

POINT OF CONTACT
04/05-GS-12/13

DCSOPS

DAMO-FD (COORDINATOR)	X
DAMO-FDA	X
DAMO-FDP	X
DAMO-FDU	X
DAMO-FDF	X
DAMO-RQR	X
DAMO-RQS	X
CNGB	X
CAR	X
DCSPER	X
DCSLOG	X
DCSRDA	X
COA	X
DASG	X
MILPERCEN	X
DARCOM	X
TRADOC	X
FORSCOM	X
USAREUR	X

NOTE: It is anticipated that Point of Contact participation will not exceed 3 hours per week. However, unforeseen circumstances may require more time than planned.

INCL 1

STUDY SCHEDULE

- | | |
|--|--------------|
| 1. Define study plan and define the problems at HQDA and MACOM | Late Jul 79 |
| 2. IPR | Late Sep 79 |
| 3. Examine the existing processes for developing and directing changes to MTOE units | Mid Oct 79 |
| 4. IPR | Mid Nov 79 |
| 5. Analyze the information on the existing processes and formulate alternatives | Late Feb 80 |
| 6. IPR | Early Mar 80 |
| 7. Refine the analysis and develop the alternatives | Mid Apr 80 |
| 8. Final IPR | Mid May 80 |
| 9. Publish the Study Report | 30 Jun 80 |

INCL 2

APPENDIX C
BIBLIOGRAPHY

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Department of the Army Publications

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AR 70-1, Army Research, Development, and Acquisition, 1 May 75

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AR 71-1, Army Combat Developments, 16 Sep 68

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AR 220-1, Unit Status Reporting, 15 Jun 78, with interim change 01, dated 4 Dec 79

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AR 310-34, Equipment Authorization Policies and Criteria, and Common Tables of Allowances, 24 Feb 75

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AR 570-2, Organization and Equipment Authorization Tables - Personnel, 15 Sep 78, with Change 10, dated 15 Sep 78

AR 570-4, Manpower Management, Nov 75

AR 611-1, Military Occupational Classification Structure Development and Implementation, 27 Apr 76

AR 700-5, Total Logistics Readiness/Sustainability (TLR/S) Analysis, Apr 78

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AR 700-120, Materiel Distribution Management, Mar 74

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AR 710-3, Asset and Transaction Reporting System, Sep 72, with Change 7, dated 15 May 79

AR 710-60, Standard Study Number System and Replacement Factors, Jan 73

DA Pamphlet 11-25, Life Cycle System Management Model for Army Systems, May 75

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Manpower Authorization Criteria for Maintenance Functions, Interim Note No. 2, Jul 76

A Proposal for the Restructuring of the MACRIT for Maintenance Functions Procedures, Interim Note No. 67, Mar 78

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Letter, Gen Guthrie to LTG Meyer, DRCS-P, dated 22 Nov 78

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Teichroew, Daniel and Hershey, Ernest A., III., PSL/PSA: A Computer-Aided Technique for Structured Documentation and Analysis of Information Processing Systems, TUTORIAL: Automated Tools for Software Engineering, IEEE Computer Society and IEEE, Inc., Nov 79

APPENDIX D

DEFINITIONS

Authorized Acquisition Objective (AAO). (see Gross Requirement)

The quantity of an item authorized for peacetime acquisition to equip the US Army approved force in peacetime and sustain this force and specified allies in wartime from D-day through the period and at the level of support prescribed by the latest OSD guidance.

Army Equipment Status Reporting System (AESRS)

A system of asset reporting for selected items of Army-owned equipment to aid supply control and inventory management. The system is used by units, organizations, activities, and installations maintaining property books.

Allocated Strength. (see Strength)Army Materiel Plan (AMP)

A document that provides key logistic planning data for use in development of materiel acquisition programs. Requirements and asset reporting data are key inputs used by DCSRDA and DARCOM to develop the AMP.

Army Program For Individual Training (ARPRINT). A report generated by the Army Training Requirements and Resource System (ATRRS). The ARPRINT, as published, includes seasonality reports, input and load reports, course listings, installation load reports, comparison reports, and other data required to insure the training base is properly structured and scheduled to accommodate the Army's Annual Training Program.

Army Training Requirements and Resource System (ATRRS)

A HQDA system which draws information from and provides information to the DA staff, MILPERCEN, and its Reserve Components counterparts, the Army's school systems, and the Army's schools and training centers. It produces the Army Program for Individual Training (ARPRINT), the Military Manpower Training Report (MMTR) and other reports, analyses, and selected data displays pertaining to school entrants, graduates, training loads, and associated information. The ATRRS data base maintains information at the course level of detail on the majority of all courses taught by or for Army personnel.

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Automated Unit Reference Sheet (AURS)

A planning document depicting organizational structure. It is prepared during the materiel development cycle for use in requirements forecasting.

Authorized Strength. (see Strength)

Authorized Level of Organization

The authorized manpower spaces and equipment against which an organization is authorized to requisition personnel and equipment. ALO may be expressed in numerically or letter designated levels representing percentages of full TOE/MTOE manpower spaces (e.g., ALO 1 is 100 percent, ALO 2 is 90 percent, etc.). Inherent in the assigned ALO for an organization are the stated distribution objectives based on a programmed capability of the Army to provide assets at the designated level of personnel and equipment.

Basis of Issue Plan (BOIP)

A document used during the materiel development cycle to predict the quantitative requirements for a new item of equipment and to identify personnel changes.

Continuing Balance System (CBS)

A system designed to provide an accurate, timely, and audit-able worldwide asset position for major end items of equipment. The system maintains asset positions by assessing and screening, by computer program, those transactions (shipment, receipt, loss/recovery, modification) which cause net changes in asset positions.

Continuing Balance System - Expanded (CBS-X)

An expansion of the CBS which will replace AESRS, CONUS Depot Asset Reporting System, and several other asset reporting systems.

Consolidated Change Table (CCT)

A semiannual TRADOC publication which lists all approved changes made to TOE documents since the previous CCT was published. The CCT is published (tape released) in April and October each year.

Command Plan

A report submitted to HQDA by a MACOM or selected operating agency which reflects the current and future (insofar as guidance has been published) force structure and manpower distribution within the command or agency. The command plan troop list includes unit changes with effective dates (EDATES) in the out-years.

Common Tables of Allowance (CTA)

An authorization document for items of materiel required for common usage by individuals and/or TOE or TDA units and activities Army-wide.

Force Accounting System (FAS)

A multiple force system in which the actual, programed, and several alternate planning troop lists are retained in a single data file and updated simultaneously or individually. FAS retrievals permit detailed and summary analysis of the Army force structure.

Force Development Management Information System (FDMIS)

A part of the Army Management Information System containing force and authorization data which can be selectively manipulated and displayed to facilitate management decisions. Major FDMIS subsystems are: FAS, TAADS, SACS, BOIP, and TOE.

Force Structure Allowance (FSA)

That portion of the Congressionally authorized military manpower which may be allocated to the force structure. The FSA is determined by subtracting manpower allocated to Trainee, Reimbursable, and Trained Individuals (Transients, Patients, Prisoners, Students, Cadets) categories from the Total End Year Military Manpower Authorization.

Gross Requirement (Equipment)

The sum of IIQ, maintenance float, additive operational projects, special contingency, war reserve stocks for allies, and post D-day consumption requirements. The Gross Requirement is reduced by production offset and trade-off to derive the Authorized Acquisition Objective (AAO).

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Initial Issue Quantity (IIQ)

The IIQ is the TOE Level 1 (or MTOE Required) amount of equipment.

Line Item Number (LIN)

A six-digit alphanumeric identification assigned to generic nomenclatures and used to identify items of equipment in authorization documents.

Maintenance Float

End items of equipment authorized for stockage at installations or activities for replacement of unserviceable items of equipment when timely repair of the unserviceable equipment cannot be accomplished by the support maintenance activity. Maintenance float includes both operational readiness float and repair cycle float.

Manpower Authorization Criteria (MACRIT)

Criteria that are designed to establish an equitable relationship in TOE between services performed and the number and types of personnel required.

Master Force

The force from which planning, programing, and budgeting force structure data are extracted. It contains manpower requirements and authorizations as reflected in Program and Budget Guidance, Command Plans, etc., and is a basis for SACS computations.

Materiel Acquisition Readiness System (MARS)

An automated procurement program generator utilized by ODCSRDA to develop a baseline procurement program for analysis and development into the draft procurement program.

MOC Window

The semiannual 3-month periods during which TAADS documents may be updated with change submissions from the MACOMs. MOC (management of change) windows are 1 January-31 March and 1 July-30 September.

Operational Projects

Allowances for the provision of supplies over and above normal TOE/TDA quantities to support specific logistics, operational, or contingency plans.

Operating Strength. (see Strength)

Phased Equipment Modernization (PEM)

A subsystem of the TAEDP which provides the capability for time-phasing requirements and authorization changes in the TAEDP through the use of BOIP data.

Procurement Appropriation (PA-funded)

Procurement funded from five separate categories of appropriations: Aircraft Procurement, Army; Missile Procurement, Army; Procurement of Weapons and Tracked Combat Vehicles, Army; Procurement of Ammunition, Army; and Other Procurement, Army.

Production Offset

The quantity of an item which is deliverable to users from post D-day production to meet post D-day consumption requirements for those forces for which production offset is authorized.

Program Analysis and Resource Review (PARR)

The means by which a MACOM surfaces resource requirements early in the programming cycle. The PARR is submitted in mid-January to provide MACOM input to the Program Objective Memorandum published in May.

Program and Budget Estimate (PABE)

A MACOM document that furnishes, in budget-level detail, dollar costs and end strengths (for military and civilian manpower) to meet operating requirements as approved during HQDA staff review of the PARR. The PABE is submitted to HQDA in March.

Program and Budget Guidance (PBG)

A HQDA guidance document that provides information to commands and operating agencies for use in the preparation of Program Analysis and Resource Review (PARR), Program and Budget Estimate (PABE), and Command Operating Budget (COB) documents. The PBG is published three times per year.

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Program Development Increment Packages (PDIPs)

Issues which compete for resources in the program development process. They are formulated in the form of functional issues and costed in terms of resources.

Program Objective Memorandum (POM)

The document in which the Army describes its 5-year program. Published in May each year to cover the period FY+2 thru FY+6; i.e., in May 80 the POM covering FY 82-86 was published.

Quantitative and Qualitative Personnel Requirements Information (QQPRI)

Anticipated workload and personnel skill requirement detail submitted by the materiel developer during the materiel development cycle. This information provides a basis for TRADOC development of AURS and BOIP. The information also assists MILPERCEN in making MOS decisions relating to fielding of new equipment and in forecasting future personnel requirements.

Standard Study Number (SSN)

A unique 11-character identification used to indicate a single item or a group of items. Identification provides capability to generate a study (AMP, distribution plans, budget studies, etc.) at individual item level or roll up a group of items to any higher level that may be required.

Strength

a. Structure Strength. The full TOE strength or the "required" column strength for MTOE/TDA units. The terms "TOE strength" and "structure strength" are synonymous.

b. Authorized Strength. The strength reflected in the "authorized" column of an MTOE/TDA. It is that portion of "required strength" for which a unit can plan and program.

c. Allocated Strength. Manpower resources apportioned to a unit/command based on current constraints and decisions. These decisions amend or carry out authorized strength.

d. Operating Strength. A "faces" oriented strength. Refers to an organization's present for duty and absent (hospital, leave, temporary duty, etc.) strength--does not include in-transit strength.

Total Army Analysis (TAA)

For a given scenario and combat force, the Total Army Analysis process determines the types and amounts of combat support and combat service support structure required for each of the program years. Through computer assisted and qualitative analyses, the process produces a time-phased force requirements list for program development. The requirements are then analyzed by force structure managers at HQDA in order to project a total Army force structure across the program years that is within specified manpower constraints.

The Army Authorization Documents System (TAADS)

An automated file which includes equipment and personnel authorization and requirements, in paragraph and line detail for all units of the Active Army and Reserve Components. TAADS accepts data from the field through the extension of TAADS to the major commands (MACOMs). That extension is known as Vertical TAADS (VTAADS). A further extension links the system to installation level and is known as Installation TAADS (ITAADS).

Total Army Equipment Distribution Program (TAEDP)

A management information system which develops an equipment distribution program for the total Army force. It supports the AMP process and provides source data for POM annexes. The TAEDP provides asset position by LIN arranged to user needs and shows asset availability versus force requirements.

Vertical TAADS (VTAADS). (see The Army Authorization Documents System)

APPENDIX E

THE TOE CHANGE SYSTEM

E-1. GENERAL. This appendix describes the various processes that result in changes to TOE documents. A graphic overview of the current TOE change system is provided at Figure E-1. The left to right flow of that diagram shows the six major processes which initiate TOE changes and the routes for approval and introduction into the TOE and the CCT. Interaction and convergence of the processes occur as depicted in the figure. It should be noted that HQDA approval occurs separately for each of the six processes and therefore without regard for synergistic effects. Detailed discussions of the individual processes are found in annexes to this appendix. Each annex provides: (1) the purpose of the process; (2) a narrative description of the process; (3) the responsibilities of the various offices and agencies involved in conducting activities relating to the process; (4) key process milestones; and (5) a descriptive network model detailing workflows inherent in the process.

E-2. DISCUSSION. The TOE change system is composed of procedures that lead to the development, review, approval, and promulgation of revisions to existing TOE. As discussed in Chapter 3, TOE changes are categorized as either administrative or substantive. Administrative changes are those which have no resource impact; examples include changes to MOS, grade, branch, description, and remarks in Section II (Personnel) of the TOE and changes to Line Item Number (LIN), Equipment Readiness Code (ERC), description and remarks in Section III (Equipment) of the TOE. Substantive changes are those creating resource demands; examples include the addition or deletion of personnel or equipment lines and changes to listed quantities of personnel or equipment.

a. Developing TOE Changes. There are six processes through which the bulk of TOE changes are developed (see Figure E-1). These are:

(1) Manpower Authorization Criteria (MACRIT) Development. MACRIT are the basis for determining the number and type of personnel needed to perform specified work activities required for accomplishment of a unit's mission. MACRIT factors are reviewed on a scheduled basis. A MACRIT review schedule is published annually, and Army regulations require that each MACRIT be scheduled for review at least once every 3 years. Details of the MACRIT development process are in Annex I.

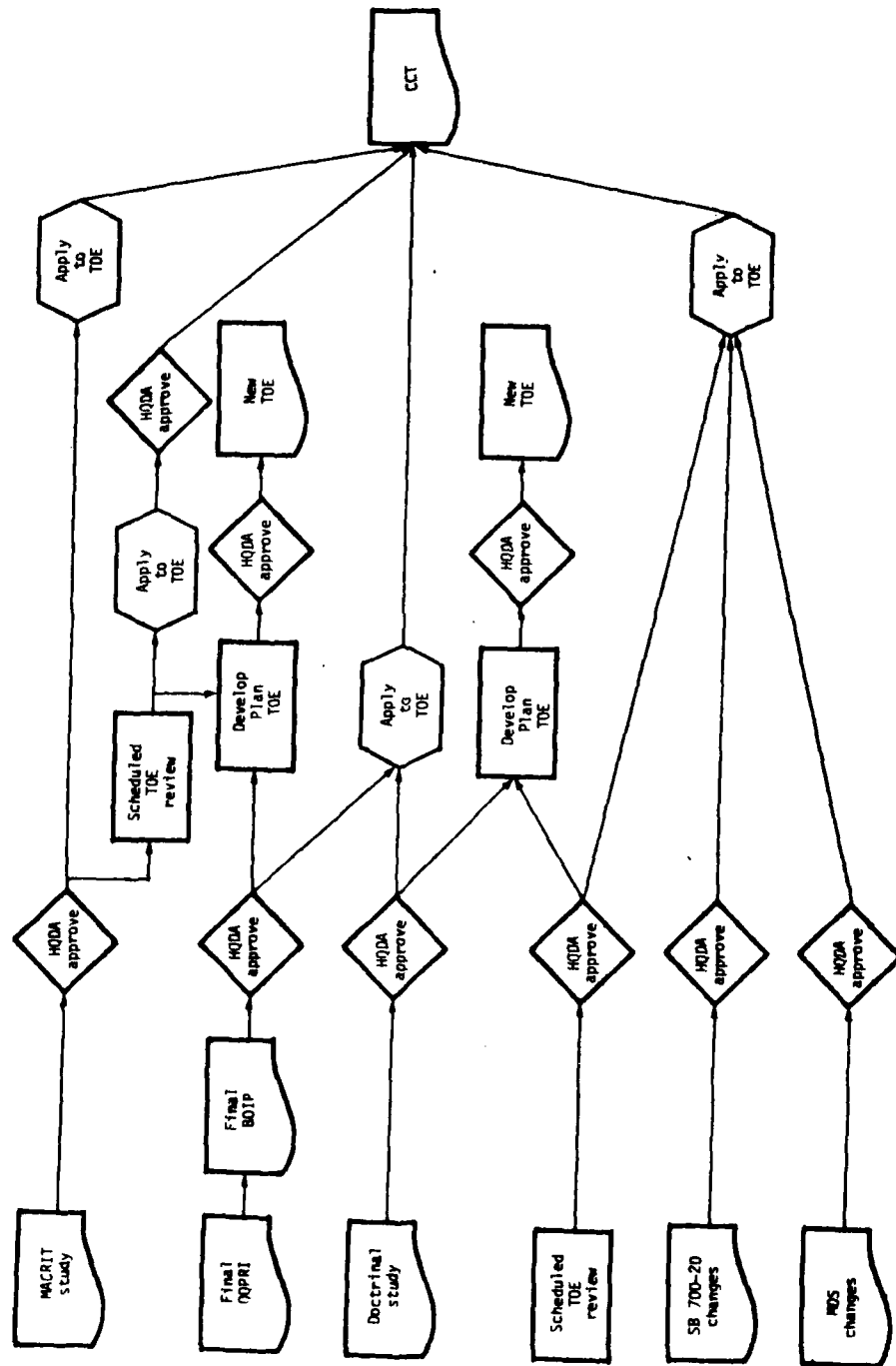


Figure E-1. Change Process Overview

(2) Basis of Issue Plan (BOIP) Development. This process identifies organizational equipment/manpower requirements for new materiel being introduced into the Army inventory. The BOIP provides planning data, early in the materiel development cycle, to support acquisition of new equipment as well as any personnel and/or ancillary equipment that will be required in organizations receiving the new equipment item. Details of the BOIP process are in Annex II.

