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THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM, (U)
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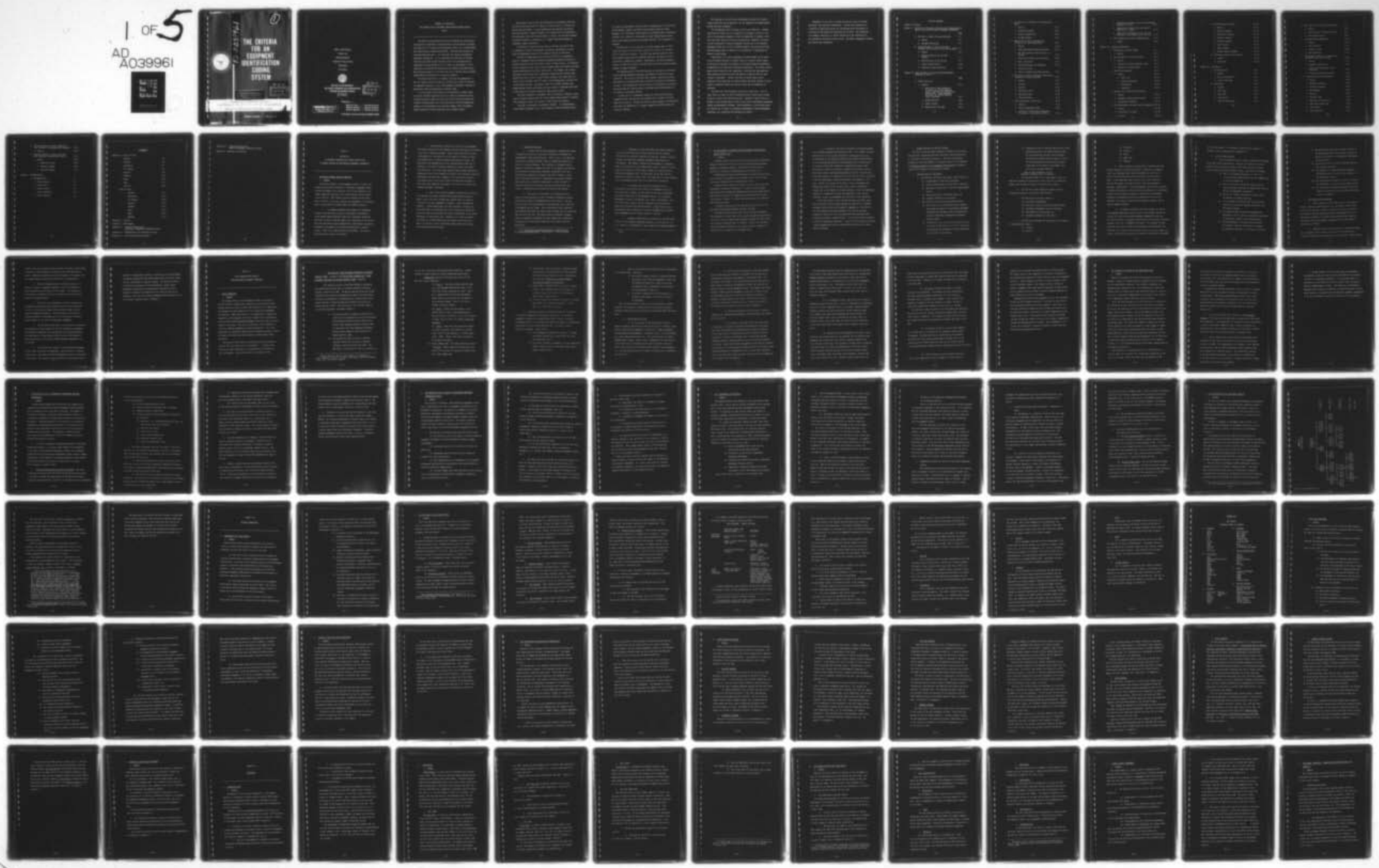

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DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM

SCHOOL OF SYSTEMS AND LOGISTICS
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

CONTRACT NUMBER F-33608-67-C-0001

THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM

THE OHIO STATE UNIVERSITY
COLLEGE OF COMMERCE AND ADMINISTRATION
DEFENSE MANAGEMENT CENTER

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SUMMARY OF FINDINGS ON THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM (EICS)

The Office of the Assistant Secretary of Defense for Installations and Logistics established a research project with the School of Systems and Logistics for the purpose of developing criteria for a uniform Equipment Identification Coding System (EICS). The EICS would possess the following characteristics: (1) facilitate the coding of maintenance management information; (2) be compatible with the Chart of Accounts Structure prescribed by DOD Directive 7220.14 for the generation of maintenance costing information at all levels of maintenance; (3) be compatible with uniform DOD Research and Development System Work Breakdown Structure process to facilitate the use of technical data including maintainability and reliability indices of hardware.

The uniform EICS has as its primary objective the aggregation of data in standard terms and frames of reference and a means of retrieval of summarized technical, fiscal, and management information relating to maintenance within the Department of Defense (DOD).

It is the intent of the Office of the Secretary of Defense (OSD) to use the retrieval capability upon its option to selectively extract raw data from the storage facility of any of the military services for a number of applications such as the functional review and comparative analysis of the performance and associated support costs of hardware support among the services employing similar weapon systems.

Such analysis could reveal the differential in maintenance practices, reliability and maintainability indices or failure rates as a function of mission and environment. In gross aggregation the analysis can provide cost data related to program elements or to varying levels of maintenance. The performance data would be most useful in analysis for possible redesign of systems currently in production or to suggest engineered changes in subsequent systems procurement.

In addition to facilitating the needs of the OSD, the EICS in turn is designed to satisfy the management information requirements at every level of maintenance in each of the separate services or activities.

The EICS is needed because at the present little or no capability exists to exchange current maintenance management information between the military services or for that matter, within a single service. An exception to this condition can be found in some instances within the common functional system codification for aircraft and missiles. For example, the aircraft functional systems codes have a commonality among the Navy, Marine Corps, and the Air Force in that in each of these services, the system code "11" refers to the airframe, code "13" refers to the landing gear, and code "14" to the flight controls. Conversely, there is no similar integral code characteristic for the sub systems and lower levels of indenture associated to the aircraft or missiles between or among these services.

The other categories of equipment such as electronics, ordnance, space, ships or surface vehicles have few if any common coding schemes to identify their integral systems, sub systems or other levels of indenture.

The EICS is structured to uniformily identify: (1) weapon/support system family groupings, such as the categories listed immediately above;

(2) specific weapon/support systems within a grouping such as a particular attack, bomber, fighter, and patrol type aircraft within the family grouping; (3) a functional system such as the airframe within a particular aircraft; (4) a code for a sub system of a given weapon/support system such as the movable surfaces of the flight controls; (5) a component of hardware.

The EICS code is to be applied to a system category when it first enters the inventory and continues therefore to identify this category until it leaves the inventory. The EICS, when applied during the acquisition phase through the work breakdown structure, interfaces with the contractor's informational network. Additionally, and upon management's option, the EICS can be used to retrieve data on selected existing weapons systems or support equipment.

The implementation of the EICS code does not envision any disruption of the existing management practices, procedures or forms used in data collection. The concept of the EICS does, however, require the uniform application of the established code in each of the practices, procedures, or forms. The implementation of the system is to be phased in an orderly transition from the existing codes to the EICS within minimum impact on the services' maintenance efforts.

In addition to its fundamental purpose of satisfying maintenance management needs, the EICS code can interface with a number of related logisticsl functions. Through the EICS the supply manager, the comptroller and others can communicate in a common language with defined terms and frames of reference

The findings of the EICS study established criteria for a uniform coding system that can be applied to all the categories of weapon/support systems and their equipments.

The recommended criteria include, but are not limited to: uniform identification systems for all categories of equipments; utility to all levels of maintenance management within the Department of Defense; interface with other logistic activities and functions; capability to relate to other Department of Defense management systems such as the Resource Management System and the Cost Information Report; the provision of feedback performance data to engineers for consideration in evaluating subsequent systems design.

Additionally, the study recommended the establishment by the Office of the Assistant Secretary of Defense (I&L) of a central control agency to initiate and maintain the integrity of an EICS through the engineered standardization of codes and of pertinent definitions. The central control agency would establish ad hoc committees to develop with representation from concerned military services and agencies a specific EICS for each category of equipment. Further, the central control agency would establish ad hoc committees to extend integral functional systems to three levels of indenture within the work unit codes for all categories of equipment.

The EICS code, when developed, would serve a dual role. First it would serve as a means to obtain information from a central data storage facility at each of the military services. Secondly it would serve as a bridge to reach varying types of data at any level of maintenance management within the Department of Defense. More importantly, it can retrieve data for further use as inputs to maintenance programming, resource management reporting, cost accounting and configuration control.

Management at any level or within any service relies on current, concurrent, and consistent information. Currency and concurrency is a function of speed and accuracy of transmission while consistency is a function of the progressive uniformity of the EICS. The credibility of a manager's decision is a direct reflection of the credibility of the information with which he has to work. The EICS is designed to achieve and sustain that credibility.

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Chapter I

THE USE OF AN EQUIPMENT IDENTIFICATION CODING SYSTEM (EICS) TO IMPROVE EXISTING DOD MAINTENANCE MANAGEMENT INFORMATION

A. THE NEED TO IMPROVE EXISTING PRACTICES

1. GENERAL

The critical element in any management system is current, concurrent and consistent information. Maintenance management within the DOD environment is no exception; in fact, the inability to assemble cogent data from any or all of the separate service sources is most critical. This inability persists despite the fact that most, if not all, of the data required for management's use currently exist in some system or storage within the separate services.

a. A fundamental weakness that hinders the assembling of data is the fact that no one set of principles or guidelines exists whereby defense materiel items can be uniformly identified. The result is that an item may appear or be identified in one service, while the same item of equal configuration, significance, and mission designation will appear or be identified differently in another service. There is no reason for this inconsistency. The lack of uniform practices results in confusion.

b. The noticeable variation that exists in the equipment description codes used by the separate services can largely be attributed to the lack of adequate guidance. Thus, a great need exists for the establishment of a universal set of principles or criteria to guide the preparation of a uniform equipment identification system. The publication and implementation of the identification system that is proposed in this study, hereafter referred to as EICS, will offset this deficiency. The system, when applied, should improve maintenance management practices and substantially enhance the maintenance planning, programming, and reporting. Managers at all levels who now may be only vaguely aware of the great wealth of useable data available in other then their immediate environment, will be able to retrieve and exchange meaningful information.

c. Most of the existing equipment identification practices are concerned with simple hardware descriptions while omitting, in whole or part, the other informational elements that are logically ascribed to the total management of hardware. These informational elements -- system engineering, test and evaluation, training, etc., -- are established as concomitant parts of all system costs during the acquisition phase and therefore are largely transferable to the system throughout its operational life. Therefore, if a state of disorder and confusion is established during the weapon system acquisition phase, it continues to grow and becomes progressively worse during the subsequent operational phase.

2. STANDARD DEFINITIONS

a. A basic cause for the breakdown of communications among or between the services is the lack of universally acceptable and understandable terms and definitions. Terms in use by the individual services are separately defined, often in conflicting frames of reference or obscured meanings. This condition is recognized and is apparently universally endured, but never to any general satisfaction. A publication of the Aerospace Industries Association (AIA) aptly described this condition by stating, "The need is urgent, in that until a universal definition is established, the accepted disorder and confusion will continue to some extent, on each contract".[1] This many faceted problem affects not only the military but also creates a communications gap between the military and industry.

b. The lack of a consistent set of definitions will hinder the understanding of a newly introduced management technique and therefore impede its implementation by the services. The difficulties that are created whenever a new technique such as the EICS is introduced are well known. These difficulties usually generate some confusion and incur the wrath of those charged with the transition from the old to the new. The burdens that are inherent to change cannot be completely eliminated, but their impact can be reduced by the publication of universally understood and accepted terms and definitions.

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[1]AIA, The Aerospace Industries Position on the Definition of Contract Management Items: Washington D.C. 20036 (undated)

c. Congruency of terms and definitions become especially critical at OSD level where the data received from the separate services must be collated, digested, and analyzed. Without a concise, accepted, and understood language, management effectiveness is fractionated. Any attempt to measure the performance of a materiel item or to ascertain its cost effectiveness index is diluted in direct ratio to the ambiguity of the terms or frames of reference used to describe the equipment item. The factuality of the data that are generated is perforce, suspect; thus, the comparison of actual technical, fiscal and management data tends to be effectively frustrated.

d. A consistent EICS reporting framework must be established if the varying data needs of all management levels are to be satisfied. Further, the data needs of the various functional specialists within each of the management levels, e.g., planners, programmers, analysts, accountants, etc., must be accomodated. Each of the specialists require similar information in varying detail. Supported by uniform terms and definitions, a common data base has increasingly greater capability to satisfy ascending levels of maintenance management from the lowest echelons to the OSD.

e. Equipment identification as conceived by the EICS study is basic to any equipment management program, or as AIA sees it "It is as essential and fundamental as house numbers and telephone numbers".[2]

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[2] Ibid.

B. THE DEVELOPMENT OF CRITERIA FOR DOD EQUIPMENT IDENTIFICATION CODING SYSTEM (EICS)

1. GENERAL

A logical question can be raised as to the need for an additional coding system such as the EICS, in view of the existing maintenance management information systems. The answer to this question is contained in the phrase "standardization; or the lack of it".

Standardization, wherever possible must be achieved and enforced, not in a manner of uniformity for uniformity's sake alone, but for the positive advantage that standardization offers.

Standardization provides the ability to select and use the most advantageous procedures and methods. It fosters the development and application of engineered standards that have broad applicability and extends the ability for comparison of one maintenance activity with another. Further, it isolates the problem areas and identifies their underlying cause.

A standard system such as the EICS must provide the basic data upon which maintenance management decisions are made.

Therefore, the EICS must concern itself with the fundamentals that pertain to its goal; that of the uniform equipment identification. In order to merit its application throughout the DOD, the EICS system must provide information that is credible. Further, the EICS must earn and maintain confidence by its accuracy and its timeliness in order that it be responsive to management needs.

a. In contrast, the services presently are operating under a non standard equipment identification system. As a commonly accepted practice each of the separate departments independently initiated and developed its own equipment identification system without concern as to the interrelationship and interdependence that existed between it and that of the other departments equipped with similar items. The separate systems were unified in purpose but divided in practice. Each unique system, although having generally similar characteristics, lacks the capability or compatibility of structure for cross-correlation or direct interchange of materiel maintenance, performance, or cost data. Further, any attempt by the OSD to retrieve meaningful data through the current service systems tends to add to information systems that are in themselves already redundant. Thus, the fundamental inability to communicate has made the comparison of inter-system technical, fiscal, and management data difficult, if not impossible.

Initial DOD studies of this problem indicated that great advantage and benefit could be gained through the adoption of a standard equipment identification code designed to aggregate or "roll-up" not only the hardware costs and performance, but also the software, production, and service costs associated with that hardware within a particular weapon or support system. In view of the obvious benefits to military maintenance management, a project was initiated to establish a set of criteria upon which a uniform coding system could be subsequently developed.

2. PRIMARY OBJECTIVE OF THE EICS PROJECT

The Office of the Assistant Secretary of Defense (Installations and Logistics), Maintenance Division furnished a work specification to the School of Systems and Logistics. The work specification provided for the establishment of a research project for the purpose of developing criteria for an equipment coding system with uniform application throughout the Department of Defense.

3. SPECIFICATIONS OF THE PROJECT

a. The EICS must facilitate the uniform identification of:

(1) weapon/support system family groupings,

(2) specific weapon/support system within a grouping,

(3) functional system within a specific weapon/support system,

(4) sub-system within a functional system, and

(5) component hardware of a sub-system.

b. The EICS must have the following characteristics:

(1) the facility to aid the machine and/or computer processing and analysis of maintenance management information in accordance with the proposed DOD Directive "Maintenance Management Information Systems" 32XX.X.

(2) compatability with the Chart of Accounts Structure prescribed by DOD Directive 7220.14 to facilitate the generation of maintenance costing information at all levels of maintenance.

(3) compatability with the proposed DOD Directive "Work Breakdown Structures For Defense Materiel Items" and the proposed MIL STD XXX, "Work Breakdown Structures For Defense Materiel Items", to foster use of maintainability and reliability indices established in the research, development, and test cycle of military hardware.

(Each of these directives will be discussed in greater detail in Chapter 2)

c. The EICS must permit direct interchange of data and experience information between the military services or between the services and the defense industry on similar type hardware.

d. The EICS must enable comparison between services' equipment performance or maintenance effectiveness.

e. The EICS must provide basic inputs to:

(1) maintenance programming,

(2) functional reviews of the maintenance program,

(3) maintenance management resource reporting,

(4) maintenance cost accounting, and

(5) equipment configuration and control.

f. The EICS must accomodate the following seven categories of weapon/support systems:

(1) aircraft,

(2) missile

(3) electronics,

(4) ordnance,

(5) ships,

(6) space, and

(7) vehicles

g. These categories can logically be included under the "system" concept in that each represents a composite of equipment, skills, and techniques that form an instrument of combat which usually, but not necessarily, has an aircraft, missile, tank, or ship -- F-111, Minuteman ICBM, M-60 main battle tank, FDL Ship -- and also the support, training, checkout, test and maintenance equipment. Additionally, a system encompasses the facilities required to operate and maintain it; the selection and training of its personnel; software for its computer programs; its operation and maintenance procedures; instrumentation and data reduction for its test and evaluation; its special activation and acceptance programs; and its logistic support programs.

h. It should be noted that the term "systems" as used in the paragraphs immediately above is used in the broadest context and as such, has fairly uniform understanding throughout the services. The term will serve as a general identification of the levels, functions, hardware, cost, etc., throughout the project. The expanded "systems approach" will serve to identify the methodology used throughout the study and still provide bench marks upon which to correlate common data modules and preclude the omission of information that must be integrated at these bench marks. A more explicit definition of "systems" is provided in the attached glossary, Appendix B.

4. INITIAL STUDY CRITERIA

a. Early in the EICS project, certain criteria were developed to aid the initial study efforts. This set of criteria was to be included in the final project criteria after their appraisal through field discussion and actual machine testing. Such criteria included:

(1) the use of standard definitions of terms so as to assure common understanding, use, and compatibility of the data transmitted.

(2) the use of coding to facilitate machine and computer reporting, analyzing, and summarizing technical, fiscal, and management information.

(3) the use of a coding system that is usable either by machine or by manual reporting.

(4) the interchange of technical data and by-products between the services and between the services and the defense industry.

(5) the design of codes which meet requirements for flexibility, and for growth, to provide the interface of operational, logistical and financial data.

(6) the establishment of a strong central authority by the DOD to supervise and control all requests for additions, deletions, or revisions to the EICS.

(7) the provision for the entry by remote stations to the data bank of each of the military services or agencies for retrieval of information requirements at such stations.

(8) the provision for the orderly transition from current coding to the EICS.

(9) the updating of the DOD maintenance management information system to reflect current advances in the information systems.

(10) the provisioning of feedback of data for research and development of a new weapon or support system.

(11) the evaluation of equipment performance and maintenance effectiveness between or among the military services or agencies.

5. ADDITIONAL STUDY CONSTRAINTS

a. A basic concern of this study was not to challenge the concept of materiel identification since some method already exists in each of the services; rather its concern was to seek an answer to the question, "Can the required maintenance management data be assembled and retrieved in an orderly and economical manner whenever and wherever they may be needed, regardless of place and method of collection or storage"?

b. Additional areas of concern that were recognized during the development of the criteria were focused on the provision of sufficient flexibility and expansibility of application. These concerns, however, were not in conflict with the concept of having a system which is uniform, or the feasibility of the basic core code structure in itself. Sufficient flexibility should be designed in the concept without jeopardizing the integrity of the EICS or its applicability.

c. The EICS although primarily hardware oriented is to provide a catalyst to aggregate technical, fiscal and management data associated with the control of the hardware. The aggregation of these data is further directed to the relation of resource information to a program element.

d. The EICS is to be designed to provide a standard set of addresses within each of the several military central data banks in order to facilitate an orderly collection and storage of maintenance management information. The EICS further is to provide a convenient method of extraction and use of a wide array of informational elements by all levels of maintenance management.

e. The structure of the EICS is to facilitate the reporting of maintenance data and improve not only the evaluation, programming and production comparison, but significantly assist budget planning and justification. These benefits should accrue to the sequential decision processes at all levels of DOD maintenance management, and to the OSD.

f. The EICS must be integral to all maintenance management control, data collection, and reporting. Because of this, it becomes evident that a consistent and uniform implementation must be established and sustained. All elements of the system must be inextricably joined and have a common purpose; namely to contribute to the establishment of complete communication and understanding based on specific inputs that are translatable to specific outputs. The absolute necessity to maintain the coherence of the EICS demands a strong central management charged with the responsibility and given the broad authority to enforce the integrity of the coding structure to be developed. The role of the central management control authority will be discussed in greater detail in Chapter 3.

Chapter II

EICS INTERFACE WITH EXISTING DOD MAINTENANCE MANAGEMENT DIRECTIVES

A. POLICY DIRECTIVES

1. GENERAL

The design criteria of an information system as involved as the EICS structure requires the recognition of every possible data element that may in some way affect the structure and its application, even though every data element may not be used in every management consideration. Under this premise, it is appropriate to examine the feasibility of the proposed structure in light of its relationships with the several DOD maintenance management directives that will cause inputs to the system. This action is necessary if the structure is to achieve complete compatibility with the Directives. It is also appropriate to consider the impact that the proposed structure criteria will have on the Directives and the policies established by these Directives.

The Directives that basically establish the policy constraints upon the EICS cover three levels of management -- weapon system acquisition, depot maintenance, and organization and intermediate level maintenance. Each Directive will be discussed in turn.

a. <u>DOD DIRECTIVE "WORK BREAKDOWN STRUCTURES FOR DEFENSE MATERIEL ITEMS"</u> (proposed) and <u>DOD MILITARY STANDARD XXX - "WORK BREAKDOWN STRUCTURES FOR DEFENSE MATERIEL ITEMS"</u> (proposed)

This proposed directive establishes DOD policy governing the preparation and application of the Work Breakdown Structures, hereafter referred to as WBS. The WBS are applied during the concept formulation and acquisition (Engineering and Operational Development and follow-on production) of systems/projects, other weapon systems, support systems or designated materiel, hereafter referred to as defense materiel items.[1] (The provisions of the directive apply to all military departments and defense agencies.)

(1) The proposed military standard establishes the criteria for the preparation and use of the Project Work Breakdown Structure (Project WBS) and the Contract Work Breakdown Structure (Contract WBS) in combination with other management techniques during concept formulation and acquisition of defense materiel items.

(2) The concept of a WBS is to depict a product-oriented "family tree" division of hardware, software, services and other work tasks. The WBS family tree displays the item to be produced as

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[1]Defense materiel items in this context are designated in seven categories, such as: aircraft, electronics, missiles, ordnance, ships, space, and surface vehicles.

well as all of the work associated with that production. The WBS concept is further defined in certain specialized applications:

. . . Summary WBS consists of the upper three levels of the WBS (first three indentures):

(a) Level 1 - The entire defense materiel item, e.g., the Minuteman ICBM, the FDL ship, or the M-16 rifle system, including its round. Level 1 has a compatibility with the DOD programming/ budget system as an integral program element or as one program element. Level 1 can thus be related to program elements.

(b) Level 2 - Major end item elements of the defense materiel item, or the aggregations of data, activities, or services, e.g., an air vehicle, a vessel, the M-16 rifle, or systems engineering/ management.

(c) Level 3 - Major end items subsystem elements or types of services. An airframe, an electric plant, the M-16 rifle magazine, or systems engineering. (NOTE - Levels 2 and 3 may be specified as contract line items.)

(3) Project Summary WBS. The Summary WBS which applies to specific defense materiel items have been prepared by the selection of applicable elements from one or more Summary WBS.

(4) Contract WBS. The Contract WBS is prepared through the selection of elements from the Project Summary WBS that have been specified in the individual contract and that identifies the complete WBS as developed and used by the contractor.

(5) Project WBS. A detailed WBS for a specific defense materiel item, through which the system and contractual processes evolve into a WBS containing all elements of all contracts.

(6) A discrete entry in a breakdown structure: An element may either be an identifiable product, a set of data, or a collection of services.

b. The broad objectives of the Project WBS are to provide a consistent framework for developing, coordinating, and reporting management responsibility, engineering actions, resource allocation, procurement actions, cost estimates and reports throughout the development and production of the defense materiel item. Two other corollary objectives also apply. These are to:

(1) unify management techniques which employ or require information derived from a family-tree type breakdown structure; and to

(2) facilitate technical, programming, and cost comparisons within a defense materiel item and/or among several defense materiel items.

c. There are two general fields possible for the application of the Project WBS. These are:

(1) To provide a common reference or technical baseline upon which a more effective management liaison can be established between the contractors and the governmental offices responsible for acquisition of defense materiel items; and

(2) to provide a framework for cost and progress reporting for the purpose of analysis and review by management.

Thus, the Project WBS is used as the principal method of representation of the project's configuration structure and the primary reporting scheme for the defense materiel items during their acquisition phase.

d. APPLICATION OF THE WBS

(1) In the instance of the WBS applied during the acquisition phase, specifically at the second level of indenture, terms such as "prime mission equipment" "system test", "support equipment", "systems engineering management", "training", "data", "site activation", etc., have common applicability across the largest majority of major weapon/support systems. There is also a commonality of terms applied at the third level of indenture wherein certain hardware items can serve similar functions in different defense materiel item categories, i.e., the functional similarity of engines and power plants, propellers and screws, etc.

(2) The basis for the selection of the data elements in the second and third indenture of the WBS is the possibility of combining the information requirements of the several users. As an example, the elements in the second indenture of the WBS are not based solely on financial considerations, rather the selection was made to respond to special management needs. For example, the second indenture elements provide management visibility of technical data and procurement policies in the form of information bearing on generally accepted contract line items. Also provided is the contractually significant information such as system test results or the differentiation between on site or in plant operations.

(3) The third indenture level selection is based on agreement with configuration management, project planning and control, and cost analysis.

(4) The general uniformity of the top three levels of indenture is intended to facilitate OSD comparison of the data with those data gathered from another weapon system or contractor. At the lower levels of indenture wherein the interfaces with the contractor's system are established (level 4 and below) the WBS, although following a general pattern, are not necessarily identical or uniform. These levels afford a management flexibility to accomodate the variance in size and complexity between projects and weapon systems. Although differences of aggregation exist at these lower indentures, the related data must be such that they can be successively summarized to the higher level of indenture.

The WBS approach maintains that the indentures below the universal levels (level 4 and below) should reflect how the work is accomplished. Although management flexibility is provided at these lower levels, complete permissiveness in accepting any or all contractor management system's data output is not. The structure at the lower levels is related to acquiring data that relate to contract line items, contract end items, work statement tasks, contract data items, and configuration elements.

(5) In attempting to have a WBS design serve different management disciplines and users, a series of compromises was undertaken. The result of these compromises have, to an extent, reduced the WBS's complete utility to any one discipline or for any singular purpose. As an example, the weapon system planning and control manager may need even greater detail than is furnished by the lower levels of indenture, while on the other hand, cost analysts may be interested in the less detailed data of the upper levels, (indenture three and above).

(6) During the initial development of the WBS, a basic principle was followed; that is, one structure can and should be used throughout the acquisition cycle from the conceptual phase to the final delivery of the item. The principle is further used to establish a discipline that can insure the comparability of the basic weapon system's project structure with all of the other relatable aspects, such as the budget chart of accounts, work statements, contract line items, specification tree, etc. The WBS recognizes that during the

present time one structure may not fully satisfy every user, any unique structures developed to satisfy these special needs must be compatible to the basic WBS. Ultimately, all unique structures must be included in the basic WBS.

(7) Throughout the WBS field studies, two basic structures were considered. One proposed structure included only the weapon system development phase while the other structure pertained solely to production and assembly. After review of the arguments in support of the two separate structures, the WBS research team decided that separate structures were not required.

The decision to adopt one WBS for both development and production has been the basis for limiting the proposed Summary WBS to the first three levels of indenture. This approach has been reflected in both the proposed DOD Directives and Military Standards (MIL STD) for the WBS.

(8) The proposed directives and military standards for the WBS serve as a baseline for all subsequent coding system development. The EICS criteria are established on this baseline and follow the logic pattern established by the WBS; that is, the categorization of defense materiel items, and the identification of the weapon/support systems and their related functional sub structure.

(9) The WBS study has already suggested that the scope of the Summary WBS should be expanded to be more directly

compatible to and include the weapon systems' operational phase. The primary object of this expansion is to provide a framework for the prediction and reporting of total life cycle costs for management decisions. Today's managers are unable to relate economics with a state of readiness because of the absence of such a framework. Further, management cannot make logical comparisons between systems and the separate services without a uniform framework supported by common definition or terms of reference.

Meaningful end item systems management requires that knowledge provided by the information networks is necessary to identify the total maintenance demand and resources applied. Since there is a continual shifting of demand and effort between the various levels of maintenance support, there must be a viable communications link between these levels. The prospect of the extension of the WBS concepts through the complete life cycle of a system is supportable through the implementation of the EICS. Thus, management at all levels will be provided a mechanism necessary to fully carry out DOD maintenance management policies.

B. <u>THE EXTENSION OF THE WBS IN THE OPERATIONAL PHASE</u>

1. GENERAL

While the discussion thus far has been primarily oriented to hardware, a number of related logistics information and cost elements were not intentionally excluded. Such elements as manpower and transportation, consumables, etc., are characterized as major work elements that are evident only in the operational phase of a system's life cycle. The present Summary WBS do not provide for the inclusion of any information elements below the acquisition phase.

One of the basic precepts of the EICS criteria is to facilitate the collection of costs and related fiscal data that are pertinent to not only the hardware, but also to the functions and services that support the specific hardware. The recent emphasis by DOD on the total package concept includes not only the acquisition costs, but also those costs identified as associated with the system during its operational phase. The "total cost concept" is applied by the OSD in the analysis of the costs contingent to a major weapon or support system not only during its design and acquisition phase, but also during operation. These cost data assume great importance not only when related to budget estimating and programming, but also when used in comparison analysis between similar systems in use by separate services, i.e., for differentiating the effectiveness among production and support alternatives.

The difficulty of isolating costs that are identifiable to a specific aspect of a system's life, assumes major importance to the total cost concept. While this study does not appertain to the exploration of the total cost concept in great detail, it does concern itself with the need to aggregate supporting costs throughout the system's life. The inclusion of all support cost data within the EICS facilitates inter and intra system comparison and the subsequent relation to program elements.

An extension of the WBS information system is required to support DOD's efforts in the evaluation of systems and equipment on a total lifetime basis. DODI 3200.6 and DOD Directive 3200.9 both include references to the evaluation of the system's total life time costs. Notwithstanding the tremendous acquisition costs, the operation and maintenance phases tend to accrue the preponderance of the total systems costs.

2. In order to evaluate total system cost, the functional elements of the operations and maintenance programs must be identified and standardized. Any program that is a measure of system effectiveness in terms of operational capability, must consider reliability and maintainability, plus the other criteria used in the repair or replace decisions, such as the associated materiel and manhour costs.

3. A basic compatibility exists between the maintenance data collection systems extant in the military services and the hardware portion of the WBS. This compatibility, for example, is most apparent in the work unit codes or similar functional system breakdowns that may be peculiar to a separate service. The compatibility prevails to the major functional systems levels; however, if compatibility of the lower levels is to be achieved, a standard definition of common functional system terms will be required.

4. Systems hardware is at once, the source of maintenance requirements and the sole basis for the establishment and sustained retention of a maintenance capability. The production effort of maintenance is best measured in terms of mission ready end items of hardware (weapon/support systems). The objectives of Maintenance Management and its primary orientation is toward the support of total weapon systems as contrasted with the homogenous commodity aggregations of the bits of hardware associated to the many end item equipments.

C. <u>DOD DIRECTIVE 7220.14, "UNIFORM COST ACCOUNTING FOR DEPOT MAINTENANCE."</u>

1. GENERAL

A primary means through which the EICS will be related to the separate military departmental depot maintenance costing procedures will be through the use of the chart of accounts. The purpose of the chart of accounts, as outlined in DOD Instruction 7220.14, is to prescribe a uniform cost classification structure for depot level maintenance. The main objective of the structure is to provide the methodology of gathering and reporting data to facilitate the comparison of depot maintenance productivity with the established performance and cost standards. The comparison of these data and their analysis allows management to focus its emphasis on actions requiring the greatest attention.

2. In order to accomplish a meaningful assessment of the Depot Maintenance Program, it is essential that ASD(I&L) be knowledgeable of the source of the workload requirement; products to be produced; capabilities of the various depot maintenance organic sources; planned distribution of the products to be produced among the various organic and contract sources and, production schedules for the current year by organic or contract source.

3. <u>The EICS Interface With The Chart of Accounts</u>. The union established between the EICS and the WBS during the acquisition phase is enlarged to include the relationship with the Chart of Accounts during the operational phase, especially at the depot level of maintenance.

The EICS must interface with the Chart of Accounts specifically in the following areas:

(a) mission design/model/series/class

(b) weapon or support system/subsystem or component

(c) commodity groups, as applicable

(d) resources applied in depot maintenance including but not limited to:

(1) personnel i.e., civilian salaries and wages, and military pay (cost and allowances)

(2) materials and supplies

(3) contractual services

(4) indirect and overhead costs

(5) maintenance support costs

(6) contractual maintenance costs

4. Each depot maintenance activity within DOD is required to adopt and use a uniform cost classification structure. The uniform cost classification structure when combined with a cost accounting system provides the basis to:

(a) Measure and evaluate the relative effectiveness and efficiency at each of the various maintenance industrial activities, i.e., depots, intermediate maintenance, and organizational (comparison of program with actual production and cost).

(b) Provide the basis for comparing contract and organic performance. The objective to be attained is the ability to distribute workload between contract and organic sources that produces the best cost/effectiveness results to the DOD.

(c) Compare the return being realized from investments made in maintenance capability at the various maintenance industrial activities (organizational, intermediate and depot levels).

(d) Provide historical performance data for use in projecting and pricing future requirements and their associated programs.

5. The chart of accounts furnishes a standard structure of functional and resource costs that can be used to break down the repair process into functional tasks (e.g., engineering, set up, quality control, manufacturing) and resources (materials, labor, overhead) for each item under repair. The structure permits detailed data collection on manhours and dollars associated with repair under certain cost criteria.

6. The depot maintenance cost summaries derived through the chart of accounts structures are designed to report the costs associated with completed end products or services on weapon or support systems, and cost of maintenance support services. Once these elements of cost are isolated, they can be associated to the EICS and summarized as inputs to many OSD programming and analysis actions.

7. However, accrued cost data are presently limited to the depot level of maintenance. Policy direction and the cost structure for application at the depot level is covered by DOD Instruction 7220.14. The system and approach to cost accounting as covered by this directive is adequate and provides the basis for accumulating

the total cost of maintenance operations both by type end item support and by product(s) produced at organic and contractor sources. The system, however, should be extended to the organizational and intermediate levels of maintenance, possibly in a modified form.

8. The chart of accounts and the EICS interface to the level where the definitions of system and support system are common. However, if it becomes appropriate to recapture depot data elements on individual subsystems or components below these levels, it will be necessary to depart from the EICS and treat with these cases on a special basis within each departmental framework. In general, separate management structures can exist as long as a comparison between these structures and the EICS remains possible.

D. <u>DOD DIRECTIVE 32XX.X (proposed) "MAINTENANCE MANAGEMENT INFORMATION SYSTEM."</u>

1. GENERAL

This directive establishes a DOD information management system that is applicable to all levels of equipment and materiel of all departments and agencies. The directive is designed to facilitate quantitative assessments of maintenance operations in response to the increased emphasis on higher equipment readiness rates and correspondingly reduced reaction times. The emphasis therefore requires the DOD to exercise a greater control of available resources that pertain to the total maintenance management function.

2. The policies as conceived by the Directive require that:

(a) Each military service will employ a uniform maintenance management information system for equipment maintenance <u>within its services</u>.

(b) Maintenance data will be collected at the point of generation.

(c) Maintenance data will be processed by mechanized equipment for review and analysis.

(d) The responsibilities for management of the equipment maintenance function will be centralized to the extent feasible at each level within the command chain.

(e) The data elements and codes prescribed in this directive will be integrated into the maintenance management information system of each military service.

(f) Each military service will establish a point for the centralized accumulation, processing, mechanized analysis and publication of maintenance data products on an across-the-board basis.

3. In the analysis of this Directive's requirements, answers to these questions must be determined. They are:

(a) Can the EICS facilitate the retrieval of the data gathered through maintenance management information system defined in this Directive?

(b) Can the EICS provide differentiation between the separate departmental information systems and yet be flexible enough to extract more detailed information elements on a special and as needed basis?

(c) Does the EICS provide for improved use of the information derived from the separate systems?

(d) Can the EICS maintain compatibility between the other management techniques and codes that relate to maintenance management, i.e., Federal Stock Numbers, Resource Management Systems, etc.?

4. The final proof of the concept and the absolute answers to these and other questions must await the DOD service wide test. However, it appears at this early stage that the EICS structure will present a viable method of recapturing elements of information for a total system or any increment thereof. Further, the EICS can relate this information to other data such as cost, performances, reliability, maintainability, and programming.

5. The maintenance data thus assembled can be applied in many ways, such as the:

(a) Measurement and analysis of equipment and weapon reliability and maintainability levels.

(b) Validation of labor and material cost correlations chargeable to equipment or system maintenance.

(c) Assessment of equipment and weapons system operating life expectancies.

(d) Determination of future design characteristics on new equipment or weapons predicated on the reliability and maintainability data gathered on existing systems.

6. The proposed DOD Directive 32XX.X and attachments, contained in Appendix E, were reviewed as to its currency in light of the changes that have occured since the Directive's original draft was undertaken. These changes appear largely in the methodology used in portraying ratios and percentages in the status of equipment or to its maintenance efforts.

Further, the state of the art requires that the glossary of terms be updated to properly reflect the changes in the technology of maintenance management. As a result, this study has included two appendices; Appendix B, a new glossary of terms, and Appendix D, suggested modifications of the proposed Directive.

E. EICS CONFORMANCE TO DOD POLICY

1. GENERAL

The proposed EICS has been designed to serve the needs of many potential users, each of whom in the past contributed to the development of unique and sometimes unrelated equipment identification systems. In recognition of these diverse needs, any attempt to develop an equipment identification system must be measured in terms of the utility, applicability, and validity to serve these needs.

(a) During the interviews conducted by this study, much emphasis was given to the evolvement of criteria that would recognize the diverse needs. The personnel that were contacted logically voiced concern of the impact that the proposed EICS would have on their established ways of doing business. These concerns principally centered on whether the proposed EICS would provide the structural breakdown and flexibility of use as to the:

(1) peculiar management needs of the service, specifically at the lower echelons;

(2) differences in the services' maintenance management philosophy;

(3) communications between the services' maintenance management echelons; and the

(4) compatibility between disciplines other than maintenance, such as the comptroller and supply.

Each of these areas of concern will be discussed below.

2. Peculiar Management Needs: A basic thesis of the criteria project is to achieve efficient management planning, programming, scheduling, and controlling by all levels of maintenance activity with DOD. Although the EICS is hardware or product oriented, its application stands to serve a wide variety of maintenance management needs at all levels.

(a) The product orientation does not imply that functional controls were overlooked in the criteria. Rather, the product orientation and functional orientation are mutually supporting and the EICS is designed to take advantage of that mutual support.

The criteria are designed to take maximum advantage of the existing maintenance organization and information systems. Where an essential disparity exists in the individual services' functional system or work unit codes, modification is recommended. An example of the recommended functional system coding substructure is furnished in Appendix A. This structure has been adopted to minimize the impact on the current functional coding system and ease the transition to completely standardized codes.

(b) A basic criterion followed in the design was to keep to the minimum the number of data elements required and maximize their use. Many of the identifiers presently in use have been adopted in the EICS, however, by analysis and restructuring, greater utility is afforded in each code through use of the same number of digits. Further, each code has been structured to provide flexibility of use and capability of expansion during the current and foreseeable future use.

3. Difference in the Maintenance Management Philosophies of the Separate Services.

The use of the EICS will in no way affect the basic approach to maintenance management by the separate services. It is recognized that the individual approaches were created in response to widely varying service missions; however, the defense materiel items used in these varied missions are, as a rule, subject to maintenance and the management thereof.

The EICS study has no quarrel with efficiency of the individual management philosophies or the separate maintenance efforts. The study, however, does strongly suggest the adoption of a universal functional system identification code. The uniformity is especially required at the levels of indenture below the major functional system. Until and unless this is fully implemented, the total potential of the DOD maintenance management concept cannot be fully attained. Universal adoption of the EICS core code and the functional system breakout will do much to speed that attainment despite the variances in mission and maintenance philosophies.

4. Communication Between the Services' Maintenance Management Echelons

The communications gap between the echelons of the separate service management structures can be substantially bridged by the adoption of the EICS. Increased effectivity of language is achieved through commonly understood terms and frames of reference. EICS is designed to enhance the understanding of both, and by so doing, strengthen the communication line not only within the service, but also when the communication lines transcend the boundaries of a service.

5. Compatibility Between Other Disciplines - Comptroller or Supply

(a) Maintenance, as a function, is not the only area that has an interest in equipment identification. Other functions, such as materiel management and the comptroller are directly affected by whatever methods of identification are adopted to support the needs of maintenance. The EICS criteria have taken these multi-purpose requirements into consideration and have accomodated each. Only through the universal adoption of the EICS by all disciplines will data cross correlation and comparison be possible. The EICS not only defines the data, but also the terms of reference applied to each definition so that common understanding is possible regardless of user.

(b) The EICS is not only hardware oriented but, also provides a framework for reporting the function costs which support the equipment. Unless both of these elements are considered, it becomes virtually impossible to relate the technical performance and total costs of the equipment. Technical performance measures are end item hardware oriented and costs, in order to be identified to an item, must also be hardware oriented. These costs continue to apply to inventory management subsequent to acquisition. Additionally, many of the reporting requirements associated with equipment, other than costs, are based on hardware items. Finally, hardware orientation facilitates more effective comparison between disciplines and across department lines. In the final analysis, a fundamental decision process in the DOD is based on the equipment support of the program objectives, and hardware oriented data will furnish a credible basis for this process.

(c) The information collection and analysis undertaken in our study indicated that an EICS with uniform definition of data elements in regard to terms and frames of reference and structural placement can be employed at all levels of use.

6. Additional DOD Management Areas That Are Relatable to the Application of the EICS

(a) The Cost Information Reports (CIR) is structured to collect historical cost data for weapons or support systems in order to facilitate the estimating of future programs by DOD. A basic criterion of any cost comparison system is the consistency of definition of the element and subelements for a range of similar defense materiel items over a period of time. This criterion can be essentially served through the WBS as identified through the EICS.

(b) Program Element Codes: The Five Year Defense Program (FYDP) requires a periodic updating. The EICS can provide an input into the FYDP through a relationship with the Program Element Structure. The Program, as the highest level of data aggregation in the DOD programming system is the source of all program elements.

F. EICS COMPATIBILITY WITH THE BUDGET PROCESS

1. GENERAL

The cost and related fiscal information gathered on the materiel items that are identified by the EICS provides significant input to the appropriation and budget process. This process is basic to fiscal planning, programming and control since the funding for any materiel procurement must be secured from one or a number of fiscal appropriations.

The EICS is relatable to the budget process in that it can furnish substantiating support to the budget justification, and as such it establishes a corollary relationship to the DOD budget structure.[2]

The uppermost level of the budget structure pertains to appropriations such as Operations and Maintenance, Military Personnel, Research, Development, Test and Evaluation, Procurement and Construction. These appropriations are also of a specific concern to the WBS and the EICS. The concern arises from the fact that such funds that are available from these appropriations are used in the acquisition of the materiel items which the EICS is structured to identify and the WBS is designed to function as a level of data aggregation.

The next level in the budget structure immediately below the appropriation level is termed the "budget activity". The items that are identified in this level as "system family categories" correspond both in description and definition to the seven categories of defense materiel items that are inherent to the EICS structure.

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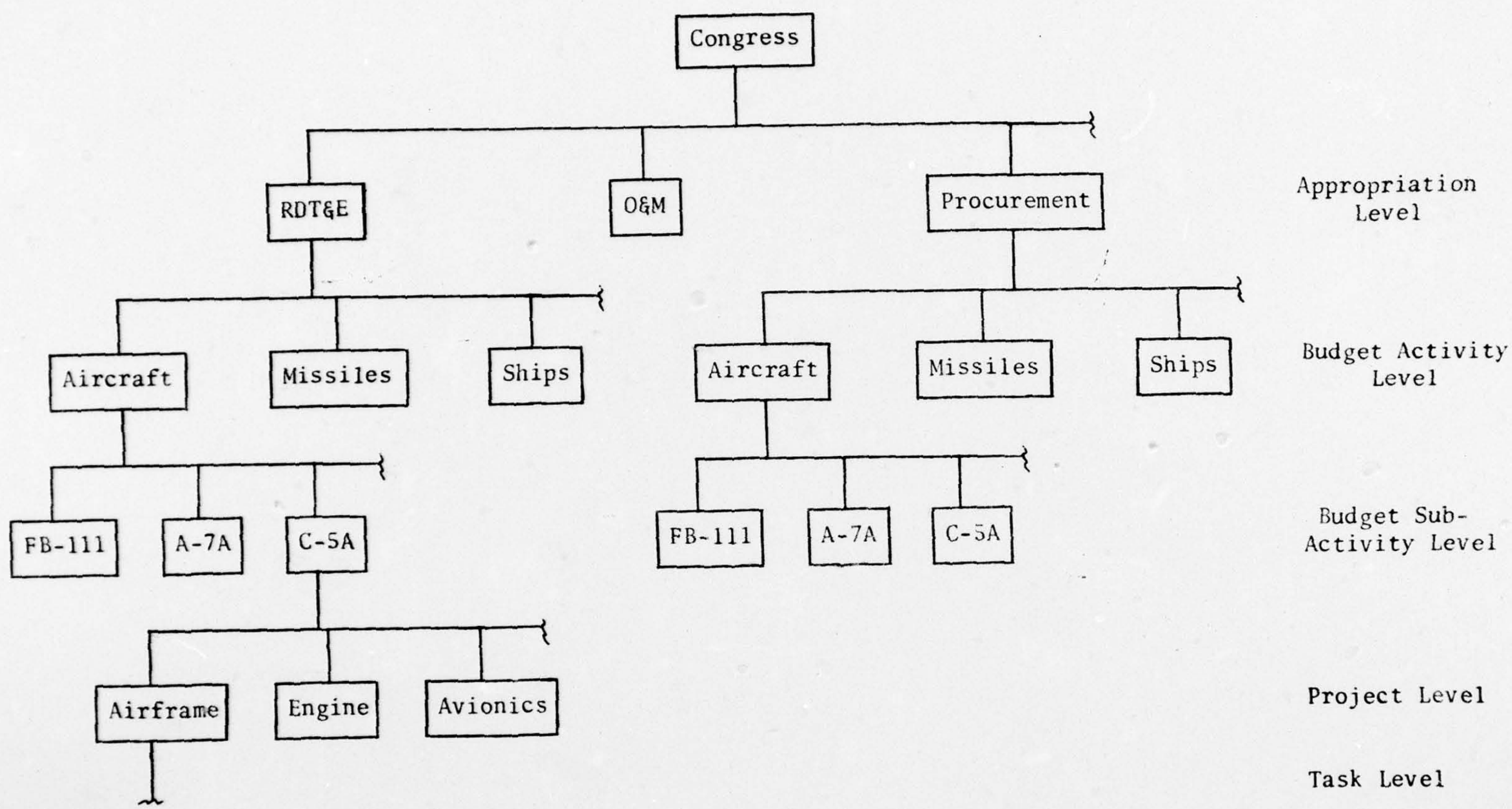
[2]The budget supporting substructures are illustrated in Figure #1.

FIGURE #1

BUDGET STRUCTURE



The third level of the budget structure encompasses the fiscal year sub-activities. The sub-activities are in reality fund aggregations that compare to the major weapon or support system level of the EICS. Department and agency chart of accounts summaries which interface to the appropriation level support the budget structure at this and lower levels with individual project listings and by detailed accounts.

While the above illustrations are associated primarily to hardware, some substantiation for the appropriation levels of O&M and military personnel can be served by the aggregation of maintenance management data through the EICS structure.

There appears to be little conflict and few problems in the summarization of data through the EICS structure. This contention is borne out through a comment contained in the study by Control Systems Research, Inc., during its development of the WBS.

> "Other procurement items are broken out to be in alignment with the manner in which the item is contracted. The purpose of the budget justification . . . is to present the data consistent with the way the item is procured and not to require a breakout by component, where such a breakout is not significant for comparing the different years' buy. Despite the conflicting data breakouts . . ., interviews with the DASD (Budget) personnel indicate that very few problems exist in the application of the Summary WBS. Their (the Budget personnel) position is that, while several structures admittedly exist, any WBS developed and accepted by OSD can be used in lieu of the present structures once the new structures come into use. The present frameworks used for budget justification are primarily based on how the departments and agencies can supply the data. When other structures are used by the departments, DASD (Budget) is willing to accept them for budget justification purposes."[2]

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[2] "Work Breakdown Structure Project" Final Report, Vol. I; Control Systems Research, Arlington Virginia: Contract No. DA 49-083 OSA 3046, 8 April 1966.

The unification of the WBS and the EICS concepts is established both in form and substance. Both concepts are mutually supporting in that the framework of the system indenturing laid down in the WBS has been adopted and expanded in the EICS, while the EICS establishes the defense materiel item identification adopted by the WBS. Hence, the budget justification parameters developed by the WBS can equally be served by the EICS.

Chapter III

RESEARCH METHODOLOGY

A. <u>PREPARATION FOR FIELD STUDIES</u>

1. GENERAL

When the EICS criteria study specifications were received, a series of actions were initiated to expedite the acquisition of information and data that would be of use to the study.

(a) The first of these actions involved the assembly of a library of publications relating to coding practices and equipment identification. The review of the literature listed in the bibliography (Appendix C) provided a base upon which the field studies were conducted. A more extensive study was conducted of the services' maintenance management publications to determine the differences in maintenance approaches and practices.

(b) The second action was the analysis of the equipment identification coding systems that are in use today. This action, in conjunction with the background documents relating to theory of coding, led to the development of field study guides.

(c) Each service system was reviewed in the light of these guides and the results indicated that the present identification systems did not meet the needs of the OSD in all of the required aspects. In order to insure a practical EICS a new approach would be necessary. Briefly, a new approach would require that any EICS development be structured to:

(1) be suitable for use throughout all DOD maintenance management activities.

(2) not only furnish hardware identification, but also identify the tasks related to the support of the hardware.

(3) support configuration management, budget estimating, submission, and reporting requirements.

(4) provide a reporting structure through which information pertinent to equipment status, technical performance, reliability, maintainability, and associated manhour and material costs can be transmitted.

(5) furnish the principal reporting structure for a particular weapon or support system that can interface between the contractor and the military, the departmental charts of accounts, and the services' maintenance management information systems.

(6) subscribe to standardized structure in order to facilitate the comparison of summary information not only within the systems but also between those systems that have multi service application.

B. THE WBS IMPACT ON THE FIELD STUDIES

1. GENERAL

One of the three basic documents specified in the study contract is the proposed WBS directive.[1] Inasmuch as this directive furnishes a basis for the EICS criteria, it was used extensively throughout the field studies.

2. The WBS directive in conjunction with its proposed MIL STD furnished the points of discussion and a framework to unite the efforts of the field studies team. The WBS directive contains a definitive listing of the seven categories of defense materiel items which establish the parameters of the study. Detailed definitions of the items all contained in the glossary, Appendix B; however, for ease of reference, a set of abbreviated terms is furnished below:

(a) Aircraft Category - Those fixed wing, rotary wing and compound, manned air vehicles, designed for powered and guided flight in the atmosphere.

(b) Electronics Category - Those systems and equipments which are classified as the electronics portion of weapon or support systems. The range encompasses Command Centers/Fire Control Systems, Communications Systems, Sensor Systems, Navigation/Guidance Systems, Electronic Warfare Systems and Support Systems.

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[1] "Work Breakdown Structure Project" Final Report, Vol. I; Control Systems Research, Arlington Virginia: Contract No. DA 49-083 OSA 3046, 8 April 1966.

(NOTE: The decision rule used to differentiate between Electronics and other categories is: When the item is peculiar to or closely identified with a system contained in another category, the item is included with the prime system in the related category. When the item is unique, or used as a building block for several systems, but not accounted for in these systems, it is included in the Electronics Category.)

(c) Missile Category - Those weapons delivery systems which employ unmanned, self-propelled air vehicles to navigate, penetrate and produce a desired destructive effect on selected targets. Includes such systems designed for employment as weapons of air defense, land warfare, strategic bombardment, and air and sea combat.

(d) Ordnance Category - Those systems and equipments which are comprised of munitions (including atomic, biological, chemical, psychological,) and a particular delivery vehicle. Includes bombs, rockets, artillery, naval guns, torpedoes, mines, rifles, mortars, and the ammunition associated with these systems. Excludes aerospace guided missiles and land, sea, or air delivery vehicles.

(e) Ship Category - Those seagoing systems which produce the capability to operate and support the operation of naval weapons and perform related naval functions on the ocean surfaces and underseas.

(f) Space Category - Those systems related to the placement, operations, and recovery of systems in space. This includes launch vehicles, various space orbiting and re-entry payloads as well as launch, flight, and recovery operations where appropriate. Both manned and unmanned systems are included.

