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FM 38-1

DEPARTMENT OF THE ARMY FIELD MANUAL

LOGISTICS SUPPLY MANAGEMENT

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HEADQUARTERS, DEPARTMENT OF THE ARMY
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LOGISTICS SUPPLY MANAGEMENT

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PART ONE

INTRODUCTION

CHAPTER 1

GENERAL

1. Purpose

a. This manual contains Army doctrine in the field of supply management. It is designed to provide a basis for appropriate courses of instruction in the Army school system, and definitive guidance for operating agencies in the field. It is concerned with the policies and principles of supply management and the skills necessary to implement them and is to serve as a reference for those who exercise responsibilities for management of the supply system at all levels.

b. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded to the Commandant, U.S. Army Logistics Management Center, ATTN: CONUS Logistics Research Division, LR&D Department, Fort Lee, Va. (See AR 310-3 for desired format for corrections and changes.)

c. USALMC will prepare and process changes to the manual on an annual basis.

d. Source data cutoff date for material in this publication is 30 June 1962.

2. Scope

The subject matter of this manual is included in the encompassing term of "logistics." Supply is that element of the science of logistics concerned with materiel from its inception as a requirement, leading through procurement, storage, and distribution to its ultimate consumption or disposal. The subject is developed in two parts.

a. Part Two: Introduction to Supply. This part contains discussion of the scope and magnitude of the Army supply system, the individuals and agencies within the Army and at high governmental levels responsible for managing the system, and the need for effective and dynamic supply management.

b. Part Three: The Management of Army Supply. This part covers the separate, but interdependent functional areas of the supply system as well as management controls.

PART TWO SUPPLY, GENERAL

CHAPTER 2 THE ARMY SUPPLY SYSTEM

Section I. MEANING OF SUPPLY MANAGEMENT

3. Purpose of Army Supply

a. Broadly stated, the mission of the military services is to defend the nation. The Army's combat forces bear a proportionate share of this burden. To support its combat forces, the Army requires service elements responsible for developing and making available to troops the implements of warfare. A large proportion of the Army's manpower—military and civilian—is devoted to this essential task.

b. Supply support of combat forces can mean a number of things. In the days of the cavalry, it meant providing forage at the end of the day's march. In World War II, it meant amassing the men and materiel with which to wrest the Far East from the hands of the Japanese and assault Europe. In the cold war situation, which characterizes the present day, it means furnishing supplies and equipment to the military forces world-wide, utilizing modern systems to meet peacetime and emergency situations.

4. The World in the 1960's

a. Three major factors govern the conduct of military supply in the existing climate of political and military affairs. They are—

- (1) The continuing threat of an enemy attack and the possibility that the attack, for which defenses must be constantly marshaled, may never occur.
- (2) The continuous need for the development of new weapons and improvement in the arts of war.

(3) The limitation on manpower, money, and materials available for defense.

b. The continuous threat of an enemy attack means that the supply system may be called upon at any time to support combat operations. The attack may involve a major conflict, initiated perhaps by a devastating assault upon the United States, or it may be limited in nature, confined to a distant localized area, and result in long lines of supply from the United States.

c. It is possible, of course, that a major war will not occur in the foreseeable future despite a continuation of international tension. The principal aim of our defense program is to deter enemy aggression, and to stand ready to retaliate with armed might if called upon to do so. A strong defense posture requires continuous effort to improve the Army's ability to wage war effectively. The Army must take advantage of scientific and technological advances and acquire weapons and equipment superior to those of the enemy to overcome a disparity of manpower. Weapons superiority becomes progressively more important as they are made increasingly destructive and warfare depends more and more on highly specialized materiel.

d. If the danger of any enemy attack were the only consideration, the nation might well maintain its military establishment on a war footing at all times. New weapons would replace old ones at a rate limited only by tech-

nological development and industry's capacity to produce. Full mobilization, however, might produce maximum short-range security, but in the long run it might so weaken the nation's economic structure that the ability to resist aggression would be impaired. Economy in the use of resources is essential if we are to remain for an indefinite period a strong military force as a deterrent to aggression and a base for mobilization in the event of an emergency. Recognizing this, it becomes extremely important that a full measure of defense be received for every dollar spent. Never in the history of the Army supply system has economical supply been so important to the accomplishment of military objectives or to the welfare of the nation.

e. During World War II and the Korean War the objectives of supply were associated with getting materiel into the system and distributing it to the troops. The nation's industrial complex and the Army supply system combined to assure that the proper materiel was available in the right amounts, at the strategic point, and in time to assure success in battle; actions involved in speeding up this process were worth the price. The nation still expects outstanding performance from the Army supply system but the problems of today require the kind of solutions which provide more for less. This suggests a different way of thinking about the supply system as it was developed in World War II and in the Korean War. The Army has since developed a reliable system of reports for measuring the adequacy of supply in both quantitative and dollar terms. While the dollar figures are of little use in their raw form, they are basic to any system of reports designed to evaluate the efficiency of supply operations. Dollar reports will not automatically produce dollar savings, but they enhance cost consciousness on the part of supply managers when making supply management decisions.

5. Supply Management

a. The supply manager must continually appraise his operations in terms of—

- (1) What is being done, i.e., how good the product or service is; and
- (2) How efficiently it is being done, i.e., how much it is costing. A private enterprise is not prone to move more goods off its shelves, or to sell more automobiles than its competitor if it costs the company more than the selling price to do it. In a profit and loss economy, management is compelled to evaluate what it is doing in terms of what it costs to do it.

b. In the Army supply system, certain overriding considerations place emphasis on effectiveness of supply rather than on cost to supply. Failure to supply troops with needed weapons and equipment can result in disaster. In business the penalty for failure is bankruptcy, an undesirable end but far less extreme than defeat on the battlefield. Individuals responsible for managing the Army's supply system tend to resist the imposition of the businessman's preoccupation with costs upon a system that is governed by considerations other than cost. Yet these same individuals recognize that the Army cannot tolerate inefficiency or condone waste. Inefficiencies in Army supply are of more concern to the nation than wasteful business practices, because the Army's supply requirements represent such a large portion of the expenditure of total national resources.

c. It is the task of supply management to appraise and control the cost to supply without impairing the ability to supply on time and in required quantities. This is a difficult task, necessitating a high order of management competence. The Army has made important strides, particularly in the area of financial controls, which provide new and useful tools for managing the supply system.

Section II. PROBLEMS OF SUPPLY MANAGEMENT

6. General

There is no management responsibility in industry equivalent in scope or complexity to the responsibility of managing the Army's sup-

ply system. Some problems arise from the size and the diversity of the Army's inventory, the value of the physical facilities involved, and the number of people required to do the job. Other

problems arise from the absence of the profit motive by which industry controls and evaluates its day-to-day operations. The lack of competition and the requirement for flexibility to meet changing conditions pose difficult problems for the supply manager.

7. Magnitude of the Supply System

a. The value of the inventory in Continental United States is approximately 14 billion dollars. This is about one-third the value of all the inventories of all the manufacturers in the United States. The Army's multibillion dollar inventory is presently stored at more than 40 depots and 10 depot activities in the Continental United States. These depots aggregate over 290 million square feet of gross storage space, about half of which is covered space. This represents substantially more storage space than the total of all commercial warehouses in the nation. Approximately 25,000 personnel are engaged in the receipt, storage, and issue functions of the Continental United States depot system. The expense of operating the system amounts to nearly 300 million dollars annually.

b. Of foremost concern is the size and value of the inventory itself. If the inventory is larger than necessary to meet current and anticipated needs, the costs of maintaining the supply system are substantially increased. These increased costs result from several factors.

- (1) Unnecessary interest charges represent one cost associated with an inventory which is larger than necessary. The stock owned by the Army is in effect financed with borrowed funds on which an average of perhaps 4 percent interest must be paid annually. Reductions in the money utilized for inventory purposes will tend to release funds which can then be applied to decreasing the Government's national debt. Thus a billion dollars of excess inventory could involve needless annual interest charges of 40 million dollars assuming there is no depreciation in inventory value.
- (2) A larger inventory means that additional storage space is required, space that is expensive to construct and maintain. If funds are not available

for construction of additional covered storage space, material that should be stored in covered space has to be stored outside. This increases the rate of deterioration of materiel and raises maintenance and preservation costs.

c. Excessive inventory also raises costs associated with obsolescence and eventual disposal. If the inventory is larger than it need be, goods will remain in the warehouse, and even if they do not deteriorate physically, they may eventually become obsolete. There is obviously little security value in outmoded equipment, and disposition of such equipment will be a necessary eventuality. While monetary returns are obtained through sales of surplus property they are small in relation to the acquisition and storage costs during the period when the equipment is held unnecessarily.

d. The cost of operating the Continental United States depot system varies with the size of the inventory. Reductions in inventory are reflected in lower operating costs. The most lucrative area for reducing costs is in manpower.

e. While operating costs can be decreased by reducing inventory, it is possible to obtain lower operating costs through management efforts even if the inventory remains the same. The opportunities for savings are great; with annual operating costs of some 300 million dollars, an increase in efficiency of only 1 percent would amount to a yearly saving of three million dollars.

f. The Army's program of supply management is designed to encourage the development of a management point of view. This must include two basic components.

- (1) A habitual emphasis on assessing supply performance in terms of its costs.
- (2) A broad understanding of the process of supply not as individual and separate functions, but as an interrelated chain of activities from the conception of a new weapon or a new item of equipment through its procurement, storage, distribution, consumption, or disposal. This point of view together with the use of modern management tools, will result in more economical operation of the supply system.

8. Diversity of Items

A second management problem, related to the size of the Army's inventory, arises from the diversity of items carried in the inventory. Managing a multibillion dollar inventory is in itself a man-sized task; the task becomes far more complex when the items to be managed range from iceberg lettuce to armored vehicles. The Army has cataloged over 1,000,000 items of supply, of which more than 700,000 are centrally procured and controlled. Some items are low cost, others high cost; some are easily acquired through normal commercial channels, others can be obtained only through the most painstaking cooperation between the Army and industry. All items essential to both military and civilian life as well as those peculiar to the Army must be purchased, stored, and distributed. Procurement of Army materiel requires the support of a major segment (about 95 percent) of the industries which make up the American economy. In order to manage this inventory properly it is necessary to segregate the entire range of items into meaningful categories. These categories have been developed based upon the nature of the item, its importance to supply needs, or its behavior in the supply system.

9. Absence of Profit Motive

"In the business operations of the Army there is an especial need to find a substitute for the profit and loss statement in industry. Such means constitute an essential tool of management."
(Advisory Committee on Army Organization, 10 February 1954)

a. Dollars are symbols of achievement and represent perhaps the most used management control in industry. The anticipation of profit is a strong motive for managerial and organizational effort. Under this concept individual managers are given a cost budget within which to conduct operations and they may be given considerable freedom in deciding how best to spend the funds available. An attempt is made to insure that they control the accumulation of all costs relating to their areas of responsibility. Under these circumstances it is possible not only to control costs but to appraise the economy of operation of each individual manager. If the work is accomplished satisfactorily with

in or below the budget amount, the manager is presumably successful. Bonus arrangements and promotions can be and often are employed to encourage efficient management. Conversely, other devices are employed or implied as a means of avoiding unprofitable operations. The important point is that profit and cost motives create positive objectives to be achieved and a means, through the dollar symbol, of appraising the economy of operation of managers.

b. Many of the Army's operations have industrial counterparts. Depots perform some of the same services as commercial warehouses. Manufacturing activities in the Army, as carried on in arsenals and at other installations, approximate similar operations in industry. The conspicuous difference has been the absence of a profit and cost framework within which to conduct these business activities of the Army. By its very nature the Army does not depend upon a continuing record of "profitability." Yet, it is of tremendous importance that the system be managed efficiently and economically. As in business, securing the maximum effort of Army supply managers require the use of incentives both monetary and non-monetary.

". . . incentives are especially needed to attract and hold men in the important supply functions which constitute an increasingly significant aspect of the Army's mission."

(Report of Advisory Committee on Army Organization)

c. Incentives do not constitute by themselves a substitute in the Army for the profit and loss statement in industry. Management tools are also needed which will approximate in their effect and usefulness the beneficial aspects of the profit and loss statement and the accounting and fiscal controls that are required to produce this statement. The Army has made considerable progress in developing substitutes for these business controls, with which cost of performance can be measured. When the cost of performance is known, it is possible to make more informed management decisions. Cost data are essential in deciding such questions as when to dispose of obsolescent materiel. The costs of some manufacturing operations carried on within the supply system are compiled through extension of Industrial Funds. These

funds put manufacturing activities on a working capital basis and make possible the formulation of a military equivalent of industry's "cost of goods sold" figure.

d. The absence of the profit motive has made the job of economically managing the supply system more difficult. Decisions requiring cost data have had to be made in many instances, on the basis of estimates. The Army is constantly moving forward with its systems for providing cost of performance information to its supply managers.

10. Absence of Competition

a. Competition is closely related to the profit and loss basis on which industry conducts its operations. It has been called the driving force in the American economy; the pressure of competition acts as an incentive to better performance. The continuing pressure of competition on businessmen probably accounts for much of the progress and increasing efficiency which characterizes the American economy.

b. The Army supply system, on the other hand, has no competition for its customers' business. It has occasionally been argued that this absence of competition is simply proof that military supply is, after all, a very simple business. If supplies are not available, the customer must usually wait or do without. He cannot take his business elsewhere as his civilian counterpart might do, but to say that it simplifies Army supply management is to miss the point of military supply. In the Army there is no alternative source of supply. The Army has a far greater responsibility to its customers and it must be prepared to meet all legitimate demands made by using units.

c. The Army supply system exists to serve a military need, not an economic end. Certain items cannot be supplied economically; however, this does not relieve the Army of the responsibility of furnishing them. From the point of view of the Army supply manager, the problem is not only *what* items to supply, but also the *most economical way* to provide those which must be supplied. Commercial organizations often make progress in developing new methods and techniques through the stimulation of competition. Trade organizations freely promulgate average operating data to provide a standard against which the individual

organization can measure its performance. There is constant pressure to improve the product or service and lower its attendant cost.

d. The absence of outside competition in the Army supply system requires that progress in developing improvements must come largely from within. Agencies in the Army must, in effect, compete with each other. With suitable cost and performance data, it is possible to achieve at least a part of this objective. Cost and performance of several similar activities can be compared, thus inducing some elements of competition.

11. Factors of Change

Additional management problems in the Army supply system arise from the factors of change, both technological and personnel, which characterize the system.

a. Technological Factors.

- (1) Technological change is a constant and desirable factor but it poses difficult problems in determining what items to procure, how many items to procure, and how long the items should be retained in the supply system. Throughout history the conduct of war has changed from period to period and weapons have become more complex and effective. In the past generation, technological developments have proceeded at an accelerated rate and the Army's modern arsenal of nuclear weapons and missiles bears little resemblance to its arsenal of ten or twenty years ago. The change, moreover, has been reflected in more than basic weapons. Transportation equipment, clothing, even office machinery have undergone a similar degree of change.
- (2) Improvements in weapons and their employment in war have always been a necessary adjunct to military responsibility, but in the present situation they take on added significance. The United States, compared with potential enemies, is short on manpower. This deficiency must be counterbalanced by greater firepower, by more effective and mobile weapons and

equipment, and by the most efficient utilization of available manpower. Thus the Army's research and development activities become increasingly important and the products of research programs can be expected to be introduced into the supply system at a continually increasing rate.

- (3) The introduction of new items of equipment poses the usual problems for current supply activities and particularly difficult problems with respect to mobilization reserves. Mobilization reserves are accumulated over a certain period of time. As time passes, our expanding technology renders these reserves obsolete. Thus at more or less regular intervals of time, the equipment in reserve, or part of it, becomes technologically obsolete and the defense system is correspondingly weakened. This "cycle of vulnerability," as one Deputy Secretary of Defense has termed it, is only one of many problems that technological change imposes upon the managers of the supply system.
- (4) The workload of the supply system is directly influenced by changes in the international situation. From the cutbacks following World War II, the supply system was suddenly required to respond to meet the demands of the Korean War. The present period of semiquiescence may, at any moment, give way to active involvement in hostilities. No businessman, despite seasonal or cyclical fluctuations, faces the degree of change that must be accepted by the Army supply manager. The businessman is able to work in a relatively stable environment in which orderly planning toward a desired objective can go forward. The objective of the Army supply manager may be firm at any given moment, but experience has taught him to be prepared for sudden and dramatic change.

b. Personnel Problems.

- (1) Changes in workload are accompanied by particularly difficult personnel

problems. A small nucleus may be required to expand to twice or ten times its size. New people must be located, trained, and given responsibility often in excess of their experience or capabilities. At some later date, the expanded workforce may be cut back, and typically these cutbacks are soon followed by periods of expansion, and the cycle of hiring and training goes forward once again.

- (2) An added burden in the area of personnel change is the Army's need to rotate its officer personnel on various assignments which complicates the immediate task of managing the supply system. Supply management is a technical field; people with such responsibility in industry undergo long periods of apprenticeship to gain the knowledge and experience to fit them for managerial positions. An Army officer must gain experience and education in intervals during and between duty assignments. The burdens that changing assignments place on the individual and on the supply organization surpass those in industry. Change is a constant factor in Army supply. Much of it is necessary. The Army supply manager is expected to make decisions in an environment that is constantly changing. A high order of competence is required to administer activities under these conditions and a premium is placed upon running a flexible operation. Not the least of the problems is insuring that policies and practices that govern peacetime operations are capable of extension or easy modification to meet increased demands during mobilization. It is apparent that the problems of managing the Army's supply system are difficult ones. In order to achieve optimum management control over this gigantic organization and its multitudinous facets, the primary task is to separate it into manageable elements and place each one under competent monitorship.

CHAPTER 3

ORGANIZATION FOR ARMY SUPPLY

Section I. SUPPLY PLANNING AND OPERATIONS

12. Purpose

The purpose here is to set the stage for a more detailed examination of the functional areas within the supply system. In discussing the management of the Army supply system, it is necessary to go beyond the organizational structure of the Army itself to higher Government levels. As a part of the military establishment, the Army is governed by the Department of Defense, and the Army's supply activities are influenced by DOD directives. The Army's supply activities are directly influenced by decisions of the National Security Council, the President, his staff, and the Congress. Organization for supply extends from levels of national policy development, where objectives are defined and dollar and statutory limitations are established, down to the lowest echelon of the military establishment. Within the mili-

tary establishment it is possible to divide the supply management function into two broad categories—supply planning and supply operations. Supply planning includes the formulation of strategic plans, control programs, and military budgets. Supply operations refer to the process of forecasting the supply demands of existing defense forces and taking necessary supply action to meet these demands. It is apparent that what is referred to here as supply operations requires constant planning; however, it is planning of a different order from the planning concerned with strategic objectives, programs, and budgets. The formulation of plans, programs, and budgets is carried on to varying degrees at all levels of the Army. Supply operations are largely managed by and within the seven technical services under the direction and control of the Deputy Chief of Staff for Logistics.

Section II. SUPPLY MANAGEMENT AT THE NATIONAL POLICY LEVEL

13. Scope

The President, his executive agencies, Congress, and the Public share in formulating and accomplishing the objectives of national security. They also share in defining the role of the military establishment and in determining the portion of the nation's resources available to the Army for the support of military units and operations.

14. The President

a. General Responsibilities. As Chief of the Executive Branch of the government, the President has responsibility for carrying out laws enacted by Congress. In terms of national se-

curity, the President allocates the defense mission among his executive departments and agencies, and directs and coordinates these departments and agencies in their execution of the foreign, domestic, and military aspects of national security.

b. Specific Responsibilities.

- (1) *Foreign affairs.* The President is authorized with certain limitations to make treaties with foreign nations and direct the Department of State in the conduct of foreign affairs. While the conduct of foreign affairs is a civil responsibility, it is closely allied to defense problems. The network of

treaties which links us to other nations is a powerful deterrent to aggression against any of the member nations. This system of treaties imposes on us a responsibility for the defense of other nations as well as our own. In terms of supply management, we must be prepared to support worldwide combat operations.

(2) *Budgeting.* Federal funding policy, no less than foreign policy, has a significant impact on defense and therefore on supply management. The Department of Defense budget is larger than the combined budgets of the other executive departments. Supply requirements represent one of the largest items in the defense budget. It follows, therefore, that the Treasury Department's task of handling the finances of the Federal Government must be closely coordinated with the financial requirements of the Army supply system. Each year the executive departments, including Defense, submit their annual budget to the President through the Bureau of the Budget established in the President's executive office. The President submits the Federal budget to Congress for review and enactment. With the budget, the President sends to Congress statements designed to show in practicable detail the financial condition of the Government, together with his recommendations for action to raise funds to support budget recommendations.

(3) *Control of military funds.* After initial projection of military programs and dollar requirements, many changes occur during the two-year period required for preparation and submission of the military budget. The President, therefore, maintains expenditure control of military funds even after the money has been appropriated by Congress and raised by the Treasury Department. The Army must justify its proposed expenditures to the President, as represented by the Bureau of the Budget, before

funds become available for Army supply.

15. The National Security Council

a. Organization. By the National Security Act of 1947, Congress created the National Security Council to assist the President in coordinating the various elements of national security policy. The National Security Council is composed of the President, the Vice-President, the Secretary of State, the Secretary of Defense, and the Director of the Office of Civil and Defense Mobilization. Secretaries and Under Secretaries of other executive departments and of the military departments may serve as members of the Council when appointed by the President by and with the advice and consent of the Senate.

b. Function. The function of the Council is to advise the President with respect to the integration of domestic, foreign, and military policies relating to national security so as to enable the military services and the other departments and agencies of the Government to cooperate more effectively in matters involving national security. In carrying out its function, the duties of the Council are to assess and appraise the objectives, commitments, and risks of the United States in relation to its actual and potential military power in the interest of national security; and to consider policies on matters of common interest to the departments and agencies of the Government concerned with the national security; and subsequently make recommendations to the President. Thus the recommendations of the National Security Council, when translated into decisions by the President, have an effect on the Department of Defense, which in turn have a profound influence upon the objectives and operations of the Army supply system and, consequently, upon the management of this system.

16. The Congress

In our check and balance type of government there is an inevitable interaction between the spheres of responsibility assigned by the Constitution to the President and to Congress. The Legislative Branch of the Government makes the law, and the Executive Branch carries out the law. Since the Army's supply op-

erations must be carried on within statutory limitations, Congress thereby exerts a controlling influence. The influence of Congress upon supply management, of course, goes well beyond the enactment of governing legislation.

a. Budgetary Review. The military mission cannot be accomplished without money appropriated by Congress. At the beginning of each calendar year the President submits to Congress his budget for the following fiscal year. Congress reviews the budget and makes such changes as are considered necessary prior to appropriating money. In practice, any congressional cuts in military budgets are usually smaller than cuts previously effected by the Department of Defense and the Bureau of the Budget. However, since congressional cuts come after reductions are effected within the Department of Defense and the Bureau of the Budget, the congressional cuts are more significant than their dollar magnitude or their percentage of the total military budget would indicate. In addition to the influence produced by

budgetary review and subsequent appropriations, Congress directly influences the conduct of supply through statutory regulations. Public Law 413, the Armed Services Procurement Act, affords greater flexibility in procurement; Public Law 216 requires the Defense Department to establish a unified system of financial accounting; Section 638 of the Department of Defense Appropriations Act of 1953 caused the Department of Defense to promulgate Department of Defense Directive 4000.8, "Basic Regulations for the Military Supply System."

b. Investigations. In order to guide Congress in formulating legislation affecting the military establishment, the Joint Armed Services Committee of Congress maintains close liaison with the military services. In carrying out its duties, the committee conducts investigations of both a routine and special nature. These investigations, even when they do not lead to new legislation, have an important influence upon the conduct of supply operations.

Section III. SUPPLY MANAGEMENT AT THE DEPARTMENT OF DEFENSE LEVEL

17. Organization

a. The Secretary of Defense is responsible for accomplishing the military aspects of the national security mission. The Secretary of Defense directs and coordinates the military services in their efforts to fulfill their assigned missions. He is assisted by the Deputy Secretary of Defense, Assistant Secretaries of Defense, Assistants to the Secretary of Defense, and the Joint Chiefs of Staff.

b. The Joint Chiefs act in an advisory capacity to the Secretary. They interpret the broad guidance of the National Security Council and translate it into specific missions to be accomplished by each of the armed services. This translation takes the form of a midrange estimate which is prepared prior to the formulation of a Joint Strategic Objective Plan (JSOP). The JSOP provides the coordinated position of the Military Department and is used by the services to prepare comparable plans. It is used by Army planners participating the preparation of the Army's Strategic Objectives Plan (ASOP).

c. The Army Staff formulates five Control Programs in support of midrange estimates. The Department of the Army Budget represents the dollar costs which will be required for accomplishing these programs. The Office of the Secretary of Defense, in joint hearings with the Bureau of the Budget, reviews the Budgets of the three Military Departments and makes the necessary alterations desired by the office of the President and the Secretary of Defense.

d. The Assistant Secretaries of Defense and the Assistants to the Secretary of Defense are principal staff assistants to the Secretary of Defense in their functional fields. In the course of exercising full staff functions, they are authorized to issue instructions appropriate to carrying out policies approved by the Secretary of Defense for their respective assigned field of responsibility.

18. Authority

Pursuant to the authority contained in the National Security Act of 1947 as amended, the Armed Forces Supply Support Center

(AFSSC) was established in 1958 under the direction and control of the Secretary of Defense. The Assistant Secretary of Defense (In-

stallations and Logistics), acting for the Secretary of Defense is responsible for guidance and policy direction of the AFSSC.

Section IV. SUPPLY MANAGEMENT AT THE DEPARTMENT OF THE ARMY LEVEL

19. The Secretary of the Army

a. The Secretary of the Army is the head of the Department of the Army. Subject to the direction, authority, and control of the President, as Commander-in-Chief, and of the Secretary of Defense, the Secretary of the Army is responsible for and has authority to conduct all affairs of the Department of the Army. This includes, but is not limited to, those affairs necessary to or appropriate for the training, operations, administration, logistics support and maintenance, welfare, preparedness, and effectiveness of the Army, including research and development and such other activities as may be prescribed by the President or Secretary of Defense.

b. He is responsible for the performance of the Army's mission in occupied areas, and for the protection of all installations and facilities within the United States, its Territories, and the District of Columbia which are vital to the national security. He is also responsible for the civil works program of the Corps of Engineers.

20. The Under Secretary of the Army

The Under Secretary of the Army acts as deputy to the Secretary of the Army and is his principal civilian assistant.

21. The Assistant Secretaries of the Army

There are Assistant Secretaries of the Army for Installations and Logistics, Financial Management, and Research and Development.

a. *The Assistant Secretary of the Army (Installations and Logistics)*. The Assistant Secretary of the Army (Installations and Logistics) is authorized and directed to Act for the Secretary of the Army within the following fields of responsibility: procurement, including contracting for personal property and services; production; logistical single manager activities and materiel management, including storage, distribution, maintenance, and disposition; communications; medicine; transportation; and

other service activities of the technical services. He is responsible for Army participation in the Military Assistance Programs; materiel and materials requirements and industrial mobilization; and industrial labor relations. He is responsible for real property, for industrial facilities and logistical installations, and for construction of industrial facilities funded from procurement and production appropriations; his responsibility includes management and engineering at industrial facilities and logistical installation; physical security of industrial facilities; the Army Panel, Armed Services Board of Contract Appeals; Army Contract Adjustment Board; and the Armed Services Explosives Safety Board.

b. *The Assistant Secretary of the Army (Financial Management)*. The Assistant Secretary of the Army (Financial Management) is responsible for general management, control, comptrollership and review and analysis of programs and budgets. He has been designated as the Secretary to whom the Comptroller of the Army reports. In this capacity the Assistant Secretary has supervisory and review authority over the preparation of the Army's control programs and budgets.

22. The Chief of Staff

The Chief of Staff is the principal military adviser to the Secretary of the Army and is charged with the planning, development, execution, review, and analysis of the Army programs. The Chief of Staff, under the direction of the Secretary of the Army, supervises all members and organizations of the Army, performs the duties prescribed for him by the National Security Act of 1947 and other laws, and performs other military duties not assigned by law but may be assigned to him by the President or the Secretary of the Army. Except as otherwise prescribed by law, the President, or the Secretary of the Army, the Chief of Staff performs his duties under the direction of the Secretary of the Army. He is di-

rectly responsible to the Secretary of the Army for the efficiency within the Army, its state of preparation for military operations, and plans therefor. He transmits to the Secretary of the Army plans and recommendations prepared by the Army Staff, advises him in regard thereto, and, upon the approval of plans or recommendations by the Secretary of the Army, acts as his agent in putting the plans or recommendation into effect.

23. The Deputy Chief of Staff for Logistics

a. General Responsibilities. The Deputy Chief of Staff for Logistics operates under the functional supervision of the Assistant Secretary of the Army (Logistics), and under the direct supervision and control of the Chief of Staff. His responsibilities extend to direction and control of the technical services, with the exception of the civil functions of the Chief of Engineers, and matters concerning health, medical care of troops, and mobilization of professional military personnel for which The Surgeon General has direct access to the Secretary of the Army and the Chief of Staff.

b. Specific Responsibilities.

- (1) The Deputy Chief of Staff for Logistics has Army Staff responsibility for development and supervision of the Army logistics organization and system including all controls over policies, doctrine, procedures, standards, funds, material, facilities, manpower and personnel (within overall Deputy Chief of Staff for Personnel policies on manpower and personnel), and training (within overall Deputy Chief of Staff for Military Operations policies on training) which are essential to the discharge of this responsibility. He has responsibility for logistics planning; for formulation and execution of policies and the evaluation of results in matters of logistics requirements, procurement, supply, services, and materiel activities; for development and supervision of the logistics program; and within the budget policies developed by the Comptroller of the Army, formulation and execution of those portions of the annual military budget of the Army which per-

tain to the logistics programs. Within policy and standards developed by the Comptroller of the Army, the Deputy Chief of Staff for Logistics has Army Staff responsibility for development and supervision of Financial Inventory Accounting, Stock Funds and Industrial Funds, and Performance Analysis in connection with logistics activities; and applications of the Army Command Management System which involve logistics installations. He also has Army Staff responsibility for the coordinated development of logistics policies, plans, and programs for, and supervision of, the acquisition, activation, utilization, inactivation, and disposition of Army facilities (including real estate) worldwide, to include class I installations in the United States.

- (2) Within overall Department of the Army policies, the Deputy Chief of Staff for Logistics directs and controls the technical staffs and services in all matters covered by his Army Staff responsibilities. In addition, he prescribes the missions, organization, and procedures of the technical services; he develops and supervises a single, integrated career system for technical service personnel which will fit them for top logistics positions throughout the Army; he exercises manpower control over military and civilian personnel of the technical services; and develops and supervises the civilian personnel management program of the technical services. He also develops and supervises budgeting, funding (including allotting of funds and allocation of personnel ceilings), accounting, other financial and fiscal activities, performance analysis, review and analysis, and reports control of the technical services; he supervises and correlates financial management and financial operations in the technical services; and develops policies for and supervises the industrial and labor relations in the technical services.

- (3) Thus, the Deputy Chief of Staff for Logistics occupies the *key position* in the Army supply system. All communications on supply matters which are directed to the technical services from levels above the DCSLOG, as well as questions directed up from the technical services to the Chief of Staff or to the Secretariat, must pass through the office of the Deputy Chief of Staff for Logistics. He must translate the broad policy from above into operating policy and procedure for the technical services; moreover, the missions of the technical services must be coordinated by the Deputy Chief of Staff for Logistics in order to insure that they conform with overall supply management objectives.

24. Technical Services

a. General.

- (1) The seven technical services bear the burden of operating the Army supply system. These seven services are organized around major commodity and service groupings. Within each of the services there are activities specializing in a supply function such as procurement or stock control.
- (2) The technical services are established and experienced in their assigned jobs. Their basic long established, commodity-type organization is similar to the organization that is used by many prominent corporations today. Many corporations, as a result of the successes achieved by the military, have shifted from a "functional" to a "commodity-type" organization.

"The controlling consideration . . . is whether the advantage of greater specialization, coordination and uniformity with respect to a function (e.g., procurement) is more important than the need for coordinating and resolving all differences between functions with respect to an item (e.g., tanks). Coordination of the development, procure-

ment, and distribution of an item is a more meaningful basis for organization . . . than specialization in each function. The present technical services' organization is designed to achieve that primary coordination. "

(Report of the Advisory Committee on Army Organization)

- (3) Despite minor organizational and procedural differences, the seven technical services are marked by a broad degree of similarity. All perform the same functions of requirements computation, procurement, storage, distribution, and maintenance of the items for which they are individually responsible. All exist primarily to serve one customer, the combat units, and for one common purpose—to help deter a war or, if war cannot be prevented, to support ultimate victory.
- (4) Because the technical services bear the major responsibility for operating the supply system, it is desirable to summarize briefly the supply missions of each of the services. Each chief of technical service is involved in CONUS depot operations, and each is in command of at least one depot. All of the depots are assigned specific missions by the chief of technical service as approved by DCSLOG. A depot mission is a concise statement of the functions, scope, and purpose of a depot, and includes the limitations placed upon it. Each depot mission represents a share of the total supply responsibility of the Army depot distribution system. Responsibilities and functions common to all depots are not normally included in mission delineations. The missions are stated individually for each depot and are classified into three principal groups, "supply," "maintenance," and "other activities." Distribution and reserve are in the "supply" group, depot maintenance by itself, with "other activities" covering such missions as

assembly, returned materiel, and procurement. Depots may have mission assignments of any or all principal mission groups.

b. Ordnance Corps. Ordnance is by far the largest of the technical services. The value of the inventory for which Ordnance is responsible exceeds the combined total of the inventories of the other six technical services. The Chief of Ordnance is the Executive Director of the Military Automotive Supplies Agency (MASA).

(1) Ordnance supplies the following types of materiel:

- (a) Weapons and ammunition (except chemical).
- (b) General purpose vehicles.
- (c) Special purpose and special equipment vehicles.
- (d) Combat vehicles.
- (e) Fire control instruments.
- (f) Repair parts, assemblies, tools, and cleaning and preservative materials necessary to the maintenance of all Ordnance equipment except general transport administrative vehicles.

(2) The Ordnance Corps provides the following services:

- (a) Supply and maintenance of all Ordnance materiel and supplies.
- (b) Collection and dissemination of technical information relating to the operation and maintenance of Ordnance materiel and the materiel of allied and enemy nations as necessary.
- (c) Collection, evaluation, and dissemination of Ordnance technical intelligence concerning enemy Ordnance materiel.
- (d) Disposal of Ordnance ammunition and ammunition components, explosives, duds, and unexploded or delayed action bombs (except booby traps and land mines).
- (e) Inspection of Ordnance materiel and ammunition.
- (f) Specialist training of Ordnance personnel; and troop training in preventive maintenance, servicing, characteristics and limitations of Ordnance equipment.

(g) Establishment of standards of serviceability for Ordnance equipment.

(h) Furnishing technical advice and assistance concerning safety in processing, handling, and storage of Ordnance materiel.

(3) Like other technical services, the Ordnance Corps provides Support services through class II installations and activities under its direct control and through troop units and activities of class I installations and in major field commands. These latter elements operate under major commands other than Ordnance but receive technical supervision from the Ordnance Corps. The Ordnance Corps, in accomplishing its direct responsibilities for supply and maintenance operations, uses national inventory control points, national maintenance points, and depots, having distribution or reserve missions. Some of these depots receive, store, issue, rebuild, and maintain general supplies; some handle ammunition (including special weapons, missiles, etc.); and some handle all categories of Ordnance supplies. The Corps also operates schools and training centers which conduct individual and unit training. TOE troop units are designed for use in a theater of operations and after initial activation and training are not usually retained under the command of the Chief of Ordnance.

(4) The TOE troop unit support system has been developed to provide immediate response to the needs of supported units under all conditions of warfare and to reduce to a minimum the placement of demands on the communications and transportation networks during periods of intense nuclear exchange and recuperation therefrom. This is accomplished by assembling into each battalion a balanced composition of those companies required to give the battalion the maximum practicable capability to con-

tinue support operations even though cut off temporarily from outside support. Battalions operating in the forward areas of the combat zone are completely mobile, while those operating further to the rear are progressively less mobile. Although all supply and maintenance battalions and all ammunition battalions from front to rear have essentially the same structure, those operating in forward areas, because of frequent movement, have less productive capability than do those in more rearward areas.

- (5) This similarity of battalion composition provides flexibility and improves recuperability by maximum practicable interchangeability of companies. The number of different types of companies is held to a minimum, and emphasis is placed on companies with a broader spectrum of capabilities. Resources (supply stocks and maintenance capability) are dispersed in multiple locations to reduce vulnerability and to place Ordnance service nearer the supported units. Intermediate handling of supply demands and of shipments of supplies is reduced to a minimum by basing each combat zone nondivisional Ordnance battalion on an appropriate communications zone depot and making the maximum practicable degree of direct shipments from CONUS and communications zone depots to support battalions. Capability and authority to act have been decentralized to support battalions by giving each a balanced combination of companies and by giving each supply manager the capability and authority necessary to accomplish his support mission.
- (6) Fixed composition major field commands such as divisions and missile commands have their own organic Ordnance elements capable of providing varying degrees of direct support to units of those commands. The composition and capabilities of these units

are described in the appropriate divisional and missile command Tables of Organization and Equipment. Non-divisional battalions are normally assigned either a class II-IV or V support mission. In small commands these missions may be assigned to a single battalion. In a large theater all nondivisional Ordnance battalions (Classes II-IV and V) in each corps forward area are assigned to a single forward group. These forward groups have the two-fold mission of providing direct reinforcement to division Ordnance elements and of providing direct support to nondivisional combat and service units operating in the rear areas of the division and in the forward areas of the corps. Ordnance battalions operating in the rear corps and army service area in general support of a corps are assigned to rear Ordnance groups. The mission of these groups is to reinforce the forward Ordnance groups and to provide direct support to nondivisional service and combat units operating in the rear of the combat zone. Principal troop units include—

- (a) Direct support supply and maintenance units including divisional ordnance battalions, nondivisional direct support (armament), direct support (automotive), and direct support (missile) companies and detachments.
- (b) General support supply and maintenance units including general support (armament), general support (automotive), tire repair, supply depot, park and collection and classification companies and detachments.
- (c) Ammunition supply point units including ammunition companies and special weapons/missile supply point companies.
- (d) Ammunition depot units including ammunition, special weapons/missile (general support), and special weapons/missile (depot) companies.

- (e) Command and control units including Ordnance group headquarters, Ordnance supply and maintenance battalion headquarters, and Ordnance ammunition battalion headquarters.
 - (f) Miscellaneous units including explosive Ordnance disposal, technical installations, calibration, ammunition renovation, and supply and stock control detachments.
- (7) Naturally, the demand for materiel supplied by all the technical services undergoes a substantial increase with the increased activity of mobilization and war. This is particularly true of Ordnance supply because of the nature of its materiel; e.g., ammunition. Furthermore, many items have long production lead times. These are the complex items such as tanks and fire control equipment which in time of mobilization limit the speed with which combat troops can be put into the field. For these reasons mobilization planning plays a central role in Ordnance supply.
- (8) The disparity between peacetime and wartime rates of consumption has a significant effect on the problems of Ordnance supply. It is often said that "When wars end—depots bulge." When these depots are bulging, as was the case at the end of World War II, the peacetime supply system is seriously handicapped by excesses which can neither be immediately consumed by the troops nor sold to the public.

c. Quartermaster Corps. The Quartermaster Corps has a supply responsibility associated with the welfare of the individual soldier. With the exception of the Army Medical Service, none of the Army's technical services is so vitally concerned with this function. Other Army supply services necessarily concern themselves with tanks, guns, bridging equipment, trucks, and communications systems. The Quartermaster Corps, to cite only two aspects of its mission, is concerned with the clothes the soldier wears and the food he eats. Among the technical services, the Quartermaster Corps is

the oldest. The Quartermaster General commands all general depots and is responsible for their management to include programming, budgeting, and funding for all operations thereat. Certain general staff actions have been delegated to the Quartermaster General such as the Army Food Program and commissary and laundry operations. Single manager executive direction for Subsistence, Military Clothing and Textile Materiel, and General Supplies are under his jurisdiction. He is responsible for staff and technical supervision over the Army-wide disposal of surplus and foreign excess personal property.

- (1) Quartermaster supplies the following types of materiel:
 - (a) Air items required for air delivery of supplies and equipment.
 - (b) Clothing and equipage.
 - (c) General supplies.
 - (d) Furniture and office supplies.
 - (e) Laundry and drycleaning equipment.
 - (f) Kitchen equipment.
 - (g) Materials handling equipment.
 - (h) Special purpose equipment.
 - (i) Special vehicles.
 - (j) Subsistence.
 - (k) Petroleum products.
 - (l) Repair parts to support quartermaster equipment.
 - (m) Petroleum handling equipment and containers.
 - (n) Mortuary supplies and equipment.
 - (o) Live animals such as horses, mules, and dogs.
 - (p) Packing and crating supplies.
 - (q) Musical instruments.
 - (r) Ecclesiastical equipment and supplies.
 - (s) Printing and graphic arts equipment.
- (2) The services provided by the Quartermaster Corps include the following:
 - (a) Army Food Program supervision (AR 30-11) which encompasses food supply and preparation facilities (messes, bread bakeries, both

- fixed and mobile, central pastry kitchens and meat processing facilities, ration distribution, refrigeration, menu and ration development, commissaries and commissary stores), and the related equipment and training of personnel required for the management and operation of these activities.
- (b) Central meat processing which includes receipt, processing, and issuing to using organizations all perishable meats, meat products, fish, and poultry.
 - (c) Maintenance of quartermaster supplies and equipment.
 - (d) Research and Engineering which includes research, development, engineering, testing and standardization of items necessary for the support of the Quartermaster Corps.
 - (e) Laundry and drycleaning.
 - (f) Storage of bulk petroleum.
 - (g) Operational maintenance of petroleum pipelines.
 - (h) Identification and disposition of military deceased personnel.
 - (i) Overall supervision of national cemeteries.
 - (j) Clothing Service Program.
 - (k) Army Clothing Sales Stores.
 - (l) Quality control for QM items.
- (3) The principal field installations include supply points, depots, administration centers, labor pools, commissaries and commissary stores, laundries and dry cleaning plants, bakeries, and other installations necessary to perform Quartermaster services including schools and training centers.
- (4) The principal troop units are—
- (a) Command units including headquarters and headquarters company base depots, group, and battalion headquarters.
 - (b) Supply units including mobile petroleum supply companies, subsistence supply companies, depot supply companies, direct support companies, and petroleum depot companies. Division Quartermaster units, because of their supply functions, may also be included in this category; but they provide, in addition to supply, such services as parachute supply and maintenance, salvage collecting, laundry, troop bathing, and graves registration.
 - (c) Service and maintenance units including general support companies, field maintenance companies, aerial supply companies, and air item repair and depot companies. Special hospital laundry detachments, office machine repair detachments, base and mobile petroleum products laboratories, drum cleaning detachments, drum filling detachments, and clothing equipment and repair detachments are also included in this category.
 - (d) Miscellaneous units including mobile sales companies.
- (5) The supply problems of the Quartermaster are directly related to the troops themselves. A soldier eats approximately the same quantity of food and wears the same number of the same size of shoes regardless of his activities. Shifts in troop strength affect the Quartermaster Corps more quickly than any of the other technical services. For most soldiers, military life begins at the end of a long line in which they receive such supplies as food or clothing. For the duration of his military service, the soldier will in all probability draw Quartermaster supplies every day. If he dies while in the Army, the Quartermaster will dispose of his remains and care for his grave if he is buried in a national cemetery.
- d. Corps of Engineers.* The Corps of Engineers differs markedly from other technical services. Principal responsibilities are in the areas of construction, rehabilitation, real estate, and supply. In accomplishing its con-

struction and rehabilitation missions, the Engineers are major consumers of the items for which they have supply responsibility. The Engineers have a civil works function as well as a dual role as combat troops. The Chief of Engineers has single manager Executive directorship for the Military Construction Supplies Agency (MCSA).

(1) The Corps of Engineers supplies the following types of materiel:

- (a) Construction equipment and supplies.
- (b) Bridging equipment including boats as necessary in construction.
- (c) Fortification materials.
- (d) Petroleum distribution equipment, such as pipelines and large storage tanks.
- (e) Certain industrial gases.
- (f) Fixed refrigeration and air conditioning equipment.
- (g) Surveying equipment, maps, and map reproduction equipment.
- (h) Water purification and distillation equipment.
- (i) Camouflage materials.
- (j) Electric generating equipment and nuclear power plants.
- (k) Repair parts for the items shown in (a) through (j) above.

(2) The Corps of Engineers provides the following services:

- (a) Maintenance of Engineer equipment.
- (b) Design, construction, rehabilitation or repair, and maintenance of structures of every character with the exception of telegraph and telephone systems and other communication equipment. This mission includes the building and maintenance of roads, bridges, shelters, airfields, wharves, piers and jetties, and permanent fortifications.
- (c) Construction and rehabilitation of roadways.
- (d) Clearance of obstacles including minefields.

- (e) Installation and maintenance of fixed refrigeration plants, pipelines (except operational maintenance of petroleum pipelines), water purification and distillation systems, and utilities not specifically assigned to other arms or services.
 - (f) Providing waterborne transportation in inland amphibious operations.
 - (g) Operation of beach and port maintenance areas from the time of landing onward.
 - (h) Surveying, mapping, and the production of maps.
 - (i) Photographic work related to terrestrial reconnaissance and Engineer terrain intelligence.
 - (j) Supervision and inspection of camouflage technique.
 - (k) Operation of sawmills.
 - (l) Dredging operations.
 - (m) Furnishing utilities.
 - (n) Firefighting and fire prevention.
 - (o) The acquisition and disposal of real estate, including land, buildings, docks, wharves, office and storage space, and quarters for individuals, organizations, and detachments.
 - (p) Training of Engineer personnel and dissemination of technical information in the use and maintenance of Engineer equipment.
 - (q) Providing advice and assistance to troop units other than Engineer units who, during combat operations, are required to engage in construction and fortification and in the assault of fortified positions.
- (3) The principal field installations include depots, supply points, maintenance shops, pipelines, water purification and distillation installations, general utilities establishments, and Engineer schools and training centers.
- (4) The troop units with which Engineer accomplishes its missions include the following:

- (a) Command units including headquarters, brigade, Army; headquarters, brigade, Corps; headquarters, brigade; and headquarters, aviation brigade.
 - (b) Combat units, including combat groups and battalions, armored battalions, airborne battalions, and bridge units.
 - (c) Construction units, including construction groups and battalions, equipment companies, dump truck companies, and pipeline companies.
 - (d) Maintenance and supply units, including maintenance and supply groups, maintenance battalions, depot battalions, light and heavy maintenance companies, depot companies, parts companies, and equipment supply companies.
 - (e) Topographic units, including Army and Base topographic battalions, topographic companies, Base map distribution companies, and technical intelligence teams.
 - (f) Miscellaneous units, including water supply companies, camouflage battalions, and various teams of the service organization.
- (5) The supply problems of the Corps of Engineers are closely related to the construction and maintenance mission. Over 60 percent of its supply falls into class IV (special projects). Effective execution of these projects involves careful logistical planning and a high degree of coordination among diverse elements. Since these projects are frequently the end result of an emergency situation, the time available for planning must frequently be abbreviated. At the present time the Engineers have developed a functional component system to meet the need for rapid computation of requirements for both individual projects and for the total class IV supply demands, e.g., the component parts of a port in a particular size range are prepared to serve as a standard. When the demand arises for a port in a given size range, supply planning

will consist of modifying the standard plan to meet the needs of the particular situation. Forecasting total class IV demands is a matter of estimating the number and the kind of projects which they will be called upon to provide during the period covered by the forecast. This method will probably be no less accurate than the old method of item-by-item forecasting but it will save a significant amount of time and work in preparing requirements estimates.

- (6) The Corps of Engineers bears a large portion of the repair parts problem. Because of the large number of makes and models of mechanical equipment, the number of repair parts which must be maintained and supplied is huge. With only about 25,000 total end items, the Engineers supply from stock over 90,000 repair parts.
- (7) To reduce the number of makes and models the Engineers now have a family of small size military-type engines. This program, together with Industry Preparedness Measures, will eventually eliminate many commercial makes and models from the supply system and provide longer engine life, interchangeable parts, improved production methods, and standardization.

e. Chemical Corps. The Chemical Corps develops and supplies the materiel and equipment necessary for the employment of and defense against chemical, biological, and radiological (CRB) warfare by the Army, Navy, Air Force, and Marine Corps. The Chemical Corps is the responsible Department of the Army technical staff agency for the conduct of radiological warfare and radiological defense. Approximately one-third of the items supplied by the Chemical Corps are military in nature. They consist of weapons such as flamethrowers and toxic, biological, and incendiary munitions; protective devices against chemical weapons such as protective masks and filter units; and related materiel such as smoke generators, decontaminating units, and testing and analyzing kits. Because many chemical items have limited application during peacetime, supply

management must be based on complex projections. Issue experience on many items has been limited. As a result, accurate supply management forecasting and technological development on items and equipment for this highly important segment of the national arsenal are difficult to achieve. In addition, the Chemical Corps procures many of the items related to CBR warfare for the Departments of the Navy and Air Force. A large portion of the total inventory stored by the Chemical Corps is for the Air Force. The Air Force determines requirements, budgets, and provides funds while the Chemical Corps procures, stores, and issues.

- (1) The Chemical Corps supplies the following types of materiel:
 - (a) Chemical and biological weapons.
 - (b) Chemical and incendiary ammunition.
 - (c) Detection devices for chemical, biological, and radiological weapons.
 - (d) Protective devices against chemical and biological weapons.
 - (e) Commercial chemicals, insecticides, herbicides, disinfectants, and chemical specialties.
 - (f) Other items related to CBR warfare such as laboratories and smoke generators.
 - (g) Repair parts for equipment supplied.
 - (h) Safety and rescue equipment.
- (2) The Chemical Corps provides the following services:
 - (a) Decontamination services to units and installations in excess of that normally performed by the individual units.
 - (b) Processing services including impregnation and reimpregnation of clothing and equipment in bulk for reissue.
 - (c) Laboratory services including the examination and analysis of captured materiel and surveillance of supplies and equipment.
 - (d) Dissemination of technical and training information pertaining to

chemical, biological, and radiological (CBR) warfare.

- (e) Furnishing technical advice and assistance concerning safety in the processing, handling, and storing of chemical materiel and in chemical operations.
 - (f) Training of Chemical Corps personnel for performance of technical and staff operations.
 - (g) Training of personnel from other Arms and Services of the Department of the Army, the Navy, the Air Force, and the Marine Corps, and other governmental agencies and foreign nationals as required in aspects of CBR warfare.
 - (h) Technical escort for chemical and biological agents and ammunition for the Department of Defense.
 - (i) Disposal of radioactive waste for the Department of the Army.
- (3) The principal field installations include supply points, Chemical schools, Chemical training centers, impregnating plants, maintenance shops and depots, and laboratories.
 - (4) The principal troop units include the following:
 - (a) Command units, including platoon, company and battalion headquarters and group, battalion and company headquarters.
 - (b) Combat units including smoke generator battalions.
 - (c) Maintenance and supply units including depot companies, maintenance companies, and combat support companies.
 - (d) Miscellaneous units, including processing companies, decontamination companies, laboratories and special decontamination, processing, and intelligence teams, demolition and destruction, escort, and safety teams.
 - (e) Radiological Center teams.

f. Signal Corps. The Signal Corps is the communications, electronic, pictorial, and cryptographic expert for the arms and services of

the Army. It also supplies ground communications for the other departments of the armed forces. The Signal Corps consumes a substantial quantity of the items for which it has supply responsibility.

(1) The items supplied by Signal include the following:

- (a) Tactical radio, certain types of radar, telephone and telegraphic communications and detection equipment, and supplies and parts for all such equipment.
- (b) Fixed radio, telephone and telegraph communications systems.
- (c) Communications and communications security devices.
- (d) Electronic devices including those for Army aviation, electronic warfare, combat surveillance, and outer space communications and tracking.
- (e) Meteorological equipment supplies.
- (f) Pictorial equipment and supplies.
- (g) Repair parts for the items shown in (a) through (f) above.

(2) The services provided by Signal include the following:

- (a) Installation, maintenance, and operation of all communications and electronic systems and equipment including communications security systems within the established national policy (except communication systems within regiments and similar units of the other arms and services and certain Air Force communications systems).
- (b) Pictorial work (except for Navy and Air Force).
- (c) Cryptographic work.
- (d) Maintenance and repair of all items of signal supply.
- (e) Training of specialists and training in the operation of signal equipment for signal troops and for other troops using this equipment.

(3) The principal field installations through which it accomplishes its mission include wire and radio networks, electronic systems, engineering laboratories, radio stations, centers,

procurement and stock and supply control centers, depots, maintenance shops, motion picture production facilities, photographic laboratories and film and equipment exchanges, schools and training centers.

(4) The principal troop units include the following:

- (a) Units in support of divisions, Corps, and Army including Division and Corps Signal battalions, Signal operations battalions, electronic warfare companies, and radar maintenance detachments.
- (b) Theater logistic type Signal support units such as Service battalions, supply and maintenance battalions, combat area battalions, pictorial battalions; headquarters communication service groups, operations groups and intersectional groups; radio and television broadcasting company, pictorial company (TV), and photographic company.
- (c) Miscellaneous units including various special purpose technical teams for intelligence, radio propagation, and meteorological activities.

(5) The equipment supplied by Signal is of a highly technical nature creating difficult supply and maintenance problems. Repair and maintenance of Signal equipment require technical skill and training. In order to minimize the degree of skill required by the user and by the lower echelons in the maintenance organization, Signal employs a system of kits and assemblies of component parts for distribution to using agencies. While this reduces the problems of maintenance and training, it increases the difficulty of supply. The component parts of the kits and assemblies must be consolidated at one point for assembly prior to distribution throughout the system, and the component parts of the assemblies must be supplied to the points in the maintenance organization where the assemblies are themselves overhauled.

g. Army Medical Service. The procurement, ownership, and management of the Continental United States depot (wholesale) stocks of medical materiel is accomplished under the direction of the Secretary of the Navy who is the single manager for medical materiel. These functions are assigned to the Executive Director, Military Medical Supply Agency who utilizes personnel and facilities of the medical services of the Army, Navy, and Air Force in accomplishing his mission. However, the direction and policy guidance of Army medical supply activities in oversea areas and at the installation level in continental United States remain the responsibility of The Surgeon General. The Medical Service is the principal and largest consumer of its own supplies and equipment which includes medical, surgical, veterinary, and dental materiel; and the repair parts applicable thereto.

(1) The principal services provided by the Medical Service include—

- (a) Care and treatment of the sick, wounded, and injured.
- (b) Medical care for dependents, including care at medical treatment facilities and programming for certain treatment from civilian sources.
- (c) Preventive medicine.
- (d) Provision of veterinary food inspection service.
- (e) Storage, distribution, and maintenance of medical supplies and equipment.
- (f) Training of Medical Service personnel.

(2) The principal units of the Medical Service include—

- (a) Command units including headquarters and headquarters detachments, medical group headquarters and headquarters detachments, medical battalion; and headquarters, hospital center.
- (b) Treatment and hospitalization units including clearing companies; surgical hospitals, mobile army; field hospitals; station hospitals, evacuation hospitals, and general hospi-

tals; convalescent centers; and medical detachments.

- (c) Evacuation units including ambulance companies, collecting companies, holding companies, air ambulance companies, and ambulance trains.
- (d) Maintenance and supply units including Army and Communications Zone medical depots, supply detachments, medical equipment maintenance detachments, and optical detachments.
- (e) Complementary service units including medical laboratories, dental detachments, veterinary detachments, preventive medicine companies, and miscellaneous administrative and professional teams.

h. Transportation Corps. The Transportation Corps is wholly occupied in the field of logistics. In addition to the service it performs in moving men and materiel, it also has supply responsibility for aviation, marine, and rail items used by the Army.

(1) Transportation supplies the following types of materiel:

- (a) Army aircraft and allied equipment except communications.
- (b) Marine floating equipment except dredges, assault boats, bridge power boats; and construction barges assigned to the Corps of Engineers.
- (c) Military rail equipment.
- (d) Certain cargo handling equipment and certain petroleum handling equipment.
- (e) Repair parts for the items shown in (a) through (d) above.

(2) Transportation Corps performs the following services:

- (a) Transportation of persons and things.
- (b) Operation of cargo helicopter units in support of tactical or logistical operations and heliports.
- (c) Water operation on inland waterways, operation of ports, water terminals, and marine repair facilities.

- (d) Operation of military railways, railway shops, and railway terminals.
 - (e) Operation of highway transport, repair shops, highway terminals, and administrative motor pools.
 - (f) Operation of supply depots and depot maintenance facilities.
 - (g) Operation of staging areas army-wide, transportation schools, and training centers.
 - (h) The training of transportation specialist personnel, Army aircraft maintenance personnel, and other armed forces personnel including personnel of allied countries in the use of the transportation equipment.
 - (i) Operation of Holding and Reconsignment Points during mobilization.
 - (j) Monitorship of joint land transportation operations in oversea areas for the Department of Defense.
 - (k) Transportation engineering.
 - (l) Administration of the DOD Highways for the National Defense Program.
 - (m) The Chief of Transportation has single manager Executive Directorship for the Military Traffic Management Agency (MTMA).
- (3) Principal transportation field commands, installations, and activities including Terminal Commands, Army terminals, Transportation Materiel Command, supply depots, repair shops, Administrative Transport Management Agency, administrative motor pools, schools, and training centers.
- (4) The principal troop units include the following:
- (a) Command units including terminal commands, railway commands, highway transport commands, and rail, highway, and transportation movement (movement control) group and battalion headquarters.
 - (b) Service or operating units including truck, boat, terminal service, amphibious truck, helicopter, and railway battalions and companies.
 - (c) Supply and maintenance units including depot companies as well as railway shop, boat maintenance, and aircraft maintenance battalions and companies.
 - (d) Miscellaneous units including transportation (movement control) companies and teams and staging area companies.

25. Single Managerships

a. The foregoing paragraphs have identified the majority of commodities for which technical services have supply responsibility and many of the services which they perform. These responsibilities apply principally to support of Army activities and units.

b. Responsibility for logistic support emanates from the highest levels of government through the Department of Defense. It is reasonable, therefore, that positive steps have been necessary to integrate the management of many supplies and services which are common to the three Military Departments. Single Managers are the management organizations which make these integrations possible.

c. The Secretary of Defense assigns responsibility for Single Managership of common major commodities and services to the Secretary of one of the three Military Departments. The "dominant user" of the supplies and services normally receives such assignments. In the Army, one of the Technical Service Chiefs is assigned responsibility as the Executive Director for management of the commodities and services for which the Army is the "dominant user." The technical service chosen is the one which normally managed the commodity or service for the Army alone.

d. Single Managers are responsible for supply management, including that for world-wide requirements, distribution and redistribution, and determination of excesses. They do not, however, manage the depots required for the receipt, storage, and issue of the materiel. Major items of equipment are not included within the commodities managed by them.

e. Single Managers arrange with the three Military Departments to utilize their depot facilities for the receipt, storage, shipment, or disposal of Single Manager owned stocks. Thus, in many instances, all three departments contribute portions of their facilities in support of a Single Manager. The exact facilities utilized depend upon their location to serve the ultimate users, their capability to perform the missions, and many other considerations. (See sec. IV, ch. 4.)

26. United States Continental Army Command

a. The United States continental Army Command is primarily a training command, but its functions of direction, supervision, and coordination of matters pertaining to development of tactics, organization, doctrine, and materiel, outline the system within which the chain of supply must be designed. The needs and desires of the fighting forces determine in large measure the types of new equipment to be developed. The Commanding General USCONARC insures that troop needs are accorded adequate recognition; this recognition is achieved by and through the Combat Development System of the Army. Elements of this system work with representatives of the technical services, the combat arms, and science and industry in developing and evaluating new equipment and in modifying existing equipment. From a supply management standpoint, the U. S. Continental Army Commander's work is often of central importance to the supply system. Although its first concern is combat effectiveness, USCONARC representatives must also think in terms of the dollar sign. USCONARC plays a part in any decision to replace existing items of equipment with new and improved versions. Here, among other things, the cost of rendering existing equipment obsolete must be weighed against the advantages of the new model.

b. The Commanding General, USCONARC, commands the six armies, the Military District of Washington, and other units, activities, and installations within the continental United States. Within overall Department of the Army policies, he directs and controls logistics activities of all elements of his command, including Army Reserve components. He is responsible for preparing and verifying Tables of

Organization and Equipment for the Army in the field and all others pertaining to his assigned activities. His logistics functions in the continental United States include planning for, direction, and control of supply and maintenance activities at his installations, including Field Maintenance. In addition, he is responsible for many service functions to include—

- (1) Operation and maintenance of fixed wire systems and radio facilities.
- (2) Installation of fixed wire communication and guard radio systems.
- (3) Commercial communications, film and equipment exchange operations, and provisions of photographic services.
- (4) Operation of rail and floating equipment, administrative aircraft and motor pools, and administration of movement services.
- (5) Operation of commissaries, laundries, and drycleaning and meatcutting plants.
- (6) Maintenance and management of facilities, including management engineering, utilities services, R&U services, repair and modification of facilities, fire protection and prevention, acquisition and disposal of real estate.
- (7) Operation of hospitals, dispensaries, and regional laboratories.

c. Accordingly, the Commanding General, USCONARC, has a distinct influence on the procedures utilized in the overall logistics system in support of activities within the continental United States.