(3) Doctrinal Studies. These are studies aimed at investigating a doctrinal need perceived by the Army. Examples of actions which fall into this category include TRADOC studies such as the Fire Support Team (FIST) Concept Study which consolidated the forward observer capability, organizationally, into the field artillery battalion as fire support teams; studies conducted outside the TRADOC community, such as WHEELS which analyzed the requirements for tactical wheeled vehicles within the Army force structure, and studies supporting HQDA directed actions, such as inclusion of a nuclear, biological, chemical (NBC) capability in all units. Details of the doctrinal study process are in Annex III.

(4) TOE Review. Each TOE is scheduled for periodic review aimed at incorporating the results of other actions and changes to insure the sufficiency of organizations. Details of the TOE review process are in Annex IV.

(5) Supply Bulletin (SB) 700-20 Change Process. This process results in equipment LIN changes and transfers from one chapter of the SB to another. Details of the SB 700-20 change process are in Annex V.

(6) Military Occupational Specialty (MOS) Change Process. This process results in changes to the MOS structure as well as minor changes to titles and relationships between grade, branch, and MOS. Details of the MOS change process are in Annex VI.

b. Review, Approval, and Promulgation of TOE Changes. The procedures for review and approval of TOE changes at different echelons vary depending on the nature, magnitude, and type of change. Substantive changes must be approved by HQDA while administrative changes may be approved by HQTRADOC. Some changes may be of such magnitude that an entirely new TOE must be published while others are published through the Consolidated Change Table (CCT) as changes to existing TOE. Details of the review, approval, and promulgation process are shown in appropriate network diagrams in Annexes I through VI. While the above activities generate the bulk of TOE changes, some change actions do not appear to fit such categorization. The addition of equipment readiness

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codes and changes that are the result of recommendations from Army units in the field are examples of other actions that have resulted in changes to TOE. Changes of this type, however, are either one-time changes or tend to follow the review and approval processes shown for doctrinal studies. The vast majority of TOE changes are caused by the six processes mentioned above, and development of an exhaustive list of possible actions resulting in TOE change is not necessary for the purposes of this study.

E-3. ANNEX FORMAT AND CONTENT. The six annexes to this appendix provide detailed information relative to each of the six processes summarized above. Each annex is organized to provide: (1) the purpose of the process; (2) a description of the process to include the workflows involved; (3) a responsibilities section which provides a listing of agencies and organizations and a statement of actions required by each to insure that the process operates successfully; (4) as applicable, the milestones or points which are considered most critical to the process; and (5) a network diagram depicting the process.

Annex I. MANPOWER AUTHORIZATION CRITERIA (MACRIT) DEVELOPMENT

E-I-1. PURPOSE. MACRIT are intended to establish an equitable relationship in TOE between services performed and the number and types of personnel utilized. The MACRIT provide standards and criteria to support refinement or changes to existing TOE, the establishment of new TOE, and the preparation of MTOE.

E-I-2. DESCRIPTION

a. MACRIT is the collective name given to approximately 100 criteria defined in Chapters 4 through 13 of AR 570-2 that are used to standardize personnel structures in US Army organizations. They are intended to insure that a consistent relationship exists between the workload to be performed by an organization and the number of qualified personnel found in the organizational structure. The MACRIT are for use in determining the number of direct workers required to perform effectively a specified work activity. Supervisory positions are not MACRIT based and are categorized as standard position requirements. Determination of these requirements is generally based upon tactical and organizational doctrine as modified by tests, maneuvers, and experience. Standard position requirements (both officer and enlisted) are detailed in Chapter 3 of AR 570-2.

b. The MACRIT concept can best be explained by use of an example. A typical authorization criteria is that used to determine the number of automotive maintenance (MOS 63B, 63C, 63J) positions required for performance of organizational maintenance within a unit.

The formula used is:

$$\sum_{i=1}^n \frac{A_i B_i}{C} = D$$

where: A_i = Density of equipment type i in the organization

B_i = Annual organizational level maintenance manhours required per item of type i (per AR 570-2)

n = Number of equipment types in the unit

C = Annual productive manhours per repairman (per AR 570-2)

D = Number of repairmen required

Factors B and C in the formula above are difficult to measure reliably as they reflect maintenance and performance statistics expected under "typical" combat conditions. Since more than half of the manpower positions in the force structure are MACRIT based, the overall impact of errors made in estimating these factors is highly significant.

c. MACRIT studies are performed on a cyclic schedule; each MACRIT is reviewed and updated every 3 years. MACRIT studies are performed at TRADOC schools with the materiel developer providing annual maintenance manhour (AMMH) input. The DCSPER, HQDA, is responsible for staff coordination and approval of MACRIT changes. Approved MACRIT are accumulated at HQDA and periodically published as changes to AR 570-2. Pending revision of AR 570-2, interested parties are made aware of approved MACRIT changes via the Organization Directorate Bulletin which is published monthly by TRADOC.

d. Once MACRIT are approved by the DCSPER, they are applied to TOE, and resultant changes to TOE are published as part of the CCT. The TOE changes resulting from HQDA approved MACRIT do not require HQDA approval prior to publication.

e. A network flow diagram of this process is provided at Figure E-I-1.

E-I-3. RESPONSIBILITIES. MACRIT development requires the support and interaction of several major organizations. The major contributors to the MACRIT development process and their responsibilities are listed below:

a. DCSPER, HQDA. The DCSPER exercises Army general staff supervision over MACRIT development and is the HQDA approval authority for all MACRIT.

b. TRADOC. TRADOC is charged with responsibility for development and preparation of MACRIT studies and for overall management of the MACRIT program for HQDA.

c. Materiel Developers. Proponent agencies develop AMMH requirements for equipment and provide that data to TRADOC.

E-I-4. MILESTONES. MACRIT are reviewed for update on a 3-year cyclic schedule.

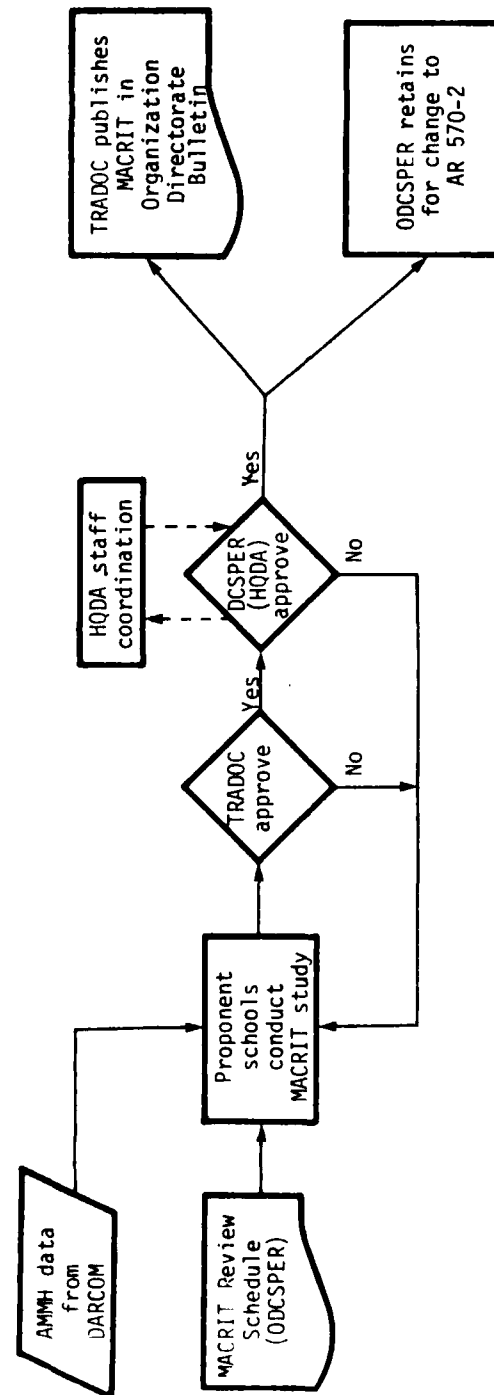


Figure E-I-1. MACRIT Development Process

Annex II. BASIS OF ISSUE PLAN (BOIP) DEVELOPMENT

E-II-1. PURPOSE. The BOIP is intended to provide, early in the materiel acquisition process, the data required to plan, program, and budget for modernized equipment items and associated personnel and equipment resources. The BOIP is used by HQDA to forecast requirements (equipment densities) for procurement programing purposes and to identify related personnel changes; by combat developers to revise TOE; and by MACOM to revise Tables of Distribution and Allowances (TDA) and other authorization documents after equipment has been type classified as Standard.

E-II-2. DESCRIPTION. The BOIP, with accompanying quantitative and qualitative personnel requirements information (QQPRI), is intended to provide, at any point in time, a coordinated "best" forecast of total personnel and equipment requirements resulting from proposed adoption of a new item of equipment. The BOIP, with QQPRI, progresses from an initial "tentative" (TBOIP/TQQPRI) version, through interim changes, to a "final" (FBOIP/FQQPRI) version as materiel development moves from the validation phase, through full scale development, to the initial production and deployment phase. Updates are submitted as changes occur. The process followed in submitting BOIP/QQPRI input is graphically displayed at Figure E-II-1.

a. The results of developmental and operational tests are analyzed by the materiel developer to determine the personnel and equipment impacts of new materiel systems. Equipment impacts are detailed on DA Form 3362b-R (BOIP Feeder Data), and personnel impacts are reported on the QQPRI. Each of these inputs is reviewed by a DARCOM support activity for correctness prior to forwarding to the combat developer; the Equipment Authorization Review Activity (EARA) reviews the BOIP feeder data and the Materiel Readiness Support Activity (MRSA) reviews the QQPRI.

b. Initially, Tentative QQPRI (formerly Provisional QQPRI) and BOIP feeder data is furnished by the materiel developer to the combat developer (school) for use in developing a Tentative BOIP. If it is anticipated that the introduction of the item will result in the need for a new type of unit, an Automated Unit Reference Sheet (AURS) is created to display, for planning purposes, the probable structure of the new unit. In such cases, the AURS will be revised throughout the development cycle and will eventually become the draft Plan TOE for the new unit.

c. The Tentative BOIP, with Tentative QQPRI, is forwarded by TRADOC to DCSOPS, HQDA, for review with the Required Operational Capability (ROC) document for the item. The TQQPRI and TBOIP provide valuable data for use by HQDA in assessing potential costs and affordability of new systems.

d. The TQQPRI and TBOIP are updated continually during the materiel development process so that current "best estimates" are always available for use in the resource allocation process. A Final BOIP, with Final QQPRI, is submitted to HQDA at least 15 months prior to scheduled type classification date or 27 months prior to scheduled availability date of the equipment, whichever date is earlier. (It should be noted that TRADOC cannot publish a new TOE until after the equipment is type classified as Standard. If type classification does not precede the availability date by the necessary time, the TOE will not be available soon enough to support timely MTOE documentation and subsequent requisitioning of personnel and equipment. This can result in a delay in fielding procured items.)

e. Each BOIP forwarded by TRADOC to HQDA is initially arrayed against the force structure in order that a BOIP Impact Report can be prepared. The BOIP, with QQPRI and BOIP Impact Report, are then coordinated with appropriate sections of the HQDA staff. Key input recommendations are received from MILPERCEN and the Force Integration Staff Officer (FISO) prior to the final HQDA decision regarding approval.

f. After the BOIP is approved, it will either be incorporated into a draft Plan TOE (the AURS evolves into this) or, in the case of equipment items not requiring a new type of unit structure, be held by TRADOC pending equipment type classification. Upon type classification, the necessary changes can be applied to the TOE file and promulgated via the CCT. If a draft Plan TOE is developed, it will evolve into a Plan TOE following TRADOC approval and be forwarded to DCSOPS, HQDA, for staffing and approval. After HQDA approves a Plan TOE, it is published by The Adjutant General (TAG) and added to the master TOE file.

g. The TOE revisions which result from application of BOIP to existing TOE documents are not forwarded to HQDA for approval since the BOIP which caused the changes was previously staffed and approved by HQDA.

E-II-3. RESPONSIBILITIES. The BOIP development, approval, and implementation process is the result of coordinated actions by a number of organizations and staff elements. The responsibilities of the primary action agencies are outlined below:

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a. DCSOPS, HQDA. The DCSOPS is charged with Army general staff responsibility for the BOIP process. In fulfilling this responsibility, the DCSOPS accomplishes final coordination of the BOIP at HQDA and is the HQDA approval authority for all BOIP.

b. Materiel Developer. The materiel developer is required to submit a completed DA Form 3362b-R (BOIP Feeder Data) to TRADOC as soon as the developmental equipment is deemed to satisfy the Letter of Agreement (LOA) or other requirement document. Along with the DA Form 3362b-R, the developer submits a tentative QQPRI (TQQPRI) to TRADOC. As significant changes occur during the materiel development process, the developer submits updated versions of the BOIP Feeder Data and QQPRI, and 18 months prior to type classification of the item, the FBOIP/FQQPRI inputs are provided to TRADOC.

c. DARCOM. DARCOM assigns a Z series Line Item Number (LIN) which uniquely identifies the item during the development cycle and is used in BOIP and developmental TOE. DARCOM also assigns the developmental item a standard study number (SSN) which identifies it as a member of a grouping of related equipment. When the item is type classified Standard, DARCOM assigns a standard LIN to replace the temporary Z LIN.

d. Equipment Authorization Review Activity (EARA). This DARCOM organization reviews BOIP to insure that equipment resources are appropriately allocated.

e. Materiel Readiness Support Activity (MRSA). This DARCOM organization reviews QQPRI data to insure proper personnel allocation prior to forwarding to TRADOC.

f. TRADOC. TRADOC is proponent for BOIP and, as such, is responsible for providing a TBOIP when the Letter Requirement (LR) or ROC document is forwarded to ODCSOPS, HQDA, and for submission of a FBOIP to HQDA 15 months prior to the estimated date the item will be type classified Standard. TRADOC further assures that training requirements are included in BOIP. Upon approval by HQDA, TRADOC publishes the BOIP and prepares appropriate changes to TOE.

g. MACOM. Each MACOM determines its command-wide requirements for the item under development and, when TOE changes are announced, the MACOM is responsible for application to affected MTOE.

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E-II-4. MILESTONES. Current policy requires that the FBOIP (with FQQPRI) be received at HQDA 15 months prior to estimated type classification date or 27 months prior to the projected availability date of equipment.

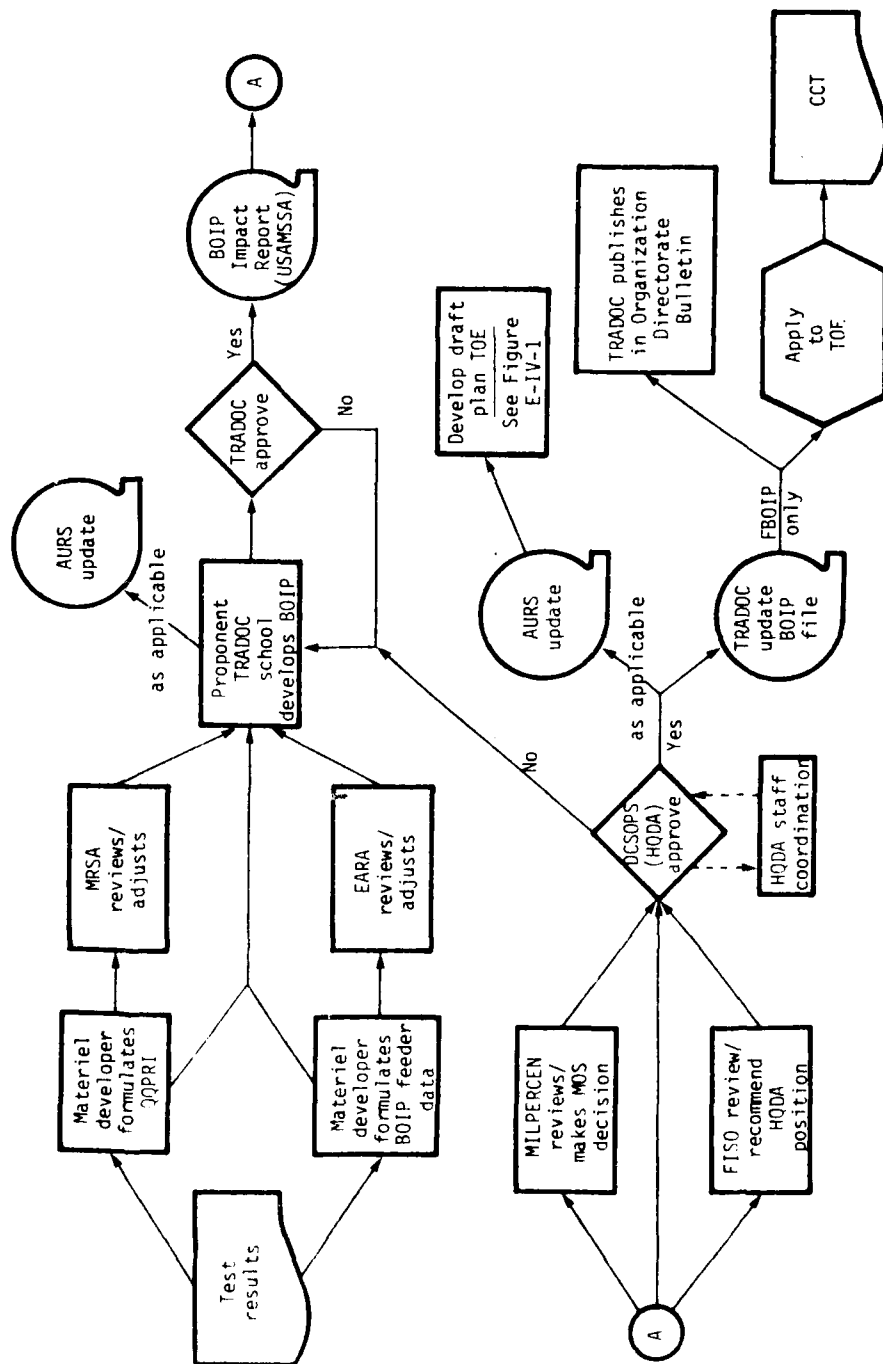


Figure E-II-1. BOIP/QQPRI Process

Annex III. DOCTRINAL STUDIES

E-III-1. PURPOSE. Doctrinal studies are undertaken to investigate the need to modify existing doctrine or develop new doctrine.