(g) Surface Vehicle Category - Those systems characterized by mobility and a capability to navigate over the surface. Includes vehicles primarily intended for general purpose applications and those intended for mating with specialized payloads. Includes cargo and logistic vehicles, mobile work units, and combat vehicles serving as armor, weapons platforms, reconnaissance vehicles, and amphibians. The definitions indicate the range of defense materiel items falling within individual categories by the medium in/on which movement occurs or equipment operates; the manner in which locomotion, if any, takes place; the mission/function/design/purpose; and the number and kinds of constituent parts.

3. In order to make it possible to relate certain of the seven major categories of equipment, a consistent approach in defining subcategories was essential.

(a) Two simple rules for selecting and ranking system attributes were followed:

(1) Does inclusion of the attribute add to the number of items and subitems in the WBS?

(2) Does the ascending rank of these attributes successively narrow the number of subcategories to be considered?

As an example of the CSR[2] approach to the definition process, the Surface Vehicle Category is discussed below.

MAJOR CATEGORY - SURFACE VEHICLES

	Rules for Categorizing Vehicle[3] Types	Attributes
High Level Attributes	Medium on which movement occurs	Surface
	Manner in which locomotion takes place	Wheeled Tracked Propeller (amphibian) Other (Ex, hydrojet)
	Mission/function/design /purpose	Combat - recon - assault - obs, comm Logistics General Purpose Engineer (Ex, Tractor) Special Purpose
	Physical Size	Weight/size category 2T, 2T-5T, 5T-20T, etc.
Lower Level Attributes	Number and kinds of constituent parts	Prime mover, trailer Propulsion, transmission drive train, wheels, tracks, propeller, suspension, chassis, hull, body controls, steering, elect, hydraulic systems, weapon system, mount, fire control, feed, etc.

Possible combinations were identified for the first three levels and examined in order to form subcategories or various vehicle classes.

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[2]Control Systems Research, Arlington Virginia.

[3]Excluding ships, small craft, GEM's, and AGE or weapon system vehicles specifically designed for that purpose.

These subcategories were then ranked according to their significance, e.g., that portion of the present and future DOD vehicle inventory accounted for by each subcategory. The primary advantages of this systematic development of subcategories is that it overcomes deficiencies in the R&D Project List data and accommodates subcategories for future development items.

On the basis of the category content, defense materiel items were selected from the RDT&E Project Listings, Weapons Dictionary, and Military Systems Categories. Certain selection criteria were used to narrow the list to a workable number and yet provide for a comprehensive sample that would permit the development of WBS with wide applicability. These criteria were selected to assure that the sample represented:

1. the various classes and types included in the category, both large and small, sophisticated and simple;

2. each of the military departments, as well as differing developing/procuring commands within the department;

3. major financial importance in terms of the system development and procurement dollars in relation to others in the category;

4. differing stages of the life cycle, with heavy emphasis on new systems entering Contract Definition;

5. the latest thinking of OSD and the departments on the requirement for, and use of, the WBS and the EICS;

6. defense materiel items on which WBS had already been prepared, (although some projects were selected on which WBS did not exist); and

7. defense materiel items on which data were accessible, i.e., a TDP existed, the project office and principle contractor was accessible, classification and sensitivity of project information was not a problem.

To verify the comprehensiveness of the sample, the tentative candidates were also reviewed with ODDR&E technical specialists and the military departments. The selection process resulted in a sample of some 70 defense materiel items, shown in Figure III.1.

A description of the samples in terms of the selection criteria follows:

1. Aircraft

The 12 candidates cover the three departments and the FAA, including several joint projects. All but one is project managed. The range of types includes rotary wing, fixed wing, V/STOL, etc., and subtypes by function, i.e., fighter, bomber, transport, attack, etc. A variety of avionics and propulsion subsystems are included. All of the systems approved for engineering development were considered large projects, and most can be considered highly sophisticated.

2. Electronics

The 17 candidates cover the three departments and their electronics procuring agencies. The sample considers the principal types of systems within the category, i.e., command centers, sensor systems, and support systems; and considers many of the subtypes.

Both the large and small, sophisticated and relatively simple systems are included. Most of the candidates are in development, but several are in production or operation. Contractors range from SE/TD organizations to major firms within the electronics industry. Many of the smaller systems are not project managed.

3. Missiles

The 10 candidates represent the three departments. The various types of missile systems, e.g., surface to surface, surface to air, etc., as well as the subtypes, e.g., tactical, strategic, defensive, and target, are included. The missile systems are of varying physical size and technical complexity, but all may be considered large in a program funding sense. Contractors included electronic as well as aircraft oriented manufacturers.

4. Ordnance

The 10 candidates cover principally the Army and Navy, although the Air Force jointly procures some ordnance with the Navy. Very few ordnance items, with the exception of selected ammunition, are project managed. Ordnance items within the sample are not characterized by large or extended development efforts, and most of the candidates are in a production status. The sample adequately represents various types listed in the Weapons Dictionary Index. By subtypes, the sample includes torpedoes, bombs, mines, small arms, ammunition, fuzes, and weapons, and also represents a balance between large and small, simple and relatively complex items. Contractors include government agencies, such as arsenals, as well as industrial firms.

5. Ships

Predominantly Navy, the sample covers both surface and subsurface vessles ranging from attack carriers and FBM subs to amphibious and supply ships. The sample considers large as well as small projects, produced by Naval and privately owned shipyards.

6. Space

The 6 candidates represent the three services and NASA, but emphasize Air Force systems/projects. The sample includes by type, ground station, satellites, habitable space vehicles, launch vehicles, and re-entry vehicles. The candidates are both small and large systems, and range from advanced development to operational.

7. Surface Vehicles

The 10 candidates are heavily Army oriented, although a Navy Amphibious vehicle is included. Vehicles are developed and procured by two Army agencies. The sample represents the type, i.e., wheeled, tracked, amphibian, and also function. Most are in development, although several are presently in production. Again, both large and small programs are considered.

FIGURE III.1

WBS PROJECT

CANDIDATE SAMPLE BY CATEGORY

a) Aircraft

AAFSS
UH-1D
STAAS
A-7A
F-4
P-3A
CH-53A
C-5A
AMSA
F-111A/B
T-38
SST (FAA)

b) Electronics

RADA
Selected Tactical Radios
AN/APS-94
TIIF
FADAC
NTDS
SOSUS
AN/SQS-26
AN/SQQ-1
ILAAS
ATCRBS/AIMS
407L
416M
418L
425L
496L
AN/QRC-54

c) Missiles

Shillelagh
Lance
NIKE-X
Poseidon
Phoenix
Shrike
ASROC
Walleye
Minuteman II
SRAM

d) Ordnance

MK 48 Torpedo
CBU-3 Bomb
MK 82 Bomb
MK 56 Mine
SNAKEYE Bomb
.223 Cal. Ammo
M-565 Fuze MT
SPIW
8" Howitzer, M-115
107MM Mortar (and Ammo)

e) Ships and Small Craft

CVA-67
DLG-30
SSBN-659
DE-ASW (Seahawk)
LPD-6
AOE-2
FDL Ship

f) Space

Program 369/SATCOM
Titan III
START
ABRES
AGENA
Voyager (NASA)

g) Surface Vehicles

Main Battle Tank-70
XM-551, Sheridan
MICV-70
Amphibious LF Assault
M-110 8" Howitzer SP
LARC-V
Mobile Assault Bridge
GOER, XM-437E1
XM-656 5T Truck
SM-561 Gamma Goat

C. FIELD TRIP PROCEDURES

1. GENERAL

Prior to the undertaking of a field trip, the study team prepared a check list in order to maintain continuity between interviews. The check list covered the following items:

(a) Obtain a copy of the service's existing or proposed equipment identification system.

(b) Furnish a detailed explanation of the proposed EICS criteria, such as:

(1) the need for uniformity of terms and frames of reference;

(2) the requirement of an equipment identification system to satisfy OSD needs as opposed to meeting only the requirements of the single service;

(3) the specific requirement to aggregate data that are meaningful in both sum and substance; and

(4) the requirements to identify not only the equipment, but also the costs associated with the support of the equipment.

(c) Elaborate on the relationships of the EICS to the:

(1) WBS/contractor interface

(2) WBS levels of indenture

(3) maintenance management information systems

(4) chart of accounts as prescribed in DOD Directive 7220.14

(5) configuration control and management

(6) service or agency fiscal management

(7) functional review and comparison of performance between service maintenance efforts.

(d) In addition to the check lists, a series of questions were posed to the interviewed in order to stimulate discussion. Not all of the questions listed below were asked during every interview, however they represent a general sampling in areas that have management interest, such as:

(1) Can the management needs of each echelon be adequately served?

(2) Does the EICS core code and functional system code structure allow sufficient flexibility for the lower echelons of management?

(3) What method of configuration management and control is provided by the EICS?

(4) How can the cost and performance data be aggregated for most effective use?

(5) Is a standard EICS really necessary?

(6) Can the EICS be employed through all phases of the systems life cycle?

(7) Why can't the FSN be used for this purpose instead of creating another system?

(8) Will the capability of the EICS comparison between the individual service maintenance efforts be used as a punitive measure as well as a management tool?

(e) Additional observations that were made during the field studies included:

(1) detailed reviews of the existing and proposed equipment identification systems;

(2) an examination of the maintenance management concepts and philosophies of the separate services;

(3) a review of the maintenance management organizations;

(4) a review of the responsibilities and authority of each level of maintenance management;

(5) examinations of comments made by the separate services as to the intended use of maintenance management data;

(6) reviews of the individual service's approach to configuration control; and

(7) examinations of the services' work unit codes or functional systems breakouts.

(f) The field studies also reviewed the possible interface between the EICS and other DOD management concepts such as the Resource Management System, Cost Information Reporting system and advanced computerized maintenance management concepts. In addition, commercial coding practices were examined for the latest thinking in other than a purely DOD environment. For example, the EICS study team discussed and coordinated with such industry activities as the Air Transport Association and the Aerospace Industry Association.

These discussions proved beneficial in comparing the EICS criteria development against those that are in use by industry. Further, a detailed review was made of the efforts by the German Air Force to adopt an existing code to a new weapon system. The review pointed up the difficulties that occur when an existing system is applied to a situation requiring greater flexibility and option of use.

(g) The personnel that were contacted during the field trips, represented a cross section of military and civilian experts knowledgeable in their fields and experienced in programming, maintenance management at all levels, cataloguing, coding, supply, and budgeting. The composite suggestions offered by these personnel have significantly contributed to the study.

D. <u>RESULTS OF THE FIELD DATA COLLECTIONS</u>

1. GENERAL

The field study discovered that equipment identification systems of some description exist in each of the services. However, the existing identification systems usually apply to but one function such as supply, maintenance, or the comptroller. If management is interested in the <u>total</u> in information that relates to a materiel item, separate informational systems must be entered. When this action is taken, the information furnished by the separate system may or may not be usable for comparison purposes. This condition has developed because the separate systems, although reporting on the same item, furnish information in different time frames or reporting cycles. Under this condition factual comparison becomes difficult if not impossible.

2. The field studies also disclosed that most of the current equipment identification systems have been developed primarily for item identity or control and secondarily for cost or performance analysis. Item identity of course, is important; however, the framework of the identification system must be such that it not only accommodates identity and control requirements, but also the flexibility to satisfy other management needs.

Flexibility can be permitted at lower indentures of a work unit or functional system code only to the degree that the meaning and content of the upper indentures is not changed.

On the other hand, an identification system prepared for cost or performance analysis must maintain an element of rigidity from the beginning in order to insure comparability of data throughout the system's life and across service lines.

3. It was further noted during the field trips that when a new system is to be introduced a detailed WBS cannot be defined until the system is well into its development phase. Only a summary structure, that is, the top three levels, can be established. For those large and complex systems, only a few of the configuration elements are included in the top three indentures. Most of the detailed configuration elements will not appear until the fourth indenture and below. In view of the difficulty of forecasting the exact composition of the configuration elements at all levels, only the upper three levels of any WBS are standardized as a matter of practicality.

E. EICS DEVELOPMENT AND SPECIFICATION PREPARATION

1. GENERAL

Analysis of the individual service identification systems and other supporting data followed a standard pattern. Each sample system and its supporting documentation was analyzed for compatability in respect to the depth and coverage specified by the DOD criteria.

For the most part the individual identification systems, although apparently adequate to the separate services needs, had limited utility to DOD wide application. Quite often there were several unrelatable structures involved in the management of a specific materiel item. The separate structures, while satisfying the informational and management requirements of an individual discipline, were of a nature that precluded total summarization at higher levels. As a result, if total summarization of technical, fiscal, or management data was desired, a number of separate informational systems, each with its distinct identifiers, would have to be called upon.

Further, the detail of each information system differed. As an example, the level of detail depended upon the separate service planning and reporting criteria. Summary budgets, program management, and funding limitations on the projects were tailored to a separate service requirement.

2. Based on the analysis of the conditions outlined above and a review of the related documentation, a preliminary test model

EICS was constructed. The preliminary structure was based upon the work specification of the study contract as to scope of coverage, depth of detail, and the eventual management products to be delivered. The preliminary structure drew upon the established identification systems in so far as these met the DOD specifications.

3. After this review, a set of criteria for the prototype EICS was established to guide the efforts subsequent development committees. These criteria evolved from the analysis described above in conformance with the guidelines laid down by the specification of the study contract.

Both the field work and in-house analysis verified the applicability of the criteria to the seven categories of defense materiel items at different levels of management. The aggregation of data thus satisfies the OSD's requirements for summary technical, fiscal, and management data while permitting a flexibility of operation to the lower echelons.

F. ITEM DESCRIPTION PATTERNS

1. GENERAL

Based on the item categorization pattern laid out by the WBS, the initial character of the EICS core code was established. The core code, although based upon the initial categorization, departed from the pattern whenever necessary. Listed herein is a capsulated description of the categories and the rationale used in their adoption to the core code.

2. AIRCRAFT CATEGORY

The code structure used in testing the EICS criteria as they pertain to aircraft followed the pattern of the Navy 3-M "Type Equipment Codes". To this pattern, other aircraft identifiers were applied, i.e., the work order suffix of AFM 66-1 and selected prefixes from the Army's proposed Equipment Category Roll-Up Code (ECRC).

(a) Primary guidance to the aircraft core code was furnished by the DOD Directive 4505.6, 6 July 1962, "Designating, Redesignating and Naming Military Aircraft". The basic mission symbol, such as bomber, fighter, partol, etc., coupled with the design number and series letter establishes the heart of the aircraft category core code. An example of the EICS core code as applied to aircraft is furnished in Exhibit 1, Appendix A.

3. ELECTRONICS CATEGORY

During the initial WBS project, it was determined that a formal work breakdown structure did not exist for all of the electronic systems that were sampled by that project. However, the WBS project was able to construct a representative example of each of the electronic systems for the purpose of the study.

A similar set of circumstances was faced by the EICS study team when an attempt was made to locate a master listing of electronic materiel. In the absence of a master listing, the study team was able to construct one using many sources. Representative of these sources were listings from the Electromagnetic Compatability Analysis Center (ECAC), Air Force's "Standard Facility Equipment List", Army's "Equipment Category Roll-Up Code", and the Cataloguing Handbook, H-6-1.

This listing indicated the inventory density of each of the types of electronic equipment under review. The listing also facilitated the screening of those electronic sets that are capable of performance in their own right, but by definition, are considered as a functional system of specific weapon system environment, i.e., airborne, ships, submarine, tanks, etc. Such functional systems will be considered as part and parcel of the major weapon system.

The electronic systems and end items are categorized by their joint nomenclature (AN/____), "L" System Number, or computer designation. The Joint Electronics Type Designator system forms the framework of the EICS Electronic category core code. See Exhibit 2 to Appendix A.

4. MISSILES CATEGORY

During the data collection period of the WBS Project it was determined that there was little or no commonality of missile management philosophy or management practice. In order to achieve a reasonable parity of understanding, the WBS project created a design that did not necessarily reflect a consensus of the service missile managers. In answer to the questions arising from the missile managers, the WBS team stated that it had concerned itself more with the structure philosophy such as orientation and relation to budget structure than with the WBS element selection practices.

The missile structure selected as appropriate by the WBS project established the structure of the EICS study. The core code identifying the individual missile system, follows the DOD Directive 4000.20 "Designating, Redesignating, and Naming Military Rockets and Guided Missiles", 11 December 1962. The functional system or work unit code breakout follows the rationale of the proposed Mil Std XXX, "Work Breakdown Structure for Defense Materiel Items", 30 September 1966. See Exhibit 3 to Appendix A.

5. ORDNANCE CATEGORY

The field work of the WBS Project found little direct application of the concept of the work breakdown structure. The MK 48(EX-10) Torpedo was the one notable exception. In other ordnance systems, the data aggregations that generally followed a WBS format, were as a rule, prepared in response to a directive requirement, e.g., for inclusion in a TDP.

Ordnance equipment is characterized by the variety of systems or end items of equipment that logically fall within a defense materiel item category. This includes: torpedoes, bombs, rockets, hand guns, infantry weapons, recoiless rifles, machine guns, anti-aircraft guns, field guns, howitzers, mortars, and the ammunition of various types associated to all of these weapons.

The WBS project determined that ordnance development and production is generally managed at the component level, rather than the systems level. A new fuze, light weight rifle ammunition, rocket assisted projected, or a new bomb is frequently developed separately with a specified compatability with other components of the system with which it is to be used. All of the Ordnance items examined were of this nature in one respect or another.

The first step followed during the development of a preliminary WBS was to formulate an overall Ordnance system concept which would accommodate the varying components. A basic concept that was followed was that all ordnance systems are comprised of two main subsystems: basic munitions and the means of delivering these munitions. However, even under this concept the different ordnance systems and equipments are included in a WBS only through the recognition of certain generic functional similarities.

As an example, munitions are "Launched" whether from a rocket pod, a howitzer, a rifle, an aircraft, bomb rack, or a torpedo tub. Through this rationale, the generic term "launcher" is used to identify that part of an ordnance system which supports the munition at the start of the firing cycle and then initiates the delivery trajectory.

In the instances wherein the "launch" system is a functional system of a major weapon system, i.e., Main Battle Tank, Amphibious LF Assault, XM-656, Self Propelled Artillery or integral armament of an aircraft or ship, it is considered as a constituent part of the major weapon system and is so identified.

The EICS ordnance core code is established on the WBS framework described above and follows the patterns described in the Army's Equipment Category Roll-Up Code (ECRC), The Navy's Equipment Identification Code (EIC) and Department of the Army Technical Manual, TM 9-500, September 1962. See Exhibit 4 to Appendix A.

6. SPACE CATEGORY

The WBS Project concentrated its initial study efforts on the Air Force space systems being developed and produced through BSD and SSD. The work breakdown structures developed by AFSC to serve the Air Force space effort appeared to have commonality of application to all other space programs. Additionally, the space work breakdown structure designed by AFSC had significant level and terminology commonality with the WBS designed for the Aircraft Category.

Thus, through the framework of the AFSC WBS and close coordination with NASA, the present WBS was established. This WBS in turn, guided the structure of the EICS Space Category Core Code, and its related functional system or work unit code.

Reference documents used in the Space Category include NASA NPC 500-1 "Configuration Management Manual"; NASA NHB 7500.1 Logistics Requirements Plan; NASA "Standard Mechanical Ground Equipment Support Plan". See Exhibit 5 to Appendix A.

7. SHIPS CATEGORY

The WBS Project was greatly influenced in its categorization of Ships by the Ships System Command's "Consolidated Index of Drawings, Materials, and Service's Related to Construction and Conversion". The "Consolidated Index" establishes groupings of materials and components for the design and construction tasks of both new ship-buildings and conversion. The "Consolidated Index" serves to unify reporting and planning in the Ships Systems management operations. These reports and plans pertain largely to cost estimating and budget preparation and such other technical areas such as weight records, drawings and specifications cataloguing and project reporting.

The Classification Index groups the ship's functional segments. Seven of the groups, e.g., hull, propulsion, armament, communications, etc., and other systems and machinery are supplemented by two services groups apply to the vessel as a whole rather than directly to any of its functional sub elements.

The seven ships functional groups pertain largely to hardware items and are analogous to the functional systems. The EICS core code is patterned upon the basic mission design of the vessel type, i.e., auxiliary, destroyer, carrier, etc., with such other appropriate modifiers as series, type, class, and the like. The Ships Category listing was based upon "Jane's Fighting Ships 1964/1965" and "Thesaurus of Descriptions Terms and Code Book" NAV SHIPS - 250 - 210 - 1: Bureau of Ships, Washington 25, D.C. See Exhibit 6 Appendix A.

8. SURFACE VEHICLE CATEGORY

The WBS Project discovered that there was no clear cut current practice which could be used throughout the Surface Vehicle Category. The basic problem at hand was to identify and unify those practices that could be used in developing a WBS.

Contributing to the difficulty in standardizing the practices were the basic management philosophies. As an example, on combat vehicles, there was a tendency to separate automotive work from weapons work at level 2, and break these elements of work into major sub-systems at levels 3 and 4.

On the other hand, other vehicles such as logistics support or special purpose vehicles do not have similar breakouts at level 2. Instead, they tend toward a more nearly uniform subdivision of the vehicle into its major functional sub-systems.

In the case of the Main Tank-70 or the "Sheridan", the systems approach is used to identify not only the systems engineering and related service elements, but also the functional systems and sub-systems.

At level 2, a uniformity with other weapon system categories is achieved through the identification of the major hardware systems and the related services. In the instances wherein more than one vehicle is included in a system, such as train-type vehicle systems or combination prime movers and transporters, both the primary and secondary vehicle are included in the level 2 breakout.

The EICS follows the WBS pattern at levels 2 and 3. The core code is based on listings derived from the Department of the Army Technical Manual, TM 9-2300-23-34P, "Consolidated Authorized Field Stockage List for Repair Parts for Tank-Automotive Materiel"; the Army Materiel Plan; the Army Equipment Category Roll-Up Code (ECRC); The Air Force Technical Manual T.O. 00-25-06-6-1 "Automotive Vehicle Maintenance Work Limit Code Manual"; and Volume II, Number 6. "The Armed Forces Management Magazine", March 1965. See Exhibit 7 Appendix A.

G. FUNCTIONAL SYSTEM OR WUC STRUCTURE

1. GENERAL

The functional system or work unit codes applied to identify the indentures below the EICS core code are patterned to reflect the basic functional substructure of a defense materiel item.

The first increment, a five character alpha numeric code, is to be mandatory throughout DOD. This increment follows the equipment substructure pattern of the indentures that relate to functional systems, subsystems, and components assembly.

As an additive to the five character alpha numeric code, a two character code is offered to differentiate between "on equipment - off equipment" maintenance actions. The use of this code can be by service option depending on the service peculiar management needs.

A more detailed description of the functional substructure code is contained in Chapter IV.

2. The conclusions reached as a result of the field and in house analyses indicate the feasibility of an item identification coding system that will essentially satisfy all of the specifications of the contract.

The criteria of the EICS as well as other specific recommendations are contained in Chapter V.

Chapter IV

DISCUSSION

A. INFORMATION FLOW

1. GENERAL

Fundamental to the successful management of a maintenance function is information to assess progress, measure effectiveness and efficiency, determine future resource requirements, provide alternative solutions to specific problems and other considerations of equal importance.

Information flow in maintenance management relies heavily on automatic data processing and communications systems. The transmittal of intelligence via these techniques requires a form that is usable to the managers upon receipt without undue translation.

2. The EICS is in reality a method to improve the flow of information pertaining to the materiel that is subject to management by the maintenance activities. The improvement of the information flow requires a number of considerations, such as:

a. The use or development of standards to facilitate information interchange among and between the military and contractor activities.

b. A recognition of the various interfaces between the EICS and the other information systems.

c. A definition of the information required by each organization at each level of management.

d. A recognition of the new data automation techniques and processing resources.

3. In an effective processing and communication system, the establishment of a central data bank assumes a major importance. The central data bank serves as a link that can unite a number of systems in a common network. Thus, a single maintenance data input can be made to one central bank and processed to meet the needs of a number of the managers who are customers of the bank. Each maintenance manager or other activity can contribute data to or extract data from the central bank. The data then can be made available to other management elements throughout the DOD without the need for duplicative gathering, entering, and processing the same information through a number of different systems.

The interchange of information through the central bank and into the various systems is possible only through the standardization of data elements, codes, terminology, frames of reference, record formats and reporting. It is to this end that the EICS criteria are oriented.

B. DEFINITIONS

1. GENERAL

A Data Element is a basic unit of information and a special class of data. These classes of data have unique meanings and are composed of sub-classes called "Data Items". Each Data Item has some distinct identifying feature (e.g., units, values, identities) which distinguishes it from other items; however, each Data Item also has characteristics, conditions or properties which determines the class, i.e., the Data Element of which it is a member. For example, the Data Item "B-52" is distinguished from a "KC-135" by definition of terms and differences in basic design; however, these two Data Items have in common the property of "Aircraft". Thus, the word "Aircraft" can be considered the Data Element.

2. DATA ITEMS

The Data Item is a sub-class of descriptive information or value classified under a Data Element. It may be a datum which is placed in the provided spaces on a form or format, punched in a field in a punched card, or listed under a column heading on a machine listing or display device. Data Items are distinguishable from Data Elements since the Data Element is the class of data and the Data Item is the specific data. Data Items may be coded or may be of such a nature that the literal meaning or value of the item is used without further coding. For example, Data Items of the Data Element "Surface Vehicle System" such as the Primary Vehicle or Secondary Vehicle, may have a unique code such as "GAØ" and "GBØ", whereas the Data Elements such as "Vehicle Type Identifiers" would literally describe the vehicle, i.e., carrier, personnel M-59 or truck cargo, M-57.

However, there are certain stipulations that apply. These are that:

a. Each data item is mutually exclusive to avoid the possibility of a single factor being categorized or classified in two or more data elements.

b. Each identifier or abbreviation assigned to a data item is unique.

c. Data items are clearly and unmistakably defined to avoid misrepresentation or misunderstanding.

d. Data items which can be identified as a part of a data element are included in that data element.

3. DATA CODE

A Data Code is a number, letter character, or symbol or any combination thereof used to represent a data element or data item. For example, the data codes "11", "12", and "13" might be used to represent data items such as the airframe, cockpit, fuselage, or landing gear ascribed to the data element "aircraft".

The codes that are designed to facilitate the EICS data integration, interchange, and retrieval best accommodate the elements of sorting, aggregating, grouping, and summarization.

4. DATA SYSTEM

A Data System is a combination of personal efforts, forms, formats, instructions, procedures, data elements and their related codes, data processing software and hardware; and an integrated communication network which provides an organized and unified means, either manual, automated, or combination of these several segments, for the recording, collecting, processing and communicating of data.

5. DATA USE IDENTIFIERS

When the Data Items of a Data Element appear in a system, they are used in specific contexts and have specific connotations. These uses do not change the class, the Data Items, or the basic definition of a Data Element. These uses are called "Data Use Identifiers". For example, consider the Data Element "Ordnance System". This system may require an identifier such as "mission design, model and series", or class. In the coding system design, the terminology "mission design, model and series" could be used to identify a file, and would be designated as a Standard Data Use Identifier. A Data Use Identifier may be designated by a unique mnemonic abbreviation.

a. The Data Use Identifiers conform to the following criteria:

(1) Each Data Use Identifier is different from any other Data Element or related feature.

(2) Data Use Identifiers use the Data Items of the Data Element from which they are derived.

(3) Two or more Data Use Identifiers can be linked together in a prescribed sequence and used as groups.[1]

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[1]The definitions in this section are based on the DOD Directive 50000.11 "Data Elements and Data Code Standardization Program" 7 December 1964.

C. THE CRITERIA FOR THE DATA CODE DESIGN

1. GENERAL

There are two major steps to be followed in the development of codes for the identification of data elements and data items. The first step is to organize a well defined data element or data item into a logical scheme. The second step is the assignment of an abbreviated set of symbols that can be used independently to identify and represent the data elements and data items.

2. THE OBJECTIVES OF THE DATA DESIGN

The coding system designed for the EICS will provide the maximum interchange of data through a consistent scheme of identity for all like items, and a standard method of recording the data that pertain to these items.

b. The EICS code will follow the principle of design simplification in order that any scheme evolved improves, not impedes, the code utilization for recording, processing, and communicating in either summary or complete report presentation.

c. The EICS code will adhere to the standardization of data elements and codes while avoiding special data elements and codes designed for unique purposes.

d. Each data element of the EICS will be identified by an alpha or numeric code or combination thereof.[2]

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[2] A combination is strongly recommended as one that presents the greatest coverage potential. The code thus constructed facilitates reference to the desired data element and provides an ease of use.

e. Each data element or data item will be uniquely defined and identified and consistently applied throughout the EICS and its use by management.

3. CODE CHARACTERISTICS

There are certain distinguishing traits in the development of unique and usable data elements. The assignment of an abbreviated set of symbol codes that can be used independently to represent the desired data will have the following characteristics:

a. Flexibility

The assignment of codes to data seriously considers the accommodation of additional entries in the same sequence at a later date. This is fundamental if constant re-engineering of codes is to be avoided.

b. Scope

The code design provides an allowance for expansion to accommodate additional codes. "Block Codes" for example, demand a precise design and usually affect numerous records, tapes, or storage devices when implemented. Sufficient consideration is necessary to the possibility of expansion to include additional categories.

c. Operation

Any code design reflects its intended use. Codes that are designed for data summaries will be adaptable for data retrieval at any level. The codes designed for data retrieval at OSD level will recognize the inherent differences of the separate department systems.

d. Convenience

The codes which are to be assigned to a data element will be designed for ease of application. Coding systems that are unnecessarily complex have a propensity for error in use.

e. Construction

Any code design will be constructed to include the least possible number of digits consistent with the identification desired. Therefore, the number of characters of a code is predicated on the number of items within the element. This number of characters is a balance between brevity on one hand and item growth within the element on the other. An overriding consideration is the accommodation of expansion without restructuring, redesign, or recoding.

f. Identification

The code, which may be used independently to represent data, will facilitate visual identification. "Significant Digit Codes" and "Mnemonic Symbols" are recommended in these instances.

g. Standardization

If the EICS design is to meet the concept of universal application, then the criteria of the data codes that support and sustain the EICS will adhere to the principle of standardization.[3]

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[3] The terms in this section are based upon the DOD Directive 5000.12, "Data Elements and Data Code Standardization Procedures" 27 April 1965.

D. A STRONG CENTRAL MANAGEMENT

1. GENERAL

The establishment of a central control to manage the EICS program from its inception to its application is strongly recommended. The central control, located at a management level within the OSD should have the responsibility of maintaining the integrity of the EICS and the authority to carry out its responsibility.

a. The functions of the basic central control authority include the:

(1) Establishment of a code assignment policy and the priorities for coding,

(2) Establishment of standardized coding criteria and auditing procedures for the determination of satisfactory compliance,

(3) Field publication of coding and the establishment of the requirements for coding change,

(4) Establishment of cross-reference requirements,

(5) Establishment of requirements for computer hardware and software for the data processing operations directly associated with the maintenance of the coding system, and

(6) Responsibility for the control of coding system costs and for the policing and evaluating of the developing system on a continuing basis.

2. In the absence of such an authority, any coding structure will be subject to the abrasive action of uncontrolled requests for change by the individual user. Thus, in a short time, the integrity of the code could be reduced to an empty shell rather than the solid management tool it is designed to be.

3. It is recognized that changes will be required to reflect modifying conditions. In this respect this study has no quarrel with change since the code is designed to accommodate change. What is of concern however, is the change that is requested to solve an individual service need without consideration of the impact the change may have on the total code system. The central control requires an authority and capability to adjudicate each change request in light of the impact it may have on the entire system.

4. The central control will function to assure the continuity of the EICS core code structure. To this end, authority will be provided to halt or reduce the proliferation of unrelated coding structures; to require the correlation of the EICS to all phases of data collection such as the acquisition level, depot level, and organization or intermediate levels as these relate to item identification, contract end items, associated costs, configuration control and performance characteristics; to unify the efforts of the development committees which are discussed subsequently; to exercise control over any management techniques brought to bear by the development committees; and to guide the ultimate construction of the EICS in totality.

E. DEVELOPMENT COMMITTEES: ORGANIZATION RESPONSIBILITIES AND AUTHORITY

1. GENERAL

The ultimate design of the EICS based upon the set of criteria established herein will be developed by ad hoc committees assembled for this express purpose.

2. COMMITTEE ORGANIZATION

The chairmanship of each ad hoc committee appears logically to fall to the service having the greatest interest in the particular category of defense materiel item under consideration. Thus, the Army might assume the chairmanship of the committee designing the EICS pertaining to surface vehicles and ordnance; the Navy, ships; the Air Force, aircraft and missiles, etc. The responsibility for the development of the detailed procedures for the development of the EICS rests with the chairman of the committee.

a. The membership of each committee will be composed of full time representation from each of the interested military services, each member carefully selected for his depth of knowledge and expertise in the defense materiel item under scrutiny.

Formal development committee reviews will follow a carefully defined schedule established by the central control authority. The reviews will be centrally scheduled to assure the complete phasing of the total EICS program and the evaluation of its technical adequacy in all respects.

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THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM,(U)

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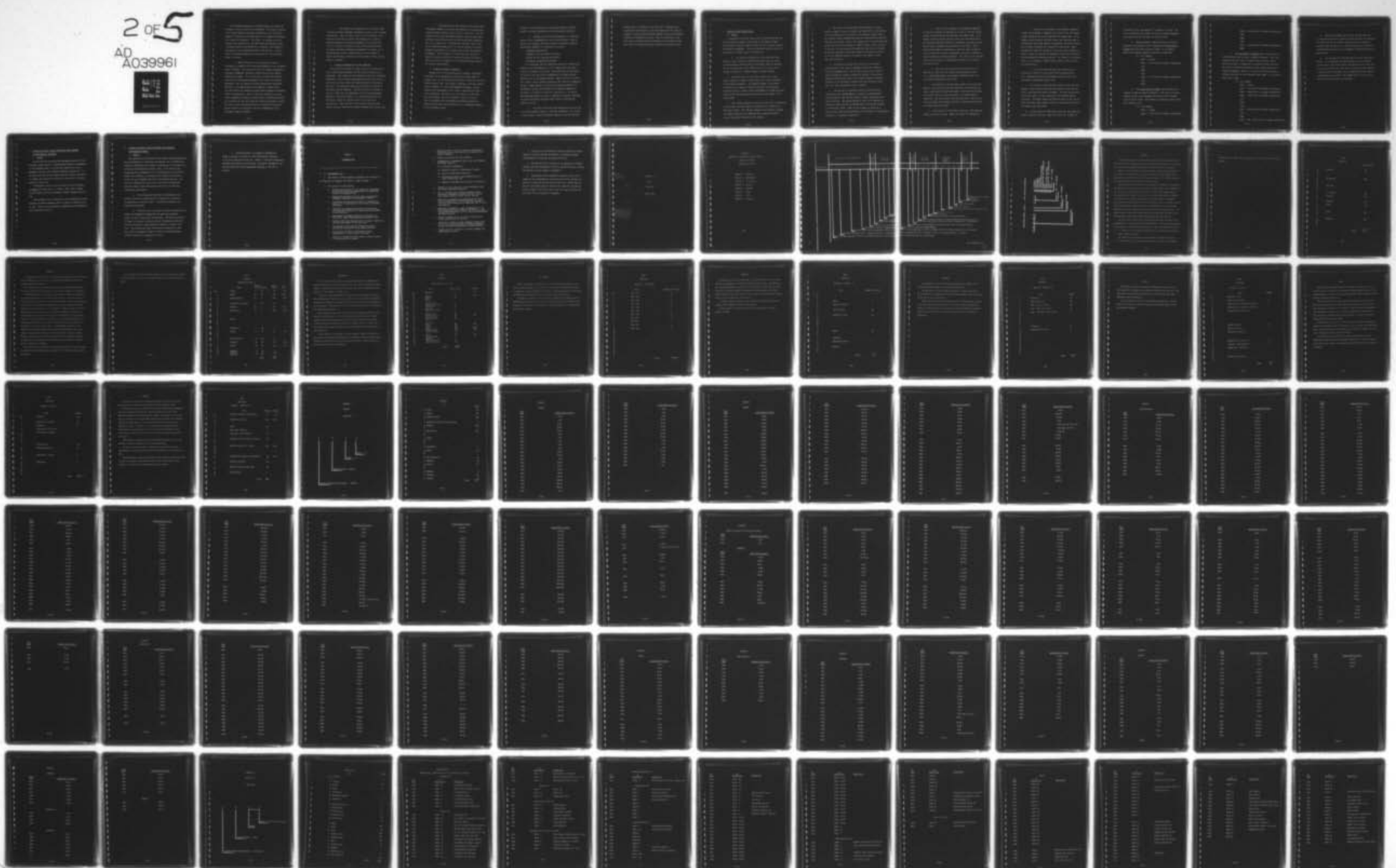

The comprehensive phasing of the EICS program will be based on systematic activity reviews by the committees. The reviews, relating to the defense materiel item under consideration, will reveal the adequacy of the EICS criteria when applied in a technical environment and in specific disciplines. The reviews will include but not be limited to the feasibility of the EICS toward the gathering of data to determine materiel maintainability, reliability, serviceability, availability, cost configuration control, and the like. A review cannot be considered complete until the adequacy of the total EICS design is assessed.

b. The EICS design will not significantly restrict the manager's flexibility for retrieving information in any reasonable number of formats. The initial entry into the separate departmental maintenance management information systems should provide summary informational outputs. If it is desired to retrieve data from the lower levels of maintenance management within each of the military departments, this too should be possible without undue translation difficulty. The proposed EICS has the adequacy to permit entry into the separate sub-information systems while avoiding an unworkable rigidity of application. Access to the lower indentures of a maintenance management information system should be unconstrained despite the variations that may exist among the separate departmental systems. The level of detail desired should be at the option of the central control authority in conjunction with the recommendation of the development committee chairman.

c. The problem of non-compatibility of the EICS to the existing maintenance management information systems is one of primary consideration. This, of course, would be the circumstance if the EICS would constitute an entirely new technique or a radically modified departure from existing techniques. The proposed EICS is but the catalyst to combine the best of the existing systems. It presents the means and method to management to assemble all of the maintenance actions, considerations, and cost elements and permits the focusing of attention on these elements within standard frames of reference.

3. CRITERIA CONSIDERATIONS FOR THE COMMITTEES

The EICS criteria define an orderly process for achieving the total system design development and the rationale leading to the development. The criteria are not intended to direct the development committees on how to organize and manage their individual efforts, nor do these criteria create the ultimate approval or disapproval authority. This authority remains entirely within the purview of the central control authority. The EICS criteria are intended to serve as a tally list for completeness of the ad hoc development committees' efforts and function as a reference point where the EICS can be related to a specific level of a system or its sub-functions. Thus, the single EICS structure identifies data elements that are consistent in meaning throughout the system's life.

b. The application of the criteria by each ad hoc EICS development committee will relieve the necessity of reviewing each candidate defense materiel item on a case by case basis. Thus the efforts of each ad hoc development committee can more effectively contribute to an EICS structure that has already been established early in a system's life. Following this rationale, each of the ad hoc committee chairmen can be in a better position to allocate personnel and resources to a specific phase of the EICS structure development. The assignment of the EICS identifier during the acquisition phase can provide a framework upon which to unite the efforts of the ad hoc committees in an integrated systems approach for increased effectiveness.

4. INTEGRATED REPORTING STRUCTURE

Through the use of the building block technique, the modules, or elements can be aggregated to progressively higher orders of assembly until all of the functional systems are related to the total defense materiel item. The concept of reducing a task into discrete control elements is a time tested management technique and was applied in the development of the criteria upon which the EICS is to be established. The EICS, by its very nature, is built from many data elements and can be designed to foster an orderly flow of information into a meaningful relationship between the separate system levels and also provide for an independent analysis of the individual systems.

Therefore, the methodology for an integrated reporting structure should be an added responsibility of the development committees.

b. Although the task of the development of a reporting network is not insurmountable, it can be most difficult, since at any one time, separate, and under certain circumstances competing informational methods can be employed by differing:

--management organizations

--equipment terms and frames of reference

--demands for cost reporting and analysis

--maintenance management philosophies

It is recognized that the differences between the informational methods are an established fact, but it remains that each method cannot be considered in isolation. Each method must in some manner be related to the total EICS, accommodating such common elements that may exist in the separate methods. Where variations of method exist within separate reporting structures and cannot be accommodated through a common element, one master EICS reporting method can be established, and any other methods not in complete consonance to the master is modified to assure full compatibility. The master EICS reporting method will serve to integrate the separate reporting structures and methods and unify their utility to OSD and the separate services.

c. The EICS criteria have been developed with an end view of providing summary guidance to reporting methodology. The concept of establishing a universal equipment identifier code for the major weapon system is to maintain a firm base line. Guidelines are specified for the extension of this code beyond the first level of assembly to provide uniform reporting methods, levels, and structure essential for management decisions. Thus the consistency of the EICS code is preserved while the flexibility of the content of the lower levels of indenture provides a necessary latitude of action.

F. INTEGRAL SYSTEM IDENTIFICATION

1. GENERAL

A stipulation of the EICS study contract requires that not only will the weapon or support system groups or the specific weapon system within a group be identified, but also the functional systems, subsystems and components. Thus, the functional system or work unit code becomes an integral part of the EICS code.

a. As a point of clarification, the terms functional system or major system are considered synonymous and apply solely to the functional structure within a maintenance frame of reference. The use of these terms in this manner are not to be construed to include or pertain to a complete weapon or support "system".

2. The appreciation of a functional approach to various types of weapons or support systems results in a logical definition of the system sub elements. An essential element of the process of breaking out a weapon or support system into its constituent functional parts or systems is the establishment of a common reference frame work for the identification of each level of assembly of the total system.

3. The reference framework assures that each level is recognized, can be defined, and thus reduces the possibility of omission of a functional element. The reference framework also provides a network for communicating data on a comparable basis among the military services and between the military and industry.

4. The intent of the functional system breakout of a major weapon or support system is to portray and establish the relationships of the sub-elements to the structure of the complete weapon system. The system's original engineering design has established this relationship and, to an extent, controls the interfacing to the other functional system for the life of the weapon or support system. Thus a baseline of the inter or intra system relationship has been fixed and insures an orderly transition from the major functional system down through all of its component levels to the Federal Stock Number, should this prove necessary.

5. The baselines, having been established as engineered reference points, also serve as aggregation points for technical, fiscal and management data. The baselines also provide a level of control through the original configuration design of the materiel. Beginning from the broad scope of the original design, the materiel structure can be described in progressively more definitive terms until the lowest identifiable level is reached.

6. The work unit or functional codes for each functional system cover each item designated as reparable in the applicable source document at the time the weapon or support system enters the active inventory. The primary purpose of codes is to identify the hardware on which work was accomplished and to relate that hardware to a functional system. Codes are not assigned to locations or general terms, such as station numbers in the fuselage or "miscellaneous equipment", or "mechanical components".

a. Codes are also assigned to non-reparable components if they are determined or suspected to be vital to the total weapon system's operation and for non-reparable time change items. As an example, certain pressure switches, timers, and controllers may be non-reparable items which require "on equipment" servicing or adjustment in order to maintain the reliability of the system. These non-reparable items have functional or work unit codes assigned in order to report the critical "on equipment" actions for reliability and maintainability evaluation purposes. The coding of non-reparable items is not considered a common practice however, and is done on an exception basis.

b. The source data that guide the construction of a functional or work unit code include systems engineering data (i.e., engineering analysis and equipment maintenance data) and correlating configuration control data.

7. The structure of the functional system or work unit code embraces a five position code which identifies the system and the first, second and third level of assembly. The first two positions of the code, that is to the system level, are standard numeric characters. The third, fourth, and fifth positions of the code are alpha and numeric which identify the first, second and third levels of assembly below the system.

8. In the design of a functional system code, both alpha and numeric characters are used. Upper case letters "A" through "Z"

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8. In the design of a functional system code, both alpha and numeric characters are used. Upper case letters "A" through "Z"

(excluding I and O) and numerals "1" through "9" are used. The first two characters are numeric and must be standard throughout the system, as in the case with all characters used.

a. Alpha and numeric symbols are used as the third character of the work unit code to designate the first level of assembly below the major functional system. In this manner thirty-three separate indenture levels may be identified.

(1) As an example:

52000 = System

52A00 = First level of assembly (underscored)

thru

52Z00

then

52100 = First level of assembly (underscored)

thru

52900

b. The second level of assembly code construction is composed of alpha and numeric characters. This level, the fourth character of the code, designates the second level of assembly below the major system. This method of structuring permits thirty-three separate levels.

(1) As an example:

52000 = System

52A00 = First level of assembly (underscored)

52AA0 = Second level of assembly (underscored)

thru

52AZ0

then

52A10 = Second level of assembly (underscored)

52A90

c. The <u>third level of assembly</u> code is structured in a similar fashion, that is, alpha or numeric characters. This level identifies the third level of assembly below the major system. Thirty-two levels of assembly may be identified by this character. The level of identification differs in the respect that the last numerical designator, numeric 9, is used in the fifth position to indicate items that are "not otherwise coded" (NOC); i.e., brackets, nuts, bolts, clamps.

(1) As an example:

52000 = System

52A00 = First level of assembly (underscored)

52AA0 = Second level of assembly (underscored)

52AAA = Third level of assembly (underscored)

thru

52AAZ

then

52AA1 = Third level of assembly (underscored)

thru

52AA8

52AA9 = NOC - Third level of assembly (underscored)

9. While these examples indicate that an alpha character is preferred in the third, fourth, and fifth position, the structure will permit the use of a numeric character only after positive assurance that the capacity of a numeric coding system will not be exceeded during the initial code assignment or future additions and modifications.

10. The necessity for reserving codes for future expansion is obvious. It is suggested that this possibility be incorporated in the design of the third, fourth, and fifth positions of the code. This will assure that new codes that are related to future additions or modifications of equipment can be accommodated without complete re-engineering of the codes. Code changes must be avoided to prevent the loss of previously recorded data.

G. <u>OPTIONAL ADDITIONS TO BASIC FUNCTIONAL CODE STRUCTURE (ON EQUIPMENT/OFF EQUIPMENT)</u>

1. GENERAL

In the event that the maintenance management practices of the individual service require a differentiation between "on equipment" or "off equipment" work, a two character additive code can be appended to the basic five character functional system code. Its use would be at the services' option; however it must be structured in a manner that precludes interference or distortion of the basic functional system code.

"On Equipment" work are those maintenance actions performed on <u>complete</u> end items such as: aircraft, tanks, ships, removed aircraft engines, aircraft, maintenance support equipment, and the like.

"Off Equipment" work is considered as those maintenance actions performed on removed components that are subject to repair and are so coded. These actions are usually accomplished at an intermediate level maintenance activity.

H. <u>OPTIONAL ADDITIONS TO BASIC FUNCTIONAL CODE STRUCTURE (CONFIGURATION CONTROL)</u>

1. GENERAL

Any modification or alteration of the original design configuration must be performed in a closed-loop relationship. Once a modification program is undertaken, the item and its interfacing to other functional systems may be substantially altered. Thus, if the intent of the designed materiel configuration is to be maintained, any modification thereto will, perforce, be recorded not only during the alteration action, but also throughout the life of the modified material. The effort of configuration control at all times will be purposefully directed to meet, rather than exceed or fall short of, the total system design requirements.

a. The recording and reporting of a maintenance action directly involved in a modification of an assembly or system will be supported by an ancillary code that positively identifies that which has been modified.

b. Provisions also are essential to record the quantitative numbers of configuration changes that are approved and applied against the basic systems under consideration. The detailed recording of changes is necessary to provide accurate configuration definition and data retrieval for items through all phases of a system's life cycle. The accurate and timely recording and availability of such data satisfies management's needs in addition to providing obvious technical benefits for configuration control.

c. A potential method of recording a configuration change is through the addition of three alpha-numeric characters to the basic functional system code. However, a detailed configuration management philosophy and function must be designed, implemented, and enforced before the ultimate management advantage of the EICS is achieved.

Chapter V

RECOMMENDATIONS

A. IT IS RECOMMENDED THAT:

1. The concept of EICS be approved, expanded, and developed for all categories of equipment and weapon or support systems.

2. The criteria for EICS include:

   a. Uniform identification for all categories of equipment to facilitate reporting, aggregating, and summarizing maintenance management data.

   b. Application and utility for all levels of maintenance management throughout the Department of Defense.

   c. Facilitation of data flow for conduct of quantitative analysis of, and appropriate action within, maintenance operations.

   d. Capability for automatic/electronic data processing, with additional adaptation for manual processing, where or when necessary.

   e. Development of standard definitions and terms of reference for common understanding and compatible data.

   f. Interface with other functions such as supply, comptroller, and with other phases in the life cycle.

   g. Interchange of data among and between the military services and contractors in the defense industry.

   h. Facilitation of review of maintenance resource expenditures at various levels, by systems.

   i. Analysis of design and actual figures of merit relative to systems and their elements.

j. Support by OSD Directive for mandatory compliance by all military services and activities through an OSD central authority.

k. Controls to preserve the code integrity.

l. Accommodation to management needs at any level through furnishing inputs to:

   (1) Maintenance Programming,

   (2) Functional Analysis of Maintenance Programs,

   (3) Control of Maintenance Resources,

   (4) Configuration Control During Modification and After Installation, and

   (5) Budgetary Programming and Financial Considerations.

m. Minimum core code characters to meet management needs and permit foreseeable expansion.

n. Use as a bridging device between separate service maintenance management information systems, central data storage facility of each service, and OSD.

o. Capability of assembling and aggregating data from a point of generation, of facilitating data storage in a central service bank, and of expediting data retrieval when required.

p. Capability of adaption to, and accommodation for the Work Breakdown Structure (WBS) per MIL STD XX___, and the proposed DOD Directive 32XX.X, Maintenance Management Information Systems.

q. Adequate training in use for better implementation by the separate military services.

r. Capability to relate to other management systems such as the Cost Information Reports; Resource Management Systems; Planning, Programming and Budgeting Reports.

s. Feedback from use in analysis of future equipment and weapon/support systems.

3. The Office of the Secretary of Defense establish a Central Control to initiate the EICS and maintain its integrity through standardization of codes and pertinent definitions.

4. The Central Control establish ad hoc committees to develop specific EICS with representation from the concerned military services and agencies for each category of equipment.

5. The Central Control establish in addition, other ad hoc committees with representation from concerned military services and agencies to extend the present integral functional systems found in the first and second digits of the work unit codes for aircraft and missile systems to the third, fourth, and fifth digit of these work unit codes for all categories of equipment.

APPENDIX A

EICS

CORE CODE

DEVELOPMENT

APPENDIX A

EQUIPMENT IDENTIFICATION CODING SYSTEM

TABLE OF CONTENTS

DEVELOPMENT A-1-20

	PROGRAM ELEMENT								lvl of data agg.	EICS CORE CODE			
CARD COLUMN	1	2	3	4	5	6	7	8	9	10	11	12	13

mod

mission de

category of Defe

level of data aggrega

identifies the DOD compone

identifies the specific Program Elem

identifies minor level of aggregation within a pr

identifies the major level of aggregation within a program to

identifies major programs to which the program element has been assigne lvl of data agg.

E I C S
CORE CODE

FUNCTIONAL
SYSTEM
BREAKOUT

OPTIONAL
SERVICE
USE

7 8 9 10 11 12 13 14 15 16 17 18 19 20

added option for service peculiar use

3rd level of assembly

2nd level of assembly

1st level of assembly

major functional system of the Defense Materiel Item

series - H, E, etc.

model 52- M-60-etc.

mission design--bomber/destroyer/tank/radar/etc.

category of Defense Materiel Item--aircraft/missiles/electronics/etc.

level of data aggregation--acquisition/depot/organization & intermediate

identifies the DOD component-having cognizance over the Program Element

identifies the specific Program Element

minor level of aggregation within a program to which a program element has been assigned

evel of aggregation within a program to which the program element is assigned

ch the program element has been assigned

ACQUISITION LEVEL - CORE C… - WORK BREAKDOWN STRUCTURE

X • XX • XX • XX • X   A A   F P D

11 AIRFRAME
23 PROPULSION
51 INSTRUMENTS
74 FIRE CONTROL
AØ PECULIAR SUPPORT EQUIPMENT
AA ORGANIZATIONAL AND INTERMEDIATE
AB DEPOT
BØ COMMON SUPPORT EQUIPMENT
BA ORGANIZATIONAL AND INTERMEDIATE
BB DEPOT

LEVEL 3 - WBS - SYSTEM

LEVEL 2 - WBS - AIR VEHICLE

LEVEL 1 - WBS - AIRCRAFT

ACQUISITION LEVEL

PROGRAM ELEMENT

GENERAL

In the development of a recommended uniform DOD coding system, one of the criteria was to maximize the use of existing coding systems, to minimize any confusion which might result from the imposition of a new system.

Since the U.S. Navy had recently developed a four position alpha code for aircraft, consideration was given to determine if that system would accommodate the additional aircraft types and models in the USAF inventory, but which had not been identified in the Navy code.

When it had been determined that the system was adequate to accommodate the additional aircraft population, further experimentation was conducted to see if that same concept could be applied to other major weapon systems. The experimentation proved that the same four alpha code would be adequate to accommodate the additional systems as shown by exhibits 1 through 7. The exhibits basically follow the seven category breakout of defense materiel items and the letter designations for each category as shown in the Work Breakdown Structure Project submitted by Control Systems Research Inc. The seven categories and their designations are Aircraft (A), Electronics (E), Missiles (M), Ordnance (O), Space (P), Ships (S) and Vehicles (V).

The core code consists of four alpha characters with the first letter designating the category of defense materiel item. Of the twenty-six letters of the alphabet, eight letters were utilized. With the elimination of the l r I, because of its probable confusion with the numeric one (1) seven- alpha characters remain.