27. Troop Units

The Supply System exists for one primary purpose—to support troop units in combat and training for combat. Supply managers at all levels must appraise their operations in terms of the degree to which they adequately meet troop needs. "Paper work" inherent to the supply system must be constantly examined in terms of facilitating the task of the unit supply officer. In this connection the commodity specialization of the technical services sometimes presents problems at the user level. Supply activities exist primarily to support troop units; however, troop units themselves must share

heavily in the responsibility for effective supply.

28. Implications of Nuclear Warfare

The tactical principles of dispersion, duplication of resources, mobility, and speed of communication assume vastly increased importance in nuclear warfare and under conditions of possible mass destruction. The extent to which these principles are applied is a matter of

calculated risk, balancing between combat necessity on one hand and capabilities and resources on the other. In support of the shifting weight on tactical principles, systems to achieve greater dispersion and duplication of supplies and facilities, and to gain mobility and speed of communication are being considered and tested. Supply managers must be alert to the importance of guidance evolving from such tests.

Section V. PLANS, PROGRAMS, AND THE BUDGET

29. Plans

a. Planning for future requirements entails many uncertainties, and the Army planner must consider any external factors which might develop. Experience has shown that these uncertainties can best be managed by dividing the planning process into periods of time, and developing, accordingly, long range, midrange, and short range plans. The first, considers possible conditions of war eight years in the future; the second, much more realistically, five years in the future; and the third, conditions at the moment and for the succeeding fiscal year. All such plans are revised annually to recognize international political changes, developments in pure and applied science and technology, and national budgetary policies. The Army planners work closely with their counterparts in the Joint Chiefs of Staff, who develop a plan for corresponding periods mentioned, which include the Army, Navy, and Air Force.

b. To develop precise plans upon which actual operations could be based for a possible war eight years in the future is manifestly impractical. It is, however, necessary for planners to assess the ability of the national economy to support a major war effort, and to evaluate current and anticipated technological developments to determine what weapons and other means may be available. Similarly, the potentialities of possible enemies must be evaluated to determine what obstacles may stand in the way of our own national interest. This assessment is the objective of the long-range plan, known as the Joint Long-Range Strategic Estimate (JLRSE). On the Army side we have the Army Requirements Develop-

ment Plan, which feeds information into the JLRSE. By taking into account the factors mentioned, it indicates the possible courses of development to which the Army will have to adapt itself. Current technological developments in electronics, nuclear science, metallurgy, aeronautics, propellants, and other fields show the type of equipment which may be available for production in eight years. Equipment and weapons growing out of such developments can radically change the nature, composition, and organization of the Army, and accordingly, tentative organizations are drawn up and efforts made to envision their tactical and strategic employment. By successive annual reviews, the previous year's estimates are revised in light of the current year's actual accomplishments in transforming designs to prototypes, and prototypes to production runs.

c. For the midrange plan more specific factors are considered. Forces of specific size and composition are scheduled for deployment in selected theaters of war, and their logistical support is carefully calculated. The midrange plan is an actual operational plan and is designated the Joint Strategic Objectives Plan (JSOP). The Army plan is called the Army Strategic Objectives Plan (ASOP). The objective is stated in terms of political, military, and geographical accomplishments. Although the projected D-day of the Army Strategic Objectives Plan is five years in the future, the plan becomes the guiding document for the Army's procurement and development during the fiscal year beginning two years in the future. The Army plan is normally approved by the Chief of Staff in June of each year, following which preparations are initiated to

attain a calculated degree of readiness for a war which, it is assumed, may start on the first of July five years after approval.

d. The first step in this preparation is the development of a second document known as Mobilization Requirements in Support of the Army Strategic Objectives Plan (MOB-R-ASOP). This is a considerably more detailed document. It specifies the number of units of different types which will be required to carry out the operations plan, establishes what their equipment will be, how much shipping and aircraft will be needed for their movement and logistical support, and in general provides the basis upon which the technical services can begin the detailed computation of requirements upon which subsequent budget requests will be based.

30. Programs

a. Plans have been defined as schemes of action, programs as administrative plans with specific time phases for the accomplishment of interim objectives, and budgets as the program with a price tag. By considering all three activities as successive steps in a continuing process, the function of each falls into position logically. The Army Program System was devised in 1950 for the Department of the Army level only, and extended to subordinate echelons in fiscal year 1955. The system is presently based on five controlling programs: Troop, Reserve Components, Materiel, Installations, and Research and Development. Column 2, figure 2, lists the five control programs together with the staff organization responsible for their preparation. The control programs become the repository for basic information, guidance, and planning information necessary to the operation of the Army, and this guidance is segmented for each of the five fiscal years covered by these programs. The third column of the chart, entitled "Appropriation," shows the budget structure which is used as a means to convey specific objectives and guidance required for the budget fiscal year. The appropriations titles are shown in capitals and are underlined. Beneath each appropriation is listed the intraappropriation structure only to the detail necessary to convey objective guidance. The first indentation consists of the broad budget programs; the second indenta-

tions are budget activity accounts for which separate guidance is necessary. These are two areas—Tactical Forces and Army-wide Activities—where it is necessary to go to the budget level to define clearly the single agency charged with the preparation of specific guidance as shown in the fourth column.

b. The agency responsible for preparing the guidance extracts applicable objectives from the control program for the budget fiscal year and, in coordination with the Comptroller of the Army, includes a dollar estimate required to accomplish the objectives. This effects a complete marriage of program guidance with the budget structure. The Oversea Commands, Continental Army Command, DCSLOG, and Department of the Army operating agencies receive guidance directly from the Department of the Army. Each of these commands and agencies receives a single directive from the Department of the Army containing program and budget guidance for a fiscal year. The Office Chief of Staff prepares the guidance by consolidating the information received from each staff agency responsible for a portion as shown on the chart by an "X." In general, the guidance follows the format of a military field order and contains the necessary information needed by a specific commander to do his job for a year and it replaces the numerous program documents and budget guidance memoranda formerly received by a command.

c. Against this background of national policy, the details of requirements planning for principal items take on greater significance. Planning must be complete and any figure or estimate may require justification before a number of reviewing agencies both within and outside the Army. At the same time the control of requirements planning for these items is removed to a considerable extent from the Army's supply management organization and is located at higher levels of the Defense Department, the Administration, and Congress. While the necessity for adequate control of the many dollars spent annually on principal items demands close review at all levels, it must be recognized that this multiplicity of review and direction raises certain administrative problems. At the Department of Defense level, planning should be sufficiently in advance of the

JOINT-ARMY PLANNING INTERRELATIONSHIPS

LONG RANGE

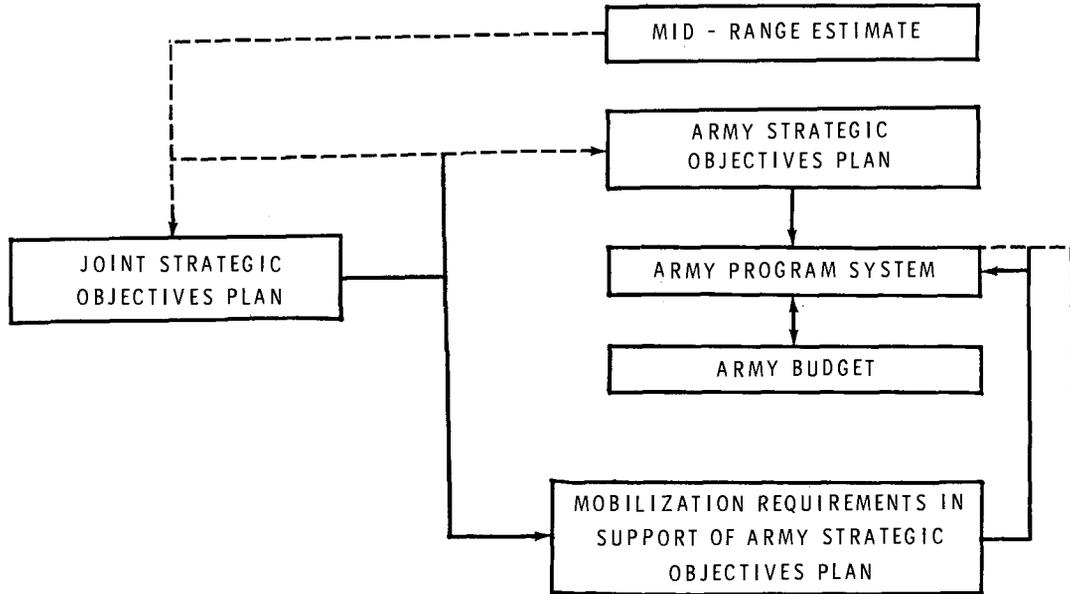
JOINT PLANS



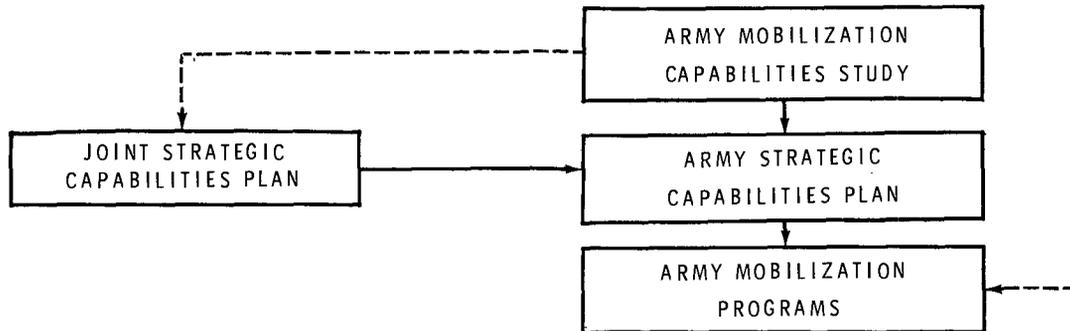
ARMY PLANS



MID RANGE



SHORT RANGE



LEGEND: — GUIDANCE
 --- ARMY INITIAL POSITION

1 July 1961

6A-1-1

Figure 1. Joint Army planning interrelationships.

**PROGRAM-BUDGET RELATIONSHIPS AND RESPONSIBILITIES
BASED ON FY 1961 APPROPRIATION STRUCTURE**

BASIC GUIDANCE	CONTROL PROGRAM	APPROPRIATION, BUDGET PROGRAM AND BUDGET PROJECT	GUIDANCE PREPARED BY	MAJOR COMMANDS		SEPARATE AGENCIES
				O/S	CONARC	
JSOP	TROOP (DCSPER)	MILITARY PERSONNEL ARMY*	DCSPER**			X
		PAY AND ALLOWANCES OF MILITARY PERSONNEL	DCSLOG		X	
		SUBSISTENCE	DCSPER		X	
		MOVEMENTS, PCS	OTHER MILITARY PERSONNEL ACTIVITIES	DCSPER		
		OPERATION & MAINTENANCE, ARMY	TACTICAL FORCES	DCSOPS	X	
			OPERATION OF TACTICAL FORCES	DCSOPS		
			OPERATION & MAINTENANCE OF TACTICAL FORCES FACILITIES	DCSLOG		
			TRAINING ACTIVITIES	DCSOPS	X	
			ARMY-WIDE ACTIVITIES	DCSPER***		
			HEADQUARTERS, DEPARTMENT OF THE ARMY (EXCEPT TECHNICAL STAFF)			
ASOP	MATERIEL (DCSLOG)	OFFICES OF THE HEADS OF TECHNICAL STAFF (EXCEPT THE SURGEON GENERAL)	DCSPER***			X
		ARMY FIELD COMMAND HEADQUARTERS	DCSPER	X		
		ARMY-WIDE SPECIALIZED SERVICES	DCSPER	X		
		ARMY-WIDE COMMUNICATION SERVICES	DCSLOG	X		
		EVALUATION ACTIVITIES	ACSI	X		
		MILITARY SURVEYS & MAPPING	ACSI	X		
		ARMY-WIDE FINANCE SERVICES	COA	X		
		ARMY-WIDE AUDIT SERVICES	COA	X		
		CENTRAL SUPPLY ACTIVITIES				
		MAJOR OVERHAUL AND MAINTENANCE OF MATERIEL				
AND	INSTALLATIONS (DCSLOG)	MEDICAL ACTIVITIES	DCSLOG	X		
		PROCUREMENT OF EQUIPMENT & MISSILES, ARMY	DCSLOG	X		
		MILITARY CONSTRUCTION, ARMY	DCSLOG	X		
		NATIONAL GUARD PERSONNEL, ARMY	CNGB			
		OPERATION & MAINTENANCE, ARMY NATIONAL GUARD	CNGB			
		MILITARY CONSTRUCTION, ARMY NATIONAL GUARD	DCSLOG	X		
		RESERVE PERSONNEL, ARMY	CARROT			
		MILITARY CONSTRUCTION, ARMY RESERVE	DCSLOG	X		
		OPERATION & MAINTENANCE, ARMY RESERVE & ROTC	CARROT			
		RESEARCH, DEVELOPMENT, TEST & EVALUATION, ARMY	DCSLOG	X		
DOD	RESEARCH & DEVELOPMENT (CRD)	PRP, ACS, & O&M, A - JOINT PROJECTS	CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
			CRD	X		
DIRECTIVES	NONE		VARIOUS	X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		

5 YEARS ANNUAL

*DOLLAR GUIDANCE WILL NOT BE ISSUED TO COMMANDS WHERE FUNDS ARE ADMINISTERED THROUGH OPEN ALLOTMENTS.
 **ASSOCIATE: DCSLOG FOR INDIVIDUAL CLOTHING OF ENLISTED PERSONNEL.
 ***CONSOLIDATED GUIDANCE.

Figure 2. Program-budget relationships.

required date to permit phasing of requirements computations, to cover a specific situation, into the normal computing workload, thus avoiding "crash" action, and throwing normal computations out of mesh.

31. Budget Cycle

a. The process of translating a strategic plan into a budget is extremely complex, and involves general and specific guidance or subsequent review by the Chief of Staff, the Joint Chiefs of Staff, the Secretary of Defense, and the Bureau of the Budget. Therefore, only the critical points in the whole chain of events are considered herein. The ASOP is approved by the Chief of Staff by the end of June three years before the Target Fiscal Year (X-3), and the MOB-R-ASOP is completed approximately four months later. By the spring of the following year, (X-2), the technical services and other staff agencies will have computed the requirements based on the Plan. Based on such requirements, estimates are developed by the Army Staff to establish approximations of the funds which will be required to support the Army objectives. As there is normally a considerable gulf between what is theoretically required and what is practicably attainable, substantial adjustment is required before the Army's position for the development of its budget can be firmly established. This position is normally accomplished by the fall of X-1, so that it may be incorporated into the President's Budget Message which is presented to Congress in January of each year—in this instance January of X-1. Congressional review of the Budget then follows and funds are finally appropriated normally in midsummer of the same year. Assuming that the funds appropriated are immediately available, and procurement

contracts can be let at once, it would be possible for the Army to get production of needed items started two years after the approval of the Army Strategic Objectives Plan. Due to the complete nature of much of the equipment, approximately a two to three year lead time is required for it to reach the Supply System. This equipment is to fulfill the requirements of a war plan with a D-day of X-2. Two peacetime years are provided for a buildup of quantity production, distribution of the new item through the supply system, issue to using troops, and the training of troops in the use of the particular item.

b. This idealized sequence of budget preparation, presentation, defense, appropriation, and expenditure of funds is rarely realized in actual practice. There are frequently last-minute changes in national fiscal policies which necessitate radical revisions in earlier estimates, so that the Budget presented by the President may not have had the benefit of two years' preparation. While Congressional action on the Federal budget must be taken before adjournment; adjournment particularly in nonelection years, is often deferred until August or September—that is, two or three months into the fiscal year. After congressional appropriation the Army must request an allocation of the funds from DOD and delays and some reductions are normally encountered. The Bureau of the Budget may make reductions when the apportion funds to the Army, and still further restrictions may be imposed by the Department of Defense. Both agencies require justification for specific quantities of funds requested. These justifications often cause delays, with the result that money may not be available for actual expenditure until well into the fiscal year.

PART THREE
MANAGEMENT OF ARMY SUPPLY

CHAPTER 4
STORAGE, DISTRIBUTION, AND CONTROL OF STOCKS

Section I. THE SUPPLY SYSTEM AND ITS CUSTOMERS

32. General

a. The size of the Army supply system is equaled by the complexity of its operations. The supply of some critical items is planned and controlled at the highest level in the Army supply organization, and in some cases, by the Secretary of Defense. Other items are left to the discretion of the local supply officer at an Army installation. Supplies in heavy demand cannot be controlled in the same way as those which are relatively slow moving. The same item may be supplied in different ways, according to its eventual disposition as an independent end item, as a repair part for another end item, or as a component of a set or kit. At the same time all the varying processes of supply have a common end—to support the Army's current or planned operations—and all have a more or less integral relationship with each other. To provide for the management of its supply operations, the Army generally breaks down the whole process of supply into segments or functions constituting the components of the supply cycle.

- (1) The computation of supply requirements.
- (2) The procurement of required supplies.
- (3) The storage and distribution of supplies to meet the needs of the consumers.
- (4) The maintenance required while items are in the inventory.

(5) The disposal of surplus items when no longer needed.

b. Traditionally the basic components of the supply cycle are taken in the order presented above, with requirements at the head of the list, followed by procurement, distribution, maintenance, and disposal. This is the sequence in which plans, directives, and materiel itself moves from the strategic plan and the research laboratory to the consumer. Presentation of the material in this order has a logical appeal; however, in the management of an operating supply system the supply cycle may be encountered in many different stages and forms at any given moment. The interrelationship of requirements, procurement, storage and distribution, maintenance and disposal at all levels makes it impossible to manage any one function as an element isolated from the others.

33. Customers of the Supply System

a. General. In an overall view, the customers of the Army supply system are a surprising aggregation. They include the Active Army in the Continental United States and overseas, the National Guard, the reserve components such as the USAR and ROTC, other branches of the military establishment (Navy, Air Force, Marine Corps), other Government agencies, other governments receiving military aid, industry (Government-furnished property), civilian agencies (emergency relief), and the general public. These customers draw supplies for

many purposes under many rules: they may receive free issue or be required to reimburse the Army; they may draw supplies against allowance tables or for the purpose of installing them in a building; they may merely "borrow" supplies for a brief period such as for housekeeping at an installation; they may obtain supplies for permanent addition to their equipment and for other purposes almost beyond tabulation. The methods by which these customers place their demands upon the system also show many variations. The demand may be stated by an issue slip or by a requisition, or supplies may be issued "automatically," that is, without any active demand from the user at all.

b. Active Army.

(1) *Troops in the Continental United States.* The Active Army within the continental limits draws the great bulk of its supplies from the technical service property officers at posts, camps, and stations.

(a) *Troop units.* Troop units draw their basic equipment and supplies from the station in accordance with tables of equipment published by the Army. These are ordered through the unit supply officer or supply sergeant by means of an issue slip. During garrison duty authorized unit equipment may be reduced to the amount required for training and full equipment issued only when the unit is sent to the field. Troop units also draw various housekeeping items such as beds, desks, typewriters, etc., which are required for the period of their garrison duty and training. These housekeeping items are "loaned" to the units on hand receipt, and are dropped from accountability by the station property officers, and picked up on the "installation property book" of the unit. However, such housekeeping items are assets of the station and must be returned by the units when they depart. Troop units also borrow many items from the station property officers for

various purposes: generator sets to provide field lighting, tools to maintain the premises or to perform a certain repair job, etc. Troop units, particularly Engineer and Signal units, may draw class IV supplies to construct permanent or semi-permanent installations. Troop units also draw large quantities of repair parts to maintain the equipment issued to them.

(b) *Other activities at Army posts, camps, and stations.* In addition to troop units at a station, various activities such as hospitals, maintenance shops, bakeries, laundries, administrative offices, etc., draw some or all of their supplies from the station property officers. Property officers themselves use equipment and supplies furnished by more than one service. Most items are carried on installation property books by units and activities.

(2) *Troops overseas.*

(a) *Oversea requisitions.* All requisitions representing the demands of troops overseas are placed on the Oversea Supply Agencies at New York, New Orleans, or San Francisco. Although the organization and operation of the supply system in overseas areas is not within the sphere of this manual, it might be noted that, in general, overseas commands organize depots, stock control points, and supply control points. The names that have been applied to these functions sometimes vary, but the processes are somewhat similar to those performed within the CONUS. The requisitions from the overseas commands are received by the Oversea Supply Agencies at the local Transportation Terminal Command designated to support each overseas command. The Oversea Supply Agencies are directly supervised by the

Deputy Chief of Staff for Logistics, and act as representatives of the oversea commanders in presenting demands of oversea customers upon the CONUS supply system. Technical service personnel in each Oversea Supply Agency—

1. Edit the requisitions with their stated bases for supply against various criteria available to the agency, such as known strength of the command, mission, approved bills of materials for class IV projects, prior issue experience, etc.
 2. Break down the requisitioned items according to the initial source of supply designated by the technical service.
 3. Prepare oversea extract requisitions to be sent separately to each source of supply (or purchase requisitions if the terminal has the facilities to accept direct delivery from vendors and if the technical service has authorized USA OSA to go directly to procurement offices).
 4. Maintain records of the status of oversea requisitions and conduct follow-up liaison with the various sources of supply as to the status of requisitioned items in order to advise the oversea command when items may be expected.
 5. Maintain close liaison with oversea commands.
- (b) *Automatic supply to oversea commands.* When a new oversea command or base is established, supplies may be provided automatically for the first few months of the operation. Requirements are calculated by the CONUS Inventory Control Points on the basis of the command's mission and strength. Shipping orders are then placed on depots and delivery of supplies is phased with the Oversea Supply Agency at the Army Terminal. As

the oversea command or base becomes fully established, the stock already received is picked up on its stock records. When demand experience is built up, automatic supply is phased out and stocks are replenished by requisition. Automatic supply may continue, however, for some time for special categories of materiel. Newly developed equipment may be shipped without requisition to designated commands as it becomes available from the manufacturer. However, repair parts requirements for new equipment or for any substantial increase in the population of older equipment are computed and shipped in advance of the end items when possible, in order to permit oversea commanders to integrate the supplies into their system and thus provide timely maintenance support for the equipment when it arrives overseas.

- (3) *Technical services.* Technical services requisition supplies from each other principally for the following purposes:
- (a) Set assembly, when the set is composed of items supplied by more than one technical service.
 - (b) Maintenance and operation of other facilities that require Ordnance vehicles, Engineer cranes, or Quartermaster Materiels handling equipment to cite a few examples. This type of demand may also originate at depots, arsenals, or other installations of the supply system itself.
 - (c) Installation of another service's item in a larger end item being assembled by a manufacturer.
 - (d) Research and development.

c. *Other Requisitioners.* In addition to the Active Army located in the CONUS or overseas, there are other customers of the Army supply system.

- (1) *Other governments.* The shipment of military supplies to other governments is either automatic or based on

requisitions through Oversea Supply Agencies. The initial determination of which items will be furnished to the foreign government is made by an Allocations Committee based on need, availability of the items, and the ability to support them. Oversea Supply Agencies place requisitions both for the end items and the repair parts, tools, and equipment to support the end items, usually directly on the inventory control points of the technical services. However, the inventory control point generally must translate broadly stated "repair parts, tools, and equipment to support X number of items for X period" into specific quantities of specific quantities of specific items. Shipping orders for the required number of major end items and computed repair parts, tools, and equipment to support them are then placed on the depots for shipment to Army Terminals. Replacement items are ordered by foreign governments through appropriate Oversea Supply Agencies which follow essentially the same extract procedure as for Active Army supplies.

- (2) *National Guard.* Requisitions from National Guard units are submitted to the United States Property and Fiscal Officer (USP&FO) for the State in which the unit located. This officer is the accountable property officer for all Federal property issued to the National Guard of that State. The USP&FO submits consolidated requisitions to sources of supply designated by the technical service except for such items over which the Chief, National Guard Bureau desires to exercise centralized distribution control. In the latter case USP&FO's submit requisitions through the Chief, National Guard Bureau.
- (3) *Army Reserve and ROTC.* Army Reserve and ROTC units and activities are satellited for supply on Active Army installations as designated by major subordinate commanders. Sup-

ply is obtained from installation stocks, by local purchase, or by requisition on appropriate technical service depots or National Inventory Control Points. Due to the nature of ROTC clothing demands—large quantities once a year—it is more economical to supply direct from appropriate depots than from installation stocks. ROTC-owned stock of such items, which may be on hand at the designated parent installations, are applied against these annual demands by the parent installations, prior to forwarding requisitions to the depot. Procedures are essentially the same as for Active Army units, except as noted above and the control over processing demands to parent installations which may be exercised by the respective U.S. Army Corps. This parent satellite installation supply procedure not only simplifies supply and affords economies of operation in peacetime, but it facilitates the transition of USAR units to Active Army status if they are required during a national emergency.

- (4) *Other departments of the military establishment.* The Army furnishes the Air Force and Marine Corps with various items such as trucks, construction machinery, ground radio apparatus, and weapons. For some technical services, this demand, particularly that of the Air Force, constitutes a sizable portion of the total supply workload of the technical service. The Navy obtains Army items to be supplied as Government-furnished property to manufacturers assembling Navy items that include Army components.
- (5) *Military attachés.* The Army furnishes supplies and equipment to military attachés at various foreign posts either from the nearest military depot or by requisition on the CONUS supply system.
- (6) *Civilian agencies and the public.* Under such emergencies as flood,

drought, cold, famine, and pestilence the Army furnishes supplies to civilian agencies and the general public.

34. Operating Organization of the Distribution System

The primary aim of the Army supply system is to meet the demands of its requisitioning agencies scattered throughout the world and representing a wide variety of needs and activities. Concentration herein is upon the actual operations, the operators, and their responsibilities in the vast complex of personnel, equipment, and facilities that constitute the distribution system.

a. The Deputy Chief of Staff for Logistics. The implementation of DOD policy guidance and the responsibility for day-to-day control of the system begins with the Deputy Chief of Staff for Logistics. Except in emergency situations and in certain well-defined areas of critical importance, such as operation of the Oversea Supply Agencies and control of specific major procurement actions, the Deputy Chief of Staff for Logistics does not perform any specific operating functions in the supply system but exercises direction and control over the technical services. Here he is responsible for the formulation of plans, policies, and procedures in the following areas:

- (1) Budget preparation and defense for supplies and equipment.
- (2) Logistics plans.
- (3) Mobilization plans.
- (4) Materiel requirements.
- (5) Procurement.
- (6) Supply and service troops.
- (7) Standards and specifications for equipment.
- (8) Cataloging and identification of equipment.
- (9) Storage and distribution system.
- (10) Foreign and civilian aid.
- (11) Construction.
- (12) Disposal.

b. Chiefs of Technical Services. The chiefs of technical services have both supervisory and operating responsibilities. They are responsible both for supply and support of the commodity

groups assigned to them. This involves the direct supervision of central procurement activities, inventory control points, and depots. They also perform regular staff functions as subordinates of the Deputy Chief of Staff for Logistics, including the coordination, with DCSLOG and USCONARC, of equipment tables for the items for which their respective technical services are responsible. In addition to these supervisory and staff functions, the regular operating phases of supply begin in the offices of the chiefs of technical services. They compute requirements for all principal items either independently or in coordination with their inventory control points. Furthermore, the distribution of certain major items, known as "regulated items," is directly controlled by the chiefs of technical services or by inventory control points.

c. Inventory Control Points. An inventory control point is an organizational unit within the supply system of a technical service to which the head of the technical service has assigned primary responsibility for the management of a commodity or group of items, either the responsibility of a particular technical service or for the Department of Defense as a whole. In concept, each item for which a technical service has logistics responsibility regardless of the manner of acquisition, is under the cognizance of but one inventory control point of that technical service.

(1) *Functions.* Inventory control points carry out these functions among others:

- (a) Initiate action leading to cataloging of items in Department of the Army supply manuals.
- (b) Compute quantitative requirements.
- (c) Require procurement to be accomplished.
- (d) Control stocks in, due in, or planned for the distribution system on a quantitative and monetary basis.
- (e) Require rebuild to be accomplished.
- (f) Initiate action leading to disposal of unneeded items.

(2) *Responsibilities.* Inventory control points are responsible for all of the

intricacies of supply management within the scope of the above functions such as—

- (a) Maintaining cognizance of worldwide inventories of items assigned to them on either a quantitative or monetary basis or both.
- (b) Controlling the positioning of stocks to eliminate unnecessary cross-hauling and back-hauling and to reduce aggregate inventory holdings.
- (c) Minimizing the entrance of non-standard items into the supply system.
- (d) Insuring maximum practical and economical use of obsolescent items and their repair parts.
- (e) Conducting liaison in the interest of effective and efficient performance of assigned functions.

d. Depots. The depot is the basic facility for handling materiel in the supply system including receipt, inspection and classification, storage, care and preservation, issue, assembly, and maintenance. The position of the depot in the supply system and the range of its management responsibilities for specific supply functions depend on how a technical service is organized for supply, specifically the division of responsibilities between depots and NICP's.

e. Installations. At each installation, supply officers representing each technical service requisition, stock, and issue to troop units and other requisitioners, the supplies for which their technical service is responsible. In addition, a consolidated point of distribution for specified expendable supplies called a Self-Service Supply Center is also established at those installations where volume of supply justifies. Operational control of the Center is vested in the G4 or S4. In concept and operation, the Center is similar to a commercial supermarket with accountability for inventories being on a dollar basis rather than on an item basis. A monetary credit system is established for customers, troop units, and activities, with no actual funds being involved in issue transactions, except for sales to nonappropriated fund activities. This use of monetary credits supervised through command channels to control utilization of many expendable type

items not only eliminates necessity for quantitative authorization edit, but is also designed to increase cost consciousness on the part of customer units and activities, and provide for reduction in paper work in the low dollar value items of supply. In the Continental United States, the station stockrooms form the final link in the chain of distribution. Unlike the inventory control points and the depots, installation supply officers are not under the administrative control of the heads of technical services, but report through the chain of command. They are subject to the technical control of the supply system, however, through the editing of requisitions, the examination of stock levels, and the monitoring of excess stocks. Limitations on amounts and items authorized for local procurement by the installation, together with the form and frequency of requisitions and reports, are also prescribed by supply authorities through the chain of command. The supply responsibilities of installations are in many aspects parallel to those of depots and include—

- (1) Protecting and preserving stock in storage.
- (2) Maintaining accountable records of stocks in storage and checking physical stock on hand against inventory records at periodic intervals.
- (3) Issuing authorized supplies against issue slips presented by troop units at the station or by other authorized customers.
- (4) Maintaining authorized stock levels and replenishing inventories by placing periodic requisitions on the appropriate technical service source of supply.
- (5) Where items requested by an issue slip are not available in stock, either place items on due out against quantities due in or to be requisitioned; or procure item on local market if authorized to do so.
- (6) Receiving supplies turned in for repair or as excess by troop units and disposing of them as directed by the depot or NICP.
- (7) Maintaining stock fund and financial inventory accounting records at designated posts, camps, and stations.

Section II. MANAGEMENT PLANNING FOR THE DISTRIBUTION SYSTEM

35. Distribution Pattern

a. General. Any descriptions of supply functions which are broad enough to include the seven technical services, Army single managerships, the dozens of inventory control points, and the depots comprising the distribution system in the Continental United States must deal largely in generalities. To appreciate the actual management problems confronting the operators of the distribution system, it is necessary to examine the pattern of distribution set up by each of the technical services and single managers for the commodities which it handles. This includes maintenance, distribution and control of stocks, the flow of consumer demand through the supply organization, and the return of needed supplies to the consumer. An understanding of the distribution pattern in these terms will define the basic management task of the Army supply system as a whole: *to find the means for flexible yet adequate control of the huge volume and variety of supplies demanded to support the military mission.*

b. Development of the Distribution System.

- (1) The basic unit of the system is the technical service distribution mission area in which technical service items are distributed to all customers, primarily posts, camps, stations, and army terminals in an assigned geographic area. Depot stockage is determined by recurring demand for items and by a consideration of the economy and desirability of stocking items at the particular depot in question. Prior to World War II the technical service distribution stocks, except ammunition and a few others, were generally stored in five "general depots." With few exceptions, stations placed their requisitions on the appropriate technical service section of the general depot. Distribution areas for the services generally conformed to each other.
- (2) This simple picture of distribution was upset by World War II. The tonnage of supplies and number of new items multiplied so rapidly that the

general depots would not hold them. Highly complex new equipment entered all supply systems. No longer was it practical to attempt to store at one point every end item and repair part for a technical service. Specialization began: one depot specialized in artillery weapons, another in tanks, another in subsistence, another in toxic chemicals, and so on. The expansion was so great that often more than one depot specialized in the same commodity. Because of their specialized functions, these depots came to be known as "key depots" for the commodities which they handled and were thus distinguished from "distribution depots," which handled a broad group of commodities for customers in a limited area. The distribution depot remained and even grew larger but no longer could it store and issue the whole range of commodities of a specific technical service. Both key and distribution depots were often given "satellite" or "reserve" depots to handle the overflow of their stocks. Reserve depots issued supplies only on orders from the master depots or the chief of the technical service.

- (3) With this increase in items and tonnage came an increase in tempo: the Army had to know as quickly as possible what it had and where it was located in order to meet the constantly shifting requirements of war. A reporting system was developed to meet this need. Every storage point transmitted its stock balances at varying intervals to the technical service headquarters where they were consolidated for an overall picture of stock availability. But the many other tasks that the war brought to the technical services soon forced them to move this central control of stock away from the congested Washington area to stock control points in various parts of the country. In many cases the technical service initially retained

the computation of requirements function and merely moved out the day-to-day control of extracting between depots and related functions. Gradually, however, the computation of requirements for all but a few selected principal items and major secondary items was also delegated to inventory control points dispersed throughout the country. These were often housed with the stock control points, but the two functions have usually been maintained intact. The end of World War II caused a rapid contraction of both tonnage and number of items, together with the closing of some depot facilities. However, the complexity of today's munitions and supporting equipment, together with the military demands of the present world situation, have considerably reduced this contraction.

c. Management Problems in Distribution Pattern.

(1) *General.* From divergent interpretations of the original concepts, such as the general depot or key depot, the present distribution system has developed. There are variations in the distribution patterns of the technical services; not all of these constitute problems for the overall management of the Army supply system. Many of them are based upon sound principles according to the different types of commodities handled. In other cases divergencies from original storage and distribution plans have been caused by the limited facilities available to a technical service at the time stock was received. Many of the variations are the direct result of the impact of World War II upon the distribution system, followed by the Korean War while the system was still wrestling with the effects of rapid demobilization and peacetime economies. These dislocations constitute recognized problems of supply management. They may be summarized under three principal headings:

the mission of the general depots, the assignment of geographic areas to distribution depots, and the interpretation of distribution missions. The distribution patterns of our supply system present problems of high importance to the supply manager, e.g.:

- (a) The institution of the most efficient and economical patterns for peacetime operations coincidental with the basic patterns which should be established to maintain readiness for war.
 - (b) The length to which the Department of the Army should go in seeking uniformity in technical service supply and service systems.
 - (c) Providing for flexibility and the ability to expand rapidly to meet suddenly imposed demands. Supply managers in the offices of the DCSLOG, the technical services and single managers work continuously to solve these ever-changing problems.
- (2) *Mission of general depots.* At present only one general depot stores supplies of all technical services. In some, a majority of technical services are represented but the supply mission of each technical service is assigned independently by the technical service head as approved by the DCSLOG. These missions may vary strikingly within the same general depot, whereas the distribution areas served for two technical services may vary. Again one technical service may have assigned a regular distribution mission, while another at the same depot may have assigned only a reserve storage mission as a satellite of a branch depot. Where the distribution mission of one technical service whose stocks are stored at a general depot includes an Army Terminal, the distribution missions of another may not include the same terminal or even supply the terminal from one of its branch depots.

- (3) *Assignment of depot distribution areas.* The geographic areas served by technical service branch or general depots vary between technical services and single managers. Generally there is no single geographic area within the Continental United States that is supplied by all technical services in common. Similarly, no Army Terminal is supplied by all technical services from the same location and there is little relationship between depots located within the same geographic area.
- (4) *Assignment of key and distribution missions.* Every technical service has found it desirable to continue to a greater or lesser degree the depot specialization by commodities developed in World War II. The services key certain commodities or items to a single depot or to two or more depots, each serving a designated zone broader than the coverage of a regular distribution area. In some instances supplies are keyed by commodity class or end use, in others by frequency of issue alone. When the practice of "multiple keying" is followed, the zoning of the Continental United States, like the division of distribution areas, differs among the technical services. In practice the methods of keying vary considerably from service to service. The keyed stocks are not always concentrated at a single depot or even at the satellites of a single depot. This pattern arises in part from the assignment of key missions after the stocks are already distributed widely through the system. Even after assignments are made, however, space limitations and other factors dictate the stockage of keyed items in more than one designated depot when the key mission is assigned. Frequently, the key depots do not have a complete inventory picture of the stocks for which they have key missions; consequently requisitions for these stocks must be placed upon inventory control points.

d. Analysis of Depot Distribution Areas.

- (1) *General.* The fact that depot distribution areas differ from each other does not by itself present real difficulty for supply management. An analysis of the distribution areas is directed to supply performance and economy in supply, which in this case means primarily economy of transportation. Potential savings in this area are considerable. The size of the expenditures emphasizes the importance of good planning and the maximum utilization of management techniques to keep these costs to the minimum. Transportation is a complex subject involving technical rules with respect to transit privileges, documentation, packaging, routing, commodity classification for rating purposes, and fixing of responsibility for damages in transit. The effectiveness of individual depots, however, is limited by the degree of initial planning, on an interservice basis, for the most efficient relationship between each depot, its customers, its sources of supply, and other depots supplying the same customers. There are two principal areas of potential economies in the overall freight and transportation pattern: first, *the maximum utilization of transit privileges* and second, *the maximum consolidation of shipments.*
- (2) *Transit privileges.* With some exceptions, the transit privilege may effect a reduction of freight rates when a carload or truckload shipment is offloaded at an intermediate point between origin and destination and shipped on to its final destination within certain time limitations. For example, the carload rate from Chicago to St. Louis may be \$1.50; from St. Louis to New Orleans, also \$1.50; but the rate from Chicago direct to New Orleans, only \$2.00. If a shipment is offloaded at St. Louis and then shipped on to New Orleans within a stated time, the rate for the

second shipment is only \$0.50 plus a small transit charge. This is obtained by subtracting the amount paid, \$1.50, from the through rate of \$2.00. Full utilization of this privilege reduces transportation costs substantially. The situation at each depot must be analyzed in relation to the locations of its customers and its major sources of bulk supplies. If these supplies originate mainly in the Northeast, they can be shipped more economically to bulk customers in the Middle West and West from a depot located between the source and the customer than from a depot located to the West of its customers. The rate differential is such that the "in between" location is more economical even if it is many miles farther from its customers than the "outside" location. The proportion of bulk supplies and the consequent savings are particularly significant in the selection of depots to effect oversea distribution through Army Terminals.

- (3) *Consolidation of shipments.* Another freight cost consideration to be weighed in the assignment of depot service missions and areas is the rate advantage of shipping carload or truckload lots over shipping less-than-carload or less-than-truckload lots. This analysis applies particularly to general depots where shipments are made to customers involving the supplies of two or more technical services at the same location. If the customers of all technical services are the same, that is, if the distribution areas for all technical service supplies at a general depot coincide and if they are assigned similar distribution missions, instead of independent reserve or key missions, consolidation of shipments into carload or truckload lots can be regularly accomplished at considerable savings. It may cost the government no more to ship a carload of 40,000 pounds than a less-than-carload lot of 15,000 pounds. To illus-

trate, the New Orleans Army Terminal is supplied by the Quartermaster Corps and the Corps of Engineers from the Atlanta General Depot; whereas the Signal Corps, which uses Atlanta as a distribution point, supplies the New Orleans Army Terminal from Decatur, Ill., and Lexington, Ky. In many cases it would be possible to combine Signal shipments with Engineer and Quartermaster shipments to New Orleans at no extra cost of transportation to the Government. If a single consolidated shipment of Engineer and Quartermaster supplies to New Orleans amounted to 15,000 pounds, another 25,000 pounds of Signal supplies could be shipped in the same car for no additional cost in transportation, subject to minor variations for differences in commodity rates. Sometimes the cost advantages of consolidation must be offset against the use of transit privileges, while in other cases both cost advantages may be used to reinforce each other. An overall analysis and reassessment of the types of missions and the distribution areas assigned to all depots of the Army supply system should yield measurable savings in transportation costs.

e. Assignment of Distribution Missions.

- (1) *Need for specialization.* All technical services have adopted with some variations the concept of specialization by one or more depots in certain items or commodities with a corresponding reduction in the responsibilities of each. In general, there is no distribution depot which stocks the full range of a technical service's items. It is probable that some depots in the system are capable of handling a balanced stock of items which are the responsibility of a specific single manager. In general, however, no distribution depot supplies all the needs of the requisitioners within its proximity. Specialization is necessary and supply managers are guided by many influences in determining the

degree of specialization actually needed in consideration of their primary mission. The distribution system exists only for the purpose of supplying the Army with the things it needs to perform its missions. The urgency of the need can dictate the speed at which the supply system must react, often at higher cost.

(2) *Locating stocks by frequency of issue.*

To provide effective supply to the consumer and to obtain economies in time and costs of storage, the largest possible proportion of consumer demand is normally satisfied from the nearest possible point of issue. This basic rule suggests that the items in depots should be those which are most frequently demanded. Studies by a number of the technical services indicate that between 10 percent and 20 percent of the items stocked by a service represent between 80 percent and 90 percent of the line item issue volume by the depot system. Locating items on the basis of frequency of issue offers the simplest method for designating stockage items. The criterion of frequency of issue, however, cannot be used exclusively; other factors must be considered in each case. Some of these are as follows:

(a) *Item bulk.* Although an item may be relatively infrequently issued, its bulk and consequent transportation costs may suggest that the first destination stockage point from the manufacturer should not be centralized. On the other hand, the item may be small and transportation costs inconsequential.

(b) *Specialized storage requirements.* Such items as dry batteries, photographic film, toxics, and ammunition may require specialized storage which is not available in an otherwise logical location for depot storage.

(c) *Constant or urgent demand versus relatively small number of issues.* When the item is wanted it may be

wanted faster than it can be supplied from a remote central location. Again the item may have a low issue frequency but an urgent issue characteristic.

(d) *Holding items in reserve for wide distribution in an emergency even though current issues are relatively small.* Protective gas masks may not be issued frequently but should be widely dispersed to gain rapid employment to meet emergencies.

(e) *Concentration of use in certain geographic areas by virtue of types of units, climatic conditions, etc.* It is not desirable to stock large numbers of snowplows in the Memphis and Atlanta areas, yet it is necessary that large quantities be stocked in areas such as Schenectady, N. Y., and Ogden, Utah.

(f) *Dispersion of stocks to obtain minimum vulnerability in the event of war.* Stockage based on frequency of issue, when modified by dispersion criteria, has certain drawbacks. For most items, frequency of issue changes from time to time, and concerted efforts to disperse stocks become frustrated. If stocks are constantly shifted to reflect changing rates of issue, the problems of keeping all requisitioners, depots, inventory control points, Army Terminals, and other activities in the supply system informed of the changed status of the item becomes very great. Further, the costs to transport the items can become prohibitive. If demands increase, issues will exhaust stocks at some points, while they may increase at other storage points, creating location imbalances between the users and the item. Thus planned dispersion does not necessarily contribute to the best supply performance.

(3) *Keying by commodity classification.*

(a) The keying of items to depots by commodity classes offers a partial

solution to the problem of changes in frequency of issue and makes it possible to fix responsibility for many categories of materiel with some permanence. To be effective this method should be combined with considerations of frequency of issue and should be flexibly applied. Frequently items of a given commodity class which are stocked in one or two depots may be excepted from the general commodity assignment because of considerations of large bulk, and resulting shipping costs savings, or a need to furnish them rapidly on demand. Many commodity classes will be subject to exceptions of this kind.

- (b) Prior to the assignment of Federal Supply Classification codes, it was not entirely possible to assign items by the commodity classifications then in use, consequently the services resorted to keying by groups of items: i.e., topographic equipment, mortuary equipment and trucks. These categories often cut across a number of commodity classes common to more than one technical service and include items not peculiar to the specific end items. The Federal Supply Classification of Commodities now in use is much more adaptable to keying by commodity class.

36. Storage Capacity of the Distribution System

a. General. It is obvious that the vast storage facilities of the Army are difficult to manage because of the diversity, quantity, and uses of the items to be stored. In many cases, it is not possible to physically concentrate certain items or commodities in one depot or group of depots because of the limitations on storage space, and the materiel must be fitted into whatever space is available. The analysis of total storage capacity, the selection and location of stocks to be placed into it, and due consideration to the needs of the users, present great problems in the overall management of the supply system. There is no parallel in the

commercial world to the problem faced by the Army in terms of volume and duration of storage required for military supplies. In general, businesses must have working inventories and may acquire larger stocks temporarily to take advantage of favorable prices or other conditions. Ideally, the raw materials flow to the manufacturer, the finished goods to the wholesaler, the retailer, and finally the consumer, are all geared to customer demand. Any change in this demand should be quickly reflected in the channels of distribution. Accumulation of excesses in inventories and the consequent tie-up of excessive amounts of capital should be avoided. The Army must not only supply its present customers, the Army in being, but must be prepared to furnish vast quantities of equipment and supplies to sister services and agencies which may leap into being overnight. There will be no time to react to larger customer demand in distribution and production channels. Initially required supplies and equipment must be available when an emergency occurs. The costs of long-range storage and preservation have a direct bearing on decisions to dispose of items versus retention in emergencies.

b. Costs of Long-Range Storage.

- (1) *Need for cost information.* The Army cannot store the quantities of all the items which it may need. Even if the standards of military necessity are rigorously applied, the acquisition and storage of supplies in quantities still strain the capacities of the present distribution system. In order to make informed decisions on what supplies to acquire and dispose of, the managers of the supply system must know the relative costs of storing the items or commodities under consideration.
- (2) *Capital investment.* Capital investment is of no less concern to the United States than it is to a private industry, although it does not keep precise accounting to determine it. Private enterprise considers interest paid on borrowed capital as an expense of running the business. Thus, if it could be shown that the Government must borrow in order to

make the investment in inventory, it might be argued by analogy that the interest paid on the borrowed capital should be considered as a part of the cost to hold. By the same reasoning, however, if fiscal policy dictates that borrowing is not necessary, interest charges should not be included in computing holding costs.

(3) *Other costs.*

(a) To the base of the invested capital in the acquisition cost of the item must be added a large number of additional capital and operating costs, such as—

1. The investment in fixed assets, i.e., warehouses, sheds, improved storage areas, and trackage.
2. The costs of labor and other personnel at the depots, inventory control points, procurement offices, and technical service headquarters.
3. The investment in operating assets such as forklift trucks, cranes, locomotives, dip tanks, spray guns, and sandblasting machines.
4. The cost of operating supplies such as preservation and packaging materials and office supplies.
5. The cost of repairs and utilities.

(b) Using data on inventory value obtained through the financial inventory accounting program, the direct and indirect costs of storage can be applied against the value of the inventory to give an accurate picture of the costs of storing given quantities of an item or commodity for given periods of time.

(4) *Uses of storage cost information.* Information on storage costs cannot be used as a sole criterion for selection of inventories. In many cases strategic considerations will be paramount; it may be necessary to store critical and complex items until the storage costs far exceed the cost of acquisition if the items must be on hand immediately in an emergency. Storage cost

data should focus attention on items or categories of supply in which storage costs are high in relation to inventory value, and, in combination with other considerations will help to determine whether these high costs are justified. Decisions can then be made to reduce, maintain, or increase current stockage, reserve stockage, or retention levels so as to achieve the most effective balance between the usefulness of stocks on hand and the cost of keeping them. Since complete data on storage costs will represent a major portion of total costs of operating the supply system, further analysis of these data for various purposes is necessary in all phases of supply management.

c. *Economy of Storage Costs.*

(1) *General.* Storage costs have been discussed as though they were more or less fixed "overhead charges" to be applied against the inventory on hand. The supply manager must take an objective view of storage costs to hold them to a minimum. The less money spent in storing and caring for supplies, the more will be available for paying manpower for other important functions.

(2) *Cost of fixed assets.*

(a) The Army's supplies are stored in warehouses, sheds, and in open storage areas. Almost all supplies will deteriorate most rapidly in open storage and least rapidly in covered space. Since all items cannot be stored under cover, the Army has published lists showing which items *may* be stored outside in open storage when sufficient covered space is not available. In practice, certain items *must* be stored outside. Factors such as the floorload of extremely heavy equipment, the inability to use vertical space for stacking heavy items, and the inaccessibility of heavy material to proper handling equipment make storing of some items inside im-

practical. However, there are many items which may be stored inside if conditions warrant. A small generator set may be stored outside although the rate of deterioration and cost of preservation is higher than when stored inside. To obtain the most economical use of fixed assets, therefore, managers in the supply system should know relative costs of inside and outside storage. Comparisons should include costs and depreciation of warehouses, sheds, and handling equipment as balanced with costs of packing and preservation in outside storage. The latter costs will vary considerably for different items. Some of the considerations are—

1. Economic feasibility of warehouse construction.
 2. Availability of commercial storage space at a rate and for a period which will more than offset the cost for preservation of the equipment to be stored outside.
 3. The cost of moving material from open to covered storage exceeding savings which could be anticipated in care and preservation costs. Proper location to meet anticipated demands upon movement from one depot to another, and the added costs in backhauling to meet these demands.
 4. The relative costs of depreciation and preservation in sheds as opposed to warehouses. Justification of relative costs of preservation and depreciation in shed versus warehouses and the added costs commensurate with warehouse storage.
- (b) The problem of deciding between additional construction of sheds or warehouses or abandoning storage facilities and shipping the material to another location are common occurrences. Comparative costs must be known regardless of military considerations because they point

up economies which may lead to more service to the customer for each dollar spent.

- (3) *Costs of care and preservation in storage.* The costs of preserving materiel are intimately related to the costs of the facilities in which the supplies are stored. Preservation costs should be subjected to analysis in order to determine the most economical and effective preservation obtainable. The estimated length of time items will remain in storage, the cost of the item, and the cost of preservation should be considered. Another important factor is the ultimate location where the item will be stored and used. The costs of preserving equipment to withstand extreme cold, salt air, or tropical mildew are far greater than those to protect the same equipment for storage in most areas of the United States. If items are packaged for oversea shipments, the initial cost of preservation and packaging will be high, but maintenance in storage will be low, even when stored in the open or in sheds. Warehouse space should not generally be filled with materiel packaged to withstand extremes of temperature and humidity while materiel not so protected is left in less desirable storage areas.
- (4) *Controlled humidity storage.* As one answer to the care and preservation problem, the Army has a program to expand its controlled humidity storage facilities. Substantial economies are anticipated as this program is extended. The introduction of controlled humidity space on a large scale in CONUS depots may change storage policies and procedures since several problems are posed which were not present before. Consider the criteria for selection of items or groups of items for storage in controlled humidity space, the levels of preservation and packaging that are appropriate for supplies stored in

controlled humidity space, and new standards required for inspection, re-preservation, and care of supplies in storage to realize a reduction in costs through the use of controlled humidity space. Personnel of the distribution system must keep pace with the development of new storage techniques, equipment, and facilities in order to take full advantage of the economies these developments may afford.

37. Flow of Requisitions Through the Supply System

a. General. The location and amounts of items stored in the Army supply system and the physical pattern of distribution are determined by considerations of effective supply, economy of time, and transportation and storage costs. All are related to the much larger management problem, *the effective control of the movement of supplies through the distribution system.* Basic to this problem of control is the flow of requisitions expressing customer demand through the supply system and the resultant action taken as to destination of the requisition, who acts upon it, and how this action is reported.

b. Classes of Supply. The station supply officer and the Oversea Requisitioning Agencies, through the Oversea Supply Agencies utilize various requisitioning procedures for obtaining different classes of supply which in many cases require diverse processing by depots and inventory control points. The classes of supply and an expression of these differences in requisitioning procedures are given below.

- (1) *Class I—subsistence.* Subsistence items are ordered on a special pre-printed requisition form on which the requisitioner shows the consumption of food for a stated number of past days and the requirements for a stated period in the future. Perishable produce is ordered from the nearest market center and nonperishable items from the appropriate distribution depot. Some bulk subsistence items such as flour, sugar, and salt may be shipped direct to stations from

wholesalers based on requirements furnished to the depots.

- (2) *Class II—troop issue.* Class II items are those which are authorized in tables of organization and equipment, Department of the Army approved special lists of equipment, equipment modification lists, tables of allowances, and items with approved requisitioning objectives. In the past many different requisitioning procedures were utilized by each of the technical services. However, a high degree of uniformity is now accomplished through the implementation of AR's of the 700-series covering single-line requisitioning. The advent of Automatic Data Processing into the supply system has necessitated a higher degree of uniformity in order to obtain compatibility of processing data through the many machines which are in operation throughout the world today.
- (3) *Class III—petroleum, oil, and lubricants.* In the Continental United States the major portion of petroleum products are supplied from open end contracts awarded by the Military Petroleum Supply Agency (operating agent for the Single Manager—Petroleum) to oil companies. Special type items, in small container sizes, having long procurement lead time are ordered from depots unless authorized for local procurement. Local purchase is authorized when the aggregate amount of any single item does not exceed \$2,000.00 and when the item is not available on MPSA contract to serve the requiring location. Oversea installations are supplied bulk petroleum items by the service having purchase and consignment responsibility (Army, Navy, or Air Force) on the basis of slates submitted through the Area Petroleum Officer serving the area to the Military Petroleum Supply Agency. The National Inventory Control Point of the service having purchase and consignment responsibility for bulk products

arranges for supply of slated items through coordination with MPSA and the Military Sea Transport Service (MATS). Supply of packaged petroleum products, not stocked in CONUS depots, for which the Department of the Army has purchase and consignment responsibility, are supplied on the basis of petroleum slates submitted to the Quartermaster Petroleum Center (Petroleum NICP for the Army). Specialty type packaged items for oversea use are requisitioned through the Overseas Supply Agency from depot stocks. Oversea requisitions for subsistence are similarly submitted to the Overseas Supply Agencies at the Army Terminals by oversea commands.

- (4) *Class IV—supplies not authorized under class II, such as construction materiel, project materiel, and those in excess of authorized allowances.* Oversea commands draw up plans for various construction projects such as docks, airfields, barracks, and fortifications and submit these plans together with estimated bills of materials through the technical services to the Deputy Chief of Staff for Logistics. When the plans and bills of materials as submitted or as modified are approved, they may be used as the basis for the submission of requisitions to the Overseas Supply Agencies. In addition, the maintenance of existing facilities such as utilities and buildings is included in class IV supply. This is a continuing problem and results in a steady demand upon the supply system for a wide range of both standard and non-standard items. Class IV supplies pose a large number of problems without easy solutions. (Within the United States most new construction is handled through the Corps of Engineers district organization which contracts for such work. Repairs and utilities supplies are obtained through local procurement or through the

depot system. Special projects may receive special treatment.)

- (5) *Class V—ammunition.* The Ordnance Corps and the Chemical Corps exercise logistic responsibility for ammunition; this responsibility includes stock control, storage, and issue. Requisitions for ammunition are submitted to Ordnance or Chemical depots and supply points. Under certain conditions Ordnance and Chemical ammunition supply points may be combined in a single field installation.

c. Exceptional Items. A number of items are consumed or used by the Army which do not pass through regular supply channels, i.e., construction materiel such as cement, sand, or gravel. Coal is purchased centrally by the Navy with the Corps of Engineers being responsible for coordinating requirements within the Department of the Army. Bulk shipment of coal to oversea installations is arranged by the Chief of Engineers. Tactical maps are considered "intelligence materiel" and are supplied by shipment from the Army Map Service to the Engineer officer for the command. Repair parts for office machinery are not stocked but procured locally. Many bulk supplies for fixed installations such as maintenance shops, laundries, and drycleaning plants are procured locally. Various kinds of bulk paper stock used in printing are procured from local vendors. Bulky items such as tanks, vehicles, large pipe, compressed gasses, and many other similar items are shipped to stations or oversea installations direct from manufacturers. Lumber for class IV construction projects is procured and shipped direct to consumers without passing through the depot system.

d. The Requisition. Virtually all classes II, IV, and V supplies, and a certain proportion of classes I and III supplies are requested on some form of requisition upon the depot system. The simple issue-slip procedures used to request items at stations cannot be applied between stations and depots because of the added complications of large volume business at the depots and greater distances items must be moved. In addition, depots must have separate requisitions for each class of supply, type of demand

and fund citation. The following basic information must be contained on each requisition, whether submitted on punched cards or on printed form:

- (1) *Basis or authority for supplies.* A brief statement transferred from the issue slip, such as "Authorized by TOE 5-53 and not previously drawn" or "To replace the identical item which has been turned in due to fair wear and tear." The basis may be a rather long statement in justification of the issue of more than is allowed by the tables of organization and equipment. It can be, of course, any reason why supplies are required.
- (2) *Required date.* This is the date the supplies are needed. Except for emergency, Equipment Deadlined for Parts (EDP), and Blue Streak requisitions, the required date for supplies for supplies for consumers within CON-US is 30 days or more after requisition is placed. The order and shipping time for oversea commands vary by command requisition code, and whether the item is a stocked (S) or nonstocked (NS) item.
- (3) *Type of requisition.* Requisitions must indicate the type, the urgency of the requirement, and the required date. This designation determines the rapidity of processing required in the depot and the priority of handling.
- (4) *Special marking instruction.* Requisitions must specify the markings to be shown on the packages to facilitate rapid delivery to the ultimate delivery point.
- (5) *Item identification.* This consists of the stock number, the nomenclature or description of the item, and unit of issue, such as pound, drum, each, gallon, etc. Much of this information is coded on single line requisitions.
- (6) *Quantity required and stock status.* The requisition must indicate the quantity required and the stock status.
- (7) *Type of demand.* Requisitions must specify whether demand is to fill an initial or recurring requirement.

- (8) *Fund citation.* Each requisition must contain a citation of funds for items which must be purchased from the Army Stock Fund.

e. Processing Requisitions Through the Supply System. In addition to the various methods of handling requisitions for different classes of supply, the processing of requisitions through the supply system, including the original destination of the requisition and its subsequent handling, is subject to many variations, according to the individual procedures of the technical services and the supply status of the item.

f. Management Problems in the Requisitioning Process. One of the simplest transactions is the requisition for supplies which the initial source of supply (depot or NICP) is authorized to issue and which it has available in stock. The paperwork consists of a requisition prepared by the requisitioner and a shipping document prepared by the depot or NICP. When the depot or NICP cannot approve the requisition for issue, either additional processing of the same paperwork occurs or a new document must be created. Processing complexity and the number of new documents increase as more stages are added to the requisitioning process. If the requisition includes regulated or key items, the amount of paperwork further increases. If the requisitions are for special commodities or special activities, additional processing may be necessary. Every time an item is extracted to another supply agency or a dues-out is established, the danger of failure to meet the required date arises. All requisitions are submitted under a normal schedule which provides an orderly submission for processing through the supplying activities in time to meet the required due date. The processing of the document to the initial source of supply and through the storage and transportation activities must be so coordinated and expedited that the required date is met in every possible instance. The primary aim of supply managers in the area of processing documents is to reconcile the need for simplicity in requisitioning procedures with the equally urgent need for selective and adequate control of the supplies moving through the system.

Section III. SUPPLY MANAGEMENT AT THE DEPOT LEVEL

38. General

a. The minimum task of depot supply management, comprising those supply functions which are peculiar to the depot and for which the depot usually has full responsibility, may be stated as follows:

- (1) To physically receive supplies and process applicable documents.
- (2) To ship supplies against demand to meet required dates.

b. In the complex organization of the distribution system the maximum task of depot supply management extends far beyond these limits. For certain items the depot may have purchase authority, and for others it can call for stocks from the manufacturer under centrally placed indefinite delivery type contracts to meet demands from its customers. Many depots also have a maintenance responsibility.

39. Management of Action Documents at Depots (Processing Requisitions)

Control of depot operations is not always exercised within the depot itself; the inventory control point may have been assigned certain record keeping and management functions which in the past were associated with the depot itself. Modern communications and data processing facilities have permitted the centralization of stock accounting for a commodity or group of items at a designated depot, single manager, or NICP although the stocks may be stored in several depots. The division of supply functions to single managers and technical services between depots and NICP's dictates the operating policies of the supply system of that service. Although there are variations, decentralized and centralized stock control are the two prevailing methods employed.

a. Decentralized Stock Control.