E-III-2. DESCRIPTION. A doctrinal study is initiated as a result of an Army perceived need to investigate the adequacy of its current doctrine. This need may arise from budgeting decisions, introduction of new equipment, changes in perception of the threat, or development of concepts purported to involve a better way to fight. TRADOC initiates a study effort by assigning responsibility to an integrating center or study group. Ultimately, the study will be performed at a TRADOC school either with in-house resources or by sponsoring a special study group. During the study, conceptual doctrine and current doctrine are measured, compared, and, if necessary, a "strawman" TOE is prepared. Upon publication of the study, TRADOC staffs the conceptual doctrine within the TRADOC community and invites comments from other MACOM (DARCOM, FORSCOM, USAREUR, etc.). Upon final TRADOC approval, proposed doctrine is submitted to HQDA for review and decision. HQDA either disapproves the doctrine, approves the doctrine for test thereby reserving final judgment on the doctrinal concept, or approves the doctrine for implementation. Upon receiving approval for a doctrinal test, TRADOC develops, publishes, and distributes a Tentative TOE (TTOE). The development process for TTOE is basically the same as for standard TOE. HQDA approval of a TTOE is required prior to unit activation or reorganization to support a HQDA approved test. After a test unit is organized, the concept is tested, and a test report is prepared. Test results are reviewed by TRADOC with major input from the tested unit's MACOM and from DARCOM. If appropriate, TRADOC modifies the doctrine based on the test results and submits the revised doctrine with supporting troop test documentation to HQDA for review and approval. At this point, HQDA either approves or disapproves the conceptual doctrine. If approved, TRADOC initiates action to develop a draft Plan TOE or makes modifications to existing TOE. At the same time, MOS and MACRIT policies are reviewed as appropriate. Graphic representation of this process is found at Figure E-III-1.

E-III-3. RESPONSIBILITIES. Completion of doctrinal studies and implementation of the recommendations requires actions by several MACOM and HQDA staff agencies. The responsibilities of the major players are outlined below:

a. ODCSOPS, HQDA. The ODCSOPS formulates, develops, monitors, coordinates, and approves the policies and procedures which govern

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and control doctrinal studies. ODCSOPS is also the HQDA approval authority for TOE documents.

b. HQDA Staff. The HQDA staff elements review doctrine, as it evolves from the doctrinal studies process, for feasibility and compatibility within their functional areas of responsibility.

c. TRADOC. TRADOC acts as the proponent for US Army doctrine and as such sponsors, monitors, coordinates, reviews, and analyzes combat development activities related to the development of doctrine. As part of the review and analysis, TRADOC conducts area-of-interest (AOI) reviews with appropriate MACOM. TRADOC also provides MILPERCEN with information concerning doctrinal requirements which impact on the MOS structure and publishes and distributes TTOE for test and evaluation.

d. DARCOM. DARCOM conducts technical/AOI reviews of new doctrine and TTOE as they relate to materiel.

e. Specified MACOM. As required, and as interest dictates, the MACOM participate in the AOI reviews and provide units for test and evaluation of TTOE. They also participate in post-test review of TTOE and doctrine.

E-III-4. MILESTONES. Not applicable.

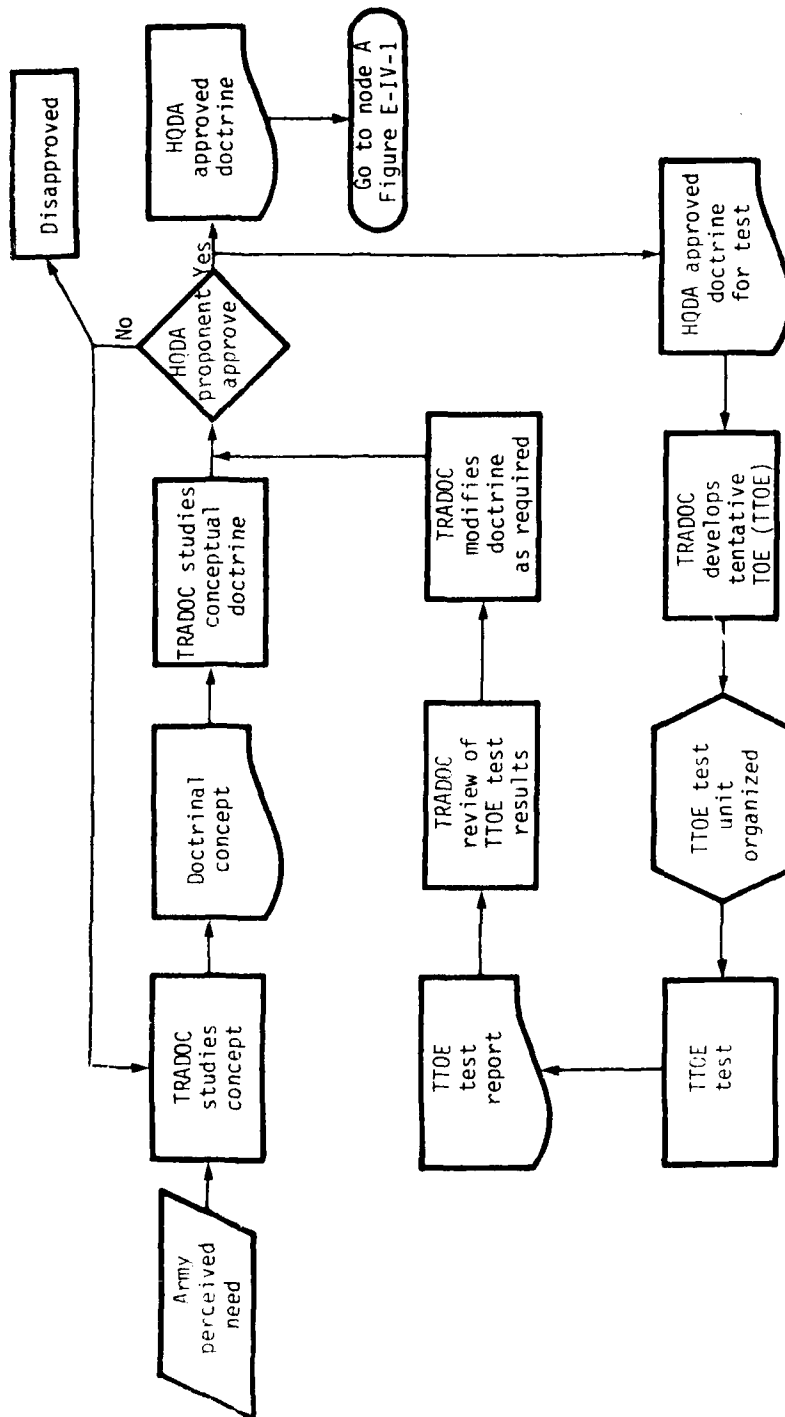


Figure E-III-1. Doctrinal Studies Process

Annex IV. TOE REVIEW PROCESS

E-IV-1. PURPOSE. The TOE review process is intended to provide for a periodic review of all TOE. This review provides for analysis of the current applicability of published TOE and elimination of superfluous organizations, personnel, equipment, and functions. TOE are reviewed on a 3-year cyclic schedule.

E-IV-2. DESCRIPTION

a. Current policy requires that existing TOE be reviewed and updated/revised on a 3-year cyclic basis. In addition to the cyclic review, proponent organizations and field units modeled on specific TOE perform informal review of that TOE and recommend interim actions as required.

b. The TOE review process is governed by the TOE Documentation Program. The program is controlled by the HQDA Program Schedule for Preparation and Processing of TOE. The schedule specifies TOE to be developed or reviewed during a 12-month period. TRADOC, with input from TOE program subproponents, develops a draft TOE program schedule and submits it to ODCSOPS, HQDA, by 1 April. Conditions causing a TOE to be scheduled for review and development include:

(1) Imminent introduction of major equipment systems under development requires new or revised TOE.

(2) New or revised TOE are required due to operational necessity, or for current and mobilization troop programs.

(3) Revision of existing tables is required to reflect policies and developments which impact on TOE structures.

(4) Cyclic (3-year) review required.

c. ODCSOPS, in coordination with the HQDA staff, finalizes and approves the program schedule, and it is published in July. Recommended revisions to the schedule are submitted to HQDA by TRADOC in November, and a revised schedule is published in January.

d. As a matter of course, TOE are scheduled for review by TRADOC on a 3-year cycle. During cyclic reviews, TOE are analyzed by proponent TRADOC schools to insure that all HQDA approved BOIP, MACRIT, and doctrinal modifications have been applied.

e. A major revision of a TOE involves one of the following and requires development of a plan TOE for approval by HQDA.

(1) A change in unit mission, capabilities, or basis of allocation.

(2) A change in unit organizational structure.

(3) Additions to or major changes in personnel or equipment, except those detailed changes approved by HQDA and those which fall into the category of routine revisions.

(4) A change in the designation of a unit from one branch of service to another.

f. A routine TOE revision is one which reflects approved HQDA policy and does not require further HQDA approval. Routine revisions generally consist of the following types:

(1) Changes to duty position titles, MOS codes, grades, and branches that are based on changes to MOS structures found in the AR 611 series.

(2) Changes resulting from application of approved BOIP.

(3) Changes to equipment LIN and nomenclature.

(4) Changes resulting in decreases in allowances for non-controlled equipment.

g. Figure E-IV-1 displays the work flow of this process.

E-IV-3. RESPONSIBILITIES. The TOE review and approval process requires coordinated actions by several MACOM and HQDA staff elements. The major responsibilities are shown below:

a. ODCSOPS, HQDA. The ODCSOPS formulates, develops, monitors, coordinates, and approves policies and procedures for TOE. This staff element is the HQDA approval authority for TOE. The DCSOPS is also responsible for Army Staff coordination and evaluation to insure availability of additional resources to support TOE changes and conversions of units to new or revised TOE.

b. HQDA Staff. Elements of the HQDA Staff are responsible for review of TOE relative to matters pertaining to their functional areas of responsibility.

c. TRADOC. TRADOC is proponent for TOE and as such has the

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responsibility to sponsor, monitor, coordinate, review, and analyze combat development activities related to the development of TOE. In the TOE development process, TRADOC conducts AOI review with MACOMs and obtains subsequent HQDA approval of the Plan TOE. TRADOC is responsible for applying HQDA approved doctrine, BOIP, MACRIT, etc. to TOE.

d. DARCOM. This organization is responsible for technical/AOI review of all draft Plan TOE and TOE changes to insure that proper types and quantities of equipment are included and that appropriate tools and support equipment are included. DARCOM also conducts a postpublication review of all TOE and TOE changes for accuracy.

e. Specified MACOM. MACOMs perform postpublication accuracy reviews and, as required, conduct AOI review of draft Plan TOE.

E-IV-4. MILESTONES. TOE are reviewed for routine update on a 3-year cyclic basis.

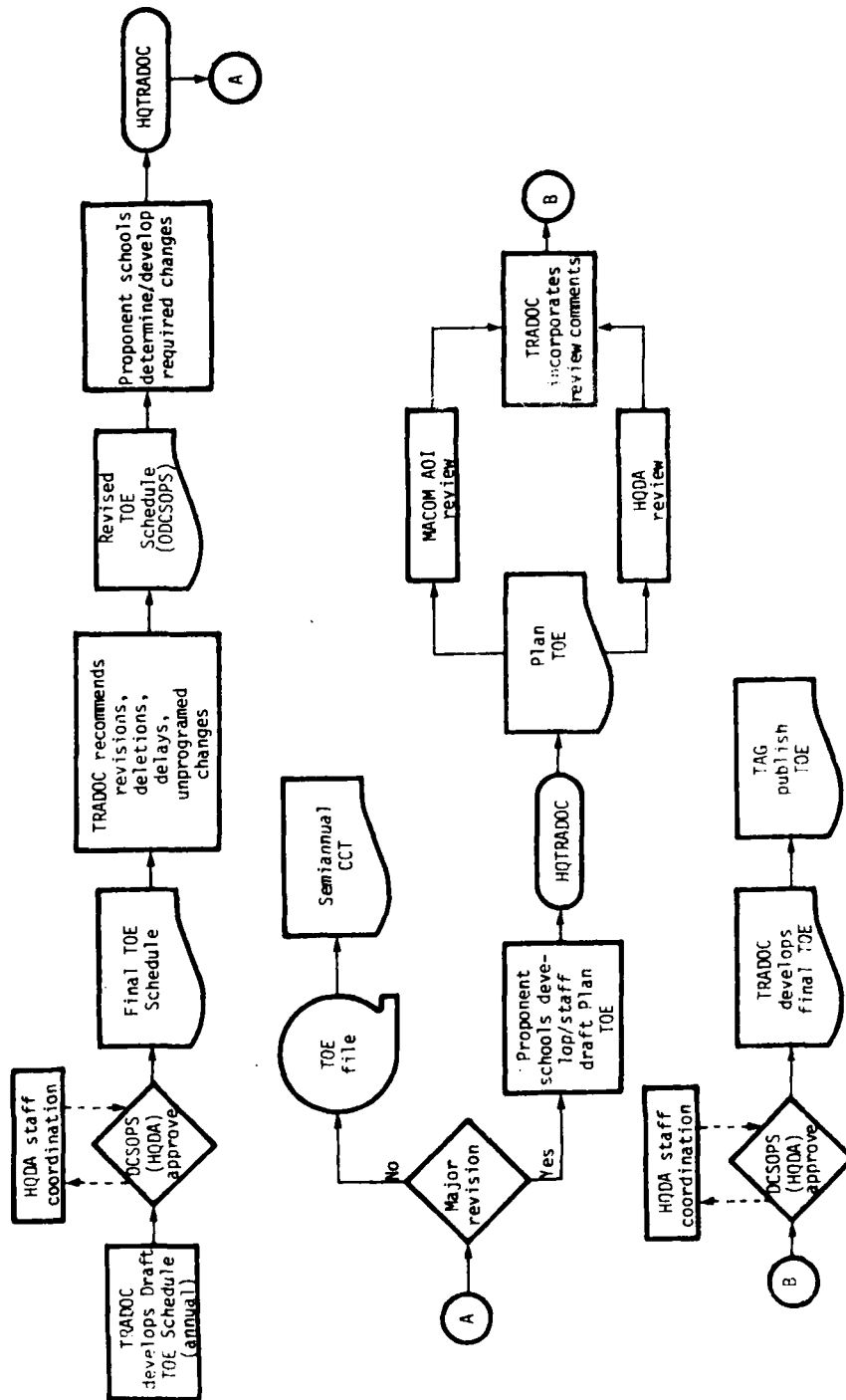


Figure E-IV-1. TOE Review Process

Annex V. SUPPLY BULLETIN (SB) 700-20 CHANGE PROCESS

E-V-1. PURPOSE. As stated in Chapter 1 of SB 700-20, the purpose of this bulletin is to provide "a list of Army Adopted Items and Other Selected Items for use in conjunction with The Army Authorization Document System, TAADS (AR 310-49), and Common Tables of Allowances, CTAs (DA Pam 310-3), The Army Maintenance Management System (TM 38-750), the preparation and maintenance of property book pages/stock records (AR 710-2), and Cataloging and Supply Management Data (AR 708-1). It also identifies items assigned Reportable Item Control Codes 1, 2, and 3 and is the guide for all units, organizations, and installations responsible for furnishing reports as prescribed by Chapter 2, AR 710-3."

E-V-2. DESCRIPTION. Updated SB 700-20 are published in January and July each year. The process is initiated by automated input that flows from data originators to US Army DARCOM Catalog Data Agency (CDA) on a daily basis. As change requests/recommendations are received by CDA, they are forwarded to ODCSOPS, HQDA, and, if approved, are accumulated in the CDA work file. CDA provides the data originators with confirming approval/disapproval information. Approximately 110 days prior to the effective date of a new SB 700-20, CDA freezes the work file, updates its SB 700-20 file and forwards the revised tapes to The Adjutant General Center (TAGCEN) for publication. CDA then finalizes the SB 700-20 edit tape and provides tape copies to HQDA (ODCSLOG), TRADOC, and MACOMs at least 45 days prior to the effective date in order that necessary changes to TOE and TAADS files may be affected. Chapter 2 of SB 700-20 lists Army Adopted Items which are those items that may be included in TOE and MTOE documents. Other chapters list developmental items, TDA items, and CTA items. Any SB 700-20 change that results in moving items into or out of Chapter 2 will result in changes to TOE and, consequently, MTOE documents. Also, changes made to the LIN or nomenclature of items listed in Chapter 2 will require similar changes to TOE and MTOE documents. The SB 700-20 change process is graphically represented in Figure E-V-1.

E-V-3. RESPONSIBILITIES. The responsibilities of agencies with major impact on the SB 700-20 change process are:

a. DCSLOG, HQDA. The DCSLOG exercises Army general staff supervision over Army participation in the Federal Catalog System of which SB 700-20 is a part.

b. DCSOPS, HQDA. The DCSOPS is the HQDA approval authority for additions to and deletions from SB 700-20.

c. DARCOM MRC, Service Item Control Centers, The Surgeon General (data originators). These agencies are responsible, within their functional areas, to insure the accuracy, completeness, and justification of all entries. They prepare and submit automated SB 700-20 file maintenance transactions for additions, deletions, or changes to SB 700-20.

d. CDA. The CDA maintains the SB 700-20 data file and obtains HQDA approval or disapproval of changes. CDA updates files and publishes a revised SB 700-20 each January and June in magnetic tape and microfiche form. CDA provides a tape to TAGCEN for publication of a hard copy SB 700-20.

e. TRADOC. This organization is responsible for reflecting SB 700-20 changes in TOE and the semiannual CCT.

E-V-4. MILESTONES

a. CDA provides edit tape to HQDA, TRADOC, and MACOMs 45 days prior to the effective date of new SB 700-20.

b. HQDA, TRADOC, and MACOMs update TOE, TAADS, and VTAADS files to insure consistency at the close of the TAADS update windows on 31 March and 30 September.