The remaining alpha characters are available to expand the system s any category such as aircraft, electronics or vehicles increase in population to the point where the capacity of one letter will no longer suffice.

EICS

CORE CODE

		TOTAL SYSTEMS
A B C D	AIRCRAFT	747
E F G H	ELECTRONICS	1255
I J K	NOT USED	
L	"L" SYSTEMS	32
M N	MISSILES	120
O	ORDNANCE	155
P Q R	SPACE	32
S T U	SHIPS	107
V W X Y Z	VEHICLES	816
	TOTAL	3264

AIRCRAFT

In identifying aircraft types, fourteen alpha characters have been used, with the exclusion of the letter "I", eleven alpha characters remain to provide capacity for expansion.

The second core code position from the left is utilized to designate the mission design of the equipment such as bomber, fighter or helicopter.

The third position from the left, in the case of aircraft, designates the type-model such as C- for C-47, D- for C-54 etc. Limiting the use of the third position to indicate the type-model suffices where the population, as in the case among bombers, fighters, etc, does not exceed the maximum number of letters available, i.e. twenty-four. However, should the number of type-models exceed 24 it will no longer be possible to restrict the third position of the core code solely for the designation of type-model. Further, if the third position is limited to a type-model designation, it automatically restricts the use of the fourth position to 24, since the characters "I" and "O" are not used. As illustrated in exhibit 1 the cargo/transport coding is saturated beyond 24, and fighters and the helicopter codes approach saturation with 23 types each. Among the cargo/transport aircraft, the C-47 type & model contained 30 different series. The additional requirement for six identifiers was provided by utilizing numeric characters 0 through 5.

This problem can be overcome by utilizing the third and fourth positions in combination which will provide capacity for 576 different types, models and series.

By combining the third and fourth characters, the utilization capacity is 576 model series. This is the premise upon which the attached table is based.

EICS

CORE CODE

CATEGORY-AIRCRAFT "A"

		TYPE	LETTERS USED	LETTERS REMAINING	TOTAL SYSTEM	% USED
"A"	A	ATTACK	9	15	39	6.7
	B	BOMBER	11	13	86	14.9
	C	CARGO/TRANSPORT	24	0	209	36.2
	D					
	E	ELECTRICAL ELECTRONIC	2	22	2	
	F	FIGHTERS	23	1	145	25.1
	G	HELICOPTERS	23	1	103	17.8
	H					
	I					
	J					
	K	TANKER				
	L					
	M					
	N					
	O	OBSERVATION	1	23	4	
	P	PATROL	4	20	21	3.8
	Q					
	R					
	S	ANTI-SUBMARINE	1	23	11	
	T	TRAINERS	12	12	60	10.1
	U	UTILITY	12	12	43	6.8
	V					
	W					
	X	RESEARCH	7	17	7	
	Y	VTOL/STOL	9	15	14	
	Z	AIRSHIPS	1	23	3	
				TOTAL	747	

ELECTRONICS

In the area of electronics, the equipment population was divided into segments utilizing the second position of the core code to designate mission design. Previously standardized JAN letters were used to identify the segments, i.e. "P", Radar, "R", Radio etc.

A research of the population of equipment in these segments indicated that utilizing the third and fourth positions of the core code in combination would provide sufficient capacity (576 items) to accommodate the population in each segment. Eliminating "O" and "I", twenty letters were used, allowing two letters for expansion.

Radar equipment approached saturation and will probably require utilization of either letter B or Z, the two remaining unused letters. Radio equipment was provided expansion capability by not saturating the letter R, (the second code character) and going to another letter U. This will in all probability provide accommodation for any expansion that may develop in radio equipment.

In any event, it is possible to utilize another letter, in addition to the primary code character, (letter E), to designate electronics which would double the accommodation which only one letter permits, thereby meeting all of the forseeable needs for expansion.

EICS

CORE CODE

CATEGORY-ELECTRONICS "E"

		TYPE	TOTAL SYSTEMS	% USED
E	A	INFRARED	7	1.5
	B			
	C	CARRIER	16	2.5
	D	RADIAC	3	
	E	NUPAC		
	F	PHOTOGRAPHY		
	G	TELEGRAPH-TELETYPE	7	
	H	INTERPHONE	5	
	I	NOT USED		
	J	ELECTRO-MECHANICAL	1	
	K	TELEMETERING	9	
	L	COUNTERMEASURE	51	9%
	M	METEOROLOGICAL	17	
	N	SOUND-IN-AIR	2	
	O	NOT USED		
	P	RADAR	507	88.0
	Q	SONAR	13	
	R	RADIO	380	65.9
	S	SPECIAL TYPES	118	20.4
	T	TELEPHONE-WIRE	10	
	U	RADIO	77	13.3
	V	VISIBLE LIGHT	3	
	W	ARMAMENT		
	X	FACSIMILE OR TV	6	
	Y	DATA PROCESSING	23	
	Z			
		TOTAL	1255	

"L" SYSTEMS

Since the various "L" Systems are, in most instances, referred to by their numeric designations and since it is possible a requirement may exist to aggregate costs by specific "L" System, a simple coding system was developed embracing the standard four alpha position core code concept.

Although it would have been possible to include all "L" Systems within LAØØ (32 spaces utilized with a potential 576) the systems were divided into segments of 10 systems each with letters A,B,C,D,E,F,G,H,J, & K identifying each separate segment.

EICS

CORE CODE

CATEGORY - "L" SYSTEMS

	TYPE	NUMBER OF SYSTEMS
L A	400 - 410	2
B	411 - 420	7
C	421 - 430	1
D	431 - 440	3
E	441 - 450	0
F	451 - 460	1
G	461 - 470	2
H	471 - 480	4
I	NOT USED	
J	481 - 490	9
K	491 - 500	3
L		
M		
N		
O		
P		
Q		
R		
S		
T		
U		
V		
W		
X		
Y		
Z		
	TOTAL	32

MISSILES

The Missile core code was developed using the letter "M" in the first position to designate the category of defense materiel item. In addition, the standard designations such as "D" for Decoy and "Q" for Drone as established by DOD Directive 4200.20 "Designating, Redesignating, and Naming Military Rockets and Guided Missiles" were used to form the basis of second, third, and fourth character construction.

A total of eight letters was used, leaving 17 additional letters for expansion (25 available, I used, 0 eliminated).

No percentage of utilization shown since the population in each segment is small.

EICS

CORE CODE

CATEGORY - MISSILES "M"

		TYPE	NUMBER OF SYSTEMS
M	A		
	B		
	C		
	D	DECOY	4
	E	SPECIAL ELECTRONIC	
	F		
	G	SURFACE ATTACK	44
	H		
	I	INTERCEPT, AERIAL	48
	J		
	K		
	L		
	M		
	N		
	O		
	P		
	Q	DRONE	23
	R		
	S		
	T	TRAINING	
	U	UNDER WATER ATTACK	1
	V		
	W	WEATHER	
	X		
	Y		
	Z		
		TOTAL	120

ORDNANCE

The Ordnance core code was developed utilizing the letter "O" in the first position category of defense materiel item.

The population in this particular category is relatively small. In the absence of a definitive listing for this category, one was developed for use in code construction.

Only 7 letters of the second position of the core code were utilized with 17 available for further use. As a matter of note, although the guns were segmented into four sections they could be easily accommodated within one section freeing an additional three letters for other applications.

EICS

CORE CODE

CATEGORY - ORDNANCE "O"

		TYPE	NUMBER
O	A	AMMUNITION	30
	B	GUNS, THRU 30 MM	54
	C	GUNS - 30 MM - 115 MM	33
	D	GUNS - OVER 150 - 200 MM	11
	E	GUNS - OVER 200 MM THRU 300 MM	5
	F		
	G		
	H		
	I		
	J		
	K		
	L	LAUNCHERS	14
	M	MISCELLANEOUS WEAPONS	8
	N		
	O		
	P		
	Q		
	R		
	S		
	T		
	U		
	V		
	W		
	X		
	Y		
	Z		
		TOTAL	155

SPACE

The Space core code was developed utilizing the letter P in the first position to designate the category of defense materiel item. The segmentation of the second position of the core code was taken from appropriate NASA publications.

As can readily be seen this area provides practically a complete field for use since the present population has scarcely begun to fill the available segments.

EICS

CORE CODE

CATEGORY - SPACE "P"

		TYPE	NUMBER
P	A	AEROSPACE CRAFT	
	B	BOOST GLIDE VEHICLES	1
	C	COMMUNICATIONS SATELLITES (ACTIVE)	1
	D	COMMUNICATIONS SATELLITES (PASSIVE)	
	E	METEOROLOGICAL SATELLITES	
	F		
	G		
	H		
	I		
	J		
	K		
	L	LAUNCH VEHICLES	10
	M	RE-ENTRY VEHICLES	9
	N	NAVIGATION SATELLITES	
	O		
	P		
	Q		
	R	RECONNAISANCE SATELLITES	2
	S	STANDARD LAUNCH VEHICLES	9
	T	SATELLITES - ARTIFICIAL	
	U		
	V		
	W		
	X	SCIENTIFIC SATELLITES	
	Y		
	Z		
		TOTAL	32

SHIPS

The Ships core code was developed utilizing the letter "S" in the first position to designate the category of defense materiel items. The second character of the core code was adopted from "Jane's Fighting Ships", and Ships Systems publications.

Since the population in each segment was small, the core code for Ships was constructed by utilizing whenever possible, the current U.S. Navy designation prefixed by the letter S. When this was not possible or where duplication would ensue, a change was made, (i.e. ARS Submarine Rescue Vessels, and ARSD Salvage Lifting Vessel, the former was identified as SARS and the latter SARD).

Prefixing the letter "S" to the two letter U.S. Navy identification required an additional letter to complete the four letter core code framework. In such instances the suffixing of the letter A completed the code (i.e. AV-Seaplane Carriers-Core Code SAVA).

Of the 24 letters available for segmentation only 8 were used, allowing an additional 16 for additional segmentation. Since the populations within each segment are relatively small expansion will not present a problem.

EICS

CORE CODE

CATEGORY - SHIPS "S"

		TYPE	NUMBER
S	A	AUXILIARY	47
	B		
	C	CRUISERS AND CARRIERS	11
	D	DESTROYERS	9
	E	EXPERIMENTAL FIRING SHIP	
	F	FIRE SUPPORT (INSHORE)	
	G		
	H		
	I		
	J		
	K		
	L	LANDING CRAFT	16
	M	MINELAYERS-SWEEPERS	10
	N		
	O		
	P	SUB-CHASERS - PATROL	6
	Q		
	R		
	S	SUBMARINES	8
	T		
	U		
	V		
	W		
	X		
	Y		
	Z		
		TOTAL	107

VEHICLES

The Vehicle core code was developed utilizing the letter "V" in the first position to designate the category of defense materiel item.

An attempt was made to utilize the two letter designation for segmentation as set forth in Circular No. 750-XX proposed, in the U.S. Army Equipment Category Roll Up Code (ECRC), however, this proved to be unworkable. Prefixing the two letter ECRC coding with the letter V for Vehicles limited the field capacity of the fourth position of the core code to twenty-four items. Therefore, it was determined that segmentation be accomplished by utilizing but one letter in the second position of the code, with the remaining two letters to be used for mission design, model and series.

This procedure utilized 11 of the 24 available letters in the second position, leaving an additional 13 for future expansion.

In only two areas was there a substantial usage of the potential accommodation, commercial vehicles 40.1% and the Military "M" series with 52%.

Should additional space be required for future expansion ready provision is made by utilizing an additional letter in the second position, thus doubling the capacity for a particularly populous segment.

EICS

CORE CODE

CATEGORY - VEHICLES "V"

		TYPE	NUMBER	% USED
V	A B	AIRFIELD VEHICLES AND EQUIPMENT	55	9.5
	C D E	COMMERCIAL VEHICLES	231	40.0
	F	TANKS	19	
	G	GUNS, SELF PROPELLED	7	
	H I	HOWITZERS, SELF PROPELLED	11	
	J K L	CARRIERS AND OTHER COMBAT VEHICLES	21	
	M N O P Q	MILITARY VEHICLES "M" SERIES	301	52.0
	R S	CONSTRUCTION VEHICLES AND EQUIPMENT	94	16.0
	T U	RAILROAD EQUIPMENT	24	
	V W	MATERIALS HANDLING EQUIPMENT	49	
	X Y Z	MISCELLANEOUS	4	
		TOTAL	816	

EXHIBIT 1

AIRCRAFT

CORE CODE

A F P D

SERIES - "C"

MODEL - F4

DESIGN MISSION - FIGHTER

DEFENSE MATERIEL ITEM CATEGORY - AIRCRAFT

AIRCRAFT

"A"

			TOTAL
A	A	ATTACK	39
	B	BOMBER	86
	C	CARGO/TRANSPORT	209
	D		
	E	ELECTRICAL-ELECTRONIC INSTALLATION	2
	F	FIGHTER	145
	G		
	H	HELICOPTERS	103
	I		
	J		
	K	TANKER	
	L		
	M		
	N		
	O	OBSERVATION	4
	P	PATROL	21
	Q		
	R		
	S	ANTI-SUBMARINE	11
	T	TRAINERS	60
	U	UTILITY	43
	V		
	W		
	X	RESEARCH	7
	Y	VTOL/STOL	14
	Z	AIRSHIPS	3
		TOTAL	747

AIRCRAFT

ATTACK

EICS CODE	MISSION/DESIGN-SERIES
AAAA	A-1D
AAAB	A-1E
AAAC	EA-1E
AAAD	UA-1E
AAAE	EA-1F
AAAF	A-1G
AAAG	A-1H
AAAH	A-1J
AAAP	A-2A
AABA	A-3A
AABB	EA-3A
AABC	RA-3A
AABD	A-3B
AABE	EA-3B
AABF	RA-3B
AABG	TA-3B
AABH	VA-3B
AABJ	YA-3A
AABK	YEA-3A
AABL	YRA-3A
AABM	YRA-3B
AACA	A-4A

EICS CODE	MISSION/DESIGN-SERIES
AACB	A-4B
AACC	A-4C
AACD	A-4E
AACE	YA-4A
AACF	YA-4B
AACG	YA-4C
AADA	A-5A
AADB	RA-5C
AADC	YA-5A
AADD	A-5B
AADE	A-5C
AAEA	A-6A
AAEB	EA-6A
AAFA	A-7A
AAGA	A-11
AAHA	A-26
AAJA	A-7

AIRCRAFT

BOMBER

EICS CODE	MISSION/DESIGN-SERIES
ABAA	B-25J
ABBA	B-26B
ABBB	TB-26B
ABBC	VB-26B
ABBD	B-26C
ABBE	RB-26C
ABBF	TB-26C
ABBG	DB-26J
ABBH	UB-26J
ABBJ	YB-26K
ABBK	RB-26
ABBL	TB-26
ABCA	TB-29A
ABDA	B-45C
ABDB	RB-45C
ABEA	B-47B
ABEB	DB-47B
ABEC	TB-47B
ABED	WB-47B
ABEE	B-47E
ABEF	EB-47E
ABEG	QB-47E

EICS CODE	MISSION/DESIGN-SERIES
ABEH	RB-47E
ABEJ	EB-47H
ABEK	RB-47H
ABEL	RB-47K
ABEM	EB-47L
ABEN	JB-47B
ABED	NTB-47B
ABEQ	WB-47E
ABER	JB-47E
ABES	NB-47E
ABET	NRB-47E
ABEU	JQB-47E
ABEV	RB-47D
ABFA	TB-50D
ABFB	WB-50D
ABFC	RB-50F
ABFD	KB-50J
ABFE	KB-50K
ABFF	KB-50
ABFG	RB-50E
ABFH	WB-50

EICS CODE	MISSION/DESIGN-SERIES
ABGA	B-52A
ABGB	B-52B
ABGC	B-52C
ABGD	B-52D
ABGE	B-52E
ABGF	B-52F
ABGG	B-52G
ABGH	B-52H
ABHA	B-57A
ABHB	RB-57A
ABHC	B-57B
ABHD	RB-57B
ABHE	B-57C
ABHF	RB-57C
ABHG	TB-57C
ABHJ	B-57E
ABHK	RB-57E
ABHL	TB-57E
ABHM	B-57
ABHN	RB-57D
ABHP	EB-57E
ABHQ	RB-57F
ABHR	RB-57D2
ABHS	NB-57B

EICS CODE	MISSION/DESIGN-SERIES
ABJA	B-58A
ABJB	YRB-58A
ABJC	TB-58A
ABJD	B-58
ABJE	B-58 Lead the Force POD
ABJF	B-58 Lead the Force
ABJG	B-58 POD
ABJH	RB-58A
ABJK	YB-58A
ABKA	RB-66A
ABKB	B-66B
ABKD	RB-66B
ABKE	RB-66C
ABKF	B-66D
ABKG	WB-66D
ABKH	B-66
ABKJ	B-66E
ABLA	XB-70A
ABLB	XB-70B

AIRCRAFT

CARGO/TRANSPORT

EICS CODE	MISSION/DESIGN-SERIES
ACAA	C-45G
ACAB	C-45H
ACAC	RC-45H
ACAD	TC-45H
ACAE	RC-45J
ACAF	TC-45J
ACAG	UC-45J
ACBA	C-46A
ACBB	C-46D
ACBC	TC-46D
ACBD	C-46
ACBE	C-46F
ACBF	C-46G
ACBG	TC-46
ACBH	TC-46A
ACBJ	ZC-46A

EICS CODE	MISSION/DESIGN-SERIES
ACCA	C-47A
ACCB	HC-47A
ACCC	RC-47A
ACCD	VC-47A
ACCE	VC-47B
ACCF	C-47D
ACCG	EC-47D
ACCH	HC-47D
ACCJ	RC-47D
ACCK	TC-47D
ACCL	VC-47D
ACCM	C-47E
ACCN	C-47H
ACCP	EC-47H
ACCQ	LC-47H
ACCR	SC-47H
ACCS	TC-47H
ACCT	VC-47H
ACCU	C-47J
ACCV	EC-47J
ACCW	LC-47J
ACCX	SC-47J
ACCY	TC-47J

EICS CODE	MISSION/DESIGN-SERIES
ACCZ	VC-47J
ACC0	TC-47K
ACC1	C-47
ACC2	VC-47
ACC3	AC-47
ACC4	C-47B
ACC5	TC-47B
ACDA	C-54A
ACDB	C-54D
ACDC	EC-54D
ACDD	HC-54D
ACDE	TC-54D
ACDF	VC-54D
ACDG	C-54E
ACDH	C-54G
ACDJ	VC-54G
ACDK	C-54M
ACDL	VC-54N
ACDM	C-54P
ACDN	VC-54P
ACDP	C-54Q
ACDQ	VC-54Q
ACDR	C-54R
ACDS	NC-54R
ACDT	C-54S

EICS CODE	MISSION/DESIGN-SERIES
ACDU	VC-54S
ACDV	C-54T
ACDW	EC-54U
ACDX	RC-54V
ACDY	C-54
ACDZ	ZC-54A
ACEA	C-97A
ACEB	C-97C
ACEC	C-97D
ACED	VC-97D
ACEE	C-97E
ACEF	KC-97E
ACEG	C-97F
ACEH	KC-97F
ACEJ	C-97G
ACEK	KC-97G
ACEL	C-97J
ACEM	C-97
ACEN	HC-97
ACEP	KC-97
ACEQ	C-97B
ACER	C-97K
ACES	YC-97J
ACFA	C-117A

EICS CODE	MISSION/DESIGN-SERIES
ACFB	VC-117A
ACFC	C-117B
ACFD	VC-117B
ACFE	C-117C
ACFF	C-117D
ACFG	LC-117D
ACFH	TC-117D
ACFJ	VC-117D
ACFK	C-117
ACGA	C-118A
ACGB	VC-118A
ACGC	C-118B
ACGD	VC-118B
ACGE	C-118
ACHA	C-119C
ACHB	C-119F
ACHC	C-119G
ACHD	C-119J
ACHE	C-119
ACJA	C-121A
ACJB	C-121C
ACJC	TC-121C

EICS CODE	MISSION/DESIGN-SERIES
ACJD	EC-121D
ACJF	RC-121E
ACJG	VC-121E
ACJH	C-121G
ACJJ	EC-121H
ACJK	C-121J
ACJL	EC-121K
ACJM	EC-121L
ACJN	EC-121M
ACJP	WC-121N
ACJQ	EC-121P
ACJR	C-121K
ACJS	TC-121C
ACJT	EC-121Q
ACJU	YEC-121K
ACJV	RC-121D
ACKA	C-123B
ACKB	C-123H
ACKC	UC-123
ACKD	C-123J
ACKE	C-123K

EICS CODE	MISSION/DESIGN-SERIES
ACLA	C-124A
ACLB	C-124C
ACLC	C-124
ACMA	C-130A
ACMB	DC-130A
ACMC	MC-130A
ACMD	RC-130A
ACME	C-130B
ACMF	HC-130B
ACMG	C-130D
ACMH	C-130E
ACMJ	HC-130E
ACMK	C-130F
ACML	KC-130F
ACMM	LC-130F
ACMN	C-130G
ACMP	WC-130B
ACMQ	RC-130
ACMR	HC-130H
ACMS	C-130E Lead the Force
ACMT	WC-130E
ACMU	C-130A III

EICS CODE	MISSION/DESIGN-SERIES
ACMV	JC-130B
ACMW	GC-130A
ACNA	C-131A
ACNB	VC-131A
ACNC	C-131B
ACND	C-131D
ACNE	C-131E
ACNF	C-131F
ACNG	C-131G
ACNH	VC-131H
ACPA	C-133A
ACPB	C-133B
ACPC	C-133
ACQA	C-135A
ACQB	KC-135A
ACQC	RC-135A
ACQD	C-135B
ACQE	KC-135B
ACQF	RC-135B
ACQG	C-135F

EICS CODE	MISSION/DESIGN-SERIES
ACQH	EC-135H
ACQJ	EC-135J
ACQK	EC-135K
ACQL	EC-135L
ACQM	EC-135A
ACQN	EC-135N
ACQP	EC-135C
ACQQ	EC-135Q
ACQR	EC-135G
ACQS	RC-135C
ACQT	RC-135E
ACQU	RC-135M
ACQV	RC-135D
ACQW	WC-135B
ACQX	JKC-135A
ACQY	JRC-135A
ACQZ	NKC-135A
ACRA	VC-137A
ACRB	VC-137B
ACRC	VC-137C
ACSA	C-140A
ACSB	C-140B

EICS CODE	MISSION/DESIGN-SERIES
ACSC	VC-140B
ACSD	C-140C
ACSE	C-140
ACTA	C-141A
ACTB	C-141A Lead the Force
ACUA	XC-142A
ACVA	C-1A
ACVB	EC-1A
ACWA	C-2A
ACXA	VC-3A
ACYA	VC-4A
ACYB	C-4B
ACYC	TC-4B
ACZA	C-5A

AIRCRAFT

SPECIAL ELECTRONICS INSTALLATION SERIES

EICS CODE	MISSION/DESIGN-SERIES
AEAA	E-1B
AEBA	E-2A

FIGHTERS

EICS CODE	MISSION/DESIGN-SERIES
AFAA	F-80C
AFAB	QF-80F
AFAC	QF-80
AFAD	F-80A
AFAE	F-80B
AFAF	RF-80A
AFBA	F-84F
AFBB	RF-84F
AFBC	F-84G
AFBD	RF-84K
AFBE	F-84
AFBF	RF-84
AFBG	F-84F-25

EICS CODE	MISSION/DESIGN-SERIES
AFCA	F-86D
AFCB	F-86F
AFCC	F-86H
AFCD	F-86L
AFCE	F-86
AFCF	F-86A
AFCG	F-86K
AFCH	RF-86F-30
AFDA	F-89D
AFDB	F-89H
AFDC	F-89J
AFDD	F-89
AFEA	F-100A
AFEB	F-100C
AFEC	DF-100C
AFED	DF-100D
AFEE	F-100F
AFEF	DF-100F
AFEG	F-100
AFEH	F-100D
AFEJ	JF-100F
AFFA	F-101A

EICS CODE	MISSION/DESIGN-SERIES
AFFB	YRF-101A
AFFC	RF-101A
AFFD	F-101B
AFFE	TF-101B
AFFF	F-101C
AFFG	RF-101C
AFFH	F-101F
AFFJ	TF-101F
AFFK	RF-101G
AFFL	RF-101H
AFGA	F-102A
AFGB	TF-102A
AFGC	YF-102C
AFGD	F-102
AFHA	F-104A
AFHB	CF-104A
AFHC	XQF-104A
AFHD	QF-104A
AFHE	F-104B
AFHF	F-104C
AFHG	F-104D

EICS CODE	MISSION/DESIGN-SERIES
AFHH	F-104G
AFHJ	RF-104G
AFHK	TF-104G
AFHL	F-104J
AFHM	TF-104J
AFHN	F-104A-I
AFJA	F-105B
AFJB	F-105D
AFJC	F-105F
AFKA	F-106A
AFKB	F-106B
AFKC	YF-106C
AFKD	F-106
AFLA	F-111A
AFLB	F-111B
AFLC	F-111
AFLD	RF-111A
AFMA	F-1C
AFMB	DF-1C
AFMC	MF-1C

EICS CODE	MISSION/DESIGN-SERIES
AFMD	DF-1D
AFME	F-1E
AFMF	AF-1E
AFMG	YF-1E
AFMH	YAF-1E
AFMS	F-2C
AFMT	F-2D
AFNA	F-3B
AFNB	YF-3B
AFNC	MF-3B
AFND	F-3C
AFPA	F-4A
AFPB	F-4B
AFPC	RF-4B
AFPD	F-4C
AFPE	RF-4C
AFPF	F-4G
AFPG	YF-4J
AFPJ	F-4D
AFPK	F-4E

EICS CODE	MISSION/DESIGN-SERIES
AFPL	JF-4C
AFQA	YF-5A
AFQB	F-5A
AFQD	F-5B
AFQE	F-5C
AFQF	F-5D
AFQG	NF-5A
AFRA	F-6A
AFRB	DF-6A
AFRC	YF-6A
AFRP	YF-7A
AFSA	F-8A
AFSB	DF-8A
AFSC	QF-8A
AFSD	RF-8A
AFSE	TF-8A
AFSF	F-8B
AFSG	F-8C
AFSH	F-8D
AFSJ	F-8E

EICS CODE	MISSION/DESIGN-SERIES
AFSK	DF-8F
AFSL	YF-8A
AFSM	YRF-8A
AFSN	YF-8C
AFSP	YF-8D
AFSQ	YF-8E
AFTA	DF-9E
AFTB	F-9F
AFTC	DF-9F
AFTD	QF-9F
AFTE	QF-9G
AFTF	F-9H
AFTG	F-9J
AFTH	AF-9J
AFTJ	QF-9J
AFTK	RF-9J
AFTL	TF-9J
AFTM	YAF-9J
AFTN	YTF-9J
AFUA	F-10A
AFUB	F-10B
AFUC	EF-10B
AFUD	MF-10B

EICS CODE	MISSION/DESIGN-SERIES
AFUE	TF-10B
AFVA	F-11A
AFVB	F-11B
AFVC	YF-11A
AFWA	F-12A

AIRCRAFT

HELICOPTERS

EICS CODE	MISSION/DESIGN-SERIES
AHAA	UH-1
AHAB	UH-1A
AHAC	YUH-1B
AHAD	UH-1B
AHAE	UH-1D
AHAF	UH-1E
AHAG	UH-1F
AHBA	UH-2A
AHBB	UH-2B
AHCA	SH-3A
AHCB	VH-3A
AHCC	CH-3B
AHCD	CH-3C
AHCE	RH-3A
AHCF	YSH-3A
AHDA	OH-4A
AHEA	OH-5A

EICS CODE	MISSION/DESIGN-SERIES
AHFA	OH-6A
AHGA	OH-13E
AHGB	OH-13G
AHGC	OH-13H
AHGD	UH-13H
AHGE	UH-13J
AHGF	OH-13K
AHGG	TH-13L
AHGH	TH-13M
AHGJ	TH-13N
AHGK	UH-13P
AHGL	HH-13Q
AHGM	UH-13R
AHGN	OH-13S
AHGP	OH-13
AHHA	UH-19A
AHHB	HHU-19A
AHHC	UH-19B
AHHD	HH-19B
AHHE	UH-19C
AHHF	UH-19D
AHHG	CH-19E
AHHH	UH-19F
AHHJ	HH-19G

EICS CODE	MISSION/DESIGN-SERIES
AHHK	HH-19
AHHL	UH-19
AHHM	HH-19A
AHJA	CH-21A
AHJB	CH-21B
AHJC	HH-21B
AHJD	CH-21C
AHJE	CH-21D
AHJF	CH-21
AHJG	HH-21
AHKA	OH-23B
AHKB	OH-23C
AHKC	OH-23D
AHKD	OH-23F
AHKE	OH-23G
AHLA	UH-25B
AHLB	UH-25C
AHMA	CH-34A
AHMB	CH-34C
AHMC	VH-34C
AHMD	LH-34D
AHME	UH-34D

EICS CODE	MISSION/DESIGN-SERIES
AHMF	VH-34D
AHMG	UH-34E
AHMH	HH-34F
AHMJ	SH-34G
AHMK	UH-34G
AHML	SH-34H
AHMM	SH-34J
AHMN	UH-34J
AHMP	CH-34
AHMQ	BQM-34
AHMR	YSH-34G
AHMS	YSH-34J
AHNA	CH-37A
AHNB	CH-37B
AHNC	CH-37C
AHPB	UH-41A
AHPC	NH-41A
AHQA	HH-43A
AHQB	HH-43B
AHQC	UH-43C
AHQD	OH-43D
AHQE	TH-43E
AHQF	HH-43
AHQG	HH-43F

EICS CODE	MISSION/DESIGN-SERIES
AHRA	CH-46A
AHRB	RH-46A
AHRC	UH-46A
AHRD	XCH-46B
AHRE	CH-46C
AHSA	CH-47A
AHTA	XH-48A
AHUA	QH-50A
AHUB	QH-50B
AHUC	QH-50C
AHVA	XH-51A
AHWA	HH-52A
AHXA	CH-53A
AHXB	HH-53B
AHYA	YCH-54A
AHZA	XH-33A

AIRCRAFT

PATROL

EICS CODE	MISSION/DESIGN-SERIES
APAA	P-2D
APAB	P-2E
APAC	DP-2E
APAD	EP-2E
APAE	SP-2E
APAF	P-2F
APAG	MP-2F
APAH	TP-2F
APAJ	P-2G
APAK	P-2H
APAL	SP-2H
APAM	LP-2J
APAN	YP-2H
APBA	YP-3A
APBB	P-3A
APCA	QP-4B
APDA	P-5A
APDB	SP-5A
APDC	P-5B
APDD	SP-5B
APDE	TP-5A

AIRCRAFT

ANTI-SUBMARINE

EICS CODE	MISSION/DESIGN-SERIES
ASAA	S-2A
ASAB	TS-2A
ASAC	US-2A
ASAD	S-2B
ASAE	S-2C
ASAF	RS-2C
ASAG	US-2C
ASAH	S-2D
ASAJ	S-2E
ASAK	S-2F
ASAL	YS-2A

AIRCRAFT

TRAINERS

EICS CODE	MISSION/DESIGN-SERIES
ATAA	T-1A
ATBA	T-2A
ATBB	T-2B
ATBC	YT-2A
ATCA	T-28A
ATCB	T-28B
ATCC	DT-28B
ATCD	T-28C
ATCE	T-28D
ATCF	YAT-28E
ATCG	T-28
ATDA	T-29A
ATDC	VT-29A
ATDD	T-29B
ATDE	VT-29B
ATDF	T-29C
ATDG	ET-29C
ATDH	VT-29C
ATDJ	T-29D
ATDK	VT-29D
ATDL	VT-29E

EICS CODE	MISSION/DESIGN-SERIES
ATEA	T-33A
ATEB	DT-33A
ATEC	RT-33A
ATED	WT-33A
ATEE	T-33B
ATEF	DT-33B
ATEG	DT-33C
ATEH	T-33
ATFA	T-34A
ATFB	T-34B
ATFC	T-34
ATFD	YT-34B
ATGA	T-37A
ATGB	T-37B
ATGC	T-37C
ATGD	T-37
ATGE	T-37 Lead the Force
ATGF	AT-37D
ATHA	YT-38A
ATHB	T-38A
ATHC	T-38
ATHD	T-38 Lead the Force

EICS CODE	MISSION/DESIGN-SERIES
ATJA	T-39A
ATJB	T-39B
ATJC	T-39D
ATJD	T-39E
ATJE	T-39
ATJF	JT-39A
ATKA	T-40
ATKB	T-40A
ATLA	T-41
ATMA	T-6C
ATMB	T-6D
ATMC	T-6F
ATMD	T-6G
ATME	T-6H
ATMF	T-6J
ATMG	LT-6
ATMH	LT-6G

AIRCRAFT

UTILITY

EICS CODE	MISSION/DESIGN-SERIES
AUAA	O-1A
AUAB	O-1B
AUAC	O-1C
AUAD	TO-1D
AUAE	O-1E
AUAF	O-1F
AUBA	U-1A
AUBB	U-1B
AUCA	WU-2A
AUCB	U-2A
AUDA	U-3A
AUDB	U-3B
AUDC	U-3C
AUDD	U-3
AUEA	U-4A
AUEB	U-4B
AUEC	U-4
AUFA	XU-5
AUGA	U-6A

EICS CODE	MISSION/DESIGN-SERIES
AUGB	U-6
AUHA	U-7A
AUHB	U-7B
AUJA	U-8D
AUJB	RU-8D
AUJC	U-8E
AUJD	U-8F
AUJE	TU-8G
AUKA	U-9B
AUKB	U-9C
AUKC	U-9D
AULA	U-10A
AULB	U-10B
AULC	U-10C
AULD	U-10
AUMA	U-11A
AUNA	HU-16A
AUNB	HU-16B
AUNC	HU-16C
AUND	LU-16C
AUNE	TU-16C

EICS CODE	MISSION/DESIGN-SERIES
AUNF	HU-16D
AUNG	HU-16E
AUNH	HU-16

AIRCRAFT

RESEARCH

EICS CODE	MISSION/DESIGN-SERIES
AXJA	X-7A
AXKA	X-13A
AXLA	X-15A
AXMA	X-19A
AXNA	X-20A
AXPA	X-21A
AXQA	X-22A

OBSERVATION

AOAA	L-1A
AOAB	L-1E
AOAC	TL-1D
AOAD	TL-1E

VTOL/STOL

AYAA	OV-1A
AYAB	OV-1B
AYAC	AV-1C
AYAD	OV-1C
AYBA	CV-2B
AYBB	CV-2A
AYCA	XV-3A

EICS CODE	MISSION/DESIGN-SERIES
AYDA	XV-4A
AYEA	XV-5A
AYFA	XV-6A
AYGA	CV-7A
AYHA	XV-8A
AYJA	OV-10

AIRSHIPS

AZRA	EZ-1B
AZRB	SZ-1B
AZRC	EZ-1C

EXHIBIT 2

ELECTRONICS

CORE CODE

E P D K

SERIES - ANFPN 10 RADAR BEACON

MODEL -

DESIGN MISSION - RADAR

DEFENSE MATERIEL ITEM CATEGORY - ELECTRONICS

ELECTRONICS

"E"

			TOTAL
E	A	INFRARED	7
	B		
	C	CARRIER	16
	D	RADIAC	3
	E	NUPAC	
	F	PHOTOGRAPHY	
	G	TELEGRAPH-TELETYPE	7
	H	INTERPHONE	5
	I		
	J	ELECTRO-MECHANICAL	1
	K	TELEMETERING	9
	L	COUNTERMEASURE	51
	M	METEOROLOGICAL	17
	N	SOUND-IN-AIR	2
	O		
	P	RADAR	407
	Q	SONAR	13
	R	RADIO	380
	S	SPECIAL TYPES	118
	T	TELEPHONE-WIRE	10
	U	RADIO	77
	V	VISIBLE LIGHT	3
	W	ARMAMENT	
	X	FACSIMILE ON TV	6
	Y	DATA PROCESSING	23
	Z		
		TOTAL	1254

COMMUNICATIONS

AIRBORNE (B), SUBMARINE (B) & SHIP INSTALLED (S) OMITTED

INFRARED (A)

EIC CODE	AN DESIGNATION	DESCRIPTION
EAAA	ANGAC 46	HF TELETYPE TERMINAL
EAAB	ANGAD 1	GROUND BASED IR IMAGE SCANNER
EABA	ANPAC 2	IR TELEPHONE SET
EABB	ANPAS 2	IR INTRUSION ALARM
EACA	ANSAC 4	IR COMMUNICATIONS SET
EADA	ANUAS 4	IR SURVEILLANCE SYSTEM
EADB	ANUAT 1	IR COMMUNICATIONS TRANSMITTER

CARRIER (C)

EIC CODE	AN DESIGNATION	DESCRIPTION
ECAA	ANFCC 17	MULTIPLEXER SET
ECAB	ANFCC 18	MIL. VERSION OF COMMERCIAL MULTIPLEX
*ECBA	ANMCC 12	MULTIPLEX SYSTEM
ECCA	ANTCC 4	LT. WT. TACTICAL TELEGRAPH TERMINAL
ECCB	ANTCC 7	TRANSPORTABLE VOICE MULTIPLEXER
ECCC	ANTCC 14	LT. WT. PORTABLE TACTICAL TEL. TERM.
ECCD	ANTCC 37	12/24 CHANNEL PCM MULTIPLEX
ECCE	ANTCC 39	24 CHANNEL PCM CHANNEL REPEATER
ECCF	ANTCC 40	24 CHANNEL PCM CHANNEL TERMINAL
ECCG	ANTCC 41	48/96 CHANNEL PCM MULTIPLEX
ECCH	ANTCC 44	12 CHANNEL PCM MULTIPLEX
ECCJ	ANTCC 45	24 CHANNEL PCM MULTIPLEX
ECCK	ANTCC 46	48 CHANNEL PCM MULTIPLEX

EIC CODE	AN DESIGNATION	DESCRIPTION
ECCL	ANTCC 47	96 CHANNEL PCM MULTIPLEX
ECDA	ANUCC 1	ANALOG INTEGRATED CIRCUIT COM. SYS.
*ECAC	ANFCC 55	MULTIPLEXER (AUTOTEC PROJ)
	RADIAC (D)	
EDAA	ANPDR 1	RADIAC SET
EDAB	ANPDR 22	RADIAC SET
EDAC	ANPDR 61	X-RADIATION ALARM
	TELEGRAPH-TELETYPE (G)	
EGAA	ANFGC 20	TELETYPEWRITER
EGAB	ANFGC 25	TELETYPEWRITER
EGAC	ANFGO 1	FIXED CRYPTO ASSEMBLY
EGBA	ANGGC 3	PORTABLE TYPEWRITER
EGCA	ANMGC 17	MOBILE SWITCHING CONTROL
EGDA	ANPGC 1	TELETYPEWRITER
EGEA	ANUGC 4	TELETYPEWRITER
	INTERPHONE (I) "I" NOT TO BE USED	
EHAA	ANPIQ 1	PACK CARRIED PORTABLE ADDRESS SYSTEM
EHBA	ANTIQ 2	GEN'L PURPOSE PUBLIC ADDRESS
EHBB	ANTIQ 3	OUTDOOR INTERCOM & PA SYSTEM
EHCA	ANTIP 2	HI-POWER PA SYSTEM
EHDA	ANWIC	UNDERWATER INTERCOM NUC. SUBS

ELECTRO-MECHANICAL (J)

EIC CODE	AN DESIGNATION	DESCRIPTION
EJAA	ANGJQ 9	TEST EQUIPMENT, AUTO FLT. CONTROL SYST

TELEMETERING (K)

EIC CODE	AN DESIGNATION	DESCRIPTION
EKAA	ANGKA 5	TIME CONTROL DATA LINK
EKBA	ANMKR 6	TELEMETRY RECEIVER
EKBB	ANMKR 9	MOBILE GROUND RECEIVING EQPT.
EKCA	ANTKQ 1	DATA RECEIVING SET
EKDA	ANFKA-1	
EKAB	ANGKA-5V	
EKAC	ANGKQ 1	
EKAD	ANGKR 4	
EKEA	ANUKR 5	

COUNTERMEASURE (L)

EIC CODE	AN DESIGNATION	DESCRIPTION
ELAA	ANFLR 3	COUNTERMEASURE RECEIVER
ELAB	ANFLR 12	COUNTERMEASURE RECEIVER
ELAC	ANFLR-2	
ELAD	ANFLR-9A	
ELAE	ANFLR- 9B	
ELAF	ANFLR-9C	
ELBA	ANGLH 1	GROUND ECM RECEIVER
ELBB	ANGLR 1	PASSIVE DETECTION EQUIPMENT
ELBC	ANGLR 1B10	
ELBD	ANGLR 1B11	

EIC CODE	AN DESIGNATION	DESCRIPTION
ELBE	ANGLR 1B6	
ELBF	ANGLR 1B7	
ELBG	ANGLR 1B8	
ELBH	ANGLR 1B9	
ELCA	ANMLQ 7	COUNTERMEASURE SET-AF
ELCB	ANMLQ 26	ECM SET-ARMY
ELDA	ANTLQ 2	CM JAMMER
ELDB	ANTLQ 11	COUNTERMEASURES SET
ELEA	ANWLR 1	MARINE ECM RECEIVER
ELEB	ANWLR 2	SUBMARINE SONAR CM SET
ELEC	ANWLR 5	ACOUSTIC INTERCEPT RECEIVER
ELFA	ANWLR 1A732A	
ELFB	ANWLR 1A733A	
ELFC	ANWLR 1A734A	
ELFD	ANWLR 1A735A	
ELFE	ANWLR 1A736A	
ELFF	ANWLR 1A737A	
ELFG	ANWLR 1A738A	
ELFH	ANWLR 1A739A	
ELFJ	ANWLR 1A740A	
ELFK	ANWLR 1B732B	
ELFL	ANWLR 1B733B	
ELFM	ANWLR 1B734B	
ELFN	ANWLR 1B735B	

EIC CODE	AN DESIGNATION	DESCRIPTION
ELFP	ANWLR 1B736B	
ELFQ	ANWLR 1B737B	
ELFR	ANWLR 1B738B	
ELFS	ANWLR 1B739B	
ELFT	ANWLR 1B740B	
ELGA	ANWLR 1CV732	
ELGB	ANWLR 1CV733	
ELGC	ANWLR 1CV734	
ELGD	ANWLR 1CV735	
ELGE	ANWLR 1CV736	
ELGF	ANWLR 1CV737	
ELGG	ANWLR 1CV738	
ELGH	ANWLR 1CV739	
ELGJ	ANWLR 1CV740	
ELGK	ANWLR 3	
ELGL	ANWLR 3A	
ELHA	ANULT 1	
	METEOROLOGICAL (M)	
EMAA	ANFMN 1	RUNWAY VISUAL RANGE COMPUTING SET
EMAB	ANFMQ 5	SEMI-AUTOMATIC WEATHER STATION
EMAC	ANFMQ 2A	
EMBA	ANGMD 1B	AUTOMATIC RADIO DIRECTION FINDING
EMBB	ANGMH 4	AUTOMATIC DATA HANDLING
EMBC	ANGMQ 13	CLOUD HEIGHT RADAR

EIC CODE	AN DESIGNATION	DESCRIPTION
EMBD	ANGMD 1	
EMBE	ANGMD 1A	
EMBG	ANGMD 2TX	
EMBH	ANGMD 2RX	
EMBK	ANGMQ 19	
EMCA	ANMMQ 2	METEOROLOGICAL SYSTEM, STATIONARY
EMDA	ANTMQ 14	ELECTRONIC CLOUD HEIGHT DEVICE
EMDB	ANTMQ 15	WIND MEASURING SET
EMDC	ANTMQ 16	MANUAL METEOROLOGICAL SET
EMDD	ANTMQ 19	METEOROLOGICAL GROUND
EMDE	ANTMQ 20	TEMPERATURE & DEWPOINT MEAS. SET

SOUND IN AIR (N)

ENAA	ANFNS 64	STATION KEEPING EQUIPMENT
ENBA	ANUNH	TAPE RECORDER

RADAR

EIC CODE	AN DESIGNATION	DESCRIPTION
EPAA	ANFPS 18A	
EPAB	ANFPS 24A	
EPAC	ANFPS 26A	
EPAD	ANFPS 37A	
EPAE	ANFPS 4	
EPAF	ANFPS 54	
EPAG	ANFPS 6C	
EPAH	ANFPS 64A	
EPAJ	ANFPS 65A	
EPAK	ANFPS 66A	
EPAL	ANFPS 87A	
EPAM	ANFPS 67B	
EPAN	ANFPS 86	
EPAP	ANFPS 90	
EPAQ	ANFPS 91A	
EPAR	ANFPS 93	
EPAS	ANFPS 93A	
EPAT	ANFPS 94	
EPBA	ANDPM 2	GUIDED MISSILE CONTROL TEST SET
EPBB	ANDPM 3	HARNESS BENCH TEST SET
EPBC	ANDPM 4	SEEKER TEST SET
EPBD	ANDPM 5	ILLUMINATOR TEST SET

EIC CODE	AN DESIGNATION	DESCRIPTION
EPBE	ANCPN 18	
EPBF	ANDPM 7	GUIDED MISSILE TEST SET
EPBG	ANCPN 18A	
EPBH	ANDPM 9	CALIBRATOR GUIDED MISSILE SET
EPBK	ANDPM 14	MISSILE TEST SET
EPBL	ANCPN 18C	
EPBM	ANCPN 2A	
EPBN	ANCPN 4	
EPBP	ANCPN 4A	
EPBQ	ANCPS 9	
EPBR	ANCRD 4	
EPBS	ANCRD 6	
EPCA		
EPCA	ANDPN 15	SEMI-ACTIVE SEEKER
EPCB	ANDPN 24	MISSILE GUIDANCE SET
EPCF	ANDPN 51	MISSILE GUIDANCE SET
EPCG	ANDPN 53	BOMARC TERMINAL GUIDANCE
EPCJ	ANDPN 60	MISSILE GUIDANCE SET
EPCL	ANDPN 66	C-BAND RADAR TRANSPONDER
EPCM	ANDPN 72	MISSILE GUIDANCE SET
EPCR	ANDPN 37	
EPCS	ANDPQ 4	
EPCT	ANDPQ 14	ATRAN DRONE
EPCU	ANDPW 18	
EPCV	ANDPW 18A	

EIC CODE	AN DESIGNATION	DESCRIPTION
EPCW	ANDRW 15	
EPDA	ANFPA 15	ECCM CONSOLE
EPDB	ANFPA 16	ECCM CONSOLE
EPDC	ANFPA 17	ANTENNA GROUP
EPDD	ANFPA 22	L/UHF RANGE INSTRUMENTATION SYSTEM
EPDE	ANFPA 23	L/UHF RANGE INSTRUMENTATION SYSTEM
EPDK	ANFPN 10	RADAR BEACON
EPDL	ANFPN 16	PRECISION GCA RADAR
EPDM	ANFPN 28	GCA S & X BANDS
EPDN	ANFPN 29	HARBOR SURVEILLANCE
EPDP	ANFPN 34	ATC; L BAND; LONG RANGE
EPDQ	ANFPN 36	FOUR PURPOSE TACTICAL GCA RADAR
EPDR	ANFPN 47	SURVEILLANCE RADAR
EPDS	ANFPN 13	
EPDT	ANFPN 33	

EIC CODE	AN DESIGNATION	DESCRIPTION
EPDU	ANFPN 36	
EPDV	ANFPN 40	
EPDW	ANFPN 28A	
EPDX	ANFPQ 6	MISSILE PRECISION INSTRUMENTATION
EPEA	ANFPS 3	LONG RANGE RADAR
EPEB	ANFPS 3A	LONG RANGE RADAR
EPEC	ANFPS 6	LONG RANGE HEIGHT FINDER
EPED	ANFPS 6A	HEIGHT FINDER
EPEE	ANFPS 6B	HEIGHT FINDER
EPEF	ANFPS 7	LONG RANGE HT & SEARCH RADAR
EPEG	ANFPS 7A	SEARCH AND HT FINDING
EPEH	ANFPS 7B	SEARCH AND HT FINDING
EPEJ	ANFPS 7C	SEARCH AND HT FINDING
EPEK	ANFPS 7D	SEARCH AND HT FINDING
EPEL	ANFPS 8	LONG RANGE SEARCH RADAR
EPEM	ANFPS 10	SEARCH RADAR
EPEN	ANFPS 14	S BAND MEDIUM RANGE
EPEP	ANFPS 16	MONOPULSE PRECISION MISSILE TRACK

AD-A039 961 OHIO STATE UNIV COLUMBUS DEFENSE MANAGEMENT CENTER F/G 5/1
THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM,(U)
1967 R E TRAPP, W P BERKELEY, A V EGERLAND F33608-67-C-0001

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EIC CODE	AN DESIGNATION	DESCRIPTION
EPEQ	ANFPS 17	LONG RANGE MISSILE DETECTING
EPER	ANFPS 18	S BAND MEDIUM RANGE
EPES	ANFPS 19	AIR DEFENSE RADAR DEW LINE
EPET	ANFPS 20	L BAND RADAR LONG RANGE 416L
EPEU	ANFPS 20A	L BAND RADAR 412L
EPEV	ANFPS 20B	L BAND RADAR 412L, 416L
EPEW	ANFPS 24	LONG RANGE SEARCH 416L
EPEX	ANFPS 26	LONG RANGE HEIGHT FINDER
EPEY	ANFPS 27	AIR DEFENSE SEARCH RADAR
EPEZ	ANFPS 28	SEARCH RADAR 416L
EPFA	ANFPS 30	LOW RANGE LOW DENSITY
EPFB	ANFPS 33	LONG RANGE AIR TRAFFIC CONTROL
EPEC	ANFPS 35	LONG RANGE SEARCH 416L
EPFD	ANFPS 36	AIR DEFENSE RADAR
EPFE	ANFPS 37	HIGH POWER ACQUISITION RADAR
EPFF	ANFPS 41	METEOROLOGICAL RADAR
EPFG	ANFPS 46	ELECTRONICALLY STEERABLE ARRAY
EPFH	ANFPS 49	VERY LONG RANGE MISSILE TRACKING
EPFJ	ANFPS 50	SURVEILLANCE RADAR, BMEWS
EPFK	ANFPS 56	AIR DEFENSE RADAR
EPFL	ANFPS 59	SPECIAL TRACKING RADAR
EPFM	ANFPS 60	HEIGHT FINDER SAGE
EPFN	ANFPS 61	AIR DEFENSE
EPFP	ANFPS 62	INSTRUMENTATION

EIC CODE	AN DESIGNATION	DESCRIPTION
EPFQ	ANFPS 63	GAP FILLER, DEW LINE
EPFR	ANFPS 64	SEARCH RADAR 416L
EPFS	ANFPS 65	SEARCH RADAR 416L
EPFT	ANFPS 66	SEARCH RADAR 416L
EPFU	ANFPS 67	SAGE 416L RADAR
EPFV	ANFPS 67A	SAGE & AWCS
EPFW	ANFPS 69	AIR DEFENSE
EPFX	ANFPS 70	AIR DEFENSE
EPFY	ANFPS 71	AIR DEFENSE
EPFZ	ANFPS 73	SURVEILLANCE
EPGA	ANFPS 74	GAP FILLER FOR DEW LINE
EPGB	ANFPS 75	AIR DEFENSE RADAR
EPGC	ANFPS 76	AIR DEFENSE
EPGD	ANFPS 77	WEATHER SEARCH
EPGE	ANFPS 78	TRACKING RADAR
EPGF	ANFPS 79	TRACKING-BLUE NINE
EPGG	ANFPS 80	TRACKING-BLUE FOX
EPGH	ANFPS 81	WEATHER
EPGJ	ANFPS 85	THREE DIMENSIONAL PHASE ARRAY
EPGK	ANFPS 88	SEARCH AND HEIGHT FINDER
EPGL	ANFPS 89	TRACKING RADAR
EPGM	ANFPS 100	MODERNIZED VERSION ANFPS80
EPHA	ANFPT 5	LONG RANGE SURVEILLANCE
EPHB	ANFPT 7	LONG RANGE SURVEILLANCE

EIC CODE	AN DESIGNATION	DESCRIPTION
EPHC	ANFPT 3	
EPHH	ANGPA 68	
EPHJ	ANGPA 8	ANTENNA GROUP FOR IFF
EPHK	ANGPA 17	VIDEO MAPPER
EPHL	ANGPA 37	GROUND INTERCEPT CONTROL
EPHM	ANGPA 67	FREQUENCY DIVISION DATA LINK
EPHN	ANGPA 73	INTERCEPT
EPHP	ANGPA 101	INTERFERENCE BLANKER
EPHT	ANGPQ T1	RADAR TRAINER
EPJA	ANGPN T2	RADAR TRAINER
EPJB	ANGPN 6	ATC SURVEILLANCE RADAR
EPJF	ANGPQ T6	RADAR TRAINER
EPJG	ANGPQ 8	COMMUNICATIONS ZONE INDICATOR
EPJH	ANGPQ 8A	COMM. ZONE INDICATOR COZI
EPJK	ANGPQ 8B	COMM. OPERATIONS ZONE INDICATOR
EPJR	ANGPS 3	SURVEILLANCE
EPJS	ANGPS 4	LONG RANGE SEARCH
EPJV	ANMPA 4	RADAR CONTROL TRAILER
EPJW	ANMPA 4A	TARGET TRACKING
EPJX	ANMPA 4B	MISSILE TRACKING
EPKA	ANMPB 1	DEEP SEA ACOUSTIC PROJECTION
EPKB	ANMPB 2	DEEP SEA ACOUSTIC PROJECTION
EPKC	ANMPB 3	DEEP SEA ACOUSTIC PROJECTION
EPKG	ANMPM 49	RADAR TEST SET