- (1) *Initial actions by depot.* This method permits the depot to receive requisitions direct from its customers. Ordinarily the depot is responsible for stock accountability under this arrangement, and as the initial source of supply, edits the requisition. If the

item requisitioned is not an authorized item of issue for the requisitioner, the requisition may be returned with an appropriate notification, or clarification may be requested. In the case of oversea requisitions, this edit is accomplished by the Oversea Supply Agency prior to forwarding the demand and is not duplicated by the depot. Stock records are checked at the depot to determine whether or not the requested items are in stock. This process is called "editing for availability." Available items are listed on shipping detail cards or on Army Shipping Documents on single line item processing. Transportation control cards are prepared, indicating all shipping detail information by prescribed codes. When a shipping document is prepared, additional information is added including transportation detail data. In most services, shipping documents are prepared using punched cards on tabulating machines to list much of the information on reproducible masters for reproduction of the necessary copies.

(2) *Secondary action by depots.*

(a) *Committing dues in.*

1. When items are not available at the depot but are properly demanded by the requisitioner, the depot may take certain secondary actions. First, it may place the items on due-out if stock is due-in within sufficient time to meet the required date on the requisition. The requisitioner in such cases is advised that these items have been ordered. If the stock is not due-in within sufficient time to meet the required data on the requisition, the requisitioner in such cases is advised that these items have been ordered. If the stock is not due-in within the required time, the depot extracts

the unavailable item to the inventory control point. Dues-in are recorded upon notification that items will be received from—

- (a) Central procurement.
- (b) Interdepot shipment.
- (c) Local procurement.
- (d) Station returns.
- (e) Repair facilities.
- (f) Oversea returns.

2. The largest volume of stock is received from central procurement, with interdepot shipments and depot procurements generally running second and third, respectively. The principal problem is the time of delivery. Depots are advised of stocks due in from central procurements by copies of purchase documents which specify delivery dates. Often contracts call for delivery many months in the future and are subject to manufacturer's delays in receiving material, labor difficulties and scheduling of deliveries by inventory control points. It is necessary to distinguish between current dues-in and long-range dues-in, in order to properly process the demand for the best service to the customer.

(b) *Extracts and shortage reports.* The depot refers the items to the inventory control point by one of the two following methods:

- 1. *Extracts.* Advice on the nonavailable items are transmitted to the inventory control point. Under this procedure, the depot passes the primary responsibility for locating and furnishing the items to the requisitioner to the inventory control point.
- 2. *Shortage reports.* Some services use what is known as the "shortage report" procedure. Under this method the depot transmits

advice on items not available to the inventory control point by transceiver. The inventory control point checks the national availability records for location of stocks. The original depot is notified of the location on an "advice of availability." This is their authority to forward an extract requisition to the secondary depot to make direct shipment to the requisitioner.

b. Centralized Stock Control. This method calls for all requisitioners, regardless of their location in CONUS, to submit requisitions to a central point, usually an NICP designated to perform the stock control function for a group of items. Ordinarily the NICP, or other designated agency, is responsible for stock accountability for the commodity concerned. A minimum responsibility for supply management exists at the depots under this arrangement since the depot's supply mission mainly comprises shipping supplies as directed by the central agency. As the initial source of supply, the NICP performs the function of requisition edit. The depot ships supplies against the action document received from the NICP. In the event of an inventory discrepancy, such as a warehouse refusal, the depot notifies the inventory control point. The NICP assumes responsibility for secondary supply actions to satisfy the demand and notifies the requisitioner of the disposition made of the demand.

c. Decentralized Versus Centralized Stock Control. There are valid arguments for and against centralization of inventory control. The growing use of automatic data processing equipment and modern communications equipment has resulted in a trend toward centralized accountability and control within large segments of the supply system. This has had important effects upon the supply procedures of the depots. The use of data processing and improved communications is changing the mechanics by which control is accomplished but it does not change the fundamental factors of the problems involved. The technical services have aligned their supply organizations to take advantage of these rapidly developing electronic tools of inventory management. It may

be argued that management is complicated by the concentration of a great volume of inventory data at a single point. However, proponents of centralized stock control point out that service to customers is expedited through such concentration of data and that centralization affords better controls and facilitates reporting, particularly in the areas of financial inventory accounting and the stock fund. The requirement to reduce the vulnerability of centralized inventory control is recognized; consequently, alternative locations must be designated to maintain certain records to minimize interruption of supply during a national emergency. Opponents of centralization argue that the historical depot-customer relationship is lost. Moreover while centralization minimizes lag time, thereby making available more timely information on stocks, it complicates taking and reporting physical inventories of stocks.

40. Transportation Management at Depots

a. General. Managers at depots must plan for the most economical movement of supplies from their warehouses to their customers. Recognition of the complexity of the subject has caused the establishment of a Transportation Division under the technical supervision of the Chief of Transportation in each depot. The supply manager at the depot cannot be expected to become familiar with all the rules, regulations, and details; however, he must have sufficient familiarity with transportation to plan the movement of goods intelligently and economically.

b. General Procedures.

(1) *Shipping analysis.* Detailed procedures are not altogether uniform between depots or for all kinds of commodities. The general routines described below are typical. After the availability of stock has been ascertained, the proposed shipment is examined, line item by line item, to determine—

(a) The weight and cubage of each line item. When a number of small packages fall within parcel post limitations, but does not amount to a truck or carload, the shipment is

marked for parcel post or for LCL (less-than-carload lot).

- (b) Which types of commodities must be separately documented? Many items, such as dangerous chemicals or explosives and high precision instruments of special value are subject to extensive monetary damages.
- (c) Whether the shipment will be carried in a boxcar, on a flatcar, in a refrigerated car, by motor freight truck, etc.
- (d) The rate at which loading can be accomplished when a large shipment of construction equipment is to be made, because only a limited number of cars a day may be inspected, serviced, and loaded. Such factors must be used in coordinating empty car arrivals and loaded car removal.

(2) *Carload and truckload movements.* After the proposed shipment has been analyzed and the number of cars or trucks by type determine, the Transportation Division receives advice from the Storage Division on the location where trucks or cars are to be spotted for loading. The Transportation Division of the depot requests advice from the Military Traffic Management Agency (MTMA) Regional Office as to the desired mode of transportation and the routing. Movements must be scheduled by the Regional Officer for coordination with the Army Terminals involved to meet ship schedules, avoid "piling up," and to provide for arranging diversions where necessary.

(3) *Less-than-carload or truckload lots.* When the Transportation Division has determined that parcel post is the desired method for shipment, the Storage Division of the Depot packages, marks, and mails the items. When the shipment exceeds the limits of parcel post, but is less than a truck or carload, the Storage Division picks, packs, and marks the goods. They

then advise the Transportation Division that the shipment is ready. The Transportation Division may pick up the goods from the Storage Division and take them to a consolidating point where they may be combined with other small shipments to the same destination. During all these processes careful attention is given to the "required date" of the requisitioner.

(4) *Reusable cargo transporters.*

(a) One method of improving the shipment of military cargo is use of the CONEX container, which is essentially a steel box with side opening doors, equipped with hoisting pads and skids. Designed to facilitate oversea shipment of materiel, the container affords the following advantages:

1. Protection of materiel in transit to enable reduced preserving and packing.
2. Physical consolidation of small shipments for a single destination.
3. Expeditious handling and loading of materiel, as a unit, by materials handling equipment.
4. Greater security for pilferable materiel.

(b) Current Army policy promotes their utilization for shipments to oversea destinations. They are ordered by depots from the Chief of Transportation, who is logistically responsible and controls their allocation by serial number in the same manner that freight cars are controlled. When a depot shipment for a single oversea destination is not large enough for utilization of a CONEX container, it may be processed and documented for CONEX shipment but transported to an Army Terminal to be consolidated with other materiel for the same destination by container.

c. Management Aspects of Transportation Planning.

(1) *Required dates.* The DCSLOG establishes order and shipping times for oversea and CONUS requisitioners. Required dates appearing on a requisition together with the applicable order and shipping time influence the time available to the depot to fill and ship the items. They therefore have a direct bearing on transportation planning. Frequently required dates have passed when the depot processes the requisition because of delays incident to extracting, reextracting, and procurement actions. However, when the depot has the stock and authority to issue it, the depot can pick, pack, and ship the supplies well in advance of the required date. Requisitions are processed through Stock Control and Storage and Transportation Divisions, within priority, in the order of receipt. Scheduling is sufficiently flexible to provide for expediting requisitions which have been delayed in transmittal, or for items requiring care and preservation. Shipments of most classes II and IV items are not held up at depots if they can be made earlier than necessitated by required dates established by the requisitioner.

(2) *Consolidation of shipments.* Objectively, supply managers strive to reduce order and shipping time to stations. Consolidation of items for shipment frequently tends to oppose such reductions, but potential savings in transportation costs warrant continued emphasis in this area. A balance between the two points of view should be sought. Ideally, from the point of view of savings, the majority of items being moved to major requisitioners should be accumulated at the depots until quantities permit least rate truckload or carload shipments to be made. Adherence to required dates places the first limiting factor to totally achieving this ideal by establishing mandatory time boundaries. Criteria established for premium transportation for priority items also limits consolidation of

items for bulk shipment. With the installation of Automatic Data Processing Systems, emphasis is being placed on the reduction of total processing time in depots between the receipt of demands from requisitioners and the physical movement of the materiel to them. Improved procedures and better coordination of information between the operational elements in the depot are showing reductions of processing time and providing better planning factors for accomplishing economical consolidation of shipments.

41. Storage Management at Depots

a. General. Where ample prescribed type of storage space is not available, the storage manager at the depot must determine which supplies should be afforded greater or lesser storage protection than that prescribed. Ultimately many economies in storage costs depend upon the efficiency of depot storage.

b. Location of Stocks.

(1) *Physical location.* The ideal location of all stocks is seldom obtainable. This means the location of fast-moving small items near the packing room, location of heavy or bulky items near handling facilities such as cranes and rail tracks, and location of the same item always at the same place. Military requirements are so variable that the storage division of a depot can rarely anticipate receipts and issues far enough in advance to plan locations advantageously. Nevertheless the storage manager should know as far ahead as possible the items and dates due into the depot, any contemplated bulk shipments out of the depot, and the rates of issue of many items. He should also have up-to-date information on changes in any of these rates or schedules. Knowledge of shipments due in or out permits him to better schedule personnel, handling equipment, and space. Knowledge of the rate of issue of various items permits him to plan for storage of items in more advantageous locations, to

gain economies in storage space, time to pick for issue, physical movements, and personnel efforts. Where he is hampered by lack of space and inadequate advance planning information, he is forced by necessity to provide multiple storage locations for many identical items. This situation is the rule rather than the exception but has been given much attention by all of the services. When items are received, the locator files are examined to see if a location is already assigned. The location is checked to determine whether the quantity reserved can be added in the same space. If so, the new stock is placed in this location. If not, and the quantity of old stock is low, it may be expedient to assign a new location where there is sufficient space to store the consolidated stock.

(2) *Location of related components in storage.* One of the responsibilities of the depot is the assembly of sets, kits and outfits. In addition, a large number of stock items not classified as sets are issued in similar manner as sets because components, accessories, and supplies are frequently issued with the end item. A camera may be issued with a carrying case, extra lens, a tripod, and so forth. Normally a camera would pose no unusual storage problem because it is likely that the accessories would be packaged with the camera. But in the case of a large crane-shovel that must be equipped with a boom, a boom extension, a bucket, a set of fair-leads, tagline, tools and publications, the problem is of some consequence. The basic power unit is stored inside; (preferably in a controlled humidity warehouse) the booms buckets and fair-leads are stored outside. The tagline is stored inside in one place and the tools are stored elsewhere inside. The Storage Division of the depot must collect all of these related items when preparing for shipment so as to provide the cranes shovel to the requisitioner for use except for normal assembly.

The same problem occurs in the issue of a tank with radio apparatus, tools, and parts. The Storage Division must establish various types of subsidiary records which show quantities and locations of the various related items or components that are required for an end item.

- (3) *Storage locator records.* Location records are generally maintained in stock number sequence by condition code. These records may show the size of the packages but not quantities at the location. Storekeepers prepare forms for "locations established" or "locations exhausted" when incoming shipments must be located or outgoing shipments exhaust a location. These forms are posted to manual or punched cards by reflecting the updating information. These files may be maintained in the administrative office of the warehouse or in the records of accountability in stock control. In the latter case, picking tickets sent to storage contain location information.

c. Physical Inventory Procedures. Physical inventories of stocks to verify stock records usually are performed once each fiscal year, and are normally scheduled to spread the inventory workload over the year. Technical services are permitted to conduct inventories less frequently in the case of relatively slow moving items and items having a low monetary value. However, these items must be inventoried at least once each three fiscal years. On the other hand, sensitive items such as certain drugs of the Army Medical Service are inventoried once each month. Special inventories are taken for specific purposes in accordance with established criteria and as may be directed by the chiefs of technical services. The general practice is to copy the location records and send out an inventory team. If the team count agrees with the records, no further action is taken. If the count does not agree, a recount is taken. The accountable officer may, however, accept as correct the stock record balances if the value of the overage or shortage of the item does not exceed \$100.00 or 10 percent of

the recorded balance. This criterion for adjusting stock records reduces inventory costs without a significant sacrifice of accuracy of records. In taking an inventory, all stacks are flagged to show that they have been counted and at the end of the counting a check is made to see whether any stack is left unflagged. This annual inventory is scheduled so that only a limited number of classes of supply within a depot are closed down during the period of the inventory. In the case of special inventories, an inventory team is sent out to check on the item that reaches a zero balance on the stock record to determine if the stock is actually exhausted in the warehouse. Warehouse refusals, or cases in which the records show a balance but the warehouse reports that no stock can be found, are also verified by physical inventory. Whether the physical inventory is annual, cyclic, or special, the records are finally adjusted, except as previously noted, by an inventory adjustment report or a report of survey. The latter is used when there are unusually large discrepancies in value or quantities. A great deal of attention recently has been given to statistical methods and in some cases a "statistical quality control" method of inventorying a large segment of stocks has been adapted. Essentially, this is a matter of sampling and accepting the whole as being accurate if the accuracy of the sample is within established tolerances.

d. Rotation of Stocks. The rotation of stocks is important for virtually all commodity areas and absolutely essential for certain items. Items such as canned food, rubber products, drugs, and chemicals that deteriorate rapidly in storage must be so stored as to assure issuing oldest stocks first. This principle varies with many items depending on their physical characteristics and the degree of preservation and packaging applied to them. If recently received stock has not been processed for long-range storage and stock already on hand has been so processed, it may be expedient to issue the new stock first, depending upon the anticipated length of time the items will remain in storage. It is not economically sound to preserve all items against maximum deterioration while in storage. Thus, rotation of stocks is necessary for many commodities. Stock rotation may present some difficult problems. If a depot is

turning over its items rather frequently, selection of the oldest stock for issue is no great problem. However, issue rates on items rarely remain constant, and operational problems preclude complete control over the physical placement of stocks to assure picking the oldest items first. Rotation of some items, such as

subsistence, is so important that the records reflect the "date of pack," the administrative burden of establishing separate records for each receipt of the same item is generally prohibitive if applied beyond absolute necessity. Much can be done by training and inspection to assure movement of the older stock.

Section IV. SUPPLY MANAGEMENT AT INVENTORY CONTROL POINTS

42. Functions of Inventory Control

The functions of inventory control make up the central and critical area of supply management. National planning of the overall distribution pattern and facilities is an essential first step and the efficient movement of supplies through the depots is an essential sequel. The effectiveness of the supply system as a whole is measured by its success in balancing supply, the assets and inputs of the system, against the multitude of demands upon it. This is the task of inventory control. Single Managers normally exercise centralized inventory control for all items which they manage.

43. Tools for Control of Stocks

The National Inventory Control Points and Single Managers are responsible for requirements computation, procurement direction, distribution management, disposal direction, cataloging direction, and rebuild direction. In order to fulfill these responsibilities they must receive information, in the form of reports, which has a bearing on their assigned commodities. The most important of these reports are described below.

a. Reports of Stock Status. Under the decentralized requisitioning and stock control concept, depots account for and issue designated stocks without prior recording by the inventory control point. They also receive stock from various sources before it is recorded by the inventory control point, and establish dues-out against anticipated receipts. The inventory control point must receive frequent reports of depot stock status to obtain a picture of national availability in order to process extract requisitions and shortage reports, and provide a basis to forecast future needs. Reports of depot stock status are prepared and furnished by depots at prescribed intervals.

Frequency of issue or whether the item is in long or short supply are other factors which govern when reports are to be submitted. The basic information on stock status reports generally includes stock on hand, due-in, due-out, and issues. Condition and account codes as well as stock levels or requirements objectives may also be included.

b. Detailed Analysis Reports of Depot Issues and Receipts. The depot stock status reports are supplemented by detailed analysis of stocks issued, due in, and due out at the depots. These issue reports, which are compiled for periods varying from six to eighteen months, eliminate the distortions which would follow from the analysis of a single month's issues. A consolidated issue analysis report is prepared at the inventory control point to show by stock number the initial issues and replacement issues for the Regular Army, National Guard, reserve components, oversea installations, etc. Issues are generally consolidated for all depots and for the entire period under review. Reports are also submitted analyzing depot receipts. These are broken down by source, i.e., regional procurement, local procurement, depot transfer, returns from stations, or returns from overseas.

c. Repair and Rebuild Schedules. The quantities of repairable stock at the various depots are included in the depot stock status reports. Schedules showing current and anticipated progress in repairing or rebuilding this stock are required by the inventory control point.

d. Procurement Status Reports. The inventory control point receives reports from procurement activities showing quantities of stock being centrally procured, together with estimated dates of receipt.

e. Reports of Stocks with Troops, in Station Inventories and Oversea Depots. The Machine

Records Units of the Adjutant General's Corps, although basically organized for the reporting of personnel, also compile quarterly reports of several thousand selected items of supply in the hands of troops in the Continental United States and overseas, and CONUS station inventories. These reports include quantities of equipment by make and model to assist the inventory control points in computing repair parts requirements. Some technical services receive periodic complete reports of all stocks in overseas depots and others receive special reports of selected items from time to time.

f. Reports of Troop Basis and Movements. The inventory control point has information on the present location and composition of troops together with any contemplated changes in troop composition, location, or equipment.

g. Liaison Visits. Regular and special liaison visits to depots, stations, army terminals, overseas supply agencies, and overseas areas add personal observations and reports to the information collected by the inventory control point.

44. Control Actions to Meet Immediate Demand

a. Daily Activity at the Inventory Control Point. A considerable part of the inventory control point's daily activity is concerned with determining secondary sources of supply for those requests referred to it by the depots; those requisitions received directly from the field by the inventory control point without passing through the depots and those shipments initiated by the inventory control point not based on requisition. Approximately 50 percent of all line items shipped by all depots are processed through inventory control points, either initially or as a secondary action.

b. Extract Requisitions. When extract requisitions or shortage reports are received from the depots, the inventory control point determines from its records whether or not stock is available at other depots. If the stock is available, the inventory control point prepares shipping orders or sends notices of availability to the depot or depots in accordance with the procedures outlined under depot supply management.

c. Regulated Items. Requisitions for regulated items received direct from overseas supply agencies and stations are checked for national availability and shipping orders are prepared on the depot with stock nearest the requisitioner.

d. Miscellaneous Requisitions. Other requisitions received by the inventory control point, such as requisitions for class IV projects, large overseas demands, Government-furnished property, etc., are likewise disposed of by the preparation of shipping orders on the various depots.

e. Automatic Shipments. The inventory control point computes requirements and initiates shipping orders on the depots for various purposes without a formal requisition from the consignee. Examples of this type of action are—

- (1) *Initial activation of troop units during time of war.* Here the inventory control point calculates from the tables of organization and equipment or tables of allowances the quantity of stock required to equip initially or bring the organization up to authorized equipment and initiates the shipping orders on the depots.
- (2) *Equipping POM units during time of war.* The inventory control point receives requisitions for equipment shortages in units preparing for overseas movement and forwards necessary shipping orders to the depots to equip the units before departure from the CONUS. During peacetime essentially the same procedure is followed in bringing troops up to authorized equipment strength for maneuvers.
- (3) *Establishment of new overseas bases.* The determination of requirements for new overseas bases is made and shipping orders placed on the depots by the inventory control point.
- (4) *Initial repair parts allowances.* The inventory control point computes from various allowance tables the required repair parts to support end items that have been or are being supplied to consignees and initiates shipping

orders on the depots to supply the parts.

f. Set Assembly. The inventory control point maintains certain numbers of preassembled sets, kits, and outfits at the depots. Where these sets are composed of separately stocked items, the inventory control point instructs depots to segregate items for set assembly into a separate account and by shipping orders consolidates the items into a particular depot charged with the physical assembly of sets, kits, and outfits.

g. Repair and Rebuild. The inventory control point must keep informed of the repairing and rebuilding of economically reparable stock to meet current and future demands. This activity must be closely coordinated with maintenance facilities, and the technical service headquarters. The inventory control point is informed of the return of stock to an issuable condition by the repair and rebuild schedules mentioned above.

45. Management of Stock Control Activities

a. Extraction and Reextraction.

- (1) *The problem.* Under procedures which provide for control of stocks to be split between depots and inventory control points, extracting is the largest single problem in the day-to-day control of stocks and causes a considerable time lag between stock movement and stock reporting.
- (2) *Acceleration of document and report processing.* Rapid communication between depots and inventory control points is accomplished through the use of electronic tools such as the transceiver. Transactions are reported daily, and electronic data processing machines give the inventory control points the capability of automatically processing huge amounts of data so that overnight a stock status report can be produced which reflects all the transactions of the previous day across the entire system.
- (3) *Refinement of the national stock availability picture.*

(a) Experience and judgment factors.

Over a period of time, inventory

control points build up a considerable amount of information relating to the movement of stocks through the system and at individual depots. On the basis of this information certain limited predictions can be made of the rate at which items in depots are likely to be exhausted. Knowledge of anticipated troop movements and other plans enable them to plan for unusual demands before they are reflected in national availability records or other reports which are received. Use of these informational factors help considerably in maintaining national and local stocks in a balanced condition. Added latitudes of judgment are allowed to permit the tempering of formula computations by human reason. Judgment cannot be unreasonably restricted by rigid directive or interpretation of general directives.

(b) Control and records of stocks in transit.

1. *Recording assets in transit.* Dues in consist of two types of assets. The long-range dues-in representing items to be manufactured or being manufactured are not yet owned by the Army, while items undergoing interdepot transfer and those accepted by the Army, FOB manufacturer's plant, as well as returns from stations and overseas, are already owned. From the standpoint of national stock availability, in transit stocks would tend to disappear from the records if accurate in transit control was not maintained. Such records are essential to the functions of computing requirements, advising availability, or preparing shipping orders.
2. *In transit stock as a type of dues in.* In transit stocks must be considered as separate types of dues-in. When materiel is trans-

shipped from one depot to another or is en route from stations as returns, accountability is dropped by the shipping activity before it is picked up by the intended receiving depot. Neither shipper nor receiver, therefore, considers the materiel as assets during the period in which it is being picked, packed, transported and received. Actual assets, as dues-in, are not distinguished from potential assets which are still on the assembly line or in the raw material stockrooms of the manufacturer. But from the point of view of the inventory control point, stock in transit is an asset in being regardless of the technicalities of accountability. Since station and oversea stocks are not usually merged with continental United States depot stocks at the inventory control point, dues in from station and oversea returns cannot be treated similarly and must be handled as special kinds of dues in that reveal the in transit nature of the transaction by the indicated source of the due in. Dues in from procurement where there has already been acceptance at the manufacturer's plant may be reflected as a special type of firm due in from a copy of the inspection report.

b. Account and Condition Reservation Codes.

(1) General.

- (a)* The Army procures and holds stocks for many purposes and sets aside these stocks in separate "account codes" which may be regarded as claimant or ownership accounts.
- (b)* Condition codes are normally used to indicate the physical condition of stocks: new, used but serviceable, unserviceable but economically repairable, and not economically repairable. However, in practice the

condition code has been broadened in scope to represent a refinement of the accounting classification of stock, known as a "condition reservation code." The purposes of the accounting and condition classification code include—

- 1. Segregation (usually as a "book-keeping entry" rather than physical separation) of specific quantities of specific items by ownership.
 - 2. Segregation of stocks held for mobilization reserve. Again, normally, the segregation is not physical separation of stocks in the warehouse, but merely on the books.
 - 3. Segregation of stocks within accounts by physical condition. Here the segregation is usually both on the books and in the warehouse.
 - 4. Segregation of stocks for some specific purpose, often by the use of the condition reservation code method described above. A principal use of condition reservation codes is in connection with set assembly. Sometimes the items to be assembled in sets will be identified under one condition reservation code pending assembly, and transferred to a second reservation code during actual assembly. Equipment set aside for repair, equipment set aside pending inspection for serviceability, equipment set aside because it is incomplete for one reason or another are examples of the many types of segregation made on stock records by the account and condition codes.
- (c)* Account and condition reservation codes are another major source of administrative and clerical work in the supply system. Various studies have indicated that a large quantity of all stock transactions in the system are paper transfers between

account and condition codes. As in the case of extraction, the workload pyramids at the inventory control point. Interim changes are made by the use of lists and cards furnished to the depots which enables them to translate a requisition for a set of equipment into the latest composition. Thus the maximum flexibility is obtained to meet changing requirements in set composition without continuous alteration to the tables of organization and equipment.

c. Problems of Set Assembly.

- (1) *General.* Among the enormous variety of item collections, those which cause more difficulty to the supply system and to the inventory control point in particular are the sets whose components are separately procured, stock numbered, and issued. The small sets, kits, and outfits procured, stocked, and issued as an unbroken unit cause relatively little difficulty except for replacement of the components. When replacement of a component is feasible, separate identification and stockage of the replacement components can be correlated with the number of complete sets, kits, and outfits in use.
- (2) *Segregation of stock record accounts.* When the components of a set are separately procured, separately stock numbered and assembled into sets in varying quantities, it becomes necessary to segregate the balances for set assembly on the stock records to prevent issue for another purpose before the sets can be assembled. Since in many instances the components of a particular set are separately issued as end items, are components of other sets, or are likely to be issued as replacements for sets already in the hands of users, the inventory control point directs that the balances held for set assembly be set up in separate stock record accounts to prevent dissipation of the assets for other purposes. But establishing separate stock

record accounts for the items held for set assembly can lead to other complications: a more pressing demand for the item as a replacement to a set already issued may require "robbing" of the account and later restitution. Since the inventory control point is not certain exactly how many sets can be assembled until the depots have confirmed what quantities have been set aside, it may be found that issues of the required components are made before the advice to set aside is received. The timelag between actual stock status and availability reports is again an important factor here. When this situation occurs, which is the rule rather than the exception, either the number of sets to be assembled must be reduced and the excesses of plentiful items returned to issuable accounts, or the short quantities placed on due out. When the items are placed on due out, every receipt of a missing item or quantity must be correlated against the other items on dues-out to determine whether this particular receipt will permit assembly of the sets.

- (3) *Operability of incomplete sets.* When not all the items in the set are available, the question arises whether the set would be operable with the available items. The decision is a difficult one and requires considerable technical knowledge of the use to which the set will be put. If it is decided to issue the available components, the depot normally establishes dues out for the missing components and supplies them when they become available. Also, sets are often composed of items supplied by more than one technical service. Normally, the assembling service will obtain the other services' equipment and include it in the initial issue of the set but will require the user to requisition replacements from the other services.
- (4) *Replacement of components.* The practice of preassembling sets on

orders from the inventory control point gives priority to initial issues of complete sets over replacement issues of components. During the period that stocks are "frozen" to determine availability, the depots cannot issue individual components and supply performance suffers by the generation of extracts. This problem is extended by the common practice of designating many sets as regulated items. Even when the inventory control point has not designated the set as regulated, individual requisitions for complete sets from users may be extracted to the inventory control point and compel it to freeze stocks in order to meet demand.

- (5) *Interdepot transfers.* Although in theory components are bought specifically for set assembly and shipped to the assembling depot, in some instances shifting requirements after initiation of procurement results in considerable traffic in interdepot shipments of components being transferred to a central depot for assembly.
- (6) *Excessive supply to users.* Since many items such as common handtools are included in a wide variety of sets, using units sometimes receive excessive supplies of such common components by receiving several different sets with the same component.
- (7) *Changes in set requirements and composition.* Often quantities of items are set aside in separate stock record accounts to build X number of Set No. 1, but a more urgent demand occurs for a related Set No. 2 before Set No. 1 can be assembled. Since many of the components may be common between the two sets, but in different quantities, it therefore becomes necessary to set aside additional quantities or to transfer out excess quantities of particular items. Changes in the composition of sets after assembly sometimes occur and it becomes necessary to unpack and substitute another item, or to substitute a different

quantity of the same item, or to add other items, or to remove certain items.

d. Management of Set Assembly and Issue—Advantages and Disadvantages of Preassembly. Listing sets on tables of organization and equipment rather than listing the individual components enables the supplier to modify the composition of the set without the great expense of republishing the many tables of organization and equipment on which the set appears. Depots are provided with current set compositions and are able to assemble a set requisitioned as such in accordance with the latest approved composition. Thus, the fact that the set is listed by name only on the tables of organization and equipment does not require the depot to preassemble the components prior to the receipt of a requisition.

- (1) *Controlling preassembly of sets.* The preassembly of sets within the supply system should be critically reviewed by stock managers at the inventory control points and by technical service headquarters. Preassembly at the depot increases stock accounting transactions because of the interim transfers or balances between accounts and condition reservation codes that must be made during the course of preassembly, but physical preassembly of sets is not the only means of insuring that sufficient quantities of set components are available to meet demands. Firm obligation of sufficient quantities of individual items to preassemble the number of required sets for strategic and mobilization reserves might accomplish the same purpose. However, so long as equipment tables contain sets and Army Materiel Control studies are based on these set requirements, preassembled sets must be available to fill requisitions based on table items. From the standpoint of the ultimate user, the convenience of receiving a preassembled set varies considerably with the nature of the set and the mission of the unit.

(2) *Controlling assemblages.* The adage to the effect that one may get too much of a good thing is particularly appropriate to the control of sets, kits, and outfits. The practice could ultimately be projected to the point at which the tables of organization and equipment would contain seven lines: Ordnance Equipment, Infantry Company, Quartermaster Equipment, Infantry Company, and so on. Manifestly the grouping of tools into sets and kits for the automobile mechanic, electrician, and the carpenter is a convenience to the user and to the supply system. On the other hand, grouping a wide assortment of items such as clothing, guns, and cooking gear into a single set would combine material that has little in common as to use, physical characteristics, source or procurement, consumption rate, storage requirements, and responsibility for distribution. Because literally every item in the supply system has some relation to other items in the hands of the same user, any item in the supply system might be combined with one or more other items to form a kit, set, or outfit. It has been noted too, that the issue of accessories, attachments, carrying cases, repair parts, etc., with major items is little different in the final analysis from the issue of what is formally termed a set. In an area so broad, it is impossible to establish principles that might govern the universe of commodities issued to every element of the Army. The following generalizations may be observed in testing the validity of assemblages of items.

- (a) The purpose or end use to be made of the set should be as narrowly limited as possible in order that all users may employ all of the items in the set.
- (b) The practice of compiling "super sets" that embrace hundreds or thousands of items, including sets within sets, may be questioned in

several respects. These sets seldom exist as such in the supply system and the single line identification on the tables of organization and equipment for such an assemblage destroys the purpose of the tables of organization and equipment, which is to provide to the user a list of the supplies and equipment to which he is entitled. It might be noted in this connection that as more and more assemblages are listed on tables of organization and equipment and the description of the material on the tables is further abbreviated, tables are increasingly becoming merely reference indexes to other publications instead of lists of authorized allowances. These super sets are often approaching, if not reaching, the situation where they embrace all of a technical service's equipment issued to a particular user.

- (c) The practice of combining both expendable supplies and nonexpendable items into sets might be questioned from several standpoints. Replacement demand calculations for the components of such sets are much more complicated. Quantities and varieties of the expendable supplies tend to be modified much more frequently than the nonexpendable items in the set. The same expendable supply item in the set may also be consumed for other purposes by the same user and its inclusion in the set is therefore duplicative and serves no useful purpose. The list of consumable supplies is usually, at best, an estimate of the quantity of such supplies that should be carried in reserve, and this may be unrealistic when the set is placed in actual operation.
- (d) The practice of combining equipment and supplies issued by more than one technical service in the same set might be questioned on

the basis that the confusion in supply responsibility caused may not be worth the convenience to the user.

- (e) The composition of sets must be carefully reviewed to avoid inclusion of components for which supply responsibility has been delegated to station level.
- (f) The practice of including common purpose handtools with each major item issued should be carefully analyzed against the possibility that the recipient of the major item already has such tools.

46. Controlling Stock Levels

a. *Forecasting Local Demand.*

- (1) *Inventory functions.* The problems of national demand forecasting are multiplied locally in proportion to the number of depots in which any stock item is held. If only one depot is to stock the item, its stock level is the national stock level. But the majority of items are stocked by a number of depots, ranging from two to more than a dozen. It is a major task of inventory control to anticipate demand at each of these storage points, to establish operating and safety levels for them following the pattern of the national level, and to schedule deliveries into each point to maintain the level and meet demand. Local demand forecasts are based primarily upon issue experience of individual depots, which were obtained from the issue analysis report or corresponding data. Like the national stock analyst, the forecaster of local demands must make use of—

- (a) *Information on troop basis, composition, and disposition, and scheduled changes in these programs.* Knowledge of the location and composition of troops with supporting overhead services and installations can be applied against allowance tables to determine where supplies

should be placed for distribution. When it is known that troop strengths will be changed at different locations, that alterations will be made in overhead services and facilities, or that changes will be made in the quantities or kinds of items authorized, the manager can plan and revise his quantities and levels.

- (b) *Seasonal demand.* Seasonal demand may vary at different locations with climate and local programs.
 - (c) *Equipment population.* Because the dispersal of equipment does not necessarily follow the dispersal of troops, reports of equipment in the field are broken down by areas to give a local demand. Since these reports are generally compiled by continental Army areas in the United States, they do not always correspond to the distribution areas of individual depots. In addition, the manager must take into account certain factors that are peculiar to local demand. These include the total and the available storage capacity of individual depots, the bulk and shipping costs of the items stocked, and the repair and rebuild schedules at individual depots which will add to or subtract from their issuable stocks.
- (2) *Problems in estimating local demand.* The fluctuations of day-to-day demand make it extremely difficult to plan levels in advance so that actual quantities of stock on hand at any individual depot will be sufficient to fill requisitions and shipping orders. Large demands from oversea requisitioners, demands for initial and special supplies and the movement of troops within the continental United States and to and from overseas may exhaust one depot's stock overnight and leave another with stocks far exceeding the needs of its reduced supply mission. No general rule for

the establishment and review of stock levels will take care of every possible demand at every point in the system. In seeking improvements, the closest attention should be paid to flexible scheduling of receipts from procurement and to the analysis of stock imbalances with a view to the most economical means of correction.

(3) *Scheduling receipts from procurement.* In the planning of procurement schedules, the stock control manager is normally interested in the greatest possible frequency and flexibility of deliveries under any given order. There are limiting factors, however, to the frequency with which deliveries can be scheduled:

(a) The contractor's production methods and schedule, which may necessitate relatively large infrequent deliveries.

(b) Transportation costs. The analysis of freight costs for carload and less-than-carload lots may indicate that it is extremely uneconomical, particularly for low bulk items, to make a number of small shipments. If items of low issue frequency are stocked in only one or two depots, the results of miscalculation of demand are less serious than if the same items are widely stocked in smaller quantities, where a slight quantitative increase in demand can wipe out stocks at any one of the scattered storage points.

(4) *Balancing stock after receipt.* The limitations on the flexibility of delivery scheduling make it almost impossible to insure that all local stocks will be in balance at all times. In instances where individual depots have shortages or excesses beyond their established levels, it is the usual practice to redistribute stocks by "leveling actions" involving inter-depot transfers of supplies to raise or lower stock quantities to established levels. Since this procedure involves additional paperwork, transportation,

packing and handling, an aggressive program directed by the Department of the Army has been aimed at reduction of these transactions. A certain minimum of interdepot transfer, however, will always remain, and the manager is still faced with the problem of maintaining local levels and correcting unbalanced stock positions. In analysis, the following points need to be considered:

(a) *Excesses at the station level.*

1. If an item is in short supply nationally it may be expedient to pull in the excess stock for redistribution regardless of other considerations.

2. If the excess stock can be absorbed in a reasonable time measured in terms of costs of transportation to remove it, the costs of caring for it at the station must be considered.

(b) *Excesses and shortages at different depots.*

1. If an item is in short supply in several depots, the quantity in overall excess in relation to the quantity in overall shortage must be considered against time and desirability of procuring to replenish depots in short supply.

2. If an item is small and frequently issued, transfers between depots may be economical, whereas if the item is bulky and infrequently issued, extracts against the excess at one or more storage locations may be more economical.

3. If an item is of a deteriorating or seasonal nature, it requires rapid consumption of the excess in the first instance and permits the stock to lie dormant in the second instance until the new season.

4. Considerations of future planned changes in missions or anticipated changes in troop strengths

and locations or changes in allowances or other such considerations, will affect the demand at the depot in long or short supply.

b. The Army Field Stock Control System.

- (1) One part of the Army's plan for modernizing its supply procedures is a system of controlling stocks below depot level, i.e., the Army Field Stock Control System. It is composed of three basic elements: a selective stockage plan, improved stock records, and gathering and reporting realistic consumption-demand data.
- (2) This new system came about when the Deputy Chief of Staff for Logistics in late 1954 directed that all technical services develop a common stock control system based on demand data reporting which was being tested by the Ordnance Corps under Project 170.
- (3) Previous systems allowed supporting elements including direct support companies, Army field depots, theater depots, and posts, camps and stations to requisition those items of supply which they thought were needed. So-called "reasonable" levels of stock on many of the 700,000 odd minor secondary items and repair parts were maintained regardless of true requirement based on the major end items and units supported. The reporting of issues instead of demands confused the true requirements for supply. When a desired item was not available, substitutes were frequently issued. A six-inch screwdriver can often be substituted for an eight-inch screwdriver. Through the use of issue data alone, it is theoretically possible to increase procurement and subsequent distribution of six-inch screwdrivers to the point where no more eight-inch ones remain in the supply system.
- (4) Under the Army Field Stock Control System, no stockage is authorized below technical service depots unless supported by a specific number of

demands within a given period of time. Concurrent programs in standardization, cataloging, and end item density reporting have provided better data for more realistic basic load requirements which in turn enable supporting supply echelons to provide the fast-moving items as needed and to call forward from key depots the slow-moving items when required. Complete implementation of this program was affected at all appropriate installations 31 December 1957. Department of the Army objectives under this plan include—

- (a) Positioning an adequate amount of supplies at the proper place and proper time without overstocking at any point of supply.
- (b) Establishment of a realistic stockage plan based upon true consumption-demand experience of the activities supported.
- (c) Reduction of the number of items and the quantity of items at forward supply echelons.
- (d) Reduction of storage and accounting costs at forward supply echelons by reduction of items stocked.
- (e) Establishment of a uniform method of supply accounting among all technical services at the forward supply echelon.

47. The Single Manager System

a. General. The Single Manager System of supply management was designed to provide a means of coordinating the supply activities of the military departments to eliminate duplication and overlapping of supply functions with respect to common use items and common services. It is a plan to blend the existing facilities, skills, and personnel of the three military departments into the common objective of effective and economical supply operations.

b. Authority for and Implementation of Single Manager Assignments.

- (1) The National Security Act of 1947, as amended, gave the Secretary of Defense considerable latitude in the

conduct of materiel management within the Department of Defense. This authority was reinforced by Section 638, of the Fiscal Year 1953 Defense Appropriations Act (Section 2202, Title 10, United States Code): "Notwithstanding any other provision of law and for the purpose of achieving an efficient, economical, and practical operation of an integrated supply system designed to meet the needs of the military departments without duplicating or overlapping of either operations or functions, no officer or agency in or under the Department of Defense, after the effective date of this section, shall obligate any funds for procurement, production, warehousing, distribution of supplies or equipment, or related supply management functions, except in accordance with regulations issued by the Secretary of Defense." Subsequently, the Department of Defense announced basic policies for guidance of the military departments in discharging their responsibilities for supply. An Amendment to the Defense Reorganization Act of 1958 (McCormack Amendment) provided further authority to the Secretary of Defense. It read in part:

"Wherever the Secretary of Defense determines it will be advantageous to the Government in terms of effectiveness, economy, or efficiency, he shall provide for the carrying out of any supply or service activity common to more than one military department by a single agency or such other organizational entities as he deems appropriate."

- (2) Within the framework of vested authority and established policies, studies were made within DOD of various proposals and existing systems of supply for common-use commercial type items. These studies culminated in the issuance of the first Single Manager Assignment, that for

Subsistence, on 4 November 1955. Other assignments were not rapidly forthcoming because of the complexity of the military systems and the time required to make preliminary studies of the commodities susceptible to the single manager arrangement. Every commodity or service receives attention and a determination is made based on whether, in the aggregate, integration through a single manager assignment will produce an increase in efficiency and economy without a decrease in effectiveness.

- (3) The Secretary of Defense directs the Single Manager Assignment to the Secretary of a military department. Having been given the Assignment, a Secretary of a department takes action to establish an Operating Agency and to appoint an Executive Director. The appointment is subject to the approval of the Secretary of Defense. The Executive Director has the primary duty of managing the operating agency, subject to the authority, direction, and control of the Single Manager. Policies regarding organization are prescribed by the Secretary of Defense to achieve basic uniformity and to make optimum use of existing facilities, skills, personnel, and units or activities engaged in similar pursuits. Both civilian and military personnel from one or more departments may be employed in the operating agency.

Present Single Manager assignments follow:

<i>Assignee—date</i>	<i>Control</i>	<i>Executive director's operating agency</i>
Army—1955 ----	<i>Supply</i> Quartermaster Corps.	Military Subsistence Supply Agency (MSSA) Chicago, Ill.
Army—1956 ----	Quartermaster Corps.	Military Clothing and Textile Supply Agency (MC&TSA), Philadelphia, Pa.

<i>Assignee—date</i>	<i>Control</i>	<i>Executive director's operating agency</i>
Navy—1956 ----	Bureau of Supplies and Accounts for managment; Bureau of Medicine and Surgery for technical matters.	Military Medical Supply Agency (MMSA) Brooklyn, N. Y.
Navy—1956 ----	Bureau of Supplies and Accounts.	Military Petroleum Supply Agency (MPSA) Washington, D. C.
Army—1959 ----	Quartermaster Corps.	Military General Supply Agency (MGSA) Richmond, Va.
Navy—1959 ----	Bureau of Supplies and Accounts.	Military Industrial Supply Agency (MISA) Philadelphia, Pa.
Army—1960 ----	Ordnance Corps	Military Automotive Supply Agency (MASA) Detroit, Mich.
Army—1960 ----	Corps of Engineers.	Military Construction Supply Agency (MCSA) Columbus, Ohio
Army—1956 ----	<i>Service</i> Transportation Corps (U.S. Land Transport).	Military Traffic Management Agency (MTMA) Washington, D. C.
Navy—1956 ----	Military Sea Transport Service.	Military Sea Transport Service (MSTS) Washington,
Air Force—1956--	Military Air Transport Service.	Military Air Transport Service (MATS) Washington, D. C.
DOD -----	Defense Communications Agency.	Washington, D. C., DOD

c. Military Relationship and Communication.

The basic military relationship is retained through delegation, as in the case of the Subsistence Assignment shown below.

Secretary of Defense (ASD, Installations and Logistics).

Secretary of the Army (Single Manager) (ASA, Installations and Logistics.)

Chief of Staff (Deputy Chief of Staff for Logistics).

The Quartermaster General.

Executive Director, Military Subsistence Supply Agency.

Communication is governed by the policy of the department having the assignment. Coordination with other military departments on matters affecting their operations is a primary factor in the harmonious operation of a single manager assignment.

d. Effect on Supply Operations. The application of the single manager system has provided improvement in supply operations. It has—

- (1) Centralized the control of distribution and the control of inventories for the most economic utilization.
- (2) Eliminated duplication of warehousing of identical items in adjacent depots (where two or more services are involved).
- (3) Reduced time and distance for serving retail consumption points from depots.
- (4) Assured coordination of procurement, procurement scheduling, and contract administration.
- (5) Centralized into one location the supply demand and control functions such as net requirements computation, inventory management, and procurement direction.
- (6) Permitted the flow of materiel into and through the supply system so that aggregate inventory holdings and related costs are minimized.
- (7) Increased the opportunity for application of traffic management factors in order to eliminate unnecessary cross-hauling, circuitous routings, and other practices, which result in need-

less expenditure of transportation funds.

- (8) Provided greater opportunity for efficient geographic positioning and distribution of supplies.
- (9) Achieved a significant increase in the number of multiuser items.

e. Specific Services Rendered. The Single Manager directs in his Assigned Commodity and Geographic Area—

- (1) Wholesale CONUS inventories.
- (2) Research (Recommending improved materials).
- (3) Central procurement.
- (4) Wholesale stock fund.
- (5) Screening excesses.
- (6) Training.
- (7) Net wholesale requirements computation.
- (8) Cataloging and standardization.
- (9) Inspection and quality control.
- (10) Wholesale distribution and redistribution.
- (11) Storage and transportation.
- (12) Maintenance and manufacture in the CONUS.

f. Services Required. The Single Manager relies on the supply departments of the services for—

- (1) Net retail requirements.
- (2) Technical advice.
- (3) Operation of Area distribution depots.
- (4) Optimum utilization of existing departmental skills and facilities.

g. The Single Manager System and the Department of Defense Materiel Management Program.

- (1) Efforts by the Department of Defense to achieve optimum integration of logistics operations have been confronted by marked differences in the organizations, doctrines, concepts, terms, policies, procedures, and systems that have evolved in each of the military services for the discharge of the logistics function. Since the logistics element of each service must be integrated with other functional

elements of that service into a cohesive force, and since these logistics elements are designed to respond to the peculiar operational or mission requirements of the parent service, it is understandable that these differences have developed and that some of them must persist. With the introduction of the Single Manager System, the Department of Defense became committed to a commodity approach to logistics unification. As a matter of necessity during the formative period each Single Manager agency was permitted to develop implementing procedures independently. The resulting supply systems bear varying degrees of resemblance to the parent systems upon which they were superimposed and to each other. This produced a situation whereby a Marine Corps base, for example, depends upon materiel furnished through eight or more systems, i.e., Marine Corps, several Single Managers, Navy, several Army Technical Services and the Air Force, all using slightly, or in some cases substantially different procedures. Therefore, the problem of multiplicity of systems has not yet been resolved. In fact, the severity of the problem is intensified as each additional Single Manager Assignment is made. To alleviate or preclude problems of this nature, and others inherent in such a vast effort, specific study projects have been established in the DOD Materiel Management Program. These projects are designed, for example—

- (a) To develop a means for determining which methods of supply management are most efficient for each item of supply, i.e.
 1. Individual military service supply management control including commercial purchase.
 2. Coordinated Procurement Program Assignments.
 3. Single Manager Assignments.

4. Interservice Supply Support Agreements.
 5. General Services Administration Assignments.
- (b) To develop a single integrated materiel distribution system, to the extent practicable, for all Single Manager and potential Single Manager commodities which will most efficiently meet the needs of the military services.
- (c) To develop uniform operating procedures, to the extent practicable, for all Single Manager Agencies to include requisitioning of materiel, stock status reporting, depot supply procedures, simplified funding and accounting procedures, organizational patterns and related operations.
- (2) Through the Materiel Management Program projects and objectives the DOD has brought under cognizance and surveillance the salient facets of the total supply system, of which the Single Manager System is a principal component.

h. Department of Defense Goals. The Department of Defense goal of "Maximum Effectiveness at Minimum Cost" can be achieved only through application of the optimum management method or technique to a given item or commodity. In evaluating current Single Manager Assignments and prospects for the future, a DOD Panel observed that experience to date indicates that Single Manager Assignments can be implemented more efficiently and are less likely to disrupt effective supply during the formative stages when they are applied to commodities of comparatively high commonality and are preceded by a relatively high degree of interservice integration and coordination. In taking notice of the attainments of the Single Managers, the Panel noted that the commodities now assigned to them are those most readily amenable to the concept and in which the greatest benefits were expected. It was for this reason that they were selected for the initial Single Manager assignments. The Panel said, however, that it would be a mistake to proceed from an acknowledgment

of current success to the conclusion that the concept is susceptible to broad application throughout the Defense supply system. Rather, any expansion of the Single Manager system of supply should be supported by comprehensive studies which demonstrate that there are additional items susceptible to this management technique. The Single Manager approach should not be expected to solve the fundamental supply problems. Neither the Single Manager arrangement nor any other form of consolidation will solve all the problems that arise from bigness itself or those which stem from the complex relationship of strategy, technology, logistics and the national economy. The Single Manager Plan should be viewed in perspective as but one element of a comprehensive program for the management of Defense inventories. The DOD Panel concluded that the data developed during the evaluation of the Single Manager System may be controversial, but, when viewed in the light of professional judgment and experience, significant economies have been realized without loss of effectiveness. These include economies associated with elimination of concurrent buying and selling; reduction of cross-hauls and back-hauls; reduction of inventories, payrolls, and warehouse space; procurement operations; and stimulation of item reduction and standardization programs.

48. Interservice Supply Support

a. General. Interservice supply support is defined as "action by one military service or element thereof to provide logistical and/or administrative support to another military service or element thereof." The term is relatively new; the program itself is not. For many years the military services have used each other's facilities and assets wherever it has been practicable to do so. Examples of interservice support are the cross-servicing agreements of long standing for support of electronic equipment and aircraft, and more recently the joint use of medical and storage facilities. The Single Department Procurement Assignment Program which was set up as a result of the Unification Act of 1957 is another form of interservice support. Under this arrangement a single department is assigned the responsibility to procure items or designated commodities for

all military departments. Thus the industries providing the items can deal with a single department concerning the supply of all departments. Coordinated procurement operates through the medium of the Military Interdepartmental Purchase Request by which a department makes known its procurement requirements to the department assigned the procurement responsibility.

b. Responsibilities. Interservice supply support responsibilities of each military department follow:

- (1) Support of its own forces.
- (2) Requesting, when feasible, supply support from another military service.
- (3) Providing, when feasible, supply support to another military service.

c. Definitions. An understanding of interservice support requires familiarity with some of the pertinent terms.

- (1) *Cross-servicing.* That function performed by one military service in support of another military service for which *reimbursement is required* from the service receiving support.
- (2) *Common-servicing.* That function performed by one military service in support of another military service for which *reimbursement is not required* from the service receiving support.
- (3) *Joint-servicing.* That function performed by a jointly staffed and financed activity in support of two or more military services.
- (4) *Dominant user concept.* The concept that the service which is the principal consumer will have the responsibility for performance of a support workload for all using services. This concept may be applied at the installation, regional command, theater, or worldwide level. This does not imply that the dominant user will provide complete resources.

d. Interservice-Supply Support Committee. In view of the various individual supply systems being operated within the Department of Defense the possibility existed for one department to be procuring an item at the same time

another department was disposing of the same items or a suitable substitute therefor. The very existence of this condition offered a basis for criticism by Congressional and other parties of supply management within the Department of Defense. As a solution to this problem and in response to the DOD directive of 5 July 1955, the Chiefs of Staff of the Army and Air Force, the Chief of Naval Operations, and the Commandant of the Marine Corps signed a joint agreement which—

- (1) Provided that the supply managers of the military services would act jointly to establish an "Interservice Supply Support Committee."
- (2) Provided that the aforementioned Supply Managers would be the senior members of this committee for their respective services.
- (3) Assigned the committee responsibility for—
 - (a) Recommending policies and procedures for implementation by the services.
 - (b) Reviewing and evaluating directives and supplementary agreements regarding policy.
 - (c) Policing operations of the program and assuring orderly reporting.
 - (d) Assisting activities in resolving problems.
 - (e) Initiating action through military channels to remedy deficiencies.
 - (f) Providing guidance to Commodity Coordination Groups and major commands.
- (4) The desire of the Department of Defense was clearly stated in charging the military services with responsibility for aggressive use of interservice support at all management and operating levels in furtherance of maximum use of available resources.
 - (a) The first area to be implemented was the Overseas Program. The JCS — established Unified Commanders overseas were assigned responsibility for coordination of

the efforts of the subordinate service commanders to make arrangements for interservice supply support within and between their respective areas. Hence, the interchange of assets on a retail level between bases overseas was formally recognized and accounted for as a part of the overall program.

- (b) The second area implemented was the Commodity Coordination Group arrangement. These groups composed of representatives of inventory managers (NICP's) were individually chartered by the Committee to develop procedures which would assure maximum use of the type of material concerned. Hence, the interchange of assets on a wholesale level among inventory managers was accounted for.
- (c) The third area involved was the CONUS Command. Area Coordination Groups were established with boundaries corresponding to the six CONUS Armies. Members of the groups were furnished by various major CONUS commanders of all services. Hence, the interchange of assets on a retail level in the CONUS was bought under the cognizance of the Interservice Supply Support Committee.

e. Typical Procedure for Interservice Support.

- (1) Each Commodity Coordination Group is established by a Charter issued by the Interservice Supply Support Committee. The charter designates a military service responsible for chairmanship of the group. The chairman is responsible for calling meetings, coordinating the proceedings, and for submitting reports. He has no special authority by reason of his designation as chairman. Normally, quarterly meetings are held to discuss the status of critical or important items assigned to the group, exchange asset and requirements data, and generally to promote interservice support. In addition

to these meetings an interrogation procedure between inventory managers is in force. When an inventory control point manager reaches a "buy" position on an item which is annotated as "interserviceable," the other known inventory managers are queried for releaseable assets. After evaluation of replies, the inventory manager needing the item either initiates a transfer order or goes ahead with procurement. If he refuses to accept materiel offered by another service he must report his reasons for rejection of the offer to the Interservice Supply Support Committee.

- (2) The Interservice Supply Support Committee operated until June 1958 when its functions were assumed by the Armed Forces Supply Support Center which had been established within the Department of Defense and charged with the responsibility for administration of certain common supply functions of the military services, promotion and coordination of integrated supply management regarding common materiel, and the elimination of undesirable inconsistencies, duplication, and overlapping among supply operations of the military services.

49. The Armed Forces Supply Support Center

a. General. Interservice supply and service cooperation and coordination activities are performed largely within the services. The Armed Forces Supply Support Center marks a departure from this practice. Under the direction of the Secretary of Defense it is headed by a civilian and staffed by representatives of the military services. Its objectives are in harmony with those of such activities as the Single Manager system and the Interservice Supply Support Program. The AFSSC was established to meet a need for formal coordination of certain activities among the military services. This formal coordination is carried on in the Federal Cataloging Program; the Defense Standardization Program; and the analysis of operations of the supply systems of the military services.

b. Purposes and Objectives of the Armed Forces Supply Support Center.

(1) The purposes and objectives of the Center are to—

- (a) Provide the most effective and economical administration of certain common supply functions of the military services.
 - (b) Promote and coordinate integrated supply management among the military services concerned with common materiel.
 - (c) Develop means for eliminating any undesirable inconsistency, duplication, and overlapping among supply operations of the military services, and the elimination of any unnecessary administrative procedures.
- (2) The Armed Forces Supply Support Center does not become engaged in the determination of materiel requirements or in procurement, inventory control, storage, or distribution operations. These functions are performed by the technical services on a commodity specialization basis.

c. Functions of the Armed Forces Supply Support Center. The Center is charged with the performance of the following functions:

- (1) *Administration of the Federal Catalog Program.* The Federal Cataloging Program was initiated to develop, establish, convert to, and maintain, a single uniform catalog system and thereafter utilize this system as an effective tool of management in all materiel logistics functions. This system provides a common item identification language, reveals interchangeability of items, facilitates standardization and intradepartmental logistical support, assists industrial mobilization, and strengthens government-industry relationships. The conversion of numerous stock numbering systems within the military services to the Federal Catalog System has largely been completed and is now in a maintenance phase. Having achieved the initial goal of a common identification language, the

program managers and the Armed Forces Supply Support Center pursue an aggressive program of catalog purification so that optimum materiel utilization can be achieved.

- (2) *Administration of the Defense Standardization Program.* The objective of the Defense Standardization Program is to improve, simplify, and economize logistical functions. This objective also includes promotion through designed practices of the utmost practical uniformity and interchangeability of items required to fulfill departmental missions by limiting the selection of materials, parts, and procedures. The Standardization Program is concerned with all actions which are designed to reduce the varieties and kinds of physical objects or of engineering and technical processes.
- (3) *Administration of the Defense Materiel Utilization Program.* This program is designed to screen "personal" property excess to the needs of the military departments and insure its maximum utilization through redistribution within the Department of Defense. Where the DOD no longer needs such property it is released to Government agencies outside the DOD. The program is also designed to coordinate interservice operational relationships for utilization screening, compiling reports of redistributed materiel, and screening of government-wide synopsis of proposed procurement against available DOD excesses.
- (4) *Conduct of analysis of the operations of the supply systems of the military services concerned with commercial and noncommercial common items of material.* This responsibility is performed in accordance with specific study projects, and is intended to obtain optimum integration in the interests of increased military effectiveness and economy. Such studies include the development of practical

steps to foster efficient interservice utilization of assets; increase the degree of commonalty of items; obtain greater consistency in requirements computation practices (factors, cycles, lead times, and levels) and distribution patterns; and achieve closer working relationships among the organizational elements concerned

with the management of common supply, i.e., inventory control, procurement, distribution, and standardization. These specific study projects give particular attention to these matters in the commodity areas covered by single manager assignments and single department procurement assignments.

Section V. COMMODITY CONTROL AND DELEGATION OF SUPPLY RESPONSIBILITY

50. Principles of Distribution Management

Over the past few years a number of methods and management concepts have been introduced or have been given new emphasis by the Army. Some of these concepts, such as the wide use of indefinite delivery type contracts in the delegation of procurement authority, have already become significant factors in supply operations. Two of the principles which are directly related to recent developments and which can be applied to future analysis of the Army supply system are—

a. Undivided supply responsibility for commodity classes and categories of items.

b. Delegation of supply responsibility to levels in the supply system which are appropriate for each item or group of items.

51. Undivided Supply Responsibility

a. *Combination of Functions.* The requirements function for minor secondary items (the estimation of total future demands) is inseparable from the distribution function (the location of this demand by geographic areas and the scheduling and placement of receipts to meet it). Both in turn are intimately related to the procurement function in the areas of delivery scheduling, analysis of market conditions, and economical order quantities.

b. *Commodity Organization.*

- (1) The logical end of these developments is an organization which brings together the related functions of supply under single management. This amounts to unified supply responsibility for commodity groupings. The technical services are broad commodity organizations. In some services one inventory control point

handles all the items assigned to that service. In others there are two inventory control points, one for end items and one for repair parts, and in others a number of inventory control points have been set up for commodity groups within the supply responsibility of the technical service. In addition, in cases where a single manager responsibility has been assigned to a technical service, there may be two NICP's, one wholesale and one retail, for the same commodity groups. The already existing commodity orientation of the technical services therefore provides the basis for the organization of "national inventory control points" within the technical services which are assigned complete supply responsibility for a more or less limited group of related items.

- (2) A national inventory control point handles a group of items which is small enough and has a sufficiently close relationship so that overall supply performance can be measured by significant and practical standards. Within the national inventory control point, the concept of commodity and item specialization is the guiding principle of organization. While the ideal of one specialist for each item is economically impossible, the specialist concept implies the maximum stability of personnel in commodity or item assignments and the continuous accumulation of experience to apply to the difficult problems of distribution management.

c. Unification of Accountability and Control.

(1) *General.* The combination of supply functions includes two functions of supply which are important under any supply organization: accountability for stocks and control of issues. A distribution mission depot may maintain accountability records for items stocked and issues against requisitions received direct from its customers, and the inventory control point can direct the depot to ship from the same stock. To this dual control, which keeps the historical depot-customer relationship, has been ascribed many of the shortcomings of the supply system such as extraction, absence of timely stock balance information, and the lag time in accumulating detailed demand data at any one point in the supply system. These shortcomings prompted some technical services to centralize accountability and authority to issue stock at a designated inventory control point with central processing of all requisitions at the national inventory control points.

(2) *Responsibility.* The national inventory control point concept brings together the computation of requirements, the control of procurement and distribution of stocks, and to some extent, the control and recording of issues and is a potent means of obtaining supply management objectives. It gives the commodity manager greater responsibility than previously existed in the supply system. His overall performance is constantly under review and the demands on his judgment are heavy and continuous. But it also gives him the means of meeting this responsibility and the opportunity to develop a high level of experience in commodity behavior. The combination of great responsibilities and the tools with which to fulfill them is an incentive to efficient and economical supply.