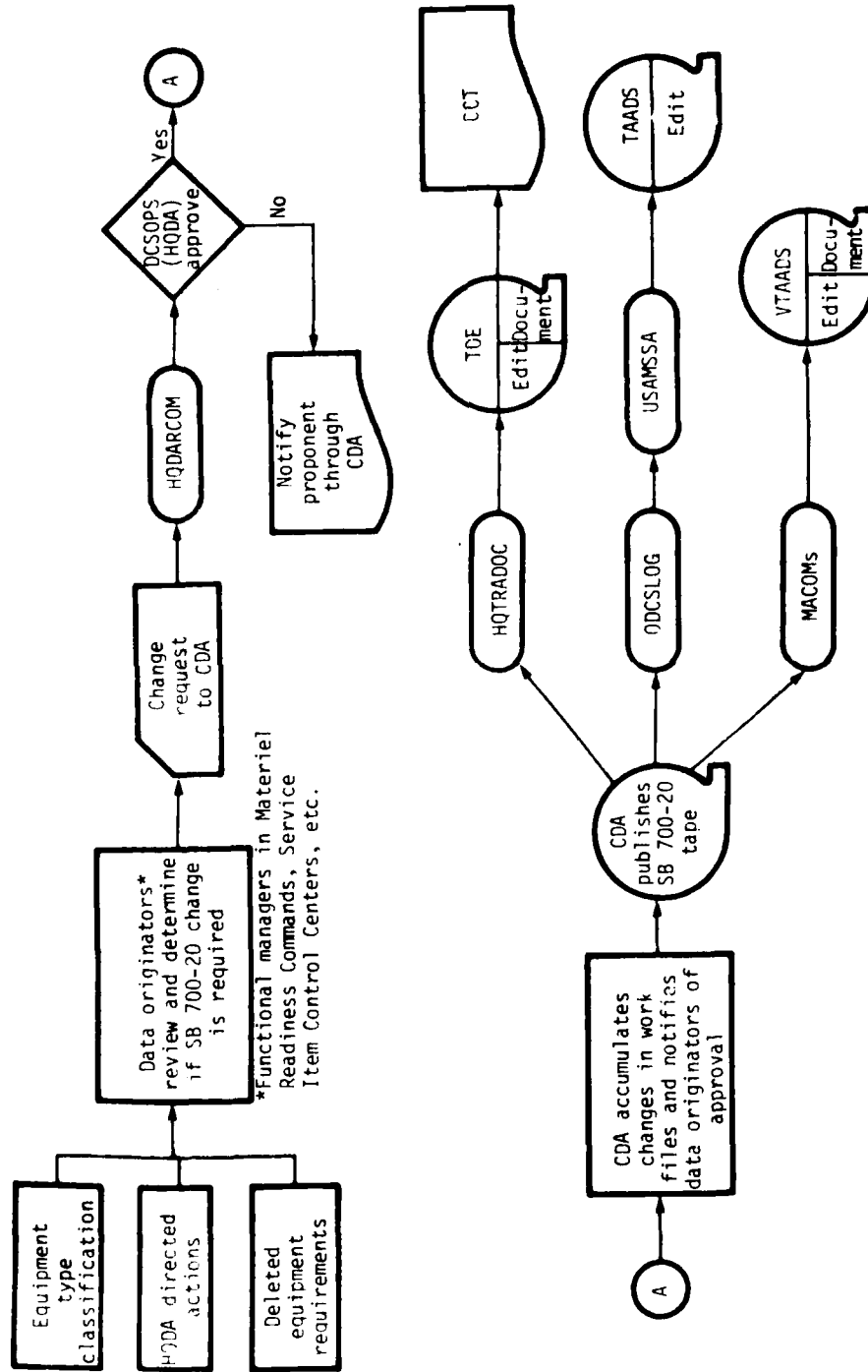


Figure E-V-1. SB 700-20 Change Process

Annex VI. MILITARY OCCUPATIONAL SPECIALTY (MOS) CHANGE PROCESS

E-VI-1. PURPOSE. MOS changes occur to insure that the MOS and Specialty Skill Identifier (SSI) structures are consistent with doctrinal changes and compatible with new or improved materiel systems. The MOS update process controls the manner by which MOS changes evolve from a request for change through publication of an approved change in the personnel occupational specialty (POS) edit tape.

E-VI-2. DESCRIPTION. As implied above, changes to the MOS structure occur as a result of evolving doctrine, organization, and equipment. MOS changes may also be initiated as a result of occupational surveys, changes in training requirements, or investigative reports made by the Inspector General (IG) or General Accounting Office (GAO). The process may be initiated by any individual at any level. Requests for change are forwarded through the MACOM to MILPERCEN. Action is taken there to coordinate the request for change with the proponent MACOM and develop a position on the request; proposed changes with broad impact may be staffed with all MACOM. MILPERCEN then coordinates the proposal with the HQDA staff (through ODCSPER) and develops a coordinated HQDA position. If approved, changes are announced to MACOMs through serially numbered letters of notification (LON) from MILPERCEN. The LON are accumulated by MILPERCEN until 15 December and 15 June each year, at which time the change data is used to prepare an updated POS edit tape. The edit tape is distributed sequentially to TRADOC, other MACOMs, and HQDA. TRADOC receives the tape about 1 January and 1 July and uses it to update the TOE file. This update is ultimately reflected in a CCT (published 25 April and 25 October of each year). The POS tape is provided to the MACOMs approximately 20 April and 20 October for update of VTAADS. HQDA receives the tape about 1 July and 1 January to update TAADS. A network diagram depicting this process is at Figure E-VI-1.

E-VI-3. RESPONSIBILITIES. The MOS change process requires coordinated action by several Army agencies. The agencies with major impact and their responsibilities are indicated below:

a. DCSPER, HQDA. The DCSPER has Army general staff supervision over this process and is the HQDA approval authority for MOS changes.

b. MILPERCEN. This organization establishes and maintains a processing cycle for review and analysis of proposed MOS structure changes and approves additions, deletions, and revisions of MOS/SSI within established policy. MILPERCEN provides interested

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agencies with notification of approved MOS/SSI decisions. This agency maintains the POS Edit Files and distributes copies of that file to TAADS and TOE proponents as indicated in paragraph E-VI-2.

c. TRADOC. TRADOC is responsible for changing TOE to conform with MOS changes and for informing MILPERCEN of individual training plans and programs which may impact on the MOS/SSI structure.

d. MACOM. Each MACOM is responsible for preparing changes to MTOE/TDA for which it is proponent.

e. DARCOM. This agency informs MILPERCEN of maintenance and supply concepts which may have an impact on MOS/SSI.

E-VI-4. MILESTONES

a. MILPERCEN forwards the POS edit tape to TRADOC in January and July.

b. TRADOC publishes update of MOS in TOE in the April and October CCT.

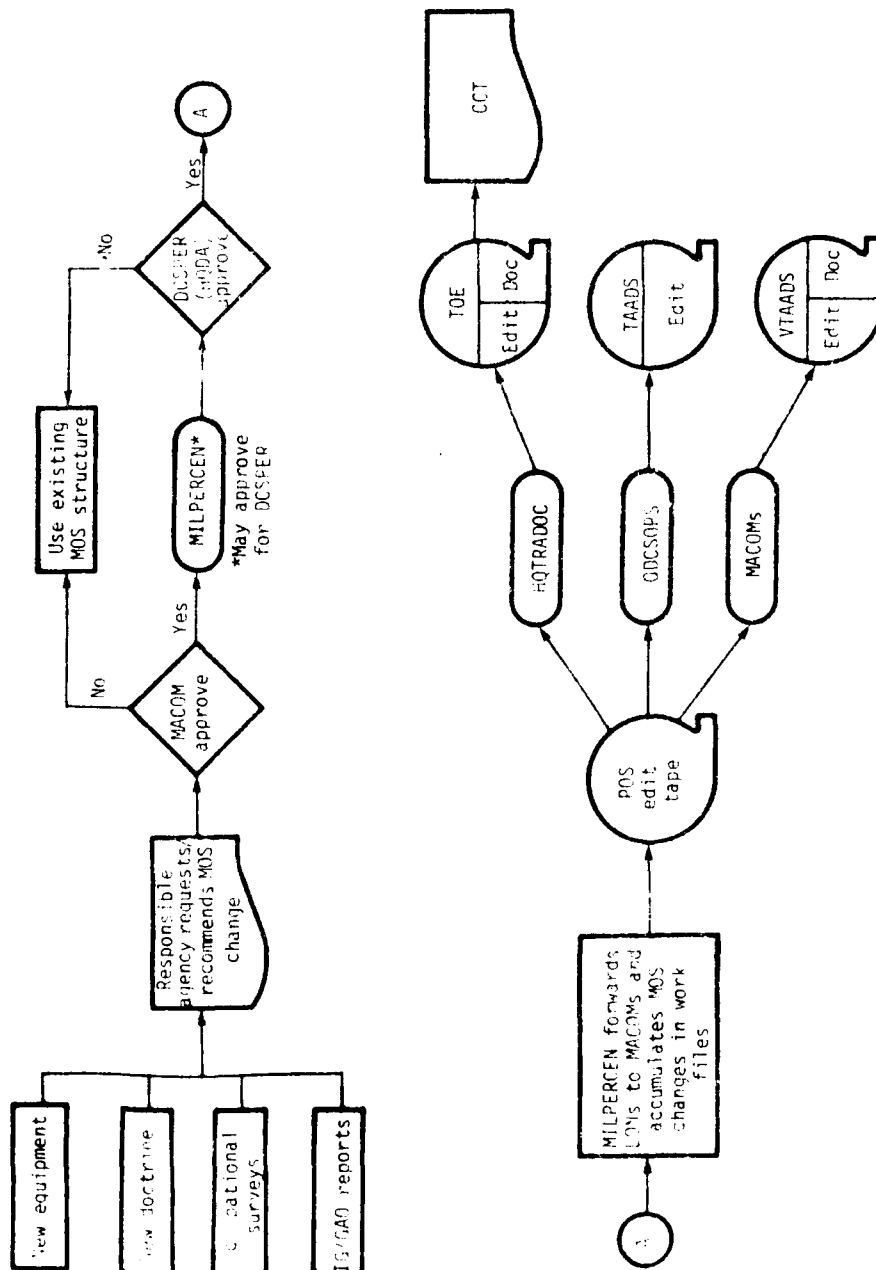


Figure E-VI-1. MOS Change Process

APPENDIX F

RESOURCING OF CHANGES

F-1. GENERAL. This appendix provides detailed descriptions of the key systems and processes which interact to provide resources for implementing TOE changes in MTOE. The six annexes contained in the appendix discuss individual systems and processes which most directly impact on the resourcing of changes. They are organized to provide the purpose and a description of each system or process, the responsibilities of various organizations and agencies with respect to each, and the milestones which are critical to successful operation of each system or process. All annexes are accompanied by network diagrams which graphically show the inputs, feeder processes, subprocesses, and the outputs or process results.

F-2. DISCUSSION. The processes which will be discussed in this appendix are:

- The Force Development Management Information System (FDMIS), Annex I.
- The Structure and Composition System (SACS), which is a part of FDMIS but is of such importance to the resource allocation process to warrant specific discussion, Annex II.
- The Personnel Distribution Process, Annex III.
- The Personnel Recruiting and Training Process, Annex IV.
- The Equipment Procurement Process, Annex V.
- The Equipment Distribution Process, Annex VI.

a. The above mentioned processes interact to provide personnel and equipment resources to implement TOE changes in MTOE units. The processes for resourcing both personnel and equipment changes are initiated by computing the requirements and authorizations using the FDMIS. The FDMIS provides the current force structure by copying the master force from the Force Accounting System (FAS). The force is then refined so that requirements and authorizations for personnel can be identified by grade, branch, and MOS, and equipment requirements and authorizations can be identified by LIN. That refinement is done using the SACS process in which TAADS (MTOE) documents are applied to the force structure to produce either a personnel (PERSACS) or an equipment (LQSACS) SACS.

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The PERSACS provides time-phased personnel requirements and authorizations by grade, branch, and MOS for each MTOE unit. PERSACS requirements data is used for mobilization planning while the PERSACS authorization data is used to validate field requisitions and project future assignments. The LOGSACS identifies either equipment authorizations or requirements by LIN for each unit in the force. The LOGSACS which identifies total Army equipment requirements is used in the equipment procurement process. These requirements are prioritized and input to the POM development process where equipment requirements compete with other requirements for resources. The authorization LOGSACS identifies the quantity of equipment by LIN that is authorized to be on hand in each MTOE unit of the force. That information is used for comparison with reported on-hand equipment quantities to allow distribution of available equipment according to priorities set by HQDA.

b. The processes discussed in this appendix begin with the force structure requirement, then develop detailed requirements and authorizations by unit. The requirements and authorizations are compared with on-hand assets in order to procure and distribute personnel and equipment.

Annex I. FORCE DEVELOPMENT MANAGEMENT INFORMATION SYSTEM (FDMIS)

F-I-1. PURPOSE. The US Army Force Development Management Information System is operated and maintained by the ODCSOPS. It was developed to support the various functions of the force development process and is made up of a number of automated subsystems which interact to facilitate management decisions. This study considers five major subsystems of FDMIS and their relationships or interfaces with each other. The subsystems considered are:

a. The Force Accounting System (FAS) which is an automated data file providing information on the current, programed, and planned status of all Army units. It contains the Army Master Force (M-force) and is used to produce force structure guidance for the major commands.

b. The Army Authorization Documents System (TAADS) provides the mechanism by which organizational changes are documented by MACOMs. It defines the approved personnel and equipment requirements and authorizations for MTOE organizations.

c. The Structure and Composition System (SACS) provides planning and management information relating to personnel (PERSACS) and equipment (LOGSACS) requirements and authorizations. The SACS and its uses will be described separately in Annex II of this appendix.

d. The Table of Organization and Equipment (TOE) system provides information relating to the equipment and personnel requirements of standard Army tactical units.

e. Basis of Issue Plan (BOIP) system facilitates the recording, maintenance and retrieval of data used in planning the procurement and distribution of new equipment items prior to documentation in TOE and TAADS. It identifies ancillary equipment required for the new item and is used to predict quantitative materiel requirements.

F-I-2. DESCRIPTION. The key subsystems of the FDMIS are the FAS and TAADS. These two automated data bases provide the primary basis for reflecting, promulgating, and documenting force structure guidance and information. The continued accuracy of the information contained in these data bases is necessary to insure the validity of personnel and equipment forecasts made through the SACS.

a. Force Accounting System (FAS). The FAS is the central file of the FDMIS and is an automated data processing system designed

to facilitate the recording, maintenance, and retrieval of data necessary for force structuring, force planning, and manpower management. It is designed as a multiple force system in which current, programed, and planning forces are retained in a single data file. It includes over 90 categories of information on all current and planned units of the Active Army and Reserve Components. The FAS reflects aggregate strength, major command, stationing, priorities, and other force structuring and planning data for each unit. The major permanent force in the FAS is the M-force which is continuously updated to record force structure decisions and resultant manpower authorizations from the current year through the period covered by the Program Objective Memorandum (POM). Inputs to the FAS are based on OSD/DA decisions, the Total Army Analysis, the Program and Budget Guidance, command plans submitted by the MACOMs, and automated updates from TAADS and other HQDA management information systems. Some important uses of the FAS are:

- Producing detailed and summary force structure analyses
- Providing a basis for force planning
- Developing troop and stationing lists
- Maintaining accountability for manpower authorizations
- Providing force structure guidance for major commands
- Providing a basis for SACS computations

b. The Army Authorization Document System (TAADS). TAADS is an automated data processing system used to develop and document organizational structures necessary to support the assigned missions of Army units. It contains authorization documents (MTOE/TDA) for all units of the Active and Reserve Components. As discussed in Chapter 3, the basis for MTOE documents is the organizational detail specified in the corresponding TOE. The basis for TDA units includes appropriate staffing guides, regulations, and manpower surveys. These approved authorization documents serve as the official basis for personnel and equipment requisitions and for unit status reporting. TAADS documents contain the detailed organizational structure of a unit i.e., personnel requirements and authorizations by grade, branch and MOS; and equipment requirements and authorizations by LIN. Generally, each unit documented in TAADS is expected to have both a current document and a projected document that is scheduled to become effective at a specified future date. Inputs to the TAADS must be applied to current and projected documents by the MACOM having document proponentcy.

TAADS inputs consist of changes to organizational structure, to quantities and types of personnel and equipment, and to administrative data as a result of MOS and SB 700-20 changes. Some important uses of the TAADS are:

- Providing each Army unit with a basic authorization document.
- Maintaining HQDA control of organizational structure.
- Providing quantitative and qualitative data on personnel and equipment requirements and authorizations.
- Providing detailed personnel and equipment data for SACS computations.

c. FDMIS Information Flow/Data Relationships. Accurate and timely reflections in SACS of the resource levels determined by the POM process (and stated in the PBG) is essential. Thus, the FDMIS must quickly react to reflect aggregated PBG resource guidance as detailed manpower and equipment authorizations. Figure F-I-1 depicts the FDMIS information flow. As the data flows through the FDMIS it is refined from aggregate resource guidance in the PBG through the FAS and into the grade, branch, MOS, LIN detail of TAADS documents. January PBG guidance is entered into the FAS by Army Management Structure Code (AMSCO), by MACOM, and, where possible, by unit. The force information is transmitted to the major command where analysts complete the breakout of the AMSCO guidance to individual units and enter this data in the MACOM element of the FAS (VFAS). The more detailed spread of the guidance to the force is then returned to HQDA as the MACOM Command Plan where it is reviewed and entered into the M-force as approved program actions. The MACOM then prepares TAADS documents which correspond to these programmed unit actions and submits them as proponent approved documents in the July-September MOC window. Thus, the authorizations document agrees, when submitted, with an entry in the FAS which agrees, when aggregated, with the guidance published in the January PBG. This schedule insures that resource guidance is developed in the level of detail required for consistency in the various automated systems. Response to the October and May PBG is accomplished in a similar fashion as shown in Figure F-I-1.