EIC CODE	AN DESIGNATION	DESCRIPTION
EPKH	ANMPM 28	
EPKM	ANMPN 1	GCA RADAR
EPKN	ANMPN 5	GCA, S & X BANDS
EPKP	ANMPN 11	MOBILE GCA
EPKQ	ANMPN 13	MOBILE GCA
EPKR	ANMPN 14	MOBILE GCA
EPKS	ANMPN 15	MOBILE GCA
EPKT	ANMPN 16	MOBILE GCA
EPKU	ANMPN 17	MOBILE GCA
EPKV	ANMPN 18	
EPKW	ANMPN 5A	
EPLA	ANMPQ 4	MORTAR LOCATOR, ARMY
EPLB	ANMPQ 12	MISSILE TRACKING
EPLC	ANMPQ 18	MISSILE TRACKING
EPLD	ANMPQ 25	TRAILER MOUNTED
EPLE	ANMPQ 25A	ANTENNA GROUP
EPLF	ANMPQ 29	RADAR CONTROL SYSTEM (DRONE)
EPLG	ANMPQ 31	TRACKING & GUIDANCE
EPLH	ANMPQ 32	FIELD DETECTION & TRACKING
EPLJ	ANMPQ 33	CW ILLUMINATOR
EPLK	ANMPQ 34	CW TARGET ACQUISITION
EPLL	ANMPQ 35	PULSE TARGET ACQUISITION
EPLM	ANMPQ 37	RANGE RADAR
EPLN	ANMPQ 39	CW TARGET ILLUMINATION
EPLP	ANMPQ 501	COUNTER MORTAR

EIC CODE	AN DESIGNATION	DESCRIPTION
EPLQ	ANMPQ T2	
EPLR	ANMPQ 10	
EPLS	ANMPQ 2A	
EPLT	ANMPQ 34	
EPLU	ANMPQ 39	
EPLV	ANMPQ 4A	
EPMA	ANMPS 3	HEIGHT FINDER
EPMB	ANMPS 4	HEIGHT FINDER
EPMC	ANMPS 4A	HEIGHT FINDER
EPMD	ANMPS 4C	HEIGHT FINDER
EPME	ANMPS 7	LONG RANGE SEARCH
EPMF	ANMPS 8	SURVEILLANCE
EPMG	ANMPS 9	DRONE & MISSILE CONTROL
EPMH	ANMPS 11	LONG RANGE SEARCH
EPMJ	ANMPS 11A	LONG RANGE SEARCH
EPMK	ANMPS 14	LONG RANGE HEIGHT FINDER
EPML	ANMPS 16	NODDING BEAM HEIGHT RADAR
EPMM	ANMPS 21	THREE D SEARCH
EPMN	ANMPS 23	THREE D SEARCH
EPMP	ANMPS 24	LONG RANGE SEARCH
EPMQ	ANMPS 25	MONOPULSE TRACKING
EPMR	ANMPS 26	THREE D TRACKING
EPMS	ANMPS 30	MOBILE SURVEILLANCE
EPMT	ANMPS 34	METEOROLOGICAL RADAR
EPMU	ANMPS 19	

EIC CODE	AN DESIGNATION	DESCRIPTION
EPNB	ANMPT 1	
EPND	ANPPN 16	MANPACK RADIO BEACON
EPNG	ANPPS 3	PORTABLE SURVEILLANCE
EPNH	ANPPS 4	GROUND RADAR SURVEILLANCE
EPNJ	ANPPS 5	BATTLEFIELD RADAR
EPPA	ANTPA 5	COMPUTER INDICATOR GROUP
EPPB	ANTPA 6	INDICATOR GROUP
EPPH	ANTPN 8	GCA
EPPJ	ANTPN 12	AIR TRAFFIC GCA
EPPK	ANTPN 14	TRANSPORTABLE SHELTERIZED GCA
EPPL	ANMPX 7	
EPPM	ANMPX 7A	
EPPN	ANTPN 12A	
EPPP	ANTPN 7	
EPQA	ANTPQ 10	COURSE DIRECTION CENTRAL
EPQB	ANTPQ 11	CLOUD HEIGHT AND LAYER MEASURING
EPQC	ANTPQ 14	CW TARGET ILLUMINATOR
EPQD	ANTPQ 15	CW ACQUISITION
EPQE	ANTPQ 16	PULSE TARGET ACQUISITION
EPQF	ANTPQ 18	MISSILE PRECISION INSTRUMENTATION
EPQG	ANTPQ 19	CW TARGET ILLUMINATION
EPRA	ANTPS 1B	AIR DEFENSE
EPRB	ANTPS 1D	AIR DEFENSE
EPRC	ANTPS 1G	SEARCH RADAR

EIC CODE	AN DESIGNATION	DESCRIPTION
EPRD	ANTPS 10D	HEIGHT FINDER
EPRE	ANTPS 15	AIR DEFENSE
EPRF	ANTPS 17	AIR DEFENSE
EPRG	ANTPS 21	PORTABLE SURVEILLANCE
EPRH	ANTPS 22	TACTICAL LONG RANGE
EPRJ	ANTPS 25	BATTLEFIELD SURVEILLANCE
EPRK	ANTPS 25A	COMBAT SURVEILLANCE
EPRL	ANTPS 27	TACTICAL SEARCH & HT. FINDING
EPRM	ANTPS 28	LONG RANGE SURVEILLANCE
EPRN	ANTPS 31	HARBOR SURVEILLANCE
EPRP	ANTPS 32	AIR DEFENSE HEIGHT FINDER
EPSA	ANTPS 33	PORTABLE SURVEILLANCE
EPSB	ANTPS 34	TACTICAL LONG RANGE EARLY WARNING
EPSC	ANTPS 35	SURVEILLANCE RADAR
EPSD	ANTPS 37	HEIGHT FINDER
EPSE	ANTPS 39	AREA SECURITY SURVEILLANCE
EPSF	ANTPS 40	HEIGHT FINDER
EPSG	ANTPS 41	MOBILE WEATHER
EPSH	ANTPS 44	TRANSPORTABLE RADAR
EPSJ	ANTPS 1E	
EPSK	ANTPS 22A	
EPSL	ANTPS 34A	
EPSM	ANTPS 37A	
EPTA	ANTPX 19	MARK X IFF RADAR

EIC CODE	AN DESIGNATION	DESCRIPTION
EPTB	ANTPX 20	MARK X IFF RADAR
EPTC	ANTPX 21	MARK X IFF RADAR
EPTD	ANTPX 22	MARK X IFF RADAR
EPTE	ANTPX 17	
EPTF	ANTPX 17A	
EPTG	ANTPX 17C	
EPTH	ANTPX 18	
EPTJ	ANTPX 18A	
EPTK	ANUPA 3	MARK V IFF ANTENNA GROUP
EPTL	ANUPA 5	MARK V IFF DISPLAY GROUP
EPTM	ANUPA 6	MARK V IFF ANTENNA GROUP
EPTN	ANUPA 9	MARK V IFF DISPLAY GROUP
EPTP	ANUPA 35	STANDARD INDICATOR
EPTQ	ANUPA 38	MARK V IFF CODER-DECODER
EPTR	ANUPA 48	RADAR DISPLAY SET
EPTS	ANTPX 26	
EPTT	ANTPX 27	
EPUA	ANUPD 2	SURVEILLANCE SYSTEM
EPUB	ANUPM 20	RADAR TEST SET
EPUC	ANUPM 30	RADAR TEST SET
EPUD	ANUPM 32	RADAR TEST SET (X BAND)
EPUE	ANUPM 79	RADAR TEST SET
EPUF	ANUPM 102	RADAR MICROWAVE TEST SYSTEM
EPUK	ANUPN 8	RADAR BEACON
EPUN	ANUPW 1	RADAR TRACKING & CONTROL

EIC CODE	AN DESIGNATION	DESCRIPTION
EPUP	ANUPN 12	
EPUQ	ANUPN 12B	
EPUR	ANUPN 15	
EPUS	ANUPN 7	
EPVA	ANUPX T1	MARK X IFF TRAINER
EDVB	ANUPX 2	MARK X IFF RADAR
EPVC	ANUPX 5B	MARK X IFF RADAR
EPVD	ANUPX 6	MARK X IFF RADAR
EPVE	ANVPX 7	TRANSCEIVER
EPVK	ANWPN 3A	LORAN C RECEIVER
EPVL	ANWPN 4	LORAN C RECEIVER
EPVM	ANUPS 1	
EPVN	ANUPS 1A	
EPVP	ANUPS 1B	
EPVQ	ANUPS 1C	
EPWA	ANGPX 18A	
EPWB	ANGPX 28	
EPWC	ANGPX 34	
EPWD	ANGPX 6A	
EPWE	ANGPX 7	
EPWF	ANGPX 7A	
EPWG	ANGPX 8	
EPWH	ANGPX 8A	
EPWJ	ANGPX 9	

EIC CODE	AN DESIGNATION	DESCRIPTION
EPWK	ANGPX 9B	
EPXA	ANUPX 1	
EPXB	ANUPX 1A	
EPXC	ANUPX 11	
EPXD	ANUPX 14	
EPXE	ANUPX 17	
EPXF	ANUPX 4	
EPXG	ANUPX 5	
EPXH	ANUPX 6A	
EPXJ	ANUPX 6C PN 4A	
EPXK	ANUPX 6G PX 7A	
EPXL	ANUPX 7	
	SONAR (Q)	
EQAA	ANFQQ 10	SONAR SET
EQAB	ANFQQ 8	SUBMERGED SONIC DETECTION
EQAC	ANFQS 3	SONAR "ON SHORE SCANNING"
EQBA	ANUQC 1	UNDERWATER TELEPHONE
EQBB	ANUQN 1	NAVIGATION SONAR
EQBC	ANUQS 1	HIGH RESOLUTION SUBM. SONAR
EQBD	ANUQS T1	SONAR TRAINER
EQBE	ANUQS T1A	SONAR TRAINER
EQBF	ANUQS T1B	SONAR OPERATION TRAINER
EQBG	ANUQS T1C	FOR AN-SQS-4-29,
EQBH	ANUQS T1F	-30,-31,-32

EIC CODE	AN DESIGNATION	DESCRIPTION
EQCA	ANWQC 1	UNDERWATER ACOUSTIC COMM SYSTEM
EQCB	ANWQC 2	SONAR SSB COMMUNICATION SET
	RADIO (R)	
ERAA	ANCRD 6	RADIO DIRECTION FINDER
ERAD	ANFRC 10	
ERAE	ANFRC 101	
ERAF	ANFRC 102	
ERAG	ANFRC 109	
ERAH	ANFRC 15	
ERAJ	ANFRC 20	
ERAK	ANFRC 23	
ERAL	ANFRC 24	
ERAM	ANFRC 25	
ERAN	ANFRC 26	
ERAP	ANFRC 27	
ERAQ	ANFRC 31	
ERAR	ANFRC 34	
ERAS	ANFRC 35	
ERAT	ANFRC 36	
ERAU	ANFRC 37	
ERBA	ANFRA 49	HF TRANSMITTER ANT. COUPLER
ERBB	ANFRC 39	GROUND RADIO
ERBC	ANFRC 39A	RADIO FREQUENCY EQUIPMENT

EIC CODE	AN DESIGNATION	DESCRIPTION
ERBD	ANFRC 40	GROUND COMMUN. ELEMENT SPACECOM
ERBE	ANFRC 45	FIXED COMMUNICATION STATION
ERBF	ANFRC 47	TROPO SCATTER
ERBK	ANFRC 84	MICROWAVE
ERBL	ANFRC 88	TROPO COMM EQUIPMENT
ERBM	ANFRC 109	MILITARY MICROWAVE
ERBN	ANFRQ 11	FIXED MICROWAVE DATA LINK
ERBP	ANFRT 32	RADAR TRANSMITTER
ERBQ	ANFRT 33	HF POWER TRANSMITTER
ERBR	ANFRT 48	UHF TRANSMITTER
ERBS	ANFRT 61	LF TRANSMITTER
ERBT	ANFRT 62	SHORE RADIO TRANSMITTER
ERBU	ANGRA 24	
ERBV	ANGRA 34	
ERBW	ANGRA 53	
ERBX	ANGRA 54	
ERCA	ANGRA 39	RADIO SET CONTROL GROUP
ERCB	ANGRC 3	VEHICULAR FM RADIO
ERCC	ANGRC 4	SETS FOR TANK AND
ERCD	ANGRC 5	COMMAND
ERCE	ANGRC 6	10 MI. RANGE
ERCF	ANGRC 7	
ERCG	ANGRC 8	
ERCH	ANGRC 9C	TACAN

EIC CODE	AN DESIGNATION	DESCRIPTION
ERCJ	ANGRC 10	PORTABLE RALIO RELAY
ERCK	ANGRC 19	RADIO SET
ERCL	ANGRC 26	MOBILE AM-FM SET
ERCM	ANGRC 29	AN GRC-46 WITHOUT SHELTER
ERCN	ANGRC 100	
ERCP	ANGRC 115	
ERCQ	ANGRC 119	
ERCR	ANGRC 124	
ERCS	ANGRC 126	
ERCT	ANGRC 127	
ERCU	ANGRC 129	
ERCV	ANGRC 26A	
ERCW	ANGRC 26B	
ERCX	ANGRC 26D	
ERCY	ANGRC 27	
ERCZ	ANGRC 27A	
ERDA	ANGRC 46	RADIO TELETYPE
ERDB	ANGRC 50	TACTICAL TWO WAY COMM SET
ERDC	ANGRC 62	TACTICAL COMMUNICATIONS
ERDD	ANGRC 66	RADIO SET
ERDE	ANGRC 68	RADIO SET
ERDF	ANGRC 86	SINGLE SIDEBAND
ERDG	ANGRC 106	TWO WAY MOBILE SET
ERDH	ANGRC 109	
ERDJ	ANGRC 112	RADIO SET

EIC CODE	AN DESIGNATION	DESCRIPTION
ERDK	ANGRC 125	DUAL PURPOSE SET
ERDL	ANGRC 32	
ERDM	ANGRC 32A	
ERDN	ANGRC 32B	
ERDP	ANGRC 41	
ERDQ	ANGRC 46A	
ERDR	ANGRC 46B	
ERDS	ANGRC 48	
ERDT	ANGRC 50V1	
ERDU	ANGRC 50V2	
ERDV	ANGRC 87	
ERDW	ANGRC 9	
ERDX	ANGRC 9Y	
ERDY	ANGRC 9Z	
EREA	ANGRD 11	UHF DIRECTION FINDER
EREB	ANGRD 5	
EREL	ANGRM 32	COMM. FIELD MAINT. FACILITY
EREM	ANGRQ 2	
ERER	ANGRR 5	PORTABLE AM RADIO
ERES	ANGRR 13	
ERET	ANGRR 5	
EREU	ANGRR 7	
EREV	ANGRR 7C	
EREW	ANGRS 1	

EIC CODE	AN DESIGNATION	DESCRIPTION
EREX	ANGRT 3	
EREY	ANGRT 3A	
EREZ	ANGRT 3D	
ERFA	ANMRC 54	COMPLETE MOBILE RADIO-RELAY
ERFB	ANMRC 59	TACTICAL COMMUNICATIONS
ERFC	ANMRC 60	TACTICAL COMMUNICATIONS
ERFD	ANMRC 68	MOBILE 4 CHANNEL RADIO RELAY
ERFE	ANMRC 69	MOBILE 12 CHANNEL RADIO RELAY
ERFF	ANMRC 83	MOBILE COMMUN. SYSTEM
ERFG	ANMRC 95	MOBILE HF SINGLE SIDEBAND
ERFH	ANMRC 98	MOBILE TROPO SCATTER COMM. TERM
ERFJ	ANMRC 107	MOBILE COMMUN. CENTRAL
ERFK	ANMRC 108	MOBILE COMMUN. CENTRAL
ERFL	ANMRC 104	
ERFM	ANMRC 105	
ERFN	ANMRC 22	
ERFP	ANMRC 23	
ERFQ	ANMRC 37	
ERFR	ANMRC 38	
ERFS	ANMRC 40	
ERFT	ANMRC 41	
ERGA	ANMRN 7	MOBILE ILS TRANSMITTER
ERGB	ANMRN 8	MOBILE ILS GLIDESLOPE TRANSM.
ERGC	ANMRN 20	MOBILE AIR TRAFFIC CONTROL
ERGD	ANMRQ 7	RADIO SET, TRAILER MOUNTED

EIC CODE	AN DESIGNATION	DESCRIPTION
ERGF	ANMRN 12A	
ERGG	ANMRN 13	
ERGH	ANMRN 18	
ERGJ	ANMRN 21	
ERGK	ANMRN 7A	
ERGL	ANMRN 8A	
ERGM	ANMRN 9	
ERGN	ANMRR 5	
ERGP	ANMRR 5A	
ERGQ	ANMRT 6	
ERGR	ANMRT 9	
ERGS	ANMRW 5	
ERHA	ANPRC 6	PORTABLE SHORT RANGE RADIO
ERHB	ANPRC 8	MAN PACKED PORTABLE FM
ERHC	ANPRC 9	MAN PACKED PORTABLE FM
ERHD	ANPRC 10	MAN PACKED PORTABLE FM
ERHE	ANPRC 25	TRANSISTORIZED FM SET
ERHF	ANPRC 38	PORTABLE RADIO TRANSCEIVER
ERHG	ANPRC 41	UHF PACK SET
ERHH	ANPRC 47	PORTABLE DUAL PACK HF-SSB
ERHJ	ANPRC 55	HAND SET RADIO
ERHK	ANPRC 56	HELMET RADIO
ERHL	ANPRC 62	PORTABLE RADIO

EIC CODE	AN DESIGNATION	DESCRIPTION
ERHM	ANPRC 64	LIGHT WEIGHT PORTABLE
ERHN	ANPRC 65	MANPACK VHF TRANSCEIVER
ERHP	ANPRC 66	COMPACT MULTI CHANNEL
ERHQ	ANPRC 71	FORWARD AIR CONTROLLER PACK
ERHR	ANPRC 10A	
ERHS	ANPRC 21	
ERHT	ANPRC 28	
ERHU	ANPRC 29	
ERHV	ANPRC 33	
ERHW	ANPRC 39	
ERHX	ANPRC 40	
ERHY	ANPRC 40AX	
ERHZ	ANPRC 58	
ERJA	ANPRD 3	RADIO DIRECTION FINDER
ERJB	ANPRR 9	HELMET-VEST POCKET FM RECEIVER
ERJC	ANPRT 4	RADIO TRANSMITTER FOR HELMET
ERKA	ANTRC 16	RADIO SET
ERKB	ANTRC 20	AIR TRANSPORTABLE BROADCASTING
ERKC	ANTRC 24	TRANSPORTABLE COMMUN. SYSTEM
ERKD	ANTRC 27	TDM TACTICAL COMMUNICATIONS
ERKE	ANTRC 27A	TDM TACTICAL COMMUNICATIONS
ERKF	ANTRC 66	TROPO SCATTER RADIO SET
ERKG	ANTRC 68	AIR-GROUND RADIO SET
ERKH	ANTRC 80	TRANSPORTABLE COMM. TERMINAL

EIC CODE	AN DESIGNATION	DESCRIPTION
ERKJ	ANTRC 87	AIR TRANSP. UHF COMM. SYSTEM
ERKK	ANTRC 90	TRANSP. TROPO SCATTER TERMINAL
ERKL	ANTRC 90B	GROUND COMMUNICATION SET
ERKM	ANTRC 97	AIR TRANS. TROPOSCATTER SYSTEM
ERKN	ANTRC 112	TROPOSPHERIC SCATTER TERMINAL
ERKP	ANTRC 129	MOBILE TROPOSPHERIC SCATTER SYSTEM
ERKQ	ANPRC 59	
ERKR	ANPRC 61	
ERKS	ANPRC 8A	
ERKT	ANPRC 9A	
ERLA	ANTRD 2	MICROWAVE TELEPHONE EQUIPMENT
ERLB	ANTRD 3	RADIO DIRECTION FINDER
ERLC	ANTRD 10	
ERLD	ANTRD 12	
ERLE	ANTRD 4	
ERLF	ANTRN 9	PORTABLE RADIO BEACON
ERLG	ANTRN 14	TACAN GROUND BEACON
ERLH	ANTRN 16	TACTICAL BEACON
ERLJ	ANTRN 17	TACAN NAVIGATION TRANSPONDER
ERLK	ANTRN 20	PATHFINDER RADIO BEACON
ERLL	ANTRN 6	
ERLN	ANTRQ 12	
ERLP	ANTRQ 1	INFRARED SURVEILLANCE INFO CTR.
ERLQ	ANTRQ 20	HELICOPTER TRANSP. BROADCAST SYS.

EIC CODE	AN DESIGNATION	DESCRIPTION
ERLR	ANTRQ 21	MOBILE MICROWAVE DATA LINK
ERLV	ANTRR 2	TACTICAL RADIO RECEIVER
ERLW	ANTRR 5	
ERMA	ANURA 22	DIGITAL SELECTIVE COMM. SYSTEM
ERMB	ANURA 29	DIGITAL SELECTIVE COMM. SYSTEM
ERMC	ANURA 32	CODER SWITCHING GROUP
ERMD	ANTSM 29A	
ERME	ANTSM 47	
ERMH	ANURC 3	GENERAL COMMUNICATIONS SET
ERMJ	ANURC 32	GENERAL PURPOSE RECEIVER
ERMK	ANURC 44	AIR TRANSPORTABLE COMMAND POST SYST.
ERML	ANURC 54	UHF PORTABLE TRANSCEIVER
ERMR	ANURD 2	VHF DIRECTION FINDING SYSTEM
ERMS	ANURD 4	UHF DIRECTION FINDER
ERMT	ANURD 2A	
ERNA	ANURM 144	GENERATOR
ERNB	ANURM 47	
ERNE	ANURN 5	BEACON TRANSMITTER
ERNH	ANURR 1	RADIO DIRECTION FINDER
ERNJ	ANURR 35	RECEIVER
ERNK	ANURR 40	RADIO DIRECTION FINDER
ERNP	ANURT 14	MF 500 WATT TRANSMITTER
ERNS	ANURW 12 (AA)	GROUND GUIDANCE CONTROL
ERNT	ANVRQ 1	VEHICULAR FM RADIO-CONSISTS

NOTE: COMBINE ANVRQ 1,2,3

EIC CODE	AN DESIGNATION	DESCRIPTION
ERNU	ANVRQ 2	OF TWO AN VRC 8-9-10 ON A
ERNV	ANVRQ 3	SINGLE MOUNTING
ERPA	ANWRC 1	SHIP TO SHORE COMM. SET
ERPB	ANWRR 1	RADIO RECEIVER
ERPC	ANWRR 2	
ERPE	ANWRT 1	MEDIUM FREQUENCY SHIPBOARD XMTTR
ERPF	ANWRT 2	SHIPBOARD HF GP TRANSMITTER
ERPG	ANWRT 4	
ERQA	ANFRC 42	
ERQB	ANFRC 45	
ERQC	ANFRC 45V	
ERQD	ANFRC 47	
ERQE	ANFRC 51	
ERQF	ANFRC 52	
ERQG	ANFRC 52A	
ERQH	ANFRC 52B	
ERQJ	ANFRC 58	
ERQK	ANFRC 59	
ERQL	ANFRC 6	
ERQM	ANFRC 6A	
ERQN	ANFRC 7	
ERRA	ANFRC 7A	
ERRB	ANFRC 70	
ERRC	ANFRC 70A	

EIC CODE	AN DESIGNATION	DESCRIPTION
ERRD	ANFRC 75	
ERRE	ANFRC 83	
ERRF	ANFRC 92	
ERRG	ANFRC 93	
ERRH	ANFRD 10	
ERRJ	ANFRD 2	
ERSA	ANFRN 12	
ERSB	ANFRN 12A	
ERSC	ANFRN 17	
ERSD	ANFRN 20	
ERSE	ANFRN 22	
ERSF	ANFRN 22A	
ERSG	ANFRN 23	
ERSH	ANFRN 24	
ERSJ	ANFRN 24A	
ERSK	ANFRN 7	
ERSM	ANFRQ 11	
ERTA	ANFRR 12	
ERTB	ANFRR 21	
ERTC	ANFRR 22	
ERTD	ANFRR 23	
ERTE	ANFRR 26	

EIC CODE	AN DESIGNATION	DESCRIPTION
ERTF	ANFRR 27	
ERTG	ANFRR 28	
ERTH	ANFRR 30	
ERTJ	ANFRR 36	
ERTK	ANFRR 38	
ERTL	ANFRR 39	
ERTM	ANFRR 40	
ERTN	ANFRR 41	
ERTP	ANFRR 49	
ERTQ	ANFRR 50 2	
ERTR	ANFRR 59	
ERTS	ANFRR 59A	
ERTT	ANFRR 60	
ERTU	ANFRR 60V	
ERTV	ANFRR 70V	
ERUA	ANFRT 10	
ERUB	ANFRT 15	
ERUC	ANFRT 15A	
ERUD	ANFRT 15D	
ERUE	ANFRT 17	
ERUF	ANFRT 18	
ERUG	ANFRT 19	
ERUH	ANFRT 22	

EIC CODE	AN DESIGNATION	DESCRIPTION
ERUJ	ANFRT 24	
ERUK	ANFRT 24A	
ERUL	ANFRT 25	
ERUM	ANFRT 26	
ERUN	ANFRT 27	
ERUP	ANFRT 31	
ERUQ	ANFRT 33	
ERUR	ANFRT 37	
ERUS	ANFRT 39	
ERUT	ANFRT 39A	
ERUU	ANFRT 39B	
ERUV	ANFRT 39C	
ERUW	ANFRT 39D	
ERUX	ANFRT 39E	
ERUY	ANFRT 39G	
ERUZ	ANFRT 39H	
ERVA	ANFRT 4	
ERVB	ANFRT 40	
ERVC	ANFRT 40A	
ERVD	ANFRT 40B	
ERVE	ANFRT 40C	
ERVF	ANFRT 49	
ERVG	ANFRT 5	
ERVH	ANFRT 5A	

EIC CODE	AN DESIGNATION	DESCRIPTION
ERVJ	ANFRT 5B	
ERVK	ANFRT 50	
ERVL	ANFRT 502	
ERVM	ANFRT 503	
ERVN	ANFRT 51	
ERVP	ANFRT 52	
ERVQ	ANFRT 52A	
ERVR	ANFRT 53	
ERVS	ANFRT 56	
ERVT	ANFRT 57	
ERVU	ANFRT 6C	
ERVV	ANFRT 61	
ERVW	ANFRT62	
ERVX	ANFRW 2	
ERVY	ANFRW 2A	
ERVZ	ANFRW 3	
ERWA	ANGRN 6	
ERWB	ANGRN 9	
ERWC	ANGRN 9A	
ERWD	ANGRN 9B	
ERWE	ANGRN 9C	
ERWF	ANGRW 5	
ERXA	ANVRC 7	VEHICULAR FM RADIO-1 MILE
ERXB	ANVRC 8	VEHICULAR FM RADIO
ERXC	ANVRC 9	VEHICULAR FM RADIO

EIC CODE	AN DESIGNATION	DESCRIPTION
ERXD	ANVRC 10	VEHICULAR FM RADIO
ERXE	ANVRC 12	TRANSISTORIZED VEHICULAR FM 22 MILE
ERXF	ANVRC 18	VEHICULAR FM RADIO 10 MILE
ERXG	ANVRC 24	VEHICULAR FM RADIO 30-100 MILE
ERXH	ANVRC 29	MOBILE TELETYPEWRITER SET
ERXJ	ANVRC 43	VEHICULAR FM RADIO 22 MILE
ERXK	ANVRC 45	VEHICULAR FM RADIO 22 MILE
ERXL	ANVRC 47	VEHICULAR FM RADIO 22 MILE
ERXM	ANVRC 49	VEHICULAR FM RADIO 22 MILE
ERYA	ANVRC 45	
ERYB	ANVRC 47	
ERYC	ANVRC 56	
ERYD	ANVRC 6	
ERYE	ANVRC 6C	
ERYF	ANVRC 69VCB	
ERYG	ANVRC 69VH1	
ERYH	ANVRC 69VFLO	
ERYJ	ANVRC 79	
ERYK	ANVRC 80	
ERYL	ANVRC 83	
ERYM	ANVRC 85V	
ERYN	ANVRC 85V3	
ERYP	ANVRC 87	
ERYQ	ANVRC 99	

EIC CODE	AN DESIGNATION	DESCRIPTION
ERYR	ANMRD 14	
ERZA	ANTRC 1	
ERZB	ANTRC 11	
ERZC	ANTRC 13	
ERZD	ANTRC 22	
ERZE	ANTRC 24BBND	
ERZF	ANTRC 24CBND	
ERZG	ANTRC 24DBND	
ERZH	ANTRC 24FH1	
ERZJ	ANTRC 24FLO	
ERZK	ANTRC 28	
ERZL	ANTRC 29	
ERZM	ANTRC 32	
ERZN	ANTRC 35B	
ERZP	ANTRC 35C	
ERZQ	ANTRC 36C	
ERZR	ANTRC 38	
ERZS	ANTRC 42	
ERZT	ANTRC 47	
ERZU	ANTRC 66A	
ERZV	ANTRC 75	
ERZW	ANTRC 8	

EIC CODE	AN DESIGNATION	DESCRIPTION
EUAA	ANURC 10	
EUAB	ANURC 17	
EUAC	ANURC 18	
EUAD	ANURC 32A	
EUAE	ANURC 32B	
EUAF	ANURC 38	
EUAG	ANURC 40	
EUAH	ANURC 45	
EUAJ	ANURC 49	
EUAK	ANURC 50	
EUAL	ANURC 54	
EUAM	ANURX 7	
EUAN	ANURC 9	
EUAS	ANURN 3	
EUAT	ANURN 3A	
EUAU	ANURN 3MRN 18	
EUBA	ANURR 13	
EUBB	ANURR 13A	
EUBC	ANURR 13B	
EUBD	ANURR 21	
EUBE	ANURR 21A	
EUBF	ANURR 23	
EUBG	ANURR 23A	
EUBH	ANURR 27	

EIC CODE	AN DESIGNATION	DESCRIPTION
EUBJ	ANURR 27A	
EUBK	ANURR 27C	
EUBL	ANURR 29X	
EUBM	ANURR 35A	
EUBN	ANURR 35B	
EUBP	ANURR 35C	
EUBQ	ANURR 35D	
EUBR	ANURR 39	
EUBS	ANURR 50V	
EUCA	ANURT 10	
EUCB	ANURT 17	
EUCC	ANURT 17A	
EUCD	ANURT 18	
EUCE	ANURT 19	
EUCF	ANURT 19V	
EUCG	ANURT 23V	
EUCH	ANURT 3X	
EUCJ	ANURT 7	
EUCK	ANURT 7A	
EUCL	ANURT 7B	
EUCM	ANURT 7C	
EUCN	ANURT 7O	

EIC CODE	AN DESIGNATION	DESCRIPTION
EUDA	ANVRC 12 MOD	
EUDB	ANVRC 125	
EUDC	ANVRC 19	
EUDD	ANVRC 19X	
EUDE	ANVRC 19Y	
EDUF	ANVRC 2	
EUDG	ANVRC 2B	
EUDH	ANVRC 26X	
EUDJ	ANVRC 27	
EUDK	ANVRC 29	
EUDL	ANVRC 32	
EUDM	ANVRC 33	
EUDN	ANVRC 34	
EUDP	ANVRC 36	
EUDQ	ANVRC 37	
EUDR	ANVRC 41	
EUDS	ANVRC 42	
EUDT	ANVRC 46	
EUDU	ANVRC 51	
EUDV	ANVRC 51X	
EUDW	ANVRC 52	
EUEA	ANVRC 56	
EUEB	ANVRC 57	
EUEC	ANVRC 58	

EIC CODE	AN DESIGNATION	DESCRIPTION
EUED	ANVRC 6	
EUEE	ANVRC 6X	
EUEF	ANVRC 6XX	
EUEG	ANVRC 6Y	
EUEH	ANVRC 6O	

SPECIAL TYPES (S)

EIC CODE	AN DESIGNATION	DESCRIPTION
ESAA	ANFSA 12	DETECTOR TRACKING EQUIPMENT
ESAB	ANFSA 21	WEAPONS CONTROL EQUIPMENT
ESAC	ANFSA 23	JAMMER TRACKING EQUIPMENT
ESAD	ANFSA 31	DATA PROCESSING CENTRAL
ESAK	ANFSG 1	SEMI-AUTO COMMAND CONTROL SYSTEM
ESAL	ANFSM 17	RADAR MEASURING SYSTEM
ESAM	ANFSQ 7	SAGE COMPUTER
ESAN	ANFSQ 8	SAGE COMPUTER
ESAP	ANFSQ 27	DATA PROCESSING CENTER
ESAQ	ANFSQ 31	DATA PROCESSING CENTRAL
ESAR	ANFSQ 38	AIR DEFENSE SYSTEM COMPUTER
ESBA	ANFSR 2	OPTICAL SURVEILLANCE SYSTEM
ESBB	ANFSS 3	NUCLEAR DETONATION DETECTION SYSTEM
ESBC	ANFSS 7	RADAR SURVEILLANCE CENTRAL
ESBD	ANFST 2	SAGE DATA TRANSMITTER
ESBE	ANGSA 7	REMOTE CONTROL UNIT
ESBF	ANGSA 28	PRELAUNCH TRANSLATOR
ESBG	ANGSA 34	BATTERY INTERCONNECTION GROUP
ESBH	ANGSA 42	AUTOMATIC VOICE INSTRUCTION DATA LINK
ESBJ	ANGSA 50	LAUNCH CONTROL GROUP
ESBK	ANGSA 52	UHF COMMUNICATION SYSTEM

EIC CODE	AN DESIGNATION	DESCRIPTION
ESBL	ANGSC 7	GROUND HF RECEIVER
ESBM	ANGSC 10	COMMUNICATIONS SYSTEM
ESBN	ANGSG 5	BATTERY INTEGRATION FIRE CONTROL
ESBP	ANGSG 6	BATTERY INTEGRATION NIKE CONTROL
ESBS	ANGSM 16	TEST CONSOLE ATLAS III
ESBT	ANGSM 18	POWER SUPPLY TESTER, ATLAS III
ESBU	ANGSM 19	PLUG IN TEST UNIT, ATLAS III
ESBV	ANGSM 73	AGE TESTER
ESCA	ANGSN 5	TRACKING RADAR
ESCB	ANGSN 5A	AIRCRAFT LANDING SYSTEM
ESCF	ANGSQ 29	TARGET TRACKING SYSTEM
ESCG	ANGSQ 33	DIGITAL COMPUTER ATLAS III
ESCH	ANGSQ 44	ATOMIC STRIKE RECORDING COMPLEX
ESCJ	ANGSQ 47	BOMB DAMAGE ASSESSMENT
ESCP	ANGSS 1	RADAR SURVEILLANCE CENTRAL
ESCQ	ANGSS 7	RADAR SURVEILLANCE CENTRAL
ESDA	ANMSA 6	COMPUTER GROUP
ESDB	ANMSA 7	BATTERY CONTROL TRAILER
ESDF	ANMSC 29	MOBILE TELETYPEWRITER UNIT
ESDH	ANMSE 1	GUIDED MISSILE FIRING STATION
ESDL	ANMSG 4	MISSILE TEST STATION
ESDP	ANMSM 4	MISSILE TEST STATION
ESDQ	ANMSM 42	FAULT LOCATOR SET
ESDR	ANMSM 43	FLIGHT READINESS TEST SET

EIC CODE	AN DESIGNATION	DESCRIPTION
ESDS	ANMSM 63	SPECTRUM SIGNAL ANALYZER SET
ESEA	ANMSN 3	RADAR COURSE DIRECTING CENTRAL
ESEE	ANMSQ 5	TEST AND TRAINING CENTRAL
ESEF	ANMSQ 18	AIR DEFENSE OPERATIONS SYSTEM
ESEG	ANMSQ 19	TACTICAL OPERATIONS CENTER
ESEH	ANMSQ 28	MISSILE MONITOR
ESEJ	ANMSQ 35	TRACKING RADAR
ESEK	ANMSQ 37	MOBILE TEST SYSTEM
ESEL	ANMSQ 43	RADAR DATA BRIGHT DISPLAY
ESEM	ANMSQ 44	TRACKING RADAR
ESEN	ANMSQ 51	TRACKING AND GUIDANCE RADAR
ESEP	ANMSQ 55	MOBILE CALIBRATION VAN
ESEU	ANMSW 1	ACQUISITION RADAR
ESEV	ANMSW 2	
ESFA	ANPSS 6	IR INTRUSION ALARM
ESFH	ANTSA 14	TRANSISTORIZED AUTO VOICE
ESFL	ANTSC 15	HF-SSB MULTIPLEX CONTROL
ESFM	ANTSC 18	SSB COMMUNICATIONS SYSTEM
ESFN	ANTSC 20	SSB COMMUNICATIONS SYSTEM
ESFP	ANTSC 22	COMMUNICATIONS SYSTEM
ESFQ	ANTSC 23	COMMUNICATIONS CENTRAL 482L
ESFR	ANTSC 28	HF SSB TRANSCOM
ESFS	ANTSC 38	HF SSB
ESFT	ANTSC 39	AIR TRAFFIC CONTROL COMM CENTER

EIC CODE	AN DESIGNATION	DESCRIPTION
ESFU	ANTSC 53	COMMUNICATIONS CENTER
ESGA	ANTSM 22	TRANSPORTABLE TEST SET
ESGB	ANTSM 26	TRANSPORTABLE TEST SET
ESGC	ANTSM 29	RADIATION SYSTEM
ESGD	ANTSM 39	FIELD TEST SET
ESGE	ANTSM 40	FIELD TEST SET
ESGF	ANTSM 41	FIELD TEST SET
ESGG	ANTSM 42	FIELD TEST SET
ESGH	ANTSM 43	FIELD TEST SET
ESGJ	ANTSM 44	GROUND EQUIPMENT TEST SET
ESGK	ANTSM 45	GROUND EQUIPMENT TEST SET
ESGL	ANTSM 46	CONTROL SYSTEM TEST SET
ESGM	ANTSM 56	HELICOPTER TRANSPORTABLE MAINT. FAC
ESGN	ANTSQ 13	TACTICAL AIR CONTROL SYSTEM
ESGP	ANTSQ 18	RADAR SURVEILLANCE CENTRAL
ESGQ	ANTSQ 38	AIR DEFENSE OPERATIONS SYSTEM
ESGR	ANTSQ 39	TRACKING AND GUIDANCE
ESGS	ANTSQ 47	AIR TRAFFIC CONTROL COMM SYSTEM
ESGT	ANTSQ 51	FIRE COORDINATION SYSTEM
ESGU	ANTSQ 61	OPERATIONS CENTER
ESHA	ANTSW 2	BATTERY CONTROL CENTER
ESHB	ANTSW 4	FIRE COMMAND CONSOLE
ESHC	ANTSW 5	TACTICAL APPROACH RADAR
ESHD	ANTSW 6	CONTROL TOWER CENTRAL

EIC CODE	AN DESIGNATION	DESCRIPTION
ESKA	ANUSC 2	TARGET INTERCEPT COMPUTER
ESKB	ANUSC 2	SSB COMMUNICATIONS SYSTEM
ESKC	ANUSC 3V	SSB COMMUNICATIONS SYSTEM
ESKL	ANUSD 1	AREA SURVEILLANCE
ESKM	ANUSD 7	ECM SYSTEM
ESKR	ANUSM 41	TEST SET
ESKS	ANUSM 49	BATTERY TEST SET
ESKT	ANUSM 117	OSCILLOSCOPE
ESLA	ANUSQ 6	MEASURING EQUIPMENT
ESLB	ANUSQ 20	NAVAL TACTICAL DATA SYSTEMS
ESLC	ANUSQ 25	EXTENSION OF SAGE
ESLD	ANUSQ 28	PHOTO MAPPING SYSTEM
ESLN	ANUSC 1	VEHICULAR RADIO TELETYPEWRITER
ESLW	ANUSW 2	
ESMA	ANMSQ 10	
ESMB	ANMSQ 10A	
ESMC	ANMSQ 2	
ESMD	ANMSQ 37GLSL	
ESME	ANMSQ 37LFF	
ESMF	ANMSQ 37TACN	
ESMG	ANMSQ 39ACQ	
ESMH	ANMSQ 39TRK	
ESMK	ANMSQ 39ATRK	
ESML	ANMSQ 48	
ESMM	ANMSQ 49	

EIC CODE	AN DESIGNATION	DESCRIPTION
ESMN	ANMSQ 54	

TELEPHONE (T)

ETAA	ANFTC 27	100 LINE FIXED TACTICAL CONTROL SYST
ETAB	ANFTC 28	200 LINE FIXED TACTICAL CONTROL SYST
ETAC	ANFTC 29	330 LINE FIXED TACTICAL CONTROL SYST
ETBA	ANMTC 3	MOBILE CENTRAL OFFICE
ETBB	ANMTC 7	MOBILE MANUAL TELEPHONE CENTRAL
ETBC	ANTTC 7	MOBILE CENTRAL TELEPHONE OFFICE
ETBD	ANTTC 12	ELECTRONIC TELEPHONE OFFICE
ETBE	ANTTC 14	ELECTRONIC TELEPHONE OFFICE
ETBF	ANTTC 19	TACTICAL CONTROL SYSTEM 100 LINE
ETBG	ANTTC 20	TACTICAL CONTROL SYSTEM 200 LINE

VISIBLE LIGHT (V)

EVAA	ANPVM 1	RADAR CHRONOGRAPH
EVBA	ANTVN 1	AIR TRANSPORTABLE AIRFIELD LIGHTING
EVCA	ANUVS 1	VISUAL AIRBORNE TARGET LOCATION SYST.

FACSIMILE (X)

EXAA	ANGXC 4	HI-SPEED MOBILE PHOTOFACSIMILE
EXBA	ANTXC 1	FACSIMILE TRANSCEIVER
EXCA	ANUXH 5	FACSIMILE RECORDER
EXDA	ANMXR 1	

EIC CODE	AN DESIGNATION	DESCRIPTION
EXEA	ANTRX 1	
EXEB	ANTXT 1	

DATA PROCESSING (Y)

EIC CODE	AN DESIGNATION	DESCRIPTION
EYAA	ANFYC 1	AUTOMATIC MESSAGE PROCESSING SYSTEM
EYBA	ANFYQ 2	DATA TRANSMITTAL TERMINAL
EYBB	ANFYQ 3	DATA COMMUNICATIONS CENTRAL
EYBC	ANFYQ 4	DATA COMMUNICATIONS CENTRAL
EYBD	ANFYQ 5	MESSAGE HANDLING CENTER
EYBE	ANFYQ 6	DATA COMMUNICATIONS CENTRAL
EYBF	ANFYQ 7	DATA COMMUNICATIONS CENTRAL
EYBG	ANFYQ 8	DIGITAL COMPUTER INFORMATION
EYBH	ANFYQ 9	DATA DISPLAY SYSTEM
EYBJ	ANFYQ 11	DATA PROCESSOR
EYBK	ANFYQ 38	DATA DISPLAY CENTRAL
EYCA	ANGYK 3	MODULAR DATA PROCESSING SYSTEM
EYCB	ANGYK 3(V)	MODULAR DATA PROCESSING SYSTEM
EYDA	ANMYK 1	DATA PROCESSOR
EYDB	ANMYK 2	DATA PROCESSOR
EYEA	ANTYC 1	FIELDATA TERMINAL LOW SPEED
EYEB	ANTYC 2	FIELDATA TERMINAL MED SPEED
EYEC	ANTYC 3	FIELDATA TERMINAL HIGH SPEED
EYFA	ANTYK 6(V)	DATA PROCESSOR GENERAL PURPOSE
EYFB	ANTYK 7	DATA PROCESSOR GENERAL PURPOSE

EIC CODE	AN DESIGNATION	DESCRIPTION
EYGA	ANTYQ 1	MARINE TACTICAL DATA SYSTEM
EYGB	ANTYQ 2	AIR OPERATIONS CONTROL CENTRAL
EYHA	ANUYK 1	GENERAL PURPOSE COMPUTER

EXHIBIT 2A

"L" SYSTEMS

CORE CODE

L A A A

SERIES

MODEL -

DESIGN MISSION - DESIGNATION

DEFENSE MATERIEL ITEM CATEGORY - "L" SYSTEMS

"L" SYSTEMS

			TOTAL
L AØØ		400-410	2
B		411-420	7
C		421-430	1
D		431-440	3
E		441-450	0
F		451-460	1
G		461-470	2
H		471-480	4
I	NOT USED	- -	
J		481-490	9
K		491-500	3
L M N O P Q R S T U V W X Y Z	NOT USED		
		TOTAL	32

"L" =L SYSTEMS

LAAA	407L	TACTICAL AIR CONTROL SYSTEM
LAAB	410L	AREA SURVEILLANCE CONTROL SYSTEM
LABA	412L	AIR WEAPONS CONTROL SYSTEM
LABB	413L	DISTANT EARLY WARNING DEW LINE
LABC	415L	USAF CONTROL & WARNING SUPPORT SYSTEM
LABD	416L	SAGE AIR DEFENSE SYSTEM
LABE	416M	BACK UP INTERCEPT CONTROL SYSTEM
LABF	416N	SEA LAUNCHED MISSILE DETECTION SYSTEM
LABG	418L	RYUKYU AIR DEFENSE SYSTEM
LACA	425L	NORAD COMBAT OPERATIONS CENTER
LADA	431L	TRACALS-TRAFFIC CONTROL & LDG SYSTEM
LADB	433L	WEATHER OBSERVING & FORECASTING SYSTEM
LADC	440L	OVER THE HORIZON RADAR
LAFA	460L	WEATHER REPORT SYSTEM
LAFB	465L	SAC COMMAND CONTROL SYSTEM
LAFC	466L	ELECTRO-MAGNETIC INTELLIGENCE SYSTEM
LAHA	473L	HQ USAF COMMAND CONTROL SYSTEM
LAHB	474L	BMEWS-BALLISTIC EARLY WARNING SYSTEM
LAHC	477L	NUDETS-NUCLEAR DETONATION SYSTEM
LAHD	480L	AEROSPACECOM
LAJA	482L	EMERGENCY MISSION SUPPORT SYSTEM
LAJB	483L	DIGITAL COMMUNICATION SYSTEM
LAJC	484L	SOFT TALK

LAJD	484N	PACIFIC AREA COMMUNICATION SYSTEM
LAJE	486L	MEDCOM-MEDITERRANEAN COMM SYSTEM
LAJF	487L	SAC SURVIVABLE LF COMM. SYSTEM
LAJG	488L	GREEN PINE
LAJH	489L	NORTHERN AREA COMMUNICATIONS SYSTEM
LAJJ	490L	DCA ANALOG SWITCHING CENTERS
LAKA	492L	USSTRICOM COMMAND CONTROL SYSTEM
LAKB	493L	SECURE VOICE COMMUNICATIONS SYSTEM
LAKC	496L	SPACETRACK

EXHIBIT 3

MISSILES

CORE CODE

M G B L

SERIES

MODEL - ICBM-TITAN II

DESIGN MISSION - SURFACE ATTACK

DEFENSE MATERIEL ITEM CATEGORY - MISSILES

MISSILES

"M"		TOTAL
M A		
B		
C		
D	DECOY	4
E	SPECIAL ELECTRONIC	
F		
G	SURFACE ATTACK	44
H		
I	INTERCEPT, AERIAL	48
J		
K		
L		
M		
N		
O	NOT USED	
P		
Q	DRONE	23
R		
S		
T	TRAINING	
U	UNDERWATER ATTACK	1
V		
W	WEATHER	
X		
Y		
Z		
	TOTAL	120

MISSILES

DECOY

MDAA	ADO 51	SHORT RANGE ATTACK MISSILE
MDBA	ADM 20A	GAM 72 QUAIL
MDBB	ADM 20B	GAM 72A QUAIL
MDBC	ADM 20C	GAM 72B QUAIL

SURFACE ATTACK

MGAA	MGM 1C	MATADOR
MGAB	MGM 5A	CORPORAL
MGAC	RGM 6A,B	REGULUS I
MGAD	PGM 11A	REDSTONE
MGAE	AGM 12A	BULLPUP
MGAF	AGM 12B	BULLPUP
MGAG	AGM 12C	BULLPUP
MGAH	XAGM 12D	BULLPUP
MGAJ	AGM 12D	BULLPUP
MGAK	MGM 13A	MACE
MGAL	YMGM 13B	MACE
MGAM	MGM 13B	MACE
MGAN	YCGM 13C	MACE
MGAP	CGM 13C	MACE
MGAQ	RGM 15A	REGULUS II
MGBA	CGM 16E	ATLAS
MGBB	HGM 16F	ATLAS

MGBC	XPGM 17A	THOR
MGBD	PGM 17A	THOR
MGBE	MGM 18A	LACROSSE
MGBF	PGM 19A	JUPITER
MGBG	MGM 21A	
MGBH	XAGM 22A	
MGBJ	HGM 25A	TITAN I
MGBK	XLGM 25C	TITAN II
MGBL	LGM 25C	TITAN II
MGBM	UGM 27A	POLARIS A1
MGBN	UGM 27B	POLARIS A2
MGBP	UGM 27C	POLARIS A3
MGCA	AGM 28A	HOUND DOG
MGCB	AGM 28B	HOUND DOG
MGCC	XMGM 29A	SERGEANT
MGCD	XLGM 30A	MINUTEMAN
MGCE	LGM 30A	MINUTEMAN I
MGCF	LGM 30B	MINUTEMAN I
MGCG	LGM 30F	MINUTEMAN II
MGCH	XMGM 31A	PERSHING
MGCJ	MGM 32A	ENTAC
MGCK	AGM 45A	SHRIKE
MGCL	XAGM 48A	SKYBOLT
MGCM	XMGM 51A	SHILLELAGH
MGCN	XMGM 52A	LANCE

MGCP	AGM 53A	CONDOR
MGCQ	ZRGM 59A	

INTERCEPT

MIAA	RIM 2A	TERRIER BW-0
MIAB	RIM 2B	TERRIER BW-1
MIAC	RIM 2C	TERRIER BT-3
MIAD	RIM 2D	TERRIER BT-3A
MIAE	RIM 2E	TERRIER HT-3
MIAF	MIM 3A	NIKE-AJAX
MIAG	AIM 4	FALCON
MIAH	AIM 4A	FALCON
MIAJ	AIM 4B	FALCON
MIAK	AIM 4C	FALCON
MIAL	AIM 4D	FALCON
MIAM	AIM 4E	FALCON
MIAN	AIM 4F	FALCON
MIAP	AIM 4G	FALCON
MIBA	AIM 7A	SPARROW I
MIBB	AIM 7B	SPARROW II
MIBC	AIM 7C	SPARROW III
MIBD	AIM 7D	SPARROW III
MIBE	AIM 7E	SPARROW III
MIBF	RIM 8A	TALOS 6B
MIBG	RIM 8B	TALOS 6BW

MIBH	RIM 8C	TALOS 6B 1
MIBJ	RIM 8D	TALOS 6BW 1
MIBK	RIM 8E	TALOS 6BC 1
MIBL	RIM 8F	TALOS
MIBM	AIM 9A	SIDEWINDER 1
MIBN	AIM 9B	SIDEWINDER 1A
MIBP	AIM 9C	SIDEWINDER 1C-SAR
MIBQ	AIM 9D	SIDEWINDER 1C-1R
MICA	CIM 10A	BOMARC
MICB	CIM 10B	BOMARC
MICC	MIM 14A	NIKE-HERCULES
MICD	MIM 14B	NIKE-HERCULES
MICE	XMIM 23A	HAWK
MICF	RIM 24A	TARTAR-BASIC
MICG	RIM 24B	TARTAR-IMPROVED
MICH	XAIM 26A	FALCON
MICJ	AIM 26A	FALCON
MICK	AIM 26B	FALCON
MICL	XMIM 43A	REDEYE
MICM	XMIM 46A	MAULER
MICN	RIM 46A	SEA MAULER
MICP	XAIM 47A	FALCON
MICQ	AIM 47A	FALCON
MICR	XLIM 49A	NIKE-ZEUS
MICS	RIM 50A	TYPHON 1R

MICT	AIM 54A	PHOENIX
MIDA	RIM 55A	TYPHON MR

DRONE

MQAA	BQM 6C	REGULUS I
MQAB	MQM 15A	REGULUS II
MQAC	MQM 33A	PISTON ENGINE TARGET DRONE
MQAD	MQM 33B	PISTON ENGINE TARGET DRONE
MQAE	BQM 34A	FIREBEE
MQAF	BQM 34D	FIREBEE
MQAG	AQM 34B	FIREBEE
MQAH	AQM 34C	FIREBEE
MQAJ	AQM 35A	JET POWERED TARGET DRONE
MQAK	AQM 35B	JET POWERED TARGET DRONE
MQAL	MQM 36A	
MQBA	AQM 37A	SUPERSONIC TARGET MISSILE
MQBB	AQM 38A	SUPERSONIC ROCKET POWERED TARGET DRONE
MQBC	AQM 38B	SUPERSONIC ROCKET POWERED TARGET DRONE
MQBD	MQM 39A	PROP DRIVEN TARGET DRONE
MQBE	XQM 40A	
MQBF	AQM 41A	PETREL
MQBG	MQM 42A	REDHEAD ROAD RUNNER
MQBH	PQM 56A	FRENCH SS TARGET DRONE
MQBJ	MQM 57A	SURVEILLANCE DRONE SYSTEM
MQBK	MQM 58A	TARGET LOCATION DRONE