52. Delegation of Supply Responsibility

a. General.

(1) The principle of unified supply

responsibility must be viewed and applied with another fundamental principle of distribution management, the delegation of supply responsibility. This principle calls for the application of the best business judgment in determining, from several alternatives, the proper acquisition source and management level for a broad range of items. Wider use of Definite Quantity—Indefinite Delivery, Requirements type, and Indefinite Delivery type contracts and increased procurement authority at both depots and stations enhance supply objectives.

(2) In the light of the centralized inventory control concept, the importance of delegation is increase. Centralizing the complete supply responsibility, including issue control, for all items for which responsibility is presently delegated would involve wasteful storage and administrative effort. Many items which are at present controlled centrally by NICP's may not prove adaptable to such measures. To the extent practical, any concept of supply should demand the maximum delegation of supply responsibility for items that can be economically supplied at the local level. Possibly, control of these items also should be delegated since NICP's usually receive financial inventory accounting, and item transaction reports.

(3) The basic purpose of delegation is to remove the delegated items themselves together with the costs of storing, handling, issuing, and controlling them, wholly or partially, from the supply system. If a certain item is procured and stocked by distribution depots, the records, reports, and workload related to central control of this item are eliminated; if the same item is further delegated to station stockage and procurement, the additional savings include the reduced investment in inventory and processing costs at the depots. The principal limiting factor in delegation is pro-

curement. Certain items made to military specifications and peculiar to the military must be procured centrally, from a single manufacturer or a group of manufacturers and, at the other extreme, many items are identical to those used in the civilian economy and can be procured at any station in the United States through well established commercial distribution channels. Between these extremes lies a large variety of items supplied by the Army. While other factors such as cost and strategic importance, must be taken into account, the basic determinant for the degree of delegation, as well as the items to be delegated, is the appropriate method of procurement.

- (4) Within its statutory limitations the Army has developed a considerable degree of flexibility in adapting its procurement methods to the commodities and the circumstances of supply.

b. Levels of Supply Responsibility. The operating organizations of the supply system are the—

- (1) National Inventory Control Point.
- (2) Depot.
- (3) Post, Camp, or Station.

c. Supply Responsibility at National Inventory Control Points. The inventory control points have responsibility for a wide range of commodities, including commercial as well as military items. The increasing delegation of commercial items away from central control has been noted. In general, national inventory control points have complete central control only of items for which central fixed quantity procurement is necessary, including commodities of purely military use and certain commercial-type items. In continuing the delegation of other items, attention should be paid to maintaining the benefits of commodity experience at a central point. Review of delegated items through dollar inventory and turnover reports should be maintained at the NICP, both to appraise the local management of these items and to provide a criterion for bringing them back under central control. The NICP should have control of the central placement of indefinite

delivery type contracts for items in its commodity class, on the basis of locally estimated requirements. A complicating factor is the division between wide and restricted stockage of commodity classes on the basis of frequency of issue. Studies of issue frequency make it possible to concentrate attention at the NICP on those items or classes within the general category of centrally procured materiel which are widely stocked and account for the largest volume of issues.

d. Supply Responsibility at Distribution Depots.

- (1) *General.* The Distribution depots store regional and centrally procured items. If central control of issues is added to the other responsibilities of the national inventory control point, the responsibility of distribution depots for these items is limited to receipt, storage, and shipment on orders from the inventory control point. The distribution depots represent an intermediate point of delegation between central supply responsibility at a national inventory control point and complete delegation of responsibility to installations. The supply responsibility at the distribution depot may take a number of forms according to the items being handled and their supply and demand status.

- (2) *Problems of depot supply responsibility.*

- (a) *General.* The delegation of supply responsibility to the distribution depots raises a number of problems for depot management. These are primarily associated with the fact that the balance of supply against demand is now restricted to the limited geographic area served by the depot. While this enables the depot supply manager to work more closely with his customers, it also subjects him to some complications over which he has only minor control.

- (b) *Local troop disposition and activity.* Local supply managers must have

corresponding information on the disposition and make-up of troop units in their service area as the inventory control point has for the national troop program. They should also have information on training activities on seasonal demand, and other planned activities within their area which may affect supply and demand status.

- (c) *Overseas requisitions.* While local supply responsibility in the CONUS will continue to be restricted to commercial items, these items are not so readily available in overseas commands, and requisitions for most of them must still be placed upon the CONUS supply system. It is safe to say that no one factor contributes so much to the imbalance of stock in the depot system as the placing of large overseas requisitions upon individual depots. Because of this, some technical services use indefinite delivery type contracts to fill overseas requisitions directly from commercial sources. Others request the Overseas Supply Agencies to extract requests for such items to designated purchasing agencies. Clearly these methods are used primarily for items with a short lead time between order and delivery. Extension of both methods, however, to cover more commercial type items on overseas requisitions should relieve the burden on the individual depots and permit the depot supply manager to plan and control supply for the using activities within his area of distribution.

e. Supply Responsibility at Stations.

- (1) Delegation of supply responsibility to posts, camps, and stations is the final step. The prices that will be paid by local installations for many of these

items will necessarily be higher than under central or regional procurement of large quantities of the same items. However, the cost of central or regional procurement, storage, and distribution may well make up the difference between higher local costs and the savings inherent in large bulk purchases. In view of the experience gained in World War II in maintaining essential civilian industry and construction under the impact of an all-out war, materiel allocations could permit reliance upon civilian supply channels to furnish locally required supplies in future cases of necessity.

- (2) While the maximum delegation of supply responsibility to stations offers great advantages in economy and efficiency of supply, it also poses certain problems for the supply system. As at the depot level, local forecasting of demand is difficult without adequate advance information on local activities and programs. Periodic national inventory control point or depot liaison visits as well as the limitations of consumer funding are important aids in controlling the large volume and variety of items that may be delegated.
- (3) Another problem in the control of station stocks is the frequent procurement of nonstandard items. Local suppliers may not be able to provide items which are identical to military specifications. These items are issued to troops and may later be returned to the supply system, causing confusion and duplication of stock identification and increasing difficulties in maintenance. The limits of variation to be permitted should be clearly specified. In many cases it may be cheaper to dispose of excess nonstandard items locally than to permit them to be returned to the supply system.

CLASS I AND II INSTALLATIONS

FIRST UNITED STATES ARMY AREA
(LESS TERMINALS, SUB-INSTALLATIONS AND GOCO FACILITIES)

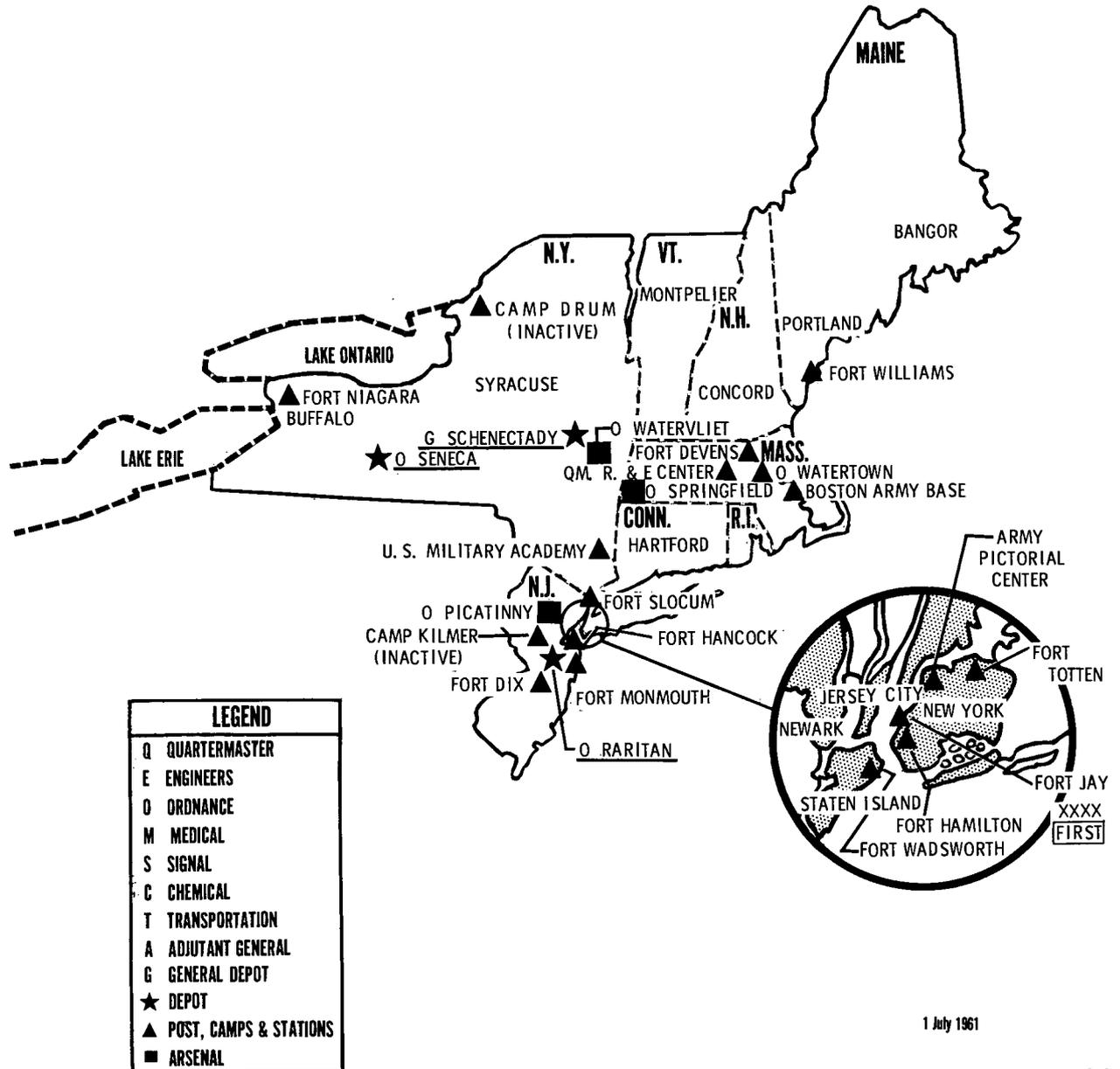


Figure 3. Classes I and II Installations, First United States Army Area.

CLASS I AND II INSTALLATIONS

SECOND UNITED STATES ARMY AREA AND MDW
(LESS TERMINALS, SUB-INSTALLATIONS AND GOCO FACILITIES)

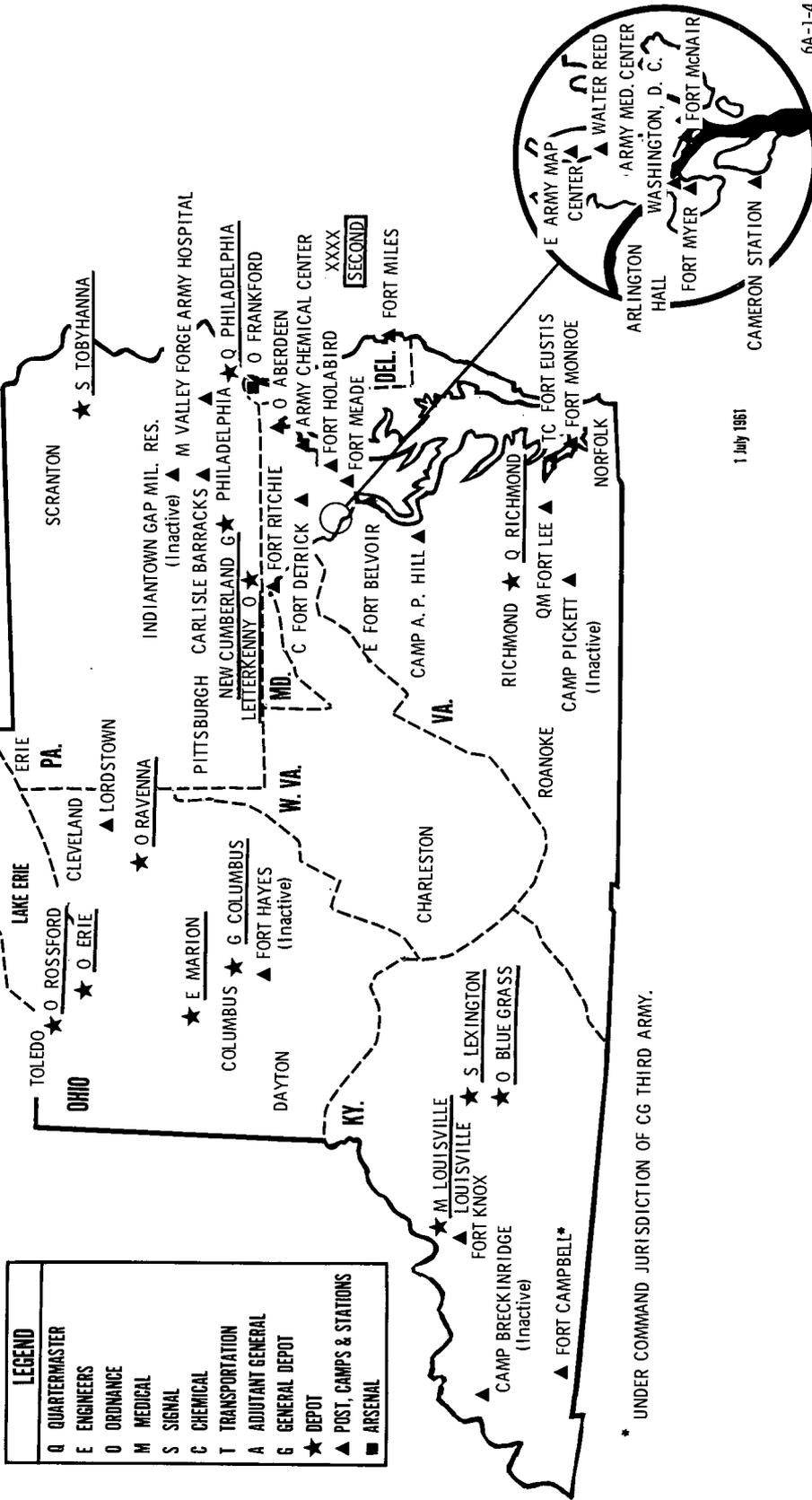
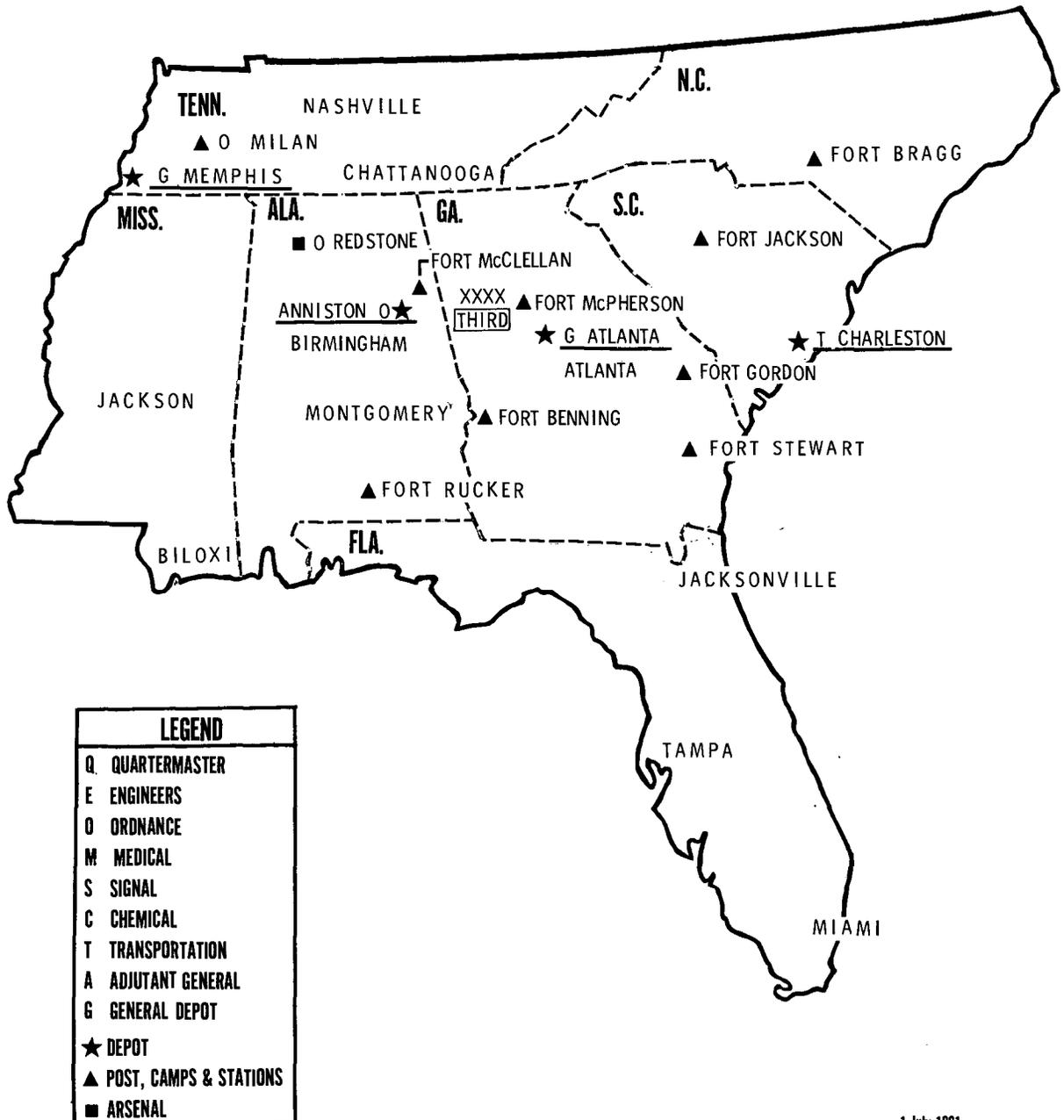


Figure 4. Classes I and II Installations, Second United States Army Area and MDW.

CLASS I AND II INSTALLATIONS

THIRD UNITED STATES ARMY AREA
(LESS TERMINALS, SUB-INSTALLATIONS AND GOCO FACILITIES)

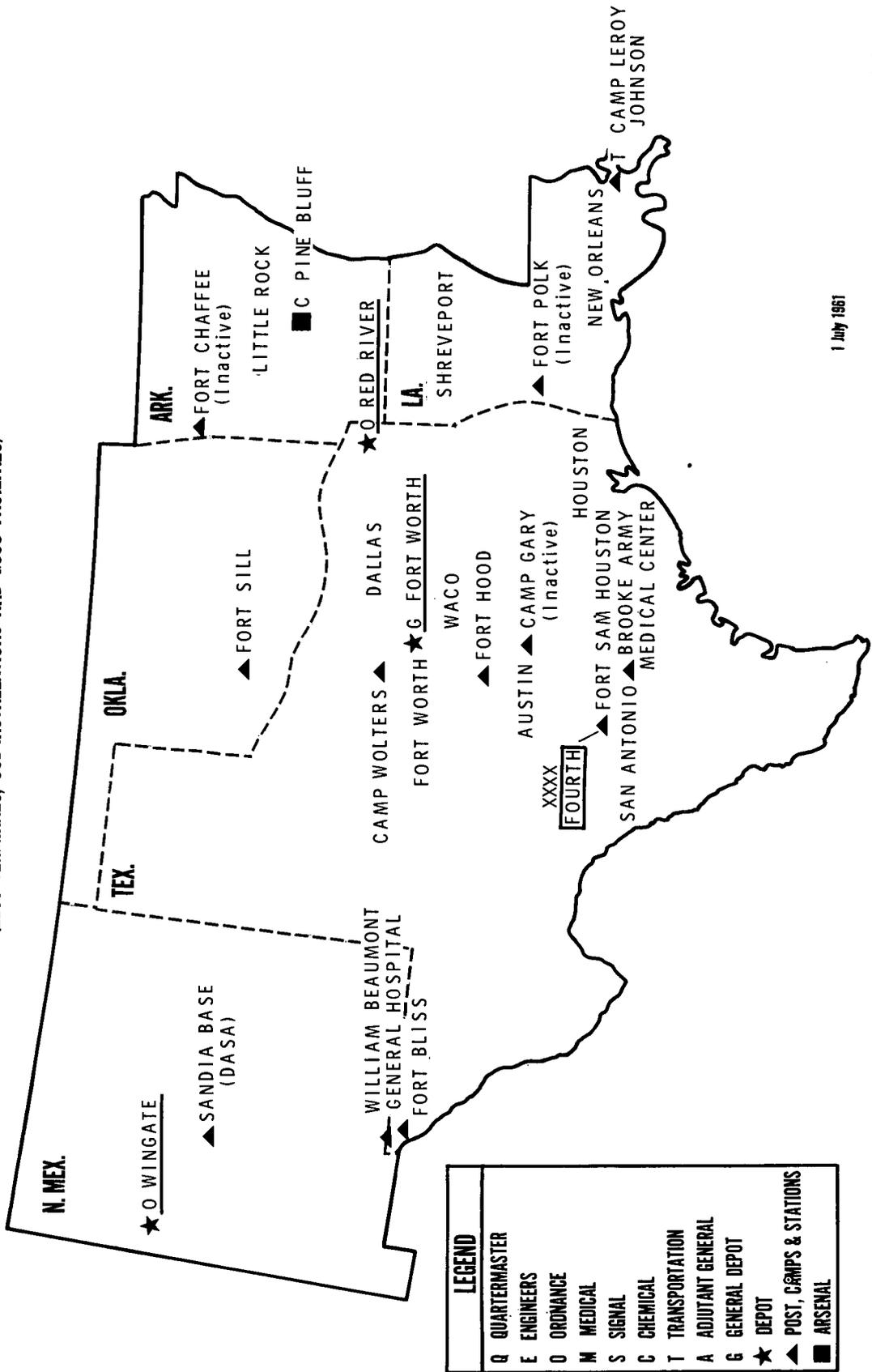


1 July 1961

Figure 5. Classes I and II Installations, Third United States Army Area.

CLASS I AND II INSTALLATIONS

FOURTH UNITED STATES ARMY AREA
(LESS TERMINALS, SUB-INSTALLATIONS AND GOCO FACILITIES)



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Figure 6. Classes I and II Installations, Fourth United States Army Area.

CLASS I AND II INSTALLATIONS

FIFTH UNITED STATES ARMY AREA
(LESS TERMINALS, SUB-INSTALLATIONS AND GOCO FACILITIES)

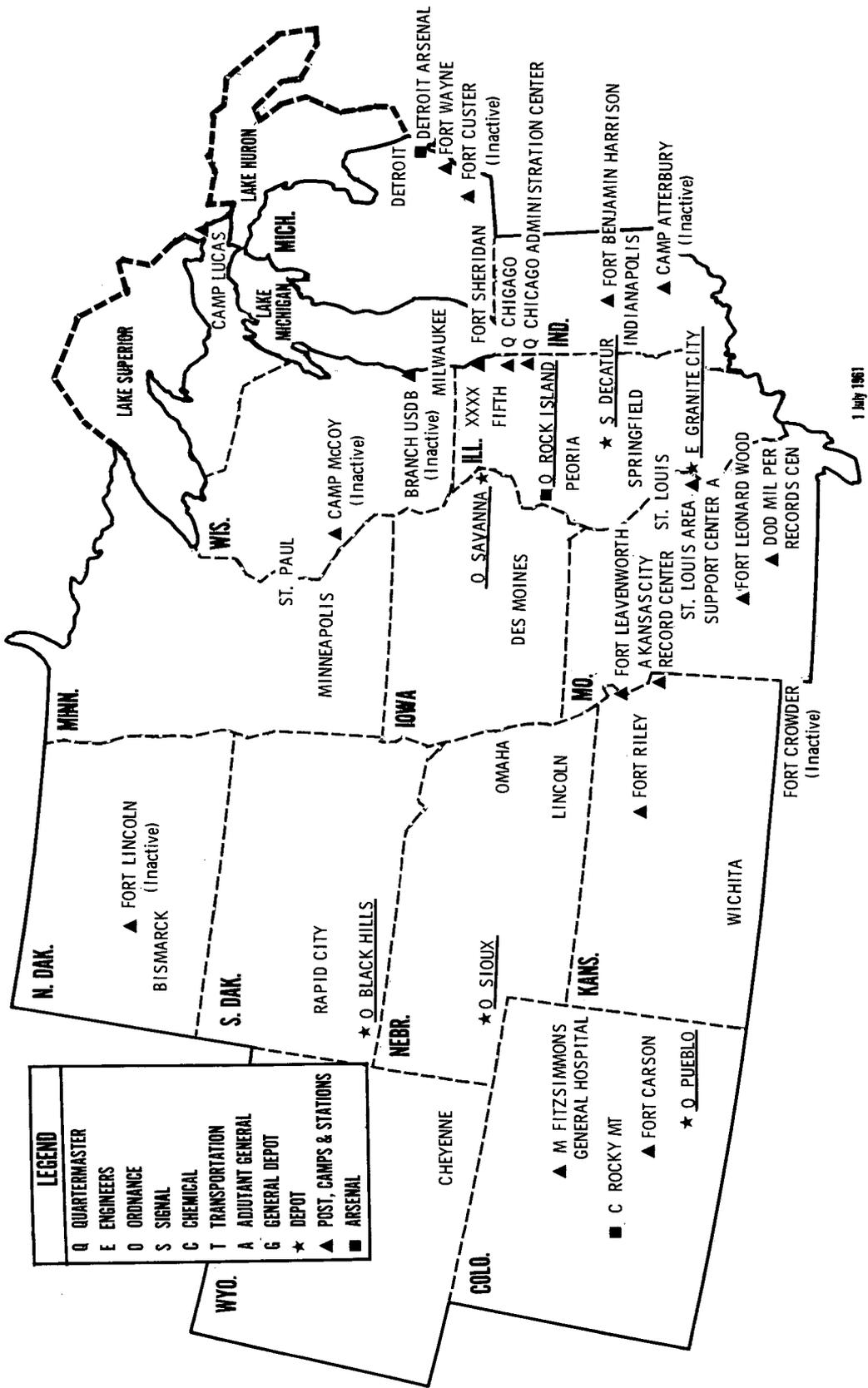
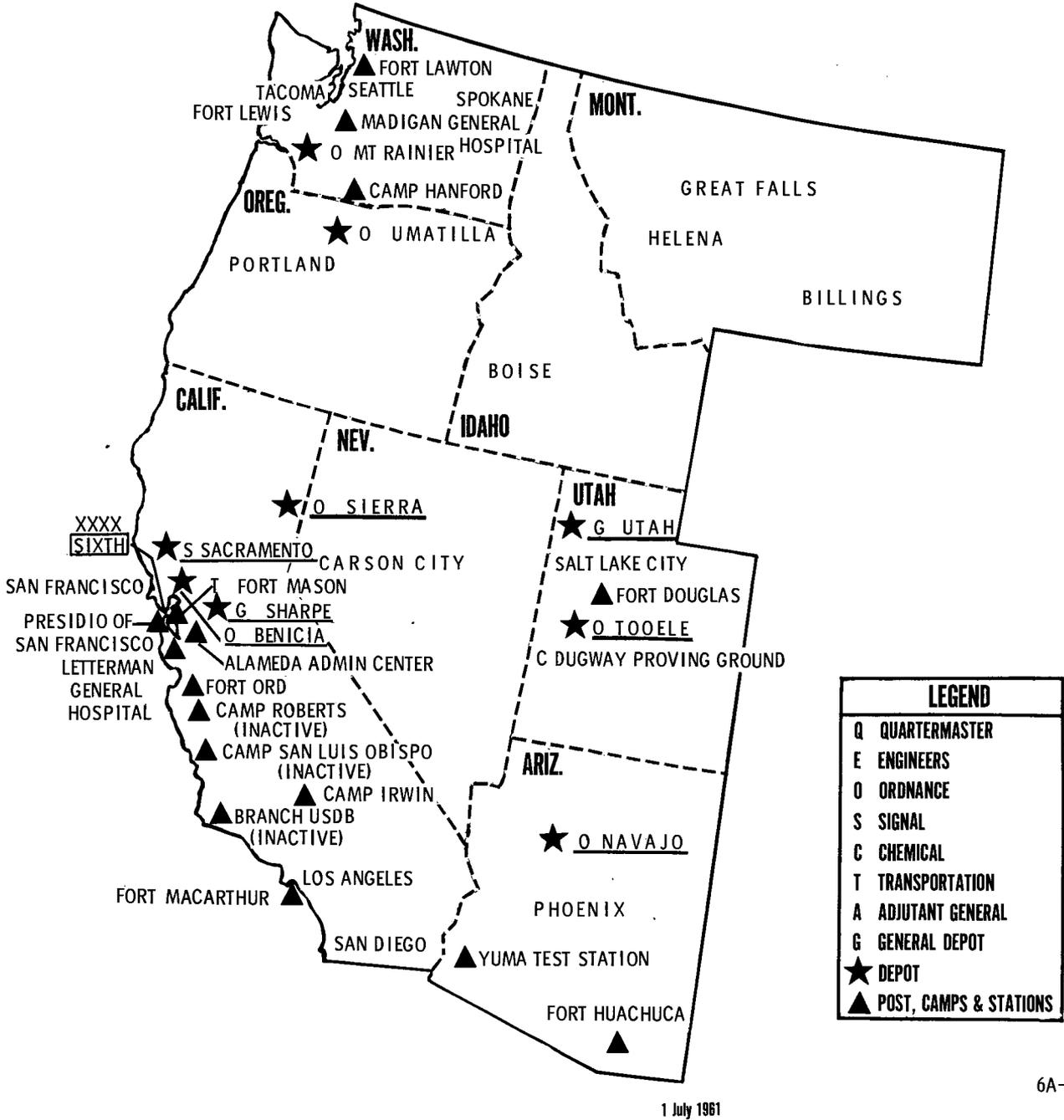


Figure 7. Classes I and II Installations, Fifth United States Army Area.

CLASS I AND II INSTALLATIONS

SIXTH UNITED STATES ARMY AREA

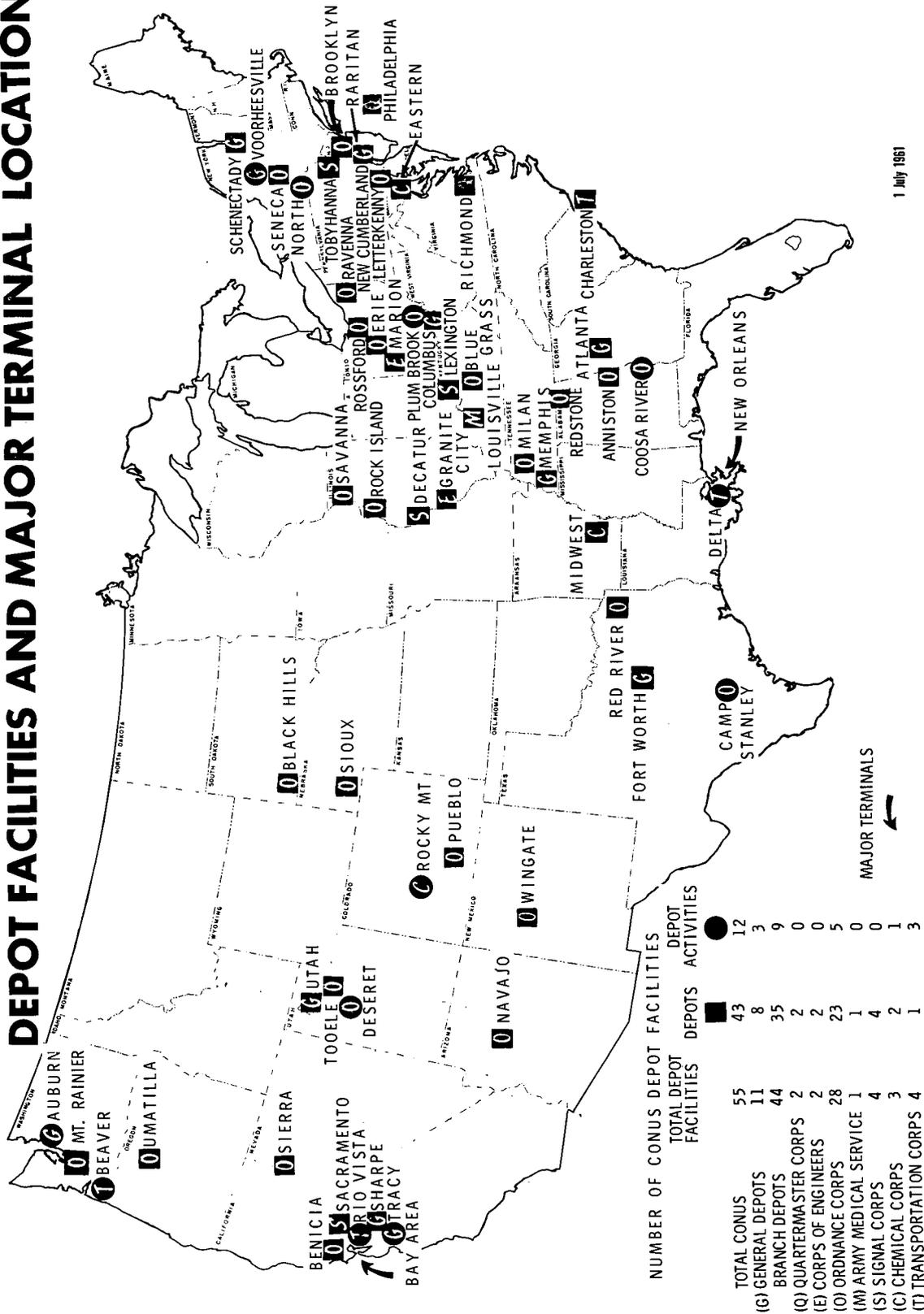
(LESS TERMINALS, SUB-INSTALLATIONS
AND GOCO FACILITIES)



6A-1-8

Figure 8. Classes I and II Installations, Sixth United States Army Area.

DEPOT FACILITIES AND MAJOR TERMINAL LOCATIONS



1 July 1961

6A-1-9

Figure 9. Depot Facilities and Major Terminal Locations.

CHAPTER 5

REQUIREMENTS PLANNING

Section I. GENERAL

53. Definition

The "Dictionary of the United States Military Terms for Joint Usage" defines requirements as: "The need or demand for personnel, equipment and supplies, resources, facilities, or services, by specific quantities, for specific periods of time or at specified times." Although the emphasis of this definition is on specific quantities for *specific* or *specified* periods of time, it is important to remember that requirements planning is not an exact science, but this does not preclude computations based on these plans from being valid.

54. Logistics Planning

Essentially, logistics planning is the analysis of strategic and force structures in terms of material, and the orderly development of plans to provide resources to meet requirements. In wartime in the past, the controlling factors have been manpower and materiel. In peacetime, it has been money, and the planner soon developed a unique awareness of its importance. In future wars the impact may fall equally upon the factors of manpower and materiel and money. The Joint Program for Planning published by the Joint Chiefs of Staff provides for the preparation of joint strategic planning documents covering three separate but related time periods. These joint documents are used as guidance for the preparation of service plans, estimates, and programs covering the same time periods. All such documents are revised annually. The Army portions of these planning documents emanate from the Joint Long-Range Strategic Estimate (JLRSE) and the Joint Strategic Objective Plan (JSOP). The Army Requirements Development Plan

(ARDS) and the Army Strategic Objective Plan (ASOP) are those plans from which Army requirements are developed. The requirements portion of these plans, as currently modified by guidance from the Office of the Secretary of Defense (OSD), is obtained through the use of Army Strategic Logistics Studies (DA—SL's). DA—SL's are staff studies of projected military operations. They develop a plan for logistic support for a given campaign, measure logistic costs in manpower and materiel, and identify situations and logistics problems likely to arise. Each study consists of a campaign plan, prepared by the Deputy Chief of Staff for Operations (DCSOPS), a logistic support plan, prepared by the Deputy Chief of Staff for Logistics (DCSLOG), and supporting annexes prepared by the Deputy Chief of Staff for Personnel (DCSPER), the Comptroller of the Army (CA), and each technical service. Campaign plans are based upon missions specified in the ASOP. Supporting annexes spell out materiel requirements and technical service troops required to support a particular plan. Each of these studies gives requirements for support of a specific campaign under the ASOP. To obtain the full requirement for support of the ASOP, it is necessary to combine the various plans and add requirements for CONUS operations of supply, training, construction, etc. This is accomplished through use of the MOB-R-ASOP, the Mobilization Requirements in support of the ASOP. For CONUS operations MOB-R-ASOP provides logistic support policies, planning factors, the Army troop basis, personnel data, replacement training center requirements, school programs, and installations. For the Theater of Opera-

tions, the MOB-R-ASOP specifies those campaigns and supporting DA-SL studies to be used in computing requirements estimates for the given ASOP.

55. Materiel Planning

a. General. Materiel planning is normally discussed in terms of possible war, but the focal point is preparedness and not war.

b. The Materiel Control System.

(1) A major element of materiel planning is the Materiel Control System which is a combination of the policies, procedures, records, studies, and reports by which the chiefs of technical services discharge their supply control and related responsibilities and over which the Army general staff exercises supervision. It requires that all essential data concerning the supply and demand status of an item be completed, maintained current, and consolidated in a central location in a form which will enable effective utilization by those agencies charged with responsibility for performing or supervising supply control functions. The basic elements of this system are—

(a) Materiel Policies which are the basic policies of the Department of the Army published in the Materiel Program, the Troop Program, and the Troop List. Interpretation of policy guidance provided in these documents and special assumptions are disseminated in separate publications.

(b) Materiel Control Data which require the establishment and maintenance of adequate quantitative data by the chiefs of technical services to insure proper implementation of supply control policies including issue experience, current and future requirements, and supply status derived from the basic operational and planning records and reports of the technical services.

(c) Materiel Planning Studies which

are designed to assist in the accomplishment of—

1. Development of sound materiel requirements for supply planning, budget preparation and funding.
 2. Procurement and production planning for support of peacetime and mobilization programs.
 3. Interchange of demand and supply information between using and procuring agencies of the technical services and the military departments.
 4. Scheduling of depot maintenance operations.
 5. Allocations to other programs and disposal actions.
 6. Determination of supply availability for peacetime and mobilization.
 7. Effecting realistic relationships between current and mobilization readiness.
 8. Identification of problem areas in the materiel supply systems.
 9. Determination of mobilization readiness.
 10. Development of the Army Materiel Control Program. They also constitute the basis for determining the impact of Army demands upon the industrial capacity of the nations resources of facilities, raw materials, and manpower. The Army Procurement Program is predicated upon requirements data presented in these studies.
- (d) The Materiel Control System encompasses worldwide supply control functions performed at technical service level and at field installations under their respective control. Its fundamental principles and basic procedures apply to all items (end items, components, and repair parts) which are maintained in the CONUS depot supply system. Its basic objective is the

attainment of a balance between supply and demand.

(e) *Responsibilities.*

1. The Deputy Chief of Staff for Logistics is responsible for developing, publishing, and disseminating materiel control policies to the technical services and other interested Department of the Army agencies; prescribing procedures for preparation, submission, and review of materiel control data; and providing assistance in obtaining data from agencies outside the Department of the Army.
2. The technical services are responsible for coordination and interchange of information and

statistics; collecting, collating, and interpreting statistical data; and submitting periodic and special materiel control and related studies.

- (f) *Item coverage.* For purposes of analyses and control, all items in the Army Materiel Control System are divided into three main categories, i.e., principal items, secondary items, and repair parts. Secondary items are further subdivided into major secondary items and minor secondary items. The major task is to define the nature of the Army's materiel inventory as sound management depends on this determination.

Section II. PRINCIPAL ITEM PLANNING

56. Importance of Principal Items

Principal items are defined as those end items which, because of their major importance require detailed analysis and examination of all factors affecting their supply and demand. They comprise less than 1 percent of all items stocked by the Army, and account for approximately 49 percent dollarwise (fig. 11). Furthermore, their supply and demand status governs the status of a large portion of the secondary items and repair parts in the supply system. Responsibility for determining principal items rests with the chiefs of the technical services. Following DCSLOG review and approval, recommended principal items are published in the current issue of the Department of Defense (DOD) Principal Items List (PIL). Recommendations for deletion of any item follow the same pattern.

57. Selection of Principal Items

An end item is considered for selection as a principal item based on the following criteria:

- a. Relative combat or training essentiality.
- b. High monetary value.
- c. Difficulty of procurement or production.
- d. Unduly short or excessive supply position.
- e. Criticality of basic materials.

58. Control of Principal Items Requirements

a. For strategic and economic reasons, the supply of principal items is carefully planned and controlled at a number of levels in the Army Supply System. Actual computations of requirements are made by the technical services. Requirements are computed and reviewed semiannually or more often, on a standard form (Material Planning Study, DOD Form 764). Further, staff review is performed in every case by the Office of the Deputy Chief of Staff for Logistics. Certain selected items from the principal item list are further reviewed by the Office of the Secretary of Defense. The DOD Form 764 is also used for Major Secondary Items; however, review by the DCSLOG is not normally performed on these items.

b. From the point of view of supply management as well as strategic necessity, the segregation of principal (and major secondary items) from minor secondary items and repair parts is a valid and desirable management technique. Procurement, supply control, and distribution problems are basically different for these various categories of supply. Dollar inventory turnover figures might be severely distorted by the inclusion of items of all categories in the same reporting group. In a group such as

CATEGORIES OF ITEMS

TYPE OF ITEMS	APPROX. NUMBER OF STOCKED ITEMS	APPROX. DOLLAR PERCENT OF INVENTORY	BUDGET APPROPRIATION	SUPPLY CONTROL REVIEW	EXAMPLES
PRINCIPAL	600 - 800	49%	PEMA	DC SLOG BY ITEM	TANKS RADAR SETS SPECIAL CLOTHING FIELD WIRE GAS MASKS
MAJOR SECONDARY	11,000	16%	PEMA	TECH SVCS. BY ITEM	ROAD BUILDING EQUIPMENT
MINOR SECONDARY	98,000	17%	O&M STOCK FUND MPA	TECH SVCS. BY ITEM TECH SVC. BY ITEM & DECENTRALIZED BY TECH SVCS. UNDER STAFF POLICY & PROCEDURE	FIXED COMMUNICATIONS CLOTHING GENERAL SUPPLIES HOUSEKEEPING ITEMS PETROLEUM
REPAIR PARTS	581,000	18%	O&M STOCK FUND	TECH. SVCS. BY ITEM & DECENTRALIZED BY TECH SVCS. UNDER STAFF POLICY & PROCEDURE	GUN TUBES CARBURETORS BOLTS, SCREWS RADIO TUBES

CLOTHING (EXCEPT FOR CERTAIN SPECIALIZED TYPES) AND SUBSISTENCE

----- MPA ----- 6 A - 1 - 11

Figure 11. Categories of items.

materials handling equipment, the few principal items might well equal or exceed the total value of the hundreds of thousands of repair parts, accessories, and minor end items. It would be impossible to determine an optimum turnover rate or any other standard of supply performance, for such a supply category.

c. Because of their importance, the calculation and review of principal item requirements receives close management scrutiny at every step in the process. A large number of general studies, directives, and reports have been published in this area, as well as periodic and detailed guidelines to reflect current changes in policies and programs.

59. Peacetime Requirements Planning for Principal Items

The basic purpose of peacetime logistics planning so far as the requirements manager is concerned is to determine the full requirement for stocks to be on hand on M-day in order to support a particular mobilization plan (and the peacetime force expected to be in being at that time), and then to establish a peacetime program to acquire gradually the desired stocks and production capability, consistent with the national policy of maintaining an effective readiness position over a long period of uneasy peace. The rate of achievement of full readiness is limited by objectives contained in the current Materiel Program. Such objectives are stated in terms of forces to be equipped by time periods. In general, priority is given to items of equipment and supply required for the support of forces scheduled for early deployment in the event of war.

60. Estimation of Current and Future Demand for Principal and Major Secondary Items

a. *Responsibility.* There are four elements to be considered in determining both peacetime and mobilization requirements. These are—

- (1) Initial allowances (initial issue) of authorized equipment to troop units and installations.
- (2) Replacement of equipment worn out or expected to be consumed in combat or training.
- (3) Levels and in transit materiel de-

livered from suppliers and en route to the consuming unit (whether in depots or in transit).

- (4) Class IV equipment and supplies because the occasional or contingency nature of requirements precludes their inclusion in TOE's and TA's.

b. *Initial Allowance.* The first element of demand in the Material Planning Study is the allowance of materiel, both at present and in the future, for the troop strength stated in the Materiel Program. Each troop unit in the Army has a table of equipment or table of allowance listing all items of equipment which are considered to be the minimum required and authorized for the unit to perform its basic mission. The number of units of each type is multiplied by the authorized allowance for a single unit of that type to give the total initial materiel allowance for current demand. This is broken down by areas, such as the Continental United States and oversea commands, and by components, including the active Army and reserve components. Whenever too much equipment is authorized by a TOE, requirements are inflated by that amount multiplied by the units planned for the TOE. Reserve components generally operate under reduced allowances. Any changes in allowances for future periods are computed and entered at the appropriate point in the study. These changes generally correspond to changes in troop strength or status contemplated in strategic plans. Allowances for other forces supplied by the United States Army are as stated in the Materiel Program and separately computed and similarly listed in the study.

c. *Replacement and Consumption.* The demand for future replacement and consumption consists of that part of the initial materiel allowance which is expected to be worn out, consumed or replaced through wear and tear and losses under combat conditions. This is computed by applying to the total number of items of each type in use a "replacement factor," which gives the proportion of replacement required per month for each unit. Thus a replacement factor of .02 for an item indicates that 2 percent of all such items in use must be replaced each month.

- (1) *Computation.* Computation of re-

placement and consumption represents an effort to arrive at "true demand." This is as much of a problem for principal items as it is for minor secondary items and repair parts, and greater efforts are made to achieve accuracy corresponding to the greater monetary and strategic value of principal items. Replacement factors are carefully studied and constantly revised for both peacetime and wartime consumption on the basis of historical data and reports. Variations in climate, terrain, and conditions of peacetime and combat use make the accurate determination of future replacement and consumption extremely difficult. No two wars, no two engagements, and no two activities of the peacetime Army are ever pursued under precisely the same conditions. Generally by the time adequate data are gathered for one area and one set of conditions, the conditions will have changed.

- (2) *Reporting.* Reports of consumption require interpretation in order to yield useful results for requirements purposes. In combat situations units are required to submit Combat Use and Consumption Reports on selected principal items of equipment. Difficulties in analyzing such reports arise from the fact that the information which they present is not always compatible with the basic data required for calculation of replacement and consumption. Troop units may report the loss of a major piece of equipment when it is damaged in an accident or by enemy action and must be abandoned. Maintenance units then pick up the equipment, restore it to serviceability, and return it to the unit. Unless the previous report is corrected, the consumption report may result in an exaggerated demand. Consumption reports must be correlated with maintenance reports from the same area over the same period if an approximation of true historical demand is to be attained.

d. Levels and Intransit. The approved levels of stock in oversea depot systems and the quantities in transit between the continental United States and oversea areas must be computed as a part of principal item requirements. Both levels and intransit time are computed based on AR 11-8. Quantities required to maintain levels are computed by multiplying replacement demand (the appropriate replacement factor times the initial allowance) by the total number of months in the pipeline for the Continental United States and each oversea area. This method further increases the significance of the replacement factor, since it is used as the basis for determination levels as well as future consumption. Levels are computed for current demand only; they do not change for future periods unless a planned change in initial allowances, issue experience, or troop disposition necessitates a recomputation of all demand figures.

e. Class IV Requirements. Class IV supplies comprise all materiel needed for special projects, such as the construction of a port or a radio station and other purposes which do not constitute a regular demand. In the construction of a port the units assigned to the work may need heavy construction equipment in excess of that regularly authorized under their TOE's, and will be required to install at the port major equipment such as power plants, cranes, and other handling devices which are not included in their own TOE allowance. Requirements for all these items are placed in the class IV category. Many of these requirements originate from the strategic plan for future operations, and from strategic logistics studies which prescribe in more detail the supply and logistics phases of projects included in the plan. To compute class IV requirements for different operations under varying conditions, the "functional component" system is normally utilized. This involves the standardization of a number of different type installations. Thus there may be four or five different types of hospitals, two or three different types of Army camps and so forth. A complete bill of materials, from nails to power plants, is prepared for each standard type of installation, thus making possible the rapid translation of plans into quantitative materiel requirements.

f. *Total Requirements.* The sum of initial allowances, pipeline, and class IV requirements gives the total current Army requirement for each principal item as of the date of the study. Replacement demand, together with any planned changes in the other demand elements, is projected into the future as changes by period to give phased increases or decreases in future demand by the Army (fig. 12). Current and future demand and supply for other agencies supplied by the Army, such as the Navy, the Air Force, and the Military Assistance Program, are stated separately on the basis of requirements guidance contained in the Materiel Program.

61. Determining Current and Future Assets

a. *Current Assets.* Current assets consist of stocks in the hands of troops, stocks at posts, camps, and stations, stocks in transit, and stocks in depots worldwide. Information as to

the size of these stocks is collected semiannually through the Army Supply Status Reporting System. The reports of current troop stocks should correspond to the current authorized troop allowances. Variations may be expected because of discretionary allowances, seasonal demand, and other factors. Assuming that stocks are available, if the discrepancy between authorized allowances and actual stocks on hand with troops becomes excessive, it indicates either that the TOE requires revision or that enforcement of authorized allowance levels is needed through inspection and command channels. The latter problem is particularly acute for what may be termed "unpopular" items. Since they are not needed for the immediate mission, most troops will not order their full allowance. Both initial demand and replacement are therefore much lower than the estimates. If inspection enforces compliance with the full TOE, TA, or authorized tables,

PRINCIPAL ITEM REQUIREMENTS

<u>COMPUTATION</u>	<u>RESULT</u>
1. TROOP LIST X ALLOWANCES	INITIAL ISSUE
2. INITIAL X REPLACEMENT FACTOR X MONTHS	REPLACEMENT
3. INITIAL X RF X PIPELINE IN MONTHS	LEVELS & IN TRANSIT
4. STRATEGIC LOGISTIC STUDIES AND SPECIAL OPERATIONAL PROJECTS	CLASS IV
5. TOTAL	GROSS REQUIREMENTS

6A-1-12

Figure 12. Principal item requirements.

supply discipline tends to be poor. The end result is often a highly inflated consumption rate, far exceeding the requirements estimate. The final element of current assets is stocks in transit. In the past stocks in transit have been estimated as those stocks which were on the rails or on shipboard between depots, between depots and ports, and between ports. Improved recording methods, such as the use of the Date of Change of Accountability method, for in transit stocks are being further developed to reduce the element of guesswork and the consequent "losing" of assets while in transit.

b. Receipts From Funded Procurement. Future assets include receipts from procurement already initiated or for which funds have been specifically authorized. Since most principal items require long procurement lead times, phased procurement receipts often extend over a considerable period in the future. Current or expected production difficulties and delays must be quickly reflected in the periodic requirements study, since they may change the entire pattern of supply status.

c. Receipts From Rebuild. The final element of future assets determination consists of receipts of overhauled or rebuilt materiel from the maintenance program. Unserviceable stock on hand is listed from depot reports by areas. Overhauling or rebuilding of unserviceable equipment is then phased into future periods to form the basis for preparing maintenance schedules. Maintenance schedules in the Continental United States and overseas are established by the chiefs of technical services. It is important that estimates of receipts from rebuild be extended throughout the whole forecast period of requirements. The estimate of replacement demand includes demand for new equipment required to replace unserviceable stock turned in for repair. If this element of replacement demand is not offset by estimates of future assets from rebuild, overall demand will be overstated.

62. Projecting Peacetime Supply Status

The peacetime supply status is obtained for the current period and for each future period in the forecast by subtracting the gross requirements from the assets for that period. Excesses in supply for future periods are available for building up reserves. Once these demands are

satisfied, excesses indicate that current procurement, if any, should be terminated or stretched out. Deficiencies in supply for any future period indicate that procurement should be initiated in time to make up the difference. This does not mean that requirements computations serve directly as a basis for procurement of principal items; the many intervening stages of budgetary review, appropriation, and funding often result in modification of the overall Army program or in the shifting of emphasis between segments of the program or even between individual items of supply. Corresponding modifications are then necessary in requirements computations before procurement is begun. The overall review of the peacetime supply status can also serve as a continuing control of accuracy in current demand and supply data and calculations, and in past demand and supply projections. Since past experience data on supply and demand are reported on each Materiel Planning Study, the total assets at the beginning of the past period plus receipts from procurement and rebuild during that period less the total reported demand (replacement and consumption) for the period should equal the reports of current assets. Since the Materiel Planning Studies are made at least semi-annually, review of successive studies will also permit a check on the accuracy of past projections of demand and supply. In making such a review, intervening program changes must be taken into account.

63. Relationship of Principal to Minor Secondary Item and Repair Parts Requirements

a. Forecasts of principal item requirements form an important element in the computation of requirements for allied minor secondary items and repair parts. A single item such as a tractor of a certain make and model may have hundreds of repair parts and accessories whose supply depends to a large extent upon the future use and distribution of the end item. This relationship is particularly important when changes in the Army program affect requirements for any principal item. A "programming change factor" is computed by the commodity analyst to express the ratio between the current and projected in use end item population. Programming change factors for minor

secondary items and repair parts are projected on supply control studies DA Form 1794 (Supply Control Study—Minor Secondary Items and Repair Parts (Active Items)) (CONUS only) for the balance of the current fiscal year and the two succeeding fiscal years or through at least the Peacetime Force Materiel Requirements (PTFMR) (30 months). Long-range estimates of program changes may themselves be subject to alteration before they can affect minor secondary item and repair parts requirements.

b. The programing change factor cannot always be applied directly. In many cases a repair part or accessory is used for more than one principal item, and program changes may

affect different items in different ways. Generally, both program changes and the requirements forecast which results are plans and estimates, subject to variations and errors. Program changes will not take place immediately. Equipment will be turned in over a period of time, and it is very possible that those items remaining in the field will receive harder usage, resulting in a higher demand for spare parts and maintenance materials. The commodity analyst in projecting allied minor secondary item and repair parts requirements should interpret the programing change factor as a trend, along with other elements of data, such as demand experience and troop disposition.

Section III. PLANNING TO MEET FUTURE DEMAND FOR SECONDARY ITEMS AND REPAIR PARTS

64. General

The inventory control point plans to keep stock available on a worldwide basis, directing initial distribution of newly procured stocks to Army depots based on anticipated demand. To assist inventory control points in anticipating this demand, the *stock* control activities furnish data on past experience. These data include information on depot stock status, analysis of depot issues, end item density, and national availability. It is necessary that the inventory control points maintain constant close liaison to assure that there is agreement on these raw materials of requirements computation.

65. Major Secondary Items

Major secondary items are those budgeted in the PEMA appropriation, but not selected as principal items. Usually these items have long lead times and cost more than \$500. Major secondary items are controlled and their materiel planning studies are prepared as for principal items.

66. Minor Secondary Items

Minor secondary items are all end items which do not fall into the principal or major secondary item categories. Generally, they are characterized by short lead times, low value, and ease of procurement.

67. Repair Parts

Repair parts are all elements, materials, components, assemblies, or subassemblies required for the maintenance and repair of an end item.

68. General Characteristics

It is interesting to note that minor secondary items and repair parts while constituting the bulk of the items in the Army Supply System, account for only about 35 percent of the procurement dollars spent by the Army. On the other hand they account for 85 percent to 90 percent of the entire workload and costs of the distribution system.

69. Minor Secondary Items and Repair Parts Requirements

Each chief of a technical service exercises worldwide supply management of minor secondary items and repair parts from a closely supervised central inventory control point. With approval of the DCSLOG, chiefs of technical services may decentralize supply control to installations where complimentary stock control, procurement direction, and maintenance control points are located. This allows more effective liaison and operation. In such cases, the operation remains under direct supervision of the chief of the technical service. Before February 1955, all minor secondary

and repair parts items received about the same degree of attention in the determination of requirements. Studies showed that a relatively small number of items accounted for most of the dollar value of issues. DCSLOG therefore authorized varying degrees of control based on annual dollar issues. Items are stratified according to value of annual issues from the CONUS depot system as—

a. Low dollar value items (\$0 to \$1,000 annual issues).

b. Medium dollar value items (over \$1,000 but not exceeding \$10,000 in annual issues).

c. High dollar value items (in excess of \$10,000 in annual issues). Some inventory control points categorize their items according to the value of anticipated annual demands rather than value of past annual issues. Depots are allowed to carry more stock of the low annual dollar demand items. A standard method for computation of requirements for minor secondary items and repair parts is established for use by all technical services (see AR 710-45).

70. Steps in Determining Minor Secondary Item and Repair Parts Requirements

The basis steps are as follows:

a. Establishment of a required number of days of supply representing the minimum stock which must be on hand plus that which should be on order to meet future demand without running out of supplies.

b. From past experience of issue or demand plus other known factors, prediction of the quantity of stock required for the period is established. This quantity plus quantities currently due out plus authorized reserves, is the gross requirements.

c. In determining how much to buy, subtract the total applicable assets from the gross requirement to get the net requirement.

71. Establishment of Gross and Net Requirements

The following formula is used in computing requirements for procurement of low dollar value items. It illustrates the steps outlined in paragraph 70 and the theory behind the more detailed computations prescribed in AR 710-45 for other dollar value category items:

<i>Requirements</i>	<i>Quantities</i>
Depot safety level (¹ 1 month) -----	_____
Protectable MRMR ² -----	_____
Forecasted demand during procurement lead time (_____ months) -----	_____
Recurring ³ ----- (_____)	_____
Nonrecurring ³ ----- (_____)	_____
Forecasted demand during procurement cycle -----	_____
Recurring ³ ----- (_____)	_____
Nonrecurring ³ ----- (_____)	_____
Dueout -----	_____
Gross requirement -----	_____
MINUS:	
Assets:	
Serviceable stock on hand as of stock status cutoff date -- (_____)	_____
Less estimated issues during stock status lag time (_____)	_____
Net stock on hand -----	_____
Forecasted receipts -----	_____
From procurement -- (_____)	_____
From returns ----- (_____)	_____
From rebuild ----- (_____)	_____
Total assets -----	_____
Net requirement -----	_____

¹ Unless otherwise established by subsequent instruction.

² That portion of the computed MRMR which is recommended for stockage after considering the essentiality of the item to the overall mission, modernization, storage characteristics and costs of storage and maintenance and as limited by the availability of procurement funds.

³ Recurring and nonrecurring demands will be included in one combined total for low dollar value items.

72. Graphic Presentation

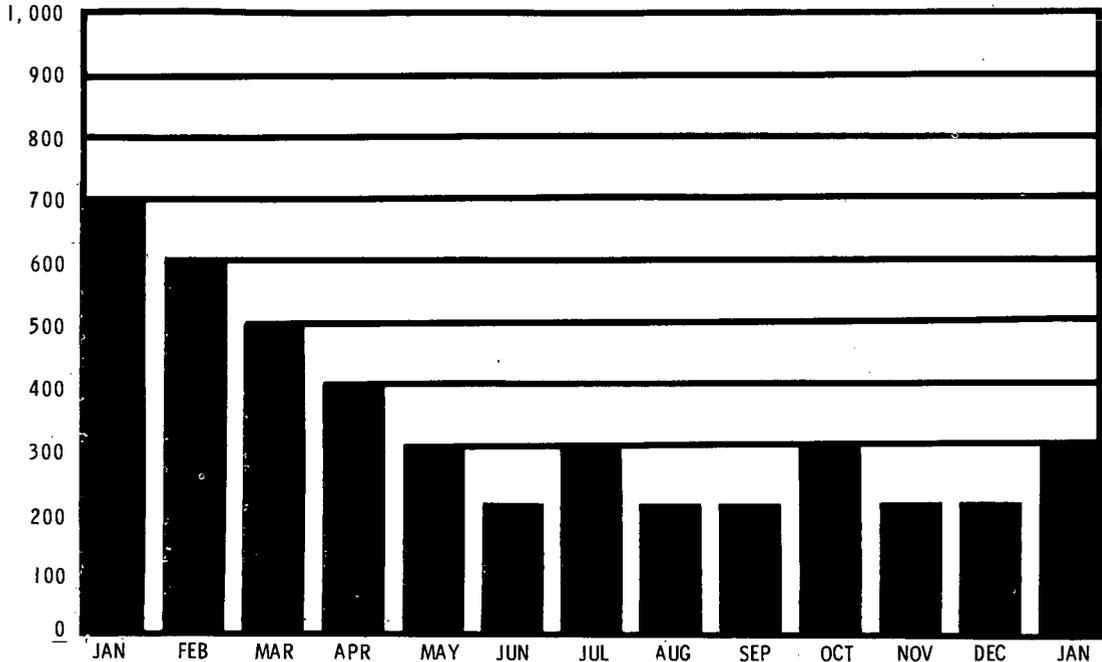
This same situation is depicted in figure 13 as a continuing process. The computation of requirements for these items which produce the biggest workload in the supply system is, in theory, a simple exercise. In practice, there are many unknowns injected into the problem. Consideration of the unknowns and the action and reaction within the system make it abundantly clear that this procedure cannot always be applied rigidly or mechanically. The judgment and experience of the analyst must govern and may override the procedure in the interest of efficient planning and control. The greater the military essentiality of the item, the dollar value of demand, etc., the greater should be the dependency on human judgment and experience. The majority of minor secondary items and repair parts do not require such extensive management.