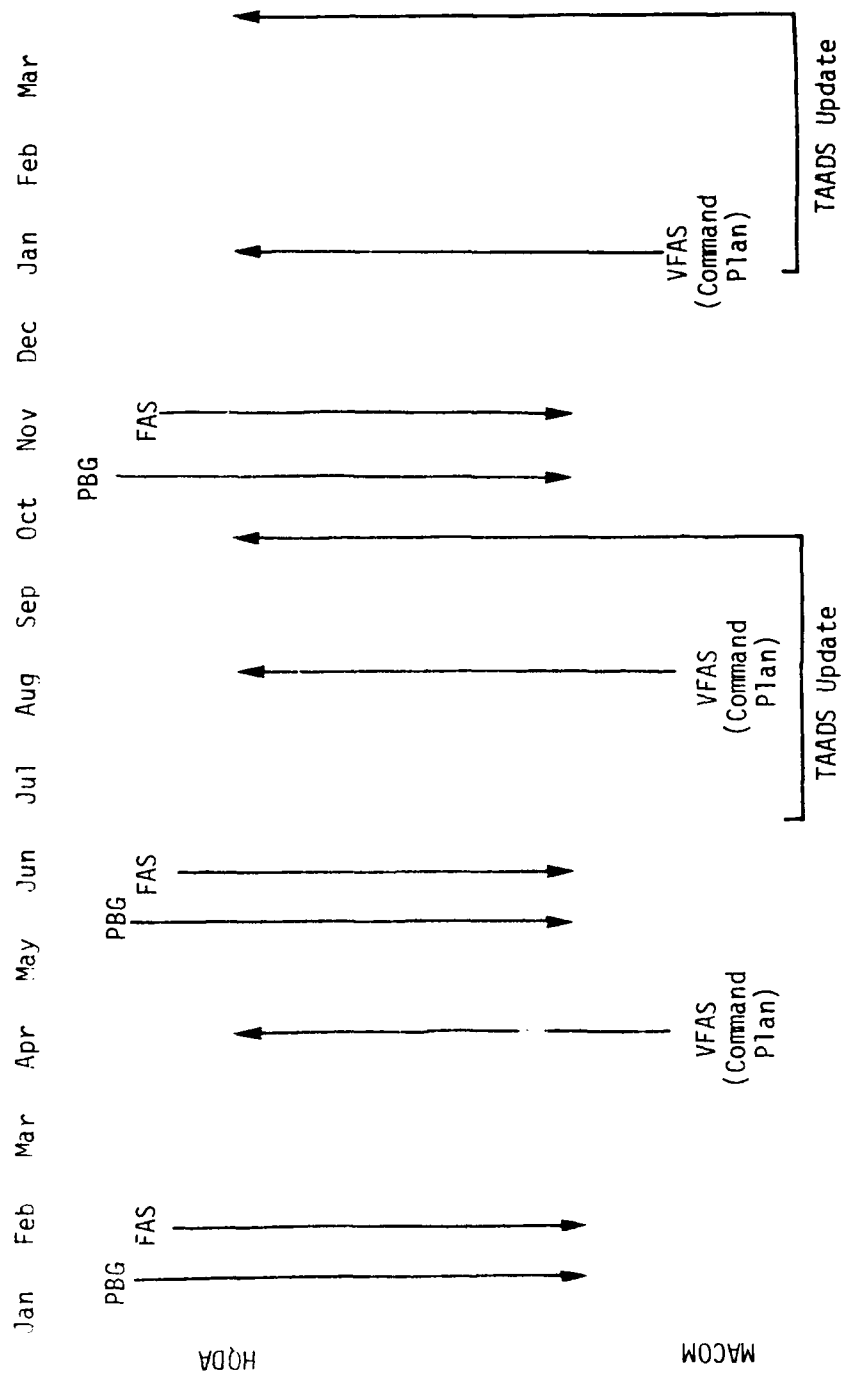


Figure F-I-1. FDMIS Information Flow

d. Force Development Integrated Management System (FORDIMS). During calendar year 1980, the Army will implement FORDIMS to replace the current HQDA FDMIS. FORDIMS will integrate three separate HQDA data bases, FAS, TAADS, and the Army Force Program (which is used to produce the PBG) into one automated system. This system is expected to ensure data consistency between the three systems and provide a guidance tracking mechanism. The basic functions and uses of the system are the same as FDMIS, but FORDIMS should provide a capability to track specific actions from guidance to documentation.

F-I-3. RESPONSIBILITIES. The FDMIS, to provide accurate and adequate information, requires the actions and inputs of several agencies. Those agencies with primary impact on the system and their responsibilities are provided below.

a. DCSOPS, HQDA. The DCSOPS has management responsibility for FDMIS. In fulfilling this responsibility, the ODCSOPS monitors FDMIS inputs for accuracy and validity and in coordination with the HQDA staff insures that required FDMIS interfaces with other elements of the Army Management Information System are accomplished.

b. HQDA Staff. Other HQDA staff elements are responsible for coordination of inputs to, and requirements for, FDMIS data with ODCSOPS. Further, they review FDMIS displays for accuracy and adequacy.

c. USAMSSA. This organization is responsible for provision of data processing support for FDMIS operation.

d. MACOM. The major Army commands provide update information for input to FAS and TAADS.

F-I-4. MILESTONES. See Figure F-I-1.

Annex II. STRUCTURE and COMPOSITION SYSTEM (SACS)

F-II-1. PURPOSE. The Structure and Composition System (SACS) is a series of automated computational programs which apply the detail contained in TOE, TAADS, and BOIP files to the time-phased force structure depicted in the FAS and project time-phased demands for personnel and equipment. The PERSACS depicts time-phased requirements and authorizations for personnel at grade, branch, and MOS level of detail. The LOGSACS performs a similar function for equipment at the LIN level of detail. Both PERSACS and LOGSACS are key inputs to the PPBS processes aimed at procuring and distributing personnel and equipment resources.

F-II-2. DESCRIPTION. The PERSACS and LOGSACS are automated computational processes (not separately maintained data bases) which act on the data contained in the FDMIS data bases. PERSACS and LOGSACS computations vary significantly enough to require separate discussion.

a. PERSACS. The PERSACS produces estimates of manpower requirements and authorizations over time. The output is provided to MILPERCEN for use in planning, programing and budgeting for recruitment, training, and distribution of personnel and in mobilization planning. The PERSACS is the key process by which planned force structure changes are translated into a time-phased personnel distribution at the grade, branch and MOS level of detail. Inputs to the PERSACS are the force structure reflected in FAS (to provide unit changes over time), MTOE and TDA documents in TAADS (to provide personnel grade, branch and MOS detail), and TOE documents in the TOE system (to provide the personnel detail required when there is no appropriate TAADS document). The first step in PERSACS production is force preparation. Force and command managers within ODCSOPS insure that the M-force is as accurate as possible. The Automated Update Transaction System (AUTS) computer program is used to insure that FAS and TAADS data are consistent. The force is then "frozen" (copied as a separate force to be used in the PERSACS) and a specific document from TAADS or the TOE file is designated to be used as a computational basis for the personnel detail of each programed unit. Appropriate TAADS documents are applied unless the unit is newly activated or scheduled to be reorganized under a different TOE. In such cases, no TAADS entry exists and the TOE document will be used. The procedure for developing the computational base is largely automated but the results are analyzed to ensure that the best possible match is being made between unit position and document. The PERSACS computation extracts the personnel detail from TAADS and, if the authorized strength reflected in FAS matches that found in the TAADS document,

states grade, branch, and MOS totals as reflected in TAADS. If the FAS authorized strength totals are different from the TAADS document (reflecting programmed unit changes having been applied to FAS), PERSACS factors the TAADS personnel detail up or down to match the FAS total. For example, if a unit in FAS is programmed to increase 25 percent in strength and no TAADS document has been received from the MACOM detailing that change; the grade, branch and MOS authorization in TAADS will be factored up by 25 percent beginning at the FAS EDATE. Thus, PERSACS estimates personnel authorization changes by factoring the base data in TAADS up or down according to the strength changes reflected in the planned force structure. The end result is a picture, changing continuously over time, of the distribution of personnel authorizations by grade, branch and MOS. A network depicting the PERSACS process is at Figure F-II-1.

b. LOGSACS. Force preparation activities for LOGSACS are basically the same as for PERSACS. The computational process, however, is significantly different. Inputs to the LOGSACS include the FAS, TAADS and TOE files, as in PERSACS, but there are two additional data base inputs. The BOIP file is used to reflect changes in equipment requirements due to modernization and the Short Hand Notes (SHN) file is used to allow equipment analysts to reflect known changes not yet reflected in other files. The LOGSACS computation matches the equipment detail as reflected in TAADS or TOE documents to changes in the force structure, however, there is no factoring of equipment. Changes in equipment requirements over time are due to activations, inactivations, conversions of units, or to equipment modernization. If the LOGSACS is to be used for equipment distribution purposes only, emphasis is upon near term authorizations and the computation is stopped prior to applying the BOIP or SHN. If the LOGSACS is to be used for procurement planning, the computation continues on to change equipment requirements based on data in the BOIP and SHN files. The end result of the LOGSACS computation is a picture, continuously changing over time, of projected equipment requirements and authorizations by LIN. The output is used by ODCSRDA and ODCSLOG for developing plans and programs relating to procurement and distribution of equipment. A network depicting the LOGSACS process is at Figure F-II-2.

F-II-3. RESPONSIBILITIES. Responsibilities for the SACS process lie primarily within the HQDA staff. Output is provided to DARCOM and MILPERCEN, who have system feedback responsibility. Specific responsibilities are:

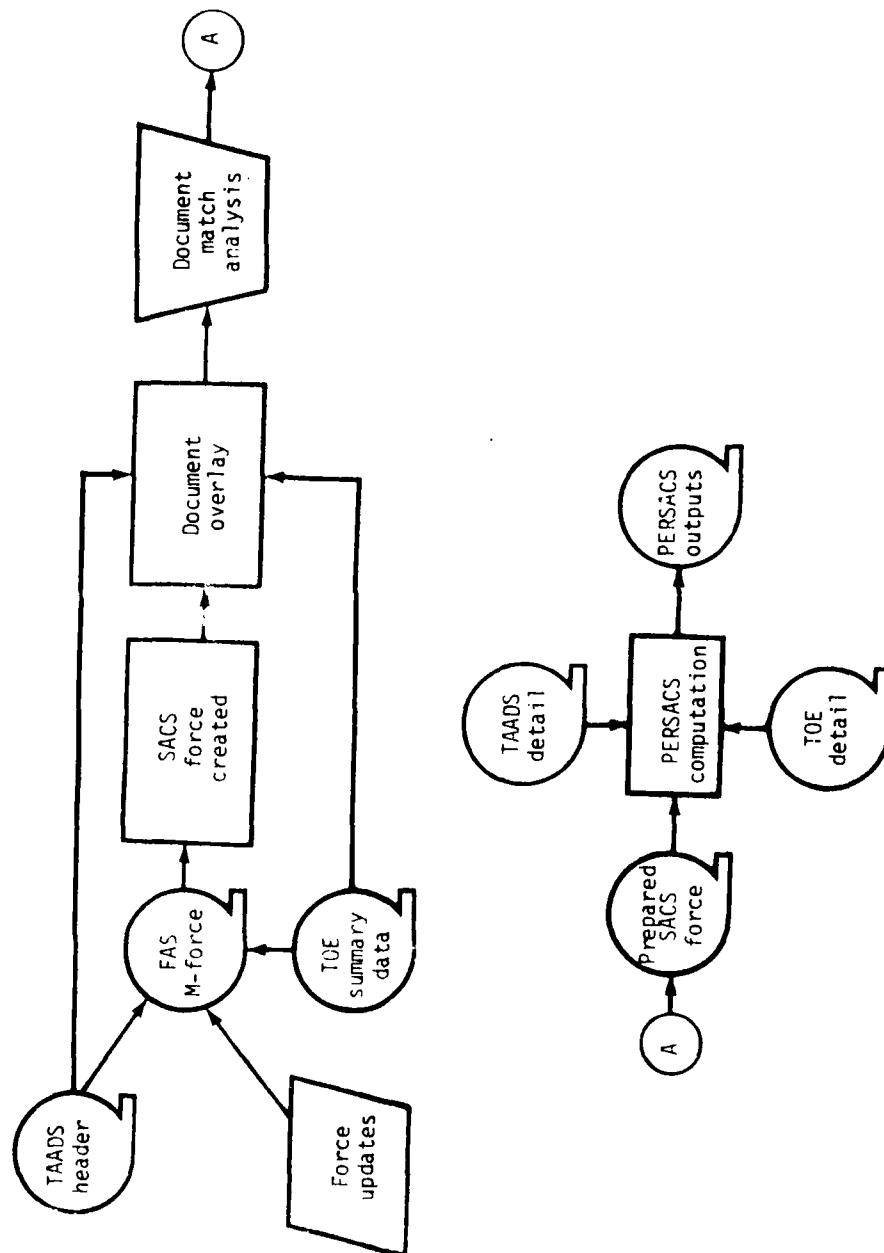


Figure F-II-1. PERSACS

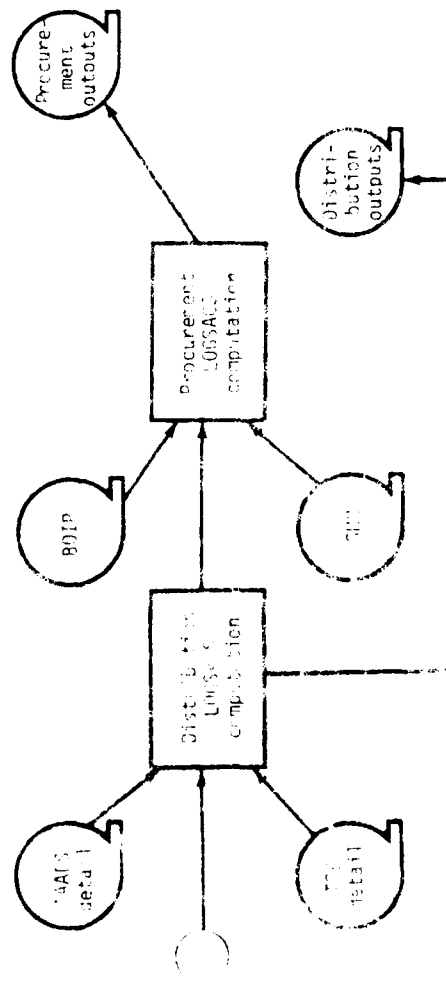
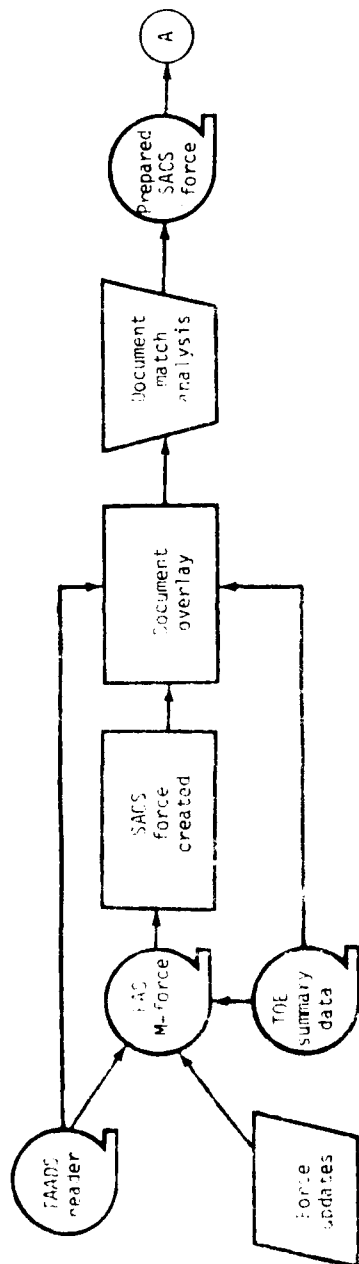


Figure F-11-2. LOGSACS

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a. DCSOPS, HQDA. The DCSOPS is proponent for SACS and, as such, is responsible for the accuracy of input data. ODCSOPS personnel prepare the force to be studied, based on the type of SACS, and coordinate the input of FAS, TAAOS, BOIP, SHN, and TOE files. This office analyzes the SACS output data for accuracy and provides the output to DARCOM, MILPERCEN, and ODCSRDA.

b. HQDA Staff. The other HQDA staff agencies are responsible, within their functional areas, for the accuracy of input data and for analysis of SACS output to insure accuracy.

c. USAMSSA. This organization provides the data processing support for operation of the SACS.

d. DARCOM. DARCOM is responsible for providing feedback to the DCSOPS concerning LOGSACS accuracy.

e. MILPERCEN. MILPERCEN provides PERSACS accuracy feedback to the DCSOPS.

F-II-4. MILESTONES. Table F-II-1 displays PERSACS and LOGSACS schedules.

Table F-II-1. SACS Schedule

SACS	Freeze force	Completed
PERSACS	October	October
LOGSACS ^a	Mid-October	Early November
PERSACS	January	January
LOGSACS	Mid-February	Early March
PERSACS	April	April
LOGSACS ^b	Mid-April	Early May
PERSACS	July	July
LOGSACS	Mid-August	Early September

^aSupports AMP Development

^bSupports Budget Development.

Annex III. PERSONNEL DISTRIBUTION

F-III-1. PURPOSE. The personnel distribution process is designed to insure that available personnel assets are assigned such that the overall needs of the Army are best served. For the purpose of this study, the manner in which MTOE, through TAADS and PERSACS, effect personnel distribution is of primary concern.

F-III-2. DESCRIPTION. The PERSACS reports provide personnel managers with a basis for validating personnel requisitions and projecting future assignments. PERSACS computations are made at the beginning (January and July) and at the end (April and October) of each of the two periods during which revised MTOE may be entered into TAADS. Figure F-III-1 illustrates how revised MTOE are entered into the Vertical TAADS (VTAADS) at the MACOM level and fed into TAADS and the Installation TAADS (ITAADS). The TAADS file becomes a basis for PERSACS computations while the ITAADS entries are passed to the units for which the MTOE are applicable. The personnel authorization data in the MTOE then provides the unit organization with authority to submit personnel requisitions to MILPERCEN for personnel authorized by the MTOE and not currently assigned. For CONUS units, these requisitions must be submitted to arrive at MILPERCEN five months prior to the date on which the personnel space(s) will be authorized to the unit--the EDATE of the MTOE. MILPERCEN compares the requisitions submitted from the field to the authorization data arrayed in the PERSACS and data contained in the Enlisted Master File (EMF). The EMF details where personnel are presently assigned, what their qualifications are, and when they are scheduled to be reassigned. The personnel assignments manager, thus, is provided with an array of authorized personnel distribution (PERSACS Report), a continuing series of demands for personnel with particular job qualifications (requisitions from field units), and current information concerning availability of personnel with various skill qualifications for reassignment. To the extent that valid requisitions are for personnel of the type and quantity that are available for assignment the task of transferring soldiers is relatively straightforward. It is, however, very rarely that simple. Recruitment and training shortfalls, MOS imbalances, and a host of other factors combine to cause situations where the skills, qualifications, and quantities of personnel available for assignment do not match those requisitioned by units in the field. Such cases may result in untimely fill of requisitions because personnel must be either retrained or recruited to meet the qualification requirement.

a. Central Assignment Procedures System (CAP III). Personnel requisitions received at MILPERCEN are compared with authorization data contained in PERSACS reports to ascertain the validity of the requirement. Requisitions deemed valid are then submitted for assignment processing in the Centralized Assignment Procedures System (CAP III). CAP III is an automated nomination/assignment system that compares the qualitative requirements recorded on requisitions against a large number of variables recorded on the master file for each individual soldier. The CAP III produces a nomination listing of optimum matches of qualified available individuals against valid requisitions. The CAP III system has four basic subsystems:

(1) Requisitioning Subsystem. This subsystem receives requisitions that have been manually validated and subjects them to an extensive machine edit procedure. The requisitions are then prioritized by the subsystem according to inputs relating to the priorities of force structure units for personnel assignment.