MQBL	AQM	60A	KINGFISHER
MQBM	MQM	61A	CARDINAL

UNDERWATER ATTACK

MUAA	UUM	44A	SUBROC

EXHIBIT 4

ORDNANCE

CORE CODE

O B C A

SERIES - M1917A1

MODEL - MACHINE GUN CAL. 30

DESIGN MISSION - GUNS - THRU 30 MM

DEFENSE MATERIEL ITEM CATEGORY - ORDNANCE

ORDNANCE

"O"

		TOTAL
A	AMMUNITION	30
B	GUNS, THROUGH 30 MM	54
C	GUNS - 30 MM - 115 MM	33
D	GUNS - OVER 150 MM - THROUGH 200 MM	11
E	GUNS - OVER 200 MM - THROUGH 300 MM	5
F		
G		
H		
J		
K		
L	LAUNCHERS	14
M	MISCELLANEOUS WEAPONS	8
N		
P		
Q		
R		
S		
T		
U		
V		
W		
X		
Y		
Z		
	TOTAL	155

GUNS THROUGH 30 MM

OBAA	CARBINE, CAL 30 M1
OBAB	CARBINE, CAL 30 M2
OBBA	GUN, CAL. 22 M-3
OBBB	GUN, CAL 22 M-4
OBBC	GUN, 20 MM AUTOMATIC M3
OBBD	GUN, 20 MM AUTOMATIC M24A1
OBBE	GUN, 20 MM AUTOMATIC M39A2
OBBF	GUN, 20 MM AUTOMATIC M61
OBCA	MACHINE GUN CAL. 30 M1917A1
OBCB	MACHINE GUN CAL. 30 M1919A4
OBCC	MACHINE GUN CAL. 30 M37
OBCD	MACHINE GUN CAL. 50 ANM3
OBCE	MACHINE GUN CAL. 50 M2
OBCF	MACHINE GUN CAL. 50 M2 FIXED
OBCG	MACHINE GUN CAL. M2 FLEXIBLE
OBCH	MACHINE GUN CAL. 50 M2 TURRET TYPE
OBCJ	MACHINE GUN CAL. 50 M85
OBCK	MACHINE GUN 7.62 MM M60C
OBCL	MACHINE GUN 7.62 MM M73
OBCM	MACHINE GUN 7.62 MM M60CA1
OBCN	MACHINE GUN 7.62 MM M60D
OBDA	PISTOL, CAL. 22 AUTOMATIC COLT
OBDB	PISTOL CAL. 22 AUTOMATIC COLT, MATCH
OBDC	PISTOL CAL. 22 AUTOMATIC HIGH STANDARD MODEL B

OBDD	PISTOL CAL. 22 AUTOMATIC HIGH STANDARD, SUPERMATIC
OBDE	PISTOL CAL. 22 AUTOMATIC MARKSMAN TRAINING
OBDF	PISTOL CAL. 22 AUTOMATIC RUGER MARK KK
OBDG	PISTOL, CAL 32 AUTOMATIC COLT
OBDH	PISTOL, CAL .380 AUTOMATIC COLT
OBDJ	PISTOL, CAL 45 AUTOMATIC M1911A1
OBEA	REVOLVER, CAL. 38 COLT DETECTIVE SPECIAL 2" BARREL
OBEB	REVOLVER, CAL 38 COLT POLICE 4" BARREL
OBEC	REVOLVER, CAL 38 COLT SPECIAL, MATCH
OBED	REVOLVER CAL 38 COLT SPECIAL, OFFICIAL
OBEE	REVOLVER CAL 38 SMITH & WESSON MILITARY
OBEF	REVOLVER CAL 38 SMITH & WESSON SPECIAL K38
OBEG	REVOLVER CAL 38 SMITH & WESSON SPECIAL
OBEH	REVOLVER CAL 38 SMITH & WESSON SPECIAL SHORT ACTION
OBFA	WEAPON, SPECIAL PURPOSE 30 CAL. SPIW
OBFA	RIFLE, CAL 22 SURVIVAL M4
OBFB	RIFLE CAL 22 M12
OBFC	RIFLE CAL 22 M13
OBFD	RIFLE CAL 30 US M1903A4 SNIPERS
OBFE	RIFLE CAL 30 WINCHESTER MODEL 70, MATCH
OBFF	RIFLE CAL 30 AUTOMATIC (BAR) M1918A2
OBFG	RIFLE CAL 30 AUTOMATIC, M1, MATCH
OBFH	RIFLE CAL 50 SPOTTING M8C
OBFJ	RIFLE 7.62 MM AUTOMATIC M14E2 (NATO USE)

OBFK	RIFLE 5.56 MM LIGHT, HEAVY VELOCITY M16
OBFL	RIFLE 5.56 MM ADVANCED M-17 AR-18
OBFM	RIFLE-SHOTGUN-SURVIVAL CAL. 22/.410 M6
OBGA	SHOTGUN, 12 GAGE RIOT TYPE STEVENS M620A
OBGB	SHOTGUN, 12 GAGE RIOT TYPE WINCHESTER M12
OBHA	SUBMACHINE GUN, CAL 45 M3A1

GUNS

30 MM - 115 MM

OCAA	BATTLE GROUP ATOMIC WEAPON SYSTEM M28	
OCBA	CANNON 76 MM M32	
OCBB	CANNON 90 MM M36	
OCBC	CANNON 90 MM M41	
OCBD	CANNON 90 MM M54	
OCBE	CANNON 105 MM M68	
OCBF	CANNON 105 MM M49	
OCBG	CANNON 105 MM M103	
OCBH	CANNON 120 MM M58	
OCCA	GUN, ANTI-AIRCRAFT ARTILLERY TOWED 75 MM M51	
OCCB	GUN, ANTI-AIRCRAFT ARTILLERY TOWED 90 MM M117	
OCCC	GUN, ANTI-AIRCRAFT ARTILLERY TOWED 90 MM M118	
OCDA	HOWITZER, 8" AIR TRANSPORTABLE	M115
OCDB	HOWITZER, PACK 75 MM	M116
OCDC	HOWITZER LIGHT, TOWED 105 MM	M101
OCDD	HOWITZER, SALUTING 75 MM	M120
OCDE	HOWITZER, AIR DROPPABLE 155 MM	M123A1
OCEA	MORTAR, 81 MM M1	
OCEB	MORTAR, 81 MM M29	
OCEC	MORTAR, 107MM M30	
OCED	MORTAR, 81 MM M125	
OCFA	RIFLE 75 MM M20	
OCFB	RIFLE 90 MM M67	
OCFC	RIFLE 105 MM M27	

OCFD	RIFLE, RECOILLESS 106 MM	M40A1
OCFE	RIFLE, CALIBER 30	M7 75 MM TRAINER
OCFF	RIFLE, CALIBER 30	M9 75 MM TRAINER
OCFG	RIFLE, RECOILLESS 57 MM	M18
OCFH	RIFLE, RECOILLESS 57 MM	M18A1
OCFJ	GUN, RECOILLESS 120 MM	M63
OCGA	WEAPON, 115 MM RAPID FIRE "MORITZER"	
OCGB	WEAPON, AUTOMATIC, MEDIUM SPEED "MOSAW"	
OCGC	WEAPON, ROCKET BOOSTED 115 MM	XM70

GUNS

OVER 150 MM THROUGH 200 MM

ODAA	BATTLE GROUP ATOMIC WEAPON SYSTEM		M29
ODBA	CANNON, 155 MM GUN	M46	
ODBB	CANNON, 155 MM HOWITZER	M45	
ODBC	CANNON, 155 MM HOWITZER	M126	
ODBD	CANNON, 157 MM GUN	M113	
ODCA	GUN, FIELD ARTILLERY TOWED	155 MM	M59
ODCB	GUN, RECOILLESS	155 MM	M64
ODDA	HOWITZER MEDIUM TOWED	155 MM	M114
ODDB	HOWITZER MEDIUM TOWED	155 MM	M114A1
ODDC	HOWITZER LIGHT TOWED	155 MM	M102
ODDD	HOWITZER MEDIUM TOWED	155 MM	M123A1

OVER 200 MM THROUGH 300 MM

OEAA	CANNON 8 IN. HOWITZER	M2A1E1
OEAB	CANNON 8 In. HOWITZER	M47
OEAC	GUN, HEAVY, MOTORIZED 280 MM	M65
OEAD	HOWITZER, HEAVY TOWED 8"	M115
OEAE	GUN, 280 MM TRUCKDRAWN	M66

LAUNCHERS

OLAA	LAUNCHER, GRENADE	M5
OLAB	LAUNCHER, ROCKET 2.75	M16
OLAC	LAUNCHER, ROCKET 3.5	M20
OLAD	LAUNCHER, ROCKET 2.75	M21
OLAE	LAUNCHER, GUIDED MISSILE, CORPORAL	M27
OLAF	LAUNCHER, GUIDED MISSILE NIKE HERCULES	M36
OLAG	LAUNCHER, GRENADE 40 MM	M79
OLAH	LAUNCHER, ROCKET, MULTIPLE 155 MM	M91
OLAJ	LAUNCHER, ROCKDT, 318 MM	M34
OLAK	LAUNCHER, ROCKET 762 MM	M33
OLAL	LAUNCHER, ROCKET	M386
OLAM	LAUNCHER, ROCKET LIGHT WEIGHT	XM33
OLAN	LAUNCHER, GRENADE 40 MM	XM75
OLAP	LAUNCHER MISSILE HAWK	XM78E3

MISCELLANEOUS WEAPONS

OMAA	PISTOL PYROTECHNIC	AN-M8
OMAB	PROJECTOR PYROTECHNIC HAND	M9
OMAC	PROJECTOR SIGNAL GROUND	M1A1
OMBA	FLAME THROWER PORTABLE	M2A1-7
OMBB	FLAME THROWER MECH. ARM	M10-8
OMBC	FLAME THROWER MECH ARM	M7-6
OMBD	FLAME THROWER PORTABLE	M9-7
OMBE	FLAME THROWER MECH. ARM	M7A1-6

ROCKETS

OAAA	AIRTO AIR-NUCLEAR WARHEAD GENIE	A1R-2A
OAAB	FOLDING FIN 2.75	M3
OAAC	CHEMICAL WARFARE ROCKET 115 MM	M55
OAAD	ANTI-TANK ROCKET 66 MM	M72
OAAE	SURFACE TO SURFACE HONEST JOHN	M6R1A,B
OAAF	SURFACE TO SURFACE LITTLE JOHN	M6R3A
OAAG	ECM ROCKET	XADR7A
OAAH	ECM ROCKET	XADR7B
OAAJ	ECM ROCKET	XADR9A
OAAK	ECM ROCKET	XADR10A
OAAL	ROCKET PROPELLED MISSILE	XAGM22A
OAAM	ROCKET PROPELLED MISSILE	XATM22B
OAAN	SOLID PROPELLANT ROCKET	XM7
OAAP	SOLID PROPELLANT ROCKET	XM7E1

TORPEDOS

OAEA	ANTI-SUBMARINE TORPEDO	EX10
OAEB	ANTI-SUB TORPEDO-ROCKET BOOST	MARK45
OAEC	ANTI-SUB TORPEDO-SOLID FUEL	MARK46 MOD 0
OAED	ANTI-SUB TORPEDO-LIQUID MONOPROPELLANT	MARK46 MOD 1
OAEE	ANTI-SUB TORPEDO-WIREGUIDED	MARK48
OAEF	ANTI-SUB TORPEDO-ROCKET BOOST	RUR5A

OAEG	ANTI-SUB TORPEDO	MARK 37 MOD 0
OAEH	ANTI-SUB TORPEDO	MARK 37 MOD 1
OAEJ	ANTI-SUB TORPEDO	MARK 43 MOD 1
OAEK	ANTI-SUB TORPEDO	MARK 43 MOD 3
OAEL	ANTI-SUB TORPEDO	MARK 44 MOD 0
OAEM	ANTI-SUB TORPEDO	MARK 44 MOD 1
OAEN	ANTI-SUB TORPEDO	MARK 45 MOD 0
OAEP	ANTI-SUB TORPEDO	MARK 45 MOD 1
OANA	LIGHT WEIGHT NUCLEAR WARHEAD DAVY CROCKETT	M28
OANB	ATOMIC DELIVERY SYSTEM DAVY CROCKETT	M29

EXHIBIT 5

SPACE

CORE CODE

P S A D

SERIES - TITAN II

MODEL - MARK 6

DESIGN MISSION - RE-ENTRY VEHICLE

DEFENSE MATERIEL ITEM CATEGORY - SPACE

SPACE

"P"

			TOTAL
P	A	AEROSPACE CRAFT	
	B	BOOST GLIDE VEHICLES	1
	C	COMMUNICATIONS SATELLITES (ACTIVE)	1
	D	COMMUNICATIONS SATELLITES (PASSIVE)	
	E	METEROLOGICAL SATELLITES	
	F		
	G		
	H		
	I		
	J		
	K		
	L	LAUNCH VEHICLES	10
	M	RE-ENTRY VEHICLES	9
	N	NAVIGATION SATELLITES	
	O		
	P		
	Q		
	R	RECONNAISANCE SATELLITES	2
	S	STANDARD LAUNCH VEHICLES	9
	T	SATELLITES - (ARTIFICIAL)	
	U		
	V		
	W		
	X	SCIENTIFIC SATELLITES	
	Y		
	Z		
		TOTAL	32

SPACE

"P"

PLAA	LV-1A	LAUNCH VEHICLE-AEROJET SENIOR
PLAB	LV-1B	LAUNCH VEHICLE-BLUE SCOUT JUNIOR
PLAC	LV-2A	LAUNCH VEHICLE THOR, THRUST AUGMENTED
PLAD	LV-2B	LAUNCH VEHICLE THORM, BLOK 1
PLAE	LV-2C	LAUNCH VEHICLE THOR, BLOK 1
PLAF	LV-3A	LAUNCH VEHICLE ATLAS D, MODIFIED
PLAG	LV-3B	LAUNCH VEHICLE MERCURY ATLAS
PLAH	LV-3C8	LAUNCH VEHICLE CENTAUR ATLAS
PLAJ	LV-4A	LAUNCH VEHICLE GEMINI LAUNCH
PLAK	LV-5	LAUNCH VEHICLE TITAN III LAUNCH
PMAA	MARK-2	RE-ENTRY SYSTEM, NEWGENERATION
PMAB	MARK-3,4	RE-ENTRY VEHICLE, ATLAS, TITAN
PMAC	MARK-5	RE-ENTRY VEHICLE
PMAD	MARK-6	RE-ENTRY VEHICLE TITAN II
PMAE	MARK-7	RE-ENTRY VEHICLE FORMER SKYBOLT
PMAF	MARK-11A	PENETRATION RE-ENTRY VEHICLE
PMAG	MARK-12	ADVANCED PENETRATION, MINUTEMAN II
PMAH	MARK-17	MANEUVERSABLE RE-ENTRY VEHICLE
PMAJ	MARK-Z	NEW GENERATION RE-ENTRY SYSTEM
PSAA	SLV-1A	STANDARD LAUNCH VEHICLE-GUIDED SCOUT
PSAB	SLV-1B	STANDARD LAUNCH VEHICLE UNGUIDED BLUE SCOUT
PSAC	SLV-2	STANDARD LAUNCH VEHICLE RADIO GUIDED THOR
PSAD	SLV-3	STANDARD LAUNCH VEHICLE RADIO GUIDED ATLAS

P SAE	SLV-5A	STANDARD LAUNCH VEHICLE GUIDED TITAN III
P:SAF	SLV-5B	STANDARD LAUNCH VEHICLE TITAN III
P:SAG	SLV-5C	STANDARD LAUNCH VEHICLE TITAN III
P:SAH	SLV-5D	STANDARD LAUNCH VEHICLE TITAN III
P:SAJ	SLV-5X	STANDARD LAUNCH VEHICLE TITAN III X-AGENA
P:RAA	239A	EARLY WARNING SATELLITE SYSTEM
P:CAA	369	COMMUNICATION SATELLITE
P:XAA	622A	SATELLITE PROGRAM FOR TESTING SYSTEMS
P:BAA	623A	LARGE SOLID PROPELLANT BOOSTER
P:RAB	706	CO-ORBITAL SATELLITE INSPECTION SYSTEM
P:RAC	720	RECON SATELLITE

EXHIBIT 6

SHIPS

CORE CODE

S C V A

SERIES -ATTACK AIRCRAFT CARRIER

MODEL -

DESIGN MISSION - CRUISER-CARRIER

DEFENSE MATERIEL ITEM CATEGORY - SHIPS

SHIPS

"S"

			TOTAL SYSTEMS
S	A	AUXILIARY	47
	B		
	C	CRUISERS AND CARRIERS	11
	D	DESTROYERS	9
	E	EXPERIMENTAL FIRING SHIP	
	F	FIRE SUPPORT SHIP (INSHORE)	
	G		
	H		
	I		
	J		
	K		
	L	LANDING CRAFT	16
	M	MINE LAYERS AND SWEEPERS	10
	N		
	O		
	P	SUBMARINE CHASERS-PATROL BOATS	6
	Q		
	R		
	S	SUBMARINES	8
	T		
	U		
	V		
	W		
	X		
	Y		
	Z		
		TOTAL	107

SHIPS

AUXILIARY

EICS CODE	NAVY CODE	DESCRIPTION
SAAA	AD	DESTROYER TENDER
SADG	AUG	DEGAUSSING VESSEL
SAEA	AE	AMMUNITION SHIP
SAFA	AF	STORE SHIPS
SAFS	AFS	COMBAT STORE SHIPS
SAGC	AGC	AMPHIBIOUS FORCE FLAGSHIPS
SAGA	AG	ESCORT RESEARCH SHIP
SAGB	AGB	ICE BREAKERS
SAGD	AGDE	ESCORT RESEARCH SHIP
SAGE	AGEH	HYDROFOIL RESEARCH SHIP
SAGM	AGM	MISSILE RANGE INSTRUMENTATION SHIP
SAGN	AGMR	MAJOR COMMUNICATIONS RELAY SHIP
SAGP	AGOR	OCEANOGRAPHIC RESEARCH SHIP
SAGR	AGR	PICKET SHIP OCEAN RADAR SHIP
SAGS	AGS	SURVEYING SHIP
SAGT	AGSS	HIGH SPEED TARGET SUBMARINE
SAHA	AH	HOSPITAL SHIP
SAKA	AKA	ATTACK CARGO SHIPS
SAKD	AKD	DOCK CARGO SHIPS
SAKL	AKL	LIGHT CARGO SHIPS
SAKV	AKV	AIRCRAFT FERRY AND CARGO

EICS CODE	NAVY CODE	DESCRIPTION
SAJA	AN	NET LAYERS
SALA	AOE	FAST COMBAT SUPPORT SHIPS
SALB	AOG	PETROL CARRIERS
SALC	AOR	REPLENISHMENT FLEET OILERS
SALD	AOSS	SUBMARINE OILER
SAPA	APA	ATTACK TRANSPORTS
SAPB	APB	DEPOT SHIPS
SAPC	APC	COASTAL TRANSPORT
SAPD	APD	HIGH SPEED TRANSPORTS
SAPS	APSS	TRANSPORT SUBMARINE
SARC	ARC	CABLE REPAIR SHIPS
SARS	ARS	SUBMARINE RESCUE VESSELS
SARD	ARSD	SALVAGE LIFTING VESSEL
SART	ARST	SALVAGE TENDER
SASR	ASR	SUBMARINE RESCUE VESSELS
SATA	ATA	AUXILIARY OCEAN TUGS
SATF	ATF	FLEET OCEAN TUGS
SAVA	AV	SEAPLANE CARRIERS
SAVM	AVM	GUIDED MISSILE SHIP
SAVP	AVP	SEAPLANE TENDERS
SAVT	AVT	AUXILIARY AIRCRAFT TRANSPORTS

EICS CODE	NAVY CODE	DESCRIPTION
SCAG	CAG	GUIDED MISSILE HEAVY CRUISER
SCCA	CC	COMMAND SHIP
SCGN	CGN	NUCLEAR POWERED GUIDED MISSILE CRUISER
SCLA	CLAA	ANTI-AIRCRAFT LIGHT CRUISERS
SCLG	CLG	GUIDED MISSILE LIGHT CRUISER
SCVA	CVA	ATTACK AIRCRAFT CARRIERS
SCVN	CVAN	NUCLEAR POWERED ATTACK AIRCRAFT CARRIER
SCVS	CVS	SUPPORT AIRCRAFT CARRIERS
		DESTROYERS
SDDA	DD	DESTROYERS
SDDG	DDG	GUIDED MISSILE ARMED DESTROYERS
SDEG	DEG	GUIDED MISSILE ESCORT SHIPS
SDER	DER	ESCORT SHIPS, RADAR PICKET
SDLG	DLG	GUIDED MISSILE ARMED DESTROYER LEADER
SDLN	DLGN	NUCLEAR POWERED GUIDED MISSILE ARMED DESTROYER LEADER
SDMA	DM	DESTROYER MINELAYERS
SEAG	EAG	EXPERIMENTAL FIRING SHIP
SFSA	IFS	INSHORE FIRE SUPPORT SHIP

EICS CODE	NAVY CODE	DESCRIPTION
SLCA	LCA	LANDING CRAFT ASSAULT
SLCM	LCM	LANDING CRAFT MECHANIZED
SLCN	LCM6	LANDING CRAFT MECHANIZED 64,000#
SLCP	LCM8	LANDING CRAFT MECHANIZED 107,000#
SLCU	LCU	UTILITY LANDING CRAFT
SLCV	LCVP	LANDING CRAFT VEHICLE, PERSONNEL
SLPD	LPD	AMPHIBIOUS TRANSPORT DOCK
SLPH	LPH	AMPHIBIOUS ASSAULT SHIPS
SLSD	LSD	DOCK LANDING SHIPS
SLSM	LSM	MEDIUM LANDING SHIPS
SLSN	LSMR	MEDIUM LANDING SHIPS, ROCKET
SLST	LST	TANK LANDING SHIPS
SLSV	LSV	VEHICLE CARGO SHIPS
SLVH	LVH	LANDING CRAFT HYDROFOIL
SMCS	MCS	MINE COUNTERMEASURE SUPPORT SHIPS
SMHC	MHC	COASTAL MINEHUNTER
SMMF	MMF	FLEET MINELAYER
SMSB	MSB	MINESWEEPING BOATS
SMSC	MSC	COASTAL MINESWEEPER
SMSD	MSCO	OLD COASTAL MINESWEEPER (NON-MAGNETIC)
SMSF	MSF	FLEET MINESWEEPERS (STEEL HULLED)
SMSG	MSI	INSHORE MINE SWEEPERS
SMSP	MSO	OCEAN MINESWEEPER (NON-MAGNETIC)

EICS CODE	NAVY CODE	DESCRIPTION
SMTB	MTBI	HIGH SPEED MARINE TEST BOAT
SPCA	PC	SUBMARINE CHASER
SPCE	PCE	ESCORTS
SPCF	PCER	RESCUE ESCORTS
SPCH	PCH	SUBMARINE CHASER (HYDROFOIL TYPE)
SPGM	PGM	MOTOR GUNBOAT
SPTF	PTF	FAST PATROL BOAT
SSSA	SS	ATTACK SUBMARINE
SSSB	SSBN	FLEET BALLISTIC MISSILE SUBMARINE NUCLEAR POWERED
SSSG	SSG	GUIDED MISSILE SUBMARINE
SSSF	SSGN	NUCLEAR POWERED GUIDED MISSILE SUBMARINE
SSSN	SSN	NUCLEAR POWERED ATTACK SUBMARINES
SSST	SST	TARGET SUBMARINES
SSSV	SSTV	SUBMARINE SHOCK TEST VEHICLE
SSSX	SSX	SUBMARINE MIDGET TYPE

EXHIBIT 7

VEHICLES

CORE CODE

V M E D

SERIES - A1

MODEL - TRUCK, CARGO M-35

DESIGN MISSION - MILITARY-"M" SERIES

DEFENSE MATERIEL ITEM CATEGORY - VEHICLES

VEHICLES

"V"

		TOTAL
A	AIRFIELD VEHICLES & EQUIPMENT	55
	COMMERCIAL VEHICLES	231
F	TANKS	19
G	GUNS, SELF PROPELLED	7
	HOWITZERS, SELF PROPELLED	11
	CARRIERS & OTHER COMBAT VEHICLES	21
L		
M N O P Q	MILITARY VEHICLES "M" SERIES	301
	CONSTRUCTION VEHICLES & EQUIPMENT	94
T	RAILROAD EQUIPMENT	24
	MATERIALS HANDLING EQUIPMENT	49
X Y Z	MISCELLANEOUS	4
	TOTAL	816

AIRFIELD EQUIPMENT

VAAA	TRACTOR, AIRCRAFT TOWING TYPE A/S32 U-18
VAAB	TRACTOR, AIRCRAFT TOWING TYPE MB-4
VAAC	TRACTOR, AIRCRAFT TOWING TYPE MB-2

FIRE TRUCKS

VABA	TRUCK, CRASH, FIRE & RESCUE TYPE O-6
VABB	TRUCK, CRASH, FIRE & RESCUE TYPE O-11A
VABC	TRUCK, CRASH, FIRE & RESUCE TYPE O-11B
VABD	TRUCK FIRE POWERED PUMPER CLASS 530A
VABE	TRUCK FIRE POWERED PUMPER CLASS 530B
VABF	TRUCK FIRE POWERED PUMPER CLASS 750A
VABG	TRUCK FIRE A/C FORCIBLE ENTRY TYPE R-2
VABH	TRUCK FIRE A/C FORCIBLE ENTRY TYPE R-2A
VABJ	TRUCK, CRASH, FIRE & RESCUE TYPE A/S32P-2
VABK	TRUCK, FIRE FIGHTING AIRFIELD RAMP TYPE A/S32P-6

SEMI-TRAILERS-COMPRESSED GAS

VACA	SEMI-TRAILER COMPRESSED GAS CYLINDER TYPE MH-1
VACB	SEMI-TRAILER COMPRESSED GAS CYLINDER TYPE MH-2
VACC	SEMI-TRAILER LIQUID OXYGEN/NITROGEN TYPE AF/M32A-4
VACD	SEMI-TRAILER LIQUID OXYGEN/NITROGEN TYPE AF/M32A-4A
VACE	SEMI-TRAILER COMPRESSED GAS CYLINDER TYPE AF/M32A-17
VACF	SEMI-TRAILER SERVICING OXYGEN/NITROGEN TYPE A/M32R-6
VACG	SEMI-TRAILER LIQUID OXYGEN/NITROGEN TYPE MD-1
VACH	SEMI-TRAILER LIQUID OXYGEN/NITROGEN 1800 GAL-MODEL 217-30

SEMI-TRAILERS FUEL SERVICING

VADA	SEMI-TRAILER, FUEL SERVICING TYPE F-6
VADB	SEMI-TRAILER, FUEL SERVICING TYPE F-7
VADC	SEMI-TRAILER, FUEL SERVICING TYPE MJ-1
VADD	SEMI-TRAILER TANK 5000 GAL. TYPE A/M32R-10
VADE	SEMI-TRAILER UDMH TANKER TYPE A/M32R-8
VADF	SEMI-TRAILER N2O4 TANKER TYPE A/M32R-16
VADG	SEMI-TRAILER UDMH TANKER TYPE A/M32R-17
VAEA	TRAILER FUEL SERVICING TYPE A-1B
VAEB	TRUCK, TANK FUEL SERVICING TYPE A/S32R-5
VAEC	TRUCK, TANK FUEL SERVICING TYPE A/S32R-2
VAED	TRUCK, TANK OIL SERVICING TYPE L-6
VAEE	TRUCK TANK OIL SERVICING TYPE MK-1
VAFA	SEMI-TRAILER VAN MOBILE RADIO SQUADRON TYPE H-1
VAFB	SEMI-TRAILER VAN PHOTOGRAPHIC EQUIPMENT TYPE MC-2
VAFC	SEMI-TRAILER WATER ALCOHOL TYPE MD-3
VAFD	TRAILER WATER ALCOHOL TYPE ML-1
VAFE	TRAILER PORTABLE WATER TYPE A/S32A-2
VAFF	TRUCK, TANK DEMINERALIZED WATER TYPE A/S32A-2
VAGA	TEST STAND, ENGINE SEMI-TRAILER MOUNTED
VAHA	TRAILER COMPRESSED AIR OR NITROGEN MD-2
VAHB	TRAILER COMPRESSED AIR OR NITROGEN MD-3
VAHC	TRAILER COMPRESSED GAS CYLINDER MB-1

VAHD	TRAILER COMPRESSED GAS CYLINGER MB-2
VAHE	TRAILER COMPRESSED CYLINDER MB-4
VAHF	TRAILER COMPRESSED NITROGEN GCK-5
VAHG	TRAILER COMPRESSED OXYGEN E-1
VAHH	TRAILER COMPRESSED OXYGEN E-2
VAHJ	TRAILER COMPRESSED OXYGEN E-3
VAHK	TRAILER COMPRESSED GAS CYLINDER MD-1
VAHL	TRAILER MISSILE REPAIR
VAHM	TRAILER VAN, AIRCRAFT MAINTENANCE
VAJA	TRUCK, SHOP, VAN ARMAMENT
VAJB	TRUCK SHOP, VAN, RADIO
VAJC	TRUCK SHOP, RADIO & RADAR REPAIR

(MMERCIAL TYPES

AMBULANCE

VCAA	AMBULANCE METROPOLITAN 4 LITTER 4 X 2
VCAB	AMBULANCE METROPOLITAN 2 LITTER 4 X 2
VCAC	AMBULANCE STATION WAGON 1 LITTER 4 X 2
VCAD	AMBULANCE HEARSE, METROPOLITAN 1 LITTER 4 X 2

SEDANS

VCBA	AUTOMOBILE, SEDAN 4 DOOR COMPACT 4 X 2
VCBB	AUTOMOBILE, SEDAN 4 DOOR LIGHT 6 CYL 4 X 2
VCBC	AUTOMOBILE, SEDAN 4 DOOR LIGHT 8 CYL 4 X 2
VCBD	AUTOMOBILE, SEDAN 4 DOOR EXECUTIVE PRESTIGE TYPE 3 C1A
VCBE	AUTOMOBILE, SEDAN 4 DOOR EXECUTIVE PRESTIGE TYPE 3 C1B
VCBF	AUTOMOBILE, SEDAN 4 DOOR EXECUTIVE PRESTIGE TYPE 4 C1C
VCBG	AUTOMOBILE, SEDAN 4 DOOR EXECUTIVE PRESTIGE TYPE 4 C1D
VCBH	AUTOMOBILE, SEDAN 4 DOOR EXECUTIVE PRESTIGE TYPE 5 C1E

STATION WAGONS

VCCA	AUTOMOBILE, STATION WAGON 2 SEAT
VCCB	AUTOMOBILE, STATION WAGON 3 SEAT

COMMERCIAL TYPES

BUSES

VCDA	BUS MOTOR FORWARD CONTROL		45 PASSANGER
VCDB	BUS MOTOR FORWARD CONTROL, AMB. CONVERSION, REAR LOAD		44 PASSENGER
VCDC	BUS MOTOR FORWARD CONTROL AMB. CONVERSION, SIDE LOAD		45 PASSENGER
VCDD	BUS MOTOR, SCHOOL	4 X 2	20 PASSENGER
VCDE	BUS MOTOR, SCHOOL	4 X 2	29 PASSENGER
VCDF	BUS MOTOR, SCHOOL	4 X 2	37 PASSENGER
VCDG	BUS MOTOR, SCHOOL	4 X 4	20 PASSENGER
VCDH	BUS MOTOR FORWARD CONTROL STANDARD	4 X 2	25 PASSENGER
VCDJ	BUS MOTOR FORWARD CONTROL AMB. CONV.	4 X 2	25 PASSENGER
VCDK	BUS MOTOR SUBURBAN	4 X 2	45 PASSENGER
VCDL	BUS MOTOR SUBURBAN	4 X 2	53 PASSENGER
VCDM	BUS MOTOR INTERCITY	4 X 2	41 PASSENGER
VCDN	BUS MOTOR CONVERSION	4 X 2	12 PASSENGER

VCEA	MOTORCYCLE, SOLO, CHAIN DRIVE
VCEB	MOTORCYCLE, SOLO CONVENTIONAL DRIVE
VCEC	MOTORCYCLE, SOLO WITH SIDE CAR
VCED	SCOOTER, MOTOR GASOLINE ENGINE DRIVEN 3 WHEEL
VCEE	SCOOTER, MOTOR ELECTRIC ENGINE DRIVEN 3 WHEEL

TRAILERS

VCFA	TRAILER, LOW BED, 10 TON 4 WHEEL TILT DECK
VCFB	TRAILER, LOW BED, 6 TON 2 WHEEL TILT DECK
VCFC	TRAILER LOW BED, 14 TON 4 WHEEL TILT DECK
VCFD	TRAILER STAKE 2 1/2 TON 4 WHEEL SLATSIDES, STEERABLE

VCFE	TRAILER TANK POTABLE WATER 400 GAL. 2 WHEEL
VCFF	TRAILER ANTENNA PLATFORM
VCFG	TRAILER CARGO 1/4 TON 2 WHEEL
VCFH	TRAILER CARGO 1/2 TON 2 WHEEL
VCFJ	TRAILER CARGO 1 TON 2 WHEEL
VCFK	TRAILER CARGO 2 TON 2 WHEEL
VCFL	TRAILER, LIVING OR OFFICE SELF CONTAINED 2 WHEEL
VCFM	TRAILER, LIVING OR OFFICE SELF CONTAINED 4 WHEEL

SEMI-TRAILERS

VCGA	SEMI-TRAILER LOWBED 15 TON 4 WHEEL
VCGB	SEMI-TRAILER LOWBED 20 TON 4 WHEEL
VCGC	SEMI-TRAILER LOWBED 25 TON 4 WHEEL
VCGD	SEMI-TRAILER LOWBED 25 TON 8 WHEEL
VCGE	SEMI-TRAILER LOWBED 35 TON 4 WHEEL FX
VCGF	SEMI-TRAILER LOWBED 35 TON 4 WHEEL FL
VCGG	SEMI-TRAILER LOWBED 35 TON 4 WHEEL FX
VCGH	SEMI-TRAILER LOWBED 60 TON 8 WHEEL
VCGJ	SEMI-TRAILER LOWBED HYDRAULIC LIFT PLATFORM 20 TON, 4 WHEEL
VCGK	SEMI-TRAILER, STAKE 26 FT. 12 TON 2 WHEEL
VCGL	SEMI-TRAILER STAKE 28 FT. 12 TON 2 WHEEL
VCGM	SEMI-TRAILER STAKE 32 FT. 20 TON 4 WHEEL
VCGN	SEMI-TRAILER TANK, FUEL SERVICING 2000 GAL. 2 WHEEL
VCGP	SEMI-TRAILER TANK, FUEL SERVICING FORCE DISCHARGE
VCGQ	SEMI-TRAILER TANK, FUEL SERVICING 3000 GAL. 2 WHEEL
VCGR	SEMI-TRAILER TANK, POTABLE WATER 4000 GAL. 4 WHEEL

VCGS	SEMI-TRAILER TANK, FUEL SERVICING 4000 GAL. 4 WHEEL
VCGT	SEMI-TRAILER TANK, POTABLE WATER 5000 GAL. 4 WHEEL
VCGU	SEMI-TRAILER TANK, FUEL SERVICING 5000 GAL. 4 WHEEL
VCHA	SEMI-TRAILER TANK, FUEL SERVICING 6000 GAL. 4 WHEEL
VCHB	SEMI-TRAILER TANK, FUEL SERVICING 5500 GAL. 4 WHEEL
VCHC	SEMI-TRAILER VAN FURNITURE 12 TON 2 WHEEL
VCHD	SEMI-TRAILER VAN 80 PASSENGER 7 TON 2 WHEEL
VCHE	SEMI-TRAILER REFRIGERATOR 7 TON 2 WHEEL
VCHF	SEMI-TRAILER REFRIGERATOR 12 TON 2 WHEEL
VCHG	SEMI-TRAILER REFRIGERATOR 20 TON 2 WHEEL
VCHH	SEMI-TRAILER VAN, CARGO, CLOSED 12 TON 2 WHEEL
VCHJ	SEMI-TRAILER VAN, CARGO, CLOSED 20 TON 4 WHEEL
VCHK	SEMI-TRAILER VAN, CARGO, OPEN 12 TON 2 WHEEL
VCHL	SEMI-TRAILER DUMP
VCHM	SEMI-TRAILER VAN, MEDICAL DISPENSARY
VCHN	SEMI-TRAILER VAN, PHOTO LAB
VCHP	SEMI-TRAILER REFUSE
VCHQ	SEMI-TRAILER VAN, COMMUNICATIONS

TRUCKS

VCPA	TRUCK, AMBULANCE CONVERSION 4 LITTER 4 X 2
VCPB	TRUCK, AMBULANCE FIELD TYPE 4 LITTER 4 X 4
VCPC	TRUCK AERIAL PLATFORM 90 REACH
VCPD	TRUCK AUGER
VCPE	TRUCK CARGO HI-LIFT

VCPF	TRUCK CARGO, COMPACT
VCPG	TRUCK CARGO 4 DOOR 4 X 2
VCPH	TRUCK CARGO 4 DOOR 4 X 4
VCPJ	TRUCK CARGO 1/2 TON 4 X 2
VCPK	TRUCK CARGO 3/4 TON 4 X 2
VCPL	TRUCK CARGO 1 TON 4 X 4
VCPM	TRUCK CARGO 3/4 TON 4 X 4
VCPN	TRUCK CARGO 2 1/2 TON 4 X 2
VCPP	TRUCK CARGO 2 1/2 TON 6 X 4
VCPQ	TRUCK PICK UP 1/2 TON 4 X 2 LENGTH 72"
VCPR	TRUCK PICK UP 1/2 TON 4 X 2 LENGTH 84"
VCPS	TRUCK PICK UP 1/2 TON 4 X 2 LENGTH 70"
VCPT	TRUCK PICK UP 3/4 TON 4 X 2 LENGTH 90"
VCPU	TRUCK PICK UP 1 TON 4 X 2 LENGTH 102 "
VCPV	TRUCK PICK UP, 4 DR CAB 1/2 TON 4 X 2 LENGTH 70"
VCQA	TRUCK CARGO 6 TON 4 X 2 LENGTH 197"
VCQB	TRUCK PICK UP 1/4 TON 4 X 4 LENGTH 74"
VCQC	TRUCK PICK UP 1/4 TON 4 X 4 LENGTH 70"
VCQD	TRUCK PICK UP 1 TON 4 X 4 LENGTH 109"
VCQE	TRUCK PICK UP 1 TON 4 X 4 LENGTH 95"
VCQF	TRUCK PICK UP, 4 DR CAB 1 TON 4 X 4 LENGTH 70"
VCQG	TRUCK PICK UP 4 DR CAB 1 1/2 TON 4 X 4 LENGTH 70"
VCQH	TRUCK PICK UP 1 1/2 TON 4 X 4 LENGTH 109"
VCQJ	TRUCK PICK UP 1 1/2 TON 4 X 4 LENGTH 102"
VCQK	TRUCK CARRY ALL 1/2 TON 4 X 2

VCQL	TRUCK CARRY ALL 1/2 TON 4 X 4
VCQM	TRUCK CARRY ALL 3/4 TON 4 X 4
VCQN	TRUCK CARRY ALL 1 TON 4 X 2
VCQP	TRUCK CARRY ALL 1 TON 4 X 4
VCRA	TRUCK, DUMP 5 1/2 TON 4 X 2 3 CUBIC YARDS
VCRB	TRUCK, DUMP 8 TON 4 X 2 4 CUBIC YARDS
VCRC	TRUCK, DUMP 4 1/2 TON 4 X 2 3 CUBIC YARDS
VCRD	TRUCK, DUMP 8 1/2 TON 4 X 2 5 CUBIC YARDS
VCRE	TRUCK, DUMP 8 TON 4 X 2 6 CUBIC YARDS
VCRF	TRUCK, DUMP 5 1/2 TON 4 X 2 3 CUBIC YARDS
VCRG	TRUCK, DUMP 8 TON 4 X 4 4 CUBIC YARDS
VCRH	TRUCK, DUMP 7 3/4 TON 6 X 4 5 CUBIC YARDS
VCRJ	TRUCK, DUMP 10 TON 6 X 4 8 CUBIC YARDS
VCRK	TRUCK, DUMP 10 TON 6 X 6 5 CUBIC YARDS
VCRL	TRUCK, DUMP 2 1/2 TON 4 X 2
VCRM	TRUCK, DUMP 2 1/2 TON 4 X 4
VCRN	TRUCK, DUMP 15 TON 4 X 2
VCRP	TRUCK, MULTI-STOP 1/2 TON 4 X 2
VCRQ	TRUCK, MULTI-STOP 3/4 TON 4 X 2
VCRR	TRUCK, MULTI-STOP 4 TON 4 X 2
VCRS	TRUCK, MULTI-STOP 6 1/2 TON 4 X 2
VCRT	TRUCK, MULTI-STOP 1 TON 4 X 2
VCRU	TRUCK, MULTI-STOP 1 1/2 TON 4 X 2
VCSA	TRUCK, MULTI-STOP 1 1/2 TON 4 X 4

VCSB	TRUCK PANEL 1/2 TON 4 X 2
VCSC	TRUCK PANEL 3/4 TON 4 X 2
VCSD	TRUCK PANEL 1 TON 4 X 2
VCSE	TRUCK PANEL 1 3/4 TON 4 X 2
VCSF	TRUCK PANEL 1/4 TON 4 X 4
VCSG	TRUCK PANEL 1 TON 4 X 4
VCSH	TRUCK PANEL 1 1/2 TON 4 X 4
VCSJ	TRUCK PANEL COMPACT 4 X 2
VCSK	TRUCK VAN REFRIGERATOR 2 1/2 TON 4 X 2
VCSL	TRUCK VAN REFRIGERATOR 4 1/2 TON 4 X 2
VCSM	TRUCK VAN REFRIGERATOR 5 1/2 TON 4 X 2
VCSN	TRUCK VAN REFRIGERATOR 3 TON 4 X 2
VCSP	TRUCK, STAKE 1 TON 4 X 2
VCSQ	TRUCK, STAKE 1 TON 4 X 4
VCSR	TRUCK, STAKE 1 1/2 TON 4 X 2
V	TRUCK, STAKE 1 3/4 TON 4 X 2
VCST	TRUCK, STAKE 2 TON 4 X 2
VCSU	TRUCK, STAKE 2 1/2 TON 4 X 4
VCTA	TRUCK, STAKE 3 TON 4 X 2
VCTB	TRUCK, STAKE 3 1/2 TON 4 X 2
VCTC	TRUCK, STAKE 4 1/2 TON 4 X 2
VCTD	TRUCK, STAKE 5 TON 4 X 2
VCTE	TRUCK, STAKE 5 TON 4 X 4
VCTF	TRUCK, STAKE 7 TON 4 X 2
VCTG	TRUCK, STAKE 6 1/2 TON 4 X 2
VCTH	TRUCK, STAKE 1 1/2 TON 4 X 4

VCTJ	TRUCK, STAKE 3 1/2 TON 4 X 4
VCTK	TRUCK, STAKE 3 3/4 TON 4 X 4
VCTL	TRUCK, STAKE 4 1/2 TON 4 X 4
VCTM	TRUCK, STAKE 10 TON 6 X 4
VCTN	TRUCK, STAKE 9 1/2 TON 6 X 6
VCTP	TRUCK, STAKE 13 TON 6 X 6
VCTQ	TRUCK, STAKE 16 1/2 TON 6 X 6
VCTR	TRUCK, TANK FUEL SERVICING 1200 GAL 4 X 2
VCTS	TRUCK, TANK FUEL SERVICING 2000 GAL 4 X 2
VCTT	TRUCK, TANK FUEL SERVICING 2400 GAL 4 X 2
VCTU	TRUCK TANK WATER 1000 GAL 4 X 2
VCUA	TRUCK TANK WATER 1800 GAL 4 X 2
VCUB	TRUCK TANK WATER 2000 GAL 4 X 2
VCUC	TRUCK TANK POTABLE WATER 1000 GAL 4 X 2
VCUD	TRUCK TANK POTABLE WATER 1000 GAL 4 X 4
VCUE	TRUCK TANK FUEL SERVICING 2200 GAL 6 X 4
VCUF	TRUCK TANK FUEL SERVICING 2400 GAL 6 X 4
VCUG	TRUCK TANK FUEL SERVICING 2400 GAL 6 X 6
VCUH	TRUCK TANK WATER 2000 GAL 6 X 6
VCUJ	TRUCK, TRACTOR 4 X 2 16000 GVW
VCUK	TRUCK, TRACTOR 4 X 2 24000
VCUL	TRUCK, TRACTOR 4 X 2 28000
VCUM	TRUCK, TRACTOR 4 X 2 32000
VCUN	TRUCK, TRACTOR 4 X 4 24000
VCUP	TRUCK, TRACTOR 6 X 4 34500
VCUQ	TRUCK, TRACTOR 6 X 4 39500

VCUR	TRUCK, TRACTOR 6 X 4 44500
VCUS	TRUCK, TRACTOR 6 X 4 51000
VCUT	TRUCK, TRACTOR 6 X 4 64000
VCUU	TRUCK, TRACTOR 6 X 6 36000
VCVA	TRUCK, TRACTOR 6 X 6 44000
VCVB	TRUCK, TRACTOR 6 X 6 51000
VCVC	TRUCK, TRACTOR 6 X y 60000
VCVD	TRUCK, UTILITY 1/4 TON 4 X 2
VCVE	TRUCK, UTILITY 1/4 TON 4 X 2
VCVF	TRUCK, UTILITY WAGON 1/4 TON 4 X 4
VCVG	TRUCK VAN, CARGO 4 TON 4 X 2
VCVH	TRUCK VAN, CARGO 4 1/2 TON 4 X 2
VCVJ	TRUCK VAN, CARGO 5 1/2 TON 4 X 2
VCVK	TRUCK VAN, CARGO 6 1/2 TON 4 X 2
VCVL	TRUCK VAN, CARGO 1 1/2 TON 4 X 2
VCVM	TRUCK VAN, CARGO 2 1/2 TON 4 X 2
VCVN	TRUCK VAN, CARGO 3 1/2 TON 4 X 4
VCVP	TRUCK VAN SHOP-OFFICE 4 1/2 TON 4 X 4
VCVQ	TRUCK WRECKER 6 TON BOOM 4 X 2
VCVR	TRUCK WRECKER 10 TON BOOM 4 X 2
VCVS	TRUCK WRECKER 12 TON BOOM 4 X 2
VCVT	TRUCK WRECKER 12 TON BOOM 6 X 4
VCVU	TRUCK WRECKER 12 TON BOOM 6 X 6
VCWA	TRUCK, REFUSE COLLECTION 24 CUBIC YARDS
VCWB	TRUCK, REFUSE COLLECTION 30 CUBIC YARDS

VCWC	TRUCK, REFUSE LOADPACKER
VCWD	TRUCK, CARGO 4 TON 6 X 6
VCWE	TRUCK, CARGO 5 TON 4 X 4
VCWF	TRUCK, CARGO 5 TON 6 X 6
VCWG	TRUCK, CARGO 6 1/2 TON 4 X 2
VCWH	TRUCK, CARGO 7 1/2 TON 4 X 2
VCWJ	TRUCK, CARGO 7 TON 4 X 4
VCWK	TRUCK, CARGO HI-LIFT
VCWL	TRUCK, CHEMICAL 2 1/2 TON
VCWM	TRUCK, COAL 5 TON 4 X 2
VCWN	TRUCK, COAL 5 TON 4 X 4
VCWP	TRUCK, MAINTENANCE 1 TON
VCWQ	TRUCK, MAINTENANCE 1 1/2 TON 4 X 2
VCWR	TRUCK, MAINTENANCE 1 1/2 TON 4 X 4
VCWS	TRUCK, MAINTENANCE 2 1/2 TON 4 X 2
VCWT	TRUCK, MAINTENANCE 2 1/2 TON 6 X 6
VCWU	TRUCK, MAINTENANCE H-REACH 35'
VCXA	TRUCK, MAINTENANCE H-REACH 65-95'
VCXB	TRUCK, TELEPHONE MAINTENANCE 1/2 TON
VCXC	TRUCK, TELEPHONE MAINTENANCE 3/4 TON
VCXD	TRUCK, TELEPHONE MAINTENANCE 1 TON

TANKS

VFAØ	TANKS LIGHT G-251
VFAA	TANK FULL TRACKED 76 MM GUN M-41
VFAB	TANK FULL TRACKED 76 MM GUN M-41A1
VFAC	TANK FULL TRACKED 76 MM GUN M-41A2
VFAD	TANK FULL TRACKED 76 MM GUN M-41A3
VFBØ	TANKS, MEDIUM
VFBA	TANK, COMBAT FULL TRACKED 90 MM GUN-G-(256)-M48
VFBB	TANK COMBAT, FULL TRACKED 90 MM GUN (G254) M-48A1
VFBC	TANK COMBAT FULL TRACKED 90 MM GUN (G254) M-48A2
VFBD	MAIN BATTLE TANK, FULL TRACKED 105 MM GUN (G292) M-60
VFBE	MAIN BATTLE TANK FULL TRACKED 105 MM GUN (G292) M-60A1
VFBF	TANK COMBAT FULL TRACKED 90 MM GUN (G305) M48A2
VFCØ	TANKS HEAVY
VFCA	TANK COMBAT FULL TRACKED 120 MM GUN (G256) M103
VFCB	TANK COMBAT FULL TRACKED 120 MM GUN (G256) T43E1
VFCC	TANK COMBAT FULL TRACKED 120 MM GUN (G313) M103A2
VFDØ	TANKS FLAMETHROWER
VFDA	TANK, COMBAT, FULL TRACKED, FLAMETHROWER (G287) M67A1
VFDB	TANK COMBAT FULL TRACKED, FLAMETHROWER (G316) M67A1

GUNS

VGAA	GUN, SP, FT, TWIN 44	M42
VGAB	GUN, SP, FT, TWIN 44 MM	M42 A1
VGAG	GUN, SP, FT 155 MM	M53
VGAM	RIFLE, SP, FT, MULTIPLE 106 MM	M50
VGAP	MORTAR, SP, FT, 4.2 INCH	M84
VGAS	GUN, SP, FT, 90 MM	M56
VGAU	GUN, FIELD ARTILLERY SP, 175 MM	M107

OTHER COMBAT VEHICLES

HOWITZERS

VHAA	HOWITZER SELF PROPELLED 105 MM M52
VHAB	HOWITZER SELF PROPELLED 105 MM M52 A1
VHAG	HOWITZER SELF PROPELLED FULL TRACKED 155 MM M44
VHAH	HOWITZER SELF PROPELLED FULL TRACKED 155 MM M44 A1
VHAN	HOWITZER SELF PROPELLED FULL TRACKED 8 INCH M55
VHAP	HOWITZER LT. SELF PROPELLED FULL TRACKED 105 MM XM104
VHAQ	HOWITZER LT. SELF PROPELLED FULL TRACKED 105 MM M105
VHAR	HOWITZER MED. SELF PROPELLED FULL TRACKED 155 MM M109
VHAS	HOWITZER HVY. SELF PROPELLED FULL TRACKED 8 INCH M110
VHAT	HOWITZER LT. SELF PROPELLED FULL TRACKED 105 MM T195 E1
VHAU	HOWITZER MED. SELF PROPELLED FULL TRACKED 155 MM T196 E1

CARRIERS

VJAA	CARRIER, FLAME THROWER	M132
VJAB	CARRIER, FLAME THROWER	M132 A1
VJAC	CARRIER, PERSONNEL, FT, ARMORED	M113
VJAD	CARRIER, PERSONNEL, FT, ARMORED, DISEL	M113 A1
VJAE	CARRIER, PERSONNEL, FT, ARMORED	M59
VJAF	CARRIER, PERSONNEL, FT, ARMORED	M75
VJAG	AIRBORNE ASSAULT VEHICLE	XM551
VJAH	CARRIER, CARGO, AMPHIBIOUS, TRACKED	M76
VJAJ	CARRIER, CARGO, AMPHIBIOUS, TRACKED	M116
VJAK	CARRIER, AMMO TRANSPORTER	XM548 E1
VJAL	CARRIER, COMMAND-RECON, ARMORED	M114
VJAM	CARRIER, COMMAND & RECON, ARMORED	M114 A1
VJAN	CARRIER, COMMAND POST, LIGHT TRACKED	M577
VJAP	CARRIER, COMMAND POST, LIGHT TRACKED	M577 A1
VJAQ	CARRIER UTILITY, ARTICULATED	XM571
VJBA	TRUCK, TRAILER 40 TON TANKN RECOVERY	M25
VJBB	RECOVERY VEHICLE FT, HEAVY	M51
VJBC	TANK RECOVERY VEHICLE, MEDIUM	M74
VJBD	RECOVERY VEHICLE FT, MEDIUM	M88
VJBE	RECOVERY VEHICLE FT, LIGHT ARMORED	M578