MINOR SECONDARY ITEM AND REPAIR PARTS REQUIREMENTS

REGULAR DEMAND 100/MO

PROCUREMENT CYCLE 3 MOS.
 SAFETY LEVEL 1 MO.
 PROCUREMENT LEAD TIME LEVEL 6 MOS.
 DUES OUT 0 MO.
 PROTECTABLE **MMR** 0 MO.
 TOTAL LEVEL 10 MOS.

UNITS ON HAND



MONTHS

	JANUARY REVIEW	APRIL REVIEW	JULY REVIEW
ON HAND	700	400	300
DUE IN.	0	300	400
ASSETS.	700	700	700
GROSS REQUIREMENT.	1,000	1,000*	1,000
NET REQUIREMENT FOR PROCUREMENT.	300	300	300
DELIVERY SCHEDULE.	200 JULY 100 SEPT	200 OCT 100 DEC	200 JAN 100 MAR

•NO DUES OUT

6A-1-13

Figure 13. Minor secondary item and repair parts requirements.

73. Intangibles

Since the analyst at the inventory control point level is at the end of long lines of communication, it is frequently difficult for him to determine how old and how accurate are his source data. Often the cost of obtaining exact information will exceed the value of the quantity of items in question. If his knowledge of future developments is not current, he may be surprised and/or astounded by unforeseen demands. In short, he is more than usually dependent on others up and down the line for his facts and must have a detailed knowledge of the system which produces those facts and be alert to detect trends and inconsistencies, and adjust his own actions. In this respect, some technical services have realized benefits from the demand data generated through the Army Field Stock Control System (AFSCS).

74. Examination of Factors in Planning to Meet Future Demands

a. Supply Control Review Cycle.

- (1) Since it is impractical and uneconomical to review all of the vast number of items in the supply system more frequently, the technical services generally review the status of their items at intervals of not more than six months (except for low dollar value and seasonal items).
- (2) The review is the primary activity of the Commodity Manager. It provides the analyst with the opportunity to examine past issue and demand experience, predict the demand for the next period, and adjust his stock by appropriate action. In order to make the most efficient use of administrative and clerical time, some action should result from the cyclic review; therefore, with the exception of low dollar value items, it is set to correspond to the reorder cycle.
- (3) In addition to the normal review, the technical services also review when an item reaches a level of supply designated as the reorder point. This safeguard minimizes the effect of unusual demand but does not warn the analyst of falling demand and the resulting

accumulation of excesses. Excesses are caught at the normal review periods. The most economical length for the review cycle is determined primarily by the frequency of issue and dollar demand. Generally speaking, an item with high dollar demand should be reviewed more frequently than one with a low dollar demand.

b. Economical Order Quantities (EOQ).

- (1) The principle stated above for the optimum frequency of review and reorder is that fast-moving stocks should be reordered more frequently than slow-moving stocks. To analyze this principle and obtain a workable method of fixing the length of the review and reorder cycle, it is necessary to take into account four important factors.
 - (a) The annual requirement for the item.
 - (b) The annual variable cost of ordering.
 - (c) The annual variable cost of carrying inventory.
 - (d) The unit price of the item.
- (2) Control is exercised over the minor secondary items and repair parts inventories by decisions made about WHEN and HOW MUCH to order to replenish the stocks withdrawn to fill demands. One extreme method to control the inventories would be to issue a replenishment order equal to the actual demand each time there is a demand. Such a policy would keep the inventory to a minimum level allowed by the lead time in the system. This extreme policy would mean that every time there was a demand, there would also be the cost of ordering the item. The cost of ordering could be drastically reduced if the demands were accumulated over a period and then one procurement order was issued. When the material is received, the inventory will be large. Gradually, demands will reduce the inventory until it is time to order again. Although the cost of ordering is reduced,

the costs of carrying the inventory will increase. One of the principal considerations of the inventory manager is getting a practical balance between the costs of carrying the inventory and the costs of frequent ordering. The subject of inventory balance is a broad one that has received a great deal of attention in government and industry.

- (3) The classical EOQ model now in wide use in the Armed Services and industry gives management a mathematical model that will insure consistency in inventory control decisions, and which will help determine the most economic quantity to buy. To use a simple EOQ model, assume that each order placed cost C dollars, in addition to the direct unit cost of the item. If the annual requirement for this item is taken as Y pieces, and a quantity of Q pieces is ordered, then the annual cost to buy (CB) will be—

$$CB = \frac{CY}{Q}$$

- (4) The annual cost to hold (CH) this item, safety and reserve stocks excluded, considers the average quantity on-hand (Q); the unit cost in dollars (U); and the holding cost factor (H), the ratio of cost percentage wise, to the dollar value of average on-hand inventory. Algebraically it is expressed as—

$$CH = \frac{Q}{2} UH$$

Therefore, the annual Total Variable Cost (TVC), associated with the policy of buying Q pieces, will be—

$$TVC = CB + CH = \frac{CY}{Q} + \frac{Q}{2} UH$$

- (5) The cost model is illustrated in figure 14. If the order size chosen is too small, the annual cost to buy is high. On the other hand, if Q is too large, the cost to hold is high. Somewhere there is a value of Q that balances these costs, making the total cost a minimum. Differentiating the TVC expression with respect to Q , the fol-

lowing formula for the optimum value of Q is developed:

$$Q = \sqrt{\frac{2CY}{UH}} \quad \text{or}$$

$$EOQ = \sqrt{\frac{2(\text{Order cost})(\text{Annual requirement})}{(\text{Unit cost})(\text{Holding cost}\%)}}$$

For example, the ordering cost (C) for an item may be \$200, estimated annual demands (Y) are 1,000 pieces, unit cost is \$50, and the holding cost at 20 percent, then the solution to the optimum buy quality Q can be reached graphically (fig. 14) showing the annual cost of ordering and holding. A solution to the problem can also be reached algebraically.

$$Q = \sqrt{2 \times \$200 \times 1000} = 200 \text{ pieces} \\ \$50 \times 0.20$$

- (6) There are two types of costs that must be determined if the EOQ formula is to be used: ordering cost and holding cost. The results of using the EOQ formula are not particularly sensitive to values determined for ordering and

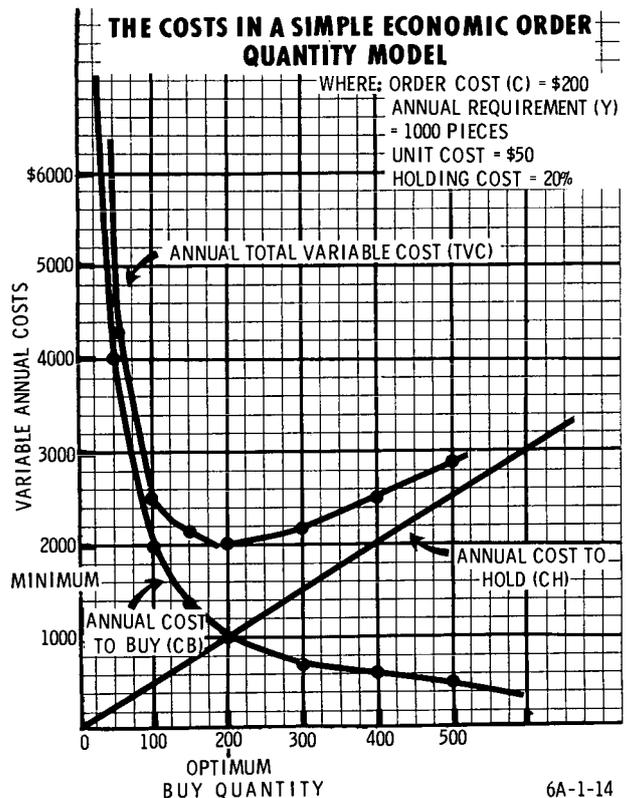


Figure 14. Cost in EOQ Model.

holding cost. That is, the total variable cost curve, figure 14, is quite flat near the minimum. It is worthwhile to devote enough effort to be sure that "true" costs are reasonable. Precision should only be sought if it can be obtained at very little extra expense. As a minimum, the following variable costs elements should be considered:

(a) *Ordering cost.*

1. Requirements review.
2. Contract placement and administration including inspection and acceptance.
3. Applicable portions of stock control and financial control.
4. Preparation, recording and submission of requirement requisitions and purchase request.
5. Control and documentation incident to shipment and receipt.

(b) *Holding cost.*

1. *Obsolescence.*
 2. Interest on dollar inventory investment (usually assumed to be 4 percent).
 3. Applicable stock control and financial control.
 4. Care and preservation.
 5. Storage.
 6. Physical Inventory.
 7. Deterioration and shrinkage.
- (7) In the interest of simplicity, convenient nomographs and tables can be developed to represent ranges of practical economic order sizes, such as one month's supply, two months' supply; and so on, representing the reorder (Procurement) cycle quantity. Differentiating the TVC expression with respect to the annual order frequency F (expressed as the number of order cycles per year) the EOQ formula can be restated in a form that is more convenient to use in constructing economic frequency tables:

$$YU = \frac{2C(F)^2}{H}$$

(8) The pair of products $F_1 \times F_2$ as values for $(F)^2$ element in the formula gives solution for points of indifference between adjacent reorder cycles. These points of indifference can be tabulated as breakpoints, in this way establishing optimum ranges of annual demands in dollars (YU) for selected order cycles.

(9) Using the economic frequency formula with the figures assumed above we may derive the following table:

<i>If value of next year's demand (YU) is between—</i>	<i>The Recorder Procurement Cycle in months is—</i>
\$0.01 to \$100	60
100 to 160	48
160 to 260	36
260 to 400	30
400 to 680	24
680 to 1340	18
1340 to 2660	12
2660 to 5320	9
5320 to 16,000	6
16,000 to 48,000	3
48,000 to 144,000	2
144,000 and over	1

(10) Situations exist where unit price is not a direct cost factor. Many manufacturers offer a discount or a series of discounts, depending on the quantity purchased. This introduces an additional variable that should be considered in determining an economical buy. A reduced unit price urges us to buy large quantities. This will also reduce reorder cost. On the other hand, buying larger quantities will increase average inventory and raise holding cost. To make the problem more difficult, the prices do not change uniformly, but are reduced in steps. This laddering is sometimes referred to as "price breaks," or "quantity discounts." By calculating the optimum buy quantities at different price ranges and comparing optimum buy quantities at associated unit price ranges an optimal buy can be calculated.

(11) The EOQ model provides the manager with a tool that can be made responsive to policy changes that require overall increases or decreases

in inventories. Once the Holding Cost Factor (H) is determined, the manager can take the point of view that the Holding Cost is merely a policy variable in the inventory control system that makes it possible to alter the balance between inventory investment on one hand and out-of-pocket costs in the other. By changing the Holding Cost Factor the economic order quantities will change proportionately and will develop into a total inventory change of the same magnitude. This is illustrated in figure 15. In the above example a Holding Cost Factor of 20 percent was used. If a policy change requires an inventory reduction, this reduction can be effected by raising the Holding Cost Factor. Raising the factor to 25 percent will reduce the inventory by 10 percent. Any percentage of increase or decrease can be obtained depending on the results desired.

- (12) A complete inventory change will take place over the period of one turnover of the inventory. Changing the Holding Cost Factor provides the manager with an inventory control "dial" that will react in a predicted and orderly manner with predictable results. The manager should compare the consequences of changing Holding Cost Factors by computing the change in investment, the change in annual ordering costs, and the price paid to get additional capital.
- (13) Analysis of economic order quantities offers an opportunity for economy to inventory control managers. Application of judgment is essential when finally deciding on the quantity of any given item to be procured.

c. Maintenance of Operating Stock Levels. After a regular review and reorder cycle has been set up, the next problem for supply management is to phase or schedule the movement of stock from the manufacturer into the system so that it keeps pace with the movement out of the system to the consumer and does not build up excessive stocks in storage at any

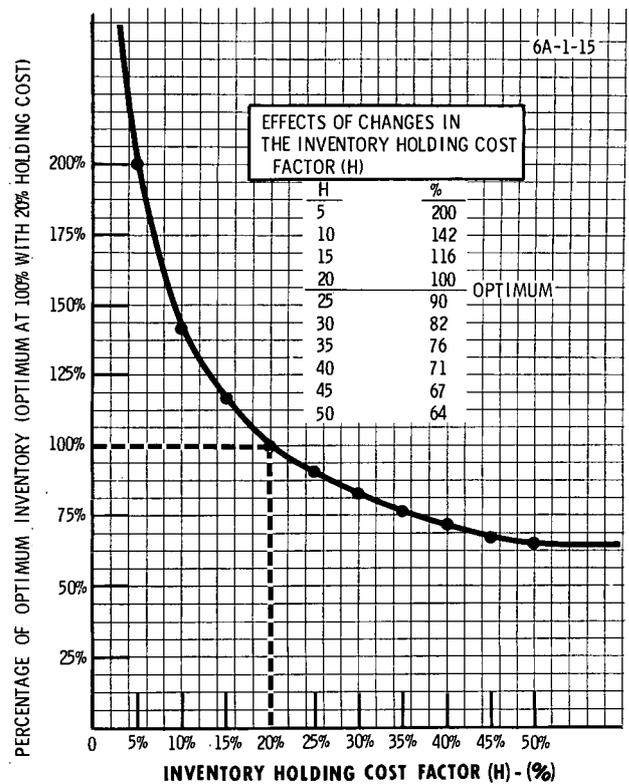


Figure 15. Effects of change in the inventory holding cost factor (H).

given time. Figure 13 serves to illustrate the relationship between the order cycle and the scheduling of deliveries. If the review cycle is three months and the other factors including demand remain constant, the commodity analyst will order in three months' supply at each review. If this amount is scheduled for a single delivery at the beginning of the period, stock will rise to four months' supply and descend as issues are made during the period to the safety level of one month's supply. If the economical review and reorder cycle is changed to six months with a single delivery, seven months' supply would be on hand at the beginning of the period. It can readily be seen that a delivery schedule of this kind would require more storage space, and would increase storage costs. These increased costs must be compared to the reduced costs realized from less frequent procurements. When these costs balance the resultant quantity of stock is the maximum economical quantity to be on hand at any given time. This is known as the stockage objective.

d. Analysis of Demand Experience.

- (1) *General.* The computation of levels, while requiring the use of experience and judgment, is perhaps the lesser part of the management job of planning to meet future demands. The analysis of past demand data and their projection into the future cannot be reduced to an exact science. With awareness of such limitations, interpretation of information on sources of demand constitute a major problem.
- (2) *Recurring and nonrecurring demand.* Throughout the supply system, an effort is made to distinguish those demands which constitute regular or recurring activity from those demands which are made for a special purpose and are not likely to recur in the future. At the wholesale or NICP level both recurring and nonrecurring demands are considered in determining the ratio of establishing levels of supply for low dollar value items. For medium and high dollar value items only recurring demands are considered for this purpose. It is assumed that nonrecurring special purpose demands will be dependent on specific programs and budgets to be added to the regular requirements at the direction of planning authorities. Stations are required to show in appropriate columns of the stock record card whether demands are "initial" (non-recurring) or "replacement" (recurring). Stations are not permitted to include the nonrecurring demands in the computation of levels to prevent inflation of their stocks. Demands in oversea commands are similarly recorded as initial or replacement at the depot or station where the demand was actually made. The depots code EAM cards for each shipped line item as either recurring or nonrecurring according to the basis of the requisition. These recurring and nonrecurring demand cards accumulated over several months are sorted by stock

number and class of requisitioner and listed as "Demand Analysis Report" for the stock control point. The inventory control points collect and maintain all the relevant information on an item, including the demand history, on a single record form for review by the stock analyst. The form of these records varies among the technical services.

- (3) *Distinguishing recurring from non-recurring demands.*
 - (a) If the quantity of an item actually consumed in normal support of operations, or replaced due to fair wear and tear, combat losses or other attrition, is to be determined, it is essential that the quantity of the item demanded for an abnormal or onetime use be distinguished in the computation of requirements. This retail demands data is now being recorded and utilized in the field through the Army Field Stock Control System (AFSCS). It is available for use at the wholesale (NICP) level as directed by the chiefs of technical services. Most technical services however, indicate that gathering data from below the CONUS depot level on all items would be extremely costly.
 - (b) Recurring seasonal demands may be confused with onetime demands. It is noted that consecutive averaging of quarterly demand rates is not satisfactory for forecasting requirements for seasonally demanded items or other items with sporadically recurring demand which conform to a definite pattern. Maintenance of levels during the "off season" in quantities sufficient to support demand during the "on season" is neither economical nor desirable. Requirements computations should therefore reflect the pattern of the seasonal or other sporadic demand, and procurement phased accordingly. To accomplish

this, the period on which the average is based should be extended to cover several complete seasonal or sporadic cycles so that average quarterly demand for the "off quarters" and the average quarterly demand for the "on quarters" can be determined separately. Average quarterly demand must also be adjusted to take into consideration increases in equipment population during the period for which the forecast is made.

- (c) Initial issues, class IV projects, "Pipeline level" increases, and depot rebuild schedules are the most common sources of nonrecurring requirements. They normally result from programs or plans made in advance of the actual demand. A program to rebuild a large number of end items during a given period in the future will create a nonrecurring demand for parts over and above usual recurring field maintenance requirements. If the requirements analyst is made aware of future programs, he can add such demands to his forecast and adjust his supply action accordingly.

e. Consideration of Stock Status Lag Time. Should there be a lapse of time between the cut-off date of the stock status reports prepared by the CONUS depots or oversea commands and the use of this asset data to determine requirements in a supply control study at the inventory control point, assets must be reduced by an amount equal to the estimated issues for the period of this lag (stock status lag time). This is equivalent to increasing the requirement by that amount. If a change in demand has intervened during this period, an error could well occur in the estimate of present assets. The shorter the lag time the less chance for error. With the advent of rapid communications, i.e., transceivers and computers, this lag time has become to be infinitesimal for CONUS depot stock status reports. However, there still exists an appreciable lag time (1 to 2 months) on overseas stock status reports.

f. Distortion of Issue History by Substitutions and Extracts. Demand history, at the depots, stations, and in oversea commands, is often distorted by issues of substitute items. For example, a screwdriver eight inches long is requisitioned. Since this is out of stock, a substitute screwdriver six inches long is issued. The demand for six-inch screwdrivers is inflated and the true demand for eight-inch screwdrivers understated. Extracts cause a similar distortion. When Depot X receives a demand for an item which is out of stock, the requisition is extracted to Depot Y. The demand at Depot X is understated and the demand at Depot Y is overstated. Although these distortions are partially compensated for by coding the EAM cards representing issues, neither substitutions nor extracts, particularly the latter, are completely or clearly unscrambled in reports of issue history. The difficulty lies in the fact that "issues" are accounting transactions whereas "demands" are statistical data. Where demand does not result in an issue, the quantity requested cannot be combined with the quantity actually issued without destroying the accounting records. The conflict has been recognized by DCSLOG and the technical services. Purification of data accumulated through Army Field Stock Control System will generate more factual demand experience data and will alleviate this recognized situation.

g. Projecting National Demand Experience.

- (1) *Adjusting levels to changing demand.* Once the stock analyst has obtained the best approximation of past demand experience, he must use this experience as a basis on which to project future demand and must adjust his levels and orders accordingly. Where demand is changing, the problem of projection is a critical one. Where procurement lead time is six months or more, any change in demand may cause serious over or under supply before it can be corrected. The analyst should be able to detect the *trend* in demand as quickly as possible if this imbalance of stock is to be minimized. This is a much harder process than mathematical computation of *average* past issues and pro-

jection of this average into the future. While averages must often be computed to analyze past issues and to obtain an approximate picture of recurring demand, injudicious application of these results to the future may compound and prolong the inevitable difficulties of adjusting supply to changing demand. If the analyst simply computes and projects the average past demand for the prescribed period, he will not reach his new proper level of stock on hand for 18 months. In experience, both averages and trends are hard to see when demands are fluctuating from month to month and initial demands are confused with replacements. The analyst's experience with the item's activity and use, his knowledge of program changes and other data should be actively employed to interpret source data and to compensate for demand changes as soon as procurement lead time will permit. If the stock has a relatively high dollar value, it may be worthwhile to terminate contracts or cut back or stretch out delivery in order to avoid the carrying of excessive stocks in the system over a long period of time. If demand increases, the reverse is true and stock may run out. It must be noted that the safeguards and incentives in the Army supply system, including the stockage

objective, the reorder point, and the scheduling of procurement, are all weighted against running out of stock rather than against maintaining excessive stocks. The interpretation of demand by trends rather than averages becomes particularly important if longer issue histories are used at review.

- (2) *Additional factors influencing future demand.* In estimating total future demand, the analyst must consider, in addition to demand experience, other elements of planning and past data which affect the supply situation. These include—
 - (a) *Scheduled changes.* Scheduled changes in troop strength, or in other programs which will affect demand.
 - (b) *Equipment population.* The demand for repair parts, accessories, attachments for major items of equipment, and components for sets, kits, and outfits, is governed by the number of these items of equipment or sets in use. Any change in the program for major equipment should be reflected in the distribution of minor secondary items and repair parts. These problems are magnified where the same repair part is used in several pieces of equipment in varying quantities.

Section IV. MOBILIZATION REQUIREMENTS PLANNING

75. General

a. Mobilization planning assumes the outbreak of a limited or general war sometime in the future. Planning for a floating D-day as a target date is essential. This factor is an important part of the overall strategic plan promulgated by the Joint Chiefs of Staff and includes an enumeration of the military forces, their composition and deployment, which will be necessary to carry out military operations for a stated period of time after the date of the enemy's initial attack, or D-day. D-day is not a fixed date. It changes with each successive plan.

b. The troop and logistics aspects of the Army Strategic Objective Plan are used as a basis for peacetime planning by the Deputy Chief of Staff for Logistics. Current guidance and policy, however, determine the size of force used in computing requirements. This force may be less than that outlined in the ASOP. The calculation of principal item requirements for the period of the mobilization plan is again delegated to the technical services as indicated in the Materiel Program. Mobilization requirements planning is performed in close conjunction with peacetime requirements planning and

appears as part of the periodic Materiel Planning Studies.

76. Computation of Mobilization Requirements

a. Elements of Computation. Mobilization requirements are computed as indicated in the Materiel Program for the same elements and using the same methods as for peacetime requirements; initial allowances, replacement and consumption, levels and in transit, and class IV projects. Requirements for limited war and general war are reflected separately on the Materiel Planning study, and are phased out by quarters over the mobilization planning period.

b. Feasibility. The feasibility of the strategic plan and the ensuing mobilization requirement is constantly tested as the plan is developed. One test which applies specifically to the supply requirement is the "gross national product analysis" developed by the Deputy Chief of Staff for Logistics. This determines the Army's share of the gross national product under the last condition of full mobilization in World War II, and continues with a projection of present mobilization requirements against an estimate of the present gross national product. This method tests the overall extent of the Army's maximum demand upon the national economy and the capacity of the economy to meet it.

c. Materiel Requirements.

- (1) The mobilization force for general war and limited war and the programming guidance for the computation of requirements to be reflected in the Materiel Planning Study is contained in the Materiel Program. The forces listed therein are the maximum authorized for computation of mobilization requirements and will not necessarily reflect those generated by the ASOP. Guidance for computation of materiel requirements in support of a limited war will be based upon Department of the Army Strategic Logistics Studies as approved by the Department of Defense.
- (2) For management and planning purposes, requirements in support of a limited war or general war are

grouped by priorities of requirements for—

- (a) Active Army and Active Army Roundout Forces.
 - (b) Selected Reserve Forces less Active Army Roundout Forces.
 - (c) Remainder Reserve Forces.
- (3) This management technique of breaking out mobilization requirements in this manner provides a method by which slices of the total requirement can be related to a strategic concept or deployment of forces. The priority system permits selective application of available funds, it also provides a basis for establishing requirements objectives which are reasonably attainable. It puts first things first and permits funding on that basis. The priority system is used primarily for funding and procurement purposes and not distribution priority.

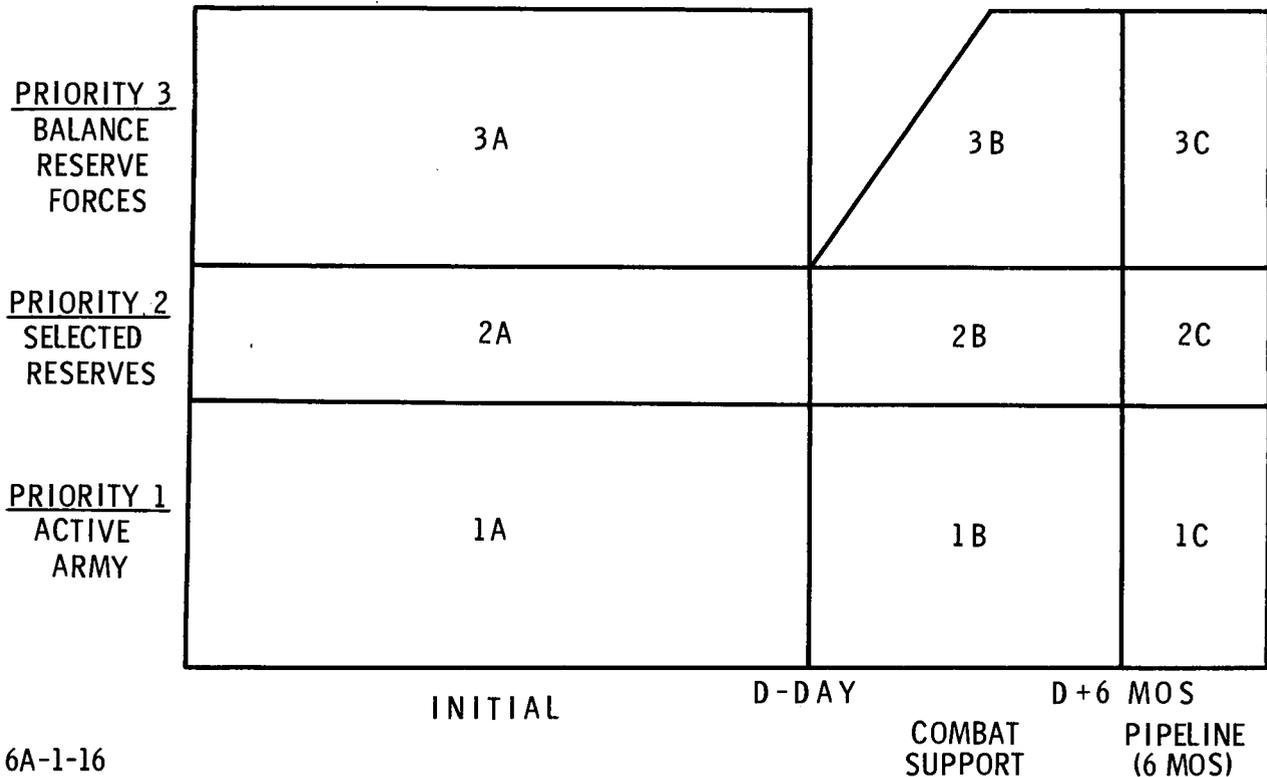
77. Building Mobilization Stocks

a. Objective. The ultimate objective in mobilization supply planning is to be able to meet all programmed objectives and establish stocks of materiel in peacetime in order to improve military readiness for war. It is evident that there be a balance between the various items required. The fulfillment of this objective is contingent on the policies, guidance, and priorities established in the Materiel Program.

b. Deterioration in Storage. Almost any item will deteriorate to some extent in storage. Most mobilization stocks, therefore, although recorded in separate accounts, normally are not physically separated from peacetime operating stocks, but are merged with them to secure stock rotation. Applied to the building of mobilization reserve stocks, the analysis of deterioration requires the consideration of the following factors:

- (1) The storage life of the item.
- (2) The present and projected rate of peacetime consumption. If the present rate of consumption is 60 units per year and the storage life is three years, it is clearly uneconomical to accumulate and maintain total stocks, including peacetime and mobilization

PRIORITY SYSTEM



6A-1-16

Figure 16. Priority system.

reserve stocks, of more than 180 units, no matter how large the requirement may be. Only the most compelling military consideration should dictate the accumulation of stocks which will deteriorate to the point of uselessness before they can be put into service under normal conditions.

c. Obsolescence. The problem of obsolescence is closely allied to physical deterioration. In the case of high-cost items of advanced design it is one of the most serious problems faced by the national military establishment today. Almost all of the major equipment of the Army and of the other military departments is subject to constant technological change, which must continue if the nation's relative military power is to be sustained. Mobilization stockpiles of critical weapons may become obsolete and require total replacement with newer weapons at

a cost which would stagger the national economy. There is no completely satisfactory solution to the dilemma of adequate protection against attack on one hand and the cost of technological change in the other. Several approaches which afford partial solutions are being used, both within the Army and at the Department of Defense level. In some cases new equipment is developed only as far as a production model with no further production or delivery contemplated until the advent of an emergency. In other cases, mobilization reserves which are subject to rapid technological change are limited to a fraction of the theoretical requirement. The proportion of actual stockpiling to the total requirement depends upon—

- (1) The military essentiality of the item.
- (2) The current funds available for procurement.

- (3) The current peacetime consumption rate.
- (4) The adaptability of the item to training or second-line use after it is replaced by a newer first-line item.
- (5) The cost of the item.
- (6) The lead time of the item.
- (7) Whether or not it is a commercial item.

d. Army Mobilization Capabilities Study. An overall review of the balance between mobilization reserve programs for different items is afforded by the semiannual Army Mobilization Capabilities Study. This study shows the Army's capability to mobilize based upon two assumed M-days and certain assumptions regarding M-day losses. Consideration is given to personnel, training, materiel, housing, and transportation. Imbalances and lack of coordination in building mobilization reserves are highlighted by this study, since full attention is brought to bear upon the most limiting factor among the many necessary to fulfill the strategic plan requirements. With such a periodic follow-up to the building of mobilization reserves, it is possible to initiate remedial action.

78. Mobilization Reserve Requirements for Minor Secondary Items and Repair Parts

a. Because many minor secondary items and repair parts are readily available or have short procurement lead times, the accumulation of mobilization reserves is only required for a limited group of the more critical and complex items and items with relatively long post M-day production lead times. Even for this group the number of items is large and planning data, such as production bases and detailed consumption experience, are often unavailable. It is impossible, therefore, to plan mobilization requirements for these items to a degree of detail comparable to the planning for principal items.

b. In early 1960, the Secretary of Defense issued new guidance for logistics programming to the military departments which intended to consider the immense gap between plans and active budgets. Specifically, it established materiel acquisition objectives which related more closely to the expected military materiel dollar appropriations. The level of forces for these

acquisition objectives does not necessarily represent full support for a general war, rather they represent a level of forces and time spans for which authority is granted to acquire materiel.

c. New programing and procedural guidance for mobilization reserve requirements computations for minor secondary items and repair parts are included in the Army Materiel Program. Essentially this provides guidance for—

- (1) The forces of the U. S. Army categorized by priority to include the Active Army Selected Reserve Forces and Remainder Reserve Forces.
- (2) The initial equipment requirement, to be computed for these forces at 100 percent or less (varies for the different forces) as provided for in the annual program.
- (3) Combat support requirements to support the General War and Limited War Plans indicated in the JSOP and MOB-R-ASOP each year. This requirement is computed for those forces planned to be in combat with a pipeline of supply for specific forces computed at combat rates. The pipeline requirement as specified for other forces are at peacetime or training rates.
- (4) The mobilization requirements for repair parts predicated on the lesser of realistically projected in use densities or required in use "densities" of supported end items as of the beginning of war. Much emphasis is being placed on the validity of the combat rate factors used to determine these requirements.
- (5) Individual item computation of the full Mobilization Materiel Requirement in support of acquisition objectives (MMR-A) for only those items meeting the criteria for mobilization reserve stockage. Also required is the determination of the Mobilization Reserve Materiel Requirement in support of the Acquisition Objective (MRMR-A); this is a major incre-

ment of the MMR-A. Then, the Mobilization Reserve Materiel Objective (MMRO-A) is computed. This is that portion of the computed MRMR-A which is desired to be stocked.

- (6) The computation of mobilization reserve Class IV requirements for the various force for both General War and Limited War.
- (7) Assets of an item are applied to its MMR-A, MRMR-A and the MRMO-A in order of priority and to the degree outlined in the annual program. Such data provides the DA staff with the degree of readiness to fight a war im-

minently or in the future under various war plans.

- (8) The determination of retention levels which are equal to or greater than the acquisition objectives are referred to as the MMR-R and the MRMR-R. (Assets are first applied to the acquisition objectives, then remaining assets are applied to MMR-R and MRMR-R.)
- (9) Special instructions regarding mobilization reserve requirements are issued separately for Department of the Army Single Managers and the Surgeon General.

CHAPTER 6

CONTRIBUTION OF PROCUREMENT TO SUPPLY MANAGEMENT

Section I. PROCUREMENT AND SUPPLY MANAGEMENT

79. General

a. In order to carry out the provisions of the Armed Services Procurement Act with uniform policies, the Armed services have jointly issued the Armed Services Procurement Regulation (ASPR). Representatives of the three services (ASPR Committee) meet periodically to discuss revisions, additions, and deviations to these regulations. Subcommittees are appointed to handle special problems. Each service is authorized to implement the ASPR to meet its particular needs; the Army Procurement Procedure (APP) establishes for Department of the Army uniform policies, procedures, and instructions relating to the procurement of supplies and services. The administration and interpretation of ASPR and APP are the responsibility of the Deputy Chief of Staff for Logistics, Headquarters, Department of the Army.

b. The procurement agencies of the Army, from the local post to the principal purchasing offices, are the points of immediate contact between the demand generated by the troops and their activities, and the national resources and facilities which are available to meet their demand. The responsive and continuous control of input into the system is fundamental to the execution of any supply management plan and cannot be achieved without the aggressive cooperation of all purchasing activities. The basic need for responsiveness on the part of purchasing activities to supply and stock control problems has been noted in the discussion on the storage, distribution and control of stocks. Supply management involves the active participation of procurement information, experi-

ence and judgment in the formulation of supply policies and decisions.

80. Procurement Activities

a. Procuring activities within the Department of the Army are—

- (1) Technical Services (7).
- (2) Zone of Interior Armies (6).
- (3) Major Oversea Commands (5).
- (4) Military District of Washington, United States Army.
- (5) National Guard Bureau.

b. Principal purchasing officers of the Department of the Army are—

- (1) CHEMICAL CORPS:
U. S. Army Chemical Procurement District, N.Y.
- (2) CORPS OF ENGINEERS:
Chicago Procurement Offices, Corps of Engineers, Chicago, Ill.
District Engineer Office, St. Louis District, Corps of Engineers, St. Louis, Mo.
District Engineer Office, South Atlantic Division, Lumber Branch, Corps of Engineers, Atlanta, Ga.
District Engineer Office, Portland District, Lumber Branch, Corps of Engineers, Portland, Ore.
- (3) ARMY MEDICAL SERVICE:
Procurement Branch, Supply Division, Office of The Surgeon General, Washington, D. C.
- (4) ORDNANCE CORPS:
Army Ballistic Missile Agency, Redstone Arsenal, Ala.

Army Rocket and Guided Missile Agency, Redstone Arsenal, Ala.

Ordnance Ammunition Command, Joliet, Ill.

Ordnance Tank-Automotive Command, Rock Island, Ill.

Raritan Arsenal, Metuchen, N. J.

Redstone Arsenal, Redstone Arsenal, Ala.

Watervliet Arsenal, Watervliet, N. Y.

Rossford Ordnance Depot, Toledo, Ohio

Birmingham Ordnance District, Birmingham, Ala.

Boston Ordnance District, Boston, Mass.

Chicago Ordnance District, Chicago, Ill.

Cincinnati Ordnance District, Cincinnati, Ohio

Cleveland Ordnance District, Cleveland, Ohio

Detroit Ordnance District, Detroit, Mich.

Los Angeles Ordnance District, Pasadena, Calif.

New York Ordnance District, New York, N. Y.

Philadelphia Ordnance District, Philadelphia, Pa.

St. Louis Ordnance District, St. Louis, Mo.

San Francisco Ordnance District, Oakland, Calif.

(5) **QUARTERMASTER CORPS:**

Columbus General Depot, United States Army, Columbus, Ohio.

Military Clothing and Textile Supply Agency, Philadelphia, Pa. (Single Manager).

Military General Supply Agency, Richmond, Va. (Single Manager).

Military Subsistence Supply Agency, Chicago, Ill. (Single Manager).

(6) **SIGNAL CORPS:**

United States Army Signal Supply Agency, Philadelphia, Pa.

Fort Monmouth Procurement Office, United States Army Signal Supply Agency, Fort Monmouth, N. J.

United States Army Signal Procurement Office, Procurement and Distribution Division, OCSigO, Washington, D. C.

United States Army Electronic Proving Ground Procurement Office, United States Army Signal Supply Agency, Fort Huachuca, Ariz.

(7) **TRANSPORTATION CORPS:**

Transportation Supply and Maintenance Command, St. Louis, Mo.

81. Centralized and Decentralized Procuring Activities

Purchasing may be classified as either centralized or decentralized.

a. Centralized purchasing is where one agency controls all purchases for an item or a group of items. This is usually effected by either one military department or a jointly staffed and financed agency procuring supplies to satisfy the requirements of all the military departments. Under single department procurement, the department is generally responsible for the following:

- (1) Operational phases of procurement planning (phasing the submission of requirements consolidating or dividing requirements, analyzing the market, and determining patterns for the phased placement of orders in such a manner as to assure meeting the needs of the military departments at the lowest possible price to the Government, and at the same time avoiding unnecessary peaks and valleys of production).
- (2) Purchasing for more than one department, thereby eliminating competition between departments.
- (3) Contract administration, including arrangements for follow-up and expediting.
- (4) Acquisition of licenses under patents or other proprietary rights covering

the subject matter of the procurement and the settlement of patent infringement claims arising out of the procurement. Approval of the military department or departments whose funds are to be charged for the acquisition of licenses or settlement of claims will be obtained—

- (5) Arrangement for inspection.
- (6) Arrangement for transportation.

b. Responsibilities for procurement by a joint agency are set forth in the individual agency charter, such as that for a single manager.

- (1) The secretary of a military department may be designated as the single manager for a class of supplies, subject to overall guidance, policies, and programs of the Office of the Secretary of Defense, with the responsibilities and authorities assigned by DOD. Additions or deletions of specific items from the cognizance of the single manager are authorized only by the Office of the Secretary of Defense. Requests for change may be initiated by a military service and forwarded through the single manager for his recommendation, to the Secretary of Defense.
- (2) As single manager for a designated class of supplies, the primary responsibility of the secretary of a military department is to meet effectively the supply support requirements of the military services. He is also responsible for fulfilling other support responsibilities placed upon the Department of Defense for the designated class of supplies.
- (3) The secretary of each military department is responsible for the administrative support of all installations and activities under his jurisdiction, including administrative support required to perform those functions assigned by the single manager. Military departments furnish the single manager with complete data regarding administrative support costs in-

curred on the basis of missions assigned by the single manager. Such data is compiled on a comparable basis and, as soon as practicable, derived from a uniform expense classification and related to budget and apportionment requests.

- (4) The secretary of each military department is responsible for requirements determination, for supplies at retail level, and for control of reserve stocks at levels below the wholesale distribution level. Departmental planned requirements are submitted to the single manager in accordance with policies and procedures established by the Assistant Secretary of Defense (Installations and Logistics).
- (5) The secretary of each military department is responsible for full cooperation with the single manager in carrying out the provisions of the applicable directive establishing the single managership and designates an executive director to direct operations. The executive director is responsible to the Secretary of the Army through channels prescribed by the secretary.

c. Decentralized procurement is applied to many specified items. Under this concept the requiring installation procures its full requirements with no reference to a central authority for other than overall supervision required by law or regulation. Regional procurement is a decentralized method whereby an installation purchases for another installation within its assigned geographical areas of responsibility.

82. Procurement Pricing

a. Since a large part of all funds appropriated to the Army is spent for procurement of supplies and services, the close control of prices paid for the supplies and services is vitally important to overall financial management. In the civilian economy competition between products and companies in a relatively free market operates to determine prices, to reward the efficient producer and to penalize the inefficient. When the Army buys commercial goods, it is essential that procurement maintain these competitive conditions. On the

basis of dollar volume, however, most of the goods bought by the Army are noncommercial, ranging from adaptations of commercial items to supplies for which no conceivable market exists outside the military. In procurement of such military items, it is again essential to substitute valid incentives to efficiency and lower cost manufacture for the pressures of competition which are sometimes lacking in the production of these commodities, especially in the case of new items. The cost analysis and the pricing terms used in negotiated contracts, including the various repricing or redetermination provisions, incentive provisions, and cost reimbursement provisions, are all designed to cope with different aspects of this problem. A fixed price contract would always be used if it were always possible to establish final prices during negotiations which were fair to both the Army and the contractor. A fixed price contract is the easiest to administer and offers the contractor the greatest incentive to reduce his cost and conserve labor and material. However, in a dynamic economy such as ours where prices and conditions are constantly changing, it is impossible to determine fair prices initially for all items procured by the Army. Under a fixed price contract the contractor assumes all the risk of performing the contract at a price agreed to in advance. Where time for performance of the contract extends over a long period or where the contract involves the first large quantity production of a new item, the contractor seeks to protect himself against the risk of possible happenings which might increase his costs by including provisions against such contingencies in his proposed price. Under such a situation, if a fixed price contract with contingencies is negotiated, the Government

will have to allow contingencies in cost. A contractor, however, can often be induced during negotiation, to accept an escalator clause or a price redetermination clause as a means of reducing his risk and thereby reducing the price to the government. The redetermination clause affords protection against incorrect estimates. The escalator clause protects the contractor against increased cost of materials and labor during the fulfillment of the contract.

b. The redetermination or incentive type clauses are used only when—

- (1) The accuracy of the contractor's estimate is questionable because of lack of cost experience or the possible occurrence of significant contingencies.
- (2) The possible savings which might result from a price adjustment offset the administrative cost of redetermination.
- (3) The contractor's accounting system is sufficient to provide the cost information required to negotiate a fair price at the time of redetermination.

c. The contract negotiator is charged with the responsibility of selecting the type of contract best suited for the individual procurement. His choice will have an important effect on the ultimate cost to the Army. Emphasis is being placed on wider use of incentive type contracts in the Army. The incentive type contract gives the contractor a greater incentive to keep his costs down by allowing the contractor to share in the savings. A combination of incentive profit provisions with advanced techniques of cost analysis and projection may provide a more effective solution.

Section II. METHODS OF PROCUREMENT

83. General

Detailed procedures for performing the purchasing function have been published in considerable volume. Many legal and administrative restrictions growing out of these procedures confront the contracting officer. This section seeks to differentiate between formally advertised procurement and negotiated procurement and to highlight the effect

that each method can have on the supply system and on the national economy.

84. Procurement by Formal Advertising

a. Formal advertising has been the "law of the land" and the preference of Congress for nearly 100 years. Its proponents claim that its advantages are wider competition, lower prices, and fairer treatment of contractors.

These characteristics serve to illustrate the responsibilities of the sovereign state to the electorate and to the industrial society. Under a system of free enterprise, maximum competition must be encouraged. This competition should result in better products, better service, and lower costs. Although formal advertising is little used in business, because of the additional administrative cost and the general prevalence of commercial reciprocity resulting from "trade relations," leaders in industry expect advertising when conditions for its use exist, and also expect that when such conditions are absent the government will purchase without advertising, i.e., by negotiation, as do prudent businessmen. The mechanics of formal advertising proceed substantially as follows:

- (1) *Bids are solicited* by invitation and public announcement. The Invitation for Bid includes the identification of the item with appropriate specifications cited and with the delivery schedule which must be met. Invitations are sent to those prospective bidders whose names are on the Bidder's Mailing List for the item desired. A copy of the invitation is displayed in a public place such as the local post office or reception room of the contracting office. An announcement may be placed in the trade journals or newspapers likely to be read by other prospective bidders. Information is furnished to the Department of Commerce for inclusion in their publication, "Synopsis of U.S. Government Proposed Procurement." In short, the widest possible competition is encouraged.
- (2) *Bids are submitted* by those potential suppliers who are desirous of furnishing the goods or services the Government proposes to buy. Bidders must meet certain administrative requirements as to form and time of submission. The bid must be responsive to the invitation, to the extent that no exceptions are taken to the qualitative or quantitative requirements or to the delivery requirements.

- (3) *Bids are opened* in public at a preannounced time and place.
- (4) *Bids are recorded* on a "spread sheet" or abstract by entering the names of the bidders and the prices bid. This record is available for public inspection.
- (5) *Bids are evaluated* as to price, the bidder's financial and technical capability, skill, and experience; foreseeable costs and delays in connection with inspection and shipping; and other factors. Preaward surveys may be required.
- (6) *Award is made*, by written notice, to that responsible bidder whose bid, responsive to the invitation, will be most advantageous to the Government, price and other factors considered.

b. Thus it is seen that formal advertising is a procedure carefully circumscribed by statute and regulation and relatively inflexible. It enjoys wide usage in the construction industry, for example, due to a generally universal understanding of construction working drawings and building material specifications, reasonably through preliminary design, and fairly generous lead times.

85. Procurement by Negotiation

Many conditions arise in military procurement which demand speed in purchasing, tight security, design flexibility, specific makes or models, and intentional development of additional producers. These demands often cannot be met satisfactorily within the framework of formal advertising. Purchasing without advertising is referred to as "negotiation." Negotiation might better be called "informal competitive bidding." This more descriptive term would tend to emphasize the concept that negotiation is an informal method of determining the best price available. Negotiation procedures are less formal than advertising procedures but nevertheless are required to be competitive whenever feasible. In contrast to formal advertising, negotiation proceeds as follows:

a. *Requests for proposals* are sent to *selected suppliers*. If there is more than one

source of the desired items or services, proposals are requested from enough potential suppliers to insure competition. When such proposals may result in an award in excess of \$10,000, they will be promptly publicized in the Department of Commerce "Synopsis of U.S. Government Proposed Procurement, Sales and Contract Awards." When so specified, proposals contain cost breakdowns to show the offerers' estimates of labor, material, overhead, administrative and tooling costs, and profit, whereas a bid in an advertised procurement never discloses the component cost. This is so because a bid price is not subject to negotiation.

b. The contracting officer may summon any or all offerers to negotiation conferences. One at a time, the potential procedures are interviewed: to insure that they understand what is wanted; to determine in greater detail what elements were included in cost estimates and how estimates were computed; to discuss methods of manufacture; to clarify drawings and specifications; and to adjust any other point of possible misunderstanding so as to arrive at a "meeting of the minds." The Government negotiator sometimes is supported in such conferences by engineering personnel, price analysts, legal advisors, and other specialists needed for a proper representation of the public interest. The manufacturers' representatives are given an opportunity to revise their proposals on the basis of a fuller understanding of the requirement. This revision may include increases in some elements of the cost estimate and cuts elsewhere. The aim of the Government negotiator should be to arrive at a fair and reasonable price, fair and reasonable to the Government and the contractor. It is of utmost importance to be able to conclude ultimately with an agreement with one of the quoters which will provide some incentive for him to reduce his manufacturing and overhead costs below estimated figures, thereby consuming less material and manpower and maximizing his own profits as a reward for good management. The type of contract negotiated can contribute to this incentive. During negotiation, costs which seem inordinately high should be questioned and examined thoroughly to insure that they do not contain "fat." Costs which appear inordinately low should be examined just as thoroughly and

in the same searching manner, but for a different purpose. A hastily computed estimate which is manifestly on the low side can threaten the financial structure, even the existence of a business, thus also threatening timely delivery of needed items. The Government negotiator is just as interested in developing sound, reliable producers as he is in driving a bargain with the taxpayer's money. Hence, he must not attempt to drive quoted costs below a sound, realistic figure lest he leave the contractor with little or no incentive. Nor should the negotiation ever be allowed to become an auction, where each offerer knows every other proposal and revises his proposal on the basis of price-cutting instead of on the basis of intelligent cost analysis and honest cost reduction. Nor should the negotiation conference be allowed to degenerate into a haggling session. Negotiation, therefore, requires a high order of business acumen and judgment on the part of Government representatives. It is in this type procurement that the Government demonstrates to industry its ability to conduct its purchasing in a business-like manner.

c. The successful offerer is selected after a review and evaluation of finally revised proposals. As with advertised procurement, award is made to that responsible offerer whose responsive proposal will be most advantageous to the government, price and other factors considered.

d. The final contract describing the agreements reached by negotiation may take one of several forms. In formal advertising, contracts are limited to fixed price types with occasional provisions for price escalation; whereas, in negotiated procurement, a wide variety of contract types are used. These are described in detail in ASPR and APP, and can be classified as being based on a fixed price or on cost. Many variations can be applied to these basic types and in general include—

- (1) Firm fixed price.
- (2) Fixed price with escalation.
- (3) Fixed price with redetermination.
- (4) Fixed price with incentive.
- (5) Cost or cost sharing.
- (6) Cost plus fixed fee.

- (7) Cost plus incentive fee.
- (8) Time and materials (Labor Hour).
- (9) Letter contracts.
- (10) Indefinite delivery.
- (11) Additional Incentives—
 - (a) Performance incentive.
 - (b) Value engineering incentive.

Thus, it is seen that procurement by negotiation is essentially informal, simple in procedure, but complex in execution. It must insure competition unless there is only one source of the supplies or services available. In such cases, the negotiators' examination of quoted costs must be sufficiently thorough to make up for the absence of competitive cost data.

Section III. SCHEDULING PROCUREMENT AND PRODUCTION TO MEET DEMANDS

86. Procurement Lead Time

a. General. There is a direct relationship between the size of inventories on hand and on order that must be carried in the Army supply system and the length of procurement lead time. Procurement lead time is a direct constituent of minor secondary item and repair parts requirements. For principal and major secondary items also a longer procurement lead time means that supplies must be ordered earlier and that more stocks will be on order at any given time. Furthermore, the requirements forecast is made for a stated period following the first delivery of the materiel ordered. The longer procurement lead time becomes, the more distant the future period over which requirements must be forecast and the greater the possibility of error. Efforts to reduce procurement lead time to a realistic minimum therefore will be directly reflected both in the money obligated by the Army and in the accuracy of requirements forecasts.

b. Administrative Lead Time.

- (1) Administrative lead time comprises the period between the initiation of procurement action and the award of a contract. Administrative lead time on major items is taken up with the solicitation of bids or proposals, the negotiation and award of contracts, and the time required for obtaining approval of programs and related funds. The time allowed for contract placement, whether by negotiation or advertising procedures, cannot be arbitrarily reduced. If contractors are not permitted sufficient time to prepare adequate bids or proposals or if contracting officers are not given enough time for consideration of bids

or analysis of the proposals and negotiation with suppliers, poor procurement is likely to result. Reductions in contracting time, therefore, must be justified and defensible as good management practices. In some cases the negotiation of a definitive contract will be complex and will extend far beyond the established administrative lead time.

- (2) Where requirements are urgent, it may be desirable or necessary to award a letter contract, which enables a contractor to begin production before a definitive contract is negotiated. A letter contract has long been recognized as having a proper place in defense procurement. This is true when the interests of national defense, particularly during periods of mobilization, demand that the contractor be given a binding agreement which authorizes immediate commencement in the performance of the contract and negotiation of a definitive contract in sufficient time to meet the procurement need.
- (3) ASPR outlines a number of restrictions on the use of a letter contract. Some of the limitations are that they—
 - (a) Shall be used only after a determination that no other type contract is suitable.
 - (b) Shall not be entered into without competition when competition is practicable.
 - (c) Shall be superseded by a definitive contract prior to the expiration of 180 days from the date of the let-

ter contract or 40 percent of completion, whichever occurs first.

The ASPR also specifies certain minimum provisions which must be included in the letter contract. It is the policy of the Army to include as many definitive contract provisions in the letter contract as possible. The interest of national defense demands that the contractor be given a binding commitment so that work can commence immediately.

- (4) Another method which may be used in appropriate circumstances to reduce administrative lead time is the solicitation of stepladder quotations on different quantities within the total amount to be procured, in advance of definite determination of quantities required and issuance of an amended procurement directive. This requires, in the first place, a close working relationship between supply and procurement activities in determining the timing of demand and the range of quantities for which proposals will be solicited. In the past, however, this method has sometimes resulted in advance hiring and other preparatory commitments by manufacturers in anticipation of contracts for which funds were not yet authorized and which in some cases were never placed. Advance solicitation, therefore, requires qualification and full explanation to contractors that no commitment is being made by the Government. It is adapted primarily to the procurement of commercial items for which the contractor does not have to make substantial changes in his workforce or production methods.
- (5) Even after definite requirements have been determined and funds obligated, the solicitation of step-ladder quotations may assist in the closer correlation of demand with supply. Administrative lead time at present is rarely less than three months in all services. This means that when the review cycle period for an item is three

months or less, the requirements resulting from a subsequent review will often be determined before the procurement resulting from a prior review can be placed. Immediate communication of any change in requirements to the purchasing agency will result in modification of quantities on order before a contract is awarded. Any change at this point is far simpler and less costly than the processes of amendment or termination of contracts. If the contracting officer has solicited quotations on a stepladder basis, he is prepared to change the quantities to be ordered on relatively short notice.

c. Production Lead Time.

- (1) Production lead time is the period from award of a contract until the acceptance of the first delivery of materiel into the supply system. It depends primarily on the nature of the item, the contractor's production methods, and the state of the market. Since these factors are largely beyond the control of the Army, the most important procurement function in this area is to set a realistic production lead time at the outset and then ensure that this schedule is met by the contractor. The procurement agency is under pressure from two directions here; requirements analysts often request deliveries within too short a period. On the other hand, contractors faced with a tight delivery schedule in a request for proposals or invitation for bids will tend to bid or quote on schedules which they know they cannot meet in order to obtain the contract, if they expect that penalties for delinquency will not be rigidly enforced. The results of this situation can be serious. Not only does this mean exhaustion of supplies and emergency requisitions, but if deliveries are habitually behind schedule, requirements tend to become inflated in other ways in order to compensate for such delays.

- (2) In the review of procurement directives, the judgment and experience of procurement personnel should be fully applied in evaluating the realism of requested delivery schedules. If the schedule cannot be met under current procurement conditions, the requiring activity should be informed and a more realistic schedule determined before invitations for bids or requests for proposals are sent to manufacturers. After invitations or requests are distributed, it is difficult to withhold award from a low bidder or offerer who proposes to meet the requested delivery schedule, even though in the judgment of the contracting officer and in comparison with delivery schedules proposed by other bidders this schedule may be unrealistic. Once a realistic delivery schedule is agreed upon contractually, it is the responsibility of contract administration personnel to make sure that is met.
- (3) Long-run delays which may alter the standard procurement lead time for any item will affect requirements computations as well as immediate supply status. If requirements are to be increased because of increased procurement lead time, it is doubly important that a delinquent contractor should not receive a bonus in the form of a larger follow-on contract, for a condition which was caused by his own delinquency.

87. Delivery, Scheduling, and Destinations

a. General. Production lead time ends with the first delivery of supplies. In most procurements this and subsequent deliveries must be phased out to maintain adequate but minimum levels of stocks in the system. Again, the purchasing agency stands between the interests of the supply system in maintaining minimum inventories on hand and the interests of the contractors in obtaining a delivery schedule suitable to their production load and their financial needs. Sometimes contractors will not maintain a constant flow of deliveries in amounts small enough to stay within the

operating level. Their production may be seasonal, or the standard packaging unit may be larger than the amounts required. They may refuse to extend production over the period desired by the Army or they may do so only at a considerable increase in price. In all these cases, it may be necessary to accept supplies into the system in excess of operating levels. Where higher prices are involved, the interests of overall economy require that procurement premiums be balanced against the costs of storing larger inventories before a decision is made. Special permission must be obtained to accept stocks in excess of authorized levels.

b. Changing Destinations. Destinations to which supplies will be delivered are generally stated in the initial procurement directive and incorporated into the ensuing contract. This has an important effect on the selection of suppliers, since it is the contracting officer's task to select a source whose price, including shipment to the destinations cited, will be the lowest among the responsive bidders. Frequently, however, destinations must be altered before delivery is actually made. Demand fluctuates, and the depot or station to which shipment was originally directed may now be in an adequate or overstocked position. It is the responsibility of the inventory control point to reschedule deliveries to maintain so far as possible a balanced stock position at each storage point. In order to provide the inventory control point with data necessary for rescheduling, it is advisable for the purchasing agency to solicit bids and proposals initially both on an FOB origin and an FOB destination basis. In formally advertised procurements the Armed Services Procurement Regulation states that the invitation shall provide for bids on either or both these bases where carload or truckload lots are involved. Only with this price information can the inventory control point and the purchasing agency select the most economical course of action:

- (1) If the costs of transportation from the contractor's plant to the new destination are less than to the old destination, shipments must be diverted.
- (2) If the costs of transportation to the new destination are considerably

greater than to the old, it may be desirable in some cases not to divert shipments but to meet demand at the new destination from a nearer source of supply. The cost of maintaining excess stocks at the old destination must also be taken into account. This alternative will be particularly applicable to stocks of high bulk and low dollar value.

c. Changing Scheduled Quantities.

(1) Not only are destinations changed to correspond to variations in local demand, but in many instances total quantities on order must also be changed after contracts are placed to reflect changes in total demand. This is a crucial point in the concept of dynamic inventory control: the regulation of input into the supply system to respond as quickly as possible to upward and downward fluctuations in demand. When demand increases, existing contracts may be modified to increase quantities or new contracts may be placed. Because an upward trend in demand, if correctly interpreted by the requirements analyst, will throw large initial orders on the market until stocks are built up to the new levels, a procurement premium must sometimes be paid as low-cost producers become loaded with capacity orders. It is the task of the purchasing agency to hold this premium to a minimum, and, if necessary, to go back to the requirements analyst and determine whether orders can be phased to avoid excessive concentration. Very often an acceleration of the review and order cycle will provide a more accurate control than more infrequent placement of larger orders. The economical order quantity analysis will assist in keeping requirements computations current with increasing demand. When demand decreases, planned procurement may be canceled or modified. Because decreases in demand also have a cumulative effect, however, it may be necessary to cancel

or modify contracts already in existence, if any additional costs are less than the costs of carrying excessive stocks in the supply system. Here again, the procurement agency is responsible for analyzing and appraising the most economical course of action. There are three basic methods of reducing input into the supply system—

- (a) Contracts may be terminated completely for the convenience of the Government.
 - (b) Contracts may be “cut back” or partially terminated for the convenience of the Government. Individual deliveries may be eliminated or all deliveries proportionally reduced.
 - (c) Delivery schedules may be stretched out so as to deliver the same amount over a longer period of time.
- (2) Almost invariably the first alternative results in cost increases. Unless termination of a contract occurs before the contractor has performed any work or made any preparations, payment must usually be made for his set-up costs, materials inventories, work in process, and settlement expenses, thereby increasing considerably the price of any finished units. The second type of action, the cut-back, has generally a less predictable effect on prices than complete termination. If a contractor has incurred large preparatory costs and has made advance commitments for materials, the price of the remaining units is increased. In some cases, however, the materials inventory is bought at short range or may be applicable to other production. Here, it is often possible to make a settlement at little or no increase in cost. Unlike complete or partial termination, stretching out deliveries depends upon the consent of the contractor to an amendment of the contract. If this is agreed upon, it may sometimes be possible

to obtain the same or even lower prices for an extension of the delivery schedule. This depends on such factors as trends in the total volume of the contractor's business and the amount and pricing of subcontracts.

- (3) The purchasing agency, therefore, is frequently in a position to determine the action which will result in the lowest overall cost to the supply system. Because of the expense and the administrative workload of termination under present regulations, many terminations of production contracts

have applied to contracts of extremely high dollar value. If close control of inventories is to be attained, however, flexible methods of canceling, cutting back, or stretching out quantities on order must be extended to the hundreds of thousands of items for which individual dollar demand is relatively moderate. Total inventories of these items amount to billions of dollars, and the costs of handling and storing them form a significant portion of the total operating costs of the supply system.