(2) Parameter Deck, Personnel Assignment Policy Subsystem. This is the control mechanism for CAP III. The parameters assigned serve to determine the order and method of requisition processing, the personnel eligible for reassignment and the degree to which their eligibility is constrained by current assignment policies.

(3) Assignment Subsystem. The subsystem used to make assignments is normally referred to as CASCADE because of the nature of the program logic. It considers the highest priority requisition first and checks the full list of assignment eligible personnel until it finds a soldier satisfying the minimum requirements for the job. The check of assignment eligibles then continues as the program "looks" for a better qualified individual. Each time one is found, the previously slotted individual is replaced and returned to the eligibles file. This procedure is iterated for each requisition until the best qualified soldier has been paired with each requisition and every possible requisition has been filled. The output is considered a nomination list. It is forwarded to assignment managers for review. Assignment managers use their own judgment in either accepting or rejecting these nominations.

(4) Output Subsystem. This subsystem completes the assignment action by taking accepted nominations from assignment managers, issuing assignment instructions to both losing and gaining commands, and updating the master file.

b. Lead Time Between Assignment Processing and Personnel Reporting. MILPERCEN requires that personnel requisitions from CONUS based units be submitted to arrive no later than five months prior to the desired reporting date of the replacement; an additional four months is required for overseas units. Since requisitions may only be submitted on one particular day of the month, requisitions from CONUS units will actually be received at MILPERCEN from 5 to 6 months prior to the desired reporting date. Present policy is to provide soldiers with at least three months of advance notification prior to CONUS reassignment. Assignment instructions also provide the soldier an opportunity to take leave en route to the new duty station. When coupled with travel time, the total lead time from issuance of assignment instructions to reporting date for CONUS reassignment is approximately 4 1/2 months. This leaves approximately 2 to 6 weeks for requisition processing and issuance of assignment instructions from the time the personnel requisition is received at MILPERCEN.

F-III-3. RESPONSIBILITIES. The responsibilities of staff agencies and organizations with respect to personnel distribution are:

a. DCSOPS, HQDA. The DCSOPS is responsible for operation and maintenance of the PERSACS.

b. MILPERCEN. MILPERCEN compares the personnel authorization data from the PERSACS with personnel status reports to validate requisitions and assign personnel as appropriate.

c. MACOM. The MACOMs input MTOE documents into VIAADS for ultimate entry into TAADS and ITAADS.

d. Units. MTOE units are responsible for submission of personnel requisitions in anticipation of known vacancies.

F-III-4. MILESTONES. This is a continuous process in which key updates for requisition validation occur at MILPERCEN upon receipt of each quarterly PERSACS output from DCSOPS.

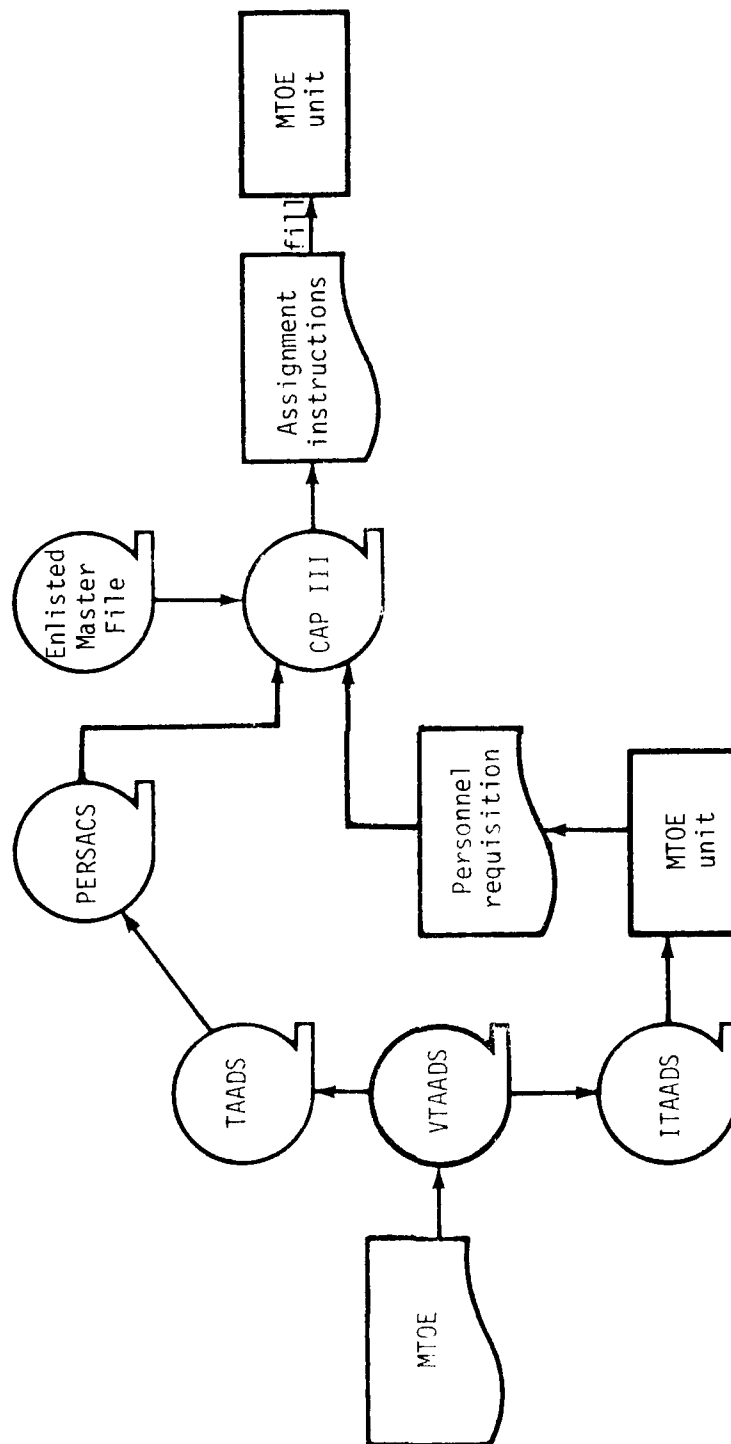


Figure F-III-1. How PERSACS Affects Personnel Distribution

Annex IV. PERSONNEL RECRUITING AND TRAINING

F-IV-1. PURPOSE. The recruiting and training process is intended to insure, to the extent possible, that the proper types and numbers of personnel are recruited, trained, and maintained in each MOS to support the force structure.

F-IV-2. DESCRIPTION. The authorization data from PERSACS is a key input used to develop initial entry training programs and refine recruiting objectives. That data defines for personnel managers the objective MOS profiles as perceived by force structure managers. In other words, the PERSACS details the quantities of personnel needed at each grade in each MOS for every unit in the force structure (Figure F-IV-1). As discussed elsewhere in this report, the MTOE documents, which are the basis for PERSACS computations, are adjusted by force structure managers in an attempt to maximize the overall combat readiness of the Army. Force structure management decisions, resulting in MTOE changes, are constrained by end strength limitations imposed on the various MACOM, but normally are not made with a priori knowledge of the full personnel impact of the changes. Personnel managers are then required to attain the desired MOS alignment in the force structure as best they can, subject to a host of other constraints that relate to the morale and welfare of the individual soldier, e.g., limitations concerning the length of time an individual must remain at a duty station before becoming eligible for reassignment, and desire to minimize adverse impact on career progression opportunities in the various MOS. These are important considerations that directly relate to the Army's ability to get and retain qualified people. They do, however, detract from the ability of the personnel system to react to force structure changes in rapid fashion.

a. Army Manpower Program. The Army Manpower Program is the official Army projection of future strength, gains, and losses of the aggregate active military force. This program is produced monthly through a computer model system called Enlisted Loss Inventory Model - Comparison of Manpower Programs using Linear Programming (ELIM-COMPLIP). The ELIM portion of the system uses data extracted from the Enlisted Master File (EMF) and transaction tapes detailing gain/loss history to produce a quantitative projected inventory of the Army. The data produced by ELIM is input to COMPLIP along with the latest force structure allowance (FSA) provided by ODCSOPS. The primary objective of COMPLIP is to determine the non-prior service accessions required to minimize the average difference between aggregate structure spaces and operating strength.

The linear program package examines many feasible alternative programs which satisfy all constraints and selects the optimum program for any chosen objective. Normally, the most important consideration is given to providing trained individuals to fill the structure requirements of the Army. The objective, however, can be weighted to give more importance to accession seasonality, Basic Combat Training (BCT) utilization or Advanced Individual Training (AIT) capacity.

b. Training Program Development. An output of the COMPLIP obtained as a result of the personnel inventory projection is the gross initial entry training requirement estimate. This is a gross estimate in that it projects the total number of soldiers to be trained without specifying the numbers to be trained for each specialty field. A separate estimate of training requirements for each MOS is obtained from a computer program called Personnel Inventory Analysis (PIA II). This program uses the PERSACS and the EMF as the data bases for authorization and personnel inventory data, respectively. Numerous factors that affect the population of an MOS are applied during the computer run. The output from PIA II is a projected training requirement for each four-digit MOS. Basically, this projection is the difference between the projected authorization (as detailed in PERSACS) and the estimated retainable inventory. The requirements for MOS training courses to be filled by nonprior service accessions are compared with the latest COMPLIP projections of non-prior service accessions to determine the attainability of MOS levels projected. Priorities for each MOS are established so that any shortfall is distributed in accordance with the needs of the Army. The final results detail the Active Army's MOS training requirements. These are entered into the Army Training Requirements and Resources System (ATRRS) where they are combined with inputs detailing Reserve, National Guard and other Army training requirements. School capacity data and other significant factors are also input into ATRRS. A principal output of ATRRS is the Army Program of Individual Training (ARPRINT). The ARPRINT provides a time-phased program for individual training in each MOS. It is produced quarterly and provides HQDA and TRADOC a basis for management of training programs.

c. Recruiting Objectives. The basic recruiting objectives, in terms of aggregate numbers, are products of the COMPLIP that was described earlier. The ARPRINT provides the MOS-level of detail needed to provide more specific guidance for Army recruiters concerning the types of jobs to be recruited for at any point in time. The interface between trainers and recruiters is provided by an automated system called REQUEST. REQUEST is a reservation system, similar to that used by airlines, that receives ARPRINT data relating to class schedules and capacities as input. A query

capability exists to allow recruiters to determine when space will be available in MOS training courses and to "reserve" a seat in a particular course for the individual being recruited. In such fashion, the COMPLIP, ARPRINT, and REQUEST systems interrelate to insure that the Army attempts to recruit and train personnel in the proper types and quantities to meet the needs of the force structure as depicted in the PERSACS.

F-IV-3. RESPONSIBILITIES. The responsibilities of HQDA staff agencies and organizations with respect to recruiting and training personnel are:

- a. DCSOPS, HQDA. This staff element operates PERSACS and provides its output to MILPERCEN. ODCSOPS also provides the FSA to ODCSPER for use in ELIM-COMPLIP and manages the ATRRS which produces the ARPRINT.
- b. ODCSPER, HQDA. Personnel of ODCSPER are responsible for operation and maintenance of the ELIM-COMPLIP which produces gross initial entry training objectives and aggregate recruiting objectives.
- c. MILPERCEN. This organization develops the active duty training requirements by MOS through use of the PIA II system.
- d. USAREC. The US Army Recruiting Command recruits personnel to meet the training objectives.

F-IV-4. MILESTONES. This is a continuous process; however, key updates occur when each quarterly ARPRINT is published.

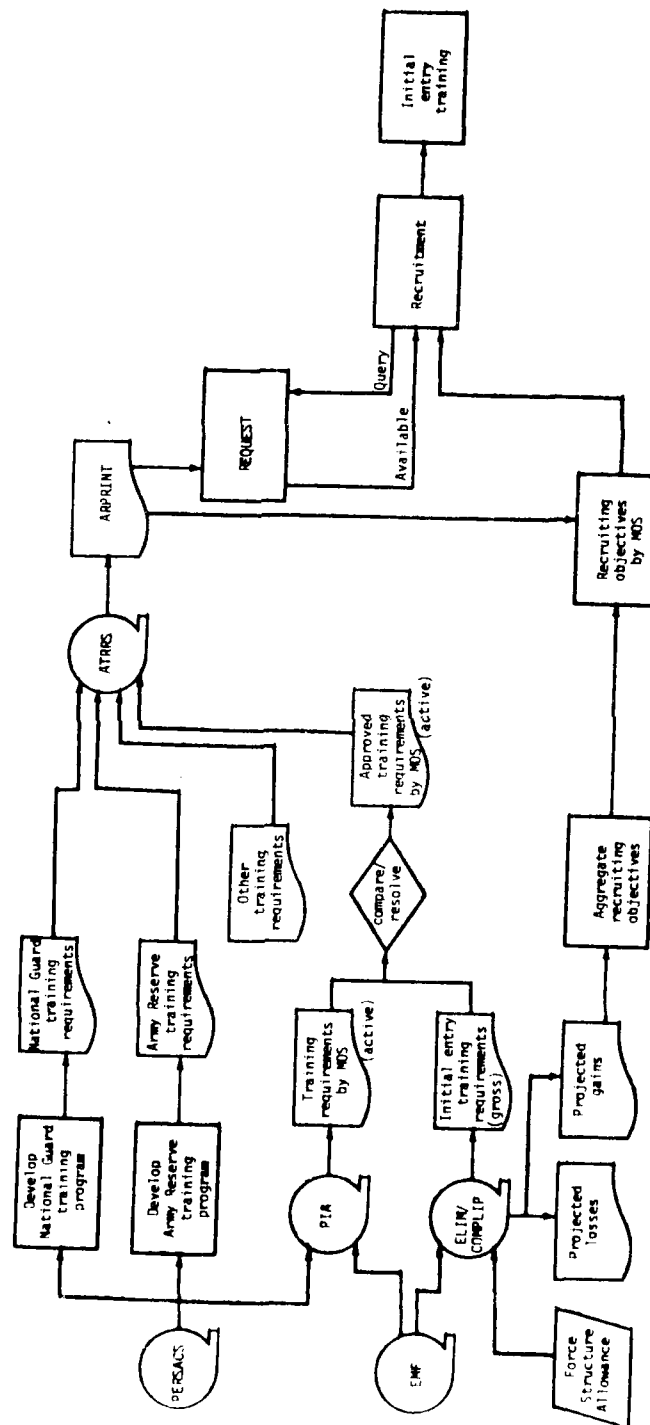


Figure F-IV-1. How PERSACS Affects Personnel Recruitment and Training

Annex V. EQUIPMENT PROCUREMENT

F-V-1. PURPOSE. Equipment procurement programing provides a prioritized, recommended Army procurement list approved by the Functional Program Review. The procurement list is integrated into the Research, Development, and Acquisition (RDA) program and provided to DOD by way of the POM. This process integrates current and projected requirements with asset inventory data, production capabilities, unit costs of equipment, replacement factors, and attrition rates through manual and computer assisted analyses. Another product of the procurement programing process is the Army Materiel Plan (AMP). The AMP is a primary source document for Army procurement programs and budgeting. It is also used for mobilization, production, and distribution planning.

F-V-2. DESCRIPTION. Beginning with development of the 1980 POM, equipment procurement programing is done using an initial baseline program. The initial baseline program is generated by an automated system known as the Materiel Acquisition Readiness System (MARS). The MARS provides the speed and flexibility necessary to allow an iterative process of "what if" parameter changes in baseline program development. The MARS assisted procurement program development parallels and is supplemented by the AMP development process. Both processes are initiated when ODCSRDA receives the POM (requirements) LOGSACS from ODCSOPS. The requirements LOGSACS has been updated through the application of BOIP and SHN to reflect the latest requirements for planned or developing equipment. The LOGSACS file provides ODCSRDA the Initial Issue Quantity (IIQ) of equipment or the sum of requirements by LIN to equip the force being considered. The IIQ is combined with other factors by ODCSRDA to compute the Authorized Acquisition Objective (AAO)*. The AAO is defined as the quantity, by item, authorized for peacetime acquisition. The AAO is input to the ODCSRDA procurement data base (PDB) for use in the MARS and is provided to appropriate DARCOM Materiel Readiness Commands (MRC) for use in AMP development. Although the AMP development and MARS program development processes use many common inputs and also converge as the procurement program is finalized for input into the POM, they are separate processes and will be discussed separately. The two processes and their interactions are shown in Figure F-V-1.

*AAO = (IIQ + maintenance float + additive operational projects + special contingencies + post D-day consumption)-(production offset + NATO/Asia trade-off).

a. The Army Materiel Plan (AMP)

(1) The AMP integrates the logistics planning data required to identify materiel requirements, time-phased inventory objective plans, procurement plans, and related maintenance programs. The AMP is developed in seven functional segments:

- Weapons and tracked vehicles
- Missiles
- Ammunition
- Aircraft
- Communications-electronics equipment
- Tactical support vehicles
- Other support equipment

A given DARCOM MRC has proponent responsibility for development and coordination of each segment. AMP development is initiated when ODCSRDA provides appropriate MRCs with the AAO along with letter guidance. Upon receipt of development guidance and data, each proponent MRC develops a first draft for its AMP segment and conducts an internal MRC command review. After the internal command review, the proponent MRC convenes a joint review of the AMP. That review includes participation of representatives from the Army Staff, MACOMs, HQDARCOM, and other interested agencies. The joint review is conducted to resolve questions or problems relative to production schedules, costs, and budget documentation. Comments and updated information from the joint review are incorporated by the MRC into a second draft AMP. The second draft AMP is provided to ODCSRDA where it is reviewed with respect to priorities and resource limitations and used in the development of the RDA program.