COMBAT ENGINEER

VJCA	COMBAT ENGINEER VEHICLE, FULL TRACKED	T118 E1

LOADER

VJDA	LOADER, TRANSPORTER, SELF PROPELLED HAWK	XM501 E2

MILITARY VEHICLES - "M" SERIES

TRUCKS

VMAA	TRUCK UTILITY 1/4 TON 4 X 4	M38
VMAB	TRUCK UTILITY 1/4 TON 4 X 4	M38C
VMAC	TRUCK UTILITY 1/4 TON 4 X 4	M38A1
VMAD	TRUCK UTILITY 1/4 TON 4 X 4	M38A1C
VMAE	TRUCK UTILITY 1/4 TON 4 X 4	M38A1D
VMAF	TRUCK AMBULANCE, FRONT LINE 4 X 4	M170
VMAG	TRUCK UTILITY 1/4 TON 4 X 4	M151
VMAH	TRUCK UTILITY 1/4 TON 4 X 4	M151A1
VMAJ	TRUCK UTILITY 1/4 TON 4 X 4	M151A1C
VMAK	TRUCK AMBULANCE 1/4 TON 4 X 4	M718
VMBA	TRUCK, UTILITY PLATFORM 1/2 TON 4 X 4	M274
VMBB	TRUCK, UTILITY PLATFORM 1/2 TON 4 X 4	M274A1
VMBC	TRUCK, UTILITY PLATFORM 1/2 TON 4 X 4	M274A2
VMBD	TRUCK, UTILITY PLATFORM 1/2 TON 4 X 4	M274A3
VMBE	TRUCK, UTILITY PLATFORM 1/2 TON 4 X 4	M274A4
VMCA	TRUCK AMBULANCE 3/4 TON 4 X 4	M43
VMCB	TRUCK AMBULANCE 3/4 TON 4 X 4	M43A1
VMCC	TRUCK CARGO 3/4 TON 4 X 4	M37
VMCD	TRUCK CARGO 3/4 TON 4 X 4	M37A1
VMCE	TRUCK, COMMAND 3/4 TON 4 X 4	M42
VMCF	TRUCK, MAINTENANCE 3/4 TON 4 X 4	M201
VMCG	TRUCK, MAINTENANCE 3/4 TON 4 X 4	M201B1

VMDA	TRUCK, AMBULANCE 1 1/4 TON 4 X 4	M725
VMDB	TRUCK, CARGO 1 1/4 TON 4 X 4	M561
VMDC	TRUCK, CARGO 1 1/4 TON 4 X 4	M715
VMDD	TRUCK, MAINT, TEL. 1 1/4 TON 4 X 4	M276

VMEA	REPAIR SHOP TRUCK MOUNTED	2 1/2 TON 6 X 6	M185
VMEB	TRUCK CARGO	2 1/2 TON 6 X 6	M34
VMEC	TRUCK CARGO	2 1/2 TON 6 X 6	M35
VMED	TRUCK CARGO	2 1/2 TON 6 X 6	M35A1
VMEE	TRUCK CARGO	2 1/2 TON 6 X 6	M35A2
VMEF	TRUCK CARGO	2 1/2 TON 6 X 6	M36
VMEG	TRUCK CARGO	2 1/2 TON 6 X 6	M36A2
VMEH	TRUCK CARGO	2 1/2 TON 6 X 6	M36C
VMEJ	TRUCK CARGO	2 1/2 TON 6 X 6	M211
VMEK	TRUCK, DUMP	2 1/2 TON 6 X 6	M47
VMEL	TRUCK, DUMP	2 1/2 TON 6 X 6	M59
VMEM	TRUCK, DUMP	2 1/2 TON 6 X 6	M342
VMEN	TRUCK, DUMP	2 1/2 TON 6 X 6	M342A
VMEP	TRUCK, MAINT. EARTH BORING, POLESETTING	2 1/2 TON 6X6	V18AMTQ
VMEQ	TRUCK, MAINT. TEL. CONSTR.	2 1/2 TON 6 X6	V17AMTQ
VMER	TRUCK, MAINT. EARTH BORING	2 1/2 TON 6 X 6	V18BMTQ
VMES	TRUCK, TANK GASOLINE 1200 GAL	2 1/2 TON 6 X 6	M49
VMET	TRUCK, TANK GASOLINE 1200 GAL	2 1/2 TON 6 X 6	M49C
VMEU	TRUCK, TANK GASOLINE 1200 GAL	2 1/2 TON 6 X 6	M49CA1
VMFA	TRUCK TANK FUEL SERVICING	2 1/2 TON 6 X 6	M49A1C
VMFB	TRUCK TANK FUEL SERVICING	2 1/2 TON 6 X 6	M49A2C
VMFC	TRUCK TANK WATER 1000 GAL	2 1/2 TON 6 X 6	M50

VMFD	TRUCK TANK WATER 1000 GAL	2 1/2 TON 6 X 6	M50A1
VMFE	TRUCK TANK WATER 100 GAL 2 1/2 TON 6 X 6 M50A2		
VMFF	TRUCK, TRACTOR	2 1/2 TON 6 X 6	M48
VMFG	TRUCK, TRACTOR	2 1/2 TON 6 X 6	M275
VMFH	TRUCK, TRACTOR	2 1/2 TON 6 X 6	M275A1
VMFJ	TRUCK, TRACTOR	2 1/2 TON 6 X 6	M275A2
VMFK	TRUCK, VAN EXPANDABLE	2 1/2 TON 6 X 6	M292
VMFL	TRUCK, VAN EXPANDABLE	2 1/2 TON 6 X 6	M292A1
VMFM	TRUCK, VAN EXPANDABLE	2 1/2 TON 6 X 6	M292A2
VMFN	TRUCK, VAN EXPANDABLE	2 1/2 TON 6 X 6	M292A3
VMFP	TRUCK, VAN EXPANDABLE	2 1/2 TON 6 X 6	M292A4
VMFQ	TRUCK, VAN EXPANDABLE	2 1/2 TON 6 X 6	M292A5
VMFR	TRUCK VAN SHOP	3 1/2 TON 6 X 6	M109A1
VMFT	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M109A1
VMFU	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M109A2
VMFV	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M109A3
VMFW	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M109C
VMGA	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M104D
VMGB	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M132
VMGC	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M220
VMGD	TRUCK VAN SHOP	2 1/2 TON 6 X 6	M109A2
VMGE	TRUCK, WRECKER CRANE	2 1/2 TON 6 X 6	M108
VMGF	TRUCK WRECKER LIGHT	2 1/2 TON 6 X 6	M60
VMGG	TRUCK WRECKER LIGHT	2 1/2 TON 6 X 6	M60E
VMGH	TRUCK VAN ELECTRONIC	2 1/2 TON 6 X 6	XM567

VMGJ	INSTRUMENT REPAIR SHOP TRUCK MOUNTED	M185A1
VMGK	INSTRUMENT REPAIR SHOP TRUCK MOUNTED	M185A2
VMGL	INSTRUMENT REPAIR SHOP TRUCK MOUNTED	M185A3
VMGM	INSTRUMENT REPAIR SHOP TRUCK MOUNTED	M238
VMCN	TRUCK, CARGO 2 1/2 TON 6 X 6	M135
VMGP	TRUCK, CARGO 2 1/2 TON 6 X 6	M211
VMGQ	TRUCK, DUMP 2 1/2 TON 6 X 6	M215
VMGR	TRUCK GASOLINE TANK 1200 Gal 2 1/2 TON 6x6	M217
VMGS	TRUCK GASOLINE TANK 1200 Gal 2 1/2 TON 6x6	M217C
VMGT	TRUCK, VAN 2 1/2 TON 6x6	M220
VMGU	TRUCK, SHOP VAN 2 1/2 TON 6x6	M220C
VMGV	TRUCK, SHOP VAN 2 1/2 TON 6x6	M220D
VMGW	TRUCK, TRACTOR 2 1/2 TON 6x6	M221
VMGX	TRUCK, TANK, WATER 2 1/2 TON 6x6	M222
VMHA	TRUCK, CARGO 5 TON 6 X 6	M41
VMHB	TRUCK, CARGO 5 TON 6 X 6	M54
VMHC	TRUCK, CARGO, DIESEL 5 TON 6 X 6	M54A1
VMHD	TRUCK, CARGO 5 TON 6 X 6	M55
VMHE	TRUCK, CARGO 5 TON 6 X 6	M55A2
VMHF	TRUCK, DUMP 5 TON 6 X 6	M51
VMHG	TRUCK, DUMP 5 TON 6 X 6	M51A2
VMHH	TRUCK, TRACTOR 5 TON 6 X 6	M52
VMHJ	TRUCK, TRACTOR 5 TON 6 X 6	M52A1
VMHK	TRUCK, TRACTOR 5 TON 6 X 6	M52A2
VMHL	TRUCK WRECKER, MED. 5 TON 6 X 6	M62

VMHM	TRUCK WRECKER 5 TON 6 X 6	M543
VMHN	TRUCK WRECKER 5 TON 6 X 6	M543A2
VMHP	TRUCK CARGO 5 TON 8 X 8	M656
VMJA	TRUCK, CARGO 10 TON 6 X 6	M125
VMJB	TRUCK, CARGO 10 TON 6 X 6	M123

SEMI-TRAILERS

VMKA	SEMI-TRAILER STAKE 12 TON 4 WHEEL	M127
VMKB	SEMI-TRAILER STAKE 12 TON 4 WHEEL	M127A1
VMKC	SEMI-TRAILER STAKE 12 TON 4 WHEEL	M127A1C
VMKD	SEMI-TRAILER VAN, CARGO 12 TON 4 Wheel	M128A1
VMKE	SEMI-TRAILER VAN, CARGO 12 TON 4 WHEEL	M128A1C
VMKF	SEMI-TRAILER VAN SUPPLY 12 TON 4 WHEEL	M129
VMKG	SEMI-TRAILER VAN SUPPLY 12 TON 4 WHEEL	ML29A1
VMKH	SEMI-TRAILER VAN SUPPLY 12 TON 4 WHEEL	M129A1C
VMKJ	SEMI-TRAILER VAN, CARGO 6 TON 2 WHEEL	M119
VMKK	SEMI-TRAILER VAN, CARGO 6 TON 2 WHEEL	M119A1
VMKL	SEMI-TRAILER VAN, OFFICE 6 TON 2 WHEEL	M164
VMKM	SEMI-TRAILER VAN OFFICE 6 TON 2 WHEEL	M164E1
VMKN	SEMI-TRAILER VAN, SHOP 6 TON 2 WHEEL	M457
VMKP	SEMI-TRAILER VAN SHOP 6 TON 2 WHEEL	M458
VMKQ	SEMI-TRAILER VAN SHOP 6 TON 2 WHEEL	M459
VMKR	SEMI-TRAILER VAN SHOP 6 TON 2 WHEEL	M508
VMKS	SEMI-TRAILER VAN SHOP 6 TON 2 WHEEL	M508C
VMKT	SEMI-TRAILER TANK, WATER 2000 GAL.	M278
VMKU	SEMI-TRAILER TANK, WATER 2000 GAL.	M278A1

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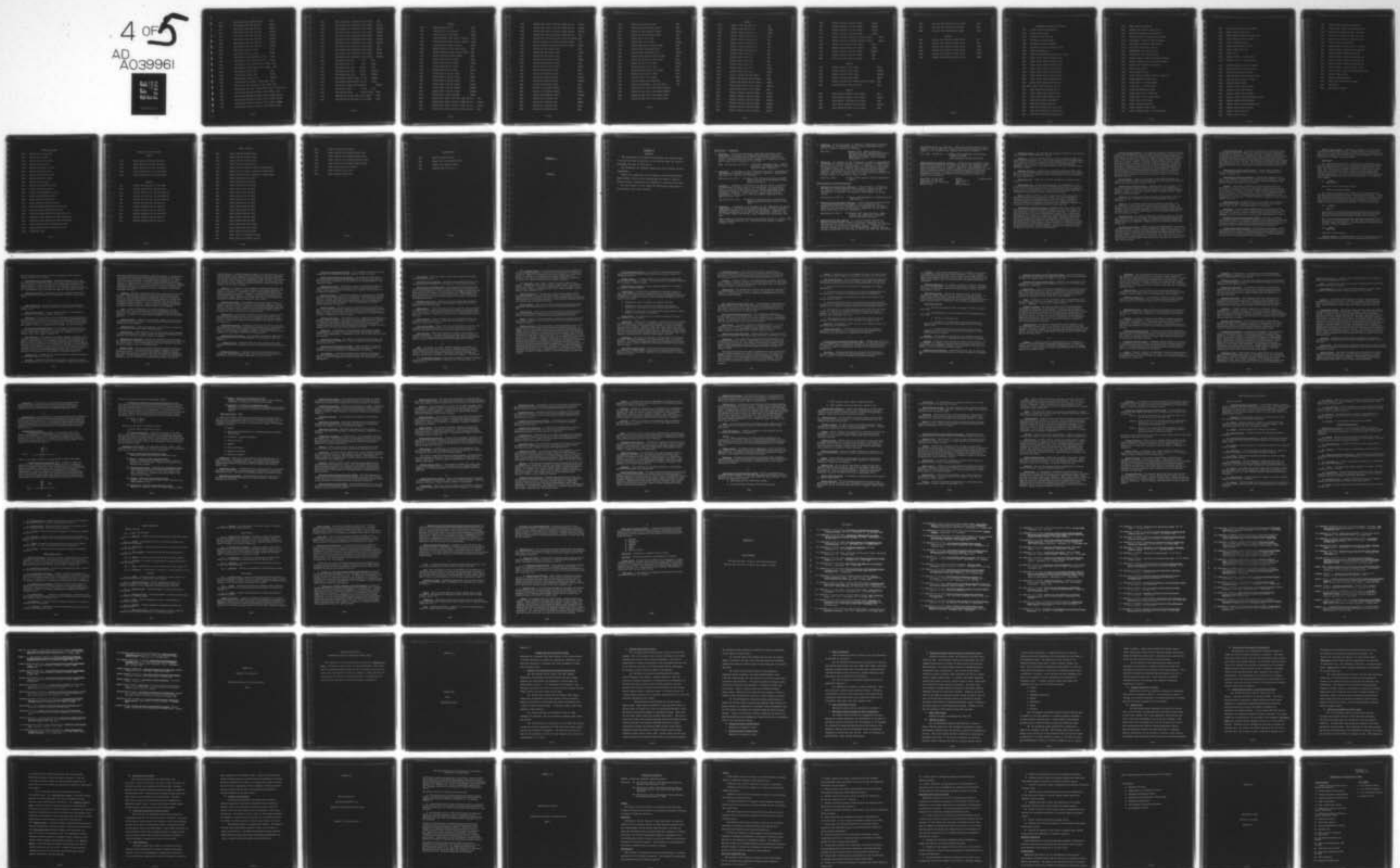

VMKV	SEMI-TRAILER TANK, WATER 2000 GAL.	M586
VMKW	SEMI-TRAILER TANK FUEL 5000 GAL.	M131A1
VMLA	SEMI-TRAILER TANK FUEL 5000 TAL.	M131A2
VMLB	SEMI-TRAILER TANK FUEL 5000 GAL.	M131A3C
VMLC	SEMI-TRAILER TANK FUEL 5000 GAL.	M131A4C
VMLD	SEMI-TRAILER TANK FUEL 5000 GAL	M131A4C
VMLE	SEMI-TRAILER TANK FUEL 5000 GAL.	M131A5
VMLF	SEMI-TRAILER TANK FUEL 5000 GAL	M131A5C
VMLG	SEMI-TRAILER LOWBED 4 WHEEL	M172
VMLH	SEMI-TRAILER LOWBED 4 WHEEL	M172A1
VMLJ	SEMI-TRAILER TANK TRANSPORTER 45 TON	M15A1
VMLK	SEMI-TRAILER TANK TRANSPORTER 50 TON	M15A2
VMLL	SEMI-TRAILER LOWBED WRECKER 12 T, 4 WHEEL	M269
VMLM	SEMI-TRAILER LOWBED WRECKER 12 T, 4 WHEEL	M270
VMLN	SEMI-TRAILER, STAKE 6 TON	M118
VMLP	SEMI-TRAILER, STAKE 6 TON	M118A1
VMLQ	SEMI-TRAILER , STAKE 12 TON	M127A2C
VMLR	SEMI-TRAILER VAN, REFRIG. 7 1/2 2 WHEEL	M349
VMLS	SEMI-TRAILER VAN, EXPANSIBLE 6 TON 4 WHEEL	M313
VMLT	SEMI-TRAILER VAN, SHOP, FOLDING SIDES 6 TON , 4 WHEEL	M447
VMLU	SEMI-TRAILER GUIDANCE & CONTROL 3 TON 2 WHEEL	M433
VMLV	SEMI-TRAILER GUIDANCE & CONTROL 3 TON, 2 WHEEL	XM433E1
VMLW	SEMI-TRAILER GUIDANCE & CONTROL 3 TON, 2 WHEEL	SM433E2
VMMA	SEMI-TRAILER GUIDANCE & CONTROL 3 TON, 2 WHEEL	XM433E3
VMMB	SEMI-TRAILER GUIDANCE & CONTROL 3 TON 2 WHEEL	M348A1

VMMC	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M348
VMMD	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M348A2
VMME	SEMI-TRAILER VAN, ELECDTONIC	3 TON 2 WHEEL	M348A2C
VMMF	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M348A2D
VMMG	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M348A2F
VMMH	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M348A2G
VMMJ	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M348A2H
VMMK	SEMI-TRAILER VAN, ELECTRONIC	3 DTN 2 WHEEL	M373
VMML	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M373A1
VMMM	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M373A2
VMMN	SEMI-TRAILER VAN, ELECTRONIC	3 TON 2 WHEEL	M373A2C
VMMP	SEMI-TRAILER VAN SHOP	6 TON	M146
VMMQ	SEMI-TRAILER VAN SHOP	6 TON	M146F
VMMR	SEMI-TRAILER VAN CARGO	12 TON	M128
VMMS	SEMI-TRAILER VAN CARGO	12 TON	M128A2C
VMMT	SEIM-TRAILER VAN CARGO	12 TON	M129A2C
VMMU	SEMI-TRAILER LOWBED WRECKER	12 TON	M269A2C
VMMV	SEMI-TRAILER LOWBED WRECKER	12 TON	M270A1
VMMW	SEMI-TRAILER LOWBED HEAVY EQUIPMENT		XM524E2
VMNA	SEMI-TRAILER LOWBED	60 TON	M162
VMNB	SEMI-TRAILER LOWBED	60 TON 4 WHEEL	XM527
VMNC	SEMI-TRAILER VAN ELEC SHOP	6 TON, 2 WHEEL	XM555
VMND	SEMI-TRAILER VAN ELEC SHOP	6 TON, 2 WHEEL	XM556

TRAILERS

VMPA	TRAILER FLATBED 10 TON	M345
VMPB	TRAILER BOLSTER POLE HAULING	V136T
VMPC	TRAILER BOLSTER POLE HAULING	V13A6T
VMPD	TRAILER AIRCRAFT CARGO LOADING 3 1/2 TON	XM712
VMPE	TRAILER AIRCRAFT CARGO LOADING 3 1/2 TON	XM712A
VMPF	TRAILER STAKE & PLATFORM 3/4 TON	XM709
VMPG	TRAILER AMMUNITION 1 1/4 TON, 2 WHEEL	M332
VMPH	TRAILER AMPHIBIOUS CARGO 1/4 TON 2 WHEEL	M100
VMPJ	TRAILER MAINTENANCE CABLE SPLICER	M367
VMPK	TRAILER CARGO 3/4 TON 2 WHEEL	M101
VMPL	TRAILER CARGO 3/4 TON 2 WHEEL	M101A1
VMPM	TRAILER CARGO 3/4 TON 2 WHEEL	M116
VMPN	TRAILER CARGO 3/4 TON 2 WHEEL	M116A1
VMPP	TRAILER CARGO 1 1/2 TON 2 WHEEL	M104
VMPQ	TRAILER CARGO 1 1/2 TON 2 WHEEL	M104A1
VMPR	TRAILER CARGO 1 1/2 TON 2 WHEEL	M105
VMPS	TRAILER CARGO 1 1/2 TON 2 WHEEL	M105A1
VMPT	TRAILER CARGO 1 1/2 TON 2 WHEEL	M105A2
VMPU	TRAILER CARGO 1 1/2 TON 2 WHEEL	M105A2C
VMPV	TRAILER CARGO 1 1/2 TON 2 WHEEL	M105E1
VMPW	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M106
VMQA	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M106A1
VMQB	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M106A2
VMQC	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M107

VMQD	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M107A1
VMQE	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M107A2
VMQF	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M107A2C
VMQG	TRAILER TANK, WATER 1 1/2 TON, 2 WHEEL 400 GAL.	M149
VMQH	TRAILER VAN, SHOP FOLDING SIDES 1 1/2 TON 2 WHEEL	M448
VMQJ	TRAILER BOLSTER POLE HAULING 3 1/2 TON 2 WHEEL	M271
VMQK	TRAILER BOLSTER POLE HAULING 3 1/2 TON 2 WHEEL	M271A1
VMQL	TRAILER DROP BED ANTENNA MOUNT	M260
VMQM	TRAILER DROP BED ANTENNA MOUNT	M260A1
VMQN	TRAILER DROP BED ANTENNA MOUNT	M406
VMQP	TRAILER DROP BED ANTENNA MOUNT	M406E1
VMQQ	TRAILER FLATBED GUIDED MISSILE	M261
VMQR	TRAILER FLATBED GUIDED MISSILE	M261A1
VMQS	TRAILER VAN DIRECTOR STATION	M259
VMQT	TRAILER VAN DIRECTOR STATION	M259C
VMQU	TRAILER VAN DIRECTOR STATION	M259A1
VMQV	TRAILER VAN DIRECTOR STATION	M259A1C
VMQW	TRAILER VAN DIRECTOR STATION	M424
VMRA	TRAILER, VAN LAUNCHING CONTROL	M262
VMRC	TRAILER, VAN LAUNCHING CONTROL	M262A1
VMRC	TRAILER, VAN LAUNCHING CONTROL	M262A1C
VMRD	TRAILER VAN, ELECTRONIC SHOP	M359
VMRE	TRAILER VAN, ELECTRONIC SHOP	M359A1
VMRF	TRAILER VAN, ELECTRONIC SHOP	M382
VMRG	TRAILER VAN, ELECTRONIC SHOP	M383

VMRH	TRAILER VAN, ELECTRONIC SHOP	M564
VMRJ	TRAILER VAN RADAR TRACKING CENTRAL	M258
VMRK	TRAILER VAN RADAR TRACKING CENTRAL	M258A1
VMRL	TRAILER VAN RADAR TRACKING CENTRAL	M428
VMRM	TRAILER BOMB 2 TON 4 WHEEL	M143
VMRN	TRAILER BOMB 2 TON 4 WHEEL	M143A1
VMRP	TRAILER CABLE REEL 3 1/2 TON 2 WHEEL	M310
VMRQ	TRAILER ROCKET TRANSPORTER 226 MM	M329
VMRR	TRAILER ROCKET TRANSPORTER 726 MM	M329A1
VMRS	TRAILER BASIC UTILITY 2 1/2 TON 2 WHEEL	M296
VMRT	TRAILER VAN ELECTRONIC 5 TON 4 WHEEL	XM460
VMRU	TRAILER LOW BED 3 TON 4 WHEEL	XM114E1
VMRV	TRAILER LOW BED 5 TON 4 WHEEL	XM455
VMRW	TRAILER VAN ELECTRONIC 3 TON 4 WHEEL	XM461
VMSA	TRAILER, CARGO 1/4 TON 2 WHEEL	M416
VMSB	TRAILER LOW BED 7 TON 4 WHEEL	XM529
VMSC	TRAILER CHASSIS, AIR CONDITIONING	M463
VMSD	TRAILER VAN ELECTRONIC 1 1/2 TON 2 WHEEL	M581
VMSE	TRAILER LOW BED 8 TON 4 DUAL WHEELS-LACROSSE	
VMSF	TRAILER LOW BED 8 TON 4 DUAL WHEELS FRUEHAUF	
VMSG	TRAILER LOW BED 8 TON 4 DUAL WHEELS HANSON	
VMSH	TRAILER LOW BED 8 TON 4 DUAL WHEELS HOBBS	

CHASSIS

VMTA	CHASSIS, TRUCK 3/4 TON 4 X 4	M56
VMTB	CHASSIS, TRUCK 3/4 TON 4 X 4	M56B1
VMTC	CHASSIS, TRUCK 3/4 TON 4 X 4	M53B1
VMTD	CHASSIS, TRUCK 2 1/2 TON 6 X 6	M44
VMTE.	CHASSIS, TRUCK 2 1/2 TON 6 X 6	M45
VMTF	CHASSIS, TRUCK 2 1/2 TON 6 X 6	M46
VMTG	CHASSIS, TRUCK 2 1/2 TON 6 X 6	M57
VMTH	CHASSIS, TRUCK 2 1/2 TON 6 X 6	M58
VMTJ	CHASSIS, TRUCK 5 TON 6 X 6	M39
VMTK	CHASSIS TRUCK 5 TON 6 X 6	M40
VMTL	CHASSIS TRUCK 5 TON 6 X 6	M61
VMTM	CHASSIS TRUCK 5 TON 6 X 6	M63
VMTN	CHASSIS TRUCK 5 TON 6 X 6	M139C
VMTP	CHASSIS, TRUCK 5 TON 6 X 6	M139D
VMTQ	CHASSIS, TRAILER 1/4 TON 2 WHEEL	M115
VMTR	CHASSIS SEMI-TRAILER 12 TON 4 WHEEL	M126
VMTS	CHASSIS SEMI-TRAILER 12 TON 4 WHEEL	M126A1
VMTT	CHASSIS SEMI-TRAILER 12 TON 4 WHEEL	M126A1C
VMTU	CHASSIS SEMI-TRAILER 6 TON 2 WHEEL	M117
VMTV	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M102A1
VMTW	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M102A2
VMUA	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M102A3
VMUB	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M102A3C
VMUC	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M103A1
VMUD	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M103A2

VMUE	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M103A3
VMUF	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M103A3C
VMUG	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M103A4
VMUH	CHASSIS, TRAILER 1 1/2 TON 2 WHEEL	M103A46
VMUJ	CHASSIS, TRAILER, GENERATOR 2 1/2 TON 2 WHEEL	M200
VMUK	CHASSIS, TRAILER, GENERATOR 2 1/2 TON 2 WHEEL	M200A1
VMUL	CHASSIS, SEMI-TRAILER 6 TON 4 WHEEL	M295
VMUM	CHASSIS, SEMI-TRAILER 6 TON 4 WHEEL	M295A1
VMUN	CHASSIS, TRAILER 2 1/2 TON 2 WHEEL	XM389E1
VMUP	CHASSIS, TRAILER 2 1/2 TON 2 WHEEL	M514
VMUQ	CHASSIS, TRAILER 2 1/2 TON 2 WHEEL	M544

CHASSIS

VMUR	CHASSIS, TRAILER 5 TON 4 WHEEL	XM456
VMUS	CHASSIS, TRAILER 3 TON 4 WHEEL	XM113E1
VMUT	CHASSIS, TRAILER 3 TON 4 WHEEL	XM113E2
VMUU	CHASSIS, TRAILER 5 TON 4 WHEEL	XM525
VMVA	CHASSIS, TRAILER GEN'L PURPOSE 31/2 TON, 2 WHEEL	M353
VMVB	CHASSIS TRAILER 1 1/2 TON 2 WHEEL	M580

DOLLIES

VMWA	DOLLY TRAILER CONVERTER 6 TON 2 WHEEL	M197
VMWB	DOLLY TRAILER CONVERTER 6 TON 2 WHEEL	M197A1
VMWC	DOLLY TRAILER CONVERTER 8 TON 2 WHEEL	M198
VMWD	DOLLY TRAILER CONVERTER 8 TON 2 WHEEL	M198A1
VMWE	DOLLY TRAILER CONVERTER 18 TON 4 WHEEL	M199

VMWF	DOLLY TRAILER CONVERTER 15 TON 4 WHEEL	M354
VMWG	DOLLY SET LIFT TRANSPORTABLE SHELTER	XM707
VMWH	DOLLY SET LIFT TRANSPORTABLE SHELTER	M689

TRACTORS

VMXA	TRACTOR, FULL TRACKED HI-SPEED 13 TON	M5
VMXB	TRACTOR, FULL TRACKED HI-SPEED 13 TON	M5A1
VMXC	TRACTOR, FULL TRACKED HI-SPEED 13 TON	M5A3
VMXD	TRACTOR, FULL TRACKED HI-SPEED 13 TON	M5A4
VMXE	TRACTOR, FULL TRACKED HI-SPEED 13 TON	M8A1
VMXF	TRACTOR, FULL TRACKED HI-SPEED 13 TON	M8A2

CONSTRUCTION VEHICLES & EQUIPMENT

VRAA	CLEANER, VACUUM SELF PROPELLED
VRAB	CLEANER, VACUUM TOWED
VRAC	COMPRESSOR, TRUCK MOUNTED
VRAD	COMPRESSOR, TRAILER MOUNTED
VRAE	CONVEYOR BELT VEHICLE MOUNTED
VRAF	CONVEYOR DRAG WHEEL OR CRAWLER MOUNTED
VRAG	CRANE SEMI-TRACTOR MB-1
VRAH	CRANE, SHOVEL CRAWLER MOUNTED 2 3/4 - 5 TON
VRAJ	CRANE, SHOVEL CRAWLER MOUNTED 10 TON
VRAK	CRANE, SHOVEL CRAWLER MOUNTED 20 TON
VRAL	CRANE, SHOVEL CRAWLER MOUNTED 25 TON
VRAM	CRANE, SHOVEL CRAWLER MOUNTED 30 TON
VRAN	CRANE, SHOVEL CRAWLER MOUNTED 35 TON
VRAP	CRANE, SHOVEL CRAWLER MOUNTED 40 TON
VRAQ	CRANE, SHOVEL CRAWLER MOUNTED 60 TON
VRAR	CRANE, SHOVEL TRUCK MOUNTED 10 TON
VRAS	CRANE, SHOVEL TRUCK MOUNTED 12 1/2 TON
VRAT	CRANE SHOVEL TRUCK MOUNTED 15 TON
VRBA	CRANE, SHOVEL TRUCK MOUNTED 20 TON
VRBB	CRANE, SHOVEL TRUCK MOUNTED 45 TON
VRBC	CRANE TRUCK MOUNTED 4000 POUNDS
VRBD	CRANE TRUCK MOUNTED 8 1/2 TON
VRBE	CRANE TRUCK MOUNTED 100' BOOM 30 TON
VRBF	CRANE TRUCK MOUNTED 110' BOOM 30 TON
VRBG	CRANE TRUCK MOUNTED TWO ENGINE 45 TON

VRBH	AUGER, EARTH SKID MOUNTED
VRBJ	CRUSHING AND SCREENING PLANT TWO UNIT
VRBK	WASHING AN SCREENING UNIT SINGLE UNIT
VRBL	CRUSHING, WASHING, SCREENING PLANT 15 UNIT
VRBM	DISTRIBUTOR , BITUMINOUS TRAILER MOUNTED
VRBN	DISTRIBUTOR, BITUMINOUS TRUCK MOUNTED
VRBP	DISTRIBUTOR WATER TRUCK 1000 GAL
VRBQ	DISTRIBUTOR, WATER TRUCK 1500 GAL
VRBR	DISTRIBUTOR, WATER TRAILER MOUNTED
VRBS	DITCHING MACHINE, LADDER TYPE CRAWLER MOUNTED
VRBT	DITCHING MACHINE, WHEEL TYPE CRAWLER MOUNTED
VRCA	GRADER, ROAD MOTORIZED 12' MOLDBOARD
VRCB	HEATER, ROAD SURFACE
VRCC	JOINT CLEANING MACHINE
VRCD	KETTLE, HEATING BITUMINOUS MATERIAL WHEEL MTD.
VRCE	LOADER AGGREGATE 3 CUBIC YARDS
VRCF	LOADER BELT, 10 - 20 CUBIC YARDS
VRCG	LOADER BELT, 5 - 8 CUBIC YARDS
VRCH	LOADER FULL TRACKED LOW SPEED
VRCJ	LOADER SCOOP 3/4 TO 1 CUBIC YARD
VRCK	LOADER SCOOP 1 1/8 - 2 CUBIC YARDS
VRCL	LOADER SCOOP 4 CUBIC YARDS
VRCM	MIXER, BITUMINOUS MATERIAL
VRCN	MIXER, CONCRETE, TRUCK MOUNTED
VRCP	MIXER, CONCRETE, WHEEL OR TRAILER MOUNTED

VRCQ	MIXER, ROTARY TILLER SELF PROPELLED
VRCR	MIXER, ROTARY TILLER TOWED
VRDA	PAVING MACHINE BITUMINOUS CRAWLER TYPE
VRDB	ROLLER, MOTORIZED TANDEM 2 ROLLS
VRDC	ROLLER, MOTORIZED 3 WHEEL
VRDD	ROLLER, TOWED PNEUMATIC TIRES
VRDE	ROLLER, TOWED SHEEPS FOOT
VRDF	ROOTER, ROAD
VRDG	SCRAPER TO WED 4 - 8 CUBIC YARDS
VRDH	SCRAPER TO WED 10 - 15 CUBIC YARDS
VREA	SCRUBBING MACHINE, FLOOR OR PAVEMENT
VREB	SEWER CLEANING SET TRAILER MOUNTING
VREC	SNOW PLOW TRUCK MOUNTED ROTARY
VRED	SNOW PLOW TRUCK MOUNTED STRAIGHT BLADE
VREE	SNOW PLOW TRUCK MOUNTED V BLADE
VREF	SPEADER AGGREGATE TOWED
VREG	SPREADER, SAND, TRACTOR POWERED
VREH	SPREADER, SAND, TRUCK MOUNTED
VREJ	SWEEPER, VACUUM, SELF PROPELLED
VREK	SWEEPER, MAGNETIC TOWED OR TRAILER MOUNTED
VREL	SWEEPER, MAGNETIC SELF PROPELLED
VREM	SWEEPER, ROTARY MANUALLY PROPELLED GEP
VREN	SWEEPER, ROTARY SELF PROPELLED
VREP	SWEEPER, ROTARY TOWED GEP
VREQ	SWEEPER, SNOW AIR BLAST

VRER	SWEEPER ROTARY, VACUUM SELF PROPELLED
VRFA	TRACTOR, FULL TRACKED LOW SPEED DED SIZE 2
VRFB	TRACTOR FULL TRACKED LOW SPEED DED SIZE 3
VRFC	TRACTOR FULL TRACKED LOW SPEED DED SIZE 4
VRFD	TRACTOR FULL TRACKED LOW SPEED DED SIZE 5
VRFE	TRACTOR WHEELED AGRICULTURAL
VRFF	TRACTOR WHEELED, INDUSTRIAL 900 - 1800 DBP
VRFG	TRACTOR WHEELED, INDUSTRIAL 1000,-1975 DBP
VRFH	TRACTOR WHEELED, INDUSTRIAL 2500 DBP
VRFJ	TRACTOR WHEELED, INDUSTRIAL 2000-2975 DBP
VRFK	TRACTOR WHEELED, INDUSTRIAL 3000-3700 DBP
VRFL	TRACTOR WHEELED, INDUSTRIAL 3725-5175 DBP
VRFM	TRACTOR WHEELED, INDUSTRIAL 5200-7775 DBP
VRFN	TRACTOR WHEELED, INDUSTRIAL 20,005-27,500 DBP
VRGA	TRAILER, TANK, ASPHALT
VRGB	TRAILER, WELDING EQUIPMENT
VRGC	TRUCK AERIAL PLATFORM 90 FT. REACH
VRGD	TRUCK AUGER
VRGE	WELL DRILLING MACHINE

RAILROAD EQUIPMENT

VTAA	RAILWAY CAR, BOX 56.5 GAGE
VTAB	RAILWAY CAR, BOX OTHER
VTAC	RAILWAY CAR FLAT 56.5 GAGE
VTAD	RAILWAY CAR FLAT OTHER
VTAE	RAILWAY CAR GONDOLA 56.5 GAGE
VTAF	RAILWAY CAR GONDOLA OTHER
VTAG	RAILWAY CAR HOPPER 56.5 GAGE
VTAH	RAILWAY CAR TANK 56.5 GAGE
VTAJ	RAILWAY CAR TANK OTHER
VTAK	RAILWAY CAR AMBULANCE 56.5 GAGE
VTAL	RAILWAY CAR GUARD 56.5 GAGE
VTAM	RAILWAY CAR REFRIGERATOR 56.5 GAGE
VTBA	RAILWAY CAR REFRIGERATOR OTHER
VTBC	RAILWAY MOTOR CAR MAINTENANCE
VTBD	CRANE, LOCOMOTIVE DIESEL 56.5 GAGE
VTBE	LOCOMOTIVE DIESEL ELECTRIC 56.5 GAGE 25 TON
VTBF	LOCOMOTIVE DIESEL MECHANICAL 56.5 GAGE
VTBG	LOCOMOTIVE DIESEL ELECTRIC 56.5 GAGE 44-80 TON
VTBH	LOCOMOTIVE DIESEL ELECTRIC 56.5 GAGE 100-115 TON
VTBJ	LOCOMOTIVE DIESEL ELECTRIC 56.5 GAGE 120-131 TON
VTBK	CRANE LOCOMOTIVE DIESEL MECHANICAL 56.5 GAGE
VTBL	CRANE LOCOMOTIVE DIESEL ELECTRIC 56.5 GAGE
VTBM	LOCOMOTIVE, STEAM

MATERIALS HANDLING EQUIPMENT

CRANES

VVAA	CRANE, WAREHOUSE ELECTRIC 3000 #CAPY
VVAB	CRANE, WAREHOUSE ELECTRIC 6000 #CAPY
VVAC	CRANE, WAREHOUSE GED, PRT, 6000 #CAPY
VVAD	CRANE, WAREHOUSE GED, PRT 10,000 #CAPY
VVAE	CRANE, WAREHOUSE GED, PRT 20,000 #CAPY

TRACTORS

VVBA	TRACTOR, WAREHOUSE GED, SRT 2000 #DBP
VVBB	TRACTOR, WAREHOUSE GED, PRT 2000 #DBP
VVBC	TRACTOR, WAREHOUSE GED, PRT 2100-2600 DBP
VVBD	TRACTOR, WAREHOUSE GED, PRT 3000-3200 DBP
VVBE	TRACTOR, WAREHOUSE GED, PRT 4000-4600 DBP
VVBF	TRACTOR, WAREHOUSE GED, PRT 5000 DBP
VVBG	TRACTOR, WAREHOUSE GED, PRT 7500 DBP
VVBH	TRACTOR, WAREHOUSE GED, PRT 8000 DBP
VVBJ	TRACTOR, WAREHOUSE GED, PRT 12,000 DBP
VVBK	TRACTOR, WAREHOUSE ELECTRIC 2000 DBP
VVBL	TRACTOR, WAREHOUSE ELECTRIC 4000 DBP

TRUCKS, FORKLIFT

VVCA	TRUCK, FORKLIFT ELECTRIC 2000#
VVCB	TRUCK, FORKLIFT ELECTRIC 3000#
VVCC	TRUCK, FORKLIFT ELECTRIC 4000#
VVCD	TRUCK, FORKLIFT ELECTRIC 6000#
VVCE	TRUCK, FORKLIFT ELECTRIC REACHING & TIERING 2000#
VVCF	TRUCK, FORKLIFT ELECTRIC, REACHING & TIERING 4000#
VVCG	TRUCK, FORKLIFT ELECTRIC, REACHING & TIERING 6000#
VVCH	TRUCK, FORKLIFT GED PRT 2000#
VVCJ	TRUCK, FORKLIFT GED SRT 2000#
VVCK	TRUCK, FORKLIFT GED SPRT 3000#
VVCL	TRUCK, FORKLIFT GED SRT 3000#
VVCM	TRUCK, FORKLIFT GED PRT 3500#
VVCN	TRUCK, FORKLIFT GED PRT 4000#
VVCP	TRUCK, FORKLIFT GED SRT 4000#
VVCQ	TRUCK, FORKLIFT GED PRT 6000#
VVDA	TRUCK, FORKLIFT GED SRT 6000#
VVDB	TRUCK, FORKLIFT GED PRT 7000#
VVDC	TRUCK, FORKLIFT GED SRT 7000#
VVDD	TRUCK, FORKLIFT GED PRT 8000#
VVDE	TRUCK, FORKLIFT GED SRT 8000#
VVDF	TRUCK, FORKLIFT GED PRT 10,000#
VVDG	TRUCK, FORKLIFT GED PRT 14,000#
VVDH	TRUCK, FORKLIFT GED PRT 15,000#
VVDJ	TRUCK, FORKLIFT SIDELOADING 10,000#
VVDK	TRUCK, FORKLIFT SIDELOADING 12,000#

VVDL	TRUCK, FORKLIFT DED PRT 6000#
VVDM	TRUCK, FORKLIFT TYPE A/S32H-7 (463L) 6000#
VVDN	TRUCK, FORKLIFT TYPE A/S32H-13 (463L) 6000#
VVDP	TRUCK, FORKLIFT TYPE A/S32H-10 (463L) 10,000#
VVDQ	TRUCK, FORKLIFT ROUGH TERRAIN (463L) 10,000#
VVDR	TRUCK, PALLET ELECTRIC 1000-6000#
VVDS	TRUCK, STRADDLE 30,000 #CAPY
VVDT	TRUCK, STRADDLE 60,000 #CAPY

MISCELLANEOUS

VXAA	BATH UNIT TRAILER MOUNTED
VXAB	DENTAL UNIT, SEMI-TRAILER MOUNTED
VXAC	LAUNDRY UNIT, TRAILER MOUNTED
VXAD	PURIFIER TRAILER MOUNTED A-1

APPENDIX B

GLOSSARY

APPENDIX B

GLOSSARY

The requirement for standard definitions for similar terms in use by the various agencies in the DOD has been set forth in preceding sections of this study.

The following two examples demonstrate the validity of this requirement.

Definitions appearing in this glossary were extracted from publications listed in the bibliography and where a conflict existed either a definition was amended or a selection was made.

For the purpose of this study the definitions appearing in this glossary have been accepted.

DEFINITIONS - COMPONENT

1. Component. A group of physically connected assemblies and/or parts which are capable of independent operation or may be externally controlled and may derive their power from another source. When combined with other components, assemblies, and/or parts, they form a subsystem or end item.

   Dept. of the Army TB 750-93-1 Functional Grouping Codes: Combat Tactical, and Support Vehicles and Special Purpose Equipment

2. Component. An assembly or any combination of parts, subassemblies and assemblies mounted together, normally capable of independent operation in a variety of situations.

   DOD Directive 4151.7 29 January 1961 Uniform Technical Documentation for use in Provisioning of End Items of Materiel

3. Component. Component is defined as an article which is normally a combination of detail parts, sub-assemblies, and assemblies, and is a self-contained element of a complete operating equipment and performs a function necessary to the operation of that equipment. Examples: Indicator unit, power unit, receiver, transmitters, tuning units, rotation antenna, modulator unit, amplifier unit, etc.

   DOD Directive 3232.2 23 February 1956 Electronic Failure Data Reporting System and DD Forms 787 and 787.1

4. Component. A component is an assembly or any combination of parts, subassemblies and assemblies mounted together, normally capable of independent operation in a variety of situations. Examples are: Receiver/Transmitter of an ARC-34 VHF Sub-System, relay of a DC or AC power supply Sub-System, Tank Transmission, Helicopter Gear Box.

   Work Breakdown Structure Project Final Report Volume I 8 April 1966 Control Systems Research Inc. 1100 Wilson Boulevard Arlington, Virginia 22209

5. Component. An article which is normally a combination of parts, subassemblies, or assemblies and is a self contained element within a complete operating equipment.

NHB 7500.1 — November 1965 Apollo Logistics Requirements Plan National Aeronautics and Space Administration Office of Manned Space Flight, Apollo Program Washington, D.C.

6. Component. An assembly or any combination of parts, subassemblies, and assemblies mounted together, normally capable of independent operation in a variety of situations. A component is also a self-contained element of a complete operating set (system, subsystem, or assembly) which has a direct item relationship by indenture. Normally, components are recoverable and have logistic support elements such as AGE, spare parts, and technical data procured for planned support of base/depot repair cycles.

AFLC Reg. 400-1 — 30 April 1965 Logistic Support Management policy

ADMINISTRATIVE USE MOTOR VEHICLES

1. Administrative Use Motor Vehicles. Motor vehicles, assigned on the basis of formal authorization documents, which are used for the purpose of providing the transportation support of an installation or separate location not classified as an installation.

DOD Directive 4500.28 — 9 August 1960 Management of Administrative Use Vehicles

2. Administrative Use Motor Vehicles. Motor vehicles which are used to provide transportation support to an installation, or a separate location not classified as an installation, including those used by the Corps of Engineers, Department of the Army, in connection with civil works functions.

DOD Directive 4505.2 — 12 November 1965 Identification, Registration and Inspection of Administrative Use Motor Vehicles

3. Administrative Use Vehicle. Any use of a motor vehicle not directly connected with combat or tactical operations or for the training of troops for such operations. Vehicles for administrative use are normally of commercial design. Vehicles of military design may be used for administrative purposes when approved by Department of the Army in which case they are classified

as administrative use vehicles. (Does not include Military and Commercial Design vehicles authorized by TOE and used for organic support, i.e., orderly room, supply, mess hall, laundry).

U.S. Army - TM 38-750 1 January 1964 Department of the Army Technical Manual
Army Equipment Record Procedures

Administrative Use Motor Vehicles. Wheeled-type, pneumatic tired motor vehicles, normally of commercial design and transport type; used for the movement of supplies, personnel, and equipment in providing administrative logistic support to installations or activities, including support of Government personnel at contractor-operated facilities. Vehicles of military design may also be designated and used for administrative purposes in which case they are so classified.

Department of the Army	AR 58-1	15 March 1962
Department of the Navy	OPNAV P 44-2	
Department of the Air Force	AFM 77-1	
Marine Corps	MCO P11240.46	

A

Acceptance Testing. All activities and materials involved in the production flight checkout of the complete air vehicle.

Accessory. A part or assembly designed for use in conjunction with or to supplement another assembly, or a unit or set, contributing to the effectiveness thereof without extending or varying the basic function of the assembly or set. An accessory may be used for testing, adjusting or calibrating purposes. (Examples: Test instrument, recording camera for radar set, headphones, emergency power supply.)

Accounts, Chart of. A complete list of account symbols and titles which are to be used in reporting and recording financial transactions. The accounts should be arranged in an orderly manner, as for example, in the order required for report presentation.

Acquisition Cost. Total cost to the DOD of acquiring a complete weapon system.

Acquisition Phase. The period starting after the establishment of the Design Requirements Baseline (end of the Definition Phase) until the acceptance by the user of the last operating unit in a certain series, and all required updating changes resulting from the testing have been identified, approved, and incorporated, and/or placed on order whichever occurs later.

Adjust. Adjust is defined as those actions required to bring a piece of equipment (system, subsystem, component, module, etc.) into a specified tolerance by mechanical or electronic means for the purpose of making the functional assembly or assemblies operate as a unit. Adjust includes the corrective action found necessary as a result of the calibration exercise and the monitoring actions performed during the normal operation.

AAE--Aerospace Ancillary Equipment. Equipment other than organizational (AVE, OGE or MGE) required to install, assemble, check out, test, repair, or train personnel to operate, control, or maintain the system. In cases where multiple utilization is made of organizational equipment (e.g., where organizational MGE test equipment is used in the assembly process in the factory), the organizational categorization (MGE) will apply. Examples of AAE include flight test equipment (instrumentation equipment); depot tooling and depot test equipment (inertial measurement unit calibration test equipment); installation and checkout (I&C) equipment (initial balancing and adjustment equipment for environmental controls) safety-destruct; classes I, II, and III training equipment (crew trainer, mission simulator, actual system equipment as parts or components thereof); and mobile training units.

Aerospace Ground Equipment. All equipments required on the ground to make a weapon system, command and control system, support system, advanced objective, subsystem, or end item of equipment operational in its intended environment. This includes all equipment required to install, launch, arrest, guide, control, direct, inspect, test, adjust, calibrate, appraise, gauge, measure, assemble, disassemble, handle, transport, safeguard, store, activate, service, repair, overhaul, maintain, or operate the system, subsystem, end item, or component. This definition applies regardless of the method of development, funding, or procurement. (Aerospace Ground Equipment is functionally subclassified only as Operating Ground Equipment and Maintenance Ground Equipment. Operating Ground Equipment is that Aerospace Ground Equipment which is a functional part of a system and which operates with the aerospace vehicle or end item. Maintenance Ground Equipment is required to restore a system or end item to operating condition.

AGE (Peculiar). Items to be developed and procured specifically for support of a system as well as those commercial items that are being introduced into the Air Force inventory for the first time.

AVE--Aerospace Vehicle Equipment. Equipment which is, of itself, or is part of the manned or unmanned vehicle which operates in the aerospace environment. Examples of aerospace vehicle equipment include bomb/nav computer, airplane, booster, orbiting space station, engines, re-entry vehicle, command module, and guidance package.

Aircraft. Those fixed wing, rotary wing and compound heavier than air, manned air vehicles, designed for powered and guided flight within the atmosphere.

Airframe. The assembled structural and aerodynamic components of an air vehicle that support subsystems essential to a particular mission. The elements included in airframe are: wing, fuselage, empennage, landing gear, secondary power, life support equipment, crew accommodations, escape and safety equipment, wheels, tires, tubes and brakes, etc., and integration/assembly of the air vehicle as a whole.

Aircraft System. The complex of equipment, software, services, and facilities required to develop and produce the capability of employing those fixed wing, rotary wing and compound, manned air vehicles designed for powered and guided flight in the atmosphere. Represented by A-7, C-5, AMSA, UH-1D, AAFSS, XC-142, etc.

Air Vehicle (Aircraft). Complete flyaway, including airframe, engines and installed equipment. Includes design, development, manufacturing, test, tooling, and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed.

Air Vehicle (Missile). The means for delivering the destructive effect to the target including the capability to generate or receive intelligence, to navigate and penetrate to the target area, and to detonate the warhead. Includes design, development, manufacturing, test, tooling and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed.

Anti-Submarine Warfare (ASW) Equipment. Includes that equipment in the air vehicle peculiar to the ASW mission, if any. Includes sensors, computer, displays, etc.

Armament/Weapons Delivery Equipment. Includes that equipment in the air vehicle peculiar to the armament or weapons delivery function. Includes guns, mounts, turrets, launchers, racks, weapons direction equipment, ammo feed and ejection mechanisms and gun cameras.

Assembly. An assembly is defined as an article which consists of detail parts and sub-assemblies, or a combination thereof, and as such, is an element of a component, and performs functions necessary to the operation of the component as a whole. Examples: Filter assembly, amplifier assembly (AF, RF, IF, video, etc.), gyro assembly, oscillator assembly (RF or AF), pulsing networks, etc. The following type items are assemblies only when an integral part of a component: filters, amplifiers, modulators, power supplies, junction boxes, etc.

Assigned Manhours. Assigned Manhours to an activity is the number of personnel therein times the number of normal working days in the period times 8 hours per day. (176 manhours/month - 1 man month).

Attachment. A part or assembly designed for use in conjunction with another assembly or a unit or set, contributing to the effectiveness thereof by extending or varying the basic function of the assembly, unit or set. (Examples: Hoisting attachment on a truck, milling attachment for a lathe.)

Automatic Data Processing Equipment (ADPE). A machine, or group of interconnected machines, consisting of input, storage, computing, control, and output devices, which uses electronic circuitry in the main computing element to perform arithmetic and/or logical operations automatically by means of internally stored or externally controlled programmed instructions.

Automatic Data Processing (ADP). The processing (classifying, sorting, calculating, summarizing, recording, printing) of data through the use of electronic digital computers, communications channels and devices used with such computers, and associated peripheral equipment. Includes preparation of source data in form appropriate for such processing.

Automatic Flight Control. Includes that equipment in the air vehicle related to automatic flight control. Includes flight control mechanisms and connectors, mechanical and electrical parts for signal transmission and application of power, reference sensors, and air data computer. It does nnt include control linkages or control surfaces.

Availability.

(1) Inherent availability (A_i) is defined as the probability that, when used under stated conditions in an ideal environment without consideration for preventive action, a system will operate satisfactorily at any time. The "ideal support environment" referred to exists when the stipulated tools, parts, skilled manpower, manuals, and other support items required are available. As such, the concept of inherent availability excludes whatever ready time, preventive maintenance down-time, supply down-time, and administrative down-time a system may require. It is expressed by the formula:

$$A_i = \frac{MTBF}{MTBF + MTTR}$$

where MTBF is mean time between failures

MTTR is mean-time-to-repair

(2) Achieved availability (A_a) is defined as the probability that, when used under stated conditions in an ideal support environment, a system will operate satisfactorily at any time. As is readily recognized, it differs from inherent availability only in its inclusion of consideration for preventive action; as in the case of inherent availability, it excludes supply down-time and administrative down-time. It may be expressed as:

$$A_a = \frac{MTBM}{MTBM + \bar{M}}$$

where MTBM is the mean-time-between-required-actions, resulting from MTBF and mean-time-between-preventive-actions, and $\bar{M}$ is mean active down-time resulting from both preventive and corrective actions

(3) A third concept of availability, operational availability (A_o), is defined as the probability that, when used under stated conditions in an actual support environment, a system will operate satisfactorily at any time. It may be expressed as:

$$A_o = \frac{MTBM}{MTBM + MDT}$$

where MDT is mean down-time.

Available Manhours. Available Manhours are the assigned manhours less those manhours absent from the maintenance organization for personal or directed purposes such as leave, sickness, processing, AWOL, base even though no production is effected.

Awaiting Maintenance Time (AWM). Awaiting Maintenance Time is that time during which an aircraft is Not Operationally Ready-Maintenance (NORM) and no maintenance work is being performed on either the aircraft or its related equipment. Related equipment is a component/part that has been issued/assigned to a particular aircraft, e.g., an engine, generator, ARC-27, etc. Awaiting Maintenance Time does not apply when the aircraft is NORS.

Awaiting Parts (AWP). Awaiting parts is that condition which exists when materials are not available on station/ship to complete a maintenance action.

B

Basic Designation. The minimum combination of letters and numbers required to adequately identify a system such as ship, aircraft, rocket, or guided missile.

Basic Mission Symbol. The prime intended function or capability of the aircraft, such as bomber, fighter, patrol, etc.