Section IV. INDEFINITE DELIVERY TYPE CONTRACTS

88. General

a. There are three kinds of indefinite delivery type contracts: definite quantity, requirements, and indefinite quantity. The purpose of these indefinite delivery type contracts is to provide delegation of supply responsibility for freely available, commercial-type items from central to local control at depots and stations; to reduce quantities of such items on hand and on order; and to coordinate supply with fluctuating demand. It is still necessary, in many cases, to maintain central records of the quantities ordered so that demand data will be retained.

b. These contracts possess some of the advantages of central procurement, such as quantity prices, inventory control, and standardization, and yet provide for local ordering of commodities. Generally, a basic contract is awarded specifying its duration and unit prices, without indicating the total amount of commodities to be ordered, or, a schedule of deliveries. Such a contract may be placed centrally as directed by the commodity center, or the inventory control point, or may be placed by a depot to provide for the stations in its area.

c. Use of Indefinite Delivery Type Contracts represents an effort to simplify Army procurement procedure, particularly where there are unpredictable demands. The problem of pack-

ing and packaging of certain commodities is sometimes alleviated by these contracts. They are legal instruments with which to accomplish a particular purpose, namely, to procure with the least administrative burden and by the simplest procedure. Where items are of a commercial nature and there is ample and reliable supply, Indefinite Delivery Type Contracts are particularly useful.

d. The kinds of funds obligated differ slightly in each of the three types of contracts. All three result in fewer purchase transactions; direct shipments from vendor to user; savings in transportation and warehousing costs; and avoidance of the expense of supply and inventory control. Indefinite Delivery Type Contracts are covered in Part 11, Section 30, Army Procurement Procedure.

89. Definite Quantity Contract

This type contract specifies a fixed total quantity to be purchased, with delivery to be specified by orders placed during the time of the contract. The quantity to be delivered on each order is not specified in the basic contract since it varies with the needs of the using activity. Funds are obligated upon issuance of the basic contract. The Definite Quantity Type Contract permits variations both in particular quantities and deliveries according to variations in demand. Further, where calls are based upon station need, this type of contract elimi-

nates stockage and handling at the depot. It is similar to the ordinary fixed-price, definite quantity contract except that it allows delivery instructions to be deferred. It is useful where contractors, having established schedule manufacturing and production lines for an item, are able and willing to store finished goods until ordered. Such storage costs may be less expensive to the Army than the storage and distribution costs within its depot system. However, each decision between commercial or Army retention must be based on all relevant facts, including such considerations as item cost and availability, frequency of demand, and price difference, if any, between commercial retention and storage and distribution within the Army depot system.

90. Requirements Type Contract

a. This type contract specifies no minimum or maximum quantities and no delivery schedule or frequency of orders. From the standpoint of inventory control, the Requirements type contract provides the greatest latitude in coordinating constantly changing demands with supply. It provides only that orders may be placed, that they will be filled, and the unit prices of the items ordered. Funds are obligated by the user each time a delivery order is issued. It is to be noted that the basic contract does not commit the Government to buy any specific quantity and perhaps it may buy none; further, no obligation is incurred until the order of the using activity is placed on the contractor. The "procurement lead time" for such a contract, therefore, consists only of the period between stock review by the using activity and actual receipt of supplies, which may be only a few days. Less order information is needed than for central fixed-quantity procurement, where a quantity for any period must be ordered in advance pursuant to extensive demand information. The effect of forecast error is minimized and responsiveness to fluctuations in demand is greatly increased. In addition, if orders against Requirements Type contracts are placed by stations, stock levels need not be maintained at depots. Total inventory and associated carrying and administrative costs are greatly reduced.

b. Under the Requirements Type Contract the Government agrees that should it need the particular item or service during the term of the contract, it will procure it only from the contractor. In turn, the contractor binds itself to supply that need. For obvious practical reasons, a limitation should be specified in Requirements Type Contracts, both as to the maximum quantity of each delivery order, and based upon mutual agreement, the total number of orders which may be placed during a stated period. Dependent upon relevant factors, a limitation should be stated as to the maximum quantity which may be ordered during the period of the entire contract, unless this is impractical because of fluctuating or unknown requirements as well as the nature of the commodity. Some agreements, patterned upon a Requirements Type contract, permit the contractor to accept or reject the delivery order. Obligation of funds for payment would, of course, be dependent upon such acceptance or rejection. Unless based upon limitations of order frequency, or quantity maximums, such agreements should be carefully scrutinized, however, to determine whether there is in fact a contract. Because of the uncertain nature of Requirements Type contracts, suppliers may be reluctant to enter into them and some contractors may include a premium in their prices in order to offset the element of uncertainty.

91. Indefinite Quantity Contract

This type contract obligates the Government to order a prescribed minimum quantity of a commodity or service within a specified period of time. Funds are obligated only for the minimum quantity. In addition to obligating itself to order a prescribed minimum quantity, the Government reserves the right, by option, to order amounts in excess of the minimum quantity; funds are obligated when each delivery order is issued. For reasons of notice and fairness to the contractor, the option to buy amounts in excess of the minimum quantity usually include a limitation as to maximum amount of each delivery order and, if practical, their frequency. Where possible, a limitation should be specified as to the total amount or quantity which can be ordered under the contract during its term.

Section V. CONTRACT ADMINISTRATION

92. General

The administration of a Government contract may be accomplished by the contracting officer, contracting officer's representative, (COR), or other person designated to administer the contract. It is here that all previous actions relating to the purchasing function are tested. Administrative problems are minimized if contractual terms have been defined clearly and if the contractor is financially and technically capable of performance. Effective contract administration assures that the contractor performs in accordance with the terms of the contract, and that the obligations of the Government, as specified by the contract, are fulfilled. The responsibility for proper administration of Government contracts rests with the contracting officer. In the discharge of this responsibility, the contracting officer must rely upon engineering, accounting, legal, quality control and procurement inspection, and other technical specialists to provide assistance in insuring that the interests of the Government are fully protected.

93. Functions

The functions of contract administration include, but are not limited to: materials expediting; issuance of Government-furnished materials or property; financial assistance; quality control and procurement inspection and acceptance; price redetermination; and negotiating contract modifications.

94. Quality Control and Procurement Inspection

a. Function. Quality control and procurement inspection are probably the least appreciated functions of contract administration. Regardless of the mutual respect and amicable relationship between the contractor and contracting officer, the Government must insure that items purchased, manufactured, and delivered satisfy the requirements set forth in contracts. The failure of an item to meet contract requirements should result in rejection, otherwise subsequent failure to perform effectively in the field will produce a substantial loss of money, time, and tactical effectiveness. Technical requirements of the contract set forth

in specifications are the standard by which products are measured. Therefore, they must be exact and describe clearly what is wanted. A specification is defined as follows:

"A clear and accurate description of the technical requirements for a material, a product, or service, including the procedure by which it will be determined that the requirements have been met."

b. Quality Control and Inspection Personnel. Historically, quality control and inspection personnel have been commodity specialists technically oriented in the details of measuring and recording the quality of supplies and in making acceptance decisions. Difficulties have arisen when specifications were ambiguous or over-strict, because, in each instance, there was either necessity for the inspector, or, pressure on the inspector, to make decisions for which he should not have been responsible and probably was not too well trained. A current program places more responsibility for detailed inspection and quality control operations on contractors. Government inspectors are responsible for assuring that the contractor actually performs effective inspection and quality control through audit of his operations and through verification inspection of the supplies. This has created a need for a different caliber of government inspection personnel. In addition to adequate technical knowledge, government inspectors in the future will have to have an ability to analyze inspection and quality control systems. On the basis of such analysis, supplemented by a smaller amount of product inspection than heretofore done, government inspectors will be able to more economically make acceptance decisions.

c. Army Quality Control and Inspection Policy.

- (1) Basic Army policy on inspection requires that the procedures to be used in determining compliance with requirements shall be set forth in specifications. Quality Assurance provisions set forth in specifications are limits on the severity of the procedures that may be used by the Govern-

ment. This policy which sets a limit on Government inspection is in direct accord with a Comptroller General's decision which states in part:

"A substantial majority of the cases upon the subject have agreed in holding that an acceptance by the buyer of one or more shipments of goods defective in quality does not, in the absence of circumstances raising an estoppel, amount to a waiver of the defect as to the entire contract, precluding the buyer from rejecting subsequent shipments similarly defective. It is implicit in most of the cases as holding, however, that such an acceptance may preclude the rejection of subsequent shipments of the same quality where the circumstances lead the seller to reasonably believe that goods of the kind delivered will be accepted in the future, and he changes his position to his disadvantage in reliance on such belief."

(2) Inspection by Army personnel of each operation in every plant, and 100 percent inspection of every article produced, is not only impossible but is an unwarranted duplication of the efforts of the contractor's inspection personnel. Consequently, the Army insists that its contractors establish and maintain inspection systems which are acceptable to the Government. One of the important decisions to be made by contracting and inspection personnel is the determination of the extent to which the Government is willing to place reliance on a manufacturer's quality control system thereby reducing the amount of physical inspection to be done by Government personnel. Army policy for such reduced inspection is set forth in Army Regulations which state:

"Where there is satisfactory evidence of high quality of production which is the definite result of an effective quality control and inspection system, the amount of Government in-

spection will be adjusted to a minimum consistent with proper assurance that the supplies accepted conform to the quality requirements established by the procurement documents."

(3) Inspection is but one of the methods by which quality is determined. Inspection, therefore, is one phase of the broader concept of quality control which includes not only the examination of finished articles for defects but also includes intelligent and aggressive action for the elimination of causes of defects. It has been said that quality cannot be inspected into a product. Inspection is only an after-the-fact measurement of manufacturing performance. Unless there is a feedback of the information gained from inspection, quality will continue at the existing level.

d. Inspection Interchange Agreements. An inspection interchange agreement is a commitment between procurement inspection activities whereby a single inspection activity provides all of the required government procurement inspection servicing at a contractor's plant. This is done in order to avoid duplication of effort and the extra burden on the manufacturer of having representatives of several different Government agencies in his plant. Substantial economies have already resulted from the interchange of inspection services and it is anticipated from past experiences in this field that substantial savings will continue in the future.

e. Economic Considerations. Finally, the underlying theme of all efforts to control quality and the economic rule which determines the amount we are willing to pay for inspection is: *The cost of quality must be weighted against the value of quality.* This question of weighing cost of quality control against its value is an extension of a series of such weighings. Historically, design engineers have always been responsible for making optimum use of material, skill, manpower, and facilities through adjusting the strictness of the demands of their design, e.g., a design engineer calling for a ground or highly polished surface

on other than a working surface, or where necessary to enhance the appearance in commercial application, would have failed in his duty. What has not been so well understood in the past is the fact that repetitive production or mass production of supplies will, in all probability, result in minor deviations from design requirements. Since design requirements normally have built into them safety factors, such minor deviations are of little import. When a manufacturing process is producing a certain percentage of defectives in every lot of production, it costs money to reduce that percentage of defectives. When we understand that probably these near-misses (failures) to comply to all the design requirements will not result in failure of the item to

operate, we begin to have an understanding of weighing quality as it relates to design and the value of that quality. There is a point beyond which it is no longer economical to reduce the percentage of defectives. It may be cheaper to make repairs or replacements in the field to a small percentage than to incur additional costs in the inspection and quality control system to reduce or eliminate the percentage. An exception to this may be found in the case of parachutes, lifesaving equipment, and other items of comparably critical nature. This concept, the cost of quality versus the value of quality, is the underlying management principle associated with inspection in all its forms and should be the basis on which inspection policies are determined.

Section VI. GOVERNMENT ASSISTANCE TO CONTRACTORS

95. General

In the procurement of military materiel, conditions often arise which complicate the relationships between the Government and its suppliers. The nature and complexity of some military items, the controlled use of raw materials, the extraordinary quantities sometimes required, and military urgency, all contribute to an unusual buyer-seller relationship between contractor and contracting officer. These same factors require the Government to extend various forms of assistance to its contractors who are asked to perform unusual feats of production and delivery which are above and beyond their normal activities. Government assistance can take many forms such as providing technical assistance, furnishing components, materials, or machine tools from Government stocks, providing tax relief through accelerated tax amortization of plant and equipment, expediting the availability of controlled critical materials, providing for tests at Government laboratories, and providing financial assistance.

96. Government Furnished Property

a. Whenever absolute uniformity in an end product is desired, the Government may elect to furnish from its own stocks or from a single source the necessary components or materials to insure physical or functional consistency in the end item. In the purchase of truck-mounted

equipment, such as crane-shovels, air compressors, and similar items, it is usually desirable to have some standard military chassis for the various superstructures. In such cases, chassis are shipped to equipment manufacturers as Government-furnished property (GFP). Similarly, when the Government has absorbed all of the production of a particular industry for an item or class of items, it accepts the responsibility of furnishing those items to all its contractors. In the manufacture of certain highly complex military items, the Government may have difficulty locating a supplier able to finance a government contract. In such cases, the Government may have to relieve the pressure on the contractor's limited working capital and furnish materials from stock or from a separate contract with another producer. Probably one of the most common forms of GFP is handled by special tooling clauses in supply contracts. These clauses provide for contractor acquisition of dies, jigs, and fixtures to be used, and probably consumed, in the performance of a particular contract. Although the contractor actually purchases or fabricates the special tooling, it is paid for by the Government as a separate item in the contract and the Government reserves the right to take title and direct the disposition of the residue when the contract is completed. Additionally, Government-owned machine tools are available on

lease agreement from the Army Industrial Equipment Reserve.

b. All of the foregoing demonstrate a form of "bailment," to use a legal term. As custodians of someone else's property, in this case the Government's, contractors receiving GFP are obliged to exercise certain safeguards and perform certain accounting so that the contracting officer, the Government's representative, may know the status and employment of the Government property which is in the hands of the contractor. It is indeed difficult for a contracting officer to insure that optimum use is being made of all Government-furnished materials, components, and tooling in the hands of contractors in so many different places. The regulations concerning these matters are contained in appendix B to the Armed Services Procurement Regulation. One of the most difficult elements in contract administration is to insure compliance with these regulations.

97. Expediting Assistance

In some quarters, the word "expediting" carries an unfavorable connotation. To some it implies pressure to do more than a normal day's work, requests for faster-than-normal methods of delivery, and similar hurry-up measures. In the broader sense, however, expediting can be thought of as assisting the contractor in tying loose ends together, and assuring that each of the contributors to a project has the technical know-how and knows the scope and magnitude of his responsibilities. Probably the greatest service that a contracting officer or a contracting officer's representative can perform, as a matter of expediting, is in the field of critical materials. During times of emergency, Defense Order (DO) Ratings are required in order to obtain certain types of steel and other critical materials. The Business and Defense Services Administration (BDSA) has continued a priorities system generally called the "D. O. Rating System." Under this system rating and allotment numbers are used to identify, and give preference to contracts and orders for defense contracts. When the regular procedures of the Defense Materials System and the rating system will not obtain materials in time for Department of Defense Programs, the contractor may apply for special

assistance from BDSA through the contracting officer. It is also possible to divert materials from one program to another based on relative urgency of their production or rearrange production schedules to meet the urgent needs of essential items. To the extent, therefore, that expediting harasses a contractor by throwing his production schedules out of kilter, it is not really assistance; however, to the extent that expediting can be beneficial in helping the contractor meet his delivery schedule, it then qualifies as true assistance. Contractors resent Government "meddling" in matters which they have demonstrated their ability to handle by themselves.

98. Financial Assistance

It is in the realm of financial assistance that the Government can act to improve the working capital position of a contractor and thus enable him to produce faster and more efficiently, where without help, he may be unable to fulfill his contractual obligations. Assisting a contractor with his working capital needs is referred to as "Defense Contract Financing." This usually takes the form of private bank loans, customary progress payments, guaranteed loans, unusual progress payments, or advance payments. Department of Defense policy states a preference for these forms of Defense Contract Financing in the order named.

a. *Private Financing.* Although private financing may be accomplished by various means, assignment of claims under a Government contract is extensively used as a method of private financing. This method of financing benefits the Government by keeping it out of the banking business. Once the assignment is made, the bank has the task of administering the financing. Another desirable feature of this type of financing is that it quickly establishes the contractor's credit at a bank, so that he does not have to wait for his money. No time is consumed in lengthy investigation by Government agencies before the loan is approved. The bank to whom the assignment is made receives all payments direct from the Government. The contracting officer can be of assistance in a contractor's negotiations with his bank by certifying the existence and nature of the Government contract and by expressing

the urgency which is attached to the procurement in question.

b. Customary Progress Payments. Progress payments are payments made to a contractor as work progresses under a contract. Progress payments, based on accumulated costs, are considered to be reasonable and necessary in certain procurements. Another type of progress payment is that made on construction contracts based on a percentage of completion of work under the contract. Progress payments are particularly applicable to contracts for the production of items having a long production lead time. In these cases the contractor is reimbursed for a percentage of the costs incurred before the actual delivery of any items from production. For short lead time items, those in production less than 30 days, progress payments in effect become partial payments, that is, payments for partial deliveries. Progress payments require careful administration to insure against overpayments. In all cases, physical progress of the work should be evaluated periodically to assure that the progress payments are fairly supported by the value of the work accomplished on the undelivered portion of the contract.

c. Guaranteed Loans. The guaranteed loan, popularly called the V-loan, is made by a bank to a Government contractor and is guaranteed up to a certain percentage by the Government. Current policy does not encourage guarantees of more than 90 percent of the amount loaned except in very unusual circumstances. In this type of loan the Government shares the risk with the bank by underwriting a certain percentage of the loan and also shares the interest paid by the contractor. By sharing the risk, the Government also sustains its share of losses incurred in case the contractor defaults. This

involves the use of Government funds and so justifies the Department of Defense preference for private financing. The records indicate an extraordinarily small number of defaults in the V-loan program due primarily to careful screening of applications by the technical services, the Comptroller of the Army, and the Federal Reserve Board.

d. Unusual Progress Payments. Progress payments at rates exceeding 85 percent (90 percent for small business firms) of direct labor and material costs, or exceeding 70 percent (75 percent for small business firms) of total costs are regarded as unusual and require special approval of the head of a procuring activity, or of a general or flag officer designated for that purpose. Final approval is required by the headquarters of the military department concerned. Contractors are required to demonstrate fully their actual needs for such payments.

e. Advance Payments. Advance payments are payments made to the prime contractor by the Government in the form of advances prior to and in anticipation of performance under a contract. Advance payments may be authorized up to the full amount of the contract price. They differ from progress payments which are made as a result of the completion of specific portions of work under the contract. Advance payments differ from guaranteed loans and private financing in that advance payments are public funds, the money being put up entirely by the Government. Advance payments must be limited strictly to the needs of the contractor and closely related to his reimbursement cycle. The official Army policy on advance payments is that they be given only if no other method of contractor financing can be arranged.

Section VII. FACILITIES CONTRACTS

99. General

As a general policy, the armed services prefer to do business with contractors who can furnish their own production equipment and facilities. However, production facilities may be provided by the Government when such action is considered necessary or desirable in the

public interest. In the case of contractor-owned facilities, a portion of the acquisition cost is amortized just like any other manufacturing costs; however, Government-furnished facilities are the property of the United States, and the contracting officer specifies their disposition upon completion of the contract.

100. Nature of Facilities

Facilities furnished are machine tools, real property, etc., that are used to produce goods or services; they are usually of such nature that there is a residue, in varying stages of depreciation, at the end of a contract. Facilities do not include "special tooling,"—the dies, jigs, and fixtures, that are consumed in the production process and are generally usable by only one contractor and relatable only to his particular production method. Since facilities are not usually consumed on a single contract, it is appropriate that their total cost should not be considered part of the contractor's proposal. Hence, the provision of facilities is usually handled as a separate agreement, not part of the supply contract.

101. Contract Provisions

a. Facilities contracts provide that title to all facilities furnished to the contractor by the Government shall remain with the Government, and that title to facilities acquired by a contractor for Government account, shall be vested in the Government at the earliest practicable time.

b. Facilities contracts allow the contractor to use the facilities only in connection with specific contracts.

c. Other provisions of facilities contracts require the contractor to perform the following services, without cost to the Government.

- (1) Maintain adequate property control records and a system of identification of all facilities.
- (2) Protect, preserve, maintain, and repair the facilities in accordance with sound industrial practice.
- (3) Notify the contracting officer, within 30 days after any facility becomes lost, damaged, destroyed, no longer usable, or no longer needed for the performance of Government contracts.

102. Standby Provisions

A facilities contract may include provisions for maintenance or storage of the facilities, upon completion or termination. Facilities thus placed in layaway status are reported to the Chief of Ordnance who maintains the central inventory for all Army-owned production equipment.

Section VIII. INDUSTRIAL MOBILIZATION PLANNING

103. General

a. Realistic war plans must include a careful consideration of the availability of adequate logistic support. In a world of steadily advancing technology, logistic support on a national scale becomes dependent upon the industrial potential of the country. Current concepts for accomplishing peacetime planning with industry for production in time of emergency consider two possible situations for future war.

- (1) A general war with severe damage to U.S. production.
- (2) A limited war of indefinite length with no damage to the production base.

b. Planning with the industry is geared to support both eventualities with specific action prescribed to enhance the Army's readiness position in either situation. Since this industrial potential is not geared in peacetime to satisfy the needs of war, it becomes necessary

to make positive plans for converting the nation's industrial output from civilian goods to military goods. To accomplish this planning and to provide for an orderly conversion of the industrial complex from peace to war, there has been developed an Industrial Mobilization Program. This program is based on the coordination of military needs and industry capability and is designed to locate the production capacity needed and to allocate that capacity for the manufacture of certain key items in time of emergency. The theme of the program is *time*. All elements of the Industrial Mobilization Program are directed toward reducing the amount of time which it takes for any given industry or plant to convert from civilian production to military production. One obvious method of gaining time and speeding up the date of logistic readiness would be the acquisition during peacetime of sufficient mobilization reserve stocks to satisfy materiel needs until

production could build up to meet mobilization requirements. The cost of this method would be staggering and prohibitive because of the threat to national economic stability. In addition to tying up huge amounts of capital by purchasing mobilization reserve stocks, another disadvantage accrues. This is obsolescence. Modern tanks, guns, missiles, and other important implements of war undergo constant development and improvement. As new models are turned out, the old ones become less desirable and less effective and eventually must be relegated to the status of obsolescence. There are items with less perishability of design and less volatility in development that can be acquired and stored with reasonable expectancy of use before being overtaken by technological programs. But for most items, mobilization planning provides for the development and training of production personnel and production facilities in the manufacture of specific items. This latter approach is an effective policy for providing the greatest possible industrial potential to be convertible in the shortest possible time in order to provide the logistic support necessary for approved war plans.

104. Organization for Industrial Mobilization Planning

a. The Office of Civil and Defense Mobilization (OCDM) was established in the Executive Office of the President for the purpose of providing one central agency to exercise strong leadership in our national mobilization effort. OCDM is the top planning body for industrial mobilization and acts to apportion available material and production resources to satisfy both civilian and military needs. The director of Civil and Defense Mobilization, being a member of the President's National Security Council, is able to give effect to the desires of that body in the formulation of overall defense mobilization plans.

b. The Business and Defense Services Administration (BDSA) of the Department of Commerce performs the mobilization functions which were once the responsibility of the National Production Authority (NPA). BDSA provides an organizational nucleus capable of expansion into a production and materials control agency in the event of an emergency.

c. The Defense Materials Service of the General Services Administration is responsible for procurement, storage, and handling of the national stockpile of strategic and critical materials. This stockpile includes those materials determined by OCDM to be critical as to availability and of strategic importance to any defense effort. Designated items and quantities are referred to OCDM for final consideration and approval for stockpiling.

d. The Assistant Secretary of Defense (Installation and Logistics) is responsible for carrying out the National Industrial Mobilization policies of OCDM and for developing the overall policies and procedures relating to industrial mobilization planning in the Department of Defense.

105. Army Industrial Mobilization Program

The Army's Industrial Mobilization Program incorporates many separate activities and many different types of plans. The following are the more important of those activities and plans:

a. Industrial Readiness Planning Programs.

b. Industrial Preparedness Measures.

c. Layaway of production equipment and facilities.

d. Central inventory of reserve production equipment.

e. Computation of mobilization requirements.

f. Industrial Defense Program.

g. Preparation of production data, inspection manuals, bills of material, and other information related to production planning.

106. Industrial Readiness Planning Program

a. This program includes the peacetime planning with industry for the production of critical items that will be needed for mobilization. The general objectives of the program are: First, to provide for the timely and effective transition of industry from peace to war-time production; and second, to coordinate the requirements of two or more government agencies or military departments for the output of a single plant. The program applies only to those items which in war are necessary for survival and retaliation, the maintenance of health, or combat efficiency. In addition to these characteristics, any given item, to be con-

sidered critical, must qualify under one or more criteria published from time to time in departmental regulations. It is necessary to scrutinize closely the real criticality of an item because planning is expensive and care must be taken to avoid planning for items which are solely for the purpose of comfort, convenience or morale, or for items which are generally identified as shelf-type items, or those which can be produced by existing facilities without undue delay.

b. Once criticality has been determined; the Industrial Readiness Planning Program operates to discover sources of supply or manufacture, to coordinate the requirements of the various services and departments, to foster mutual understanding between industry and the government concerning mobilization problems, and to develop overall plans for the optimum employment of the nation's industrial potential.

c. Since the Industrial Readiness Planning Program is a voluntary one so far as management is concerned, it behooves the individual government departments to be realistic, consistent, and conservative in their estimates of mobilization requirements. Mutual respect and confidence should grow out of this program since it is hoped that the planning relationships will grow into good working relationships in time of war. The Armed Services Procurement Planning Officer (ASPPPO) selected for each plant represents the one or more Claimant Agencies (government departments) which have an interest in the production capacity of the plant. This individual is responsible for coordinating the government's requirements and the manufacturers' capabilities. Out of purposeful, intelligent coordination will come realistic schedules of production during mobilization.

d. It is intended that Industrial Readiness planning will be as complete and detailed as the availability of personnel and funds will permit, in order to achieve the greatest amount of readiness for mobilization. Planning with a commercial firm includes planning for subcontract items, major subassemblies and components, as well as repair parts. Initial attention naturally goes to those items where production bottlenecks are foreseeable or anticipated. Thus it is seen that a continuous evaluation needs to

be made of item criticality in order that unnecessary planning is not done.

107. Industrial Preparedness Measures

a. *General.* When a new item is to be produced for the first time in quantity, when a new facility is called upon to produce any item for the first time, or when an item is to be produced by a new production process, it may be necessary to contract for certain production planning, production engineering, or pilot production runs. These actions are referred to as Industrial Preparedness Measures and are designed to shorten the span of time it would normally take a manufacturer to get into production in an emergency.

b. *Types of Industrial Preparedness Measures.* For convenience of description, Industrial Preparedness Measures are sometimes referred to as exploratory measures, engineering measures, and production measures.

- (1) *Exploratory measures* are primarily studies which explore the extent of production capability in a plant, identify the problems which are likely to arise during production, determine possible modifications to the production process to enable the plant to make exactly what is wanted in the quantities desired, and any other plans that can be made as a result of a "desk study" of the production problem involved.
- (2) *Engineering measures* generally include the redesign of items for mass production, redesign for the most available suitable material, development of new methods of manufacture to save time or reduce scrap, development of plant layout, production equipment lists, flow charts, routing sheets, bills of material, and lists of potential subcontractors, the establishment of pilot production lines, and any other measures short of actual production.
- (3) *Production measures* provide for the actual production of limited quantities in order to test, prove, and improve designs, manufacturing processes and production equipment, acquire the

maximum technical know-how for later production in larger quantities, and uncover actual production bottlenecks not foreseeable or anticipated up to this time.

108. Layaway of Production Equipment and Facilities

a. Definition. The term "layaway" refers to the act of placing in reserve status items of production equipment, or even complete industrial facilities, which are essential for mobilization production but are not needed for current requirements. Layaway can take several forms. The equipment can be laid away in place under power and maintained in a constant state of readiness to be put into operation. It can be laid away on the site in preserved storage, in place but under wraps and needing only to be deprocessed, hooked up, and turned on. Equipment can be removed from its place in the production line to nearby storage or a central storage point at some distance. Combinations of these means of layaway are also possible.

b. Some Problems of Layaway. The Department of the Army has a huge investment in production equipment and facilities which were reactivated from reserve status or newly acquired for the Korean production buildup. As this equipment and these facilities became idle, due to downward adjustment of current production programs, it became necessary to provide for their layaway in reserve status; to dispose of them as excess; or in certain cases to lease the Government-owned equipment and facilities to contractors for commercial production. However it is done, layaway and subsequent maintenance in reserve status are costly. It is therefore essential that each proposed layaway project be carefully considered before deciding on layaway and long term storage in reserve. The first problem is to determine whether the capacity represented by the Government-owned equipment and facilities is essential for mobilization. Factors to consider in making this determination include military importance of the product; mobilization requirements for the product; availability of other capacity; status of the product with respect to obsolescence; and quantity of mobilization reserve stocks of the item on hand. Another important consideration is the status

of the production equipment itself. Equipment to be laid away should be up to date by present industrial standards and suitable for the job to be done. It should also be in such condition as to require a minimum of rehabilitation for full capacity operation.

c. Inventory of Production Equipment. The Government has acquired a substantial inventory of production equipment primarily as a result of facilities contracts negotiated with manufacturers and materiel suppliers. In order to provide for coordinated and effective use of this equipment it has been necessary to set up a central inventory of production equipment. This inventory is maintained by the Chief of Ordnance. Policy guidance on the utilization of Government-owned production equipment comes from the Office of the Assistant Secretary of Defense (Installations and Logistics).

109. Integration of Current Procurement and Industrial Mobilization Planning

a. General. The Production Allocation Program described earlier provides for an orderly allocation of industrial capacity among the three military departments, and for the peacetime development of mobilization production schedules with each planned producer for items to be produced in the event of mobilization. The placement of current procurement contracts with these planned producers for the planned items would serve to establish, maintain, or improve their capabilities to produce under mobilization conditions. This principle is established to provide for integration of current procurement with the Production Allocation Program. However, the requirement for competition and the overriding need of the Army to obtain the most for its limited peacetime procurement dollars makes it necessary in many cases to place contracts with other than the planned producers.

b. Procedures. The policies of the Department of Defense on integration of current procurement and industrial mobilization are carried out at the various departmental levels by the following means:

- (1) Award of contracts by procurement offices, wherever practicable and feasible, to spread the industrial base by—
 - (a) Placement with planned producers, other than past producers.

- (b) Placement with current producers to maintain a "hot" base.
- (c) Use of "leader company procurement" to develop additional planned capacity.
- (2) Establishment and maintenance of active liaison among procurement, mobilization planning, and research and development activities, and coordination of actions taken with respect to these functions.
- (3) Cooperation between planning and procurement personnel and interchange of information between them in their respective fields.
- (4) Consultation of research and development activities by procurement and planning personnel in order to keep procurement and mobilization plans abreast of current technological developments.
- (5) Submission by the procurement activity to planning offices of essential data on procurements as they occur. These data include copies of Invitations for Bids, requests for proposals, bidders' mailing lists, bid abstracts, contracts and contract modifications.
- (6) Submission by the planning activity to procurement offices of essential data on mobilization planning as it develops. These data include lists of planned producers for planned items on preferential planning lists, information on status and progress of planning, information on contracts negotiated with planned producers for layaway of tooling and equipment and for industrial preparedness measures.
- (7) Placement of planned producers on all bidders' lists for negotiated and advertised procurement of the planned items.
- (8) Notification of ASPPO's with regard to placement of contracts with facilities in which other claimants have capacity allocations.
- (9) Request for production allocations or revisions in allocations or preferential items when awards are made to producers not in the planning program, or when the awards do not correspond to the planning previously accomplished with the facilities.

Section IX. MILITARY MANUFACTURING FACILITIES

110. General

In addition to procurement from civilian producers, the Army supplies a certain portion of its needs from its own manufacturing system, including arsenals, factories, and manufacturing depots. For the most part, this manufacturing organization produces items of a purely military nature, and in present periods of relatively high requirements it supplies only a small proportion of the Army's demands for these items. From the standpoint of supply management, the importance of Army-operated plants and arsenals lies principally in three areas: research and development, pricing information, and flexibility of supply.

111. Research and Development Information

The Army arsenals and plants are an excellent source of research, development, and pro-

duction engineering information. The research and development work can be continuous, in contrast to individual research projects undertaken by independent firms which are not so well experienced because of the noncommercial nature of the items. The Army facilities can employ a trained cadre of personnel on a full-time basis, devoted to nothing but the study of the particular items for which the facility is responsible. The information so obtained is then provided to private contractors in the form of improved specifications and techniques.

112. Pricing Information

As a source of pricing information to aid Army contracting officers, the Army facilities are of limited value. They should only be used as a source of direct manufacturing cost information and not for total unit costs. Overhead

costs of the Army facilities are not entirely comparable with those of private contractors. Methods of allocation are different, and the research and development mission of Army arsenals and plants is often difficult to segregate from production. Direct labor and direct material costs should be comparable, however, since they depend upon the efficiency with which labor and materials are utilized rather than the volume of production or the extent of research and development. The direct labor cost may actually be lower for the Army facilities because of the availability of special materials handling equipment and greater experience.

Section X. ADMINISTRATIVE OBSTACLES IN GOVERNMENT PURCHASING

114. General

Probably the one characteristic which distinguishes the procurement function from other elements of the supply system is the degree to which procurement operations are closely circumscribed by law. The Congress and the Executive Branch of Government are keenly aware of their obligations and responsibilities to the American people. This awareness is reflected in the legislation, executive orders, and policy directives which are designed to safeguard the public treasury and outline the methods by which the most may be obtained with procurement dollars. Due to the size and complexity of the government, full coordination and unanimous agreement are not always possible. This can result in occasional conflicts in direction. Contracting officers are encouraged on the one hand to do business with reliable responsible producers; and at the same time they find themselves under considerable pressure to give contracts to unproved producers so as to broaden competition and the production base.

115. Statutes

Several statutes pertaining to labor have been enacted. There are statutes prescribing minimum wages, maximum hours, safe and sanitary working conditions, and provisions for the use of child labor and convict labor. There are laws governing payroll deductions, frequency of payrolls, prohibition of rebates, and requir-

113. Flexibility of Supply

Army plants and arsenals provide a limited flexibility in the supply of the items for which they are responsible. Production lead time is no less than for private contractors, but initial production orders and changes can be put into effect with less delay than when a contract is involved. It is difficult to predict the particular sizes of uniforms which will be required by troops. At the Army Clothing manufacturing center, therefore, production schedules are determined many months in advance, but the schedules of specific sizes in a lot are subject to change within two weeks of the time manufacture is scheduled to commence.

ing the payment of wages at certain established rates. One of the oldest labor laws now in effect, the Eight-Hour Law of 1912, requires time-and-a-half pay for work in excess of eight hours per day. Nondiscrimination in employment is required so that no potential employee may be discriminated against because of his race, religion, color, or national origin. At the same time, there is legislation in effect prescribing the limitations on employment of aliens and establishing a set of fair labor standards. In addition, there is legislation specifying military security requirements for contractors who are producing items of a classified nature. Restrictions on purchases of items containing foreign material are outlined in the Buy-American Act. There are additional restrictions on the purchase of certain supplies not mined or produced in the United States.

116. Contracts

In accepting government contracts, contractors must accept contract clauses which embody the foregoing restrictions. Contractors are governed by the provisions of the Sherman Anti-Trust Act; there are also directives prescribing the extent to which blind-made and prison-made supplies can be purchased. Recognizing the economic desirability of placing contracts in areas where there is a labor surplus, contracting officers are advised to place procurement in such areas to the extent practical. Areas suffering flood damage and other

disasters are similarly recommended to be the recipients of government contracts. However, in these latter two situations, no price differential is allowed in order to favor the labor surplus or the disaster area.

117. Small Business Act

Probably the one piece of legislation which affects the largest number of producers and the largest number of contracting officers to the greatest extent is the Small Business Act. In

this legislation it was the express desire of Congress that a fair proportion of all defense purchases should be made from a small business. Among such firms many reliable producers have been discovered, developed, and utilized; but among them also are many who never become financially stable. Contracting officers are hard put to "second-guess" the outcome of contracts with small business and must rely heavily on the advice of the field agents of the Small Business Administration.

CHAPTER 7

STANDARDIZATION, CATALOGING AND COMMODITY CLASSIFICATION

Section I. GENERAL

118. Definition

There are approximately one million cataloged items in the Army supply system, of these about three-fourths are centrally procured and stocked in the depot system. Another two or three million items *could* be procured if the Army regularly stocked some of each and every item it uses. It must, therefore, be determined just what items will be procured, stocked, and issued. "Standardization" is the general term applied to the process of selecting from the many items which might be available, those items which should be procured, stocked, and issued by the Army. If procurement officers are to buy what is wanted and depots are to issue what is requested, there must be a common language to describe the items in terms of words and numbers which will mean the same thing to all people at all levels in the system. Moreover, the items must be segregated into manageable groups by commodity classification, and responsibilities must be fixed for each of these manageable groups. Unless this is done, an inventory as large as the Army's cannot be managed effectively.

119. Major Problems

Efforts toward standardization often are impeded by the exigencies of peace and war, and feast-or-famine budgets. Before the damage from the last emergency can be repaired, another emergency is in the offing and procurement officers are being pushed to buy everything in sight, including nonstandard items. Additionally, they have frequently been required to procure large quantities of varying forms of similar items. Early in the Federal cataloging program, the many variants procured by the various services, agencies, and bureaus began to pose major problems of standardization, identification, stock numbering, and assignment of logistic responsibility. This problem has been complicated because both cataloging and standardization should precede procurement wherever practicable. This may be an almost impossible task under emergency conditions, but the attempt should be made in order to reduce the number of variants entering the system.

Section II. STANDARDIZATION

120. General

Fundamentally, the entire program for standardizing equipment and materiel for military purposes is directed at increasing the combat effectiveness of the Armed Forces. But in the interest of sustaining a war economy, it is also directed at conserving materials, facilities, money, manpower, and time. Until the

passage of Public Law 436, 82d Congress (The Defense Cataloging and Standardization Act), standardization efforts proceeded by voluntary coordination between the military departments themselves and between the military departments and other Government agencies. Now, Public Law 436 makes mandatory the achievement of the highest practicable degree of

standardization throughout the Department of Defense. The objectives of the Defense Cataloging and Standardization Act specify—

a. Adoption of the minimum number of sizes, kinds, and types of items and services essential to military operations.

b. Achievement of the optimum degree of interchangeability of the component parts used in these items.

c. Development of standard terminology, codes, and drawing practices to achieve common understanding and clear interpretation of the description of items and practices.

d. Preparation of engineering and purchase documents to insure the design, purchase, and delivery of items consistent with the scope and purpose of the Department of Defense Standardization Program.

e. Provision by the military departments of the most reliable equipment possible by the adoption of materiel which has been evaluated in accordance with established Government specifications and standards.

121. Supply and Maintenance Effectiveness of Standardization

a. The achievement of maximum supply and maintenance effectiveness at minimum cost requires that a minimum of items of supply be carried in the supply systems supporting our military forces. Reduction of the number of repair parts through standardization is particularly necessary to simplify our maintenance, which is performed with difficulty in combat areas even under favorable conditions.

b. Standardization in these times of rapidly changing technologies is difficult, particularly since we must avoid retarding development. Standardization can mean freezing design; however, it can also mean introducing a new design simultaneously in many items. Standardization demands producibility and production ease, and, therefore, coordination and cooperation with industry are essential. Industry and military standards provide the foundation for the program. Interchangeability of parts and components can be achieved only if the design, procurement, and manufacturing agencies use and refer to the same standards of dimensions, tolerances, and materials. Industry standards and specifications, such as

those issued by nationally recognized engineering societies, are adopted and integrated in government standards and specifications when possible and applicable.

122. Methods of Standardization

Standardization within the Department of the Army is furthered by the following programs:

a. Engineering Standards.

b. Military and Federal Specifications.

c. Military Standards for End Items and Components.

d. Geographic Distribution.

e. Procurement Without Advertising of Specific Makes and Models.

123. Engineering Standards

Industrial and military engineering standards provide an enduring foundation for standardization in that they prescribe engineering practices which are the same, that is, interchangeable, regardless of the plant or activity in which the practices are used or the equipment manufactured. Engineering standards represent firm agreements between large numbers of people or organizations, including industrial concerns, and frequently require an extended period for their development. Out of approximately 5,000 Military Standards now in effect, over 2200 standards have been developed by the Army or through task groups in which the Army participated.

124. Standardization by Specification

a. Federal and Military specifications are used to establish common requirements for many products used by the Army, Navy, Air Force, and other Governmental activities. In many instances the types, grades, and classes of products covered by a specification must be further limited within the Military Departments to accomplish desired simplification and standardization. The specification provides a basis for standardizing many technical requirements which eliminates a variety of similar requirements being placed on manufacturers, especially in the area of materials and components.

b. In the case of items designed to military characteristics, closer control of standardiza-

tion is effected by means of detail Military Specifications and drawings. The Army has a number of specifications in this category for Military combat items such as guns, tanks, bridges, mine detectors, and fire control systems.

c. A more difficult problem arises in the use of specifications as a media for standardization of semi-commercial type items where the design is not completely controlled by the Army in detail design specifications and drawings. In this area the Army strives for the most practical compromise in specification requirements based on a combination of performance and specific material and component requirements. Although complete standardization is not attainable by the procedure, it is nevertheless accomplished to a marked degree.

125. Military Standards for End Items and Components

The adoption of standards for basic end items and for components offers major opportunities for reductions. Military standards are continuing to be developed and used in cooperation with industry. A notable example of progress is the Industrial Engine Standardization Program which consists essentially of standardizing, in certain ranges of cylinder bore sizes of gasoline engines, the high mortality parts such as pistons, piston rods, rings, valves, bearings, etc. In the 2 to 6 inch cylinder bore size range, a total of 2872 items of parts were reduced to 207. After standards for the engine parts are produced, each participating manufacturer develops for military use modified versions of his regular commercial products using standard parts.

126. Standardization by Geographic Areas

a. Notwithstanding the practical and legal limitations on the standardization of specific makes and models, it is possible within the framework of the existing system to achieve some degree of standardization by geographic areas. Through the control of issues, specific makes and models are standardized for particular theaters. In a given theater, earthmoving equipment is limited to the makes and models of only one or two of the available manufacturers, thereby limiting the range of

parts to be stocked and simplifying the job for maintenance personnel. Prior to movement overseas, units are issued preferred makes and models of equipment, and subsequent shipments are closely controlled by Oversea Supply Agencies at Army Terminals to insure that the same manufacturer's makes and models are shipped. In many instances, however, theaters may already have in stock and in use the makes and models of several manufacturers. In attacking this problem the first effort is devoted to determining the density of each make and model at all locations to ascertain how best to standardize in any given area. Normal attrition, rather than wholesale backhauls, is used in evacuating the equipment no longer desired with gradual replacement by the selected makes and models. Repair parts for the models to be withdrawn are returned and parts for the selected items built up in the theater.

b. During the exigencies of a war the pressure of events make it extremely difficult to change the equipment already in the hands of troops before departure overseas, and shortages may prevent the concentration of a specific make and model at a given locality. However, the problems of providing parts support for many different makes and models suggest the desirability of geographical standardization whenever conditions permit.

127. Negotiated Procurement in the Interest of Standardization of Equipment

a. The large number of repair parts that must be stocked arises partly from the effect of formal advertising. Award to the lowest responsible bidder often means that new makes and models enter the system creating a demand for parts different from those previously stocked. This problem is somewhat mitigated by use of negotiated procurement of additional quantities of preferred makes and models, rather than the chance acceptance of additional makes and models, as a result of a different contractor being low bidder each time the item is formally advertised.

b. Title 10, USC 2304(a)(13) authorizes the procurement of selected makes and models of technical equipment by negotiation in order to achieve standardization and to insure inter-

changeability of parts and components. Because procurement by negotiation may tend to restrict competition, it must be utilized under close controls. Prior to the approval of procurement standardization of a particular item of equipment, the chief of the technical service must provide the Assistant Secretary of the Army (Installations and Logistics) with full justification. The justification must take into account such considerations as mobilization planning, present population of makes and models in the supply system, quantities of repair parts on hand, current and projected requirements, and performance data. Moreover, the standardization must meet the general requirement of being in the "public interest." These requirements, together with other applicable provisions of law, have restricted the extent to which standardization through negotiated procurement could be achieved.

c. Even when advantage is taken of procurement without advertising, care must be exercised to insure maximum standardization of components and repair parts. Vendors vary the components within various makes and models. A crane-shovel supplier may use two or more different power-plants in the same model, or a supplier of a generator set may employ various makes of engines with the same basic generator equipment. Close review of the items supplied by the contractor under these circumstances must be maintained in order to insure accomplishment of standardization objectives.

d. Final decisions on standardization actions are made by the Assistant Secretary of the Army (Installations and Logistics). In making such decisions, the Assistant Secretary must contend with the practical problem of pacifying the majority of available producers of an item, any one of which might be able to produce satisfactorily. In times when business is slack, it is difficult to convince a supplier whose equipment is not selected that he has been accorded fair treatment. Present policy favors standardizing on the product of a minimum of two manufacturers wherever practicable. Selection of at least two suppliers provides an increased production base in case of national emergency as well as competition in negotiation.

e. Due to the extreme care exercised in this type procurement standardization, the Army has approved only a limited number of items for procurement without advertising. However, these items include many which in the past have created major repair parts and maintenance problems. Included among the items standardized to date are road rollers, air compressors, tractors, cranes and shovels, 15 KW and 30 KW electrical generator sets, fork-lift trucks, radio receivers and transmitters, and bath units. Future schedules call for the submission by the technical services of standardization actions on many more types of combat support equipment.

128. International Standardization

a. The purpose of international standardization is to permit the Armed Forces of the United States to plan and implement operations together with the armed forces of other nations in the most effective manner possible. International standardization encompasses both materiel and nonmateriel fields. In the nonmateriel field, common or compatible operational, logistic, and administrative procedures are adopted to include such subjects as tactics, training, techniques, organization, reports, maps, and terminology. In the materiel field, common or compatible engineering criteria, principles, practices, processes, technical procedures and tables of equivalents, and common, compatible or interchangeable modern military equipment, weapons, ammunition, parts and components are considered for standardization. International standardization of procedures and equipment is not pursued in areas which do not contribute to the effective implementation of plans and operations.

b. International standardization is carried on principally by nations within such regional treaty organizations as NATO, SEATO, the American-British-Canadian Standardization Program, CENTO, and the LADS. Standardization is also pursued on a bilateral basis with free-world nations through the medium of Data Exchange Agreements, Mutual Weapons Development Programs, and Military Assistance Programs. Within regional treaty organizations, each country is responsible for equipping its own forces. Some countries, be-

cause of participation in two or more regional organizations, must use standards to meet world wide requirements; other countries need equipment suitable for particular terrain or climate only. Therefore, complete international standardization of all items of military equipment is not practicable nor desirable.

c. The extent to which international standardization of materiel is possible is limited by factors outside military control. Some of these are—

- (1) The loss of production and the expense incurred by converting manufacturing plants.
- (2) Availability of resources.
- (3) Differences in engineering standards and manufacturing techniques.
- (4) Patent rights.
- (5) Commercial interests.

d. International standardization programs are pursued simultaneously by the Army, Navy, and Air Force on a decentralized basis. This decentralization permits the U. S. Armed Forces to operate with friendly foreign governments on a service to service basis in accordance with the broad policy; the joint logistics and policy guidance manual within the regional organization structure. Broad policies for the three services are contained in Department of the Army Manual—FM 110-10, Department of the Navy Publication—JANALP (A), and Department of the Air Force Manual—AFM 400-4. Prior to international agreement, interservice coordination is effected where the item, category, or matter under consideration is of interservice interest.

e. Standardization among the Armed Forces of the United States, the United Kingdom, and Canada was initiated in 1947, accorded in the Basic Standardization Agreement and implemented in the U. S. Army by AR 1-70 (Standardization Among the Armies of the United States, the United Kingdom, and Canada) Agreements reached under this program are published as follows:

- (1) American - British - Canadian - Army-Standards (ABC - ARMY - STAND -

ARDS) for materiel items, basic engineering standards, tables of equivalents, etc. These standards are disseminated to the Army in technical bulletins of the 39-9 series.

- (2) Standardization of Certain Aspects of Operations and Logistics (SOLOGS) for standardization of operations, administration, and logistics procedures. SOLOG's are disseminated to the Army by Army letters, training circulars, or changes thereto, and field manuals, as applicable.
- (3) Agreements reached in the Navy and Air Force areas of interest are published as ABC-NAVY-STANDARDS and ABC-AIR-STANDARDS.

f. Standardization within the North Atlantic Treaty Organization is conducted by the Military Agency for Standardization (MAS) and the Armaments Committee. The MAS, a subsidiary agency of the standing group from which it receives guidance and direction, consists of a chairman and three service boards—Army, Navy, and Air Force. The Armaments Committee and groups of experts organized to study specific problems or areas for standardization cooperate with the Production and Logistics Division of the International Staff in preparing correlated production programs for equipment. Standardization agreements reached under these agencies are called STANAG's and are promulgated by the MAS. The initiating authority of a STANAG is identified by numerical designation as follows:

<i>Series</i>	<i>Origin</i>
1000	Naval Board, MAS
2000	Army Board, MAS
3000	Air Board, MAS
4000	Armaments Committee
5000	Communications—Electronic Committee Standing Group

NATO Standardization has been supplemented by AR 1-71, (Standardization Among the Countries of the North Atlantic Treaty Organization).

g. SEATO agreements are entitled SEAS-TAG's and are comparable to NATO STAN-AG's in numbering and titling.

Section III. CATALOGING

129. General

Cataloging is a basic supply management tool of substantial importance and has an effect on other supply management actions. The commodity groupings for purposes of cataloging determine in large measure the organization for operation and management of the supply system. The Army's supply system is managed through commodity assignments and these assignments are determined largely by the commodity classifications in the catalog. It would appear that the establishment of a common language of supply would not be a difficult task. It would be necessary only to assign a fixed name and number to each item, publish a mail-order-type picture catalog of military items, and the task would be complete. As in so many areas of Army supply, the task is not that simple. A fuller understanding of the Federal cataloging program can be gained by a brief description of its origin and development.

130. Federal Cataloging Program

a. Background of the Program. The Congress, upon recommendation of the Hoover Commission, passed Concurrent Resolution 97 in April 1950 which stated, in part—

“The Secretary of Defense and the Administrator of General Services shall, based on their respective responsibilities, expedite the development of a coordinated plan looking to the completion of the Federal Catalog System in order that there shall be published and put into use at the earliest practicable moment a single supply catalog system to be used by all departments of the National Military Establishment and by all civil agencies.”

The objective of the Federal Catalog System was stated in the same resolution—

“In the Federal Catalog System each property item shall have but one name and one description and one item identification number.”

b. Method of Assigning Numbers. In order to expedite the program, all of the items handled by government agencies were divided

among the participants in the program in accordance with a standard commodity classification. Each category was assigned to a responsible agency, service, or bureau which was charged with developing a form of questionnaire about each different kind of item which would disclose salient facts about the item such as its dimensions, color, type, use, etc. These questionnaires called “description patterns” were drawn for every kind of supply item. The answers on the patterns were compared at Department of Defense level and if they revealed that the item studied was not previously numbered, a number was then assigned.

c. Federal Supply Classification (FSC). The Standard Commodity Classification, developed by the Bureau of the Budget in 1942, and amended in 1946, was used initially in assigning responsibilities for development of the description patterns. This classification system among others in use within the government proved inadequate. A classification committee made up of representatives of the Army, Navy, Air Force, General Services Administration, and Munitions Board was then formed to develop a commodity classification structure to be used with a seven-digit nonsignificant item identification number. This committee recognized that any commodity classification system must be a compromise between conflicting interests; no one system could simultaneously classify an item for all purposes. The committee developed a commodity classification system which served three primary purposes—stock accounting, requisitioning, and issue. They settled upon a four-digit code; the first two digits representing large groups of related items, and the second two digits representing classes within the group.

d. Implementation of the Federal Supply Classification. In order to test the validity of the system, every supply item in the Army, Navy, Air Force, and General Services Administration was indexed against the system. Where it appeared that classes were too large or too small or represented heterogeneous material or where no class existed for certain items that were not anticipated, the structure was revised accordingly. Completed indexes

were published to show the class to which each item in the military departments was assigned.

e. Complete Federal Stock Number. Federal stock numbers have been assigned to all Army items of supply. The following illustrate the format of the complete Federal stock number as assigned to some typical items.

Federal stock No.		
FSC class code No.	Federal item identification No.	Federal item name and description
5110	595-8296	FILE HAND: American pattern, hand saw, blunt, 6 in. long—heel to point, single cut hand-saw faces.
5110	224-1532	PLIERS, DIAGONAL CUTTING: with stripping notch, sleeve openings and skinning hole, 5 in. long.
5110	180-0664	SHEARS, METAL CUTTING, HAND: straight pattern, 13¼ in. long overall.
5120	293-1138	ANVIL, BLACKSMITH'S: steel face and horn, cast iron body, 10 lbs.
5120	293-0665	BAR, WRECKING: gooseneck, claw and pinch point, ¾ in. dia, 30 in. long.
5120	180-0554	SCREWDRIVER, FLAT TIP: wood handle, straight tip, 7/32 in. wide, 6½ in. long blade.

It will be noted that when items are arranged in alphabetic sequence within the commodity class, the nonsignificant seven-digit numbers will only coincidentally be in sequence. For this reason, current Army supply manuals contain an index in stock number sequence which shows where the nonsignificant numbers may be found in the alphabetic listings within classes.

f. Repair Parts.

- (1) Under the Federal Cataloging Program, "parts peculiar" are classified with the next higher assembly in the class established therefor. The term "higher assembly" is used for brevity and may actually include subassemblies, assemblies, components, end items, or systems. However, a large number of Federal Supply Classes have been established specifically for "parts common," such as bolts, nuts, screws, bearings, common electrical components, common gears, etc. Although the intent of the Federal Sup-

ply Classification system was to include all bearings in the common bearing class, all flexible hose and tubing, etc., there is now a provision permitting particular bearings, flexible hose and tubing, etc., to be classified with the next higher assembly. If this provision is applied too widely, the consequences can be a general corruption of the classification structure. Moreover, it would permit duplicate cognizance of common components by classifying the same common component with different end items.

- (2) All repair parts are numbered with the same type nonsignificant seven-digit number that is applied to end items. No effort is made to arrange parts in alphabetic sequence, to relate them to the machine they fit, to relate them to the functional purpose within the machine, or to give any other significance to the identification number. If the part is peculiar, the four-digit Federal Supply Classification number added to the nonsignificant seven-digit part number will identify the classification of the next higher assembly on or with which the part is used. If the part is common, the classification will merely indicate the category of common items to which it belongs.
- (3) All repair parts that any agency wants numbered are passed through a central screening point where the manufacturers' numbers are searched against master files to determine whether the part has been previously identified with a Federal number. The necessity for this central screening process developed early in the Federal cataloging program when situations like the following occurred:
 - (a) Army Ordnance found that Chrysler part number A-234 was a common machine screw that could be described by size, type of metal, etc., and had cross-referred Chrysler's number to an Ordnance number.

- (b) Army Engineers discovered that General Electric part number 4B512 was the same common machine screw and had cross-referred it to an Engineer number that "spelled out" the size and type of machine screw.
- (c) The Navy found that International Harvester part number 123456 was likewise the same size and type machine screw and had cross-referred the part in its cataloging system to its end item stock numbering series.
- (4) By relating all of the above facts, Army Ordnance discovered that Gen-

eral Electric part number 4B512 and International Harvester part number 123456, which it also had in stock, could be combined with the Chrysler part number A-234 that it already knew to be a common machine screw. Similarly, the Army Corps of Engineers and the Navy were able to utilize the research done by the others. Association of all these facts prevented the assignment of three Federal identification numbers to three manufacturers' parts that were in fact identical.

Section IV. COMMODITY CLASSIFICATION

131. General

Possibly no aspect of cataloging is of more concern to management than the grouping of items into commodity classes. Principal items, secondary items, commercial items, major items, long lead time items, slow-moving and fast-moving items, high cost items, repair parts, end items, etc., have been previously covered. In each of these instances, supply items have been "classified" into groups. But none of these groups can stand alone as there are high and low cost commercial items, fast and slow-moving end items, and any of a number of other combinations. Although we may be interested in principal items because of their impact on the procurement program or low cost commercially available items for purposes of fixing supply responsibilities, neither type classification would be suitable for many other purposes in the supply system. There is no single classification system that will result in a grouping of items satisfactory to the needs of all users. Those concerned with the allocation of critical materials are interested in material content; to them copper wire and copper kettles are similar items. Requirements analysts, on the other hand, are concerned with what items are used for, by whom, and in what quantity. The maintenance personnel are interested in the relationship of repair parts to end items. The storage officer is interested in the type of storage required; for his purposes flashlight batteries and photographic film are related items.

The stock control officer is concerned with relationship of items in use, i.e., the relationship of paper towels to toilet soap. These varying interests and relationships can take a thousand forms.

132. Design of Classification

a. Obviously the approximately one million supply items cannot be segregated and published in a dozen or more arrangements, each complete and tailored to meet the needs of one specialty. It is reasonable to inquire whether it is possible to satisfy any one single interest. If the classification is designed for the use, immediate conflict develops because the same item has more than one user. If the classification is designed exclusively to fit the demands of stock control, conflict again develops. Stock control's interest may lie in a distinction between slow-moving and fast-moving items or in the relationship of certain items to the seasons of the year or in the relationship of demand for dissimilar items, all of which cannot be met by a single classification system. Each interest in supply items might be similarly examined and the same conclusion reached in all cases: no system of classification can completely satisfy the needs of any single element of the supply system.

b. If this is an impossible task, why classify items at all? The answer to this question must start with the person who attempts to find in a catalog the item he wants. If the items are in

alphabetic sequence by name and he is looking for electrical supplies, the fuses, junction boxes, lamps, switches, and wire he may need would be listed from one end of the catalog to the other. In this instance, collection of the items by relationship would assist the user to find the electrical supplies he wants. If he needs a tool, his location of the exact tool would be facilitated by a grouping of all tools together. On the other hand, if we assume he is an electrician and that he wants a tool for electrical work, we can help him no further; we cannot separate electricians' tools, carpenters' tools, plumbers' tools, and mechanics' tools because some of the same tools such as files, screwdrivers, and pliers are used by all these trades.

133. Classification by "What It Is", or, "What It Is Used For"

a. A closer examination of the electrical supplies mentioned in the preceding instance will serve to illustrate the most perplexing problem in commodity classification, whether to classify an item on the basis of "what it is", or, "what it is used for." Electric lamps are produced for two major uses—illumination in houses and offices, generally for 110 volts; and for automotive-type use where they have miniature bases and operate at from 6 to 24 volts. (Lamps for surgical instruments, radios, airfield lighting, etc., are examples of further diversification.) Should the commodity classification system group all electrical lamps on a "what they are" basis, or separate them on a "what they are used for" basis; such as airfield lighting, automotive use, house use, etc.? In general, the supply manager concerned with miniature automotive-type lamps is not also concerned with supplying the larger lamps used in houses and offices. On the other hand, many of these lamps have wandered out of their original restricted usage—large lamps are designed for low voltages and miniature lamps are also designed for 110 volts; the same miniature lamp may be used in a radio set, a plane, a bus, or in a piece of surgical apparatus.

b. In general, most of the commodity classification systems in use by the Army prior to the establishment of Federal Supply Classification were based on the grouping of items related or associated in use: surgical instruments, materials handling equipment, construc-

tion machinery, laboratory apparatus, etc. The classifier starts with the premise that he will group all items related in use and then proceed to pull out of the specialized use categories those items that cut across the specialized categories such as tools, bolts, screws, and common hardware which have multiple uses. In the case of surgical instruments, there are enough items peculiar to that application to make up a useful grouping. On the other hand, there are not enough items peculiar to the plumber, the automotive mechanic, and the carpenter to produce useful classes of plumbers', mechanics', and carpenters' supplies.

c. There is no neat and precise way of settling the inherent conflict between classifying on a "what it is" or "what it is used for" basis. In certain well-established commodity areas such as tools, pipefittings, bolts and screws, rivets, and cotter pins, where the multiplicity of end uses has been recognized over a period of many years, classification on a purely "what it is" basis is accepted and incorporated into virtually all commodity classifications. It is in areas of expanding technology where the initially "peculiar" item is becoming "common" that the major problems are posed for the supply manager. Electronic equipment and supplies are a prime example of items of this kind. Classification cannot, therefore, be rigidly fixed because the peculiar item of today is the common item of tomorrow. Electronics are now in such a state of advancement that today's classification of electronic equipment, devices, and supplies will fit tomorrow's needs only by the purest chance. Decisions on these basic classification questions, which have the effects of determining commodity responsibility and deciding whether items will be duplicated within the supply system, have generally been left to the discretion of the cataloger.

d. Some of the principles of commodity classification as they relate to the Army Supply System may be stated as follows:

- (1) The cost of publication and maintenance prohibits more than one basic commodity classification system.
- (2) A single commodity classification system cannot simultaneously group items to the maximum advantage of any one element of the supply system.

- (3) The commodity classification system should, therefore, to the extent possible, group items for the benefit of those who are most directly concerned on a day-to-day basis: the ultimate users of the supplies and those directly concerned with meeting that demand.
- (4) Items should be grouped to the extent possible by their association in use, excluding from the groupings by end application those items with multiple uses and applications.
- (5) Management is directly concerned with the commodity classification system because these groupings dictate, from a practical point of view, commodity responsibility and the presence or absence of duplications in procurement, storage, and issue.
- (6) Commodity classification must remain fluid. If it is to serve as a management tool, it must be responsive to the changes that occur in the use of items.