(2) While the ultimate AMP development goal is production of the second draft (no further refinement is made), other processes are provided with vital data during the AMP development. The first draft AMP acquisition data are provided to DESCOM as input to the Total Army Equipment Distribution Program (TAEDP) development process. Each proponent MRC also provides ODCSRDA with data from the joint review process to update, as appropriate, the draft program that evolves through the MARS. Primarily, these data are used to update quantity and cost information contained in the PDIPs before the draft program undergoes the Functional Program Review process.

b. MARS Assisted Program Development. The MARS uses input data from the ODCSRDA procurement data base (PDB) along with a force packaging methodology provided by ODCSOPS to produce a baseline or strawman procurement program. That program is manually analyzed and refined in the process of RDA program development. The PDB is maintained on a continuous basis and is updated immediately prior to generation of each POM baseline program. The MARS uses PDB data relating to production constraints, unit costs, equipment inventory, attrition rates, and replacement factors. Most of these data are provided to the PDB from DARCOM MRCs. A major MARS input is the AAO which is computed by ODCSRDA using the requirements LOGSACS. The generated baseline program displays a prioritized requirements list by:

- Force package, e.g., forward deployed, training base
- Major end item of equipment, e.g., XM-1, DIVAD Gun
- Element, e.g., IIQ, Operational Readiness Float (ORF), POMCUS

That baseline program is reviewed jointly by ODCSOPS and ODCSRDA to compare force structure needs with the stated requirements; based on this review, appropriate HQDA PDIPs are developed. All PDIPs are then grouped into 11 functional or mission areas, and functional committees known as Mission Area Cells (MAC) prioritize the PDIPs within each mission area. After the MAC prioritization process, an Army ranking committee is convened to evaluate the 11 prioritized lists and merge them into a single, prioritized Army list of requirements--or a draft procurement program. Coincident with draft program development, the AMP development has progressed through the joint review stage. The results of the joint reviews are provided to ODCSRDA by the proponent MRCs and are used to update data in the draft program as appropriate. At this point, the draft program is ready to enter the Functional Program Review process. Normally, the draft Consolidated Guidance (CG) is received from OSD early enough for use in the Functional Program Review and subsequent processes to insure that the final procurement program is consistent with OSD guidance. The Functional Program Review is a series of reviews beginning with the Program and Budget Committee, followed by the Select Committee, and finally a review by the Chief of Staff, Army and the Secretary of the Army. The Functional Program Review output product is an approved draft procurement program which ODCSRDA integrates into the final RDA program. The RDA program, prior to integration into the POM, receives final review and approval by the Materiel Acquisition Resource Committee (MARC).

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F-V-3. RESPONSIBILITIES. Equipment procurement within the Army is accomplished through the joint efforts of several agencies; the major actors in the procurement process and their responsibilities are indicated below:

a. DCSRDA, HQDA. The HQDA staff proponent for equipment procurement is the DCSRDA. Personnel of ODCSRDA are responsible for computing the AAO, providing staff guidance to DARCOM MRC for AMP development, and joint AMP review participation. This agency also maintains the procurement data base and is responsible for maintenance and operation of the MARS. After the Functional Program Review, the ODCSRDA finalizes the RDA program and submits it to the MARC.

b. DCSOPS, HQDA. ODCSOPS provides the requirements LOGSACS to ODCSRDA for AAO computation and inputs the force packaging methodology to the MARS. During procurement program development, ODCSOPS participates in the review of the baseline and draft programs.

c. DCSLOG, HQDA. Personnel of ODCSLOG participate in the joint AMP review process and in the ranking of PDIPs within the logistics area.

d. DARCOM. Selected DARCOM MRCs are responsible for preparation of functional segments of the AMP; those MRCs also host and conduct the joint review of their AMP segments. The MRCs are responsible for data input to the PDB. HQDARCOM participates in the joint AMP review process.

F-V-4. MILESTONES

a. This process is dependent upon timely receipt of the requirements LOGSACS in late November. That input is used for both the AMP and the MARS.

b. Functional Program Review approval of the draft program in February (MARS process) and completion of the second draft AMP in March are essential prior to preparation of the RDA program by ODCSRDA.

c. The MARC review and approval of the RDA program in April is essential prior to submission of the procurement annex of the POM.

Annex VI. EQUIPMENT DISTRIBUTION

F-VI-1. PURPOSE. Programing for equipment distribution is supported by the Total Army Equipment Distribution Program (TAEDP). The TAEDP is an equipment distribution program for the total Army force which covers the current, budget, and POM years. It provides authorization, requirement, and inventory data to support the equipment acquisition and distribution processes. Management and requisition validation reports are provided to support users at MACOM, DARCOM MRC, and installation level. The validation reports indicate by Standard Requirements Code (SRC), by LIN, the required, authorized, and on-hand quantities as well as the fill objective and net asset position. The MACOMs, MRCs, and installations use their reports for requisition validation and distribution planning to insure equitable distribution in accordance with priorities established by HQDA. Equipment distribution, then, is supported by the TAEDP from distribution programing to the final decision to release a given major end item of equipment for issue to a specific unit.

F-VI-2. DESCRIPTION. The Total Army Equipment Distribution Program products provide the plan for distribution of Procurement Appropriation (PA) funded major end items of equipment for the current, budget, and POM years. The TAEDP is a management information system that provides 40 reports arrayed to meet the needs of specific users. It does not generate new data but does organize or reorganize the inputs for ready use by specific consumers. The products of the system provide equipment asset positions by LIN for various force groupings, e.g., battalion, brigade, division, or MACOM. That same data is also arrayed by commodity management code. Products are distributed for use at installation, MACOM, and MRC for requisition validation. TAEDP reports are used by MACOMs for planning, programing, and budgeting of resources to support projected equipment receipts. Products oriented to staff action officer use provide asset position, projected fill, and projected shortfalls over time. These products are also arrayed over time by force package and claimant for analysis and projection of readiness trends. Summary analyses are also provided which aid the Army Staff in overall evaluation of procurement, maintenance, and rebuild programs. A portion of the TAEDP output is used by ODCSLOG as input to the POM Equipment Distribution Annex. The TAEDP is normally run four times per year in support of key PPBS activities (pre-POM analyses, POM submission, Army budget submission, President's budget submission). It is initiated upon receipt of the LOGSACS from ODCSOPS by the Depot Systems Command (DESCOM). DESCOM acts as the data processing installation (DPI) for ODCSLOG. Based upon guidance from ODCSLOG, DESCOM applies

inputs from other systems such as the Army Equipment Status Reporting System (AESRS), the Army Materiel Plan (AMP) by way of the System for Automation of Materiel Plans for Army Materiel (SAMPAM) and the Continuing Balance System - Expanded (CBS-X). These input systems provide equipment authorizations, on hand assets, loss and procurement projections as well as POMCUS, and project stock asset positions and needs. The TAEDP considers these inputs along with the Department of the Army Master Priorities List (DAMPL) to produce time-phased distribution products. The LOGSACS used for TAEDP production does not include modernization items. To provide modernization considerations, a system known as Phased Equipment Modernization (PEM) is presently being implemented to provide the capability for time-phasing requirement and authorization changes in the distribution plan. The PEM enhancement will display a mixed force of new replacement equipment and old equipment to indicate a time-phased introduction. An integral TAEDP subsystem, PEM was introduced in March 1980. At that time 57 BOIP, affecting 12 weapons systems, were introduced. The PEM will be incrementally increased until all BOIPs are reflected in the TAEDP products. A second system enhancement was implemented in March 1980 which will make TAEDP more comprehensive in accounting for equipment item requirements and will therefore better align the products with the AAO. That enhancement applies Standard Study Number Component Cross Reference (SSN X-Ref) data to the authorized equipment assemblages to compute component item requirements. Comparison of the computed component requirements with reported asset data will aid the proper drawdown of distributable assets. The equipment distribution process, to include these recent enhancements, is depicted in Figure F-VI-1.

F-VI-3. RESPONSIBILITIES. The major organizations which participate in the equipment distribution process and their responsibilities are:

a. DCSLOG, HQDA. The HQDA DCSLOG has staff proponentcy for equipment distribution and for the TAEDP. The ODCSLOG receives TAEDP products and provides the POM Distribution Annex.

b. DCSOPS, HQDA. The ODCSOPS provides the authorization LOGSACS output and the DAMPL as inputs for developing equipment distribution programs.

c. MACOMs. The Army major commands are responsible for reporting their on-hand equipment assets.

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d. DARCOM. The DARCOM community provides materiel acquisition information, maintenance program production expectations, and loss projections. The DESCOM element of DARCOM is responsible for maintenance and operation of the overall TAEDP system.

F-VI-4. MILESTONES. Timely receipt of scheduled inputs such as LOGSACS for authorization data and CBS-X and AESRS reports reflecting on-hand assets are critical to the TAEDP process. The TAEDP is produced four times per year, normally in January, March, June, and October.

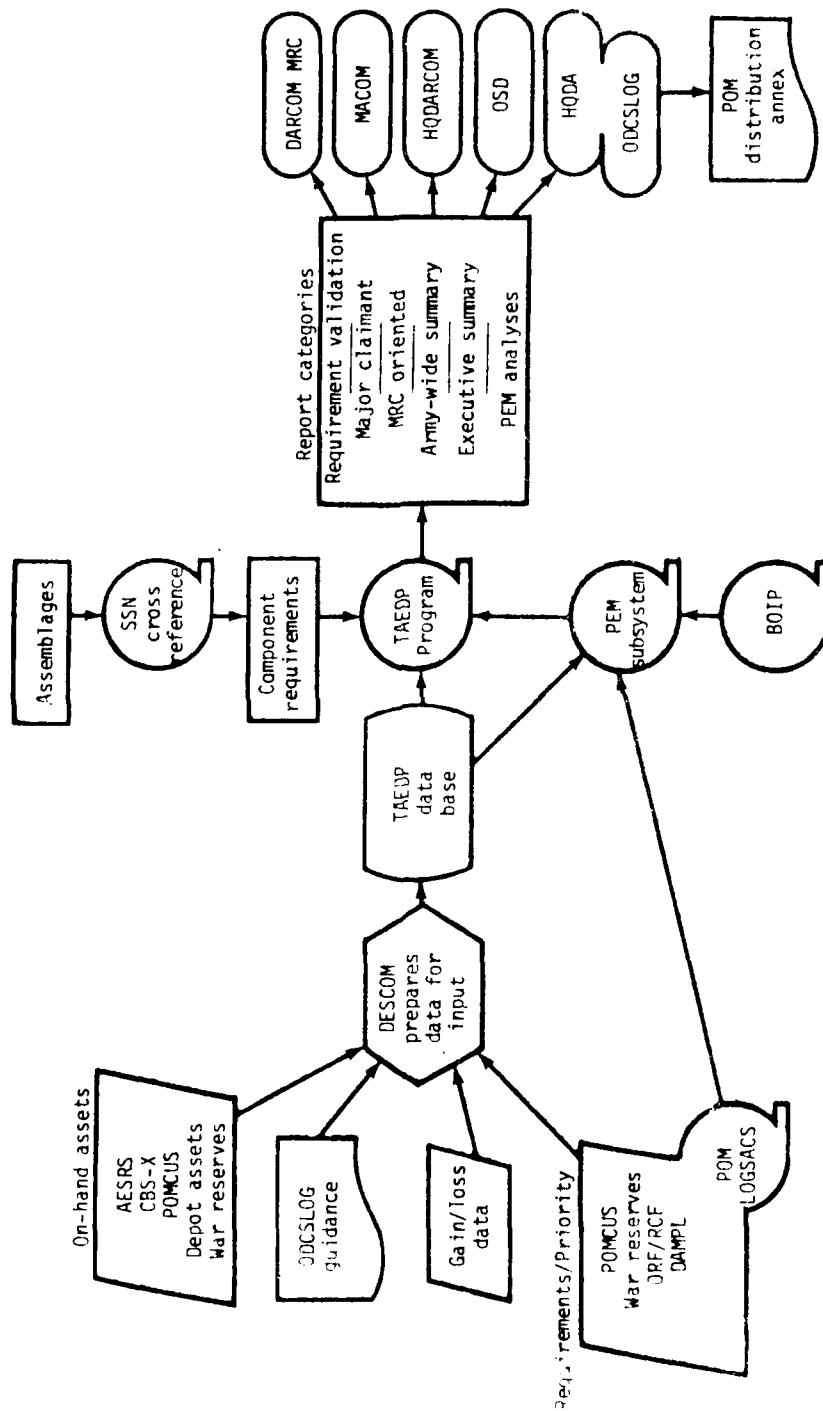


Figure F-VI-1. Equipment Distribution

APPENDIX G

COMPUTER-BASED TOOLS

G-1. INTRODUCTION. This appendix describes the computational capabilities of the computer based operational tools used to support the Implementation of Change (IC) Study analysis effort. The IC Study used two computer-aided techniques--Problem Statement Language/Problem Statement Analyzer (PSL/PSA) and a cost model developed for the IC Study. The principal analysis tool for the study was PSL/PSA. PSL/PSA is a computer-aided technique for structured documentation and analysis of information processing systems.* PSL is a computer-processable language designed primarily to describe a target system (e.g., the IC environment). PSA is a software package that processes PSL statements and acts as an interface between the analyst and the information stored in the PSL data base. PSL/PSA was used in the IC Study to analyze the processes which control organizational changes to combat units and to help identify improvements/prescriptive measures to synchronize the organizational changes with the resource allocation process. The second tool used in the IC Study was a cost model developed to analyze the resource implications of requirements changes resulting from Consolidated Change Table 300-67 (CCT-67).

G-2. STRUCTURE AND CAPABILITIES OF PSL/PSA

a. PSL/PSA is a computer-aided design system that has the following capabilities:

- (1) Capability to describe information systems, whether manual or computerized, whether existing or proposed, regardless of application area.
- (2) Ability to record such description in a computerized data base.
- (3) Ability to incrementally add to, modify, or delete from the description in the data base.

*Additional information on PSL/PSA may be obtained from an article appearing in an IEEE journal entitled TUTORIAL: Automated Tools for Software Engineer. Detailed information on PSL/PSA can be obtained from University of Michigan by referencing the ISDOS Project.

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(4) Ability to produce "hard copy" documentation for use by the analyst or other users.

b. The capability to describe systems in computer processable form results from the use of the system description language called PSL. The ability to record such description in a data base, incrementally modify it, and on demand perform analysis and produce reports comes from the software package called the Problem Statement Analyzer (PSA). PSA is controlled by a command language (see Figure G-1).

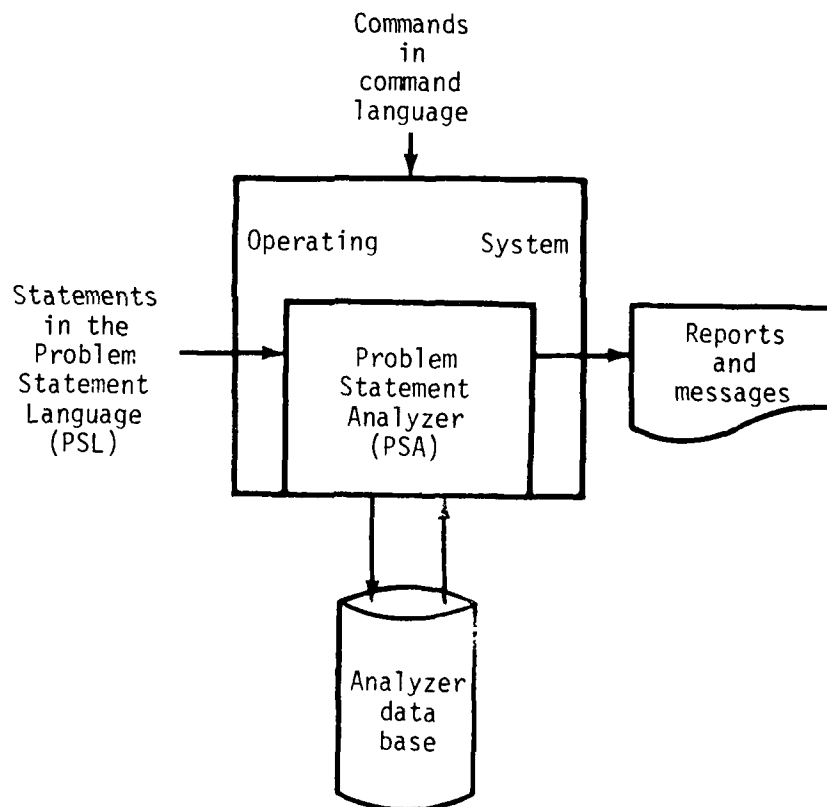


Figure G-1. PSL/PSA

c. PSL is a structured language for describing an information processing system. A problem statement (PS) in PSL can be used to describe the "present" system or to state requirements that a "proposed" target system is to fulfill. Describing the "present" system is helpful in finding where redundant information exists, standardizing procedures, etc. The present system forms the basis for designing "proposed" systems. In describing a "proposed" system, the PS can be considered as the specifications for the succeeding stages in the system life cycle, i.e., in the physical design and construction phases.

d. Requirements for proposed information processing systems are usually described in the logical system design phase sometimes called the "Feasibility Study." The end result of the logical system design process is a description of a proposed system and an analysis of the value of building it. The process itself may be accomplished in many different ways, but the particular method chosen does not affect the form of the final result. What constitutes a satisfactory description of the proposed system is not affected by whether the process is carried out manually or with computer aids (except for the fact that the computer-aided method can result in the description itself being stored in a computer-aided processable form).

e. Once a PSL description of an information processing system has been entered into a PSA data base, the user has the option of retrieving the stored information in several different standard formats called PSA reports. Each PSA report has particular characteristics with respect to its purpose, the amount of retrieval and analysis required to generate the report, the information presented in the report, the format, and how the report may be used to aid problem definers in checking the validity of the PSL description and to improve on its completeness. Paragraph G-3 will describe these reports in detail.

G-3. PSL/PSA EXAMPLES. The following discussion describes the mechanics of putting the IC data into PSL/PSA, and how this information was extracted from the data base and used in the study analysis effort. Figure G-2 is a portion of the IC network that was produced from the PSL/PSA data base. The figure is read from right to left and it models the MACOM process of analyzing the October CCT. The diagram will serve as a reference point for the remainder of the discussion.

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Figure G-2. The MACOM CCT Analysis (Oct 78) Network

a. One of the advantages of PLS/PSA is its rapid updating feature which inputs new data, without the necessity to redesign all other data elements. An example of a PSL input is shown at Figure G-3. The first section of the figure (lines 1 through 16) is the description of the data being added to the data base. This section provides the user with additional information on that particular piece of data being input. The second section (lines 17 through 21) describes the attributes of the PSL data object. These attributes are used to identify key characteristics that should be of particular importance to the study manager, sponsor, and/or analyst. The next section (lines 22 through 47) describes how the data element being added is developed, derived, or used in the system being developed/analyzed. For example, the B0IP is generated by the Materiel Developer (line 22). It is then used by the May-Sep TOE update as one of the inputs of the process deriving the Oct 78 CCT (Lines 36 to 38). The above example can also be traced pictorially in Figure G-2. The final section (line 48) describes the source (if applicable) of this particular piece of data. Additive changes to these sections are relatively easy and may be added directly to the data base without reinserting the entire data element. Modifications to the data element (i.e., deletions, corrections to the data base, etc.) may require the element to be deleted from the data base, rebuilt, and added to the data base as if it were a new input.

b. Output Products. The following discussion is geared only to PSL/PSA output reports and the discussion which supported the IC scheduling analysis.