Bench Check. The term "bench check" includes any action by maintenance when determining the condition status of an item and/or the determination of capability or lack of capability to return an item, removed for a malfunction or an alleged malfunction, to a serviceable status. It also includes repair action when the repair is accomplished concurrently with the bench check.

Bit and Piece (Preferable) Part. Bit and Piece is one piece, or two or more pieces joined together which are not normally subject to disassembly without destruction or impairment of designed use. Examples are screw, capacitor, gear, knob, gasket, brushes, etc.

Bulk Materials. "Bulk materials" are those necessary constituents of an assembly or subassembly such as oil, wax, solder, cement, ink, damping fluid, grease, powdered graphite, flux, welding rod, thread, twine and chain for which the quantity required is not readily predeterminable; or if knowing the quantity, the physical nature of the material is such that it is not adaptable to depiction on a drawing; or which can be cut to finished size by the use of such hand or bench tools as shears, pliers, knives, etc., without any further machining operations and the configuration is such that it can be fully described in writing without the necessity of pictorial presentation.

Calendar Time. Calendar Time is the total number of calendar days/hours in a designated period of observation.

Calibrate. Calibrate is defined as those actions required to compare an item of equipment with a like piece of equipment or special testing devices which are established as authorized or recognized standards. Calibrate does not include those monitoring actions required of equipment during normal operation or the correlation or adjustment processes required as a result of the calibration function. For example, when "swinging" an aircraft compass, the actions required to line up the aircraft to the master compass and take the reading from the compass installed in the aircraft are considered calibration exercises; the adjustments made to minimize the reading error and prepare the compass correction card are not considered a part of the calibration function.

Checkout. Checkout is defined as those actions required to verify that an item is operating within prescribed parameters and/or is functioning properly. Checkout shall include all functional checks made independent from or during a periodic inspection wherein the equipment or system shall be started, actuated, pressurized, etc, specifically for the purpose of verifying equipment operation. The use of MGE may or may not be necessary to perform a checkout function. Checkout shall not include those monitoring actions required during the normal operation of the equipment.

Code. A system of numbering, or otherwise designating, accounts, vouchers, reports, and other documents, or item data therein, in such a manner that the symbols used will facilitate transmission, classification, tabulation, or analysis in a predetermined arrangement. Also see "accounts, chart of."

Commercial Items. "Commercial items" means supplies or services which normally are advertised and are or have been sold or offered to the public commercially by any supplier.

Commodity Groups. A group of homogenous items of materiel as depicted in the Department of Defense supply cataloging system.

Communications. Those equipments used to receive and transmit messages from one person or place to another, except for that internal communications equipment used within the vehicle, structure or complex.

Communications (Internal). Includes all equipment in the air vehicle for communication or identification purposes such as intercom, radio system (s), IFF, and data link. When an integrated communication, navigation and identification package is used, it is included here.

Complete Round. All the components making up the ammunition necessary for firing one shot, such as mines, bombs, rockets, torpedoes, rifle and artillery ammunition. Includes structural elements, warhead or payload, fuze, safety/arming devices, guidance equipment, and propulsion equipment or propellant. For artillery ammunition, the complete round is the projectile (including structure, warhead, fuze, safety/arming devices, etc.) & the propelling charge. Includes design, development, manufacturing, test, tooling and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed.

Component. An assembly or any combination of parts subassemblies, and assemblies mounted together, normally capable of independent operation in a variety of situations. A component is also a self-contained element of a complete operating set (system, subsystem, or assembly) which has a direct item relationship by indenture. Normally, components are recoverable and have logistic support elements such as AGE, spare parts, and technical data procured for planned support of base/depot repair cycles.

Computer Programming. Those programs and routines used to direct the computer to perform a desired operation or sequence of operations. These involve among other things, the analysis of the problem, preparation of flow diagrams, preparing details, testing, and developing subroutines, allocation of storage locations, specification of input and output formats, and the incorporation into a complete data processing system.

Configuration. The relative disposition and makeup of component parts; the internal and external contours of this disposition which compose the complete technical description required to fabricate test, accept, operate, maintain and logistically support systems/equipment, the shape of a thing at a given time.

Configuration Control. Configuration control is the process of systematic evaluation, coordination, and approval or disapproval, in accordance with established criteria, of all changes subsequent to the establishment of a formal documented baseline configuration (point of reference) defined in accordance with configuration identification requirements.

Configuration Identification. The technical documentation defining the approved configuration of systems/equipment under development, test, and production.

Configured Items. Configured items are those selected items which require continuation of configuration status accounting during the operational phase.

Configured Item List. A configured item list contains those items selected for configuration accounting. This list will be published by aircraft/engine model and revised as necessary to keep it current.

Configuration Management Baseline. That configuration meeting the basic requirements of a contract and on which contract changes are based.

Configuration Management (Procedures). The formal set of procedural concepts by which a uniform system of configuration identification, control, and accounting is established and maintained for all systems/equipment, and components thereof.

Configuration Status. Configuration status is the official documented identification of the actual configuration and installation status of a serial or part numbered system or equipment at any given time in relation to an approved configuration.

Contract End Item. A deliverable equipment or facility that is formally accepted by the procuring agency on a DD Form 250 in accordance with requirements in a contract end item detail specification. It is the prime level of assembly for management control and accountability, for provisioning spares, and for preparing technical manuals. This is identified by a permanent number assigned by a contractor.

Contract Funding. The total amount of funds that have been made available to the contractor through a specified period of time against the contract. This is normally not identical with contract costs, not all of which may be funded at a given point in time, and which are tracked or controlled separately from the tracking of the flow of funds.

Contract Maintenance. That maintenance (i.e., modification, modernization, rebuild, overhaul, repair or servicing of materiel) performed under contract by commercial organizations (including original manufacturers) on a one-time or continuing basis without distinction as to the level of maintenance. Included within this term is that contracting for services to augment military capability for the direct maintenance support of materiel.

Contractor. A "contractor" is any individual, partnership, company, corporation, or association having a contract with the procuring activity for the design delineations, or manufacture of an item or items under the terms of a contract.

Contractor Commitments. The total of a contractor's cash payments for items and services, and earned fee to date, as well as those items ordered but not yet paid for.

Contractor Furnished Equipment (CFE). Items of hardware, electrical equipment, or other production or commercial items furnished by prime contractors or associate contractors as designated by the contract.

Cost Analysis. A systematic procedure for estimating the aggregate cost of a system/equipment, and for comparing the costs of alternative systems in order to determine the relative economy and effectiveness of the alternatives.

Costs, Fixed. Those costs which tend to remain relatively constant, despite changes in output.

Cost Categories, Functional. Functional cost categories will be used in reporting costs throughout the life cycle of a weapon system program.

Costs, Research and Development. Those program costs primarily associated with research and development efforts including the development of a new or improved capability to the point where it is ready for operational use. These costs include equipment costs funded under the RDT&E appropriations and related military contruction appropriation costs. They exclude costs which appear in the military personnel, operation and maintenance and procurement appropriations.

Cradle-to-Grave Costs. Total costs of given system, from conceptual cost through development, acquisition, production operations, and final disposition from the inventory.

Costs, Direct. Those costs that can easily, obviously, and conveniently be identified with specific units of product, processes, jobs, departments, etc. These costs usually relate to direct labor or direct material in such a way that a change in output can be said to cause a corresponding change in such cost.

Costs, Indirect. Costs or charges that are not associated with particular products or activities in that they do not change as a result of increases or decreases in output.

Costs Non-recurring. Those costs which are incurred but one time. This category would include development costs, production start-up costs, and those one-time additional costs associated with accelerated production.

Cost Operating. Those costs necessary to operate and to maintain the programmed capability. (Includes military personnel, operation and maintenance, and recurring procurement appropriation costs such as replenishment spares; excludes RDT&E and military construction appropriation costs).

D

Data. The general term "data" includes management, scientific, engineering and logistics information, reports, and documentation contractually required for delivery or deferred delivery from contractors. These data are for research, development, production, training, modification, overhaul, reprocurement, operation, and maintenance programs. They include:

(1) Administrative reports - Reports which require financial information of any sort, or contract/production progress, socio-economic data, cost information, etc.

(2) Technical reports - Any technical document written to permanently record technical information, conclusions and recommendations developed on scientific, technical and engineering activities relating to a single task, project or contract, or a small group of closely related efforts. A technical report may be definitive for the subject presented, exploratory in nature, or a record of inconclusive or negative findings.

(3) Other Data - Data needed to develop, acquire, install, test, operate, maintain, overhaul, repair, modify, supply, support, and reprocure systems and equipment. Such data may appear in the form of reports, technical manuals, charts, photographs, films, lists, tapes, drawings, specifications, parts breakdowns, etc.

Data Communications. The equipment used in direct support of data processing equipment. Devices that are designed to convey data from its original state to a data processing media. These equipments can be mechanical, electromechanical, electronic or optical in nature and are generally found at the terminal ends of communications lines.

Data Management. The process of determining and validating each data requirement and of planning for the timely and economical acquisition of data.

Data Services. Data services is the activity that converts documented data into data processing machine records and utilizes these records to produce machine reports, listings and pre-printed/pre-punched cards.

Demand. Demand is a valid requirement placed on the supply activity by an authorized customer for an item which may or may not have been used in a maintenance process.

Depot Maintenance. Depot maintenance is that maintenance which is the responsibility of and performed by designated maintenance activities, to augment stocks of serviceable materiel, and to support organizational maintenance and intermediate maintenance activities by the use of more extensive shop facilities, equipment, and personnel of higher technical skill than are available at these lower levels of maintenance. It normally consists of one or more of the following: inspection, test, repair, modification, alteration, modernization, conversion, overhaul, reclamation, or rebuild of parts, assemblies, sub-assemblies, components, and end items; the emergency manufacture of non-available parts; and, provision of technical assistance to using activities and intermediate maintenance organizations. Depot maintenance is usually accomplished in fixed shops, shipyards and shore based facilities. The Department of Defense term "depot maintenance" encompasses the Military Department maintenance terms of rehabilitation, depot, fifth echelon, O&R (overhaul and repair), regular overhaul, restricted availability, and Shops A and B.

Depot Maintenance Activity. That portion of a Government-owned and operated military installation performing depot maintenance support on designated material.

Design Activity. A "design activity" is an activity having responsibility for the design of an item. The activity may be a Government activity or a contractor, vendor or others.

Design Activity Standard. "Design activity standard" is a standard developed by a design activity.

Design Number. A number will be assigned for each basic mission or type. New design numbers will be assigned when an existing aircraft is redesigned to an extent that it no longer reflects the original configuration or capability. Examples of changes requiring design redesignations on aircraft are as follows:

1. Changing the number of engines of a specific aircraft.

2. Changing the wing or control surface design of a specific aircraft from a straight wing to a swept or delta wing design.

3. Changing the empennage of a specific design from straight to swept surfaces or relocating the empennage.

Design Number. The sequence number of each new design of the same basic mission or type aircraft.

Detail Part. A detail part is defined as an article which is an element of a sub-assembly, an assembly, or a component, and is of such construction that it is practically or economically not amenable to further disassembly for maintenance purposes. Examples: Relay coil, relay contact arm, fixed resistor, conduit bushing, fixed capacitor, etc. Items such as transformers, electron tubes, relays, potentiometers, switches, connectors, sockets, chokes, etc., are normally considered as detail parts, but in some cases will be considered as sub-assemblies or components when subject to repair.

Development. The process of working out and extending the theoretical, practical, and useful applications of a basic design, idea, or scientific discovery. The design, building, modification, or improvement of the prototype of a vehicle, engine, instrument or the like as determined by the basic idea or concept.

Direct Maintenance Support. Refers to that maintenance performed to materiel while it remains under the custody of the using military command. Upon restoration to serviceable condition, the materiel normally is returned directly to service.

Distribution System. That complex of facilities, installations, methods, and procedures, designed to receive, store, maintain, distribute, and control the flow of military materiel between the point of receipt into the military system and the point of issue to using activities and units.

Document. "Document" applies to the specifications, drawings, sketches, lists, standards, pamphlets, reports, and printed, typewritten, or other information, relating to the design, procurement, manufacture, test, or inspection of items or services under the contract.

Drawing Title. The drawing title shall be the name by which the part of item shall be known and will consist of a basic name, government type designator, if applicable, and sufficient modifiers to differentiate like items in the same major assembly.

E

ECO - Engineering Change Order Costs. All production, engineering, and on-line production costs for changes that are accomplished on equipment before delivery to the Air Force on DD Form 250 and all production cost for new items of equipment that are added to the system before delivery of the first flight of a series to the using command.

ECP - Engineering Change Proposal. The document for proposing any design change to an item, facility, part, etc., delivered, or to be delivered, that will require revision to the contract specifications or engineering drawings, or the documents referenced therein, which are approved or authorized for applicable items under Government contracts.

Effectiveness. As used in the phrase "cost/effectiveness," it is the capability (or an estimate of capability) of a given system to achieve a desired objective, e.g., percentage of targets killed; number of sorties; target acquisition; maximization of an output with given inputs.

Elapsed Maintenance Time (EMT). Elapsed maintenance time is the actual clock time in hours and tenths during which maintenance is performed on a job.

Electronics. Those systems and equipments which are classified as the electronics portion of a weapon or support system or capable of performing an end mission on their own. The range of the electronics category encompasses Command Centers/Fire Control Systems, Communications Systems, Sensor Systems, Navigational/Guidance Systems, Electronics Warfare Systems and Support Systems.

The appropriate decision rule used to differentiate between Electronics *per se* and other categories is: when the electronic item is peculiar to or closely related to a system contained in another category, the electronic item is included with the prime system in the related category. When the item is unique, or used as a building block for several systems, but not accounted for in these prime systems, it is included in the Electronics category.

Element. A discrete entry in a breakdown structure. An element may be either an identifiable product or set of data, or a collection of services.

End Article/End Item. It is a functional entity physically related and selected for the purpose of system development, procurement, and logistics. The following criteria shall be used in the identification of an end item:

a. An end item shall be procurable by the government to a single specification.

b. An end item shall be identified by a single top drawing which has been prepared in conformance with appropriate military specification.

c. An end item shall be identified by a separate and distinct part number and serial number.

d. The physical and functional characteristics of an end item shall be such that its configuration can be controlled and documented economically regardless of the number of changes approved and/or incorporated therein.

e. The location of the distinct/separate parts of an end item should be such that they are not remotely located with respect of one part to another, i.e., black boxes should be located in the same AVE system compartment, same maintenance area, etc.

f. By definition, magnetic tapes and card decks used with checkout equipment are classified as end items and subject to change control.

Equipment. An equipment consists of one or more components capable of performing a specified function.

Exception Principle. The exception principle for the purposes of Maintenance Data Collection is the principle that only deviations from established norms are reported or singled out for attention.

F

First Article Configuration Inspection FACI. A formal audit of the "as built" configuration of a contract end item against its technical documentation to establish the product configuration baseline for the contract end item. One action at a FACI is formal approval of Part II of the end-item detail specification.

Facilities. Physical plants such as real estate and improvements thereto, including buildings and associated equipment which are required for or contribute to system or equipment maintenance activities.

Facility. A real property improvement, e.g., buildings or structures. This includes its Real Property Installed Equipment. Facility includes: (1) Mission Support Real Property which is system peculiar and required for direct mission support (VAB, LCC, fuel storage), and (2) Administrative and Support Real Property which are not critical to the mission (cafeterias, warehouses).

Financial Management. The exercise of judicious control of allocated funds in the accomplishment of a specific objective; in systems acquisition, the control of those funds required to design, develop, produce, and test weapon/support systems.

Fire Control System. Includes that equipment in the air vehicle necessary for weapons delivery such as bombing, launching and firing. Includes radars or other sensors necessary for search, rendezvous and/or tracking; self-contained navigation and air data systems; displays, scopes or sights; bombing computer if applicable; and controls and safety devices.

First Recurring Unit.

1. The unit of production which is assigned the first cumulative unit number.

2. In designating the first recurring unit the following ground rules apply:

a. It must be a complete unit.

b. It must be in a configuration close approximating the expected configuration (same size, same material, etc.) of the production item.

c. It must be the first unit meeting the above criteria, regardless of whether the unit purchased on a development or a succeeding production contract.

Fix Phase. The fix phase is that portion of a scheduled inspection which involves the correction of discrepancies found during the look phase.

Function. A discrete action required to achieve a given objective, to be accomplished by hardware, computer program, personnel, facilities, procedural data, or a combination thereof. It is an operation the system must perform in order to fulfill its intended mission.

Functional Cost Categories. Identification of the type of work being performed (engineering, manufacturing, etc.) under the items of the Program/WBS.

G

Government Furnished Aerospace Equipment (GFAE). Materiel acquired by the Government and furnished to aerospace vehicle manufacturers for inclusion in items to be produced under the terms of a contract.

Government Furnished Property (GFP). Property in the possession of, or acquired by, the Government and subsequently delivered to or otherwise made available to a contractor.

Ground Check. Action performed at organizational or user level to check performance of accessories or components installed in an end item of equipment. Such performance checks will be accomplished by visual inspection or operational checks utilizing auxiliary power units, ground units, ground powered test equipment, or the engines as a source of power.

Group. A collection of units, assemblies, which is a subdivision of a set or system, but which is not capable of performing a complete operational function. (Examples: Antenna group, indicator group.)

Guidance & Control. The means for generating or receiving guidance intelligence, conditioning the intelligence to produce control signals, and generating appropriate control forces. Controllers may interface with the airframe by actuating movable aero surfaces or with the propulsion system to produce control reaction forces or may independently produce reaction forces for control. If design is such that electronics are packaged into a single rack or assembly, this rack will be considered part of the guidance and control system, but the circuit boards and CRT will be considered as part of the appropriate subsystems.

Guided Missile. An unmanned, self-propelled vehicle designed to move in a trajectory or flight path all or partially above the earth's surface and whose trajectory or course, while in motion, is capable of being controlled remotely, or by homing systems, or by inertial and/or programmed guidance from within. This term does not include naval torpedoes, but does include target and reconnaissance drones.

H

Hardware. A physical object, as distinguished from its capability or function. The actual engines, case pumps, guidance system, or other component, often used in regard to the stage of development, as in the passage of a device or component from the design or planning stage into the hardware stage as the finished object.

Hull/Frame. The vehicle primary structure which provides resistance to all operational loading conditions and accommodates other subsystems. May consist of monolithic cast or built-up hull, or vehicle frame. Includes all structural subassemblies and appendages which attach directly to the primary structure such as brackets, towing and lifting fittings, bumpers, and hatches and grilles. Includes accommodation means for other subsystems such as mounts for suspension, weapons, turret, truck body, cab, and special equipment loads.

Hull Structure. Main hull body with all structural subdivisions. Includes such structural components as doors, hatch covers, manhole covers, kingposts, masts, equipment and services platforms, and sonar domes.

Hybrid System/Project. A system/project comprised of major elements from two or more Summary WBS, e.g., an aircraft system together with its missile system, or a submarine together with its strategic missile.

I

Incremental Costing. Costing that takes into account the availability of existing resources when estimating the costs of adding a new system to the force, or changing the configuration or activity rate of an existing system.

Indenture. A method of showing relationships to indicate dependence and an order of dependence. Indentures may be shown by actual indention, numerically or alphabetically. Indenturing breaks down an item into assemblies, subassemblies, components, and parts. The term also applies to the successive breakdown of items such as functional diagrams and schematic diagrams.

Indirect Maintenance Support. Refers to that maintenance performed to materiel after its withdrawal from the custody of the using military command. Upon restoration to serviceable condition, the materiel is returned to stock for reissue, or returned directly to the user under conditions authorized by the military department concerned.

Integrated Logistic Support. Integrated Logistic Support is a composite of the elements necessary to assure the effective and economical support of a system or equipment at all levels of maintenance for its programmed life cycle. It is characterized by the harmony and coherence obtained between each of its elements and levels of maintenance.

Inspect. "Inspect" indicates the requirement to perform certain actions after maintenance to insure quality of the repair. This generally applies to mechanical items and would include such functions as inspecting installation of safety wire, welds, etc.

Inspection. An inspection is an examination of an aircraft/support equipment/engines to determine the material condition at prescribed intervals of hours/days/weeks or when required.

Inspection, Calendar. A thorough and searching examination of aircraft/support equipment/engines conducted at predetermined calendar periods of time. (60 days, 90 days, 120 days, etc.)

Inspection, Conditional. A conditional Inspection is an inspection required as the result of the occurrence of a specific situation at other than a scheduled interval (i.e., hard landings, engine overspeed/overtemp, one time inspections directed by higher authority but not issued as a technical directive).

Interchangeable Item. "Interchangeable items" are items which when interchanged or substituted, any one for another, without modification or selection, will provide the same design, engineering, and physical and functional characteristics required of the original items and will require no modification of any system or assembly in which either may be used.

Interface. A common boundary between two or more items. May be mechanical (e.g., physical mating), electrical (e.g., matched impedances), functional (e.g., provide roll control), or contractual (e.g., apportioning a system performance requirement, such as reliability, to two or more contractors). Also it is the point at which responsibility for a continuing function changes from one authority to another.

Internal Communications. Those equipments, such as public address, intercom and radio, used to transmit and receive messages within the vehicle structure or complex. If equipments, designed and utilized for the prime communications function, are also used for internal communications, they are to be included in the prime Communications and excluded here.

Intermediate Maintenance. Intermediate Maintenance is that maintenance which is the responsibility of and performed by designated maintenance activities for direct support of using organizations. Its phases normally consist of calibration, repair or replacement of damaged or unserviceable parts, components or assemblies; the emergency manufacture of nonavailable parts; and providing technical assistance to using organizations. Intermediate Maintenance is normally accomplished in fixed or mobile shops, tenders, or shore based repair facilities. The Department of Defense term "Intermediate Maintenance" encompasses the Military Services' maintenance terms of field, minor modification, upkeep, voyage repairs, restricted availability, Shops C and D, and third and fourth echelon.

Investment Costs. Those program costs required beyond the development phase to introduce into operational use a new capability; to procure initial, additional, or replacement equipment for operational forces; or to provide for major modifications of an existing capability. They include procurement appropriation costs, except those associated with the operating category, and all military construction appropriation costs, except those associated with research and development. Excludes RDT&E, military personnel, and operation and maintenance appropriation costs.

Item . A generic term meaning any article of material which is procured, stocked, stored, issued, or used.

Items Processed. The term items processed identifies the total number of times an action taken code is applied toward a work unit code.

L

Launcher. A structural device designed to support and hold munitions in position for firing or release. Includes bomb racks, rocket pods, mine racks or dispensers, and torpedo tubes. For guns and artillery, includes tubes, recoil assemblies, breech mechanisms, mounts, rifle stocks and the like.

Launch/Stage Vehicle. The principal energy producing means for placing the space vehicles in their operational environment. When the complete launch vehicle is composed of two or more separately developed and manufactured vehicles, mated for a specific mission, list each stage separately at Level 2 (for example, the Atlas AGENA, Thor Delta). Otherwise, list the vehicle as one unit with a stage breakout, if desirable, at the lower levels. The launch/stage vehicle is the complete flyaway for launch purposes (no payload) and includes the airframe, propulsion, guidance and control and all other installed equipment. Includes design, development, manufacturing, test, tooling and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed).

Lead Time. (Generally) The time allowed or required to initiate and develop an item or system so that it will be available and ready for use at a given time.

Life Support. The equipment and special provisions for the comfort, health, protection, and sustenance of personnel employed in the operation and maintenance of aerospace systems.

Long Lead Items. This term is normally used to identify an item which requires an extensive acquisition time cycle due to such factors as design complexity and/or scarce material supplies, limited production capability, lengthy manufacturing and/or test processes. These items usually require early or special procurement action to make projected schedules.

Look Phase. The look phase is that portion of an inspection which includes the basic requirements outlined by the Periodic Maintenance Requirements Manual, excluding repair of discrepancies which cannot be completed within the time allotted on maintenance requirement cards.

M

Maintainability. Maintainability is the characteristics, both qualitative and quantitative, of materiel design and installation which make it possible to meet operational objectives with a minimum expenditure of maintenance effort (manpower, material, skills, test equipment, technical data, maintenance support and facilities) under operational environmental conditions, in which scheduled and unscheduled maintenance will be performed within a specified period of time.

Maintainability Indexes.

(1) Mean-Time-To-Repair (MTTR) - Mean corrective action time ($\bar{M}ct$) is often construed as being synonymous with mean-time-to-repair. It is the statistical mean of the times required to repair an item or a system, and as such, represents the summation of all repair times, divided by the total number of failures that occurred during a given period. It is expressed by the following equation:

$$MTTR = \frac{\sum_{i=1}^{n} R_{t_i}}{n}$$

where n is the number of failures, and R_t is time to repair each sample.

(2) Mean Preventive Action Time ($\bar{M}_{pt}$) - In order to reduce the probability that a system will require corrective action, it normally is taken out of operation from time to time for preventive action (lubrication, cleaning, adjustment, calibration, etc). Because the time required for this type of action represents a portion of the total period of a system's inoperability, it must be calculated as contributing to total system downtime. Mean preventive action time thus is defined as the statistical mean of the summation of periods required for preventive action, divided by the total number of preventive actions scheduled for a given period as follows:

$$\bar{M}_{pt} = \frac{\sum_{i=1}^{n} M_{pt_i}}{n}$$

where n is the number of preventive maintenance actions

(3) Mean Active Corrective and Preventive Action Time ($\bar{M}$) - This index is established to represent all system down-time resulting from both corrective and preventive activities; as such, it represents active down-time, thereby excluding the down-time for which administrative actions, unavailability of tools, etc., are responsible, It is the statistical mean of the periods during which corrective and preventive work is performed on a system during a given period, divided by the total number of such maintenance actions. It is calculated by use of the following equation:

$$\bar{M} = \frac{\bar{M}_{ct} f_c + \bar{M}_{pt} f_c}{f_c + f_p}$$

where f_c is the number of corrective actions

f_p is the number of preventive actions

(4) Mean Down-Time (MD) - Mean down-time, which is an index used in computing the operational availability of a system, is the sum of mean active corrective and preventive action time ($\bar{M}$) and mean delay time for that system during a specified period. Because delay time is determined by administrative and supply factors that cannot accurately be anticipated, they are beyond a designer's control, and accordingly, can play little part in maintainability design.

Maintenance Actions-Total - The maintenance actions - total - cover the total number of all maintenance actions for each group of how malfunction codes, that is, type 0. 1, 2, 3, 4, 5, and 6, cited above.

(1) Other - Group #0 of how malfunction codes
These would include all invalid how malfunction codes.

(2) Failure - Group #1 of how malfunction codes
Failure is the cessation of ability of an item to meet the minimum specific performance. Examples are flameout, burst, sheared, bent, buckled.

(3) Inadequate Performance - Group #2 of how malfunction codes
These indicate conditions less severe than failure codes; they are deficient execution of functions required of an item. Examples are: incorrect gain, faulty safety wire, chatting, video faulty.

(4) Wearout - Group #3 of how malfunction codes
Examples are: worn, chafed, frayed, crazed, excessive wear, keyway damaged or worn.

(5) Environment - Group #4 of how malfunction codes
Examples are corroded, nicked, wet, battle damaged, chipped.

(6) Faulty - Group #5 of how malfunction codes
Examples are damaged or missing nuts, bolts, screws, improper maintenance of lubrication, transportation damage.

(7) No Defect - Group #6 of how malfunction codes
Examples are: various no defects such as removed for reliability assessment, removed for time change, removed for scheduled maintenance.

Maintenance Action - True

This is the number of maintenance actions for each group of how malfunction codes. The actions consist of the following action taken codes and all groups of how malfunction codes, that is: 0, other; 1, failure; 2, inadequate performance; 3, wearout; 4, environment; 5, faulty. Not included is group 6, no defect.

F - Repair

G - Repair and/or Replacement of L, Invalid Minor Parts, Hardware and Softgoods

K - Calibrated - Adjustment Required

L - Adjust and Reset

P - Removed

R - Remove and Replace

S - Remove and Reinstall

Z - Corrosion Treatment

Maintenance. Maintenance is the function of retaining materiel in, or restoring it to, a serviceable condition. Its phases include servicing, repair, modification, modernization, overhaul, rebuild, test, reclamation, inspection and condition determination, and the initial provisioning of support items.

Maintenance Action. A maintenance action is any corrective or preventive action taken to maintain or restore equipment or material to a satisfactory operating condition. This action will consume manhours or material or both.

Maintenance Action-Total. Maintenance action (total) is all action of scheduled and unscheduled maintenance, including correction, adjustment, servicing and inspection.

Maintenance Action-True. True maintenance actions include the repair, correction or fix of malfunctions and discrepancies but exclude servicing, inspections and other actions requiring no corrective action in themselves.

Maintenance Capability. Consists of those resources, namely: facilities, tools, test equipment, drawings, technical publications, trained maintenance personnel engineering support, and an assured availability of spare parts, required to modify, retain materiel in, or restore materiel to, serviceable condition.

Maintenance Capacity. Is the quantitative expression of maintenance capability.

Maintenance Engineering. Maintenance Engineering is the function of providing policy guidance for maintenance activities, and of exercising technical and management review of maintenance programs.

Maintenance Personnel. Maintenance personnel are those personnel assigned to all levels of maintenance, including officers, enlisted men and civilians.

Maintenance Replacement. The replacement of an unserviceable item by a serviceable item. Unserviceable items, in this context, include items which are replaced due to (1) malfunctioning, and (2) having reached the end of an administratively determined removal interval for purposes of preventive maintenance or safety considerations.

Manhours. Manhours are the total number of accumulated direct labor hours (in hours and tenths) expended in performing a maintenance action.

Matched Set. A matched set is a group of two or more separate components which function together in a single system and are normally removed, repaired, checked, adjusted, calibrated, and installed together. Replacement of a single component of a matched system normally requires check, adjustment, and/or calibration of the matched set.

Materiel. Materiel consists of all tangible items (including ships, tanks, self-propelled weapons, aircraft, etc., and related spares, repair parts and support equipment; but, excluding real property, installations, and utilities) necessary to equip, operate, maintain, and support military activities without distinction as to its application for administrative or combat purposes.

Mean Time Between Maintenance Action (MTBMA). Mean Time Between Maintenance Action for a particular system or equipment in a given time interval is the mean value of the operating period between maintenance actions, either or both corrective and preventive, occurring during that interval.

Mean Time Between Failure (MTBF). Mean Time Between Failure is the mean value of the operating periods between all failures occurring in a particular equipment during a given time interval.

Military Maintenance. That maintenance performed by a military department under military control utilizing government-owned or controlled facilities, tools, test equipment, spares, repair parts, and military or civilian personnel.

Missiles . Those weapons delivery systems which employ unmanned, self-propelled air vehicles to navigate, penetrate, and produce a desired destructive effect on selected targets. Included within this category are such systems designed for employment as weapons of air defense, land warfare, strategic bombardment, and air and sea combat.

Missile Category. Those weapons delivery systems which employ unmanned, self-propelled air vehicles to navigate, penetrate and produce a desired destructive effect on selected targets. Includes such systems designed for employment as weapons of air defense, land warfare, strategic bombardment, and air and sea combat.

Missile System. The complex of equipment, software, services, and facilities required to develop and produce the capability of employing a missile weapon in an operational environment so as to produce the desired destructive effect on selected targets. Represented by Poseidon, Minuteman II, Nike-X, SRAM, Phoenix, etc.

Mission-Essential Materiel. Consists of those weapons, equipments, and systems (including spare components and support equipments) which have been determined to be vital to a primary defense mission; the unserviceability or failure of such materiel to meet design performance would jeopardize a basic defense assignment or objective.

Modification. A modification is a change in the configuration of a system or equipment that is accomplished by the specifications of a system or equipment, and by altering items already produced.

All changes to previously delivered systems/equipment (including GFAE), and delivered spares required to correct deficiencies revealed after the date of completion of the test program are modifications, regardless of the method of generation.

Modified Mission Symbol. A letter used to indicate the current capability of an aircraft when it is so modified that its original intended capability is no longer applicable, or when it has an added or restricted capability.

N

Navigation/Guidance System. Includes the navigation/guidance equipment in the air vehicle, such as radar, radio and/or inertial guidance, altimeter, direction finding set, doppler compass, computer, if applicable.

Nonreparable. Items which, when they become unserviceable or defective will not be reconditioned or repaired but will be disposed of as condemned material.

Off-Equipment Work. Off-equipment work for the purposes of Maintenance Data Reporting includes all maintenance actions performed on removed reparable components (usually at the Intermediate Maintenance activity).

On-Equipment Work. On-equipment work for the purposes of Maintenance Data Reporting includes those maintenance actions accomplished on complete end items (i.e., aircraft, drones, aircraft ground support equipment units, removed engines, etc.).

Operational Ground Equipment (OGE). A functional part of a system which operates with the aerospace vehicle or end item as an essential operating element thereof.

Operating Life Expectancy. The Operating Life Expectancy is the projected operational usefulness of an item in time or distance based on engineering estimates or actual operational experience.

Operating Time. Operating Time is the number of days/hours an equipment is performing its intended function; that is total time minus down time and ready or standby time. Standby time is synonymous with operating time on specific missile and electronic equipment.

Operational Phase. The period from acceptance by the user of the first operating unit until disposition of the system (phase-out) of inventory. The Operational Phase normally overlaps the Acquisition Phase.

Operationally Ready. Is a condition status of an equipment or system which indicates that it is capable of safe use and that all equipment necessary for the performance of its primary mission is ready. This assumes that a system, though equipped for its primary mission, will have a capability of performing other or secondary missions. Each Military Department will specify the equipment (systems) required to perform the primary mission.

Ordnance. Those systems and equipments which are comprised of munitions (including atomic, biological, chemical, psychological and pyrotechnic) and the delivery of munitions, and which are not unique to a particular delivery vehicle. For example, this category includes bombs, rockets, artillery, naval guns, torpedos, mines, rifles, mortars, and the ammunition associated with these systems. This category does not include aerospace guided missiles or land, sea or air delivery vehicles.

Organizational Maintenance. Organizational Maintenance is that maintenance which is the responsibility of and performed by a using organization on its assigned equipment. Its phases normally consist of inspecting, servicing, lubricating, adjusting, and the replacement of parts, minor assemblies and sub-assemblies. The Department of Defense term "Organizational Maintenance" encompasses the Military Services' maintenance terms of upkeep, line, hangar, organizational, and second echelon.

Overhaul. "Overhaul" indicates the requirement for complete or major disassembly, detail inspection, rework, replacement of unserviceable parts, assembly and checkout of equipment.

Overhead. Overhead is that portion of the indirect cost applicable to the WBS items, exclusive of indirect costs classified as G&A. Overhead includes such costs as manpower, supplies and services, overtime premium, depreciation, insurance, taxes, allowable research, etc., incurred in support of the direct effort in producing a WBS item when such costs cannot be economically or practically identified with the product or program.

Overtime. Overtime is defined as hours expended during a specified period in excess of a standard based on a 40 hour week (eight hours per day, five days per week).

P

Part. One piece, or two or more pieces joined together, which are not normally subject to disassembly without destruction or impairment of designed use. A part is also the smallest sub-division (lowest indenture/level shown in provisioning documents) of an item of hardware.

Penetration Aids Equipment. Includes that equipment in the air vehicle, such as ferret search receivers, warning devices and other electronic devices; electronic countermeasures, including jamming transmitters, chaff; infrared jammers; terrain following radar, and other devices, which assist in penetration to target or mission accomplishment.

Planned Maintenance. The philosophy, plan, and procedures related to the management, accomplishment, and quality control of preventive and corrective maintenance at each level to retain material in a serviceable condition or restore it to an operable condition once it has failed. Planned maintenance includes servicing, repair, inspection, corrosion control, testing, calibration, overhaul, modification, handling, and storage. (See Reference (c) for additional guidance).

Possessed. Is the quantity of a specified equipment in the physical possession and control of an organization.

Power Package/Drive Train. The means for generating power and delivering power in the required quantities and driving rates to the driving member. Includes engine mounted auxiliaries such as air ducting and manifolds, controls and instrumentation, exhaust systems and cooling means. Includes such power transport components as clutches, transmissions, shafting assemblies, torque converters, differentials, final drives, and power takeoffs. May include brakes and steering when these are integral to power transmissions rather than in Suspension/Steering Group.

Preventive Maintenance. Preventive Maintenance is the systematic care and inspection of materiel by the user for the purpose of retaining it in serviceable condition and detecting and correcting minor incipient failures before they develop into major defects or malfunctions.

Primary Vehicle. Defined as the mobile element of the system embodying means for performing operational missions. Includes means of propulsion and structure for adaption of mission equipment or accommodations for disposable loads. Includes design, development, manufacturing, test, tooling and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed.

Probe. An instrumented vehicle not involved in space missions which is used to penetrate the aerospace environment and transmit or report back information.

Production Manhours. Production manhours are those manhours used in the actual accomplishment of assigned work.

Program.

1. (DOD) A combination of program elements designed for the accomplishment of a definite objective or plan which is specified as to the time phasing of what is to be done and the means proposed for its accomplishment. The major components of the DOD programming system are the numbered programs.

Program Element. The highest level of aggregation of cost and related data, defined as an integrated activity (a combination of men, equipment, and facilities) that constitutes an identifiable military capability or support activity. It is identified by an 8-digit code number.

Propulsion. The means for generation of propelling forces including engine structure, propellant and fuels, distribution and control of propellant and fuel, starting means, safety devices, lubricating means, and internal environmental control.

R

Real Property Installed Equipment (RPIE). This is an administrative subclassification to denote the officially designated real property installed equipment which is required to count down, launch and guide a missile. It is divided into subgroups as follows:

a. Power production and distribution systems.

b. Air conditioning, heating, and ventilating systems.

c. Water pumping, deluge, and fire fighting systems.

d. Other equipment such as launch doors, elevators, etc.

Reconnaissance Equipment. Includes that equipment in the air vehicle necessary to the reconnaissance mission such as photographic, electronic infrared and other sensors, search receivers, recorders, warning devices, magazines, data link and other reconnaissance devices.

R Recoverable Item. An item which has a planned repair cycle at field and/or depot levels, and for which the necessary special parts, AGE, and technical data have been procured.

Re-Entry Vehicle. The space vehicle specifically designed to safely re-enter the atmosphere in order to land special payload or crew. Includes the structure, propulsion and all installed equipments.

Remove. "Remove" indicates the requirement to disconnect, unmount and physically remove any equipment configuration from any other equipment configuration, e.g., remove a drawer assembly from a MGE console for a scheduled inspection.

Removal Interval. Removal interval is that period of time after which a specific item of materiel is removed and replaced by a serviceable item. The period of time may be a specified number of flying hours, equipment hours of operations, mileage, calendar time, or may be any interval after the occurrence of a specific or unusual condition.

Remove and Replace. Remove and replace indicates the requirement to remove an unserviceable item and to install a serviceable like item in its place.

Repair. Repair indicates the requirement to replace unserviceable components and/or parts, or structural repair exclusive of complete disassembly or teardown of the equipment.

Repair Cycle. All the various unserviceable stages through which a reparable type item passes from the time of its maintenance replacement until it is restored to serviceable condition. The repair cycle includes such stages as: removed; awaiting shipment; in transit; in pre-repair screening; in process of repair; and return to serviceable stock.

Repair Cycle Requirement. The quantity of reparable type items required to fill the repair cycle.

Repair Cycle Time. The time normally required for an item to pass economically through the repair cycle, excluding any extraordinary awaiting parts delays and any intentional extended transit, storage or repair process delays.

Repair Parts. Any individual part or assembly required for the maintenance or repair of an equipment or system.

Repair Turn-Around Time. The total accumulated time required to package and ship an item to the repair facility, accomplish the repair, and return the repaired item to the supply system.

Reparable. A spare part capable of being repaired or overhauled which, because of unit costs, lead time, physical characteristics, and/or other considerations, is deemed technically and economically feasible to repair.

Rocket. A self-propelled vehicle without installed or remote control guidance mechanisms. Rocket systems designed for line-of-sight ground fire against ground targets are not included.

S

Scheduled Maintenance (Preventive Maintenance). Any planned maintenance actions deemed necessary to enhance the functional success of the item.

Selected Parts. "Selected part" is a part or parts selected for special requirements or required to conform to special inspection or qualification requirements by a design activity.

Sensors. Includes those equipments which are used to extend man's natural senses; and equipment which detects and indicates terrain configuration, the presence of military targets, and other natural and man-made objects and activities by means of energy emitted or reflected by such targets or objects. The energy may be nuclear, electromagnetic, including the visible and invisible portions of the spectrum, chemical, biological, thermal or mechanical, including sound, blast, and earth violence.

Serial Number. The method of assignment of serial numbers will be at the discretion of the using military department.

Series Letter. A letter used to denote differences affecting methods of employment, differences affecting the relation of the vehicle to its ground environment, and major modifications to the aircraft which result in significant changes to the logistic support.

Series Symbol. A letter will be assigned to each series change of a specific basic design. To avoid confusion, the letters "I" and "O" will not be used as series letters.

Service . "Service" indicates the requirement for replenishing fuel, gases, liquids, chemical solids and dessicants, etc.

Set. A unit or units and necessary assemblies and parts connected or associated together to perform an operational function. ("Set is also used to denote a collection of like parts such as a "tool set", or a "set" of tires.) (Examples: Radio receiving set; sound measuring set, which includes such parts, assemblies, and units as cable, microphone and measuring instruments; radar homing set.)

Ships. Those seagoing systems which produce the capability to operate and support the operation of naval weapons and perform related naval functions on the ocean surfaces and underseas.

Site Activation. Includes contractual effort associated with the installation and checkout of equipment at the site, such as contractor operation, maintenance and support of the site prior to turnover to the using command. Includes contractual effort associated with planning, surveying, etc., incident to Phase II support, and costs incident to the assembly, installation, and check-out of the AGE and prime equipment in its operational environment. Also includes material required by the contractors to replace components which are damaged or malfunction.

Software. Support effort other than hardware, tooling, and equipment: Includes such things as engineering, technical data, computer programs, etc.

Space Vehicle. Complete vehicle or group of vehicles placed in space. Includes the structure, propulsion and all installed equipments. Includes design, development, manufacturing, test, tooling and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed.

Spares and Repair Parts. Spares are components or assemblies used for maintenance replacement purposes in major end items of equipment. Repair Parts are those "bits and pieces," e.g., individual parts or nonreparable assemblies required for the repair of spares or major end items.

Standard. That rate of performance which an organization's logistic effort must attain to support mission requirements.

Sub-Assembly. A sub-assembly is defined as an article which is an element of an assembly, replaceable as a whole or having some parts individually replaceable, consisting of a combination of detail parts having a common mounting or mounted on each other. Examples: Wafer switch, variable capacitor, coil and associated tuning assembly (such as an IF transformer with tuning slug and mechanism), terminal board with parts assembled thereon, etc. The following type items are sub-assemblies only when part of an assembly: amplifier section, electrical-indicating instrument, transformer, variometer, vibrator, voltage regulator, dynamotor machine, etc.

Sub-System. A sub-system is a major functional part of a system, usually consisting of several components, that is essentially operationally complete within the system. Examples are ARC-34 VHF or interphone of a communication system, DC & AC power supply of an electric system.

Summary Work Breakdown Structure (Summary WBS). The upper levels of a WBS, which are organized and identified in accordance with the following nomenclature:

Level 1 - The entire system/project, e.g., the Main Battle Tank, the FDL Ship, and the Minuteman ICBM.

Level 2 - Major end item oriented system segments or aggregations of services, e.g., an air vehicle, a ship hull, and systems engineering/management.

Level 3 - Major end item oriented subsystem elements or types of services, e.g., an airframe, a navigational equipment group, and systems engineering studies.

and which are prescribed by this standard as having uniform element terminology, definition, and structural placement.

Support Equipment. Equipment such as special purpose vehicles, power units, maintenance stands, test equipment, special tools, and test benches used to facilitate or support maintenance actions, detect or diagnose malfunctions, or monitor the operational status of systems, subsystems, or equipments.

Support System. An instrument used to aid, assist or complement a weapon system or tactical elements under combat conditions, i.e., submarine tender, transport aircraft, radar warning system.

Surface Vehicles. Those systems characterized by mobility and a capability to navigate on or over the surface. This category includes vehicles primarily intended for general purpose applications and those vehicles intended for marriage with specialized operational and logistic payloads. For example, encompassed in this categorization are cargo and logistic vehicles, mobile work units, and combat vehicles. The combat vehicles are exemplified by those serving as armor, weapons platforms reconnaissance vehicles, and amphibians.

Suspension/Steering. The means for generating tractive and steering forces, generally at the ground surface, and adapting the vehicle to the irregularities of the surface. Includes wheels, tracks, brakes, and steering gear for traction and control functions. Includes rudder, propeller and trim vanes for amphibians. Includes springs, shock absorbers and other suspension members.

BASIC MISSION AND TYPE SYMBOLS

Symbols, Aircraft

Basic Mission and Type Symbols. A basic mission letter is used to denote the primary function or capability of an aircraft. Mission/type symbols denote the mission and type of aircraft other than fixed-wing. An aircraft identified by a type symbol, such as "H" for helicopter, will be further identified by only one mission symbol whether it be the basic mission or a modified mission symbol.

Exception: The designation of R/S as the basic mission symbol for integrated reconnaissance strike capability.

A Attack. Aircraft designed to search out, attack and destroy enemy land or sea targets using conventional or special weapons. Also used for interdiction and close air support missions.

B Bomber. Aircraft designed for bombing enemy targets.

C Cargo/Transport. Aircraft modified for carrying cargo and/or passengers.

E Special Electronic Installation. Aircraft possessing ECM capability or having electronic devices to permit employment as an early warning radar station.

F Fighter. Aircraft designed to intercept and destroy other aircraft and/or missiles.

H Helicopter. A rotary-wing aircraft designed with the capability of flight in any plane, i.e., horizontal, vertical or diagonal.

K Tanker. Aircraft having special equipment to provide in-flight refueling of other aircraft.

O Observation. Aircraft designed to observe (through visual or other means) and report tactical information concerning composition and disposition of enemy forces, troops and supplies in an active combat area.

P Patrol. Long range, all-weather, multi-engine aircraft operating from land and/or water bases, designed for independent accomplishment of the following functions: anti-submarine warfare, maritime reconnaissance, and mining.

S Antisubmarine. Aircraft designed to search out, detect, identify, attack and destroy enemy submarines.

T Trainer. Aircraft designed for training personnel in the operation of aircraft and/or related equipment, and having provisions for instructor personnel.

U Utility. Aircraft used for miscellaneous missions such as carrying cargo and/or passengers, towing targets etc. These aircraft will include those having a small payload.

V VTOL and STOL. Aircraft designed for vertical take-off or landing with no take-off or landing roll, or aircraft capable of take-off and landing in a minimum prescribed distance.

X Research. Aircraft designed for testing configurations of a radical nature. These aircraft are not normally intended for use as tactical aircraft.

Z Airship. A self-propelled lighter-than-air aircraft.

MODIFIED MISSION SYMBOL

Modified Mission Symbol. A letter used to indicate the current capability of an aircraft when it is so modified that its original intended capability is no longer applicable, or when it has an added or restricted capability.

A Attack. Aircraft modified to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support missions.

C Cargo/Transport. Aircraft modified for carrying cargo and/or passengers.

D Director. Aircraft capable of controlling a drone aircraft or a missile.

E Special Electronic Installation. Aircraft possessing ECM capability or having electronic devices to permit employment as an early warning radar station.

H Search/Rescue. Aircraft having special equipment for performance of search and rescue missions.

K Tanker Aircraft having special equipment to provide in-flight refueling of other aircraft.

L Cold Weather. Aircraft modified for operation in the arctic and antarctic regions; includes skis, special insulation, and other ancillary equipment required for extreme cold weather operations.

M Missile Carrier. Aircraft modified for carrying and launching guided and nonguided missiles as part of the weapon system.

Q Drone. Aircraft capable of being controlled from a point outside the aircraft.

R Reconnaissance. Aircraft having equipment permanently installed for photographic and/or electronic reconnaissance missions.

S Antisubmarine. Aircraft modified so that it can now function to search, identify, attack, and destroy enemy submarines.

T Trainer. Aircraft specifically equipped or modified for training purposes.

U Utility. Aircraft having small payload utilized or modified to perform miscellaneous missions such as carrying cargo or passengers, towing targets, etc.

V Staff. Aircraft having accommodations such as chairs, tables, lounge, berths, etc., for the transportation of staff personnel.

W Weather. Aircraft having meteorological equipment permanently installed.

STATUS PREFIX SYMBOL

Status Prefix Symbol. The status letter, if applicable, will indicate an aircraft being used for experimentation and special or service test. Inclosure 1 contains status letters authorized for use. The status letter will be placed at the immediate left of the modified mission letter, or the mission/type symbols if no modified mission letter is applicable.

G Permanently Grounded. An aircraft permanently grounded, utilized for ground instruction and training.

J Special Test, Temporary. Aircraft on special test programs by authorized organizations on bailment contract having a special test configuration or whose installed property has been temporarily removed to accommodate the test. At completion of the test the vehicle will be either returned to its original configuration or returned to standard operational configuration.

N Special Test, Permanent. Aircraft on special test programs by authorized activities and on bailment contract, whose configuration is so drastically changed that return of aircraft to its original configuration or conversion to standard operational configuration is beyond practicable or economical limits.

X Experimental. Aircraft in a developmental, experimental stage where basic mission and design number have been designated but not established as a standard vehicle for Service use.

Y Prototype. Aircraft procured in limited quantities to develop the potentialities of the design.

Z Planning. Designations used for identification purpose during the planning or predevelopment stage.

LAUNCH ENVIRONMENT

SYMBOLS, MISSILES

A_______Air. Air launched.

B_______Multiple. Capable of being launched from more than one environment.

C_______Coffin. Horizontally stored in a protective enclosure and launched from the ground.

H_______Silo Stored. Vertically stored below ground level and launched from the ground.

L_______Silo Launched. Vertically stored and launched from below ground level.

M_______Mobile. Launched from a ground vehicle or movable platform.

P_______Soft Pad. Partially or non-protected in storage and launched from the ground.

R_______Ship. Launched from a surface vessel such as ship, barge, etc.

U_______Underwater. Launched from a submarine or other underwater device.

MISSION

D_______Decoy. Vehicles designed or modified to confuse, deceive, or divert enemy defenses by simulating an attack vehicle.

E_______Special Electronic. Vehicles designed or modified with electronic equipment for communications, countermeasures, electronic radiation sounding or other electronic recording or relay missions.

G_______Surface Attack. Vehicles designed to destroy enemy land or sea targets.

I_______Intercept-Aerial. Vehicles designed to intercept aerial targets in defensive or offensive roles.

Q_______Drone. Vehicles designed for target, reconnaissance, or surveillance purposes.

T_______Training. Vehicles designed or permanently modified for training purposes.

U_______Underwater Attack. Vehicles designed to destroy enemy submarines or other underwater targets or to detonate underwater.

W Weather. Vehicles designed to observe, record or relay data pertaining to meteorological phenomena.

STATUS PREFIX

J Special Test, Temporary. Vehicles on special test programs by authorized organizations and vehicles on bailment contract having a special configuration to accommodate the test. At completion of the test the vehicles will be either returned to their original configuration or returned to standard operational configuration.

N Special Test, Permanent. Vehicles on special test programs by authorized activities and vehicles on bailment contract, whose configurations are so drastically changed that return of the vehicles to their original configurations or conversion to standard operational configurations is beyond practicable or economical limits.

X Experimental. Vehicles in a developmental or experimental stage, but not established as standard vehicles for service use.

Y Prototype. Pre-production vehicles procured for evaluation and test of a specific design.

Z Planning. Vehicles in the planning or pre-development stage.

TYPE SYMBOLS

M Guided Missile. Unmanned, self-propelled vehicles designed to move in a trajectory or flight path all or partially above the earth's surface and whose trajectory or course, while in motion, is capable of being controlled remotely, or by homing systems, or guidance from within.

N Probe. Instrumented vehicles not involved in space missions but used to penetrate the aerospace environment and transmit or report back information.

R Rocket. Vehicles whose trajectory or flight path cannot be altered after launch.

System, Functional. A system is a major, functional part of a Weapons System or Support System consisting of such other components, assemblies, subassemblies, and parts necessary to perform a specific function or functions. (Examples are fuel system on aircraft or missile, communication system on a tank, ship or aircraft, propulsion system of a ship, tank, aircraft or missile.

System, Weapon. A composite of equipment, skills, and techniques capable of performing and/or supporting an operational role. A complete system includes related facilities, equipment, material, services, and personnel required for its operation to the degree that it can be considered a self-sufficient unit in its intended operational and/or support environment.

System Cost. The cost of an integrated related composite of the subdivisions of a system, including check-out servicing equipment, together with associated personnel, all aligned to establish proper functional continuity toward the successful performance of a defined task or tasks.

System Test and Evaluation. The term "test" denotes any project or program designed to obtain, verify, and provide data for evaluation of: research and development other than laboratory experiments; progress in accomplishment of development objectives; performance and operational capability of system, subsystems, components, and equipment items. The term "evaluation" denotes the review and analysis of qualitative or quantitative data produced during current or previous testing, data provided from testing conducted by other services, from operational and commercial usage, from the contractor, or combinations of the foregoing.