134. Duplication of Items

a. Focusing Attention on Duplication. The implementation of the Federal cataloging program has focused attention on some of the duplications that exist among the technical services. There are instances where more than one service has supply items in the same Federal Supply Class; this eventually will show up in financial and quantitative reporting. Since all services will use the same seven-digit identification number, duplications within the same commodity class will also stand out. It is generally recognized even now that some duplication exists, and it may well be that much of it is inevitable. But former differences among the technical services in commodity classification systems, stock numbers, and names of items made it difficult to determine the extent of the duplication.

b. Causes of Duplication. In theory, there is no duplication among the technical services. Ordnance handles weapons, ammunition, and vehicles; Engineers handle construction, bridging, and mapmaking equipment; Quartermaster handles food, clothing, and general supplies; and so on. There is no duplication in the issue

of mimeograph paper, tanks, forklift trucks, locomotives, food, tractors, and other major end products which could be termed "common use" items. An examination of a few of the end products handled by each service will show where the problem develops.

Ordnance—	Trucks, passenger cars.
Engineers—	Tractors, earth-moving equipment.
Transportation—	Locomotives, barges boats.
Quartermaster—	Forklift trucks, mobile laundries.
Signal—	Mobile radar sets.
Chemical—	Gasoline engine-driven, decontaminating apparatus.

c. In the examples cited above, every end product contains a gasoline or a Diesel engine, bearings, nuts, bolts, screws, wire, and all of the mass produced parts and subassemblies that go to make up such end products. Although Ordnance supplies and maintains the trucks in which some of the mobile equipment has been placed, the various services procure and maintain the equipment on the truck. To maintain such equipment, all of the services require identical or substantially similar tools, equipment, and supplies. To some extent, all of the services procure, stock, and issue the common tools, hardware, equipment, and supplies required to maintain these end items.

135. "Supply Must Be Responsive to Command"

a. It has been recognized that there is some duplication of procurement, stockage, and issue of the same supplies. However, there has been a tendency to minimize its seriousness by emphasizing that "supply must be responsive to command." In its broadest application, the term means that if a given service has a task to perform, that service should have control over the tools required to accomplish the task. It should not be required to depend upon other services for the tools, equipment, and supplies needed to perform its mission. If the concept were carried to its ultimate extreme, every service would supply its own clothing, food, and ammunition. The question is: Where within the two extremes of procurement and issue

by one service or procurement and issue by all services should the line be drawn?

b. The desirability of one service procuring, stocking, and issuing universally used office stationery items such as pens, pencils, paper, and paper clips has been recognized and carried out. But the electron tubes, spark plugs, electric lamps, and tools and hardware that are used almost as widely raised slightly different problems and are treated as exceptions. If a requisitioner wants a bearing, spark-plug, piston ring, miniature electric lamp, or any other item which is common to several pieces of equipment, he must go to the service on whose equipment he intends to use the item.

136. Assignment of Responsibility for Common Use Items

a. The first effort to eliminate duplicate assignment of responsibility for common use items between technical services was the establishment of the Procurement Assignment Board in July 1948. As indicated by its title, this board dealt only with the procurement and inspection functions. Early in 1950, another important step was taken toward solution of this problem through a program outlined in AR 700-51 and implemented by regulations in the AR 700-series. Although these regulations resulted in the reassignment of certain of the duplicated items to particular services, the program achieved only partial success due, mainly, to the lack of a standard item identification and classification language. This was the objective of the Federal cataloging program which, at that time, had barely gotten under way. Today, the Federal Catalog System is a fact; all Army items have been identified by the same set of rules and classified under one system of commodity classification (the Federal Supply Classification); and a program of reassignment of all logistic functions, based on these systems, is in operation.

b. Yet the duplicate procurement and issue of certain common items can often result in situations that require management attention. Situations of this kind are undesirable, and result in:

- (1) A larger number of stock record accounts, with the attendant costs of maintaining the records, taking physical inventory, and reporting the balances to higher headquarters.
- (2) Subdivision of the overall quantity of stock into smaller quantities at many locations, which may result in denial of supply at one location because of the normal imbalances that occur in any supply system.
- (3) Dissipation of assets of critical materials in times of shortages by maintaining larger stocks than would be necessary if the stock were located at fewer places.
- (4) A larger number of procurement actions and smaller, more expensive shipments.
- (5) Confusion in supply responsibility because the requisitioner's source of supply is governed not by "what an item is" but by "what he uses it for."

137. Duplication

a. It has been observed that in theory there is no duplication between the technical services; each service is a commodity specialist. In terms of major end items, the duplication is negligible, but there is an appreciable volume of duplication of the common components of machinery and equipment as well as of the equipment and supplies to service and maintain large end products. Where items are assigned upon the basis of "what they are used for" rather than "what they are," multiple assignments of the same commodity must follow. Where duplication exists, there is a direct increase in inventory and operating costs and there may be delays in supply.

b. American mass production techniques result in duplication of components among end products. Yet the reassignment of responsibilities for common use items by technical service, without regard to who makes the most use of the item, will result in confusion as to source of supply.

CHAPTER 8

MAINTENANCE AND REPAIR PARTS MANAGEMENT

Section I. GENERAL

138. Scope

Maintenance is discussed herein from the standpoint of its relationship to Army supply management. A more detailed discussion of maintenance as a separate logistic function is set forth in FM 38-5, (Army Maintenance Management). The discussion will be presented in two phases: first, the function of maintenance, and second, the supply of repair parts

necessary to accomplish the maintenance function. Since proper maintenance of equipment increases its lifetime of usefulness and reduces the requirement for new material and thus conserves funds for other purposes, the maintenance function cannot be separated from the overall area of supply management. The repair, overhaul, and rebuild of equipment is an important added source of supply.

Section II. THE MAINTENANCE FUNCTION

139. Extent of the Task

a. The word "maintenance" has various meanings in the Army, but herein its meaning is limited to those actions and related activities necessary to keep equipment in serviceable condition. This meaning includes inspecting, testing, servicing, classifying as to serviceability, renovating, reclaiming, repairing, overhauling, rebuilding, and modifying materiel. To avoid ambiguity in the use of the terms "repair", "overhaul", and "rebuild", the following definitions of the terms, as prescribed in AR 750-5, are set forth:

- (1) *Rebuild*. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts and components, repair or replacement of worn or unserviceable elements using original manufacturing tolerance and/or specifications and subsequent reassembly of the item.

- (2) *Overhaul*. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.
- (3) *Repair*. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

Note. Though these words are not synonymous, for the purpose of the general type discussion contained in this manual, the word "Repair" has been used as referring to any maintenance operation other than preventive maintenance services.

b. The maintenance problem faced by the Army today arises directly from the fact that the U.S. Army is more highly mechanized than ever before. As the degree of mechanization increases, both in quantity and in complexity of equipment, maintenance takes on increasing importance. The term "mechanized" as used herein includes not only vehicles, the traditional usage of the term, but also includes the whole range of equipment used by the Army. Guided missiles, radar, and other electronic equipment; portable and mobile shops; laundries; and dental laboratories are only a few of the complex items that require maintenance. Nor is maintenance limited to large, complex items. The carbine, the surveyor's level, the "walkie-talkie," and almost everything the soldier uses will require some degree of maintenance. Measured in terms of the number of items shipped out of the depot system, more items are consumed for maintenance purposes than for any other purpose. During recent years approximately one-third of the Army's operation and maintenance appropriation has been obligated for maintenance purposes. Army maintenance is approximately a one-billion dollar annual operation. With the exceptions of feeding and clothing the Army, maintenance activities require more supplies than any other Army activity. These supplies consist largely of tools, equipment, repair parts, and various expendable items, such as oil and wiping rags. Clearly, supply supports maintenance, and maintenance supports supply in a continuing cycle.

c. Anyone who owns an automobile or a television set can appreciate the Army's maintenance problem. The ten dollar repair bill for the new spark-plugs or the damaged tube is multiplied a thousandfold in keeping the Army's vehicles and equipment in operable condition. As with civilian goods, it is often not the initial cost but the upkeep expense which becomes troublesome. Yet a gun that does not fire, a jeep that will not start, and a radio that will not work are dangerous liabilities, because manpower, materials, and transportation space are consumed in getting them where they were needed. Maintenance of existing equipment may be as important as the acquisition of new equipment, and in an extended cold war period, may be more important. The combat readiness of a military unit bears a distinct relationship

to the combat readiness of the equipment in which it will fight. The ability to maintain equipment may spell the difference between defeat and survival.

d. It is essential in all stages of development work that adaptability of an item to quantity production, to ease of maintenance and to low maintenance costs, its effect on the supply of strategic and critical materials, and interchangeability of parts be considered as among the most important requirements of design. Consideration should also be given to accessibility of fittings, adjustment points, and accessories for periodic servicing, as well as replacement of parts and assemblies to permit expeditious and simplified maintenance.

e. Economy of maintenance, in materials and in manpower, is equally significant. Maintenance obviously is uneconomical if it costs as much to maintain the old as to acquire the new. Similarly uneconomical are labor, materials, and transportation devoted to parts which are not used. In determining maintenance policies, the economic considerations are often governing.

140. Complexity of the Task

Variations in climate, terrain, and usage of equipment complicate the maintenance task. The kind and frequency of servicing, the kind and number of parts, and the types of maintenance skills and facilities required are all directly affected by these factors. The variety of makes and models of the same basic equipment also add to the difficulties. The large number of makes and models of the same equipment poses the same problem to the Army's maintenance facilities as the problem of the corner garage which repairs the 1951 Ford, the 1955 Chrysler, and the 1959 Lincoln. Not only must the parts be readily available, but the mechanics must have the skills to work on all of these different machines.

141. Demand for Maintenance

Some of the demands for maintenance are predictable recurring demands such as those a person experiences with his own automobile. The oil must be changed, the chassis lubricated, and the motor tuned after a certain number of miles. Similarly, experience has taught that an engine must be overhauled after so many

hours or miles of operation, or a gun barrel must be replaced after so many rounds have been fired. In addition to the hours or miles of use and the mere passage of time, rough and hilly terrain, extremes of dampness, heat, cold, and other environmental factors influence the amount and type of maintenance required to keep equipment operating efficiently. The global dispersal of Army equipment—Greenland, Europe, and the Pacific Islands—suggests the variations in the demands for maintenance. “Normal” use as opposed to hard, around-the-clock use can profoundly affect maintenance demands as can combat damage and damage caused by accident-prone or careless individuals.

142. Military vs Commercial Maintenance

a. General. During World War I, the Army relied almost entirely on manufacturers’ representatives, who were present in the field, for repair parts advice. Little more was needed for the repair operation than a portable blacksmith’s shop. This system was changed, however, by the mechanization of the Army that took place between the two World Wars. The highly mobile forces deployed in Europe, Africa, and the Pacific during World War II required a network of maintenance facilities and large stocks of parts for the necessary close maintenance support. The major share of the maintenance burden fell to Army units, in marked contrast to the maintenance and repair parts situation in World War I.

b. Limitations of Commercial Maintenance.

- (1) If all of the Army’s forces were always located within the continental United States, maintenance by commercial facilities or by the original manufacturer of the equipment might be feasible. However, the global aspects of the nation’s military commitments and responsibilities preclude this easy solution. The Army’s repair facilities must be almost as mobile as the equipment for which the facilities exist. Maintenance personnel must be prepared to endure the same hardships and dangers which face combat forces and must be under the same overall command. It is difficult to conceive how the oversea maintenance

needs of a modern mechanized Army, prepared for war at various points on the earth’s surface, could be met by commercial organizations. In addition is the problem posed by the variety of makes and models used by the Army. The Army may have tractors produced by Caterpillar, International Harvester, and Allis Chalmers. It would be impractical to have individual repair shops organized and manned by each of these manufacturers accompany the tactical units which used their tractors. However, assistance is often provided by the manufacturers through the assignment of technical personnel who furnish advice on particular problems that arise in the maintenance of their equipment.

- (2) Within the continental United States, maintenance by the manufacturer is feasible where mobility is not an important consideration. Even within the continental limits, however, sole dependence upon the manufacturer is undesirable since troops must be accompanied by their own maintenance facilities and personnel upon departure from the United States. For this reason, Army facilities and training within the United States should be designed to meet any demands that may be placed upon the troops, even if a substantial part of the maintenance task within the continental limits were accomplished through commercial facilities.

c. Manufacturer Assistance. Although reliance upon the manufacturer for maintenance in overseas operations is not too practical and is limited in its usefulness within the continental United States, there is a growing need for manufacturer assistance as military equipment becomes more complex. Technological advances in electronics force a type of specialization that is difficult to provide under present draft limitations. It may require upwards of a year to train an electronics technician. This period, when added to the time required for induction, basic training, etc., leaves only a few months for the technician to apply his new skills be-

fore his military service is completed. Yet the facilities and manpower for maintenance of Army equipment must come largely from within the Army itself. Technical know-how, on the other hand, must come increasingly from outside the military ranks, particularly with respect to items newly introduced into the supply system. The longer length of service that can be expected from manufacturer's personnel, together with the technical knowledge they already possess, make it imperative that assistance of this kind be a part of the Army's maintenance plans.

d. Commercial Maintenance Contracts.

- (1) Whereas major reliance cannot be placed upon commercial maintenance facilities, either overseas or in the United States, there are instances where it is desirable to employ commercial contractors for more than technical assistance. Much of the military equipment in the United States lends itself to commercial maintenance. The Army, like the other services, owns a large stock of machine tools which are made available to manufacturers in times of mobilization. The maintenance and upkeep of these tools can probably be handled by commercial services more easily than by the Army. Again, the Army is often faced with the necessity of procuring small quantities of interim or short-time-use equipments of a complicated nature that require many special tools and test equipment in their repair and overhaul. The maintenance of this equipment, generally, can also be accomplished more steadily and economically by commercial contracts than by the Army. In general, commercial maintenance contracts are used when the requirements for maintenance exceed the capability of available government-owned facilities, when costs are excessive at these facilities, or when a shortage of authorized trained personnel exists.
- (2) In oversea areas, contractor maintenance and the use of locally available labor often offer advantages. The success of the Japanese mechanics in

rehabilitating rolled up equipment from the Pacific Islands is a case in point. In Europe a portion of the maintenance task has been assumed by European contractors. The Air Force, through Project Native Son, was better able to adjust to personnel cutbacks by making greater use of foreign labor in maintaining oversea air bases and equipment.

- (3) In the selection of contractors for commercial maintenance, it is necessary to examine the adequacy of the contractor's personnel and equipment, to study his past performance, present and projected workload, and to evaluate his managerial ability and integrity. The comparative costs of commercial and military services must be considered. Whether the contract should be performed under a cost-plus-fixed-fee arrangement, on a piece work basis, on a time-and-material basis, or with escalation and redeterminable provisions must be determined on the basis of the type of repairs and the amount of equipment to be maintained. Frequently the extent of repair necessary is not known until the equipment is disassembled and thoroughly examined. In these cases a "tear down and quote" method of contracting may be used with commercial concerns, with a fixed price for disassembly of the unit, followed by a further quotation on the repair job.

143. Maintenance Organization in the Army

a. General

- (1) Armywide staff supervision of the maintenance function is the responsibility of the Materiel Maintenance Division of the Office of the Deputy Chief of Staff for Logistics. This division establishes broad maintenance policies. The United States Army Maintenance Board coordinates the efforts of the military user and the producer to insure optimum maintainability of all equipment issued to the Army. The Board correlates the

maintenance mission and the personnel, training, parts, tools, technical publications, and maintenance support required in the five echelons of Army maintenance.

- (2) Technical supervision over all phases of maintenance is normally the responsibility of the technical service which issues the particular piece of equipment. They establish maintenance procedures and service standards, and publish supply manuals, technical manuals, servicing and operating instructions. Depot maintenance is performed under the direct supervision of the chiefs of the technical services, except in oversea commands. The technical services collaborate with the Commanding General, USCONARC, in developing training programs and furnishing technical advice to troop units and field maintenance organizations.
- (3) All commanders are required to insure that all equipment issued or assigned to their command is properly maintained in a serviceable condition, and that equipment is properly cared for and used. As distinguished from command responsibility, there is a direct responsibility assigned to individuals to whom equipment is entrusted for their personal use and being used by their subordinates. This direct responsibility may involve:
 - (a) Personal responsibility, as in the case of equipment issued to an individual for his own use and habitually under his own care.
 - (b) Supervisory responsibility, as in the case of a platoon, section, or squad leader with respect to the equipment pertaining to his command.

b. Echelons and Categories of Maintenance.

Over the years the Army has evolved echelons of maintenance, indicating the level at which repairs of ascending complexity are performed. These maintenance levels have been fixed in five broad echelons, first through fifth. The five echelons in turn relate to the three-category DOD prescribed structure of organizational,

field, and depot maintenance. The first and second echelons comprise organizational maintenance, the third and fourth echelons comprise field maintenance, and the fifth echelon is depot maintenance. Experience has taught the Army that it is essential to control the type maintenance work performed at each echelon, in order to prevent attempted repairs by personnel who lack the necessary skills, tools, equipment, and parts. Although lower echelons might occasionally manage to repair a deadlined item by performing unauthorized repairs, the practice is to be discouraged. Even though the unauthorized repair may be successful, bypassing the higher maintenance echelon may result in failure to recognize structural weaknesses, and thus lead to total breakdown of the equipment. Though common sense may sometimes dictate the use of unusual maintenance skills that may be present at a lower echelon, such deviations from established echelon policy must be carefully controlled.

- (1) *Organizational Maintenance.* Organizational maintenance is that maintenance which is authorized for, performed by, and the responsibility of a using organization on its own equipment. This maintenance consists normally of inspecting, cleaning, servicing, preserving, lubricating, and adjusting as required and also may consist of replacement of minor parts not requiring skills that are of a highly technical nature. Despite their mundane nature, cleaning, oiling, inspecting, and adjusting equipment probably constitute the most important of all maintenance operations. If these operations are performed conscientiously, the burden on higher maintenance echelons is substantially reduced. Correction of minor operating difficulties before more serious troubles develop is the most economical maintenance that can be performed at any level. The value of training and discipline in the use and care of equipment is as important to the combat commander as the combat readiness of his troops; tank battalions without operable tanks and infantry units without reliable radios

are not ready for combat. The importance of frequent inspections of equipment by commanders at all levels cannot be overemphasized, nor can the need for disciplinary action against those who fail to care for equipment properly. Poor equipment and poor discipline go hand in hand and should be considered in command inspections to be of equal importance.

- (2) *Field maintenance.* The bulk of field maintenance in the continental United States is performed by fixed shops, predominantly civilian operated under control of the Army commander; some field maintenance in the continental United States is performed by special, mobile repair activities assigned to the support of the using organizations. In overseas areas, field maintenance is performed primarily by direct and general support maintenance units. The direct support units are mobile and provide on-site repairs, delivery of parts, including direct exchange service, and technical assistance to using units. General support units receive work from the direct support units, collection points, supply units, and depots. Normally, end items repaired by general support units will be returned to the maintenance float or depot stocks; however, repair may be accomplished for using units when required by the maintenance situation. Thus the purpose of field maintenance is to furnish close support of the equipment in the hands of using units. Field maintenance units usually serve either a specific area or specific troop organizations and, accordingly, are familiar with their customers and their needs. Frequent liaison visits and inspections of the equipment in the hands of the units it serves enables the field maintenance shop to have a first-hand acquaintance with the condition of the equipment. Inspections of this kind can lead to a reduction of the number of serious breakdowns that arise from delays in making needed repairs. Field maintenance

may take several days, and using units are sometimes disinclined to go without their equipment during the repair period. Under some conditions substitute equipment may be made available. The problem is mitigated when repair teams can be sent to the equipment. Since the importance of the repairs to be made may far outweigh the temporary inconvenience of being without the equipment, the reluctance of using units to turn in equipment for repair is a problem which the commander must handle through training and discharge of command responsibilities.

- (3) *Depot maintenance.* Depot maintenance, formerly called base maintenance, is generally performed in fixed or semifixed installations. Such installations are capable of major overhaul, minor fabrication of parts, and complete overhaul of subassemblies and end items. Assemblies and subassemblies are stored and issued in support of field maintenance activities. In the continental United States, depot maintenance is performed at technical service installations under the chief of the technical service. In oversea areas, depot maintenance is performed under the control of the theater commander. Repaired items are usually returned to stock rather than to the user. Depot maintenance shops typically employ large numbers of personnel, in many cases predominantly civilian, and perform work on both a stall and production line basis. Their heavy machinery and machine tools limit their mobility. Usually they are located considerably to the rear of troops in an active theater and, accordingly, the equipment to be repaired must be transported to the shops. Because of the time required for transportation and to make the necessary repairs, equipment turned in to depot maintenance shops normally must be replaced by substitute equipment, with the repaired items being returned to stock. Be-

cause depot shops perform major overhauls requiring a wide range of parts, it is essential that production schedules be formulated many months in advance in order to insure the availability of needed parts, subassemblies, and assemblies.

144. Scheduling Maintenance

The performance of maintenance and repair work requires close production scheduling in order to avoid overloading facilities, to keep at a minimum the time in which active equipment is out of service, and to assure that repairs are made when necessary.

a. Programming the Workload. To program and budget for maintenance, it is necessary to know what needs to be repaired, when it must be repaired, and the resources necessary to make the repairs. The workload must be determined and then related to facilities, funds, and personnel available.

- (1) At the organizational level, where maintenance consists largely of inspection and servicing, scheduling can be based on fixed time periods or fixed miles or hours of use. Command inspections can assure that equipment is checked periodically, serviced according to fixed schedules, and maintained in a state of readiness.
- (2) At the field maintenance level, density of equipment plus constant liaison with the using units will provide an indication of the impending workload.
- (3) At the depot level, programming and budgeting for depot maintenance are somewhat more difficult. Much useful information can be obtained by regional maintenance representatives and depot shop personnel through field inspection of equipment and liaison with field maintenance units. Rebuild and overhaul programs carried on at continental United States depot shops generally must be forecasted and programmed at least a year in advance. This period of time is required for determining the workload to be accomplished during the fiscal year, for planning for the return of reparable, for preparing detailed schedules by

the Technical Services and depot activities, and for assembling needed parts and equipment to meet such schedules and to assemble needed parts and equipment.

- (4) One important control of depot maintenance scheduling that has yet to be fully achieved is the measurement of stocks awaiting repair and in the process of repair against stocks actually in use. Determining minimum number of trucks that should be in the depot repair shop or waiting for repair at any given time in order to maintain 100 trucks in the field at all times would in effect measure the optimum "turnaround time" for major overhaul and repair work. Such a figure is difficult to arrive at because unserviceable items are turned in to stations or oversea bases and new items identified as replacement demands are issued to replenish the unit's supply. Programming on a forecast basis using turnaround factors developed from experience over a period of time must be used in lieu of scheduling from a large backlog of on hand unserviceables. Turnaround time for major overhaul becomes excessive when it is necessary to purchase new equipment needed to supply regular demand which could have been met by overhauling unserviceable stocks. Development of standards for turnaround time in major overhaul work may have a value far exceeding the cost of their application.

b. Materiel Requirements. The maintenance facility, whether field or depot, must compute the requirements for materials and parts to accomplish the phased repair schedule. Two factors make this process inexact, at best. It is not always possible by initial examination of a piece of equipment to detect all the parts that will require replacement; nor is it always possible to obtain the required parts when they are needed. The problem is complicated by the impracticability of completely disassembling a piece of equipment in the field to determine its true condition. The inspector must rely on

training and experience in estimating the degree to which parts he cannot see must be replaced. The accuracy of his estimate will not be known until the equipment is disassembled just prior to repair. Based upon the inspector's estimate, the maintenance shop consolidates the probable requirements for parts and submits a requisition on the appropriate supply source.

(1) In a field maintenance facility, maintenance is normally limited to the repair or replacement of unserviceable parts, subassemblies, or assemblies. Where it is determined that a repair part or parts will not be available in a given length of time, the item to be repaired is normally evacuated to a higher echelon and the using unit issued a replacement item. This procedure reduces the possibility of collecting a large quantity of unserviceable items awaiting repair parts and it is necessary in the field to insure mobility of the field maintenance unit.

(2) At depot maintenance level after submission of parts requirements, certain items may be shipped immediately, some extracted to another depot, some placed on backorder, and some ordered through procurement. The shop must then test its schedule against the anticipated availability of the parts. Parts not available in the system and requiring long lead time for procurement can sometimes be reclaimed or fabricated in the shop. Substitutions are often possible. If neither of these courses is possible, the schedules must be revised in accordance with the availability of parts.

c. Adjusting Maintenance Schedules.

(1) At the depot maintenance level, after schedules have been adjusted to conform to the availability of the parts initially calculated, the schedules may have to be revised once again when the equipment to be repaired starts through the assembly line and latent defects are discovered that require additional parts. The problem from a parts supply standpoint is a particu-

larly difficult one. Depot maintenance facilities engaged in engine overhaul and repair operations face this problem daily. Inasmuch as each engine undergoes a somewhat different experience, it is difficult to know what parts need to be replaced until the engine has been torn down. One engine may need a new carburetor part and another may not. Enough parts should be in stock to meet the needs of the overhaul line to avoid costly line stoppages. On the other hand, overstocking of carburetor parts beyond foreseeable needs must be avoided because of the various costs associated with maintaining an inventory that is larger than necessary. More than one maintenance shop engaged in work of this kind has found at least a partial solution to the problem through the economical order quantity concept.

(2) When equipment scheduled for repair is torn down, it may turn out to be in worse condition than had been anticipated with repair no longer an economical solution. Similarly, it may be found that number of machines may be repaired by cannibalizing one or more of the machines most in need of repair. Higher priority jobs may be assigned to the shop, requiring alterations in the schedule of equipment previously assigned for repair. All these factors suggest that maintenance schedules must be flexible in order to permit the maintenance shop to revise its program in accordance with new information. Unless the schedule provides this flexibility, personnel and tools may stand idle while waiting for parts, or parts may be expensively fabricated that can be more economically procured from the manufacturer. These necessary alterations in maintenance schedules suggest some of the problems that the inventory manager at the stock control point faces in keeping informed of returns to stock from repair activities.

145. Economy of Maintenance

a. General.

- (1) The need for cost data to facilitate management decisions is particularly necessary in maintenance work. Many of the most basic decisions cannot be reached with any degree of confidence in their validity in the absence of such data. Unless it is known with some accuracy what it costs to repair an item, it is hard to decide whether the item is worth repairing. If the cost of making the same repairs at different installations is not known, it is difficult to appraise the relative efficiencies of the installations or to increase the performance of any one installation. If two installations repair the same defect at different costs, the disparity may result from differing overhead rates, more expensive labor costs, more costly materials and other factors; yet, without a breakdown of these costs, the particular factor or factors cannot be isolated. The costs in manpower, material, and facilities to accomplish a given maintenance load must also be known in order to compute budget requirements.
- (2) The cost of maintenance work in Army shops should also be known in order to appraise the desirability, where possible, of employing commercial maintenance contractors. The decision as to whether the Army or commercial sources should maintain equipment cannot be made upon the basis of costs alone; the need for a training base, mobility, and close troop support may preclude the use of a commercial source in any given situation. But all other things being equal, the Army should not maintain equipment which can be maintained more economically by commercial sources; this "make or buy" decision which is common to business operations of all kinds, in the Army and in industry, cannot be reached usefully without comparative cost data.
- (3) Cost data are also necessary in making decisions with respect to the

equipment itself. The costs of maintaining an older piece of equipment mounting to the point where it is no longer economical to maintain it and maintenance costs of a given piece of equipment so high as to suggest misuse or abuse of the equipment must be considered.

b. Accumulating Cost Data.

- (1) The usual method of accumulating costs in maintenance activities is to assign a job number to each unit of work. Direct charges for labor and material are recorded against the job number. The mechanics record the hours worked on each part of the job, and material is charged as it is withdrawn from the shop storeroom, or credited when returned unused. Where bulk quantities of material such as solder, lubricants, paint, and preserving materials are withdrawn for several jobs, costs are prorated to the several job orders. At the end of the job, the direct costs for labor and material are computed and overhead costs are charged against each job usually in accordance with the direct labor hours. The overhead costs, representing indirect charges, bear a relationship to direct labor costs and are often expressed as a percentage of direct labor.
- (2) Whereas direct labor and material costs can be easily obtained, it is somewhat more difficult, under present financial arrangements, to determine an accurate or realistic allocation for overhead and other indirect expenses. Inasmuch as a maintenance shop is seldom, if ever, a separate activity but rather a part of a larger Army installation, the shop must bear a fair share of the installation's total indirect costs. Unless proper indirect charges are included in the cost of maintenance, a comparison with the cost of similar work in industry cannot be made. Moreover, failure to include indirect costs may lead to decisions to repair

equipment that would be uneconomical to repair if all costs were considered. The gathering of cost data is also important as a means of controlling costs. It has been said that cost consciousness is impossible unless costs are known. Only by means of accurate historical cost data for each aspect of the repair work can management pinpoint areas where costs are rising and take appropriate action. Cost control of repair work is ineffective unless it embraces the total situation.

c. Criteria for Determining if Repair is Economical.

- (1) To determine at what point in the age, service, or condition of a piece of equipment repair is no longer economical is a problem constantly confronting maintenance personnel. The Army, where practicable, strives to move its equipment down the scale from combat to noncombat, from overseas to the continental United States, and from tactical use to training. But even where it is possible to move the equipment into the hands of less exacting users, a point is finally reached where the cost of maintenance is so high, the equipment so unreliable, the time out of commission so long, the machine so much less effective than newer models that further maintenance is no longer economical. This question of when to dispose of the equipment is influenced not only by the matter of pure economics but also by such miscellaneous variables as the strategic importance of equipment, replacement lead time, availability of funds, the need for the equipment in training, and other considerations.
- (2) The technical services have developed methods to assist them in determining when repair is no longer economical. The Corps of Engineers "point system" is one approach to the question. Under this system points are assigned for factors such as age, hours or miles

of operation, and cost to repair. Each factor is given a point score; one point is given for each year of the equipment's age, one point is assigned for each thousand hours of operation and so forth. A score of ten is arbitrarily determined to be the point beyond which repair is no longer economical, barring such overriding considerations as military necessity or the impossibility of replacement.

- (3) No single set of criteria will cover all aspects of the question of whether to repair or dispose of the equipment, nor will it provide a necessarily automatic answer. A few of the factors that may be governing in any given instance are—
 - (a) Age of the equipment. (The equipment's age has a direct bearing on the amount of deterioration, the probable usefulness of the older machine as opposed to later models, and repair parts support from the manufacturer.)
 - (b) Availability of repair parts already in the system.
 - (c) Cost to replace.
 - (d) Time to replace.
 - (e) Present salvage or resale value and rate of annual depreciation.
 - (f) Cost to repair.
 - (g) Percentage of utility of the repaired item as compared to percentage of utility of new models.
 - (h) Cost to maintain after repair as opposed to the cost to maintain a new piece of equipment.
 - (i) Amount of time expected to be required to accomplish future repairs.
 - (j) Cost of transportation of the item from where it is to where it is needed, as opposed to the cost of moving a new item from the manufacturer to where it will be needed.
 - (k) Cost to store and preserve a repaired item until it may again be required for operational use.

- (l) Cost of modification into a more useful machine as compared to the cost of a new machine having the required capability.

146. Importance of Maintenance

As Army equipment increases, both in density and in complexity, maintenance takes on increasing importance. The prospect of either a long cold war, which strains the national economy, or an all-out war with probable shortages of manpower and materials, also add new importance to the maintenance function. Commercial facilities and experts from the manufacturer should be used to the maximum extent possible in the maintenance program,

but their use must be tempered by the necessity of having Army facilities and personnel available to follow the troops. The greatest single means of preventing an excessive maintenance load is the elimination of unnecessary damage to equipment by misuse or failure to take preventive measures at the using level. Of substantial importance is the economics of maintenance—the cost of maintaining old and obsolete equipment. The Army is constantly applying various programs which embody advanced industrial techniques to improve its maintenance system. The programs emphasize care of maintenance through a reduction in repair parts support, tools, and skill requirements. Emphasis is also being given to improved inspection and testing systems or devices.

Section III. REPAIR PARTS

147. General

It is apparent that repair parts support and the maintenance function are interrelated. If repair parts are not readily available, the maintenance function cannot be met. Various aspects of the repair parts problem will be examined herein in detail, to include discussion of the procurement of initial repair parts and their distribution throughout the system, the computation of repair parts requirements, and the procurement of replacement parts. As an indication of the magnitude of the management problem involved, it should be noted that repair parts comprise approximately 85 percent of the line items carried in the supply system and that administrative costs alone involved in adding a new part to the inventory can run as high as \$3000.

148. Magnitude of Repair Parts Problem

a. The large number of repair parts currently stocked in the supply system bears a direct relationship to the variety of end items stocked by the Army. There is no commercial parallel for the Army's materiel needs. The end item may be purely military, such as a tank, partially military such as an amphibious truck, or it may be commercial, such as a typewriter. Many essentially commercial items must be modified somewhat to meet the needs of Army use. The same military item manu-

factured by more than one manufacturer may show some differences. Moreover, modifications to an item resulting from improvements in the design of assemblies and components require different parts support for the later serially numbered machines than for the earlier models. As a further complication, the improved part in the latter model is often substituted for the earlier part when replacement is needed, creating major cross-referencing problems.

b. The wide range of end items stocked is only one of the reasons why so many repair parts must be carried. Another important reason is the large number of makes and models of essentially similar equipment. At one time in the Far Eastern Command there were some 127 makes and models of cranes supplied by 29 different manufacturers. This diversity of end items, and its attendant burden of parts support, is rooted in the nature of the American economy and the practice of formal advertising and competitive bidding which tends to characterize military procurement. More than one supplier is usually available to furnish an end item, and under competitive bidding, the lowest responsive bidder receives the award. Unless one manufacturer continually underbids his competitors, different makes and models of the required end item will enter the system and require the stocking of a different line of repair parts.

149. Procurement of Initial Repair Parts

a. General

- (1) Repair parts are necessary to support maintenance operations and maintenance must be accomplished speedily in order to keep at a minimum the time that equipment is unavailable for issue and use. Thus, the required parts must be readily at hand. It is not necessary to assume in repair parts planning that all parts will require replacement. The fact that only about 725,000 cataloged repair parts are stocked, when the number of parts required to assemble all the Army's end items would run into several millions, reflects this experience. Certain parts never wear out during the useful life of the item, other parts can be repaired, and large body and frame pieces can be replaced when necessary through the practice of cannibalization. The Army, like the corner garage, cannot afford to stock every part that may conceivably be needed. However, it must have on hand many of the parts for which there is a recurring demand.
- (2) Industrial experience in maintenance has revealed that the demand for repair parts is concentrated. From 15 percent to 20 percent of the parts account for from 80 percent to 85 percent of the total demand. An automobile provides a useful illustration of this point. The brake bands, spark-plugs, distributor points, and fuel pump wear out fairly rapidly and must be replaced. The wheels, the cylinder block, the radiator, and the frame members seldom require replacement except in the case of a wreck.
- (3) Knowing in advance which parts will require replacement constitutes a major problem for repair part management. For new items, there is little or no usage experience. For old items, the conditions of use in the future may vary from those in the past. If it were possible to wait until

the demand for parts developed mortality rates, much of the guesswork as to what will wear out could be eliminated. But as in so many questions of this kind, the Army cannot afford to wait. In the first place, the Army cannot afford to have a machine dead-lined during the time that the needed parts are being obtained. Secondly, even if time were not a factor, there would be cost considerations of substantial importance. These cost factors are particularly true of military items. When a manufacturer makes the parts or components to assemble his end item, he can provide extra parts or components much less expensively than at a later date when his production lines are turning out different end items. The added costs would be accompanied by delays while the manufacturer attempted to shift his production schedules to allow for the production of the extra parts. These various factors require that there be some provision for parts support accomplished at the time the end item is procured.

b. Initial Repair Parts for Commercial and Semi-commercial End Items.

- (1) When it is decided to add a new make or model of machine to the supply system, a determination must be made as to which parts should be selected for stockage and how far down the supply line the stockage will be maintained. Commercial items will be considered first because they present a slightly different problem from that encountered in selecting parts for military-type items. In the case of the commercial-type item, some reliance must be placed on the manufacturer to advise the Army of the anticipated mortality rate of parts. But the manufacturer's advice must be weighed against the facts he does not know, as suggested by the following questions:
 - (a) What will the item be used for and where will it be used? The answers to these questions may substantially affect the consumption of parts.

- (b) What common components, such as nuts, bolts, screws, washers, wire, and other common hardware necessary to maintain the item are already in the supply system?
- (c) What assemblies, subassemblies, and parts already in the system can be substituted for the manufacturer's assemblies, subassemblies, and parts?
- (d) Which of the manufacturer's parts can be fabricated readily from tubing, hose, fittings, metal in basic shapes, and gasket material?
- (e) Does the Army expect to maintain all of the items or to cannibalize some for major assemblies such as frame pieces, body pieces, housings, and other such insurance-type items that might otherwise be stocked?
- (f) Which of the parts are likely not to be damaged beyond a point where repair cannot be made by such processes as welding, metalizing, and regrinding?
- (g) Which of the parts are moving and nonmoving and therefore subject to more or less wear?
- (h) What experience has already been encountered in connection with similar parts in other items?
- (i) Shall the Army stock the whole assembly, the subassembly, or individual parts? This question is one of the most complicated ones to be answered. Some considerations that may be helpful in answering it are—
1. Is the assembly small, intricate, and inexpensive and usually replaced as an entire unit?
 2. Are facilities and skills in the field available to repair the assembly or does it require the type of bench work available at the depot shop? If the latter, would it be more practical to replace the entire assembly in the field by a new assembly and return the old assembly to the depot shop for overhaul?
3. Does the assembly contain only a few parts subject to rapid wear that are easily replaced in the field? An example of this type of repair is the carburetor repair kit which contains those parts of the carburetor which require replacement at frequent intervals.
- (2) The nine questions listed above suggest that the Army should be particularly "hardheaded" about stocking initial repair parts for commercial items. To do this safely, it is necessary for repair parts inventory managers to have broad commodity knowledge, particularly with respect to sources of supply and the business practices of the suppliers. For many commercial items, the supplier maintains parts for his customers, and it is clearly in the Army's interest to let him supply them rather than to carry them in the Army supply system. The purchase of replacement parts when needed under indefinite delivery type contracts is discussed in a later section of this chapter.
- (3) If it is possible to defer the purchase of repair parts until a later date, it is often advantageous for the Army to do so. Two generalizations would appear to grow out of the discussion—
- (a) Initial repair parts should not be procured if the Army can maintain the equipment through repair, cannibalization, or by means of duplicate or similar parts already in the system.
 - (b) Initial repair parts should not be procured if they are easily obtainable at a later date at lowest ultimate cost.
- c. Initial Repair Parts for Military Items.*
- (1) Many of the observations made with respect to commercial items apply as well to military items. Generally speaking, however, it is more necessary to acquire initial repair parts with military items than with com-

mercial items. The reason for this is that the manufacturer normally produces his regular commercial line of merchandise and manufactures military items only when called upon. At some later date, he may be reluctant, because of inconvenience and cost, to divert his commercial production in order to manufacture needed parts.

- (2) Fortunately, there is some opportunity with military items to determine parts mortality through actual experience with the item. Military items are developed and produced upon a gradual basis encompassing various stages for each particular type of item. Through the stages of development of a new end item, exhaustive tests are conducted in the laboratory and in the field to insure that the new item is the best possible one for the job it will be required to perform. During this testing and modification, information is acquired on the mortality of the end item and its components. The initial parts list established with the pilot model is refined as these tests proceed. Service tests lead to further modification in the parts list. During the development, particular emphasis is placed upon "ease of maintenance" to make certain that defective parts may be reached and replaced easily. In the development process it is most important that standard parts, assemblies, and subassemblies already in the system be utilized to the maximum extent possible to avoid the unnecessary introduction of new parts in the system. Sometimes it is advantageous to furnish these standard parts to the manufacturer as Government-furnished property, with corresponding reductions in the manufacturer's price.
- (3) To provide uniformity in repair parts selection and maintenance capability determinations, maintenance allocation charts are prepared by heads of technical services. Charts are prepared for each end item or family of similar end

items, including common component assemblies and subassemblies. These allocation charts show by general description the maintenance operations authorized to be performed at each echelon. Repair parts are selected from a list of all parts of a major end item by determining which are required in maintenance operations. This is determined initially from applicable maintenance allocation charts of the specific end item and by maintenance evaluation of the specific major end item and its assemblies and components. Normally during maintenance evaluation a physical inspection, disassembly, and assembly of parts and components is made. The manufacturer's experience, test experience, and experience with other similar items are considered. Maintenance evaluation also determines for each maintenance echelon the most efficient form of repair parts to be used, i.e., individual pieces, bulk material, assemblies, subassemblies, and kits of parts for specific repair operation. Even with the information gained through research, development, and testing, the Army sometimes acquires initial repair parts that experience proves to have been unnecessary. This is unavoidable because it is impossible to predict which parts will wear out and when.

150. Distribution of Repair Parts

a. Initial Distribution of Parts.

- (1) Some of the many factors that must be taken into consideration in determining what parts will be stocked to maintain a new item have been discussed. After the decision has been reached as to which parts will be stocked, the next question to be resolved is how many should be stocked where? If subsequent experience discloses that a part expected to fail does not fail, every extra part procured compounds the error. On the other hand, if the part fails at a more rapid rate than anticipated, stocks may be

exhausted and machines deadlined before additional quantities can be procured.

(2) The usual practice in determining the number of each part to be bought is to calculate the repair parts mortality. This is done by estimating the frequency of consumption or replacement in the applicable maintenance echelons for each part under combat conditions for the average climate and terrain. Allowance factors are determined for each repair part allocated to each maintenance echelon. The allowance factor is based on the latest mortality data and is the estimated average quantity required by the various maintenance echelons to provide maintenance, and where applicable, supply support for 100 equipments for a 15-day period under combat conditions. Although the selection of the level at which an item will be stocked is of extreme importance, it should be borne in mind that what is here being discussed is the initial distribution of parts before there has been any accumulation of demand experience. At this stage in the introduction of a new item to the supply system, the maintenance technician can do little more than make an educated guess as to the probable consumption rate of parts.

(3) Parts to support an end item are required to be in the theater by the time the new end item arrives. Occasionally, the objective is not achieved. The manufacturer is anxious to meet his delivery schedules for the end items and typically uses the first parts he fabricates for assembly of end items. Only after all or a large number of end items have been produced is the manufacturer conveniently able to furnish the parts required under his contract. This situation can be prevented only by careful followup by contract administration personnel.

b. Publication of Parts Lists to Field.

(1) When the parts that will be stocked have been selected and it has been

determined where they will be stocked, it is necessary to publish lists of these parts to the depots, shops, and users. At the present time there are two overlapping systems in existence, during the transition period from the 7, 8, and 9 types of supply manuals to the new multiple-part technical manuals. Under the supply manual system, parts listings are normally published in the following types:

Type 7—Organizational Maintenance Allowances.

Type 8—Field and Depot Maintenance Allowances.

Type 9—List of all parts.

The organizations use the type 7 manuals to order authorized parts and supplies while the field and depot maintenance shops use the type 8 manuals as a guide to initial stockage until sufficient demand and usage data are generated. These manuals are frequently combined when efficiency and economy warrant. Present type 7, 8, and 9 supply manuals are being replaced on an attrition basis by new type technical manuals. The new multiple-part technical manuals incorporate the concept of combining the present equipment technical manuals and present 7, 8, and 9 parts list type supply manuals into a single document. This document is divided into separate parts for distribution on a need-to-know basis to the various maintenance echelons. The operator's (-10) and organizational (-20) manuals will normally be published in separate books, but may be combined under certain conditions stated in AR 310-3; while field (-30 and -40) and depot (-50) maintenance manuals may be combined at the discretion of the heads of the technical services. A Maintenance Allocation Chart is included in the organizational (-20) manual. The parts list portion, which is titled "Repair Parts and Special Tools List" (RPSTL) is usually published separately for second, third,

fourth, and fifth echelons (-20P, -30P, -40P, -50P, or combinations thereof) to facilitate use by supply personnel.

- (2) This revolutionary change in concept removes all of the optional features of current type supply manuals and provides for firm parts listings item-wise and quantity-wise. Additional features include a standard size format for all technical services, to permit binding of all publications pertaining to operation instructions and maintenance of a major end item or family of similar major end items in one binder. The parts lists of the new manuals which are subject to frequent changes may be bound separately and reproduced in loose leaf form to facilitate supply and maintenance operations. When new end items are initially distributed, or when there is a major shift in end item population, these "parts lists" are often used by the inventory control point to compute and make automatic shipments, without requisition of the number of parts required to maintain the end items being shipped to users.

c. Determining True Consumption Rates.

The discussion thus far has been limited to the initial selection and distribution of parts for new machines or other items of equipment entering the system. The decisions have been made largely upon the basis of estimates, and must be reappraised as experience with the new equipment is acquired. For various reasons the process of reappraisal is a complicated one, particularly with respect to oversea activities, and there are many factors that make it difficult to obtain true consumption rates. One of the first problems is to ascertain the actual demand history of the parts.

- (1) *Issue history of parts.* Organizations, field maintenance shops, and depot shops all carry stocks of repair parts. Thus, there is usually a "cushion" between the actual demand for the part for a repair job and the reflection of the consumption of the part by a replenishment requisition on the depot. If the initial estimate of consumption

was low, demands for additional parts may be reflected rather quickly. If the estimate was about right, additional demand is slower to be reflected at the depot. "Automatic shipment" of parts and "automatic requisitions" also make it difficult to determine the issue history of parts. The automatic shipment of parts from the depot system has already been described. The "automatic requisition" is somewhat different. It occurs when a shop must repair an end item (not necessarily one of a new type) on which it has had no previous experience. Accordingly, the shop must rely upon the accuracy of the echelon list (which has been determined upon the basis of estimate, not experience) to provide the right parts in the right quantity for accomplishing the new maintenance workload. The parts that are acquired as a result of automatic shipments and requisitions begin to build up in the shops as well as in oversea depots, which are also supplied "automatically." In addition, the shops order parts they think they will need for repair jobs but for which no actual demand may develop. The shops and the oversea depots are reluctant to declare any ensuing overstockage of parts as excess. In a week or in a month, they may be needed and it is easier to take them off the shelf than to place a requisition through the supply system.

- (2) *"Layering" of repair parts support.* The stocks of parts that exist in the oversea depot, organization, field shop, and depot shop represent only a portion of the total cushion. Posts, camps, and stations also have stocks. In oversea areas, the depot system may be in layers. During and immediately after the Korean War, repair parts for one technical service were distributed by a repair parts depot in Yokohama, a repair parts depot in Pusan (which derived some portion of its parts from Yokohama and received shipments di-

rectly from the Continental United States), and a small depot maintained by the Eighth Army near the front (which drew parts either from Pusan or Yokohama). This "layering" of parts support is illustrated as follows:

Continental United States depot stocks.

In-transit oversea stocks.

Yokohama stocks.

Pusan stocks.

Eighth Army stocks.

Depot shop stocks.

Field shop stocks.

Organization stocks.

In the technical service in question, field maintenance shops provided parts support to organizations. Thus, a demand for a part from an organization in the Eighth Army would normally have been reflected from the organization to the field maintenance shop, to the Eighth Army depot, to the Pusan depot, to the Yokohama depot, and finally, to the depot in the Continental United States. Since the demand on the supply system for parts originating at all of these levels stemmed in a large measure from the published echelon lists, it is readily apparent that the quantity of parts issued from the Continental United States depot system may have borne little relationship to the quantity of parts actually consumed within the system. If enough time is provided for the demands to level out while the number and type of end items being supported remain constant, the Continental United States depot system will finally be able to determine the true consumption rate. However, by the time it is possible to determine whether the supply of a part is short or long, the basic maintenance workload is likely to have shifted so appreciably that the reflected demand bears little relationship to the current true demand. All of the intermediate cushions of stock of the same repair part serve to dissipate the responsiveness of supply to demand.

(3) *Attempted solutions.* Sluggish reflection of true demand to the stock manager at the inventory control point may result inadvertently in the building up of an artificial demand for parts that may never be needed in the quantities supplied. Intermediate stockage of the same part at so many levels may build up reservoirs of parts that will become excess if there is a substantial exchange in the distribution of end items. On the other hand, we have seen that it is neither practicable nor desirable to ship parts over long distances only after actual demand has arisen. When the user has a deadlined end item, the Army cannot afford to wait until the parts are shipped. From these considerations it is clear that "automatic" supply cannot be eliminated. Nevertheless, there must be a means of correcting the echelon lists more promptly to prevent overstockage of unneeded parts. The Army has recognized the seriousness of this problem and is attempting to solve it in several ways. One solution is the use of the Army Field Stock Control System, in which the maintenance organization reports the actual consumption of parts by a separate card each time a requisition is placed. These cards are then sorted by part number to ascertain the consumption of parts being carried at various levels. Studies of these consumption rates show that a relatively few parts represent a high percentage of the total true consumption. The project has led to a large reduction in the repair parts loads carried by the organizations, the shops, and the depots. This approach, wherein the parts actually consumed are tabulated, as opposed to counting the parts issued from the depot system, provides a means of correcting the echelon lists promptly. Timely correction will prevent the large accumulation of excesses that will otherwise result from overstated echelon lists or, conversely, will prevent shortages from under-

stated lists. Although the demand-consumption data at user level does much to alleviate the general problem, the stockage at many intermediate levels, based upon carefully purged echelon lists, will nevertheless retain some sluggishness and will generate excesses in spite of the reduced echelon lists. Selective stockage lists, single line requisitions, rapid communications (use of transceivers), rapid transportation, and standard shipping (CONEX) containers offer potential solutions to the parts supply problems.

151. Determining Requirements for Repair Parts

a. General. There are important differentiating factors in the computation of parts requirements that the inventory manager must take into account. These factors include the need to—

- (1) Determine true demand.
- (2) Provide parts for a “mothball” force of end items in mobilization reserve.
- (3) Determine the present and planned geographic location of the end items to be supported.
- (4) Relate scheduled retirements and planned acquisition of new end items.
- (5) Relate repair, overhaul, rebuild, and modification programs.
- (6) Relate assemblies to subassemblies or to the individual parts of which they are composed.
- (7) Relate substitutability or interchangeability of parts to computed requirements.

Each of these factors will be considered in succeeding paragraphs.

b. Determining True Demand. The “automatic” supply of repair parts from echelon lists makes it difficult to ascertain true demand and leads to distortions in the issue history of depots. With respect to end items the distinction between initial and replacement issues was not always reliable. If the repair parts inventory manager cannot rely on issue experience as a true guide to demand, then testing the

validity of issues in computing requirements becomes a major problem. Some of the data that may be helpful to him are—

- (1) The quantity of the part used in all end items and the population of the end items that use the part.
- (2) The latest revisions upward or downward of the quantity of the part authorized on echelon lists. This information may indicate a previous over- or under-statement of requirements.
- (3) Future plans for augmentation or reduction of the end items that employ the part.
- (4) The extent of obsolescence of the end items that employ the part.
- (5) The population of end items in the mobilization reserve that employ the part.
- (6) The presence or absence of acceptable substitutes or interchangeable parts in the supply system.
- (7) Any distortion of the issue that may have resulted from unusually large “automatic” shipments.

c. Providing Parts for End Items in Mobilization Reserve. The quantity of parts to be held for the support of end items included in the mobilization reserve must be added to the stocks required for end items currently in use. Should the parts be segregated and held with the end items they are to support? Should the quantity of parts held for end items in reserve be computed from the echelon lists? The probable answer to both questions is “no.” It is a rare exception when some portion of the total quantity of an end item is not in use. Thus, current experience in the mortality of parts for those end items in use should be representative of the demand for parts for the end items that may later be withdrawn from storage. Stocks of parts may be rotated if there is no segregation of balances. Provision of parts for the end items in reserve can be accomplished by the addition of a percentage that takes into account the ratio of end items in use to those in storage. The base figure on which the percentage is added will then fluctuate in accordance with mortality rates of parts now being replaced and will tend to keep

realistic the quantity of parts held for the end items in the mobilization reserve.

d. Population Density by Area.

- (1) The repair parts inventory manager must be currently informed of the location of the equipment he is supporting with parts, together with any planned changes in density. He must know the distribution of the equipment, actual and planned, in order to determine where to ship parts from the manufacturer. He must know where the equipment is located and how it is being used in order to apply different mortality rates for variations in climate and use. If the equipment is in reserve, he must know where it is now located or where it is expected to be used in order that he can place stocks advantageously for the day when the equipment is withdrawn from reserve. Gathering these figures is easier said than done. A variety of slightly different models are in use both overseas and in the Continental United States, in depot stock, in shop inventories, and in transit. The repair parts inventory manager should be provided with base figures of the total number of end items acquired by the Army and the total number of end items that have been disposed of in order for him to test the accuracy of his inventory. The reports of stocks in depots or held by the depots for the depot shops are fairly reliable, except to the extent that in some instances the identification of makes and models fails to provide enough detail to distinguish between models that require different parts support.
- (2) Stocks of principal and major secondary items in the hands of troops, both in the Continental United States and overseas, stocks in post, camp, and station inventories, and stocks in oversea depots are reported quarterly under the Army Stock Status Reporting System. Machine records units of The Adjutant General's Corps con-

solidate these lists and submit them through command channels to the technical services and to the Deputy Chief of Staff for Logistics. Improvements are being made in these reports and aggressive action is being taken to rectify errors, to provide accurate, timely, and complete data, particularly with respect to brackets of serially numbered end items which require different parts support.

e. Rebuild and Modification Programs. These programs must be taken into consideration in computing requirements for repair parts, particularly in phasing deliveries. The depot shops and the field shops engaged in such programs must furnish to the inventory manager estimates of parts required by periods. These requirements must be consolidated and combined with other requirements.

f. Substitutions, Supersessions, and Interchangeability. In spite of the original research performed at the time that a new end item is introduced into the supply system, additional parts will subsequently be found to be substitutable, old parts will be superseded by newer parts, and further interchangeability of parts will be discovered. It may also be found that an assembly will be issued instead of the individual components or, conversely, that the components that wear out will be issued instead of the entire assembly. It may be discovered that a part should not be procured because it is more practical to fabricate it locally from bulk materials. In any event, the inventory manager must be able to "transfer" the demand from the old item to the new, reflecting the added requirement in the quantity of the new item to be procured. He must know what use can be made of the old item. Should it be disposed of or issued until consumed? These same problems face the inventory manager of end items but in only a fraction of the volume faced by the inventory manager of repair parts. Cross-reference data in these instances are as valuable to the inventory manager in his computation of requirements as they are at the issuing and using level, in view of the fact that funds may otherwise be expended for unneeded items. Because of procurement lead times, the data with respect to substitutions,

supersessions, and interchangeability should be furnished to the requirements personnel even before being disseminated to the field.

g. Unused Assets Returned to Stock.

- (1) The tendency of "automatic" supply to build up stocks of unused parts both at the oversea depots and in the hands of shops and organizations has previously been discussed along with the natural reluctance of personnel at these levels to return unused stock to the depot system. However, unless these stocks are recredited to the stock record account and the history readjusted, issues are artificially inflated and further assets of the same unused parts will be acquired. The problem is double barreled. The stocks must be recovered as assets and the previous demand rate adjusted to prevent further acquisitions.
- (2) What are the means of recovering the assets? Should detailed stock status reports be gathered from all levels at which the parts are stored? If this approach is followed, tremendous inventory lists must be compiled and reviewed at great cost. There also is a necessary lag in the compilation and review of such stock status reports. Because of these considerations, review and action on the spot by inspection teams is probably the most economical means of eliminating unused excesses of parts, just as depot liaison teams examine end item stock record accounts of stations. If the stock of a part is determined to be excessive, the inspection team must be prepared to answer whether or not the part is already excess in the depot system or is needed elsewhere, in order that an on-the-spot final determination can be made as to disposition. If the part is returned to the depot system, the stock will be picked up as "on hand" without complications. However, the issue history at depots is "closed" by periods of time because of the practical impossibility of relating the

return to stock to the original issue. Accordingly, the "established" rate of issue may appear sufficient to exhaust the increased assets more quickly than the true facts will support. To prevent this type of inflation of demand, the inventory manager must take account of all returns to stock in his computation of requirements.

152. Procurement of Replacement Parts

a. General.

- (1) Repair parts, in many instances, must be procured along with the end item not only to maintain the end item but to obtain the extra parts at a time when the manufacturer's production lines are tooled to make them. If the component parts can be manufactured more economically at this time, why not purchase enough parts to last for the life of the end item? There are several reasons why this course of action is seldom followed.
 - (a) The science of estimating parts mortality is inexact at best.
 - (b) It is impossible to prophesy the exact climatic conditions in which the end items will be used or the kind of use that will be made of them.
 - (c) Later production models may incorporate improved parts instead of the parts that were provisioned.
 - (d) The interest on the investment in sufficient parts to last for the life of the end item may exceed the additional cost of re-establishing the production lines.
- (2) If parts should not be provisioned for the entire life of the item, for how long a period should they be bought? There is no single answer to this question; depending upon the variables in the situation, an optimum period may be six months, a year or more. Some aspects of the problem which will help to provide an answer in individual cases would include the following:

- (a) Is the item a "one shot" production, or will the manufacturer continue to produce it for the Army or industry?
- (b) How quickly will the item be put to general use and require parts support?
- (c) Is the manufacturer well established and likely to be a continuing source of parts?
- (d) Which of the component parts require a long lead time for manufacture and which ones could be quickly replaced?

b. Sources of Replacement Parts.

- (1) Generally there are two sources of replacement parts; the manufacturer of the end item on which they are used, and the manufacturer's own sources of supply. The manufacturer of the end item will often fabricate many of the necessary parts, but in almost no instance does the manufacturer fabricate all the parts from which the final item is assembled. Many of the parts are purchased from other suppliers and often are common to a number of end items.
- (2) The question often arises: Should these common parts be procured from the assembler of the end item or from the manufacturer who supplies them to the end item assembler? From the standpoint of computing requirements for a particular end item and for placing orders for parts, it is often simpler to procure all the parts from one source of supply. On the other hand, procurement from the final assembler may result in paying the assembler an additional markup on the parts he procures from outside sources. Moreover, there may be delays while the final assembler processes purchase orders on the source of the parts. In some instances, the Army has had no recourse but to buy common parts from the manufacturer of the end item. This has stemmed from agreements between the end items manufacturer and the parts sup-

plier, wherein the parts supplier agrees to sell those parts which the end item manufacturer uses only to the end item manufacturer. Fortunately for the Army, in the past there have been few such agreements. As a general rule, it is probably advantageous to the government to buy common parts from their original source and not from the manufacturer of the end item. Replacement parts fabricated by the end item manufacturer and peculiar to that item must, of course, be obtained from the end item manufacturer.

c. Reliance on Manufacturer.

- (1) When it is necessary to procure replacement parts, the question arises as to whether or not the Army should stock the complete range of parts or rely upon the manufacturer and his normal parts distribution system to furnish parts when needed under indefinite delivery contracts or by means of local procurement? It is advantageous where possible, for the Army to rely upon commercial sources for repair parts rather than to invest the necessary money to buy and stock large quantities of them. Because of the costs of adding a new part to the supply system, it is desirable to keep the inventory as small as possible and concentrate management attention on those parts actually stocked.
- (2) If the Army is to rely upon manufacturers rather than to stock a complete range of repair parts, it must assure itself that each commercial source maintains adequate stocks on hand and has an adequate parts distribution system. More than one technical service has found that it could rely confidently upon the manufacturer's commercial distribution system to supply parts under indefinite delivery contracts or through local procurement. Indefinite delivery contracts have been awarded to manufacturers of subassemblies and parts such as generators, starting motors,

bearings, and rings where the manufacturers have national distribution systems already in operation for the supply of these components to industry and the public.

- (3) The reliance upon the manufacturer's parts distribution system for repair parts as needed may create temporary problems for all parties concerned. Under bulk central procurement from the manufacturer, separate scheduling of manufacture and delivery of the Army's needs can be planned by the manufacturer so that it will not intrude upon his normal commercial demands. If, on the other hand, requisitions are placed by the Army upon his distribution channels, the impact of the Army's demands, at least initially, may cause some dislocation. The manufacturer must acquire experience to determine the extent of the Army's demands upon his local distribution outlets.
- (4) The following comments may be helpful in determining the extent to which the Army can rely upon indefinite delivery contracts or local procurement to obtain parts as needed from commercial channels of distribution.
 - (a) Does the manufacturer have a national parts distribution network which will provide convenient distribution points to Army users of his equipment?
 - (b) Is the equipment basically commercial and is the manufacturer engaged in the support of the equipment in the hands of industry and the public?
 - (c) Is the equipment purely military and the manufacturer, accordingly, unlikely to carry component parts within his distribution network?
 - (d) If the item is a mixture of commercial and military components, can the commercial components be supplied by the manufacturer's regular distribution network?
 - (e) To what extent must the equipment be maintained in oversea areas

where the manufacturer has no distribution network?