(1) Figure G-2 is an Extended Picture Report and shows a portion of the network which used the input described in the preceding subparagraph. The Picture Report (Figure G-4) provides the analyst and study manager with a view of the relationships they have uncovered in the course of the study. The picture report allows the analyst/manager the ability to focus on one particular item in the system being investigated, developed, etc. For this specific data element all relationships are displayed. In Figure G-4, the picture report shows the data elements required to perform the MACOM CCT analysis and the products of this analysis. It also shows that this process does not have any identified subprocesses and is not part of some larger process.

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Figure G-3. Sample PSL Input

PICTURE REPORT

MACOM-OCT-78-CCT-ANALYSIS

```

+---ENTITY---+
8
8 OCT-78-CCT 8
8
+USES TO DRV+
+---INPUT---+
8
8 MAY-78-P9G 8
8
+USES TO DRV+
+---ENTITY---+
8 APR78-NON- 8
8 AFFORD- 8
8 TDE-CHGS 8
+USES TO DRV+
+---INPUT---+
8
8 JUN-78-TPG 8
8
+USES TO DRV+
+---ENTITY---+
8 NON- 8
8 AFFORD- 8
8 MACOM-INTSR 8
+USES TO DRV+

+---PROCESS---+
8 MACOM-OCT--8
878-CCT-ANA-8
8 LYSIS 8
+-----+

+---ENTITY---+
8 OCT78- 8
8 NON- 8
8 AFFORD-CHGSR 8
+---DERIVES---+

+---ENTITY---+
8 OCT-78-AFF-8
8 ORD-ADMIN-8
8 TDE-CHGS 8
+---DERIVES---+

```

Figure G-4. The Picture Report

(2) Figure G-3 is actually a sample of the Formatted Problem Statement (FPS) report. The FPS report presents, in the PSL language format, all descriptions given about one or more names in a particular data base. This report allows the analyst to view the complete description for a given PSL object name that has been entered into the data base.

(3) PSL/PSA's Name Selection report was used to select names from the data base with respect to some designated selection criteria. This name selection process was used in the analysis effort to retrieve statistics on the attributes and attribute values stored in the data base.

(a) Figure G-5 shows a sample of the Name Selection report that was used to display all sets of information that were stored in the data base.

(b) During the analyses of the current and alternative systems this report was used to query the data base for those data objects that possessed specific attributes. Figure G-6 shows a name selection report that asked for all object names that TRADOC was responsible for developing under the current system of implementing changes. This information was stored in the data base as attributes.

(4) The Attributes Report is intended to present the system properties aspect of the target system description with respect to the attributes defined for each data element. Early in the data gathering process it became necessary to define a series of attributes which would identify key characteristics. The attribute report was a bookkeeping device for the IC study team which provided a ready reference for the stated attribute values. Figure G-7 shows a sample of the Attribute Report.

NAME SELECTION

PARAMETERS: DB=93-IC-DECUR PRINT PUNCH=93-IC-ATF EMPTY NCINPUT SELECTION=SET
ORDER=8 YTYPE

1	AAG-INPUTS	SET
2	APPRVD-BOIP	SET
3	APPRVD-MACRIT	SET
4	CC T	SET
5	CCMP-TOE-FILE	SET
6	CCMP-TOE-FILE-DEVEL	SET
7	DA-APPROVED-DOCTRINE	SET
8	EMF	SET
9	EQUIP-RQMTS-PRIORITIES	SET
10	FAS-DEVELOP-MENT	SET
11	FAS-FILE	SET
12	HIDDEN-RQMTS	SET
13	ITEM-DATA	SET
14	MACRIT-STUDY-INPUTS	SET
15	MOS-TAPE	SET
16	ON-HAND-ASSETS	SET
17	PEM	SET
18	PROCURE-MENT-DATA-BASE	SET
19	RECEIPTS-LOSSES	SET
20	SB700-20-EDIT-TAPE	SET
21	TAA-DA-GUIDANCE	SET
22	TAA-DEVELOP-MENT	SET
23	TAEOP-PRODUCTS	SET
24	TOE-CHG-INPUTS	SET
25	TOTAL-ARMY-ANALYSIS	SET
	25 NAMES OUTPUT	

Figure G-5. Name Selection Report

NAME SELECTION

PARAMETERS: DB=33-IC-08CUR PRINT PUNCH=9. EMPTY NOINPUT
 SELECTION=ATTR=AGENCY-IS,TPA-000 AND ATTR=FUNCTION-IS,DEV* ORDER=RYTYPE

1	OCT-78-CCT	ENTITY
2	MACRIT-STUDY	PROCESS
3	MACRIT-STUDY-DFVEL	PROCESS
4	MAY-SEP-TOE-UPDATE	PROCESS
5	NOV-MAR-TOE-UPDATE	PROCESS
6	SCHOOL-DEVEL-FBOIP	PROCESS
7	TRADOC-DEVELGPS-TTCE	PROCESS
8	TRADOC-MACRIT-REV-BD	PROCESS
9	TRADOC-MACRIT-REVIEW-BD	PROCESS
10	TRADOC-PREPARES-FTCE	PROCESS
11	TRADOC-REVIEW-BOIP	PROCESS
12	TRADOC-REVIEW-FBOIP	PROCESS
13	TRADOC-STAFFS-OCCTRINF	PROCESS
14	TRADOC-STUDIES-CONCEPT	PROCESS
15	TRADOC-TOE-REV-BD	PROCESS
16	TTCE-TEST	PROCESS
17	TTCE-TEST-RESULTS-REVIEW	PROCESS
18	APPRVD-BOIP	SET
19	APPRVD-MACRIT	SET
20	CCT	SET
21	MACRIT-STUDY-INPUTS	SET
22	TOE-CHG-INPUTS	SET
22	NAMES OUTPUT	

Figure G-6. Name Selection Report on Specific Attributes

ATTRIBUTE REPORT			
DA-PCC	MACOM-POC	AGENCY-IS	FUNCTION-IS
PAC-INPUTS		TRA-DOC	DEV
APPVQ-BCIP		TRA-DOC	DEV
APPVQ-MACRIT		TRA-DOC	DEV
CCY		DA-DCSOPS	DEV
COMP-TOE-FILE		DA-DCSOPS	DEV
COMP-TOE-FILE-DEVEL		DA-DCSOPS	DEV
DA-APPROVED-DOCTRINE		DA-DCSOPS	DEV
EMF		MIL-PERCEN	IMP
EQUIP-RQMTS-PRIORITIES			
FAS-DEVELOP-MENT		DA-DCSOPS	P-A
FAS-FILE		DA-DCSOPS	P-A
HIDDEN-RQMTS			
ITEM-DATA		DAR-COM	DEV
MACRIT-STUDY-INPUTS		TRA-DOC	DEV
MCC-TAPE	CAF C-MSP	MIL-PERCEN	DEV
ON-HAND-A CSFTS		DAR-COM	P-A
PEN		DAR-COM	IMP
PROCURE-MENT-DATA-PAGE		DA	P-A
RECEIPTS-LOSSES			
CB700-20-EDIT-TAPE		DAR-COM	DEV
TAA-DA-GUIDANCE		DA-DCSOPS	P-A
TAAOS-DEVELOP-MENT		DA-DCSOPS	P-A
TADP-PRODUCTS		DAP-COM	DEV
TOE-CHG-INPUTS		TRA-DOC	DEV
TOTAL-ARMY-ANALYSIS		DA-DCSOPS	P-A

Figure G-7. Attribute Report

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G-4. CCT COST ANALYSIS PROGRAM. During the course of this study, it became apparent that the total resource costs to implement the TOE changes promulgated by CCT were unknown prior to issue of the CCT. It had already been determined that there was no costing procedure used during the TOE change review and approval process. It was also apparent that there were disparate estimates of what these costs might be. Since development of alternatives to the current system might be affected by the amount of the resource cost and since several of the alternatives under consideration called for costing of TOE changes, the study team determined that costing a CCT would be a worthwhile effort. A computerized costing routine was developed, using readily available data, to determine the resource costs of all the TOE changes comprising a CCT. The purpose of this activity was twofold. The first purpose was to conduct an analysis of the resource implications of the requirements changes resulting from CCT 300-67. The second purpose was to demonstrate the feasibility of developing an automated routine which could serve as a basis for development of a more sophisticated costing program. The computer program developed for these purposes is not completely adequate for the detailed and accurate costing that would be required by HQDA. A more detailed costing program would have to be developed to fully analyze the costs of TOE changes. A description of the procedures followed, suggested improvements to this program, and a brief summary of the analysis of CCT 300-67 are presented below.

a. Data used by the costing routine was obtained from two sources.

(1) A computer tape of CCT 300-67 was obtained from HQTRADOC. This tape contained a listing, by TOE number, of all personnel and equipment changes to TOE that were promulgated in that CCT. This data included:

- Personnel added and deleted by grade, branch, and MOS.
- Equipment added and deleted by LIN.
- PA and OMA dollar costs of equipment added and deleted.

(2) A computer tape extract was obtained from the HQDA TAADS data base representing all current MTOE. The data included in this extract was an MTOE listing that provided:

- MACOI.
- The number of parent units organized under the MTOE.

- The subunit (company-sized unit) TOE numbers contained in that MTOE.

- The number of subunits actually organized under the subunit TOE number.

It was necessary to use the TAADS data base to obtain unit counts because the CCT presents data at the subunit level of detail whereas the force portrayed in the FAS is at the parent unit level of detail.

b. The basic function of the costing routine is to multiply the TOE cost data contained in the CCT by the number of subunits in each MACOM organized under that TOE. The number of subunits per MACOM organized under the TOE is determined by multiplying the number of parent units by the number of subunits organized under the TOE number within the MTOE and summing over all appropriate MTOE in the MACOM; stated mathematically:

$$a_j = \sum_{i=1}^n b_i c_i$$

where:

a_j = number of units in the MACOM organized under subunit TOE j .

b_i = the number of parent units organized under the i^{th} MTOE.

c_i = the number of subunits organized under the parent unit in the i^{th} MTOE.

n = the total of MTOE in the MACOM containing subunit TOE j .

Having obtained the unit count (by subunit SRC), the costing routine next multiplies the number of units organized under a subunit TOE by the cost identified in the CCT for that TOE. The cost computed for each TOE within the MACOM are:

- Net personnel change.
- Dollar value of PA equipment added.
- Dollar value of PA equipment deleted.

- Dollar value of OMA equipment added.
- Dollar value of OMA equipment deleted.

The costs for each TOE are then summed to provide the total costs to the MACOM and to the Army in each of the above categories. Printouts are written which list the costs by TOE by MACOM and the total cost to the MACOM and to the Army.

c. The above procedure contains two limitations which would warrant improvement should costing of CCT changes be conducted on a regular basis.

(1) The first limitation is that it is assumed that all units are organized at TOE Level 1 as specified by the TOE as it appears prior to application of the CCT. In other words, it assumes that all previous CCT changes have been applied and that all units are organized at TOE Level 1. Therefore the first improvement needed would be to extract the Authorized Level of Organization (ALO) from the TAADS document under which each subunit is organized, determine subunit SRC counts by ALO, and extract the cost from the CCT by ALO to compute MACOM costs. This should be a straight forward expansion of the computer programs.

(2) The second limitation is more complex in that no secondary OMA costs are computed. Secondary OMA costs are those OMA costs that result to a MACOM from fielding an item of equipment, i.e., ASL and PLL costs, second destination transportation costs, and similar operating and support costs. The highest estimate for these costs encountered by the study team was 10 percent of the total PA cost (FORSCOM estimate). Improvement of the computer routine to include this cost, if deemed necessary, could take one of two forms. First, a percent estimate of the PA cost could be added to the OMA costs computed by this routine and adjusted based on actual data as historical experience is gained. Second, the Force Cost Information System (FCIS) contains data which could be used to more accurately estimate secondary OMA costs. Extension of the existing computer routine to interface with the FCIS for this purpose would entail some programing effort.

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d. The results of the CAA costing analysis of CCT 300-67 are summarized in Table G-1. This table shows by selected MACOM the resource cost in personnel and equipment (dollars) of applying CCT 300-67 to the Army. The personnel column is a summation of personnel who have been added or deleted from the TOE. The PA and OMA equipment columns reflect the dollar amounts added or deleted for all units organized under the TOE which CCT 300-67 is changing.

Table G-1. Cost Analysis of CCT 300-67

Code (command)	Per.	PA equipment		OMA equipment	
		Added	Deleted	Added	Deleted
a. FC (FORSCOM)	860+	\$195,631K	\$102,749K	\$4,156K	\$806K
b. E1 (USAREUR)	255+	161,599K	77,812K	2,748K	488K
c. PB (8th Army)	35+	13,797K	7,842K	317K	132K
d. AR (Army Reserve)	68+	20,458K	13,069K	2,512K	216K
e. NG (Natl Guard)	899+	318,433K	164,887K	4,726K	2,347K
f. TC (TRADOC)	0	25K	56K	--	--
g. P1 (WESCOM)	27+	2,960K	2,407K	267K	99K
h. CC (USACC)	6+	2,057K	67K	52K	--
i. Other	5+	1,145K	1,199K	4K	16K

G-5. SUMMARY

a. PSL/PSA is a powerful computer-aided system development tool which supported and assisted the IC analysis. The use of PSL/PSA does not depend on any particular structure of the system development process or any standards on the format and content of hard copy documentation. It is fully compatible with current procedures that are used in developing and maintaining systems. The ability of PSL/PSA to store these large amounts of data, analyze relationships, and depict this information graphically made it uniquely suited to the analysis requirements of the study. The data base development and the reports obtained from PSA provided numerous insights into the current system for developing and implementing TOE changes. PSL/PSA provided a unique method of assisting the specific requirements of the IC Study.

b. The feasibility of developing a costing program for the CCT has been demonstrated. The efforts by the IC study team can be expanded into a methodology which will allow the Army to develop an estimate of the total resource cost of applying a CCT.

(U) GLOSSARY OF TERMS

AAO	Authorized Acquisition Objective
AESRS	Army Equipment Status Reporting System
AIT	Advanced Individual Training
ALO	authorized level of organization
AMMH	annual maintenance manhours
AMP	Army Materiel Plan
AMSCO	Army Management Structure Code
AOI	area of interest
ARPRINT	Army Program for Individual Training
ATRRS	Army Training Requirements and Resource System
AURS	Automated Unit Reference Sheet
AUTS	Automated Update Transaction System
BCT	basic combat training
BOIP	basis of issue plan
CAA	US Army Concepts Analysis Agency
CAP III	Central Assignment Procedure III
CBS	Continuing Balance System (as pertains to equipment)
CBS-X	Continuing Balance System - Expanded
CCT	Consolidated Change Table
CDA	Catalog Data Agency
COMPLIP	Computation of Manpower Programs Using Linear Programing

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CTA	common tables of allowances
DAMPL	Department of Army Master Priority List
DARCOM	US Army Materiel Development and Readiness Command
DESCOM	Depot Systems Command
DPI	data processing installation
EARA	Equipment Authorization Review Activity
EDATE	effective date
ELIM	Enlisted Loss Inventory Model
EMF	enlisted master file
ERC	Equipment Readiness Code
FAS	Force Accounting System
FCIS	Force Cost Information System
FDMIS	Force Development Management Information System
FISO	Force Integration Staff Officer
FORDIMS	Force Development Integrated Management System
FORSCOM	US Army Forces Command
FPS	formatted problem statement
GAO	Government Accounting Office
IC	Implementation of Change
IG	Inspector General
IIQ	initial issue quantity
IPR	in-process review
ITAADS	Installation, The Army Authorization Document System

LIN	line item number
LOGSACS	Logistic Structure and Composition System
LON	letter of notification
MAC	mission area cell
MACOM	major Army command
MACRIT	TOE Manpower Authorization Standards and Criteria
MAKRO	Management Analysis of Key Resource Operations
MARC	Materiel Acquisition Resource Committee
MARS	Materiel Acquisition Readiness System
M-Force	Master Force
MILPERCEN	US Army Military Personnel Center
MOC	Management of Change
MOS	military occupational specialty
MRC	Materiel Readiness Command
MRSA	Materiel Readiness Support Activity
MTOE	Modification Table of Organization and Equipment
ODCSLOG/ DCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSPER/ DCSPER	Office of the Deputy Chief of Staff for Personnel
ODCSOPS/ DCSOPS	Office of the Deputy Chief of Staff for Operations and Plans
ODCSRDA/ DCSRDA	Office of the Deputy Chief of Staff for Research, Development and Acquisition
OMA	Operation and Maintenance, Army

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OP	operational project
ORF	operational readiness float
OSD	Office of the Secretary of Defense
PA	procurement appropriation
PABE	Program and Budget Estimate
PARR	Program Analysis and Resource Review
PBC	Program and Budget Committee
PBG	Program and Budget Guidance
PDB	Procurement Data Base
PDIP	Program Development Increment Package
PEM	phased equipment modernization
PERSACS	Personnel Structure and Composition System
PIA	Personnel Inventory Analysis
PLL	prescribed load list
POM	Program Objective Memorandum
POMCUS	prepositioning of materiel configured to unit sets
POS	personnel occupational specialty
PPBS	Planning Programing, and Budgeting System
PS	problem statement
PSL/PSA	Problem Statement Language/Problem Statement Analyzer
QQPRI	quantitative and qualitative personnel requirements information
RDA	Research, Development and Acquisition

RDAC	Research, Development and Acquisition Committee
SACS	Structure and Composition System (see LOGSACS, PERSACS)
SAMPAM	System for Automation of Materiel Plans for Army Materiel
SB	supply bulletin
SELCOM	Select Committee
SHN	shorthand note
SRC	standard requirements code
SSI	specialty skill indicator
SSN	standard study number
TAA	Total Army Analysis
TAADS	The Army Authorization Document System
TAEDP	Total Army Equipment Distribution Program
TAGCEN	The Adjutant General Center
TOE	Table of Organization and Equipment
TPG	Troop Program Guidance
TRADOC	US Army Training and Doctrine Command
TTOE	Tentative Table of Organization and Equipment
USAMSSA	US Army Management Systems Support Agency
USAREC	US Army Recruiting Command
VFAS	Vertical Force Accounting System
VTAADS	Vertical, The Army Authorization Data System