System Test and Evaluation Programs will normally be conducted in two functional categories during the Acquisition Phase, and one category during the Operation Phase (except for Strategic Ballistic Missiles, which have an additional functional test category) these are:

a. Category I - Subsystem Development Test and Evaluation consists of development testing and evaluation of the individual components, subsystems, and in certain cases, the complete system. In addition to qualification, the testing provides for redesign, refinement, and re-evaluation as necessary, including the practicality of utilizing current standard and commercial items. These tests are conducted predominantely by the contractor, but with military participation, evaluation, and control.

b. Category II - System Development Test and Evaluation. consists of testing and evaluation spanning the integration of subsystems with a complete system in as near an operational configuration as is practicable. Suitable instrumentation will be employed to determine the functional capability and compatibility of subsystems. Category II is a joint contractor-Air Force effort under Air Force control during which the Air Force effort becomes predominant with ever-increasing operating and support command participation. Actual test operation and maintenance should be performed by military personnel who have received formal system training. It is usually culminated with the demonstration effort required to complete the development portion of the acquisition phase of a system program.

c. Category III - System Operation Test and Evaluation Program consists of test and evaluation of operational systems under the control and direction of the operating command. These tests shall include all components, support items, personnel skills, technical data, and procedures, and shall be performed under as near operational conditions as practicable. Suitable instrumentation will be employed in order to adequately evaluate test results. Category III testing will be conducted utilizing a configuration as jointly agreed by the operating command and AFSC/AFLC. The test will be conducted in accordance with a specific test plan or order designed to meet the objectives of all participants.

System Testing and Evaluation. Includes all costs associated with testing and evaluation of integrated subsystems through the mating process that progresses into a complete system. This testing will be conducted by functional capability and compatibility of subsystems and the redesign requirements. It includes functional and developmental tests and the military demonstration of the whole system in as realistic and complete environment as practicable.

T

Task. A limited undertaking requiring resources, accomplishing an end result, and representing a sublevel under a contract line item.

Test. Test is defined as those actions required to trouble-shoot or isolate a malfunction of an item which is known, suspected, or assumed to have malfunctioned or failed. This shall include any bench checks made of the item after removal and before overhaul/repair and those quality checks made to insure the serviceability of the item upon completion of repair.

Time/Usuage Change. Time/Usuage Change Item is an item which must be replaced at a specified number of calendar units, operating hours, cycles, or distance.

U

Usage. Usage is a measurement of an item of supply which has been consumed or used expressed in appropriate terms, such as units, rounds, gallons, quarts, etc.

Usage Rate. Usage Rate is usage of an item per unit of time (clock hours, operating hours, flying hours, days, months, years) or distance (miles, kilometers, etc.)

Unit. Anything considered as complete in itself, but functioning as a part of a higher indenture of equipment.

Vehicles, Motor Administrative Use. Wheeled-type, pneumatic tired motor vehicles, normally of commercial design and transport type; used for the movement of supplies, personnel, and equipment in providing administrative logistic support to installations or activities, including support of Government personnel at contractor-operated facilities. Vehicles of military design may also be designated and used for administrative purposes in which case they are so classified.

Vehicles, Motor. Items of equipment mounted on wheels which are designed for highway and/or land operations and which derive power from a self-contained power unit, or are designed to be towed by and used in conjunction with such self-propelled equipment.

1. Commercial Design - Motor vehicles procurable from regular production lines and available also for civilian use. Commercial Design Vehicles are further classified as Transport and Special Vehicles.

a. Transport Design Vehicles - Motor vehicles commercially designed to provide transportation service, i.e., transportation of personnel or cargo. This definition includes any motor vehicle designed for transportation service even though modified locally as an expedient for meeting special needs, e.g., snow plows, etc.

b. Special Design Vehicles - Motor vehicles commercially designed for special purpose uses, e.g., fire engines, rotary snow plows, and other vehicles with mounted equipment which are used for purposes other than to provide transportation service for personnel, supplies or equipment. This definition excludes any motor vehicle designed for transport modified locally as an expedient for meeting special needs, e.g., snowplows, etc.

2. Military Design - Motor vehicles designed in accordance with military specifications to meet field requirements for the direct support of combat or tactical operations, or for training of troops for such operations. For purposes of this reporting system, combat vehicles (such as tanks, self-propelled weapons, etc.) with or without armor.

Vessel. The seagoing vessel of a ship system. Includes surface and undersea vessel, combatants and auxiliaries, amphibious and special purpose vessels. Spares carried on board are also included. Includes design, development, manufacturing, test, tooling and quality control associated with production of complete units (prototype and operationally configured units which satisfy the requirements of its applicable specification (s), regardless of their end use). Also includes all redesign, rework, change and tooling maintenance. All costs are to be collected at the lowest elements designated and when totaled will equal the element into which they are summed.

W

Work Breakdown Structure (WBS). A product-oriented family tree division of hardware, software; and services performed or produced during the acquisition of defense materiel items, and which are prepared and applied in accordance with the provisions of this standard for the following categories of system:

a. Aircraft
b. Electronics
c. Missiles
d. Ordnance
e. Ships
f. Space
g. Surface Vehicles

WBS Levels. Summations of comparable items of costs.

WBS Items. Descriptive entries of the structure to be costed.

Weapon System. A weapon system is defined as an instrument of combat either offensive or defensive used to destroy, injure, defeat or threaten the enemy. It consists of a total entity of an instrument of combat (any single combat instrument that incorporates in itself a complex assembly of functional parts), i.e., F-104 aircraft, F-106 aircraft, FBM submarines, destroyers, DDE, M-60 tank, Hawk missile.

Work Center. A work center is a designated functional area to which maintenance personnel are assigned.

APPENDIX C

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APPENDIX D-1

PROPOSED DOD DIRECTIVE

MAINTENANCE MANAGEMENT INFORMATION SYSTEM

(MMIS)

PROPOSED DOD DIRECTIVE

MAINTENANCE MANAGEMENT INFORMATION SYSTEMS (MMIS)

The Attachment 1 to the subject document consists of a Definition of Terms. The Terms are those used in the basic instructions. These Terms have been rearranged alphabetically for ease of reference and in some instances have been augmented or revised to reflect a single definition for use among all the military services and agencies. This Definition of Terms has been replaced by the Glossary contained in Appendix B.

APPENDIX D-2

MINIMUM DATA

TO BE

COLLECTED OR KNOWN

Appendix D-2

MINIMUM DATA TO BE COLLECTED OR KNOWN

Attachment #2, 5 September 1963, above subject, can be further studied to provide data which can improve the organization, development, and control of information. Paragraphs that follow correspond in number with the topics listed.

1. T/M/S/C of Weapon/Support/Control System Identification

(a) DOD Directive 4505.6, dated 6 July 1962, Subject: Designating, Re-Designating and Naming Military Aircraft, assigns authority and responsibility and establishes a uniform system for naming military aircraft. It is applicable to all elements of the Department of Defense and covers all current and newly designed aircraft (fixed, movable, and rotary wing) and air ships.

(b) DOD Directive 4000.20, dated 11 December 1962, Subject: Designating, Re-Designating and Naming Military Rockets and Guided Missiles, establishes a uniform system for rockets and missiles with a combat or combat related mission. It does not, however, cover space vehicles or space boosters.

(c) Similar documents are desirable to cover the other categories of equipments, that is, electronics, ordnance, space, ships and vehicles.

(d) The development in this study of a four alpha code provides a means for successive aggregation of model and series, mission design, and type and categories of equipments. This code may well serve as a model in the development of codes for those categories not mentioned in subparagraphs a or b, above.

2. Integral System Identification

(a) An Integral System Identification exists for the aircraft category. Even here, however, there are minor variations in the system identification among the three military departments. The Navy has supplemented its coding to accommodate on and off equipment and the Army in its MEADS has responded to the DOD Directive 4100.35, Development of Integrated Logistic Support for Systems and Equipment.

(b) The USAF in its military specification, MIL-M-38769, dated 28 September 1966, Subject: Manuals, Technicals: WUC (for aircraft and drones) prescribes the requirements for the preparation of WUC (Work Unit Code) manuals for all aircraft and drones. The WUC identifies the hardware on which work is accomplished and the relationship of hardware within a functional system. It further provides for a first, second and third level of assembly code construction to standardize successive sub-divisions of a system.

This specification also provides for aircraft support general codes. These codes are intended to cover repetitive tasks of a general nature and should not be used for recording malfunctions, repair, Not Reparable This Station (NRTS) or condemnation actions. These codes are five digit numeric codes with the first digit being 0. They cover a great deal of tasks such as ground handling, surface and flying; service; aircraft cleaning; "look" phase or scheduled inspections; special instructions; aircraft and installed engine storage; ground safety; preparation and/or maintenance of aircraft records; special weapons handling and shop support general codes. Similar support general codes could be developed for repetitive tasks within the constraints indicated for aircraft by other categories of equipment by necessary adjustments to meet specific recurrent work.

(c) The USAF also in MIL-M-38768, dated 28 Sept '66, Subject: Manuals, Technicals: WUC (for service launched missile and spacecraft systems) has developed a similar system to that cited above for aircraft and drones.

(d) The Air Force Technical Manual, Field Maintenance, Automotive Vehicle Maintenance, WUC Manual TO-00-25-06-6-1, dated 1 Mar '66, change 15 Sept '66, sets forth the use of codes as prescribed in AFM 66-12 and TO-00-20B-5. The document provides an integral system, sub-system and component identification. The manual is divided into two sections. Section I provides codes for all military designed special purpose vehicles and for maintenance data required. Section II provides vehicle identification codes for all other registered vehicles.

(e) The development of additional military specifications to provide for integral system, sub-system and component identification will greatly enhance the comparability of technical, fiscal and management data for like systems, sub-systems and components among the various military services. Further, the structure of codes as indicated for aircraft and missiles enables successive aggregation of data from the least identifiable parts to the total system involved.

3. Integral Sub-System Identification

Discussed in paragraph 2, above

4. Integral Component Identification

Discussed in paragraph 2, above.

5. <u>Type of Maintenance</u>

Type of Maintenance refers to whether or not such maintenance is scheduled or unscheduled.

(a) The scheduled maintenance for "on-equipment" of missiles and aircraft would include basic post flight (thru flight) inspection, preflight (scheduled inspection), the hourly post flight inspection, scheduled ballistic missile maintenance, periodic inspection, depot maintenance, special inspection and reclamation.

(b) The "on-equipment" unscheduled indicates service and unscheduled maintenance.

(c) Additional "on-equipment" actions include TOC. These are on-equipment technical order compliance actions. Additional "off-equipment" actions include bench checks, maintenance actions accomplished during bench check, shop, maintenance actions in the intermediate level shops, TOC, hours expended on TOC.

6. <u>Type of Maintenance Actions</u>

Maintenance action codes are contained in Attachment 5.

7. <u>Maintenance Manhours Produced by Type of Maintenance</u>

The integral system provides for an aggregation by weapon systems and by major commands for the determination of the number of maintenance manhours and actions that are chargeable to "on-equipment" for scheduled and unscheduled maintenance and for technical order compliance (TOC) as well as "off-equipment actions" and manhours chargeable to bench check, shop, and TOC. These are illustrated in RCS-5-LOG-K260 series of USAF, AFLC Reports.

8. Maintenance Manhours Produced by Type of Maintenance Action

Detailed maintenance actions are illustrated in Hq AFLC report RCS-3-LOG -K261. The maintenance manhours by an individual WUC at the component level becomes a printout for aircraft when that particular WUC constitutes 1 of 25 high manhour consumers at organizational and intermediate level of maintenance. Each of these 25 high manhour consumers are given a sequence number indicating its rank as a manhour consumer within a weapon system. In addition, the machine identifies each WUC that equals or exceeds a failure action or limit. These limits are established by depot technical specialists. The failure limit is the number of actions allowed for failure on a WUC before detailed management products are produced for analysis. Similarly, the action limit is the number of maintenance actions allowed for normal "wear and tear" on the WUC before detailed products are required for analysis. The actions would indicate inadequate performance, wearout, environment and faulty groups of the DOD How-Malfunction Codes. Exhibits of this data are contained in AFLC monthly reports RCS-2-LOG-K261 .

9. Bench Check Actions

Examples are shown in Attachment #6, 5 Sept '63.

10. Malfunction System

(a) The malfunction system is determined from a choice of nearly 1,000 how malfunction codes contained in Attachment 4, Failed Part/Component Condition Code, and provides an extensive differentiation of codes. These codes usually exceed the capability of technicians to distinguish among them. As far as many technicians are concerned, Code 242, Failed to Operate, and Code 374, Internal Failure, provide a choice without distinction. A component placed on a table for inspection by various technicians will be described by a wide range of how malfunction codes. The technician may well ask what is the difference between broken, burst, cracked, sheared, stripped, and torn. The use of hundreds of malfunction codes matched to a score of action taken codes produces a wide range of combinations whose impact is difficult to evaluate. A more practical and useful management tool would be the reduction of these combinations into meaningful and manageable groups. A computer directed program would assign each malfunction code into one of the following groups:

0 invalid

1 failure

2 inadequate performance

3 wearout

4 environment

5 faulty

6 no defect

(b) The computer would normally produce group malfunction data. If analysis of such data relative to a specific component, sub-system, or system warrants detailed study, a demand product can be obtained providing data on either individual or group how malfunction codes.

(c) The malfunction system should also be interpreted in light of the category of the WUC. This category would reflect first, whether or not the WUC was an item related to safety of personnel flight or operations, or secondly, whether the WUC was an item with an impact upon accomplishment of mission, or thirdly, whether it was in a general logistic category. Studies have indicated that failure of power plant, landing gear, flight controls, hydraulic systems, fuel systems, brakes and electrical systems have in this general order accounted for 90% of the major aircraft accidents caused by material.

(d) The failure of electronic components relates in many instances to over-stressing. Adequacy of design can reduce over-stressing and thereby extend the useful life of such components. Many electronic elements have relatively minor procurement cost, but in contrast high maintenance cost. In such instances, reliability consideration becomes increasingly more important in improving availability of systems.

11. Operating Time/Miles by T/M/S/C

Research may reveal more significant indicators of performance than operating time/miles by T/M/S/C. As an example, the number of landings are of greater significance in detailed performance of landing gear and tires than operating time of the aircraft.

12. Calendar Time

The relationship between degradation of material by calendar time, on the one hand, and operating time on the other, varies widely. To some items, calendar time is more significant than operating time. There is even lower performance as out of use time increases. Time change items that are calendar time items are of particular interest. With continuing improved material, improved processing, improved material properties, calendar time often diminishes in importance. However, environmental factors relating to corrosion, either chemical or biological, have important effects upon some of the military equipment.

13. <u>Metered Time of Components (if applicable)</u>

The systematic use of Elapsed Time Indicators provides the actual use time of a system, sub-system, or component. This actual time may be widely variant from the time of the weapon system on which such a system or component functions. As an example, the fire control system of an aircraft often exceeds the operating time of the weapon system because of frequent ground run-ups. Conversely, a secondary fuel pump will normally function only a fraction of the time of a weapon system. The determination of the system ratio or component operating time to the weapon system operating time will provide a co-efficient which more accurately reflects the reliability and maintainability of the system or component.

14. <u>Operational Ready Hours by Type/Model/Series/Class</u>

(a.) The DOD Instruction 7730.25, dated 1 June '54, Subject: Equipment Distribution and Condition (EDAC) - Statistical Reporting System, establishes a uniform reporting system to assist management in evaluating and improving effectiveness achieved by military departments in the use and support of equipment by performance of military missions. It also provides that each military department will establish standards of equipment readiness. The minimum standard to be established is the percentage of the equipment's <u>Operational Ready</u> status measured against equipment possessed to perform mission or function. Standards will be established on the basis of averages for a quarter year. For example, the average standard may be 75%, but not less than 70% at any one point in time. Standards in addition to the foregoing may be established for operational units based on type of equipment, unit mission and operational environment. For example, (a) Percentage of equipment - Not Operationally Ready - Maintenance measured against equipment physically in the possession of operational units. (b) Percentage of equipment - Not Operationally Ready - Supply measured against equipment physically in the possession of the operational unit.

(b) Operational readiness relates to the fact that modification contributes to it and performance of components, sub-systems and systems can be evaluated in terms of improvement in performance thru modification. This improvement would ultimately enhance equipment readiness, material readiness, and contribute to operational readiness. Modification may be considered also in terms of safety of flight of operations, change of mission items and modification considerations would include those that are consumers of manpower, those that have produced a high rate of aborts, those that have exceeded established failure and action limits.

15. Labor Force Assignment by Type of Labor

(a) In its broadest context, the labor force consists of numbers of personnel each with a skill level and a speciality. The skill level would range from the recruit to the most advanced technician. The speciality would include such things as electronics, pneudraulics and instruments. The requirements for the labor personnel are normally determined early in the development of personnel sub-systems and evaluated and refined during the category testing. RAND Corporation in a research study, RM-3370-PR, dated Nov '62, The Oxnard Base Maintenance Management Improvement Program, Chauncey F. Bell and T. C. Smith, developed a format to determine skill requirements by number and type and the impact upon operational readiness of deficiencies in personnel.

(b) The military services distinguish labor force by the following types: (1) Productive Direct Labor, identifies manhours expended on items of equipment, alert duty, operating/monitoring, maintenance TDY, plant/equipment maintenance. (2) Productive Indirect Labor, identifies manhours expended in support of controlling the maintenance activity such as manhours expended in management and supervision, maintenance administration, technical training and record keeping, tasks performed by staff agencies of the maintenance unit, maintenance meetings, transportation vehicle operation, travel time to and from job. (3) Production Delay, identifies manhours expended awaiting assistance, awaiting transportation, awaiting equipment, facilities, parts and items. (4) Duty Absence Labor, identifies absence from maintenance, but present for duty or non-maintenance TDY. Also manhours for military training, personnel inspection, commander's calls, squadron or other duties, athletic programs, and personnel processing. (5) Non-Duty Absence, identifies manhours expended for individuals who are not present for duty and are not on TDY. Included are manhours/leave, compensatory time off for over-time, excused from duty, personal affairs, confinement, AWOL and tardiness.

16. Labor Force Loss by Cause

Three factors contribute to the effectivity of the labor force. These three include: the type of labor, the number and the skill level and the specialities within each type. Personnel together with the material maintenance support combine to accomplish the maintenance tasks. Material support includes tooling, spares and repair parts, special facilities and technical data. The labor force loss by cause would include losses because of imbalance in productive indirect labor - too many chiefs and not enough Indians - production delay, duty absence labor and non-duty absence.

17. Labor Force Availability by Type of Labor

These data make the distinction between labor assigned to an operational unit and the labor force that is available. The reasons for discrepancy between assigned and available results from assignments to other duties not in the maintenance field or to production delays on duty absence labor or non-duty absence. Each of these activities not in the productive direct labor category represent a leakage and loss from the assigned labor force and should be carefully controlled. A ratio of available to assigned is an index of such control.

18. FSN of Component

The Federal Supply Number (FSN) of a component provides a service oriented unique number to obtain a component from supply sources, to lead to interchangeable or substitutable items for it, or to determine what repair parts or items are necessary to return it from a reparable to a serviceable status. However, under the current concept of program elements oriented toward the satisfaction of mission and system requirements, the FSN is a non-significant number which does not lend itself to aggregation within a component, sub-system, systems concept in determining its impact upon availability, reliability and maintainability of the weapon system.

19. Location of Organization

The accurate identification and location of an activity performing maintenance and reporting thereon has been a persistent problem. Each of the military have developed a code or series of codes to serve this basic purpose, but not necessarily to any general satisfaction. The problem of fixed, mobile, or semi-mobile activities has resulted in coding structures that have in turn relied on prefixes or suffixes to indicate change in location, organization, or status.

DOD Directive 5000.11, 7 December 1964, Subject: Data Elements and Data Codes Standardization Program", treats on the element of coding standardization. The Defense Organizational Entity Standards (DOES) Program presently under study and awaiting implementation may offer a workable solution for mobile unit identification.

APPENDIX E-1

WORK SPECIFICATION

FOR THE DEVELOPMENT OF AN

EQUIPMENT IDENTIFICATION CODING SYSTEM

CONTRACT NO. F33608-67-C-0001

Work Specification for the Development of an Equipment Identification Coding System

The School of Systems and Logistics will establish a research project for the purpose of developing a coding system criteria for the DoD which will facilitate the uniform identification of: (1) Weapon/Support System family groupings; (2) Specific Weapon/Support Systems within a grouping; (3) Sub-Systems of a given weapon/support system, and (4) Component hardware of the sub-system of a given weapon/support system.

The system will have the following characteristics:

1. The coding process will facilitate machine and/or computer analysis of maintenance management information as prescribed in the proposed DoD Directive enclosed as Attachment No. 1 as amended. (Exhibit E)

2. Be compatible with the Chart of Accounts Structure prescribed by Dod Directive 7220.14 to facilitate the generation of maintenance costing information at all levels of maintenance. (Attachment No. 2 not included)

3. Be compatible with the uniform DoD Research and Development System Work Breakdown Structure process to facilitate use of maintainability and reliability indices established in the Research, Development and Test Cycle of military hardware. (Attachment No. 3 not included)

It must be recognized that the military services currently have various methods of codifying and identifying hardware in their maintenance management information systems. Since these coding processes were developed independently by each service and at different points in time, they are neither uniform nor compatible. As a result, this project should make it possible to directly interchange data and experience information between the services or between the services and defense industries on like or similar type hardware. Additionally, it will be possible to compare either equipment performance or maintenance effectiveness between services.

The universal equipment identification coding system, when developed, will be utilized at all levels of maintenance and will provide the basic inputs for: (1) Maintenance Programming, (2) Functional Reviews of the Maintenance Program, (3) Maintenance Resource Management System Reporting, (4) Maintenance Cost Accounting, and (5) Equipment Configuration and Control.

APPENDIX E-2

PROPOSED DOD DIRECTIVE

MAINTENANCE MANAGEMENT INFORMATION SYSTEM

(MMIS)

PROPOSED DOD DIRECTIVE

SUBJECT: Maintenance Management Information System

References: (a) DOD Directive 3232.11, "DOD Maintenance Engineering Program", dated November 3, 1955

(b) DOD Directive 3232.2, "Electronic Equipment Failure Data Report System", dated February 23, 1956 (hereby cancelled)

(c) DOD Directive 4151.2, "Management of Depot Maintenance Activities",dated October 3, 1960

PURPOSE:

The purpose of this instruction is to establish a DOD Maintenance Management Information System which will facilitate quantitative assessment of Equipment Maintenance operations.

BACKGROUND:

Technological advances inherent in later type weapons and equipment together with the increased emphasis on higher equipment readiness rates and correspondingly reduced reaction times continues to increase the demand for maintenance funds, personnel,facilities, equipment and tooling. Accordingly, the DOD must place greater emphasis on management of the total maintenance function in order to attain more effective and efficient utilization of available resources. This objective must be emphasized by all levels of command within each service or agency.

APPLICABILITY:

This Directive is applicable to all levels of maintenance of equipment and materiel of all services and agencies. Any exceptions to requirements of this directive will be formally requested.

POLICY:

- Each military service will employ a uniform maintenance management system for Equipment Maintenance within their service.

- Maintenance data will be collected at the point of generation.

- Maintenance data will be collected in a manner which facilitates machine processing.

- Maximum use will be made of mechanized equipment in the processing and analysis of maintenance data.

- The responsibilities for management of the equipment maintenance function will be centralized to the extent feasible at each level within the command chain.

- The data elements and codes prescribed in this directive will be integrated into the maintenance management information system of each military service.

- Each military service will establish a point for the centralized accumulation, processing, mechanized analysis and publication of maintenance data products on an across-the-board basis.

- The OSD will establish a formal program of educating maintenance managers in techniques and methods of utilizing the information system included in this directive for management purposes. The respective military services will establish subsidiary formal maintenance management education program to assure full utilization of additional information peculiar to their respective operations and requirements.

USE OF THE MAINTENANCE DATA:

The maintenance data included in attachment #2 has been designed for the following uses by maintenance management when analyzed in accordance with attachment #7.

1. Measure equipment and weapon reliability levels and correlate with reliability levels established or predicted during the engineering development and test program. .

2. Measure equipment and weapon maintainability levels and correlate with predicted engineering maintainability criteria.

3. Validate technical training criteria and determine requirements for and the adequacy of O.J.T. Training.

4. Validate maintenance manpower requirements and the necessary skill level mix of the maintenance workforce.

5. Validate prescribed maintenance requirements at all levels (organization, field and depot).

6. Measure scheduled and unscheduled maintenance requirements for each type, model, or class category of equipment or weapon in the DOD.

7. Provide basis for factual determination of materials actually consumed in the maintenance process at all levels and for predicting future material requirements.

8. Provide quantitative data for determining maintenance resource requirements essential to sustaining weapons and equipment at varying degrees of rates of operational readiness.

9. Provide data essential to the development of factors for planning and programming future maintenance workloads by converting operating programs and force structure levels into maintenance requirements.

10. Provide basis for detecting the requirements for and the validation of equipment and weapons modification program requirements.

11. Provide for a continuing assessment of equipment and weapon maintenance demand rates.

12. Provide basis for validating equipment life expectancy and removal intervals.

13. Provide "feed-back" of data required in the establishment of improved criteria for maintainability and reliability characteristics in the design of future weapons and equipment required by the DOD.

MANAGEMENT BENEFITS TO BE REALIZED

Through the analysis and use of the information prescribed in attachment #2, maintenance management will be provided the basic data essential in the decision making process of improving the effectiveness of maintenance operations. The following principal results should be produced by the maintenance management information system

1. A factual portrayal of reliability and maintainability levels actually being realized as opposed to those which were predicted for the equipment or weapon during the engineering, development and test phase. When the degree of correlation between the two factors is out-of-limits further analysis will isolate the area(s) which are out-of-control and the reason(s) contributing to the condition which require management attention for solution.

2. Identify the unnecessary maintenance being accomplished on weapons and equipment in terms of resources consumed.

3. Validate the type manpower skills and the size of the workforce actually required to support weapons and equipment at predetermined rates of usage and deployment.

4. Factual portrayal of maintenance demand rates in terms of men and materials essential to support of each weapon or equipment category.

5. Reflect the productivity level of the maintenance workforce.

6. Identify specific weapon and equipment modification requirements that demand management attention to facilitate logistic support.

7. Correlate maintenance support requirements with equipment operational readiness rates.

8. Identify actual materials and parts used in the accomplishment of the maintenance process on specific weapons support systems and equipment commodity groups.

9. Identify unnecessary removal and replacement of time change components associated with specific weapons and support systems.

10. Provide a basis for establishing a balanced relationship between scheduled and unscheduled maintenance for specific weapons and support systems.

11. Provide realistic maintenance planning factors.

12. Identify the accuracy and adequacy of the maintenance requirements determination process.

13. Identify the adequacy of the returns or benefits being realized by maintenance from expenditures on technical training.

REPORTING REQUIREMENT:

Uniform Reporting to the OSD of maintenance management information in accordance with the system prescribed by this directive will be issued as an appendix to this instruction in the near future.

IMPLEMENTATION:

Appropriate instructions for the implementation of the policies and procedures prescribed herein shall be issued by the respective military services and agencies. Two copies of such instruction shall be submitted to the Assistant Secretary of Defense (Installations and Logistics) together with a time phased plan for implementation of the program.

7 Attachments

1. Definition of Terms
2. Minimum Data to be Collected or Known
3. Equipment Identification Codes
4. Equipment Failure/Malfunction Symptom Codes
5. Maintenance Action Codes
6. Not Reparable This Station/Ship Codes
7. Data Analysis Criteria

ATTACHMENT 1

DEFINITION OF TERMS

CONTAINED IN GLOSSARY

APPENDIX B

Attachment #2
5 September 1963

MINIMUM DATA TO BE COLLECTED OR KNOWN

TO BE COLLECTED

1. T/M/S/C of Weapon/Support/Control System Identification
2. Integral System Identification
3. Integral Sub-System Identification
4. Integral Component Identification
5. Type of Maintenance
6. Type of Maintenance Actions
7. Maintenance Manhours Produced by Type of Maintenance
8. Maintenance Manhours Produced by Type of Maintenance Action
9. Bench Check Actions
10. Malfunction Symptom
11. Operating Time/Miles by T/M/S/C
12. Calendar time
13. Metered Time of Components (If applicable)
14. Operational Ready Hours by T/M/S/C
15. Labor Force Assignment by Type of Labor
16. Labor Force Lost by Cause
17. Labor Force Available by Type of Labor
18. FSN of Component
19. Location of Organization

TO BE KNOWN

1. # of T/M/S/C Assigned
2. # of T/M/S/C Programmed
3. O.R. of T/M/S/C Programmed
4. Component Q.P.A.

AD-A039 961 OHIO STATE UNIV COLUMBUS DEFENSE MANAGEMENT CENTER F/G 5/1
THE CRITERIA FOR AN EQUIPMENT IDENTIFICATION CODING SYSTEM,(U)
1967 R E TRAPP, W P BERKELEY, A V EGERLAND F33608-67-C-0001

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ATTACHMENT 3

EQUIPMENT IDENTIFICATION CODES

APPENDIX A OF THIS STUDY

Attachment #4

FAILED PART/COMPONENT CONDITION CODE

PART I - Alphabetical Sequence

PART II - Numerical Sequence

NOT REPRODUCED

Attachment #5

MAINTENANCE ACTION CODES

A1	Scheduled Inspection
A2	Special Inspection
A3	Modification
A4	Reclamation
A5	Manufacture
A6	Servicing
A7	Repair
A8	Repair and/or Replacement of Attaching Units, Seals, Gaskets, Packing Electrical Connections, Wiring Circuits, Tubing, Hose Connectors, Fittings, etc.
A9	Equipment Checked-No Repair Required
B1	Bench Check and Repaired
B2	Bench Checked-Serviceable (No Repair Required)
B3	Bench Checked-Repair Deferred
B4	Calibrated-No Adjustment Required
B5	Calibrated-Adjustment Required
B6	Adjust
B7	Disassemble
B8	Assemble
B9	Removed
C1	Installed
C2	Remove and Replace
C3	Remove and Reinstall
C4	Remove for Cannibalization
C5	Replaced after Cannibalization
C6	Clean
C7	Deferred
C8	Test-Inspect-Service
C9	Trouble Shoot
D1	Paint
D2	Depot Inspection
D3	Depot Overhaul

Attachment 5

Attachment #6
5 September 1963

NOT REPARABLE THIS STATION OR SHIP CODES (NRTS)

1. Bench Checked-NRTS (Not Reparable This Station). Repair Not Authorized. This code will be entered when the shop is not authorized to accomplish the repair. This code will not be used unless the repair of the item is specifically prohibited by current technical directives.

2. Bench Check-NRTS-Lack of Equipment, Tools, or Facilities. This code will be entered when repair cannot be accomplished due to lack of equipment, tools or facilities. Lack of authorization for the required does not preclude use of this code.

3. Bench Checked-NRTS-Lack of Technical Skills. This code will be entered when repair cannot be accomplished due to lack of technically qualified people.

4. Bench Checked-NRTS-Lack of Parts. This code will be entered when parts are not available to accomplish repair.

5. Bench Checked-NRTS-SHOP Backlog. This code will be entered when repair cannot be accomplished due to excessive shop backlog.

6. Bench Checked-NRTS-Lack of Technical Data. This code will be entered when repair cannot be accomplished due to lack of maintenance manuals, drawings, etc., which describe detailed repair procedures and requirements.

7. Bench Checked-NRTS-Excess to Base Requirements. This code will be entered when repair will not be scheduled for shop repair due to item being excess to base requirements.

8. For Future Use.

9. Bench Checked-Condemned. This code will be entered when the item cannot be repaired and is to be processed for condemnation, reclamation or salvage. This code will also be used when a "condemned" condition is discovered during field maintenance disassembly or repair.

DATA ANALYSIS CRITERIA

1. Measure equipment and weapon reliability levels and correlate with reliability levels established or predicted during the Engineering Development Test Program.

INFORMATION	DATA
1. Identify T/M & Class Weapon	1. Identify T/M & Class Weapon
2. Identify System	2. Identify System
3. Identify Sub System	3. Identify Sub System
4. Identify Component	4. Identify Component
5. MTBMA	5. Total Maintenance Actions
	6. Maintenance Action (true)
	7. Type of Action Taken
	8. Malfunction Symptom
	9. Fleet Oper Time/Cal Time
	10. Time Meter (if applicable)
	11. Hr. O/R
	12. Each Removal (true)
	13. Bench-Check
	a. Shop Work Required
	b. NRTS

ANALYSIS

1. MTBMA

   a. By Weapon System

      (1) $\frac{\text{Total Oper Time/Cal Time}}{\text{True Maint Actions}}$ = Indicated Reliability

      (2) $\frac{\text{Total Oper Time/Cal Time}}{\text{Total Maint Action}}$ = Apparent Reliability

b. By System

(1) $$\frac{\text{Total Oper Time/Cal Time}}{\text{True Maint Actions}} = \text{Indicated Reliability}$$

(2) $$\frac{\text{Total Oper Time/Cal Time}}{\text{Total Maint Action}} = \text{Apparent Reliability}$$

c. By Sub-System

(1) $$\frac{\text{Total Oper Time/Cal Time}}{\text{True Maint Actions}} = \text{Indicated Reliability}$$

(2) $$\frac{\text{Total Oper Time/Cal Time}}{\text{Total Maint Actions}} - \text{Apparent Reliability}$$

d. By Component

(1) $$\frac{\text{Total Oper Time/Cal Time}}{\text{True Maint Actions}} = \text{Indicated Reliability}$$

(2) $$\frac{\text{Total Oper Time/Cal Time}}{\text{Total Maint Action}} = \text{Apparent Reliability}$$

2. MTBF*

a. By Weapon System

(1) $$\frac{\text{Total Oper Time/Cal Time}}{\text{\# of Shop Work Requirements + NRTS}} = \text{Apparent Reliability}$$

(2) $$\frac{\text{Total Hrs O/R (Weapon System}}{\text{\# of Shop Work Requirements + NRTS}} = \text{Apparent Reliability for Operational Readiness}$$

b. By System

(1) $$\frac{\text{Total Oper Time/Cal Time}}{\text{\# of Shop Work Requirements}} = \text{Apparent Reliability}$$

(2) $$\frac{\text{Total Hrs O/R (Weapon System)}}{\text{\# of Shop Work Requirements + NRTS}} = \text{Apparent Reliability for Operational Readiness}$$

c. By Sub-System

(1) $$\frac{\text{Total Oper Time/Cal Time}}{\text{\# of Shop Work Requirements + NRTS}} = \text{Apparent Reliability}$$

(2) $$\frac{\text{Total Hrs O/R (Weapon System)}}{\text{\# of Shop Work Requirements + NRTS}} - \text{Apparent Reliability for Operational Readiness}$$

*1. The USN will develop a similar program for vessels afloat.
2. The US Army will develop a similar program for operational field units.

d. Component

(1) $\dfrac{\text{Total Oper Time/Cal Time}}{\text{\# of Shop Work Requirement} \neq \text{NRTS}}$ = Apparent Reliability

(2) $\dfrac{\text{Total Hrs O/R (Weapon System)}}{\text{\# of Shop Work Requirements} \neq \text{NRTS}}$ - Apparent Reliability for Operational Readiness

Where predicted engineering data is not available, historical or statistical reliability levels should be used for comparison with indicated or apparent levels of reliability.

2. Measure equipment and weapon maintainability levels and correlate with predicted engineering maintainability criteria.

INFORMATION	DATA
1. T/M/S/C	1. T/M/S/C
2. MTBMA (true)	2. Each Maint Action
3. Maintenance Manhours/job	3. Fleet-Operating/Calendar Time
4. Hours O.R.	4. Maint Manhours - true by job
5. Total Maint Manhours	5. Maintenance Manhours - total
	6. Hours O.R.

ANALYSIS

1. $\frac{\text{Total Oper Time}}{\text{True Maintenance Manhours}}$ = Indicated Maintainability

2. $\frac{\text{Total Oper Time}}{\text{Total Maintenance Manhours}}$ = Total Maintainability

3. $\frac{\text{Hours/Operational Readiness}}{\text{True Maintenance Manhours}}$ = Indicated Readiness Maintainability

4. $\frac{\text{Hours/Operational Readiness}}{\text{Total Maintenance Manhours}}$ = Total Readiness Maintainability

Where predicted engineering data is not available, historical or statistical reliability levels should be used for comparison with indicated and total maintainability levels.

3. Validate technical training criteria and determine requirements for and the adequacy of OJT Training.

INFORMATION	DATA
1. Maintenance Manhours consumed by System	1. Maintenance Manhours per Job
2. Components Within Each System consuming more than One Manhour Per Unit of Equipment	2. Number of Jobs by Different Action Taken

ANALYSIS

This analysis is based on the assumption that a training program to include "on-the-job-training (OJT)" is in operation at all levels of Maintenance and at all locations.

1. Increasing, decreasing or (a lack of) trends in meantime to fix will determine adequacy of OJT. This should also be evaluated against manufactures actual test data when available.

2. Technical training program should be adjusted to concentrate on high meantime to fix components and systems.

3. Analysis of existing weapons systems should be made to develop technical training programs for new equipment of a similar nature scheduled for entry into the inventory.

4. Validate maintenance manpower requirements and the necessary skill level mix of the maintenance workforce.

INFORMATION	DATA
1. Mission Requirements	1. T/M & Class of Equipment
a. Operating Hrs/Calendar Time	2. Manhours Per Job
b. Sorties	3. Type of Maintenance
c. Degree of readiness required by type of equipment	4. Component Identification
	5. Indirect and Lost Manhours by Cause*
	6. Mission Requirements
	a. Operating Hours
	b. O/R Rates

2. Maintenance Manhours Produced on W/S by:

    a. Type of Maintenance (Scheduled vs Unscheduled)

    b. System - Job Identification

3. Maintenance Manhours Lost to Maintenance by Cause*

    a. Leave

    b. Sick

    c. Squadron

    d. Administrative Duties

    e. Other

4. Predetermined Productivity of Available Labor Force:

    a. Each Service and Separate Agency will establish appropriate goals

    b. Allow for Expansion in Emergency

*Not applicable to USN vessels afloat and US Army operational field units.

4. continued

ANALYSIS

1. Analysis of "3" above will determine planned and programmed lost maintenance manpower. (approximately 20%)

2. Analysis of "4" will determine amount of manpower required to be productive.

3. Analysis of "3" and "4" with "2" will determine manpower to be assigned by skill type.

4. Analysis of "2" with "1" will determine direct manpower requirements to meet changing mission requirements.

5. Direct manpower requirements X indirect manpower factor + direct manpower requirements = total manpower requirements.

5. Validate predetermined maintenance actions required at all levels (organization, intermediate and depot).

INFORMATION	DATA
1. Identify predetermined maintenance requirements by:	1. Item Identification
a. Item	2. Type of Maintenance
(1) Type of maintenance action	3. Action Taken
(a) Inspection for preventive maintenance	4. Maintenance Manhours by Job
b. Time/Usage Change	5. Operating Time
2. Operating Time	6. Calendar Time
3. Calendar Time	
4. Identify all Maintenance Actions	

ANALYSIS

1. Predetermine percent of maintenance manhours spent on inspection vs percent of maintenance manhours spent on fix.

2. Identify maintenance manhours by:

   a. Look

   b. Fix

   c. Time/Usage Change

3. $\frac{\text{Operating Time/Cal Time (fleet)}}{\text{\# of Fix (by items)}}$ = True Maintenance Occurrence Interval

4. Identify Time/Usage Actions vs True Maintenance action by each Time/Usage Items. (There should normally be some degree of failures before expiration of time)

5. $\frac{\text{Operating Time/Calendar Time}}{\text{\# of True Maintenance Action on Time/Usage Item}}$ = True maintenance occurrence interval for Time/Usage Item

6. Prescribed preventative maintenance requirements will be based upon the above analysis. Safety requirements may be added.

6. Measure scheduled and unscheduled maintenance requirements for each type, model or class category of equipment and weapon.

INFORMATION	DATA
1. Identify scheduled maintenance by end item	1. Item Identification
a. Preventive Look	2. Manhours per Item
b. Time/Usage	3. Action Taken
c. Fix	4. T/M & Class
	5. Type of Maintenance
	a. Scheduled
	b. Unscheduled
2. Identify unscheduled maintenance by end item	

ANALYSIS

1. Identify by T/M or Class by end item

   a. Why action performed

      (1) by scheduled

      (2) by unscheduled

   b. Maintenance Manhours

      (1) by scheduled

      (2) by unscheduled

2. Each service should determine the proper ratio of scheduled to unscheduled maintenance manhours on its respective equipment. This ratio may change as the experience is gained in the use and maintenance of the equipment.

7. Provide basis for factual determination of materials actually consumed (used) in the maintenance process at all levels and for predicting future material requirements.

INFORMATION	DATA
1. End item usage by maintenance at each level	1. Bench Check - Action Taken
	2. FSN
a. Base - include condemned and NRTS	3. Item Identification
b. Depot - includes condemned only	4. Organization Location
2. Bit and Piece (Repair Part) Usage by	
a. Base	
b. Depots	
c. Other Levels as Applicable	

ANALYSIS

1. Central processing of FSN of action taken at all levels of maintenance will identify:

a. Actual usage (condemned only)

b. Support requirements (Base NRTS to higher echelon will determine quantity to support NRTS)

2. Central processing by item identification by action taken will show total usage of all FSN's for same item.

8. Provide quantitative data for determining maintenance resources requirements essential to sustaining weapons and equipment at varying degrees of rates of operational readiness.

DEFINITION

Resources are:

a. Labor Force

b. Component Spares

c. Support Equipment

NOTE: See questions 8A, 8B, and 8C.

8A. Labor Force

INFORMATION

1. Mission Requirements:

   a. Operating Hours

   b. Sorties

   c. Degree of readiness required by type of equipment

DATA

1. T/M & Class of Equipment

2. Manhours per Job

3. Type of Maintenance

4. Component Identification

5. Indirect and Lost Manhours by Cause*

6. Mission Requirements

   a. Operating Hours

2. Maintenance Manhours Produced on W/S by:

   a. Type of Maintenance (scheduled vs unscheduled)

   b. System = Job Identification

3. Maintenance Manhours Lost to Maintenance by Cause*

   a. Leave

   b. Sick

   c. Squadron

   d. Admin Duties

   e. Other

4. Predetermined Productivity of Available Labor Force:

   a. Each Service and Separate Agency will Establish Appropriate Goals

   b. Allow for Expansion in Emergency

ANALYSIS

1. Analysis of "c" above will determine planned and programmed lost maintenance manpower. (approximately 20%)

2. Analysis of "d" will determine amount of manpower required to be productive.

*Not applicable to USN vessel afloat and US Army operational field units.

8A. continued

3. Analysis of "3" and "4" will determine manpower to be assigned by skill type.

4. Analysis of "2" with "1" will determine direct manpower requirements to meet changing mission requirements.

5. Direct Manpower requirements X Indirect Manpower Factor + Direct Manpower Requirement = Total Manpower Requirements

8B. .Component Spares

INFORMATION

1. Identify Component
2. Usage by Component at Operating Level
3. Mission Requirements
4. O/R Requirements

DATA

1. Item Identification
2. Bench Check Action Taken
3. Operating Hours/Mileage/etc
4. O/R Rate by T/M or Class
5. Mission Requirements

ANALYSIS

1. Identify NRTS and condemnations by
   a. Component
   b. By Level
2. $\frac{\text{Operating Hours, etc}}{\text{NRTS} \neq \text{Condemnation}}$ = Current Rate of Requirements (Usage)
3. Change in O/R requirements may change equipment requirements.

   Example: Increased target assignment may increase number of units of equipment which will increase number of operators which will increase operating hours.
4. Current Rate of Requirements (Mission Factor) = # of Spares to be used.

8C. Selected Support Equipment

INFORMATION

1. Identification of Support Equipment
2. O/R of Support Equipment
3. # of Support Equipment Assigned
4. O/R Goal of Assigned Systems

DATA

1. Identification of Support
2. O/R Rates of Equipment
3. # of Support Equipment Assigned
4. O/R Rate of System
5. O/R Goals

ANALYSIS

1. Identify type of equipment
2. $\frac{\text{(O/R Rate of Equip) (\# of Equip Assigned)}}{\text{O/R of Systems}} =$ O/R Goal of Systems (%)
3. $\frac{X}{\text{O/R Goal (\%)}} = \frac{Y}{100\%}$
4. "X" will be the number of equipments required today.
5. "Y" will be the number of equipments required for "D" day.

9. Provide data essential to the development of factors for planning and programming future maintenance workloads by converting operating programs and force structure levels into maintenance requirements.

INFORMATION	DATA
1. Maintenance Manhours Produced	1. Productive Maintenance Manhours at all Levels
2. O/R Rates	2. O/R Rate
3. # of Systems Assigned	3. # of Systems Assigned
4. # of Systems Programmed	4. # of Systems Programmed
5. O/R Rate Programmed	5. O/R Rate Programmed

ANALYSIS

Based on linear relationship of (increasing or decreasing) rates.

1. $$\frac{\text{Maint Manhours Produced}}{\text{\# of Systems Assigned}} = \frac{X}{\text{\# of Systems Programmed}}$$

2. $$\frac{X}{\text{Existing O/R Rate}} = \frac{Y}{\text{O/R Rate Programmed Change Force Structure}}$$

3. "X" = Direct Maintenance Workload of Changed Force Structure at Existing O/R Rate

   "Y" = Direct Maintenance Workload of Programmed Force Structure and/or Programmed O/R Rates

4. "X" and/or "Y" times overhead and non-productive factors will give indirect maintenance workload

5. #3 + 4 = Total Maintenance Workload

10. Provide basis for detecting requirements for and validation of equipment and weapons modification requirements.

Based on assumption that modifications are primarily for increasing Operational Readiness.

INFORMATION

1. Maintenance Manhours by:
    a. T/M and Class of Equipment/Weapon
        (1) System
        (2) Sub-System
        (3) Component

DATA

1. Identification of Equipment/Weapon by T/M or Class
2. Systems Identification
3. Sub-System Identification
4. Component
5. Direct Maintenance Manhours Produced by Oper Level

ANALYSIS

1. Safety and change of mission modifications requirement must be separately identified.

2. Identify Equipment/W/S by T/M or Class by:
    a. System
    b. Sub-System
    c. Component

High consumers of manpower (hi-25)

Modification required on and restricted to components consuming more than one direct maintenance manhours per unit of equipment per month.

11. Provide for a continuing assessment of equipment and weapons maintenance demand rates.

DEFINITION: Maintenance demand is

a. Labor Force

b. Materials

11A. Labor Force

INFORMATION	DATA
1. W/S/C System	1. W/S/C System Identification
2. Direct Maintenance Manhours	2. Direct Maintenance Manhours
3. Total Maintenance Manhours	3. Total Maintenance Manhours
4. Level of Maintenance	4. Organization Location
5. # of Equipment in Inventory	5. Inventory by W/S/C System

ANALYSIS

1. $\dfrac{\text{Direct M/H by W/S by Level}}{\text{Inventory}}$ = Direct Maintenance M/H Demand Rate

2. $\dfrac{\text{Total M/H by W/S Level}}{\text{Inventory}}$ = Total Maintenance M/H Demand Rate

11B. Materials

INFORMATION	DATA
1. T/M and Class of Weapon System	1. Identification of T/M & Class
2. T/M and Class of Support Equipment	2. Component Identification
3. Component Identification	3. Bench Check Action Taken (NRTS)
4. Operating Time/Cal Time of Weapon/Support System	4. FSN of Usage Items (NRTS and Condemned)
	5. Organization Location
	6. Operating Time/Cal Time

ANALYSIS

This analysis is based on the concept of:

All on base (operating level) spares assets are serviceable.
(exception - awaiting parts)

1. By T/M and Class and Component

   a. FSN by:

      (1) # NRTS by Level

      (2) # Condemnation by Level

      (3) # Repaired Items by Level

2. $\frac{\text{Operating Time/Calendar Time}}{\text{1 a(1) or (2) or (3)}}$ = Respective Rates

12. Provide basis for validating equipment operating life expectance and removal intervals.

INFORMATION

1. T/M and Class of Weapons and Equipment
2. Operating Hours of Weapons and Equipment
3. Component Identification
   a. Operating Time if Metered

DATA

1. # of Operating T/M and class of Weapon and Equipment
2. Q.P.A. (Quantity Per Application)
3. Fleet Operating Time
4. # of Bench Checks-Requiring Removal of Item
5. # of Bench Checks - Condemned
6. # of Bench Checks - Rebuild

ANALYSIS

1. Removal Interval

   a. (Equip Operating Hrs) (# of Equip) (Q.P.A) = "X"

   b. $\dfrac{X}{\text{Bench Check Action "Removal"}}$ = Removal Rates

   c. $\dfrac{X}{\text{Bench Check Action Condemned}}$ = Operating Life Expectancy

13. Provide "feed-back" of data required in the establishment of improved criteria for maintainability and reliability in the design of future weapons and equipment.

INFORMATION

1. T/M and Class of Weapons and Equipment
2. Identify Systems
3. Identify Sub-Systems
4. Identify Components
5. Operating Time of Weapons and Equipment
6. Quantity of Weapons and Equipment

DATA

1. Identification of Weapons
2. System Identification
3. Sub-Systems Identification
4. Components Identification
5. Operating Time
6. True Maintenance Actions
7. Action Taken to Facilitate Maintenance
8. Maintenance Manhours by Action Taken
9. Bench-Check Actions

ANALYSIS

1. MTBMA by T/M and Class

   a. $\frac{\text{Fleet Operating Time}}{\text{\# of True Maint Actions}}$ - MTBMA

   b. # of Equip vs Manhours to Facilitate Maint by System, Sub-System, Component

   c. # of Equipment vs True Maint Manhours by System, Sub-System, Component

   d. $\frac{\text{Fleet Operating Time}}{\text{\# Bench Check Rebuilt \& Condemned}}$ = Operational Maintainability

   e. $\frac{\text{Fleet Operating Time}}{\text{\# Bench Check Rebuilt \& Condemned}}$ = Service Reliability

   f. $\frac{\text{Fleet Operating Time}}{\text{\# Bench Check-Removals}}$ = Operational Readiness Reliability

EICS/WBS PROJECT NOVEMBER 1966

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
		1	2 Interview with Dr. Black, OSU School of Commerce	3 Interview with Dave Smith, OSU School of Commerce	4 Interview with Mr. Bob Fishback AFLC - MCM Mr. Ted Hill AFLC - MCMSA
	7	8	9	10	11
	14	15	16 AAIE Seminar-Simulation Application	17	18
	21	22 Interview with Dave Smith, OSU School of Commerce	23 Interview with Dave Smith, OSU School of Commerce	24	25
	28	29 Interview with Dr. Shahin OSU/DMC	30		

EICS/WBS PROJECT DECEMBER 1966

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
				1	2
	5	6 Interview with Mr. John Dunn ASD (I & L)	7 Interview with Mr. Guy Wickham, Dept of Army:DCS LOG Col Kalodzey, DME L/Col Shippey MSDO/Bolling AFB	8 Interview with J. O'Donnell, Capt USN Mr. Wilkinson, USN/ONM Main Navy Bldg	9 Interview with Mr. Cousins, Frank Fagansohn Mr. Banco, HQ AMC Wash. Mr. John Dunn Mr. John Taylor ASD (I & L)
	12	13	14	15 Interview with Mr. R.O. Borland (MCMPC) AFLC	16
	19	20 Interview with Mr. E.W. Marshall (MCCAC) AFLC	21	22	23
	26	27	28	29 Telephone Interview with Mr. Wilkinson, USN 3M Proj. Office **Ref. EIC rationale for Ships Maint.**	30

EICS/WBS PROJECT

JANUARY 1967

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	2	3	4	5	6
	9	10	11	12	13
	16	17 USMC, Quantico Va. Col H.G. Gunter LtCol Swinford LtCol Conway Maj Washington	18 USN Wash, D.C. J. O'Donnell, Capt USN Mr. Dennicoff Mr. Wilkinson	19 USAF/Wash D.C. Col Kalodzey LtCol Walters Col Fuhrmeister LtCol Lilly U.S. Army DCS/LOG Col Wilder	20 U.S. Army/AMC Mr. Baldwin Mr. Dockery Mr. Dill Col Hughes ASD (I & L) Mr. Taylor/Mr. Dunn
	23 Dr. Gordon Shahin OSU/DMC	24 Phone Interview Mr. Kessler HQ USAF/AFGOA	25 Dr. M. Dennicoff ONR	26	27
	30	31 Mr. R.F. Semler ASD/SEPDT			

EICS/WBS PROJECT

FEBRUARY 1967

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
			1 U.S. Army Maint. Bd Ft. Knox, Ky. Col Hughes, USA and Staff	2 Interview with Col Hughes Col Tyner Mr. Whitehouse Mr. Ray U.S. Army Maint. Bd	3 Interviews Mr. Blacklock U.S. Army Maint. Bd Mr. Thornton Mr. Poole Lexington ADC
	6	7	8 Mr. Morrel, MCMTC AFLC/	9	10
	13 Phone Interview Maj. Mezzack Electronic Compati- bility Analysis Center (ECAC)	14 Interview with Mr. Messer Mr. Whippe (ECAC)	15	16 Mr. I.J. Kessler AFGOA Mr. A.W. Dallas Mr. Eugene Brown Air Transport Association	17 Mr. Rich Baldwin AMC Dr. M. Denicoff Col Chas. Ellis AFAMA
	20	21	22	23	24
	27	28			

EICS/WBS PROJECT

MARCH 1967

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
			1	2	3
	6	7	8 Tele Con. J. O'Donell, Capt USN Re: Design Code	9	10
	13	14 DLSC Battle Creek, Mich. Col. Cornell Pope Mr. C. R. Niemann Mr. H. R. Nichols Mr. R. J. Zaborski	15 DLSC Mr. K. F. Wead Mr. G. C. Callan	16 Army Tank and Automotive Center (ATAC) Maj. R. L. Berquist Mr. M.E. Allshouse Mr. R. L. Swint Mr. G. C. Kelt	17
	20	21	22	23 USN Weapon Station Concord, Calif. Mr. James H. Flesher	24 OMMIC Ordnance Maint. Management Info Cente R. Hobdon, Lt. USN Mr. Cusimono Mr. Dwight Thomas
	27	28	29	30	31