- (f) To what extent should stocks be maintained above current demands for equipment held in mobilization reserve? If the equipment is withdrawn from the reserve and put into use, will the parts requirements be so large that the manufacturer cannot furnish them through his normal distribution network?
- (g) Even though the manufacturer may not have a distribution network, are most of the parts that he provides small enough to be conveniently sent by parcel post or air shipment from the home plant to Army users?

153. Controlled Cannibalization

a. Under present concepts, a very important local supply source for certain repair parts is by means of controlled cannibalization of disposable end items or components. Parts which are permitted to be acquired from this source are—

- (1) Nonstockage list fringe parts.
- (2) Mandatory recoverable items as determined by major commanders.
- (3) Parts for which the established source code is through salvage.
- (4) Parts authorized to be obtained through local purchase or fabrication.
- (5) Stockage list parts, temporarily unavailable through the supply system, for which a critical local requirement exists.

b. The use of the word "controlled" is emphasized to insure that parts are not secured through indiscriminate cannibalization of repairable assets, and to insure that parts secured by means of cannibalization are properly recorded. Proper recording is essential to avoid distortion of the demand picture.

c. Control of cannibalization is assured by prohibiting use of the cannibalization technique at other than specifically designated points known as "cannibalization points". Cannibalization points are established at sites designated

by major commanders after consideration of such factors as—

- (1) Availability of disposable end items in sufficient quantity to constitute a reasonably productive source.
- (2) Existence of sufficient requirement for

fringe items to insure that personnel and equipment at the cannibalization point are effectively utilized.

- (3) A geographic location which will permit rapid and efficient communication and transportation.

CHAPTER 9

DISPOSAL OF STOCKS IN EXCESS OF NEEDS

Section I. NEED FOR DISPOSAL

154. General

A constant task facing the supply manager is the purging of stocks that are excess or surplus from the supply system. An excessively high inventory is costly to maintain in terms of storage and warehouse costs, maintenance and preservation costs, and deterioration and obsolescence of materiel. To these must be added the cost of selling such material when it becomes surplus. In considering the problem, it is useful to look at the factors which cause excess stocks to be generated. A major factor is that wars do not end on a prearranged schedule. If it were possible to schedule victory to occur precisely as the last available round of ammunition is fired, the disposal of excesses and surplus would be a minor problem. It could also be reduced if it were possible to wear out all old items before new items were adopted. Despite the inevitability of the problem however, effective supply management can reduce its magnitude.

155. Distinction Between "Excess" and "Surplus"

Before covering some of the reasons why excesses develop, it is necessary to differentiate between the terms "excess" and "surplus." Stock which is *excess* to a station, a technical service, or to the Army, does not become *surplus* property until it has been ascertained that there is no need for it by any other Federal agency. The process of determining whether excess stock is *surplus* to the needs of the Federal Government is termed "screening."

156. Causes of Excess Stocks

a. Excess From World War II. When World War II ended, goods were in transit between

manufacturers and depots, between depots and stations, between depots and ports, and between ports and oversea depots; warehouses, yards, and dumps were heavily stocked. When victory came, an Army of scores of divisions with billions of dollars' worth of equipment was suddenly reduced to a few scattered divisions requiring a fraction of that equipment. A considerable portion of the material had to be demilitarized and sold as scrap because it had little or no civilian application and no peacetime utility. Other items with some apparent utility found their way into appropriate civilian surplus outlets.

b. "Cold" War and Korean Excesses. Before the flood of World War II excesses was fully released, the "cold war" started and the floodgates were closed. With the outbreak of hostilities in Korea, it became necessary to buy back some of the more critical items that had been released previously. Abandoned equipment was assembled from the islands of the Pacific and rehabilitated in Japanese workshops. Repair parts that had been retained from World War II stocks were insufficient in many instances for maintaining this obsolete and often rebuilt equipment; accordingly, newer equipment was purchased to replace older equipment ahead of the scheduled replacement rate. There was the possibility that the Korean War would be the prelude to another general war. Thus, the "wraps" were taken off many development models, and newer weapons went into production. Although the nation had modern weapons and equipment when World War II ended, a period of only five or six years had been sufficient to outmode our tanks, anti-tank weapons, and many other items. When the fighting

in Korea ended, this outmoded property became an even greater liability to the supply system.

c. Excesses From Obsolescence. Excesses arise from obsolescence of equipment and supplies irrespective of whether wars are "cold" or "hot". Improvements in design make tanks faster, harder hitting, and less vulnerable. Improvements in tanks require improvements in antitank weapons. Improvement in weapons require improvements in ammunition. As planes fly higher and faster, the ground weapons to combat them must shoot farther, and more modern tracking equipment is required, causing older equipment to become obsolescent. Obsolescence is not limited to weapons. Improvements in engines, traction, suspension, and load-carrying ability make trucks of a half decade ago equally obsolete. The clothing for Arctic wear has been completely redesigned in order to provide greater warmth and less weight. The need for reduced weight has affected more than clothing; the weight of electric motors and radio apparatus has been drastically reduced by means of new methods of insulation and miniature components. A variety of new metals, plastics, antibiotics, chemicals, and other products of the laboratories result in modifications of older items and the introduction of new ones. There is no reason to believe that this constant influx of new or improved items will stop if our superiority in arms and equipment is to be maintained.

(1) *Phasing in new material.* Continuous improvements in equipment requires that inventories be kept as low as the situation will permit in order to avoid large excesses of stocks. The objective is difficult to achieve. Quantities of old items must be stocked for current needs, but must be kept sufficiently low to permit the economical introduction of new items. When new items are developed, decisions must be made as to whether disposition should be accomplished through continued use and wear out or by immediate replacement of the old ones. Economic considerations may be opposed to military considerations, and it may be difficult to separate economic from military factors. When

economic factors are paramount, old items must be phased out by carefully prepared plans, and tight controls must be established over the issue of new items to prevent general issue before old items are exhausted. The introduction of the new item must also be coordinated with maintenance planners in order that the transition of maintenance support can be executed smoothly.

(2) *Residual stocks.* Excess stocks which result from the introduction of new items must be disposed of as promptly as possible to free storage space and reduce commensurate costs. If some of the old items can be used for training purposes or for certain noncritical applications, coordination and establishment of policies must be accomplished as soon as possible in order that quantities not needed can be rapidly removed from the supply system.

d. Excesses Due to Overestimation of Requirements. Excesses sometimes develop due to overestimation of requirements. In the computation of requirements, overestimations of rates of consumption or of demand may occur due to changes in bases of issue, in troop disposition and composition, and other such causes. Every effort is made to avoid overestimating requirements. However, changing world conditions and deployment of army units make it impossible to eliminate the generation of some excesses.

157. Cost of Carrying Excess Stocks

Excess stocks take up warehouse space that may be required for needed items. They add unnecessarily to storage costs and lessen recoverable value as a result of both deterioration and obsolescence. Failure to dispose of excesses promptly can result in forcing active stocks into unprotected outside storage. The administrative costs of holding excess material are commensurate with costs of holding active stocks. Rubber products, chemicals, certain drugs, and many other items deteriorate rapidly in storage and must be disposed of rapidly in order to realize any return as surplus property.

Section II. REPORTING AND SCREENING OF EXCESSES

158. Installation Excess

All quantities of serviceable items which are in excess of the needs of Continental United States installations are considered as installation excess. Continental United States Armies transfer excesses of installations to others having requirements for them. Residual items which are determined to be excess are reported to the distribution depot serving the installation. Once reported, installation excess property becomes subject to the control of the depot and will not be issued by the installation except by authority of the depot or, in emergency, upon prompt notification to the depot of the action taken and the justification therefor. Oversea excesses are screened within the oversea commands and then forwarded direct to the appropriate inventory control point. Technical services maintain current lists of specific items to be reported for possible return to the United States rather than disposed of overseas. Overseas excesses are then screened by the Utilization Division, Armed Forces Supply Support Center, for any Department of Defense requirements. AR 755-6 prescribes line item monetary restrictions relative to disposal actions.

159. Review by Depot

The depot, upon receipt of excess reports from stations, screens items entered thereon and notifies the installation of action to be taken. This notification may include any or all of the following:

- a. Direction to ship to a depot or another installation based on a known demand.
- b. Direction to store at the installation under depot accountability where known future requirements will develop.
- c. Direction to dispose of locally as technical service excess when the items are non-reportable to higher management levels.
- d. Notification that items have been referred to the inventory control point for screening.

160. Excesses to National Requirements

All items and quantities of items which are controlled by the National Inventory Control

Points and are physically stored within the depot system, and are determined to be in excess of total Army requirements for a given period of time, are termed Army excess. The determination of appropriate items and quantities of items for national retention or disposal can best be accomplished by national-inventory control points and single managers.

161. Reporting Procedures

a. *Installation Excesses.* Excess reports received by supporting depots from installations and activities are forwarded to the appropriate technical service inventory control point. The inventory control point screens them against known or projected requirements and provides general instructions as to whether or not the items are required within the supply system. Those items which are no longer required must be processed by the installation in general accordance with specific criteria established in AR 755-6 on the reporting of excess personal property.

b. *Depot Excesses.* In general, inventory control points furnish depots with listings which denote items and quantities of items which are in excess of national requirements. These lists are based on information on the depot stock which is maintained by the inventory control points, or on general information intended to purge all stocks of particular items. Depots prepare excess reports in accordance with the instructions from the NICP's and with specific criteria contained in AR 755-6.

c. *Reporting Criteria.* Reporting criteria are very detailed and specific concerning categories and values of items which must be reported as excess for screening by the Utilization Division, Armed Forces Supply Support Center, and by various offices of the General Services Administration. These criteria change from time to time as a need arises. They are designed to cause significant amounts of excess personal property to be reported to these central agencies to permit wide Governmental dissemination. In this manner, other Military Departments and other Governmental Agencies are able to screen all excess reports for items

which they may need. In addition, it permits the General Services Administration to conduct the donation programs required by law.

162. Screening of Excess Property

The Utilization Division, Armed Forces Supply Support Center circularizes listings of classes of excess property in which all military departments have expressed an interest. Requests for property listed on excess reports are sent direct to the Utilization Division by the representatives of all Military Departments. Screening among Federal agencies other than

those of the Department of Defense is accomplished by regional offices of Federal Supply Service, General Services Administration, upon receipt of these annotated reports of excess personal property received from the Utilization Division, Armed Forces Supply Support Center. Property which has not been redistributed or transferred is turned over to a property disposal officer for appropriate action by the depot or installation which rendered the excess report. Any legitimate request received is honored, provided the property which has been screened is still available.

Section III. DISPOSAL OF EXCESS AND SURPLUS MATERIAL

163. General

When material has been determined to be surplus it may be disposed of by one of several types of disposal action which are authorized. In many cases the types of surplus items determine the type of disposition which should be taken. Purely military items must frequently be demilitarized and sold as items or as scrap. Classified materiel must be completely rendered unrecognizable before components can be disposed of. A great many military and commercial civilian type items may be sold by one of many methods for conducting surplus sales.

164. Disposal by Transfer to Other Government Agencies

In general, a policy has been established to require the maximum utilization of government property by all agencies of the Federal Government. Thus, information on excesses of one service must be widely disseminated to all others to enhance transfers to other agencies which may need them. It is unsound, however, to pay excessive transportation charges or repair costs to satisfy the needs of an agency not located advantageously to the source of the surplus items.

165. Disposal by Donation

Public laws prescribe that surplus property under specified conditions may be donated to educational institutions of special interest to the Department of Defense, state educational and public health institutions, civil defense organizations, and in certain instances to

veterans' organizations, museums, municipal corporations, and certain other organizations. The intent of Congress is two-fold: to assist educational, Civil Defense, and Public Health organizations; and to promote the general welfare by utilization, rather than sale, of surplus personal property. Such institutions have been active in acquiring property under these laws.

166. Disposal by Sale

a. General. Programs developed within the Army stress the improvement of merchandising practices in the selling of Government surplus and foreign excess personal property. This is accomplished through:

- (1) The use of proper lotting of items and advantageous display.
- (2) Complete and accurate description of property on sales offerings so that potential bidders can better identify it and bid with greater confidence.
- (3) Adequate advertising to assure that sales of property are given the best possible publicity in order to attract more competition and a resultant higher monetary return to the Government. The major objectives of the disposal program are to dispose of surplus and foreign excess personal property as expeditiously as possible and at the same time secure the best monetary return to the Government.

b. Types of Sales. Sales of surplus and foreign excess personal property may be made through competitive bid sales (sealed, spot bid,

or auction), negotiated sales, and retail sales. Large quantities of property which is of primary interest to specialized buyers are generally offered for sale by sealed bid. There is little "impulse" buying by sealed bid. All types of scrap are normally sold by sealed bid. Limited quantities of commercial type items which can be absorbed within a single merchandising area for resale by local retailers or for use by the end-user generally are offered for sale by the spot bid method. Property of varied types, in quantity, is conducive to sale by the auction method inasmuch as it creates an interest with buyers of many types, i.e.; manufacturers, retailers, and end-users. Sale by auction promotes "impulse" bidding usually resulting in a higher monetary return.

167. Abandonment, Destruction, or Donation to Public Bodies

When it has been determined by proper authority that surplus or foreign excess personal property has no commercial value, or the estimated cost of handling and preparation for sale will exceed the estimated proceeds from sale, the property may be abandoned or destroyed, or may be donated to public bodies, i.e., states, territories, or possessions of the United States. Foreign excess personal property under the conditions cited above may be donated to organizations, institutions, or

agencies of the United States Government or of any friendly foreign government, any non-profit scientific, literary, educational, public health, public welfare, charitable institution, organization, or association in a friendly foreign country, provided its activities are not contrary to the interest of the United States. Property which is dangerous to public health and safety may not be donated. Abandonment or destruction of property must be made in a manner which is not detrimental nor dangerous to public health or safety, or which will cause infringement of the rights of persons.

168. Demilitarization

Demilitarization is performed for the purpose of destroying the military offensive or defensive advantages inherent in certain types of military equipment or materiel. Military items are demilitarized by the Department of the Army activity holding such property, or by a contractor or purchaser under supervision of a technically qualified representative of the Department of the Army. Property which must be demilitarized may be sold with the condition that it must be accomplished by the purchaser. However, in such instances, title to the property is held by the Government until the purchaser's demilitarization actions are completed.

CHAPTER 10

MANAGEMENT CONTROLS

Section I. NATURE OF MANAGEMENT CONTROLS

169. Definition

a. Military managers are continually faced with establishing objectives, determining the need for and applying available resources, and *controlling* the execution of tasks in order to achieve their mission. "Control" has therefore become a primary function of the management process.

b. Authorities in the fields of management and executive functions frequently differ in the precise meaning and application of the word "control." Some feel that control is an act of "restraining," "prevention," "domination," or "direction." Others argue that control means to "compare," "check up," "verify," or "inspect." Still others insist that control indicates "relating actual performance to a pre-determined standard." These divergencies in definition and application of the word "control" stem largely from the sphere or connotation in which it is being used.

c. In the Army the word "control" is being used with increasing frequency. Concurrently, there has been a widespread problem as to the interpretation and acceptance of this word. For some, control has solely and firmly, but incorrectly, become identified with comptrollers, dollar signs, statistics, and organization charts. Understanding control as it is used in the Army really means understanding three principal things about it.

- (1) What is control? Stated in its simplest terms, *control* is "management action to adjust operations to pre-determined standards, and its basis is information in the hands of managers."

- (2) What is controlled? *People are controlled* as well as the various tools and devices of control, such as objectives, plans, programs, policies, budgets, organization charts, etc.

- (3) Who controls? *Responsible managers at all levels* exercise control to achieve their objectives. Whoever has the responsibility for specifying and establishing standards is ultimately responsible for controlling adherence to them.

d. Thus, to the military manager or logistician, personnel and systems are controlled to achieve the objectives of effective and efficient supply. It is also apparent that control, since it is exercised on people and devices, has no significance in isolation but must be considered as an integral part of all the functions of supply.

170. Tools, Devices, and Systems of Control

a. The military manager, as in the case of any executive, has at his disposal numerous tools, devices, methods, procedures, and systems which he can use to control his operation. Decentralization, management by exception, ADPS, communications, organization charts, budgets, plans, engineered and historical standards, reports, internal audits, objectives, programs, missions, and policies are but a few of the tools and devices used by the military manager to achieve control.

b. The Army has adopted and developed various integrated systems to assist the manager in controlling his operation. Most of these

systems have financial aspects, such as the Army Stock Fund, the Army Industrial Fund, Financial Inventory Accounting, Internal Audit, Consumer Funding, the Army Program System, etc. In order to run the Army in a business-like manner, budgets and programs and costs of operation have been related in terms of dollars. The various reports and data reflect both degrees of performance and monetary significance.

c. In using these tools and systems the major consideration is personnel. It is through people and the control of people that management achieves its objectives. Control tools, techniques, devices and systems actually control nothing. The only thing affected by controls is people—their attitudes and their behavior. The military manager does not control the quality of material; rather he controls the engineers who develop the specifications, the purchasing agent who buys, and the operator who processes. The manager does not control the operating costs or the capital costs of machines; he controls the people who decide what equipment to buy, how much maintenance is to be performed, and what load factors are to be utilized.

171. Use of Tools, Devices, and Systems in Control

a. Basic to the control of an operation is the need for information. Without timely, current and reliable data, the military manager cannot adequately control his operations. The varied tools, devices, and systems of management control standardize and promote the flow of this vital information to the proper destination. Decentralization of a large organization into manageable segments with accompanying delegation of authority, permits each unit to be closely supervised and frees the overall manager from detail. Through the medium of summary reporting, only the essential data is fed to the top-level managers for control action. The management by exception principle requires established and proven procedures to handle the normal workload and permits the manager to focus his attention on the abnormal, unexpected or nonroutine occurrences which require adjustment. The determination and application of standards to specific tasks and the

measurement of actual job performance in relation to these standards gives the manager a measure of the efficiency being achieved and the adjustments necessary to improve operations.

b. Objectives, Policy, Organization, and Assignments.

(1) To accomplish any task, except through accident, people must know what they are trying to do. Objectives fulfill this need. Without objectives, people, or an organization, may work quite industriously, yet, working aimlessly, accomplish very little. Plans and programs complement objectives, since they propose how, and according to what time schedule the objectives are to be reached. However, although objectives and plans and programs are indispensable to the efficient management of any human endeavor, they are not controls. Control is the act of checking to determine whether the plans are being observed and whether suitable progress toward the objective is being made, and then acting as necessary, to correct any deviations.

(2) Policy is simply a statement of an organization's intent to act in certain ways under specified circumstances. It is a general decision, predetermined, and expressed as a principle or rule, establishing a normal pattern of dealing with recurring conditions or events. A statement of policy is useful in economizing the time of managers, and assisting them to discharge their responsibilities equitably and consistently. Nothing in these advantages, however, makes policy a control. On the contrary, by their very nature, policies generate the need for control—they do not fulfill it. Adherence to policy is not guaranteed, nor can it be taken on faith. It has to be verified. Without verification, there is no basis for control, no control, and incomplete management.

(3) Organization is often cited as control. This detracts both from its own signifi-

cance, and from the concept of control. Organization is part of the giving of an assignment. The organization chart is the first crude step in the definition of assignments. It gives to each individual, in his title, a first approximation to the nature of his assignment, and orients him as to whom he is accountable, but it is not a control. Control is checking to determine whether the assignment is being executed as intended, and acting on the basis of that information. Assignments are only partly defined by the preparation of an organization chart. Titles and lines of authority must be supplemented by specific delegations of authority and responsibility. Delegation clarifies the extent of authority of individuals and, in that way, serves to define assignments. The necessity of management control arises primarily from the act of delegation.

- (4) Control becomes necessary whenever a manager delegates authority to a subordinate, because he cannot just delegate, then not follow up. A manager's accountability to his own superiors is not diminished as a result of delegating part of his authority to a subordinate. It is therefore incumbent upon managers who delegate authority to exercise control over actions taken under the authority so delegated. This means simply that results must be checked as a basis for possible corrective action.

c. Various Army systems such as the stock fund, industrial fund, and consumer funding, are covered in later sections. These systems in-

corporate established procedures by which selection of objectives, execution of tasks, and review of accomplishments are promoted. Accounting and reporting criteria are prescribed, buyer-seller relationships are established, and the entire operation is standardized to the point that management decisions are facilitated. No system is complete in itself and many of the tools and devices of control, including all of the functions of management, must be employed in order that the mission be effectively accomplished.

d. Control is one of management's primary functions. Objectives, plans, programs, policies, budgets and organizations, and primarily people are controlled, and, in turn, these people, devices, techniques, and systems of control establish standards which management must use to evaluate performance. These standards are of course dynamic in nature for they must be constantly altered and changed. The basis of control is information in the hands of managers. Obviously for intelligent management action, information must be current and reliable. This information comes to the manager in a myriad of forms and reports, and, in fact, the lack of information can be useful and have meaning to the manager. Control occurs largely after the fact; however, this is a result of the nature of its concept. Reducing the time lag between performance and management action, with emphasis on future operations, then becomes the basic goal of the military manager. Control means action directed toward bringing operations into conformity with predetermined standards and goals, revising standards and goals as required, and changing the attitudes and behavior of people as necessary. It is exercised by managers; and its basis is information.

Section II. EFFECTIVE AND ECONOMICAL SUPPLY PERFORMANCE

172. General

Management control in the supply system must have the objective of measuring and relating performance in both the area of adequate or effective and economical supply. Standards of effective supply performance have been

fairly well developed over many years of Army supply operations, but equally good standards of economical supply have yet to be achieved. The supply system is just beginning to produce the data on which standards of economy must be based.

173. Necessity for Economy

a. Economy of Inventories. For many years the primary concern of supply managers was to provide the maximum number of items requisitioned by its customers. The principal limiting factor to the achievement of this goal was the amount of money appropriated by Congress for the procurement of materiel, for transportation, and for administrative and other operating costs. The records maintained at most echelons of the supply system formerly contained only information on individual item accounting. It was impossible to determine the overall magnitude of stocks on hand except in terms of the number of line items, estimated tonnage on hand, or the cubic measurement of occupied storage space. All items were issued free to the requisitioner upon demand, after edit against tables of allowances. There was no means, short of individual item study, to determine whether excess stocks existed or not. Following World War II and the Korean War, large quantities of inventory were found to be excess to the requirements of the Army. The Army was heavily criticized for—

- (1) Being unable to measure or express excesses in understandable terms.
- (2) Not disposing of excesses more rapidly.
- (3) Its apparent lack of management control over inventories by managers in the higher echelons of the supply system.

In commercial enterprises, management generally controls inventories by establishing maximum dollar values of stocks to be retained, largely through an evaluation of dollar "turn-over" rates of inventories in a year. The military departments were enjoined by Congress to adopt "business practices." The tremendous costs of conducting World War II and the Korean War made it apparent that the United States would never be capable of financing future military operations unless much tighter restrictions were placed on the procurement of materiel, and the most advantageous use made of that which was purchased. In addition, it has recently become apparent that the Communist countries have engaged the free world

in war of economic survival. U.S. military materiel budgets are, today, the largest portion of the total national budget; therefore, it is an absolute necessity that we use every means possible to effect maximum economy of inventory management. Many laws have been passed by Congress in recent years with this objective in view.

b. Economy of Operating Costs. Emphasis on economy has not been limited to the field of inventory management. It has been stressed in all aspects of logistics, including the inauguration of new systems of budgeting, funding, accounting, and reporting of operating costs. Prior to the use of these new systems, the principal management emphasis was on mission accomplishment and the utilization of the total monetary resources provided by higher headquarters. Economy of operations was not specifically emphasized.

c. Relationships of Economy to Performance Standards. Managers in and out of military service are devoting much thought, testing, and money on education toward improvements in the field of performance evaluation in terms of comparative type standards. There are many pitfalls into which managers may fall through their unwise or uninformed use. Standards are of no value to managers unless they permit the valid measurement of significant portions of the enterprise managed. They must represent the degree of detail appropriate to the level of management where control is exercised. Standards, of themselves, contribute nothing to performance except as they are used wisely by managers to establish objectives for performance, budgets with which to economize, and continued follow-up to assure that subordinates adhere to the provisions of both. Managers must be able to budget for resources in terms of valid performance standards and objectives in order to make practical analyses of economic efficiency. Such analyses rarely have a direct connotation as to the quality of mission accomplishment. However, wise managers are today concerned with both qualitative and quantitative evaluations of performance and economy in accomplishing missions.

Section III. QUANTITATIVE CONTROLS

174. General

The general characteristics of the quantitative inventory recording and reporting system in the Army have been previously mentioned. It is impossible to operate the Army satisfactorily without accurate, detailed, and timely records of quantities of items on hand and their movement into and out of inventories. Reports emanating from such item accounting principally reflect data on numbers of line items demanded by customers of various categories, percentage of line items filled on time, late shipment information, backlogs, etc. The entire system within the Army is highly refined.

175. Limitations of Quantitative Controls

a. The quantitative data utilized within the Army supply system provide managers at all levels with essential management information. Utilizing this information, management is able to set quantitative objectives and goals for subordinate segments of the organization, and can perform quantitative evaluations of performance. Such data does not, however, automatically contribute the important element of economy.

b. Many managers feel that quantitative data is the paramount factor in the control of mission accomplishment, and that financial data is the major limiting factor. To an extent this becomes practical reality when the resources (personnel, funds, and operating supplies) are restricted. Proponents of the virtues of financial management counter with the argument that managers do not voluntarily operate in the most economical manner unless forced to do so by restrictions placed on their resources, thus compelling them to find ways to accomplish the essential work with less personnel and funds. There is no doubt about the necessity for the retention and improvement of quantitative data and controls in the Army supply system. The problems to be resolved by managers are those which relate to the degree of influence which quantitative controls should have in the overall sphere of their exercise of responsibility.

176. Centralized Control

a. Previously this manual has discussed the trends in the Army supply system toward centralization of management responsibilities. The principal aim is to obtain better alignment of managerial functions over major commodities, and thus effect economies in requirements computation, procurement, maintenance, distribution, and disposal of materiel.

b. Centralization of these responsibilities, with its many advantages, was not instituted, however, without incurring some disadvantages. Among these are increases in the volume of reports required, increase in routine paperwork in normal transactions, concentration of analytical information, and compounding of the management decision processes.

c. Centralization of inventory management and accountability responsibilities have not necessarily been accompanied by a corresponding centralization of command responsibility. Depots are not necessarily commanded by the commander of a National Inventory Control Point, and a Single Manager does not normally control the activities which receive, store, and issue the material which he manages. Thus, the responsibilities of command are chiefly vested in the chiefs of technical services, as had been the case under decentralized inventory control.

d. Inventory control, in the consolidation of management responsibilities for commodities, has been significantly decentralized from offices of chiefs of technical services to National Inventory Control Points. Today, offices of the chiefs of technical service perform mainly command and staff functions, without many of the operational aspects formerly present. With increased emphasis on good performance, higher inventory turnover and economical operations, the staff elements have thus been required to make more general quantitative and qualitative analyses of supply operations. Additional information has likewise been required in the form of more detailed reports to satisfy these needs.

e. All levels of management have become increasingly aware of the need for curtailing the collection and processing of report infor-

mation. Efforts are being made to purge non-essential report information from command channels; however, the volume remains great and the costs are high. To cope with this prob-

lem, management is turning for relief to the most modern methods of rapid communications and automation through application of Automatic Data Processing Systems.

Section IV. FINANCIAL CONTROLS

177. Financial Management

a. General.

- (1) Prior to World War II the Army was a comparatively small organization and those responsible for its management could plan, observe, and control its activities directly. They could personally organize, integrate, and analyze the data flowing to them from their subordinates. However, the subsequent rapid and huge expansion of the Army and its entry into many new fields have brought enormous problems to top management. This is particularly true in matters of materiel and supply where the magnitude of the Army's expansion has greatly exceeded the growth in personnel. The growth of the material aspect of the Army, i.e., weapons and weapons systems, transportation and POL, maintenance and spare parts, has been tremendous. The procurement of the materiel, its worldwide distribution, and property accountability for it, have caused the Army to turn to financial management techniques with which control could be improved. It was found that many commercial financial practices were adaptable in varying degrees to meet the diverse activities and unique needs of the Army.
 - (2) The Army is not a business establishment and cannot be managed, measured, or judged solely by commercial standards. In view of the purpose, magnitude, and characteristics of the management job, financial systems of normal profit-making operations cannot be arbitrarily applied.
 - (3) The present financial management systems had their beginnings in the reports of the first Hoover Commission
- which pointed up a need for greater economy through better financial management in the Department of Defense. These, together with other studies, resulted in the enactment of Public Law 216 by the 81st Congress in 1949. The purpose of this law was "to organize the fiscal management in the National Military Establishment to promote efficiency and economy." The law provided for comptrollers in the Department of Defense and military departments, performance budgeting and accounting to measure the cost of functional programs and activities, and the use of working capital (revolving) funds for financing industrial and commercial type activities. Subsequently, the same Congress enacted The Budget and Accounting Procedures Act of 1950 which provided for full disclosure of the results of financial operations, adequate financial information for use in management and budget administration, and effective control over revenue, expenditures, funds, property, and other assets. It was intended that emphasis should be placed on effective, orderly, simplification and development of more effective accounting, financial reporting, budgeting, and auditing.
- (4) The Army itself had early recognized the need for improving the management of its financial affairs. Even before enactment of PL 216 the Army had established the Comptroller of the Army. One of his principal tasks was to inaugurate improvements in financial management. The statute, however, provided a legal basis for this new organizational entity. Following enactment of the law, the Army proceeded vigorously with the organiza-

tion of comptrollership at all levels of nontactical command to provide the needed foundation for improved financial accounting and reporting. Development of this effort was temporarily slowed by the Korean War. However, this episode itself served to highlight some of the weaknesses of the existing system. With the termination of the Korean War, the Army resumed its efforts to improve its financial structure. The continued interest in this activity by the Office, Secretary of Defense, and various Congressional Committees, served to stimulate this effort and in 1953, Army Regulation 37-5 was published, which set forth the Army's comprehensive program for financial management.

- (5) The Army Financial Management System is aimed at improving control and management of its funds. To prevent misunderstanding, it should be emphasized that financial management is not directly applicable to the tactical side of the Army. It does not extend to tactical units, although their requirements are provided by supporting commands and installations and thus are included in the total Army requirement.
- (6) Some understanding of the magnitude of involvement by the Deputy Chief of Staff for Logistics and the chiefs of technical services in financial affairs can be gleaned from the fact that the DCSLOG is annually responsible for the control of approximately 8 billion dollars which is allocated to him by the Comptroller of the Army. The DCSLOG exercises his financial accounting responsibility as follows:
 - (a) He receives allocations from the Comptroller of the Army based upon apportionments received from the Bureau of the Budget.
 - (b) He accounts for the allocation received and effects distribution in accordance with Command Programs and Budgets. Suballocations are made to the chiefs of the techni-

cal services upon the advice of the DCSLOG staff elements.

- (7) The chiefs of the technical services establish their accounting for the suballocations received from the DCSLOG in their general operating agencies— 03 Signal, 04 Chemical, 05 Ordnance, 06 Medical, 07 Quartermaster, 08 Engineers, 09 Transportation. Upon the advice of their respective staff elements, distribution of funds is made by the general operating agencies by direct allotments to the technical services' field activities. In the aggregate, the technical services have approximately 271 field activity finance and accounting offices which receive direct allotments and report upon the use of the funds.

b. Financial Inventory Accounting.

- (1) Among the more important elements of the Financial Management System are the portions that pertain to physical assets or property.
- (2) Commercial enterprises have various methods for controlling inventories, or in other words, balancing supply and demand. Input is controlled by buying only that which is forecasted to be sold or used within a predetermined period of time. If items are not sold or used within this time, they are normally sold at a loss or otherwise disposed of. Demand must be forecasted. Industry influences volume of sales by offering bonus incentives to salesmen, merchandise display, by advertising, and numerous other devices. Thus markets are created. Conversely, the Army in general attempts to reduce its sales by stressing conservation of materiel. The Army must emphasize improvements in forecasting demand, techniques for computing requirements, advantageous procurement practices, and rapid disposal of such excesses as accrue to keep supply and demand in balance.
- (3) Financial Property Accounting is the term used to describe the Army sys-

tem for the maintenance of property accounts and rendering of reports on assets in terms of dollar values. The term applies to both personal and real property. Financial inventory accounting pertains to bulk stocks in the hands of depots and installations. It is intended that another increment under financial property accounting will cover fixed assets, including real property, buildings, and equipment in use.

- (4) The first step taken in establishing financial inventory accounting was to establish logical classes or categories of materiel covering all items stocked by the Army so as to bring together like items into significant groupings for management purposes. These groupings are referred to as categories. The next step was the pricing of each item in the supply system and obtaining total values of inventories, broken down by the value of each category. Transactions including issues, receipts, adjustments, procurement, etc., are recorded financially on ledgers which reflect each type of activity by category. A uniform reporting system presents a summary of inventories and transactions to higher echelons. Two reports have been designed for this purpose. The first is called the *Statement of Inventory Transactions* which reflects the dollar value of the opening inventory, increases and decreases during the reported period, and the closing inventory. It also provides a method for accounting for stocks "in-transit" between supply installations. The second report is called the *Supply Management Report* which provides information concerning the status of the Army's inventories by identifying stocks held for operating requirements, reserves, claimants, and excesses. It also provides information concerning the input into the supply system and the amount and type of demands which are placed by customers. A series of logistical ratios, com-

puted by each reporting echelon, are designed to make the report self-analytical for management purposes.

- (5) The coverage of financial inventory accounting extends to bulk inventories only and specifically excludes materiel in combat areas and in the hands of troops. Initially, the system was installed in all Continental United States depots in January 1954 and in 26 posts, camps, and stations, 5 ports of embarkation, and in July of that year selected installations overseas. Subsequent extensions in both CONUS and oversea theaters have resulted in the great majority of the Army's bulk stocks being accounted for under this system.
- (6) The establishment of inventory values in record form is a prerequisite to the utilization of modern inventory control techniques and to the accumulation of cost of programs and activities termed "program costs," or the cost of goods and services produced, referred to as "production costs." Financial inventory accounting is also a necessary prerequisite to the preparation of operating programs and budgets by using activities, since they must forecast the cost of supplies required and report values of those on hand which have not been consumed. It is also required in connection with the establishment and operation of working capital funds. Budgets, operating accounts, and reports of industrially funded activities reflect costs of materiel purchased and in-process of manufacture. The army stock fund is wholly dependent upon the prices established by financial inventory accounting. The majority of the worldwide reported bulk inventory is financed by the Army stock fund.

c. *Stock Funds.*

- (1) Public Law 216 not only identifies the functional elements involved in financial management but recognizes the need for and authorizes the use of special management devices to fit

certain types of operations that are comparable to private industry. Among the more important of these special devices are "working capital" funds which are revolving funds established to finance certain inventories.

- (2) One of the most important types of revolving funds from the standpoint of its impact on Army-wide financial administration is the Army stock fund. This fund is used to finance inventories of "readily consumable rapidly moving" supplies or common use standard stock items. These are supplies of the types which generally may be considered to be expended when they are withdrawn from the stock fund for use. Items such as automotive vehicles, weapons, tanks, and aircraft do not meet the "consumable" criteria outlined above and accordingly are not generally considered as being suited for inclusion in a stock fund.
- (3) In operation, the stock fund pays for supplies procured and is reimbursed from cited appropriations for material issued or transferred. Reimbursements received by the stock fund are available for replenishing stocks without necessity for further fund appropriation, hence the term "revolving fund." Apportionment of these funds, however, is made on an annual basis by the Bureau of the Budget. From the standpoint of the activity buying supplies, requisitioning is controlled by the availability of allotted funds with which to reimburse the stock fund. The expenditures are recorded in the activity's fiscal accounts and, when consumed, are entered in their cost accounts.
- (4) When a stock fund is established, all inventories of supplies and equipment in the categories to be covered by the fund are capitalized, or given a dollar valuation as assets. Additional cash for working capital is also furnished the fund. The managers of

the funds prepare budgets to cover estimated quarterly and annual forecasts to include data on value of stocks on hand, estimated sales of materiel, information relative to excesses, stock fund returns, obsolescence, etc. When budgets are approved and apportionments made by the Bureau of the Budget, managers direct procurement of new stocks to be paid for out of the working capital funds. These stocks are then sold to Army customers and other Federal agencies on a reimburseable basis. Appropriated funds with which to effect this reimbursement are allotted through command channels to the customer. The stock fund is thus perpetuated as the process of purchases and sales continues.

- (5) Each item entered as a stock fund asset must have a "standard price." Normally, all sales of items must be computed at the established standard prices. To purge inventories of less desirable items, provisions exist to permit sale of such items at less than standard price under certain conditions. The standard price for each item is contained in catalogs, pricing guides, or other pricing media which are provided by the responsible supplying service. Revision to pricing media is effected as frequently as is necessary to satisfy sound business practices and sufficiently in advance of the effective date of price change to permit dissemination to customers and an orderly revaluation of inventory. The standard price of each item normally consists of the current market price of the item at the time the price is established plus a surcharge to compensate the stock fund for first-destination transportation and when authorized for single manager items of supply, second destination transportation costs and minor losses through pilferage, breakage, deterioration, etc. The objective of the stock fund pricing policy is to "break even" over a period of time,

although market fluctuations may result in temporary financial gains or losses. Standard prices are the same as those established under financial inventory accounting.

- (6) Stock fund reports provide financial statement type information concerning stocks and funds and include summary data on sales, purchases, etc. It is thus possible to make standard accounting analyses between sales, inventories, capitalization, accounts receivable, and procurement. These reports provide indicators from a financial standpoint on the relative position of inventories to cash and to sales. They thus present clues on possible overall excesses or deficiencies in stockage or cash positions.
- (7) Planning is required to assure sufficient stockage of supplies, balanced by adequate cash to effect procurement required to maintain balanced stocks. High volumes in cash or inventory may denote over-capitalization. High inventories at low turn-over rates (sales and transfers) may indicate quantities of items in excess of proper stockage levels, or unbalanced stockage.
- (8) There are other theoretical advantages inherent in the institution and operation of stock fund.
 - (a) Since stock funds are replenished in the course of doing business, they are not limited by the control measures of annual appropriations, i.e., one-year fund characteristics. Thus, more flexibility is possible for procurement of stocks on a seasonal basis, or timed to take advantage of favorable market conditions in quantities more nearly representative of "economical buys."
 - (b) Because the consumer must "buy" the supplies he requisitions, economy of operations can be more closely controlled through financial means by commanders. To the extent otherwise deemed appropriate, single service supply, or cross-

servicing between departments, is facilitated.

- (c) Financing mobilization reserve stocks of consumable materials, supplies, and equipment through a stock fund results in their protection for the use intended because they cannot be diverted to meet current needs without provision for replacement through reimbursement from current appropriations.

d. Industrial Funds.

- (1) Working capital funds with their revolving features can also be applied advantageously to industrial and commercial type activities that produce and furnish goods or render services to other activities on a reimbursable basis. Such revolving funds are referred to as industrial funds and are intended to provide the same type control for manufacturing operations and similar commercial activities of the Army that stocks funds provide for supply activities.
- (2) The Army Industrial Fund was established under the authority of Public Law 216 with initial working capital transferred on the books of the Treasury from unexpended appropriations. It is intended to provide the same general operational flexibility, control, and management to the commercial and industrial type activities of the Army as is afforded in private industry.
- (3) Each installation or activity selected for this type financing is provided a single revolving (working capital) fund to buy the material, supplies, labor, and other services required in the manufacture of the product or rendering of the service. Each such activity operates as a business entity and is reimbursed on the basis of the cost of goods delivered or services rendered. Manufacturing arsenals, clothing factories, research laboratories, depot maintenance divisions, transportation port terminals, and printing plants are the type installa-

tions suitable for operation under the industrial fund concept.

- (4) When it has been determined through a feasibility survey that the industrial fund system is adaptable to an installation, a tailor-made double-entry accounting system is designed to fill the needs of that establishment, and a management control system to utilize the data made available is developed. When the system has been designed and tested, the establishment is chartered just as is a private corporation. Its capital is made up of a cash allocation in the form of a project cash account with the Treasury, and the capitalized value of inventories on hand less outstanding liabilities. In the production of goods and the rendering of services, the assets of the establishment are used to finance all operational costs except certain statistical costs such as military pay and allowances, depreciation of plant and equipment, etc. The monies thus expended for labor, materials, and overhead, both administrative and manufacturing, are reimbursed to the performing establishment by its customers from the appropriated monies available to them for acquiring these goods and services. Thus the revolving feature of the fund is established and the working capital is kept intact.
- (5) The Army Industrial Fund differs from that used in private enterprise in that no profit or loss is intended as a result of work performed. Another significant difference is that depreciation of plant and equipment is not generally charged to the cost of the item or service produced. Both plant and equipment are provided to the industrially funded establishment through funds made available by normal appropriations. Both of these distinctions have been considered disadvantages of the system. Other disadvantages of the system are the lack of control by installation management over the volume of business to be done, excessive overhead costs in time of

low volume that cannot be reduced because of mobilization requirements, and the shortage of personnel familiar with business methods and techniques and double entry accounting systems.

- (6) The primary advantages of the industrial fund are the elimination of funding by several appropriations, allotments, and suballotments; the elimination of the many different accounting systems by the tailor-made double-entry accounting systems for all operations, the provision of accurate cost data for evaluation and management use in controlling operations and evaluating performance, the provision of factual end-item costs, and increased flexibility to the commander in the use of resources. The industrial fund makes available to the operator the resources and authority to carry out his mission. In addition, it establishes an atmosphere of cost consciousness at all levels within the establishment and encourages the use of engineered or statistical standards and scientific analysis. This permits management by exception.
- (7) The financial reports submitted by industrially funded establishments include Statements of Financial Condition, which are the counterparts of commercial balance sheets, and Statements of Revenue and Cash which are the counterparts of the commercial profit and loss statements. In addition, supporting schedules of inventory transactions, analysis of accounts receivable, and accounts payable, production data, and the like are prepared. An annual report covers the past year's operations, and a planned management improvement program. Additional financial and operating report schedules are prepared for installations management use and for the controlling technical service limited only by the imagination, inquisitiveness, and vitality of individuals concerned. The inventories and other working capital assets of Army industrial funded installations are not

included in the normal logistics asset reporting network, but are controlled as a part of the general business management of the industrial fund.

- (8) Use of industrial funds encourages the exercise of business type controls in the management of the installation or activity. It also simplifies the accounting and facilitates the accumulation of accurate end-product cost information which is the basis for billing the customer. The customer through this process has accurate cost data for recording in his accounts and for use in budgeting for the programs and functions under the respective appropriations.

e. Consumer Funding.

- (1) Authority to obligate and expend Department of the Army appropriations is subdivided and delegated in the form of allocations to major commands, administrative and technical services, and other operating agencies of the Army. These agencies in turn subdivide the allocation and delegate the obligational authority in the form of allotments to their subordinate installations and activities. The installations and activities then incur obligations under this authority, limited as to amount, for hiring of civilian personnel, procurement of consumable type supplies, issuance of purchase orders, etc., required in the accomplishment of their missions. Military personnel costs are financed at Department of Army level in MPA appropriations by means of open allotments not specifically made available to any command or agency. Previously the installations received only a minor part of their supply requirements in the form of funds. Much of the materiel which they used was provided by free issue from depots. Now, however, the issue of Stock Fund Supplies requires reimbursement from appropriated funds. Therefore, funds must be provided to the installations in order that this reimbursement can

be accomplished locally and be reflected in the budgets, accounts, and reports of the installations.

- (2) Hence, the term "Consumer Funding" simply reflects the expansion of funding to installations to provide for financing of many supplies and services in addition to payment of civilian personnel. Consumer funding places the responsibility for financial control and administration on the installation commanders. They prepare operating programs and budgets which forecast fund requirements in terms of work to be accomplished (see Army Command Management System). Allotments of funds are made on the basis of these approved forecasts. From such allotments, commanders are required to pay for civilian personnel, supplies, and other contract services.
- (3) Consumer funds are one-year funds; that is, they are appropriated each year by the Congress. The principle of providing funds to the consumer rather than to the initial purchaser of supplies offers certain advantages from a management standpoint. Missions, resources, and decisions are welded together for the improvement of operational performance through assignment of specific responsibilities in the evaluation and control of the cost of labor, supplies, and services by those who actually cause the expenditures to be made.

f. Integrated Accounting. Integrated accounting is a system of accounting for all financial transactions relating to the activities of a command within a single comprehensive system of related records. The system is designed to include control and accrual features required for producing financial data necessary to successful operation of the Financial Management System.

- (1) Integrated accounting is applicable to the entire Army establishment and applies to all financial transactions except accounting for nonappropriated funds. It includes all the records and accounting procedures covering—

- (a) The control of obligations and the use and status of appropriations and funds.
 - (b) Disbursement, collection, and deposit of Government funds.
 - (c) Property and other assets.
 - (d) Liabilities.
 - (e) Costs.
 - (f) Accounts receivable and accounts payable.
 - (g) Working Capital Funds.
- (2) All accounting records and accounting procedures are designed, in compliance with the provisions of Public Laws 216 and 784, to provide effective financial control of revenue, expenditures, funding, property, and other assets.
- (3) At one time the Army had a number of unrelated systems which had been developed for specific purposes. These systems fell generally in the following categories:
- (a) Appropriation accounting, which was administered through two Army-wide systems, one dealing with the control of allotments or obligation authority, and the other with the control of disbursing or cash.
 - (b) Working capital fund accounting, which consisted of a group of special purpose accounting systems for use at industrial type activities, or for funding for inventories of certain types of materiel.
 - (c) Property accounting, which dealt only with quantities of items.
 - (d) Operating revenue accounting which pertained to a number of special purpose systems at revenue producing activities, such as commissaries, sales stores, post communications offices, etc.
 - (e) Cost accounting, which consisted of a number of specialized systems for accumulating operating costs.
- (4) These systems evolved over the years as the specific requirements or need arose, without the benefit of an over-

all departmental policy on accounting which recognized the inherent relationships between them. Because they were not designed around a common structure of accounting policies and were administered under different sets of rules, the systems did not reflect the full effects of transactions. With a few exceptions the various systems were not reconcilable, and the resulting information could not be consolidated or summarized for review at various higher levels of command.

- (5) In effecting the integration of accounting and bookkeeping operations, certain basic policies have been adopted as to how and by whom they will be conducted. Accounting operations are a responsibility of management. Only as they become day-to-day operating responsibilities of managers can they be of real use at operating levels. Operating officials are accountable for the resources made available to them as well as being responsible for effective and economical use of such resources in conducting operations. Therefore, it is logical that they should be provided with the means of measuring the effectiveness of operations. Financial information is generated at the operating level and as it proceeds upward through the organization it is summarized and resummairized. Accounting operations at higher levels are concerned only with those transactions taking place at that level. Otherwise, accounting considerations at those levels consist mainly of reviewing and consolidating reports.
- (6) In general, the basic accounting entity is the installation or its equivalent. Subsidiary records, recording details of a specialized nature, may in some cases be maintained by the operating activities.
- (7) Disbursing and accounting functions are combined at the installation level so far as feasible, with disbursing becoming a function of command. This involves the establishment of a

simple and flexible organization and the related integrated procedures.

- (8) One of the basic policies established is that accounting is conducted under double entry principles. By applying this principle through modern account methods, the various systems can be tied together. The inventory accounts become integrated with the cash accounts, the fiscal accounts, and the cost accounts without disturbing the inventory accounting classification and results.
- (9) The final product of the integrated system is cost data. The cost represents the total outlay of resources applied in carrying out a specific program, function, or project; in the manufacture of a specific product; or in rendering of a specific service.
- (10) It is this type of costs to which we refer when discussing cost of performance budgeting. It is the relating of these costs or expenses to the functions, activities, and programs that will make cost of performance budgeting possible. In order to use such data to support fund requirements, it is essential that cost accounts be maintained under accounting controls and procedures that will permit the ready conversion of costs, as such, to obligations which are the basic of fund administration. It is obvious that this can best be done through the mechanics of an integrated system.
- (11) There are further advantages for supply management in the integrated accounting concept—
 - (a) It facilitates the administrative control of appropriations. The fund accounts are more accurate since obligations are adjusted promptly upon payment. This frees funds otherwise tied up by unavoidable overestimates of obligations. In addition, the system itself encourages better bookkeeping through the automatic checks and balances of a double entry system.
 - (b) It reduces the reconciliation prob-

lems. The heavy burden of reconciling the fiscal accounts with the expenditures reported by the Finance Corps through disbursing offices and regional accounting offices is eliminated. Agreement between the cash and allotment account is proven automatically and currently through the normal operation of the system.

- (c) Duplication of accounting effort is eliminated. Disbursing becomes a function of the command; the duplication of voucher examination and detail accounting for expenditures is eliminated. The command has control over the payment of its bills.
 - (d) More reliable information is available for budget purposes. Program cost estimates can be derived from the subsidiary cost ledgers. Other subsidiary ledgers reflect the resources on hand to execute these programs. Budget execution is based on cost control as explained earlier. Fund control is exercised in broader categories.
 - (e) Probably one of the most important advantages of the system and the related organizational structure is the flexibility to meet changing management and budgetary needs. An alert and imaginative management is constantly in search of financial facts bearing on its problems. This program is designed to provide managers with a system that is responsive to their needs and an organization that can interpret the accounting and financial data in terms of management significance.
 - (f) Finally, integrated accounting provides a basis for accurate and timely financial reporting which is an absolute essential to effective management.
- g. Internal Audit.*
- (1) The approach to auditing within the Army has been changed to make it a

more effective tool of management. Most of the audit improvements are embodied in the Internal Audit Program. Internal audit is the independent appraisal within an activity of financial, accounting, and related operations.

- (2) Commanders at all installations, having the responsibility for large sums of money and large amounts of materiel, need to know that these assets are being properly accounted for and properly safeguarded. This assurance is given by means of periodic audits conducted by disinterested persons similar to the prevailing practice in private industry.
- (3) Internal auditing determines whether adequate control and protection of the Government's and the Army's interests are being maintained. It is primarily concerned with such matters as the adequacy of and compliance with procedures, reliability of accounting and statistical data, protection of assets, and the effectiveness of internal controls. Accordingly, it is important and useful to management at all levels because the conclusions of the auditors are available to assist in achieving more efficient administration of operations.
- (4) The internal audit functions at the top Army level are performed by the Army Audit Agency under the direction of the Comptroller of the Army. Audits are usually made annually on a comprehensive basis to cover all financial operations of installations. In lieu of the account audits which were made in the past, "installation type" audits are performed on the financial aspects of all functional operations at each installation.
- (5) Internal auditing is a supplement to, not a substitute for, personal attention by responsible managers. Managers have responsibility for supervisory reviews, checks, and inspections to insure that adequate internal controls are installed and are functioning properly. The normal

verification, balancing, and reconciling process are an integral part of the systems of accounting and internal control, and for the most part are accomplished by operating personnel on a day-to-day basis.

h. Budgets and Funding.

- (1) *General.* The general policies of the Army which govern the development of Departmental plans, programs, and budgets, together with a general outline of the budget cycle has been previously covered. Herein are discussed the responsibilities of managers in the Army supply system. Every logistics manager, at every echelon, is responsible for developing portions of the Army programs and the budget and is influenced by the funding practices.
- (2) *Budgeting.* Budgets in the Army can generally be classed as—
 - (a) The Department of the Army Budget, which is combined with those of the other military departments to form the Department of Defense portion of the President's Annual Budget.
 - (b) Operating Programs and Budgets which are the detailed forecasts and resource requirements prepared by each installation commander to cover the proximate year of operations.
- (3) *Operating program and budget.* The objective of budgeting in the Army is the merging at all non-tactical managerial levels of all operational and financial aspects of management throughout the planning and execution phases. Budgets are so organized as to reflect forecasts of cost by function, and to express the total of all resources required for the operation of functions, activities, and installations, thus providing basic information essential to better management control of resources. All non-tactical commanders in the Army are required to prepare annual forecasts of resource requirements, which are termed Operating Programs and Budgets. These operating budgets re-

late costs of operations to identifiable installations, activities, functions, and frequently to processes. They are forecasts of costs to be incurred in terms of workload to be performed and the manpower needed for its accomplishment. They summarize the value of resources (manpower, supplies, and equipment which are estimated to be consumed in the performance of missions) in supporting schedules, and include estimates of funds to be spent for contractual services, as well as the value of supplies already on hand and paid for which will be used during the proximate period. These budgets contain separate forecasts by fiscal quarters of the year. Each major command and chief of technical service prepares summaries of all operating programs and budgets received from subordinate commanders, adds a forecast of his own resource requirements, and submits the resulting operating program and budget to the next higher command echelon for approval.

- (4) *The army management structure.* The Department of the Army prescribes a uniform system for the identification of cost codes and summary costs codes which must be utilized in preparing operating programs and budgets and the Quarterly Cost and Performance reports which follow. These codes are composed of terms which identify most major non-tactical functions performed within the Army together with a numerical coding system to permit machine processing. The Army Management Structure is prescribed

in AR1-11. Chiefs of technical services have the authority to prescribe further implementing codes for subdividing AMS-identified functions for their own use. Similarly, installation commanders may further subdivide functions and establish implementing numerical codes. The Army Management Structure thus established, becomes the basis for providing individual cost ledgers within all installation accounting systems.

- (5) *Budgetary—fiscal relationships.* Summary cost codes prescribed by the Army Management Structure can be directly summarized into Budget Activity Accounts (the smallest fiscal subdivision of appropriations). The consolidation of estimated costs which have been projected in operating programs and budgets thus produces the fiscal budget estimate which is contained in a supporting "schedule" thereto. In the accounting processes, the general consolidation of all costs ledgers, preceded by prescribed accounting adjustments, provides a balance with the amount of fund expenditures shown in the fiscal ledgers. Because of these general relationships, funds are allotted to installations (complete accounting provides an historical record of their expenditure identified by costs of functions), and information is available for use in projecting detailed future costs of operations. This process permits the Army to comply with the requirements established by Congress in providing "cost of performance budgets."

Section V. THE ARMY COMMAND MANAGEMENT SYSTEM

178. General

The integrated system of programming, budgeting, funding, accounting, and reporting for the normal operating funds within the Army is known as the Army Command Management System. Implementation of this sys-

tem by the Deputy Chief of Staff for Logistics is normally referred to as the Logistics Command Management System. Implementations by the chiefs of technical service are generally identified by titles in which the technical service or the activity which it covers is named.

179. Objectives

The objectives of the system are to provide management with information which will permit development of programs which are costed, a means of relating fiscal expenditures to operating costs in terms of functions performed, and a media for the systematic review and analysis of the use of resources in terms of the programs forecasted.

180. Command Responsibilities

a. Guidance. Every non-tactical commander has been given the responsibility for providing guidance to subordinate commanders with which they may prepare forecasts of operations. Although no format is prescribed and details contained in such guidance are not uniform, it normally contains as much information concerning estimated levels of work and fund availability as possible. Objectives to be attained by management are also frequently included.

b. Forecasts of Operations and Fund Requirements.

- (1) Commanders prepare annual forecasts in the form of Operating Programs and Budgets. They combine the use of guidance received with locally accumulated data and judgement to develop the required forecast. Operating Programs and Budgets are forwarded to the next higher command for review and approval. When these have been brought into line with the overall guidance and resources received by the superior command, they are returned to subordinate commanders as approved programs. As such, they become general guidelines to the commander in the execution phase of operations. Funds are not automatically furnished upon the approval of Operating Programs and Budgets, but are allocated and allotted separately.
- (2) In the performance of approved functions, commanders are permitted some latitude to reprogram available funds and personnel among the functional areas covered by the same fiscal Budget Activity Accounts. On quarterly

reports to superior commands, however, deviations from programs in functional areas in excess of 15 percent from approved operating programs must be explained in narrative form on Quarterly Cost and Performance Reports.

- (3) Tactical unit commanders are not required to operate under the formalities of the Army Command Management System. They are directly affected by its provisions, however, since support commands operate under ACMS and are required to program and budget for the cost of supplies, personnel, and the direct support necessary for accomplishment of the tactical commanders' missions. All commanders of Class I and II installations and activities operate within the provisions of the Army Command Management System.

c. Program and Budget Advisory Committees. Responsibilities for programming, incurring costs, and reviewing performance are delegated through command and supervisory channels. Commanders at each echelon establish committees (known as Program and Budget Advisory Committees) composed generally of the major subordinate operating or staff supervisors. These members are designated as Program Directors. Subordinates to Program Directors are designated as Program Leaders. A senior operating or staff official is normally designated as the chairman of the Program and Budget Advisory Committee and is known as the Program Coordinator. The latter may or may not be delegated authority by the commander to render command decisions. The primary functions of the Program Advisory Committee are to—

- (1) Effect coordination for the dissemination of program guidance to subordinate elements.
- (2) Coordinate preliminary programs to the end that the commander's proposed operating program and budget is in consonance with guidance received.
- (3) Reconcile imbalances of operating costs with programs to the end that

quantitative programming is recommended to the Commander; and

- (4) Review and analyze performance data and submit a performance report to the commander.

d. Cost Information.

- (1) The Army Command Management System encompasses all operating costs of the command, including payment of personnel (civilian and military), costs of supplies and equipment (stock funded or purchased from commercial sources), and contractual services. Direct costs and indirect costs are identified. Military construction and depreciation costs of real or capital personal property are excluded. Both funded and unfunded costs are programmed and accounted for within the system but are separately identified.

- (2) All operating costs are accumulated as incurred into a central system of double-entry bookkeeping (manual or machine) and periodic reports (daily, weekly or monthly) based on a uniform structure of cost accounts. These are disseminated to Program Directors and Leaders or other officials for their use in determining trends in cost as compared to program trends and for evaluating priorities for scheduling work. In line with normal accounting practices, balance sheets and operating costs statements are prepared on a periodic basis for command evaluation. Review and analysis, as well as reporting within commands and to higher commands is accomplished on a pyramidal basis, and within the general policies of "management by exception."

Section VI. AUTOMATIC DATA PROCESSING SYSTEM

181. General

a. Automatic data processing offers to the supply manager the capability, flexibility, accuracy, and timeliness required today in the processing of the vast amount of information associated with a modern supply system. The proper use of automatic data processing equipment is essential for efficient, effective, and economical supply management. Maximum utilization must be made of the computer's ability to make decisions. Machine decisions can be made most effectively in those areas where firm judgment factors can be expressed in numerical and logical machine terms. In the areas where human judgment is required (and they are multitudinous), more accurate and timely information can be made available through automatic data processing systems.

b. In order to centralize inventory control and property accountability, a means of rapid, accurate, communication is required. The benefits of ADPS are not realized if there is delay in transmitting information between the depots and the inventory control points. Many solutions are available. The use of accurate, high-speed transceiver networks which transmit

data punched into standard electrical accounting machine cards between distant points is one solution. New methods of data transmission are becoming available and the transmission of data at computer speeds is fast becoming a reality.

182. Personnel Factors

a. In any decision to employ automatic data processing equipment, managers must exercise prudence with regard to personnel assignment and utilization. An extensive change in methods is implicit in the conversion; there is a heavy additional workload during transition; reductions and displacement of jobs occur. All of these factors, along with other real and imaginary problems, have a disturbing effect on morale and performance. Two personnel groups are primarily affected—

- (1) Those personnel who are actively engaged in operating automatic data processing systems, or whose job have been directly affected.
- (2) Those personnel who use the computer output and must depend, with confidence, on the information produced.

b. A vigorous training program is required to prepare both groups for proper automatic data processing operation. The importance of training supply managers to utilize properly "computer-assisted supply management techniques" is frequently overlooked in the problems of training the operating and programming group.

183. Influences on Management

a. The advent of automatic data processing and high speed data transmitting equipment tends to favor centralized data processing. The judicious use of the computer allows today's manager to be selective in his efforts, concentrating time, detailed analysis, and human judgment in those areas where the value received for such effort is high. Complete, current information, in one location, capable of being processed with electronic speeds, results in better supply decisions and more effective

checking of performance. The reduction in the unit costs of processing data and the availability of correct records result in better service to the customers at the lowest possible cost.

b. One fundamental principle must be observed—ADPS is a tool of management. Whatever the particular application being performed, ADPS assists the responsible manager by receiving large volumes of data, storing and analyzing them at great speeds, making routine decisions, and presenting results for judgment and action. Regardless of what the advantages appear to be, centralization of control and accountability should not be an objective in itself. The number of record keeping activities should be consistent with a supply system that is responsive to consumer demand and provide data for the most efficient supply management at the least cost. Each proposed system should be evaluated upon its individual merits and the circumstances involved.

BY ORDER OF THE SECRETARY OF THE ARMY:

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*Major General, United States Army,
The Adjutant General.*

G. H. DECKER,
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NG: State AG (3); units—Corps Arty (2); Div (2) CC (1); Div Arty (2); Bde (2); Regt/GP/bg (1); Bn (1).

USAR: None.

For explanation of abbreviations used see AR 320-50.